

STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

For forty-eight years—IRON TRADE REVIEW

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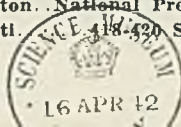


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As the Editor Views the News

SIGNS of a tremendous spurt in industrial activity are developing rapidly. During the last two weeks of February world demand for iron and steel scrap and for certain grades of finished steel increased noticeably. Prices are mounting sharply. This pending urge for greater production has been transmitted all the way to the ore mines, with the result that in the United States (p. 23) iron ore producers with associated vessel interests on the Great Lakes announce that all of the available cargo space for the 1937 season has been engaged. In other words, the ore movement will be limited only by the ability to haul it.

• • •

This unusual situation rises from a multiplicity of factors. One is the accelerated tempo of armament preparations in Europe and Asia. Another is the sharply increasing cost of production in the United States, caused by steadily mounting wages (p. 25) and the growing burden of relief and "social security." The result of these and numerous other influences is an upward spiral of demand and prices which is developing too rapidly for comfort. The situation is approaching the point where speculative influences are likely to be encouraged, and if such are permitted to gain too much headway, the day of reckoning will come all too soon.

Pace Too Fast For Safety!

In some quarters it is argued that strikes serve as a brake to a too-rapidly developing business expansion. It is true that labor unrest, such as that prevailing today, reduces the purchasing power of employes and thus tends to chill the demand for consumer goods. But at the same time, the interruptions to production caused by strikes, not only serves to increase the cost of producing goods but also often causes manufacturers to increase purchases of material in order

Price Situation Bears Watching

to anticipate delays of shipments. These two factors are inflationary in influence, and it is debatable as to what extent they offset the deflationary effect of strikes on consumer purchasing. Now that some wage scales are tied definitely to fluctuations in the cost of living, the effect of artificial or unusual influences upon commodity prices assumes considerable importance.

• • •

The experience of a midwestern railroad shop in cutting plates for repair work on steel freight car bodies should be of interest to scores of plate and sheet fabricators. The railroad "Stack Cutting" has developed "stack cutting" (p. 44) to a status of noteworthy economy. Plates are stacked upon jigs to a predetermined height. Pneumatic clamps are applied to hold the plates close together, after which the oxyacetylene torch of the cutting machine is guided automatically by a full-sized template. The operations of loading, clamping, cutting and unloading have been refined to a smooth routine. The result is the economical production of cut plates and a substantial saving in the salvage value of the left-over material.

• • •

Dr. Paul D. Merica, in presenting the Howe Memorial lecture at the recent meeting of the A. I. M. E. (p. 53), submitted information regarding the gray iron foundry industry which signifies remarkable progress. Of the 3500 iron foundries operating in the United States, 1000 are users of alloys for a part of their production. Dr. Merica estimates that the output of gray iron castings in 1936 was 10,000,000 tons, of which about 1,000,000 tons represented alloy iron castings. Approximately half of the alloy gray iron goes to the automobile industry. Twenty years ago, best quality gray iron had a tensile strength of 15,000 to 20,000 pounds per square inch. Today it is possible to obtain tensile values of from 70,000 to 80,000 pounds. Gray iron foundries rate a high compliment for their achievements!

Iron Founders Deserve Credit

E. L. Shaner



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The Key to Immediate Steel

The Ryerson Stock List is your guide to the largest and most diversified stocks of steel in the country. It shows sizes, weights, extras and other information useful to the steel buyer. In it you are sure to find the kind and quality of material best suited to your needs. And the Ryerson organization will cut, form or do whatever is required and deliver the steel and allied products in record time.

There is a special edition for each of the ten Ryerson plants. The book featuring the stocks of our plant nearest you will be mailed shortly. If you do not receive it in a few days, please let us hear from you.

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RYERSON STEEL-SERVICE

World Steel Demand Backing Up to Ore

Mines; Rush for Lake Cargo Space

WORLD-WIDE demand for iron and steel scrap, heavy exports from this country, and mounting prices are likely to have an important effect on Lake Superior iron ore and the Great Lakes vessel situation this season.

With higher prices of scrap, more iron ore is being used in blast furnaces. Before the winter is over and direct-ore shipments begin again it is estimated that ore reserves at lower lake docks and furnaces will be 10,000,000 tons less than normal.

Cheapest scrap for blast furnace use is selling in Pittsburgh today at \$14 a ton, compared with \$4.50 to \$4.80 for standard lake ore.

The most conservative interests in

the industry last week were forecasting that the ore movement this season "will be limited only by our ability to haul it down the lakes."

Two weeks ago some producers were predicting 55,000,000 tons; late last week estimates ranged from 60,000,000 tons up to the full capacity of the fleet. This capacity will depend upon how soon the vessels can start, and how late they can operate. In 1929 shipments totaled 66,157,359 tons; in 1936, 45,200,000 tons.

An unusual situation had developed by last week when the ore producers with associated vessel interests announced that all their cargo space for the season was engaged. A shortage of vessel capacity is ex-

pected to manifest itself early in the season. An advance in vessel rates is anticipated.

An increase in ore prices is being considered. These prices have remained unchanged for eight years. Operating costs have risen 35 cents a ton since last season. To this will be added any increase in vessel rates; and on top of this, some operators last week were quite sure that another wage advance will be made this season.

The only inquiry in the open market at present is that from the Ford Motor Co. for 315,000 tons, the usual request for prices from all the producers, after which it buys from one or two interests, according to its requirements. This tonnage has practically no effect on the market.

While ore prices have remained stationary for years, basic pig iron has moved up from \$14, valley, in 1932, to \$21.50, including the dollar increase last week. Heavy melting steel scrap at Pittsburgh has advanced from a low of \$8.25 in 1932 to 1933 to \$19.75.

Scrap has been assuming an increasingly important position in



RAW MATERIALS IN THE SPOTLIGHT:
"Our lake ore movement this year will be limited only by the capacity of our vessels," say leading shippers. They attribute the increase in demand largely to the heavy shipments and high prices of scrap



world markets, not only for domestic use but as an article of international trade.

Japan, Italy and Great Britain have been important buyers from this country, with others participating in smaller degree. The accompanying chart shows the tremendous increase in scrap exported from the United States, especially in the past five years. With inadequate facilities in many countries for conversion of iron ore into pig iron, scrap is the raw material for steelmaking and the United States has offered a reservoir from which tonnage could be drawn.

Scrap tonnages bought for export are backing up at Atlantic ports because of delayed arrivals of ships and some embargoes have been laid by railroads to avoid further congestion.

A temporary embargo by railroads serving Boston and Portland, Me., has been caused by accumulation of 20,000 tons on cars for which no ships are ready. About 1000 cars loaded with scrap have accumulated at Port Richmond, near Philadelphia, and need of railroads for cars may cause an embargo to stop further movement of material until the present tonnage has been unloaded.

Various restrictive measures have been taken by several European countries to conserve their domestic scrap supplies, the latest being Great Britain. Within a fortnight an agreement has been entered into between the British Iron and Steel federation and the National Federation of Scrap Iron and Steel Merchants, providing "for the supply of all available scrap at economic prices because of urgent need for conservation of raw materials to meet the

general demand for steel, including government requirements."

A result of this agreement is expected to be the immediate release of scrap which may have been held in reserve in anticipation of a rise in prices. It also is believed it will be possible to stop for the most part sales by speculative holders to foreign buyers, which recently have been increasing the shortage of supplies available to British industry.

While such action in the United States would be unprecedented, at least in peace times, exports of scrap have been such as to impose difficulties on domestic consumers and some restrictive measure to limit exports may be the ultimate effect of the resulting shortage.

Whether as a direct result of heavy war preparations in Europe, or simply an outcropping of long-delayed requirements, a world demand for steel has developed to a point where practically all long-established currents of the steel and iron movement between countries have been disrupted, and efforts are being made to establish new connections.

All Look to United States

The United States, from its position as the largest producer of pig iron and steel, is coming more and more to the fore as the hope of the rest of the world for supplying its needs.

Under former conditions European countries relied largely on exports to keep their mills and furnaces busy. So important was this outlet that the European steel entente was formed to parcel out steel export tonnage so that all should receive a share in proportion to productive ability. At the same time India shipped

considerable pig iron to the Pacific coast in competition with domestic iron and European pig iron competed on the Atlantic seaboard.

Now, all this has changed. Great Britain is seeking heavy shipments of semifinished steel from Belgium and other Continental countries, and Japan seeks all the pig iron that can be supplied by India. Countries outside Europe are unable to obtain tonnage from their usual sources and are turning to the United States.

Both India and Japan are increasing their production facilities, several new rolling mills being under way in these countries. At the same time caution is being used not to expand productive capacity beyond needs, in fear that present heavy demand is not based on lasting factors. The government of India has issued a cautionary statement warning against too great optimism and the European steel entente has not yet reached the conclusion that the present demand is sufficiently permanent to justify radical revisions upward in production quotas assigned the various member countries.

Heavy foreign demand for all forms of iron and steel continues to be noted at New York, with export price levels steadily advancing. Premiums are being paid in many instances. With the possible exception of tin plate there are no offerings at under the domestic market. Plates, shapes and bars have been established strongly at the domestic market prices as minimum.

In tin plate, the export concession is still being officially quoted although this is nominal. This price of \$4.72 applies only to shipments in the current quarter and sellers generally do not have any more material available. On future shipments the official market is up 6 cents, progressively for each three months, but higher than this scale is being quoted in some instances, especially where credit arrangements are less favorable than normally required. Tin plate inquiry is appearing in New York from practically all countries, including some which never before have been in this market.

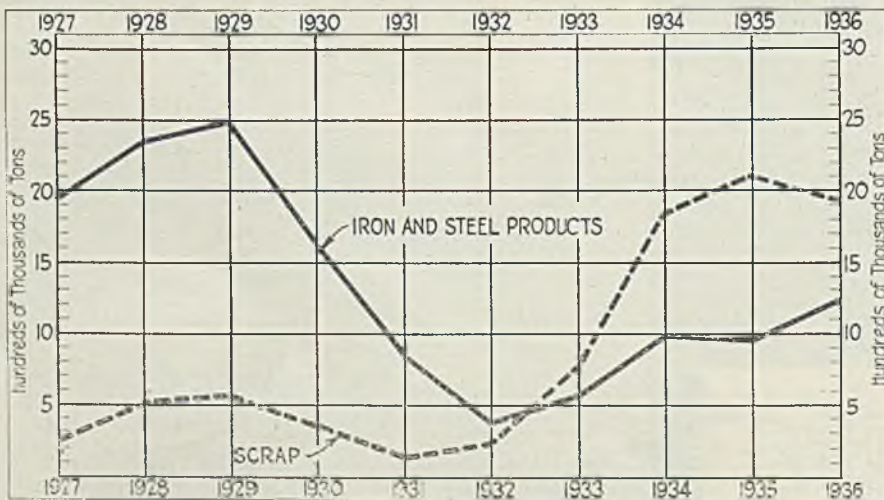
DUAL FACTORS PUSHING UP COAL, COKE OUTPUT

Coke and coal production in western Pennsylvania continues at a high rate, due to exceptionally heavy industrial demands and the desire of consumers to be covered in the event of possible disruptions from labor controversies.

Total output of soft coal in the week ended Feb. 13 was estimated by the bureau of mines at 10,065,000 tons, an increase of 2.7 over the preceding week.

All the beehive coke capacity

How Scrap Has Outdistanced Manufactured Steel Exports



EXPORTS of scrap and manufactured iron and steel products have reversed their positions in the past decade, scrap assuming the leading position with a sharp rise from 1932. Relative positions in gross tons are shown, covering the past ten years

available for use without too extensive repairs is in operation at present, including more than 3120 independent ovens. In the Connellsville, Pa., district coal and coke production so far this year has been well ahead of the comparable period last year. In 1936 coal production in the district showed a gain of 60 per cent over 1935, while coke production increased 150 per cent.

Many consumers have not been able to build up the stocks they desire because of the heavy demand for current use, but some are estimated to have supplies ranging from six to ten weeks ahead and a few are covered three months ahead.

It is reported there will be no let-up in production until April 1. After that the outlook depends upon the outcome of the negotiations now on between the United Mine Workers and the operators.

The present situation has prompted one Pittsburgh coal official to assert, "It is quite possible that between now and the first of April producers will be unable to supply demands from new sources. If this occurs, a material stiffening in market price levels may come about."

Proposes \$2,500,000 To Enlarge Engineering School

A five-year plan for expanding the physical facilities of the Columbia university school of engineering at a cost of approximately \$2,500,000 is outlined by Dean Joseph W. Barker in his annual report.

It calls for constructing two buildings to "care for the technical advances which have been made in the various fields of engineering in the past three decades".

Wage Advance Considered; Weir Answers Professors

ANOTHER wage advance in the steel industry was under consideration last week. Some independent steel makers frankly stated that they are negotiating an increase with their employe representatives. Intimations came from reliable sources that a 40-hour week may be adopted, although these lacked official confirmation.

In Pittsburgh, E. T. Weir, chairman, National Steel Corp., issued a statement replying to the recent report by Dr. Ralph J. Watkins, director, bureau of business research, University of Pittsburgh, summarizing a survey of the economics of the iron and steel industry financed by the Falk Foundation, Rockefeller Foundation and Brookings Institution. Past experience with national labor unions, he declared, have led "to a deep distrust of these unions."

"I am a member of the board of managers of the Falk Foundation, but in this statement I am not seeking to commit any of the other members of the board," he said. "I speak as a steel man and as an individual.

"As Dr. Watkins' address expressed the opinions of individuals on controversial subjects, it showed—in fact, as Watkins carefully pointed out—that it was not the pronouncement of any scientific body, nor did it carry any indorsement by anyone except the author.

"It is the first time, to my knowledge, that opinions of such a con-

troversial nature were ever published under the name of any research body with the qualifications expressly stated that the entire responsibility for each opinion rested in one case on two men and in the other on one man.

"After the facts are assembled, it is the usual practice in such a project to have the entire organization study all of the data to determine the judgment of the group, before presenting any conclusions. Any other method would deprive the conclusions of all weight except that given by the reputation and ability of the one man who may write any given section of the report. . . .

"Can there be any doubt that these proposals would lead in the commercial field to paralysis of efficiency, initiative and service, and in the labor field to domination by irresponsible labor overlords who have a major interest in their own organization and only a minor interest in the good of industry and in the welfare of employes?"

"A monopoly recommendation is based on the premise that the economic nature of the steel industry forces it to be monopolistic, that it now acts as a monopoly and therefore the only solution is for the government to regulate it. This charge of monopoly is apparently supported solely by the statement that price policies of the industry indicate that there is no competition.

Absence of Competition?

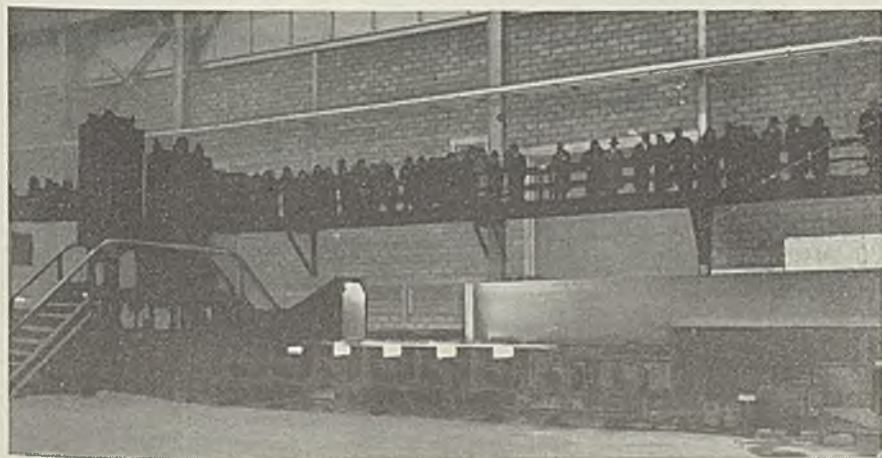
"This statement as to the absence of competition in the steel industry is far from the facts in the case. Some 30 years ago one steel corporation manufactured 60 per cent of the ingots produced. Today, despite the fact that it has grown steadily, it is manufacturing about 35 per cent. During this same period new companies have been created and companies once small have grown large. Today there are at least 10 major companies in the country.

"If there has been no competition in the steel industry where would new companies find the opportunity to start and small companies to grow? If there is no competition now, how do small companies maintain their positions?"

"National Steel Corp. is a tangible proof of the existence of competition. It started 30 years ago as a small finishing plant: now it is one of the large integrated companies of the country. It grew and lived by competition. One like myself whose life has been lived in the midst of this competition finds it difficult to see how theorists can come to such a conclusion.

"It is equally difficult to conceive the basis of facts and figures from

Semicontinuous Plate Mill Attracts Many Visitors



CARNEGIE-ILLINOIS STEEL CORP.'S semicontinuous plate mill at Homestead, Pa., formally opened last month, is still an object of great interest to visitors. Many groups are taken through the mill each week. From the walkway they have a good view of the mill

which a conclusion such as the opinion on the labor question could be drawn.

"Speaking as one who has spent his entire working life in daily intimate contacts with this question, and who has seen the steady improvements in labor relationships that have taken place in that time, I can say that the statements or insinuations that the employe representation plan as now in general use in the industry is a failure is simply not in accordance with the facts.

"The 97 per cent vote of our employes in a recent election, and the fact that this plan is able to settle and has settled all questions between management and labor, absolutely contradicts the theorists' opinions. The steel industry has

had experience with national unions in the past. This experience has led to a deep distrust of these unions not only on the part of management but also on the part of thousands of workers.

"Whatever else may be said, this address—while presenting no facts, figures, nor reasons for the one-man opinions it expresses—shows on its face that it is the concept of its author that the great *desideratum* of the country today is a government controlled industry with both management and labor regimented under an all-powerful government!

"A study of the results of this procedure in other lands should convince us that this is destructive of all that America stands for and is abhorrent to American ideals."

Steel Corporation Suggests Study of Walsh-Healey Act as Applied to Navy

THE UNITED STATES STEEL CORP. explained last week its attitude toward the Walsh-Healey act, which requires firms contracting with the government to observe a 40-hour week, with time and-a-half for overtime, and certain other labor standards imposed by the government.

In a statement, the Steel corporation pointed out since last September, when the act became effective, its subsidiaries had figured on \$2,237,000 of government contracts under the act and had actually been awarded \$672,000 of material. It further indicated a willingness to continue to do so, wherever feasible, and made a suggestion that might relieve the impasse between the government and steel industry with respect to contracts, pending an opportunity for further study and the development of a solution which is workable.

This latter appeared in the following paragraph from the statement:

"If an emergency now is contemplated, an alternative does exist in a definite provision of the Walsh-Healey act, to the effect that on a written finding by the head of a government department that the inclusion in a contract of the working hours set forth in the law would seriously impair the public business, the secretary of labor shall make exceptions in specific cases. To invoke this relief now would temporarily afford opportunity to study the whole situation with a view to finding a workable and sound solution of this matter."

Unofficially, it is understood that two subsidiaries of the United States Steel Corp. have taken work under the act, Carnegie-Illinois Steel Corp.,

and American Steel & Wire Co. It is also reported in reliable quarters that Steel corporation and government officials have been actively engaged for the past two weeks in an effort to work out a solution bearing more satisfactorily on the problem.

"It must be borne in mind," the corporation stated, "that these restrictive acts are new and adjustment to their provisions or their

modification, if found necessary, calls for co-operative toleration by all concerned. Certainly we wish to serve the government and the public on a fair and workable basis. The records will show that the subsidiaries of the United States Steel Corp. have at all times co-operated to the fullest extent with the navy department in the promotion of national defense."

SIX INTOXICATED MEN CAUSE IDLENESS OF 225

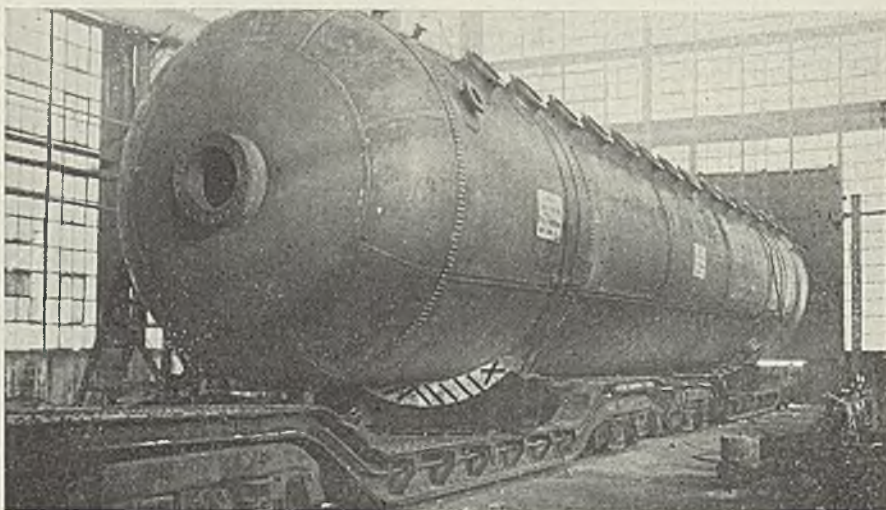
Braeburn Alloy Steel Corp., Braeburn, Pa., suspended operations last week following a strike called by the Amalgamated Association of Iron, Steel and Tin Workers.

Approximately 225 employes were idle. In a statement to the workers, T. H. McGraw, president, explained that six men on the night crew of the 14-inch mill came to work intoxicated and were discharged. A demand for their reinstatement was refused. Three then went to the CIO and precipitated the strike. There was no issue of wage rates or other differences in the controversy.

Aluminum Wages Raised

A 10 per cent increase in wages affecting hourly rated workers has been granted by the Aluminum Co. of America, effective March 1. A 5 per cent increase was granted the company's 20,000 workers last September.

Widest Oil Flash Tower Made of Steel Plates



A FLASH tower, for refining oil, weighing 130 tons, and believed to be the largest in diameter ever built, was fabricated and shipped recently by James G. Heggie & Sons Inc., Joliet, Ill. While the over-all length of 82 feet is not unusual, the extreme width of 13 feet 11 inches made careful handling necessary. Fabrication involved both riveted and welded construction. The head was made of eight segments welded to the end plate and to the cylindrical section. Two well-type railroad cars, each of 100 tons capacity, were used to convey the tower to the Sinclair Refining Co. plant at East Chicago, Ind., taking four hours for the 40-mile journey

Steel Engineers in National Meeting

TWENTY years ago few heat treating furnaces in this country were built with insulation and provided with automatic control. Today, modern furnace construction is self-contained. Insulated materials are used widely, buckstays are welded and everything is built up as a solid and complete structure.

This was brought out at the national meeting of the Association of Iron and Steel Engineers, Ohio hotel, Youngstown, O., last Thursday, by M. H. Mawhinney, consulting engineer, Salem, O.

Seven hundred members and guests attended the technical session in the morning. In the afternoon about 500 inspected Youngstown Sheet & Tube Co.'s open-hearth steelworks, power-generating department, and the 79-inch hot mill at Campbell, O.

Mr. Mawhinney in comparing various type furnaces illustrated on the screen, pointed out that the development of high-temperature cements and refractories made it possible to build piers on cars as well as cross baffling without crumbling under surface conditions. He directed attention to small sections which now are made of light alloy castings.

Heating furnaces employed in the metal finishing industry are well ahead of those operated by the steel industry, he said. He pointed out, however, that steel producers are gradually taking advantage of this experience. He classed the roller type furnace, which handles all types of steel commodities, as one of the modern developments.

Discusses Auxiliary Drives

W. B. Snyder, industrial engineering department, General Electric Co., Schenectady, N. Y., in discussing "Ward-Leonard Control for Blooming Mill Auxiliary Drives," described the system in detail by the use of wiring diagrams on the screen. Advantages of this system, he said, include high rates of acceleration and deceleration of blooming mill rolls, low-voltage motor operation, flexibility in field adjustments and low power costs.

Descaling is not as heavy with hot charged slabs as with those fed into the furnace in the cold state. This fact was developed by A. F. Giese Jr., Gary, Ind., who spoke on "Continuous Rolling of Hot Strip Steel."

He advocated the use of chrome ore as against the conventional brick and steel skids in the construction of heating furnace hearths. A 16-foot 4-inch by 18-foot hearth covered with a 4-inch layer of chrome ore can

District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

| | Week ended | | Same week | |
|-----------------|------------|--------|-----------|------|
| | Feb. 27 | Change | 1936 | 1935 |
| Pittsburgh ... | 87 | + 1 | 38 | 37 |
| Chicago | 80 ½ | None | 62 | 53 |
| Eastern Pa. ... | 56 | None | 37 ½ | 29 ½ |
| Youngstown .. | 81 ½ | + 1 ½ | 63 | 50 |
| Wheeling | 94 | +14 | 78 | 78 |
| Cleveland ... | 79 ½ | None | 66 ½ | 74 |
| Buffalo | 86 | None | 42 | 40 |
| Birmingham .. | 77 | None | 66 | 55 ½ |
| New England .. | 97 | +11 | 72 | 63 |
| Detroit | 97 | + 3 | 94 | 100 |
| Cincinnati ... | 64 | + 4 | 76 | † |
| St. Louis | 82 | None | † | † |
| Average | 84 | + 1 | 54 ½ | 48 |

†Not reported.

be installed at a total cost of \$564. He pointed out that a hearth of this type will afford the heating of at least 600,000 tons of slabs before repair is necessary.

Slippage of steel in the rolls now is prevented by etching the surface of the bottom roll in a solution containing two parts of nitric acid and one part water. This is accomplished by rotating the roll during the etching process. After washing with water the roll then is transferred to the mill housings ready for service.

New Capacity

AN IMPROVEMENT program is nearing completion which will more than double the capacity of the stainless steel department of Sharon Steel Corp., Sharon, Pa. New equipment includes a new reversing mill, normalizing furnace, pickling and annealing equipment, a battery of soaking pits at the Lowellville, Pa., works beside a plant addition at Sharon. It is expected that the program will be fully completed by April 1. It has been underway since early this year.

Semet-Solvay Installing Gas Piping for Great Lakes Steel

Semet-Solvay Engineering Corp., New York, is fabricating and installing a new blast furnace gas and cold blast pipe system in the Ecorse, Mich., plant of the Great Lakes Steel Corp., Hanna furnace division. Pipe and fittings of various dimensions up to 60 inches are being furnished.

This is the second important plant piping project undertaken by Semet-Solvay for Great Lakes, a 48-inch line for blast furnace gas having been completed recently.

Production

THE national steelworks operating rate advanced 1 point last week to 84 per cent, reflecting unusually heavy demand for finished steel.

Youngstown—Up 1 ½ points to 81 ½ per cent, with Sharon Steel Corp. at Lowellville, and Youngstown Sheet & Tube Co. at Brier Hill each adding one open hearth furnace to active units.

Cleveland-Lorain—Steady at 79 ½ per cent, with 31 open hearths continuing active.

Central eastern seaboard—Unchanged at 56 per cent, with some looking for a peak in the present trend by late March or early April.

Chicago—Held at 80 ½ per cent. A higher rate is regarded likely within the next several weeks, with no slackening in prospect for at least 60 days. Twenty-nine of 39 blast furnace stacks continue active.

Pittsburgh—Up 1 point to 87 per cent, a new high mark in the recent history of this district. At times the leading interest has been operating at 89 per cent and the independents at well above 80. Forty-five blast furnace stacks are operating.

Wheeling—Gained 14 points to 94 per cent, with all open hearths affected by the flood melting.

Detroit—Up 3 points to 97 per cent, as one producer placed an idle furnace back on Friday. This week every open hearth in the district will be making steel.

New England—Gained 11 points to 97 per cent, highest point since 1929. All open hearths, with the exception of one small furnace, are engaged.

St. Louis—Unchanged at 82 per cent. It is expected the rate will be slightly bettered this week.

Birmingham—Held at 77 per cent, with little or no change indicated for the remainder of the quarter.

Cincinnati—Advanced 4 points to 64 per cent, for supply to rolling mills.

Buffalo—Remained at 86 per cent, with 36 open hearths producing steel, the largest number in production at any time in the district's history.

Completes Seventh Year Without Serious Accident

Seven years without an accident resulting in loss of time is the record of Mica Insulator Co., Schenectady, N. Y. The company received an award in the twelfth annual accident prevention campaign of the associated industries of New York state for completing 1936 with a 100 per cent record of no lost-time accidents and a special trophy for having completed the past five campaigns with the same record.

Men of Industry

JOHAN MAY, assistant general manager of sales for electrical wires and wire rope, American Steel & Wire Co., Worcester, Mass., has been transferred to Cleveland as general manager of sales, effective March 1. He succeeds D. A. Merriman who as vice president will remain active in the company until he reaches the retirement pension age in September.

Merle J. Trees, vice president, Chicago Bridge & Iron Works, Chicago, has been elected president, United Charities of Chicago.

N. B. Gilliland has been appointed to the sales engineering staff, Detroit office of Lincoln Electric Co., Cleveland.

S. P. Kinney has been named district sales manager of the newly opened branch office in the Koppers building, Pittsburgh, of H. A. Brasert & Co., Chicago.

Duke Hutchinson, formerly head of the Duke Hutchinson Advertising Agency in Chicago, has joined the organization of Albert P. Hill Co., Pittsburgh, advertising agency.

Robert A. Wilson, George Mandula and A. T. Cox Jr. have been added to the sales staff, Chicago office, of Lincoln Electric Co., Cleveland.

Arthur E. Gaynor has been appointed manager of the New York branch, John A. Roebling's Sons Co., Trenton, N. J., succeeding the late W. P. Bowman.

Frank S. Main and Lionel W. Claypool have resigned their positions

with Micro-Westco Inc., Davenport, Iowa, to become president and vice president, respectively, of Aurora Pump Co., Aurora, Ill. Mr. Main had been vice president in charge of sales for the Westco Pump division of Micro-Westco, and was previously, for many years, general manager of the Westco Pump Corp. He has been actively engaged in the manufacture and sale of pumps since completing his schooling at the University of Michigan in 1917. Mr. Claypool, a graduate of Purdue university, had been identified with



Lionel W. Claypool

the Westco organization for the past ten years, and is credited with important contributions to the efficiency increase of turbine-type pumps widely used in industrial applications.

Thomas P. Kirk, assistant purchasing agent, Laclede Steel Co., St. Louis, for the past 13 years, has been appointed purchasing agent. He succeeds S. W. Manss, resigned.

Daniel W. Tomlinson has been re-elected president, Batavia Metal Products Corp., Batavia, N. Y. All other officers and directors also have been re-elected.

Bruce B. Wallace has joined the staff of the Los Angeles office, Foxboro Co., Foxboro, Mass., maker of industrial precision instruments. He will work out of Los Angeles as a sales engineer.

A. J. Brandt has been elected president, National Tool Co., Cleveland. Other officers include: Vice president, A. R. Glancy Jr., Detroit; sec-

retary, S. J. Kornhauser, Cleveland, attorney; treasurer, L. M. Prosser.

Ferdinand Jehle, formerly associated with the White Motor Co., Cleveland, and past chairman of the Cleveland section, Society of Automotive Engineers, is now director of the laboratory, Hoffman Specialty Co., Stamford, Conn.

Joseph Dilworth, assistant to president, Westinghouse Electric & Mfg. Co., Pittsburgh, has been added to the board of trustees, Air Hygiene Foundation of America, Pittsburgh.

Welles G. Catlin, specialist in industrial production planning, has joined the staff of the personnel training division, International Correspondence schools, Scranton, Pa. He will specialize in co-ordinating trade practice and technical instruction.

W. B. Turner, prominent Dayton, O., attorney and general counsel for Ohmer Fare Register Co., Dayton; Philip Farnham, a partner in the law firm of John Van Voorhis' Sons, Rochester, N. Y., and J. B. Mills, Ohmer factory manager, have been elected directors.

F. E. Kaulback has been elected to the board of directors, American Radiator & Standard Sanitary Corp. Mr. Kaulback is vice president and general manager of branches, Standard Sanitary Mfg. Co., Pittsburgh, and is a director and a member of the executive committee of that company.

Frank H. Dewey, general manager of the air conditioning division, Gar Wood Industries Inc., Detroit, has promoted Don J. Luty, chief engineer, to the office of assistant general manager. Norman Saylor has been appointed manager of the company's Detroit branch, air conditioning division.

Austin Edwards, for many years



Frank S. Main



Austin Edwards

associated with the Middletown sales district of American Rolling Mill Co., Middletown, O., has been named district manager of the newly established sales office of the company at Indianapolis. His territory will embrace a large section of Indiana, and offices will be located in the Circle tower.

Michael F. Dougherty has been appointed traffic manager, Sharon Steel Corp., Sharon, Pa., succeeding Charles F. McBride, recently named president, Monessen & Southwestern railroad, and traffic manager of Pittsburgh Steel Corp.

B. J. Brugge has been appointed by Lincoln Electric Co., Cleveland, to the sales staff of its Los Angeles office. A graduate of Purdue university in 1931, for several years he was employed in the Lincoln Research Laboratory, and in 1933 was given leave of absence to assist in the application of electric welding in the Near East.

William L. Weaver, associated with Ludlum Steel Co., Watervliet, N. Y., since 1920, and for the past few years as special representative, has been appointed manager of stainless steel casting sales. D. M. Scott has been placed in charge of stainless foundry operations at Buffalo where Ludlum's stainless steel castings are being produced from the new hollow electrode furnace.

Fred Schonberger has been appointed a representative in the Philadelphia territory by the Carboloy Co. Inc., Detroit. Mr. Schonberger, who has been associated with the cemented carbide industry for several years, has been assigned to the area comprising eastern Pennsylvania, southern New Jersey, Delaware, Maryland, District of Columbia and the eastern portion of Virginia.

Dr. Frank Conrad, assistant chief engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has been awarded the 1936 Lamme medal of the American Institute of Electrical Engineers, New York, "for his pioneering and basic developments in the fields of electric metering and protective systems." The medal will be presented to him at the annual summer convention of the institute in Milwaukee, June 21-25.

Manly B. Brown has been appointed assistant manager of sales, pipe division, Republic Steel Corp., Cleveland, and will devote his efforts to oil country tubular sales. Mr. Brown formerly had been eastern representative, Wilson & Bennett Mfg. Co., and before that was



S. S. Swasey

Who has been added to the sales engineering staff of Beardsley & Piper Co., Chicago, as referred to in STEEL, Feb. 22, page 25. He is available for consultation and engineering service in all territories

Chicago representative, Ohio Corrugating Co., and for eight years was district sales manager in Chicago for the Wheeling Steel Corp. His headquarters will be in Cleveland.

V. O. Johnstone has resigned from the Babcock & Wilcox Co. to become associated with Standard Tube Co., Detroit, as district sales manager. He entered the seamless field at the close of the World war, with the old Standard Seamless Tube Co., now Spang-Chalfant Inc., and later was associated with Pittsburgh Steel Co., seamless tube division.

Allen E. Connor has resigned from the Farr Alpaca Co., Holyoke, Mass., to join Standard Tube as controller. He has had broad experience in management and general accountancy.



James G. Marshall

General superintendent of the Niagara and Welland plants of Union Carbide Co. and Electro Metallurgical Co., who, as noted in STEEL, Feb. 22, page 25, has been awarded the Jacob F. Schoellkopf medal for 1937. Formal presentation will be made early in October

Died:

FRED ERB, 51, president, Eaton-Erb Foundry Co., Detroit, of heart attack, aboard the steamship NEW YORK, Feb. 20, two hours after it had departed from New York on a West Indies cruise. Graduating from the University of Michigan in 1908, he became a member of the cupola charging crew, Detroit Foundry Co., working up to the post of manager. In 1913 he resigned to assist in the organization of the Lakeside Foundry Co., and shortly afterward became identified with the Elmira Foundry Co., Elmira, N. Y. He soon returned to Detroit to become superintendent, foundry division, Packard Motor Car Co., being promoted to manager in 1920. He resigned in 1925 to become president, Erb-Joyce Foundry Co., predecessor to Eaton-Erb Foundry Co.

Mr. Erb was a former president, vice president and director, American Foundrymen's association. He also was a past president, Detroit Foundrymen's association.

Andrew A. Temmel, 68, associated with National Tube Co., Pittsburgh, for 50 years, in Pittsburgh, Feb. 18.

Robert Ashton Bingham, 34, general superintendent, Superior Iron Works, Superior, Wis., in that city recently.

Robert W. Gotshall, 54, general sales representative, Caterpillar Tractor Co., Peoria, Ill., and pioneer in the development of the track-type tractor and road machinery industries, in Peoria, Feb. 11.

David Balkansky, 57, a leader in the metalworking industries of Manitowoc, Wis., in Manitowoc, Feb. 19. He was one of the founders of the Manitowoc Brass Foundry, Wisconsin Aluminum Foundry Co., and Manitowoc Iron & Metal Co.

Charles C. Gibson, 58, president, Mullins Mfg. Corp., Salem, O., in that city, Feb. 21. He began with the company as office boy, later became private secretary to the late Mr. Mullins; then secretary, and when Mr. Mullins retired to become chairman, he was named to succeed him as president.

Frank J. Bauman, 54, manager, steel tool sales department, Republic Steel Corp., Cleveland, in that city, Feb. 23. Mr. Bauman joined Bourne-Fuller Co. as a stenographer 31 years ago and was made sales manager of the steel tool department in 1920, remaining in that position after Bourne-Fuller became part of Republic.

Financial

YOUNGSTOWN SHEET & TUBE CO. reports net profit of \$10,564,501 for 1936, representing earnings of \$7.03 per common share after payment of one year's regular preferred dividend. Net sales of \$127,674,516 represented a 47.1 per cent increase over 1935. The company's operations averaged 71.1 per cent of capacity, compared to 48.7 per cent in 1935.

Sheet & Tube plans to spend \$13,500,000 this year for plant improvements. Daily average employment in 1936 was 19,819, compared with 17,209 in 1935. The 10 per cent wage increase voted last November will add \$3,500,000 to the pay roll at the present rate of operations, the report stated.

REPUBLIC ORDERS DIVIDENDS; A. C. BROWN ON BOARD

Directors of Republic Steel Corp. have declared a dividend of \$1.50 per share on the 6 per cent cumulative convertible prior preference stock, series A, and a dividend of \$1.50 per share on the 6 per cent cumulative convertible preferred stock, both payable April 1, to stockholders of record March 12.

Alexander C. Brown, Cleveland, has been elected a director of Republic. He is vice president of the Cleveland-Cliffs Iron Co., largest individual holder of Republic stock.

AMERICAN STEEL FOUNDRIES PAYS PREFERRED ARREARAGE

American Steel Foundries, Chicago, reports net profit of \$2,953,426, after all charges including provision of \$130,000 for surtax on undistributed profits, for the year ending Dec. 31. This compares with \$116,692 in 1935 and equals \$2.58 per share on the common stock. Dividend disbursements during the year totaled \$2,186,288 thereby wiping out arrearages of \$15 on the preferred and netting the common \$1 a share.

LUDLUM VOTES MARCH 15

Holders of common stock in the Ludlum Steel Co., Watervliet, N. Y., will meet March 15 at Pompton Lakes, N. J., to vote on ratifying the action of the board in purchasing an additional 1542 shares of Wallingford Steel Co., Wallingford, Conn., stock at \$50 a share, and an additional 9607 shares of class B stock of the Forging & Casting Corp., Ferndale, Mich., at prices not exceeding \$8 per share.

EARNINGS STATEMENTS

Colorado Fuel & Iron Corp., Denver, for the six months ended Dec. 31 reported net income of \$446,921,

equivalent to 91 cents a share. No provision was made for surtax on undistributed profits except for subsidiaries filing reports on a calendar year basis. The company's fiscal year ends June 30. Fourth quarter net was \$108,263, subject to adjustments.

Continental Steel Corp., Kokomo, Ind., reported earnings of \$2.78 a share on its common stock in 1936. Net income totaled \$726,228. Sales increased 18 per cent over 1935. At the regular directors meeting a dividend of 25 cents a share on common and a preferred dividend of \$1.75 a share were declared, payable April 1 to holders of record March 15.

Acme Steel Corp., Chicago, for the quarter ending Dec. 31 had net profit of \$711,022 against \$538,847 in the preceding quarter. Preliminary report for 1936 shows net profit of \$2,155,495, compared with \$1,760,965 in 1935.

Harbison-Walker Refractories Co., Pittsburgh, reports net profit of \$3,462,482 for the year ended Dec. 31. This is equivalent to \$2.41 per share on 1,358,883 common shares outstanding and compares with \$1,805,668 in 1935. Annual meeting of stockholders will be held April 19.

DIVIDENDS DECLARED

Wheeling Steel Corp., Wheeling, W. Va., has authorized a dividend of \$1 on the \$6 preferred, leaving

arrears on the issue of \$24 a share. Last December the company paid \$4, while on July 1 and Oct. 1, dividends of 50 cents and \$1 respectively were paid.

Budd Wheel Co., Philadelphia, declared a regular quarterly dividend of \$1.75 per share, plus a participating dividend of 25 cents per share on the preferred, both payable March 31, to holders of record March 17.

Allegheny Steel Co., Brackenridge, Pa., has declared a dividend of 40 cents on the common, payable March 16 to record March 1, and a regular quarterly dividend of \$1.75 on preferred, payable March 1 to record Feb. 18.

Michigan Steel Tube Products Co., Detroit, has declared a dividend of 25 cents, payable March 10 to holders of record Feb. 28. In the previous quarter the company paid a dividend of 40 cents.

Crew Receives Medals

Medals commemorating their heroism in rescue work in the Ohio river flood were presented to Capt. H. C. Adams and crew of the steamer THOMAS MOSES, Carnegie-Illinois Steel Corp., at a celebration in Clairton, Pa., Feb. 19. Benjamin F. Fairless, president, Carnegie-Illinois Steel Corp., was unable to attend but sent an address which was read at the meeting.

Consumers' Net Earnings Show Strong Increase

AGGREGATE earnings of 41 identical companies among equipment manufacturers and other leading iron and steel consumers increased 39 per cent in 1936, compared with the preceding year. In the following tabulation all figures are net earnings, except where asterisk denotes loss.

| | Year 1936 | Year 1935 |
|--|------------|------------|
| Bliss & Laughlin Inc., Harvey, Ill. | \$667,583 | \$385,514 |
| Landis Machine Co., Waynesboro, Pa. | 83,879 | 122,160 |
| Savage Arms Corp., New York | 245,752 | 101,549 |
| Transue & Williams Steel Forging Corp., Alliance, O. | 66,621 | 55,300 |
| Reliance Mfg. Co., Alhambra, Calif. | 966,762 | 265,741 |
| Fostoria Pressed Steel Corp., Fostoria, O. | 25,995* | 8,465* |
| Blaw-Knox Co., Pittsburgh | 1,548,173 | 565,230 |
| American Steel Foundries, Chicago | 2,953,426 | 116,692 |
| Monarch Machine Tool Co., Sidney, O. | 258,076 | 90,317 |
| Domlnlon Bridge Co. Ltd., Toronto, Ont. | 91,611 | 35,233 |
| Canada Foundries & Forgings Ltd., Brockville, Ont. | 39,371 | 16,458 |
| General Steel Warehouse Ltd., Montreal | 240,471 | 161,624 |
| Minneapolis-Honeywell Regulator Co., Minneapolis | 3,082,361 | 1,793,339 |
| Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. | 15,099,291 | 11,983,381 |
| Union Twist Drill Co., Athol, Mass. | 520,076 | 329,104 |
| Buckeye Steel Castings Co., Columbus, O. | 882,219 | 167,134* |
| American Brake Shoe & Equipment Co., New York | 3,802,186 | 2,837,057 |
| Chain Belt Co., Milwaukee | 630,899 | 362,019 |
| National Bearing Metals Corp., St. Louis | 701,212 | 433,343 |
| Slyver Steel Castings Co., Milwaukee | 147,991 | 36,906 |
| U. S. Hoffman Machinery Corp., New York | 447,980 | 120,825 |
| Detroit Steel Products Co., Detroit | 874,529 | 310,774 |
| Acme Steel Co., Chicago | 2,155,495 | 1,760,965 |
| General Alloys Co., Boston | 37,199 | 23,270 |
| American Radiator & Standard Sanitary Corp., New York | 7,379,204 | 2,798,860 |
| Motor Wheel Corp., Lansing, Mich. | 1,800,933 | 1,087,979 |
| S. R. Dresser Mfg. Co., Bradford, Pa. | 392,755 | 125,566 |
| Dexter Co., Fairfield, Iowa | 122,218 | 93,950 |
| Electric Controller & Mfg. Co., Cleveland | 588,698 | 324,926 |
| Footo-Burt Co., Cleveland | 241,275 | 70,024 |
| Square D Co., Detroit | 982,022 | 726,484 |
| Caterpillar Tractor Co., Peoria, Ill. | 10,106,349 | 6,125,483 |
| American Can Co., New York | 17,226,845 | 17,310,303 |
| Hoskins Mfg. Co., Detroit | 575,348 | 429,712 |
| McCord Radiator & Mfg. Co., Detroit | 132,417 | 250,680 |
| Baldwin Locomotive Works, Philadelphia | 2,163,949* | 2,119,728* |
| Minneapolis-Moline Power Implement Co., Minneapolis | 739,149 | 170,678 |
| Midland Steel Products Co., Cleveland | 2,160,036 | 1,164,326 |
| Continental Can Co. Inc., New York | 9,038,787 | 11,223,578 |
| Lima Locomotive Works, Lima, O. | 241,104* | 538,707* |
| Link-Belt Co., Chicago | 2,221,377 | 1,092,360 |

Meetings

INDUSTRIALISTS WILL VISIT EUROPEAN LABORATORIES

AMERICAN industrialists will have opportunity to observe developments in European steel and metallurgical research this summer during a tour of scientific laboratories being arranged by the National Research Council's division of engineering and industrial research. About 100 banks and industrial men including leaders in the steel industry are expected to participate in the tour which schedules visits to research laboratories in 18 major industrial fields in England, France and Germany, as well as those of trade associations, governments and universities.

The group is scheduled to sail May 14 from New York on the S. S. CHAMPLAIN. Maurice Holland, director of the council's division of engineering and industrial research, 29 West Thirty-ninth street, New York, will be expedition leader.

NAMES AUTHOR OF BRITISH EXCHANGE PAPER FOR A.F.A.

Institute of British Foundrymen has designated J. Roxburgh, manager of foundry and pattern shop, Davy Bros. Ltd., Sheffield, England, and president of the Sheffield branch of the institute, to present the British exchange paper at the forty-first annual convention of the American Foundrymen's association to be held in Milwaukee, May 3-7. Mr. Roxburgh is author of numerous lec-

tures and papers. He was lecturer on foundry practice and science for two years at Sheffield university evening classes, and is a member of the Sheffield council and general counsel of the Institute of British Foundrymen.

Appointments have been completed for the Milwaukee convention committee and all committees are at work arranging details of the convention and exposition. W. F. Bornfleth, Cutler-Hammer Inc., is general chairman, and Walter Gerlinger, Walter Gerlinger Inc., is vice chairman.

AIRCRAFT EXPERTS TO HOLD MEETING IN WASHINGTON

National aeronautic meeting, sponsored by the Society of Automotive Engineers and its Washington section, will be held in Washington, March 11-12. Co-operating organizations include the American Society of Mechanical Engineers, Aeronautical Chamber of Commerce of America, Air Transport Association of America and Institute of the Aeronautical Sciences.

A feature will be a visit to the national bureau of standards. Arthur Nutt, vice president in charge of engineering, Wright Aeronautical Corp., Paterson, N. J., who recently returned from abroad, will report on European engines.

EXPORT CLUB OF NEW YORK IN ANNIVERSARY PROGRAM

Export Managers Club of New York Inc. announces its twentieth anniversary get-together at Hotel Pennsylvania, New York, March 30.

Subjects to be discussed in the two sessions are "The Foreign Trade Picture Today," "Developing Your Export Trade on a Five-Year Plan," "Overseas Sales Organization", and "Advertising and Sales Promotion Programs." One of the four luncheon groups will comprise representatives from the automotive, machinery and hardware industries.

Oren O. Gallup, Faultless Caster Co., 2 Lafayette street, New York, is secretary of the club.

BRITISH INSTITUTE PLANNING SYMPOSIUM ON STEELMAKING

A symposium on steelmaking is being planned by the British Iron and Steel institute for its annual meeting in May, 1938. This symposium will be designed to afford discussion on practical and theoretical aspects of steelmaking by all processes, but with special emphasis on the acid and basic open-hearth processes. Papers on the following subjects will be invited: Design and layout of melting shops; furnace design and operation, including heat economy; steel manufacture, including casting, slag utilization and steelworks refractories; metallurgical reactions, including physical chemistry of steelmaking, constitution of slags, nonmetallic inclusions and segregation.

Convention Calendar

March 1-5—American Society for Testing Materials. Spring group meeting of committees at Palmer House, Chicago. C. L. Warwick, 260 South Broad street, Philadelphia, is secretary.

March 3—American Society for Testing Materials. Regional meeting at Palmer House, Chicago. C. L. Warwick, 260 South Broad street, Philadelphia, is secretary.

March 3-4—Electrodepositors' Technical society. First International Electrodeposition conference to be held at British Industries House, London. H. Wynne-Williams, 12A, Raleigh House, Larkhall Estate, London S. W. 8, is honorary secretary.

March 10-11—Institute of Metals (British). Twenty-ninth annual meeting at Institution of Mechanical Engineers, London. G. Shaw Scott, 36 Victoria street, Westminster, London, S.W. 1, is secretary.

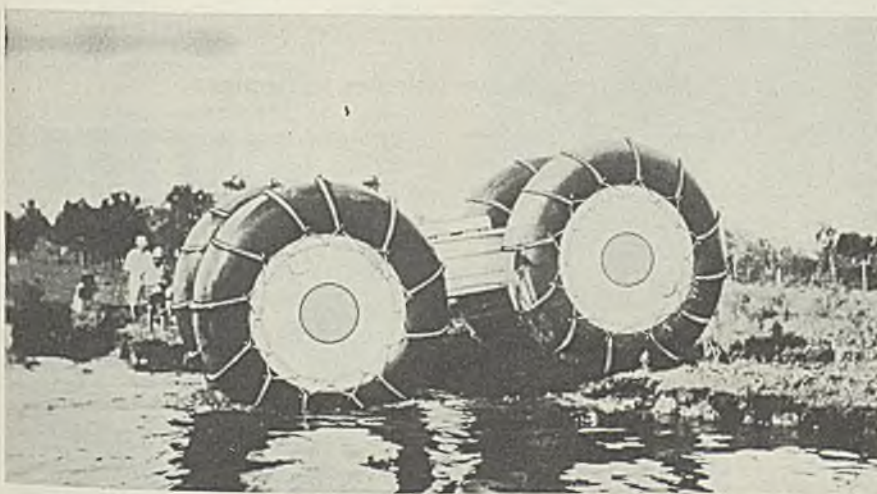
March 15-17—National Association of Waste Material Dealers Inc. Annual convention at Sherman hotel, Chicago. Charles M. Haskins, 1109 Times building, New York, is secretary.

March 15-19—Oil Burner institute. National Oil Burner and Air Conditioning convention and exposition at Convention Hall of Commercial Museum, Philadelphia. G. Harvey Porter, 30 Rockefeller Plaza, New York, is managing director.

March 21-27—American Ceramic society. Annual convention at Waldorf Astoria hotel. Ross C. Purdy, 2525 North High street, Columbus, O., is secretary.

March 23-26—American Management association. Packaging, Packing and Shipping conference and exposition at Pennsylvania hotel, New York. Alvin E. Dodd, 330 West Forty-second street, New York, is president.

Alloy Steels Impart Strength to Light-Weight "Marsh Buggy"



USE of alloy steels gives the unique "marsh buggy," developed by Gulf Oil Corp., Pittsburgh, strength to withstand shock and stresses with minimum weight and resistance to corrosion. The vehicle is used to transport crews and equipment into the remote recesses of Louisiana in search of oil bearing strata. Equipped with tires 10 feet high and 3 feet wide, mounted on 66-inch rims, the buggy floats in less than 2 feet of water despite its weight of 7500 pounds. It is powered with a Ford V-8 engine

General Rules Announced for Lincoln \$200,000 Prize Arc Welding Contest

GENERAL rules and conditions of the arc welding prize contest sponsored by the James F. Lincoln Arc Welding Foundation, Cleveland, have been announced by the secretary, A. F. Davis.

Object of the contest is stated as encouragement of scientific interest in and scientific study, research and education in development of the arc welding industry through advance in knowledge of design and practical application.

To stimulate greatest study of arc welding the contest embraces practically every field of industry where arc welding can be used as a primary process of manufacture or fabrication. Providing thousands of subjects for papers, industry has been divided into 11 main classifications and 44 sub-classifications.

A total of 446 prizes is provided. From the 44 sub-classifications 220 prizes are offered and from these 44 will be selected to receive prizes in the main classifications. From these papers four will be selected for the main prizes. Additional prizes to the number of 178, of \$100 each, will be provided for papers not sharing in other awards but deemed worthy of honorable mention. Grand prize winner will receive \$10,000 as first prize, \$3000 for the main classification and \$700 for his sub-classification.

Considerable Latitude Offered

Any person or group may enter but may submit only one paper on one subject in one classification. Each contestant must have actually participated in work on which the subject matter of his paper is based. Work described should be the product of the company with which the contestant is or has been connected, either as employe or consultant. Persons not so affiliated may submit papers on design of any machine, structure, building, manufactured or fabricated product.

Papers must describe redesign of existing machine or structure previously made in some other way, so that arc welding may be applied to its manufacture; new design of machine or structure not previously made, designed in whole or part for use of arc welding; organizing, developing and conducting a welding service by commercial welders or job shops, garages or service stations, commercial welderies or plant welderies.

The machine, structure, building, manufactured or fabricated product

may be designed either in whole or in part for the use of arc welding. However, preference will be given papers describing products showing fullest use of arc welding.

To be eligible as to subject matter, the machine, structure, building, manufactured or fabricated product, with respect to which the paper is submitted, must have been actually designed. However, machines, structures, buildings, manufactured or fabricated products will be excluded from the contest if sold in the open market, or generally used, prior to Jan. 1, 1937. Nevertheless, any preliminary studies, investigations or laboratory work conducted at any time will be admitted as part of any paper, provided the finished product referred to was not sold in the open market, nor generally used, prior to Jan. 1.

Illustrations Are Acceptable

The description of the machine, structure, building, manufactured or fabricated product featured in the paper must be expressed in practical language and be of sufficient clarity to be readily understood by those skilled in the art. Any photographs, drawings, charts, etc., which will add clarity to the description, should be included.

Comparisons as to proportionate savings, gross savings, performance, service life or social advantage provided by the design described in the paper should be made with the pre-

vious design and method of construction. In case of a design of a new machine, building, structure, etc., these same items should be considered by the contestant and compared with other methods of construction. Any savings claimed must be clearly substantiated. Any reasonable method by which the contestant believes these savings can be proved will be acceptable. It is suggested that the contestants follow the method outlined in the Procedure Handbook of Arc Welding Design and Practice for calculating welding costs. The handbook is published by Lincoln Electric Co., Cleveland.

In making comparisons and estimates of cost, particular attention should be paid to direct labor and material cost.

How Judges Will Decide

In rating merits of each paper, the jury of award will give equal consideration to the following factors: Proportionate cost saving in percentage of the design described in the paper over previous design and previous method of construction; gross savings accruing to industry through the general adoption of the design described; increased service life, efficiency and general economy and social advantage provided to mankind by the design described. All of these advantages should be clearly stated and substantiated, by the contestant.

Only papers postmarked not later than June 1, 1938, and received in Cleveland not later than July 1, 1938, will be accepted. Personal delivery of papers will not be accepted. Upon receipt of the manuscript in Cleveland, the contestant will be notified by mail.

Hours to Destroy; Minutes to Replace

*B*ARS of this county jail cell near Toledo, O., broken through by three criminals after many hours of furtive work with a smuggled hacksaw blade, were replaced in a few minutes by electric arc welding. The criminals, jailed for grand larceny, obtained the hacksaw blade by means of chewing gum attached to a piece of string by which they drew the blade into the cell



Activities of Steel Users and Makers

JESSOP STEEL CO., Washington, Pa., has placed a new 10-ton electrically operated Heroult melting furnace into operation. In addition, a new thermostatically controlled annealing furnace is nearing completion and will be placed in operation shortly. The addition of these furnaces has been made to meet an increased demand for tool and die steels resulting from general improvement in industrial activity.

Egan, Webster & Co., Pittsburgh, producer of refractories, has moved to the twentieth floor, Koppers building, Pittsburgh.

Forging & Casting Corp., Ferndale, Mich., expects to place in operation late in March its new plant for the production of Nitricastiron castings.

Lincoln Electric Co., Cleveland, has moved its Cincinnati office from Fifth and Baymiller streets to room 602, American building, Central Parkway at Walnut street.

Koppers Co., Pittsburgh, has received a contract from the government involving \$616,683 for the manufacture and delivery of control gates and appurtenances for the Marshall Ford dam in Texas.

Several new model marine motors have been placed in production recently by Gray Marine Motor Co., Detroit. All are equipped with individual porting, temperature control, speedgears and other improvements developed as a result of extensive research work.

Cap Screw & Nut Co. of America Inc., will move its Newark, N. J., warehouse from 32 Green street to 156-160 Summit street, March 1. The new warehouse will enable the company to double its space for stocks of screws, bolts, nuts, washers and rivets.

Vincent Steel Process Co., 2434 Bellevue avenue, Detroit, has completed an addition to its office and manufacturing space. It also has installed two new continuous heat treating furnaces which will add approximately 20 per cent to the company's heat treating capacity.

Carl J. Winkler, Indianapolis, and associates, have purchased the assets of the Indestructible Wheel Co. Inc., Lebanon, Ind., which includes a large plant and equipment used in the manufacture of auto-

motive parts. The business will operate under the name of Winkler Mfg. Corp.

Emerson Electric Mfg. Co., St. Louis, has moved into new modern offices at 1824 Washington avenue. This is a two-story building with approximately 34,000 square feet of floor space. The space formerly devoted to offices at 2018 Washington

Additional news of the steel and metalworking industries will be found on pages 107, 108 and 109.

avenue has been absorbed by the manufacturing department.

Frantz Mfg. Co., Sterling, Ill., a manufacturer of builders hardware, has developed and placed in production a new garage door operating mechanism with unusual features which insure easy, positive operation. Steel springs, steel weather stops and self locating hardware are parts of this mechanism.

Arcade Malleable Iron Co. Inc., Worcester, Mass., is installing a new Z-metal annealing furnace with about four times the capacity of the company's present equipment. The

new furnace, built by General Electric Co., Schenectady, N. Y., is expected to be ready for operation sometime in March.

Michigan Wheel Co., Grand Rapids, Mich., which recently designed a propeller which is reported to develop greater boat speed without any increase in the revolutions per minute, now is producing these propellers in all sizes up to and including 22-inch diameters. They will be stocked by distributors throughout the country.

Western Foundry Co. Ltd., Wingham, Ont., manufacturer of home heating equipment, has developed a new unit known as the Huron air conditioner. It is designed to convert the ordinary warm air heating system into both a gravity and forced air heating and cooling plant, giving filtered, water washed and humidified air with controlled heat.

Shirley Corp. is the new name of the company formerly known as W. H. Johnson & Son Co. With headquarters and plant at 330 East St. Joseph street, Indianapolis, the company manufactures radiator furniture and matched unit kitchen cabinet equipment, both products being made entirely of steel. J. W. Shirley is president.

Los Angeles Machine Tool Show Attracts Crowds



MORE than 14,000 persons attended a machine tool exhibit and demonstration sponsored by Herberts Machinery Co. Ltd., west coast distributor, in Los Angeles recently. Twenty carloads of machine tools were housed in the Herberts building which was gayly decorated, and illuminated at night. A 23,000,000-candle-power search light served as a beacon. The exhibit continued for a week.

Exhibitors included: Allsteel Press Co. Inc., Chicago; American Broach &

Machine Co., Ann Arbor, Mich.; American Tool Works Co., Cincinnati; Acme Electric Welder Co., Los Angeles; Bardons & Oliver Inc., Cleveland; Bryant Chucking Grinder Co., Springfield, Vt.; the Ex-Cell-O Aircraft & Tool Corp., Detroit; Hydraulic Press Mfg. Co., Mt. Gilead, O.; International Machine Tool Co., Indianapolis; Oster Mfg. Co., Cleveland; Racine Tool & Machine Co., Racine, Wis.; George Scherr Co., New York; Sundstrand Machine Tool Co., Rockford, Ill.; Van Norman Machine Tool Co., Springfield, Mass.; Whitney Metal Tool Co., Rockford, Ill.; Rockford Machine Tool Co., Rockford, Ill.; Reed-Prentice Corp., Worcester, Mass.; Niagara Machine & Tool Works, Buffalo; Baker Bros. Inc., Toledo, O.; Oliver Instrument Co., Adrian, Mich.; Moline Tool Co., Moline, Ill.

METHOD

There are Methods and Methods. Today, the Progressive Time Saving Method is more than ever essential in Efficient and Economical manufacturing.

Therefore, the selection of a satisfactory Method for Profitable operation is best done by comparison on the grounds of Past and Present Performance.

The Mult-Au-Matic has been proved and accepted for years as a basically sound and Profitable manufacturing Method. In many plants it has become the key in Production lines where operations consist of boring, turning, facing, threading, reaming, grooving, and hosts of other operations, both standard and special.

Briefly, the Mult-Au-Matic consists of a series of work stations located around a central column, each station having individual, independent, and variable speeds, feeds, and tool-setting. An additional station is provided for unloading and loading of finished and rough pieces. Automatic

indexing from station to station, and the simultaneous operation of tools at each station, enables the Mult-Au-Matic to finish seven operations in the time of the longest single operation, plus a few seconds for indexing.

The Mult-Au-Matic is characterized further by ease of tool-setting and change-over from job to job, variety of tool carrying heads, continuous flow of filtered lubricating and cutting oils, and mechanically controlled rate of production.

For the heavier classes of work, there is the Type "D" Mult-Au-Matic in 8"—12"—16" sizes with a selection of six or eight spindles, and for smaller classes of work requiring considerably higher speeds, there is the Type "J-7" and "J-11".

Let the Mult-Au-Matic Method be your Production Method. For complete information, send prints or samples for Engineering Estimates as applied to your jobs.

THE BULLARD COMPANY

BRIDGEPORT · CONNECTICUT



MIRRORS OF MOTORDOM

DETROIT

FULL speed ahead" was the signal to production departments in motor plants here last week, as the efforts of everyone from master mechanic to purchasing department were bent toward getting out more cars to hungry dealers. Especially was this true in General Motors divisions, and the result was surprising in view of the lengthy shutdown which these plants experienced. By now practically all GM plants have resumed normal production, and ambitious plans are being laid for this month.

There were a few minor exceptions to this trend, such as at Cadillac where some difficulty was being experienced due to the fact a number of machines had to be torn down to check bearings following the report sit-down strikers had dumped emery on some of the machines.

Pressure on suppliers is intense. Steel sellers are being beleaguered on all sides for deliveries, but with mills at virtual capacity, little can be done to speed shipments any further. Orders are being booked with no stipulation on the matter of price, since it appears increasingly likely prices will be marked up at the start of the second quarter.

Higher wages, mounting scrap prices and other factors all point to an advance in steel prices. although there is some feeling among buyers that mills are taking advantage of a booming market to lift prices and that from a cost standpoint the justification of higher prices may be questionable. But, however you figure it, little resistance will be felt from most buyers whose main concern is to get hold of the material as quickly as possible.

LABOR is still the only bearish factor in the picture. Sit-down strikes continue to pop up throughout the industry, even spreading to cigar factories, bakeries, bed spring manufacturers, laundries, trucking companies and the like. Chief con-

cern of the automotive industry is over the danger of a sudden disturbance in some parts plant which might tie up car production. For example, Timken-Detroit Axle was forced to close Wednesday, after a recurrence of labor difficulties. Gates were locked against the day shift after 300 men on the night shift stopped work. Signs were posted indicating the plant would be closed until further notice. Meetings between the management and UAW representatives were scheduled to consider demands of the union which included abolition of piece-work, 75-cent minimum wage, 5 per cent extra for night work, two weeks vacation with pay, and recognition of the UAW as sole bargaining agency.

Sounds Note of Caution

Numerous other strikes of short duration have been experienced in other parts plants. Settlement has been accomplished in most cases by granting wage increases. The 75-cent hourly minimum is coming to be accepted in practically all plants.

Many feel the sit-down strike is being run into the ground and is being made to appear so ridiculous in many cases that its usefulness is nearing an end. In this connection, it is interesting to note the words of Homer Martin, UAW president, in addressing a recent meeting of union sympathizers. He urged workers to go slow in calling sit-down strikes and to attempt to "understand the problems of management." No doubt Mr. Martin has read the handwriting on the wall.

Prior to this mass meeting, union organizers took truckloads of handbills to the city limits of Dearborn and, staying on the Detroit side because Dearborn police would allow them to go no further, passed out the literature to Ford workers as they drove out of the plant. The notices contained the usual hokum about the UAW's "signal" victory over General Motors, and urged Ford workers to join.

It is not likely the UAW will get

anywhere with Ford workmen who are among the most satisfied in the industry. Wage increases are being given out quietly to men in the Ford plants, with no fanfare or publicity, and the management needs no staff of Pinkerton men to ascertain its employes' thinking. The Ford service department takes care of this, and the operations of this division are a marvel to many—including, so the story goes, a number of prominent General Motors executives.

EMPLOYES of General Motors' engineering departments probably regretted to see the strike settled. With the plants closed, these men were moved down to Detroit in the General Motors building. So cramped were the quarters that the men had to be spread out in many remote places, including a nearby garage. But while they were there they all worked overtime daily and many earned as much as \$75 a week over normal pay.

Equipment buying has fallen off sharply in this district in the last two weeks, and machinery interests forecast a coming pinch when automobile plants redirect attention to equipment programs. The delay, combined with the difficulties which machine tool builders are having in making anything resembling reasonable deliveries, may exert a noticeable effect on new models which must be ready for the October show in New York.

Speaking of new models, there is considerable speculation as to General Motors plans for new transmissions on Buick, Olds and Pontiac. The new No. 66 transmission plant in Flint is now being completely equipped for production and is reported to have sufficient capacity to supply automatic transmissions for all three of these cars. It will be recalled Olds was practically ready to announce an automatic transmission for this year's models, but the plan for some reason was abandoned.

It seems reasonable to expect the 1938 Olds will be equipped with the



MIRRORS OF MOTORDOM

new type of transmission and, if it proves popular, Buick and Pontiac will likewise adopt it. This transmission is said to involve the principle of the New Departure Transitorq, which provides an infinitely variable speed ratio from 1 to 1 up to 6 to 1. Principal elements are two disks with concave surfaces around their outer edges, and rollers which ride on these surfaces of the disks which face each other. Varying the inclination of the rollers varies the speed ratio.

Plans Are Crystallizing

Development work on a new custom-built Auburn is proceeding slowly, and it may be some time before official announcement is made. Packard likewise is moving ahead on plans for 1938. Three more large presses are still to be installed in the Packard sheet metal shop. These are for forming the steel top which is to be standard. Previous plans for making the top for the largest Packard in two pieces and then welding them together have been discarded; the top will be stamped in one piece, despite the large dies required.

Graham, currently reporting about 90 cars per day, is pushing new model plans with the aim of having cars ready about Aug. 1. Hudson production has tapered to about 390 cars per day; plans for 1938 models are still in a nebulous stage.

Tool and die stamps continue slack on automotive work, but most of them have plenty of other business to keep operating at a good rate.

Some signs of activity are reported at the Hupmobile plant here. Last year, from April until September, designers were at work developing a new model, one of which was built. Pending a reorganization, nothing was done about resuming production, but several designers are now working regularly at the plant, presumably putting finishing touches on the plans and specifications. Chief difficulty seems to be in obtaining three or four million dollars for reconditioning equipment and buying materials.

HOW effectively General Motors has whipped production back in line is shown by the output figures for the week. GM divisions increased from 23,103 to 38,500, mov-

ing ahead of Ford and Chrysler for the first time in many weeks. Ford and Lincoln operations continued unchanged at 29,775, of which 29,000 were V-8s. While sales are brisk, Ford dealers are finding the used car problem more and more vexing. In this respect their troubles are no different than those of many other dealers.

Chrysler divisions likewise showed no change in weekly production, accounting for 27,900 cars. The UAW, with its main stronghold at Dodge, has presented demands to Chrysler for a collective bargaining conference. They were referred to two members of the corporation's executive and legal staff—Herman L. Weckler and Lester L. Colbert.

Chrysler has nine plants in the United States and Canada—four in Detroit, two in Windsor, one in Los Angeles, one in Newcastle, Ind., and one in Evansville, Ind. Employees total 75,000, of whom 25,000 are executives and "white-collar" employees.

500,000 for March

Total estimated auto production for the week, crossed the 100,000-mark for the first time this year and stood at 111,915. A whirlwind finish managed to put February slightly ahead of January, the figures being 352,750 and 344,000, respectively. March production, according to

present schedules, should cross the 500,000-mark, accomplished only twice last year, in April and December.

Retail financing of new and used cars for 1936 reached the astounding total of \$1,636,029,487 and involved 4,026,652 cars. This was a sharp increase over financing in 1935, indicating the willingness of more and more people to mortgage their future to own a car. Proportion between new and used car financing is about 50-50, with a slight edge in favor of used cars.

SECRETARY ROPER, speaking unofficially, has condemned the sit-down strike, asserting "any sit-down strike that undertakes to take over personal property is a serious matter which I think will not long be endured by courts." But what happens when the unions just laugh at courts? . . . A member of the Dodge engineering department relates the interesting story of how he was "invited" to join the union by two behemoth UAW plug-uglies . . . Lake freighters are sailing from Detroit this week, with insurance in force and government lights in operation—six weeks before the usual opening of the shipping season. Large numbers of ducks, not to mention robins, have already been observed in this territory . . . David E. Anderson of Bohn Aluminum maintains present automobile engines have been developed by *synthesis* rather than by *analysis*, and the time is now ripe to apply the analytical method of design to a power plant . . . Visitors to the Ford rotunda, erected last May, totaled 900,976 on Feb. 8. Last year set a new record for visitors to the Rouge plant when 132,507 persons made the trip through . . . Ford dealers are distributing free to their friends copies of the *Ford Home Almanac* for 1937 . . . Material releases following resumption of operations at Pontiac included 30 carloads of pig iron, 12,500 tons of strip, sheet and bar steel, 5620 tons of forgings, 500 carloads of frames, 100 carloads of axle housings, 2000 tons of scrap for the foundry, 1250 tons of bumpers and 500 tons of instruments and gages . . . Studebaker has introduced a new coupe-express with 16-gage steel cab and body . . . The \$500,000 power and service tunnel under the river slip at the Ford Rouge plant has been completed after six months' work. Some 1200 tons of cast iron segments were used in its construction . . . One observer in Detroit who has been in the business a good many years, thinks a dose of trade unionism is the best thing that has happened to the automotive industry in a long while.

Automobile Production

Passenger Cars and Trucks—United States and Canada
By Department of Commerce

| | 1935 | 1936 | 1937 |
|-----------------|-----------|-----------|----------|
| Jan. | 300,335 | 377,306 | *344,000 |
| Feb. | 350,346 | 300,874 | *352,750 |
| March | 447,894 | 438,992 | ..... |
| April | 477,059 | 527,726 | ..... |
| May | 381,809 | 480,371 | ..... |
| June | 372,085 | 469,355 | ..... |
| July | 345,297 | 451,474 | ..... |
| Aug. | 245,075 | 275,951 | ..... |
| Sept. | 92,728 | 139,785 | ..... |
| Oct. | 280,316 | 229,989 | ..... |
| Nov. | 408,550 | 405,702 | ..... |
| Dec. | 418,317 | 519,132 | ..... |
| Year | 4,119,811 | 4,616,857 | ..... |

*Estimated.

Calculated by *Cram's Reports*

| Week ended: | |
|-------------------|---------|
| Jan. 30 | 74,148 |
| Feb. 6 | 72,295 |
| Feb. 13 | 72,850 |
| Feb. 20 | 95,698 |
| Feb. 27 | 111,915 |



WINDOWS OF WASHINGTON

WASHINGTON

FROM the standpoint of the steel industry happenings last week in Washington continued to be headed by discussion of steel purchases for the navy under the Walsh-Healey act. It is apparent that too many cooks are likely to spoil the broth, especially with Madam Perkins coming out with practically meaningless statements from time to time.

As a typical example of this she stated at a press conference last week that the matter might be adjusted since she had explained to the steel manufacturers that they could operate 48 hours a week under a Walsh-Healey contract provided they pay their men time and a half for overtime. She contended they had not known this before in spite of the fact that the leading steel companies have adequate representation here. Of course they have known this and there was nothing new in the information she is alleged to have given to the industry.

Also, it is possible that this whole matter might be straightened out shortly in view of her remarks at her press conference that everything would be adjusted in the next 48 hours. Neither representatives of the steel interests in Washington or government officials who have been close to this matter had the slightest idea to what she had reference.

No Tariff Reduction Threat

Last week also the question of decreasing the tariff on steel imports was hung over the heads of the steel industry. However, no one conversant with the facts is taking this seriously. A few dollars a ton one way or the other would not greatly change the important situation. It is interesting to note that most other large countries further protect their steel industry by quotas and dumping laws for which we have no equivalent.

Questioned at his press conference on the subject last week Secretary of Commerce Roper pointed out that there would be no incentive in lowering the tariff on steel for imports

(although he is a low-tariff man) but pointed out that if anything had to be done, the government would probably manufacture its own steel. However, he denied that anything of the kind is contemplated and in connection with imports he called attention to the fact that the department of commerce is anxious to keep the steel industry in the hands of American manufacturers.

He exhibited a table compiled by the American Iron and Steel institute showing the tariff situation on various steel commodities in the United States and in some of the larger countries, which showed in substance that our tariff import rates on iron and steel commodities are lower than those of most countries.

On pig iron, for instance, the table showed that our tariff rate per gross ton is \$1.125, that of Great Britain, \$6.333; Belgium, \$0.241; Italy, \$15.930; Sweden, free; France, \$5.350; Germany, \$4.030.

Steel Not Delaying Navy

Apropos of statements in the daily press that the steel industry is holding up navy shipbuilding, it is interesting to note that 50 per cent of the ships are being built in private yards. They are experiencing no trouble getting steel shipments. Of the remaining ships under construction, it is understood on the highest authority that three submarines and six destroyers are in process, but the keels have not yet been laid and the drawings not completed. In other words, at this time no navy ships are under construction for which adequate steel is not available.

Senator Nye of North Dakota last week announced that he and some of his associates on the munitions committee of the upper house will introduce a bill to nationalize the manufacture of armor plate and munitions as a means of hitting back at the steel industry for refusing to bid on navy steel.

President Roosevelt said at a press conference last week that he still had heard nothing from the navy

and labor departments on the Walsh-Healey matter. He stated that representatives of these departments, when they left the White House conference last week, were told to return when they had a report to make. The President said that he had had no request, to that time, for a further conference.

Carnegie-Illinois in Denial

In Pittsburgh last week Carnegie-Illinois Steel Corp. denied the widely published reports that it had taken the lead in acceding to provisions of the Walsh-Healey act by filling a \$30,000 order from the TVA. It was unofficially explained that the order for material for a railroad runway had been accepted early in December and that only part of the work had been done by Carnegie-Illinois at its Johnstown mill, while some of the material had been rolled by another company.

WOULD BUILD PLANT TO SUPPLY NAVY STEEL

Representative Stack, Pennsylvania, has introduced a resolution calling for construction and equipping a plant in the vicinity of League Island, Philadelphia, "for the manufacture of steel, which shall be capable of supplying the navy of the United States with such steel for warship construction as the navy may require, and operate such steel plant exclusively for the requirements of the navy."

Representative Ellenbogen, Pennsylvania, has introduced a resolution calling for the appointment of a house committee of five to investigate economic conditions under which iron and steel is manufactured.

CULBERTSON CLAIMS TRADE AGREEMENTS AS REPUBLICAN

Apropos of the trade agreement bill now pending in the senate William S. Culbertson, former vice chairman of the tariff commission in his new book, "Reciprocity" contends that though the trade agree-

ments act of 1934 was passed by a democratic congress and the resulting reciprocal trade treaties are a leading part of Secretary Hull's trade policy, many principles embodied in the act are republican in origin and republicans have been largely responsible for the development of reciprocal trade treaties in the past.

Culbertson states that his claim that the republicans originated many features of the trade agreements act is proposed "not to claim any partisan credit or to detract in any way from the revitalizing statesmanship of Mr. Hull, but rather to emphasize the fact that in principle the American foreign trade policy is nonpartisan. Republicans and democrats alike have sponsored methods of scientific tariff making and have supported the principles of commercial policy and procedure which are embodied in the trade agreements act. I am supporting the Hull trade agreements program. I am supporting it because I believe it sound in principle. I am also supporting it because its fundamentals are republican in origin."

BUSINESS WITH COMMERCE DEPARTMENT IS EXPEDITED

Inquiries of American exporters will be handled much more expeditiously than for the past four years in accordance with a further modification of the co-ordination agreement of August, 1933 made last week between the state department and the department of commerce.

This modification provides that representatives of the department of commerce may now answer direct to American manufacturers their inquiries in connection with trade promotion. Inquiries dealing with trade protection will still come under the state department.

The prime credit for this new order is due to Dr. Alexander V. Dye, director of the bureau of foreign and domestic commerce, who has sought to get his foreign service men out from under the domination of the state department ever since he has been director, for more than a year now. He has been backed by Ernest Draper, assistant secretary of commerce, under whom the bureau's work comes.

However, no small share of the credit for this change is due to the steel industry in the persons of Myron C. Taylor of the United States Steel Corp. and A. M. Hook, of American Rolling Mill Co., both of whom have had the matter up direct with President Roosevelt.

This whole question goes back to the end of the Hoover administration when the foreign service men of the commerce department were practically "on their own". They

co-operated with but were not dominated by state department officials. However, in August, 1933, shortly after the present administration came into power foreign service officers of the commerce department could not answer American industry direct, even to letters directed to them. Everything had to clear through the state department. This made much delay, to the disgust of exporters who make regular use of the commerce department activities.

Under the new agreement, which has already become effective, "all inquiries received from business interests in the United States by commercial attaches and trade commissioners of the department of commerce that relate to the promotion of American foreign trade may be answered directly by such commercial attaches and trade commissioners to the American organizations under such regulations as may be established and promulgated by the secretary of commerce, provided that copies of all such communications * * * shall be provided for the files of the consulate general and the department of state."

As stated above, communications relating to protection of American foreign trade interests, under this new agreement, will be directed to state department officials.

MACHINE TOOL EXPORTS FACE CARTEL ADVANTAGES

"We are all familiar in varying degrees with the nature and functions of European cartels," said L. M. Lind, chief of the machinery division of the department of commerce, discussing the meeting of organized foreign competition in the machinery trade.

"We also read of the activities of a number of foreign governments in promoting export of products of their industries, either through some type of subdivision or merely by organizing their manufacturers in closely knit groups so that they may concert and correlate their programs in each foreign market.

"Co-operative activity is possible," Mr. Lind continued, "among American exporters under the Webb-Pomerene act, which exempts export co-ordination from certain provisions of the antitrust laws. A number of export associations are in operation under the protection of the Webb-Pomerene act, but only a limited number are in the machinery field. The reason for this is not difficult to find. Machinery built in the United States differs so widely in type and is sold in such diverse markets that not much could be accomplished by a co-operative export association unless its scope were much broader and its powers much greater than at present possible.

"In machinery export promotion, therefore, there remain the facts

that our overseas competitors possess advantages that we do not now have, and that we must use to the best of our ability the advantages which we ourselves enjoy. Our large domestic market and unique production methods enable us to offer the foreign customer a wider variety of equipment than can most of our competitors. For the same reason we can offer higher quality machinery, built by better paid labor, than can equipment builders of other countries. The bureau of foreign and domestic commerce, of which the machinery division is a part, has the most extensive export market information service of any country in the world.

"Each machinery builder and exporter has it within his power to make decisions, to complement, for his own benefit, these fortunate circumstances mentioned. He can determine to obtain all available export market information. He can resolve to stay with his good foreign agents through economic storms. He can pursue for himself, as many have done in the past, an aggressive and successful foreign sales policy fitted to his own need and capacity."

MORE ROPE FOR LAFOLLETTE

The senate last week voted a further appropriation of \$40,000 for continuation of the investigation by the LaFollette subcommittee on civil liberties.

This is the committee which has gone so extensively into espionage in steel, automobile and other plants. The LaFollette committee, which worked during the summer on a \$15,000 appropriation, came to the end of its finances last week and asked for \$50,000. This was cut to \$40,000 by the senate with Senator LaFollette definitely stating that he would be back for more later. Advance publicity some weeks ago was to the effect that the industrial world would make a big fuss about any further money being appropriated but no one lifted a voice against the appropriation when it was called up for action.

BAR COLOR CODE EFFECTIVE

Announcement was made last week by the division of simplified practice of the bureau of standards that the proposed simplified practice recommendation for a color code for marking steel bars has been given sufficient acceptance by the industry and it will be effective as of April 1.

This recommendation, which was proposed and developed by the national committee on iron and steel of the National Association of Purchasing Agents, is limited to a color code for marking commonly used grades of steel as represented by S.A.E. numbers.

Industry Battles Pressure Blocs on 49 Fronts

WHILE most industrialists seem to be fully aware of the significance of the approaching national debate on whether or not the executive branch of the federal government shall dominate the judiciary, it is doubtful whether many realize that this classic contest is only one of 49 real battles to be staged in the near future.

Because of its implications, the supreme court issue towers head and shoulders above the 48 other pending engagements. In it are involved most of the perplexing questions that have been introduced during the new deal administration. If the President wins his fight to "pack" the court, the executive branch of the government undoubtedly will act promptly to put into effect many reforms of doubtful benefit which thus far have been blocked by court decisions. If he fails, the useful system of checks and balances, which has proved so beneficial during the 161 years of this republic, will be preserved to act as a safeguard against the mistakes of untimely haste and excessive zeal.

Industrialists, in common with millions of sober-minded citizens who know the danger involved in the President's proposal, are seriously handicapped in voicing their protest effectively. A large portion of the American public has been taught by clever political propaganda to discount any statement emanating from banking, business, industrial or employer sources. It is an outrageous fact, but true, that utterances from hundreds of conscientious leaders in many lines of activity carry absolutely no weight with a large proportion of the public.

To Protest Against Pending Dangers Effectively, Industry Must Use Different Tactics Than in Past

Because of this unfortunate situation, those who desire to lodge effective protest against the administration's threat must resort to different tactics than have been used in the past. There are two angles to the problem, and each calls for a different technique.

First is the desirability of urging one's senators and representatives to oppose the proposal. Here the first duty of every industrialist, employer, engineer, or other person identified with industry is to write to his servants in Washington, expressing his opposition in *his own words*. Do not use the phraseology of "canned" telegrams or letters, such as was used by members of trade associations a decade ago. That technique is definitely out. Do not be bombastic in your protest. State your case calmly, sincerely and as convincingly as possible. Imply that you give your

senators and representatives credit for being intelligent and fair. Do not denounce them in the first paragraph as nitwits or scoundrels. Write your letter with as much care as you would take in drafting a proposal to bag a \$100,000 contract.

Try to persuade others to write to their representatives, but do not help them phrase their letters. Let them express their convictions in their own language.

The second phase is arousing the public to the danger. Speeches by persons who already have been tagged effectively as "economic royalists" will carry little weight in some quarters. Publicity releases by chambers of commerce, boards of trade, bankers' associations, manufacturers' associations, etc. will not be very effective with a large portion of the general public. One resounding note of protest from a liberal, new deal Democratic representative or senator will do more good than a thousand blasts from discredited conservatives.

Most Lower Houses in State Legislatures Are Antagonistic to Industry and Employer Interests

For publicity purposes, therefore, the cue is to use material that is most effective for public consumption. Help to disseminate widely the protests of those nationally-known liberals whose views still are respected by a great majority of the public. A protest from a person who voted for Roosevelt in 1936 is worth 10 protests from persons who have voted against him.

Many of the tactics which will be effective in blocking the effort to pack the supreme court will be equally potent in the other 48 pending contests. In 47 states there are state assemblies made up largely of over-zealous reformers who have little regard for anything except furthering the interests of selfish minority blocs. In Nebraska, the forty-eighth state, a unicameral legislature is functioning.

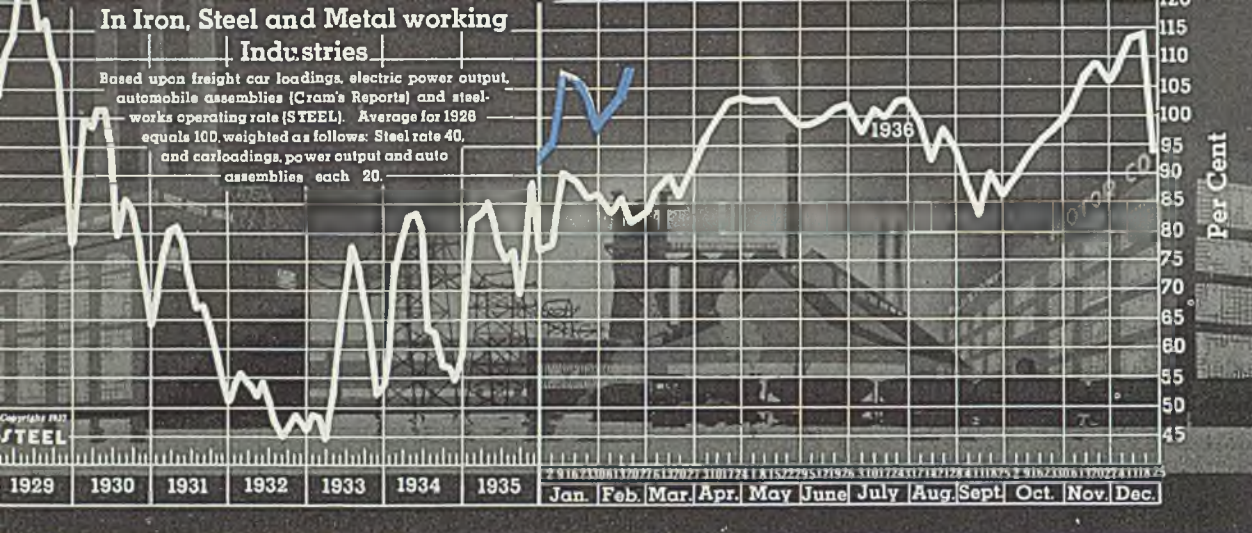
In most, if not all, of the 48 states, contests are in the making between irresponsible, power-drunken assemblymen who are almost automatically antagonistic to employers and business interests and who will promote anything that superficially seems to benefit professional labor unions and other pressure blocs. Thousands of ill-advised bills are being proposed in these state assemblies and an alarming number of them pass the lower houses by a 20 to 1 margin. Many of these bills involve penalties and hardships which threaten seriously the business interests of the respective states.

Fortunately, many state senates act as sieves which weed out some of the obnoxious bills passed by the lower houses. Nevertheless the flow of dangerous legislation is appalling.

Here is a battle on 49 fronts. It is a challenge to industry's statesmanship!

In Iron, Steel and Metal working Industries

Based upon freight car loadings, electric power output, automobile assemblies (Cram's Reports) and steelworks operating rate (STEEL). Average for 1928 equals 100, weighted as follows: Steel rate 40, and carloadings, power output and auto assemblies each 20.



The

STEEL'S index of activity gained 6.8 points to 108.7 in the week ending Feb. 20:

| Week ending | 1937 | 1936 | 1935 | 1934 | 1933 | 1932 | 1931 | 1930 |
|-------------|--------|------|------|------|------|------|------|-------|
| Jan. 9 | 107.8 | 90.2 | 73.8 | 58.1 | 48.6 | 55.8 | 69.2 | 88.1 |
| Jan. 16 | 106.7 | 89.3 | 78.1 | 60.9 | 49.8 | 56.2 | 72.1 | 91.8 |
| Jan. 23 | 104.7 | 86.0 | 79.5 | 62.3 | 50.8 | 55.8 | 72.0 | 96.3 |
| Jan. 30 | 99.6 | 86.6 | 81.8 | 66.9 | 49.9 | 56.2 | 72.9 | 97.4 |
| Feb. 6 | 100.8 | 83.8 | 82.7 | 70.7 | 48.7 | 56.0 | 74.9 | 100.8 |
| Feb. 13 | 101.9† | 85.9 | 82.8 | 72.4 | 48.3 | 55.5 | 75.4 | 100.9 |
| Feb. 20 | 108.7* | 81.8 | 80.5 | 75.5 | 46.0 | 54.5 | 76.0 | 97.7 |

†Revised. *Preliminary.

Rate of Industrial Activity Rises 6.8 Points in Week

INDUSTRIAL activity recovered sharply in the last 10 days of February. STEEL'S index stood at 108.7 for the week ending Feb. 20, a gain of 6.8 points over the preceding week, and was poised for a further advance in the final week of the second month.

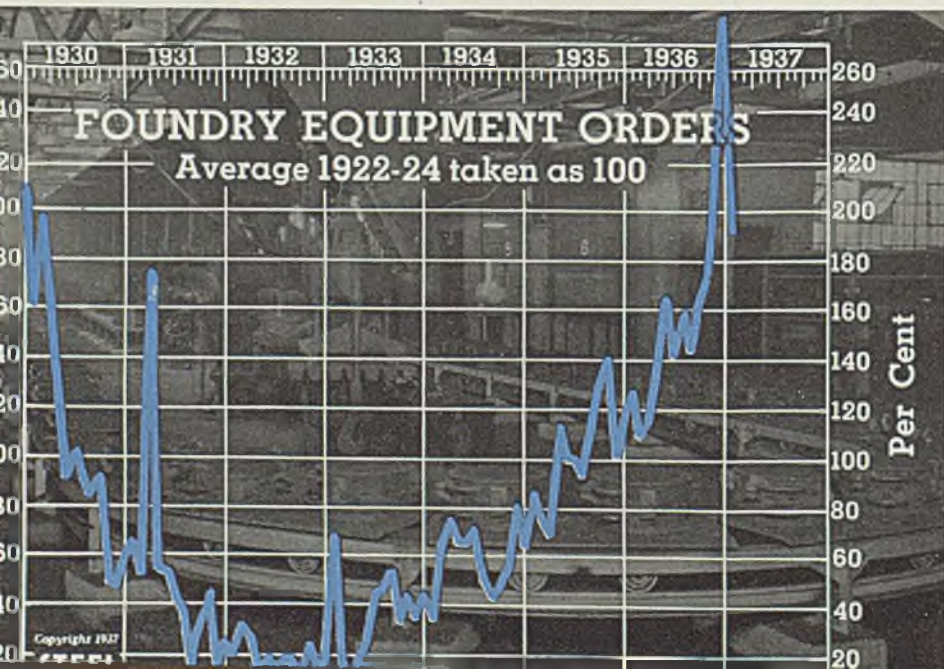
The chief factors in the present upturn are the increasing output of automobiles and continued expansion in steelworks operations. Freight traffic also is gaining.

Reflecting the resumption of activity following the settlement of the General Motors strike, automobile

assemblies in the week ending Feb. 20 were estimated at 95,698, compared with 72,492 in the preceding week. This was the highest weekly output reported since the week ending Jan. 9.

Steelworks operations advanced to 83 per cent of capacity, the highest rate since the week ending Oct. 12, 1929. By a co-incidence, the rate for the week ending Feb. 20, 1937, is identical with that of the corresponding February week of 1929. The present bulge in steelmaking is due to new releases by automobile builders and the railroads, to flood rehabilitation work and to some forward general purchasing in anticipation of strikes.

Commodity prices, particularly of metals, continue to tend upward. Increased expenditures for armament has been a factor in the recent sharp rise in the quotations of nonferrous metals.



| | Per Cent | | | |
|-------|----------|-------|-------|------|
| | 1937 | 1936 | 1935 | 1934 |
| Jan. | 190.9 | 127.0 | 76.6 | 37.2 |
| Feb. | 110.4 | 110.4 | 75.7 | 65.8 |
| March | 115.0 | 115.0 | 69.4 | 75.4 |
| April | 134.0 | 134.0 | 113.2 | 67.9 |
| May | 165.4 | 165.4 | 100.7 | 66.5 |
| June | 141.4 | 141.4 | 100.2 | 70.4 |
| July | 159.6 | 159.6 | 94.0 | 50.7 |
| Aug. | 144.8 | 144.8 | 113.0 | 43.1 |
| Sept. | 161.0 | 161.0 | 128.5 | 46.4 |
| Oct. | 173.8 | 173.8 | 140.0 | 55.3 |
| Nov. | 200.4 | 200.4 | 100.4 | 80.4 |
| Dec. | 233.3 | 233.3 | 118.1 | 66.9 |

BUSINESS

TREND

January Building Awards Unchanged; Above Year Ago

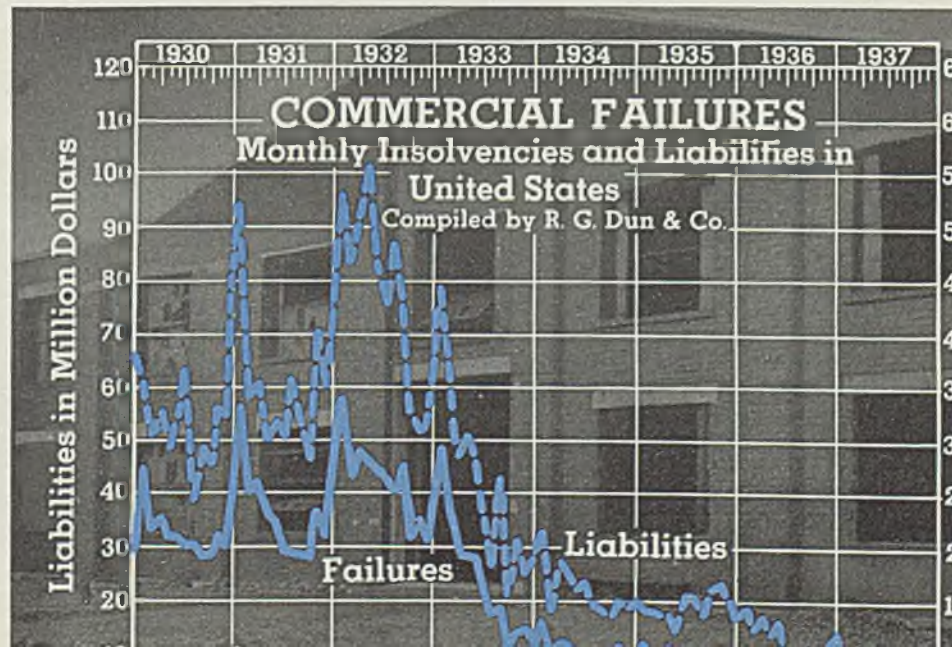
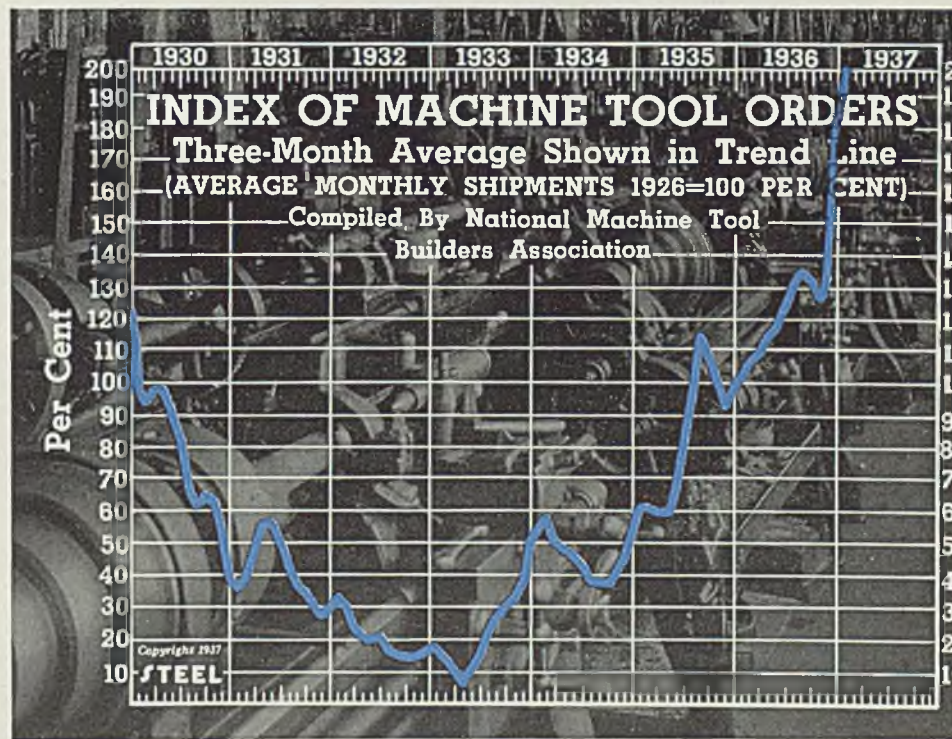
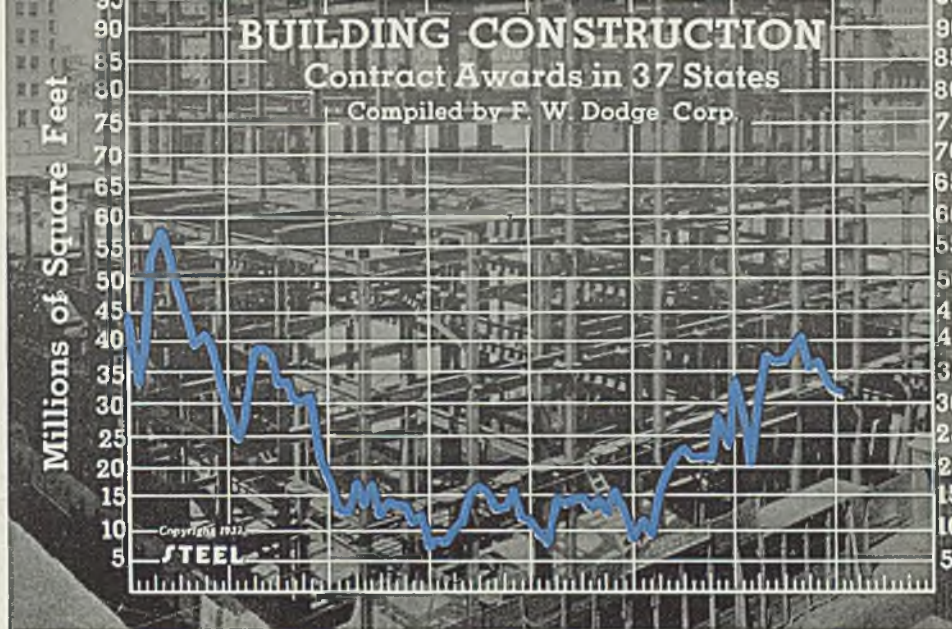
| | Square Feet | | |
|----------------|-------------|------------|------------|
| | 1937 | 1936 | 1935 |
| Jan. | 33,470,000 | 27,053,300 | 11,245,100 |
| Feb. | 20,856,700 | 9,670,300 | 15,845,300 |
| Mar. | 31,308,100 | 19,917,300 | 22,276,200 |
| Apr. | 37,490,200 | 21,565,900 | 21,545,400 |
| May | 36,362,100 | 21,365,700 | 22,378,800 |
| June | 36,883,900 | 27,775,900 | 21,565,900 |
| July | 38,762,500 | 24,120,700 | 21,545,400 |
| Aug. | 40,285,100 | 21,365,700 | 21,365,700 |
| Sept. | 35,448,000 | 27,775,900 | 21,365,700 |
| Oct. | 36,718,900 | 24,120,700 | 21,365,700 |
| Nov. | 34,947,500 | 24,120,700 | 21,365,700 |
| Dec. | 33,632,600 | 33,441,900 | 33,441,900 |

Machine Tool Orders Continue Upward Swing

| | Three-Month Average | | | |
|-----------------|---------------------|-------|------|------|
| | 1937 | 1936 | 1935 | 1934 |
| Jan. | 201.7 | 102.6 | 61.3 | 56.5 |
| Feb. | 107.1 | 61.5 | 58.2 | 58.2 |
| March | 109.4 | 60.3 | 50.9 | 50.9 |
| April | 114.4 | 60.3 | 48.5 | 48.5 |
| May | 116.6 | 67.1 | 46.8 | 46.8 |
| June | 124.5 | 76.7 | 42.6 | 42.6 |
| July | 132.6 | 94.7 | 38.6 | 38.6 |
| Aug. | 135.5 | 112.2 | 37.1 | 37.1 |
| Sept. | 132.0 | 108.5 | 37.4 | 37.4 |
| Oct. | 127.5 | 102.9 | 40.5 | 40.5 |
| Nov. | 134.0 | 93.8 | 44.2 | 44.2 |
| Dec. | 180.4 | 89.9 | 54.1 | 54.1 |

Commercial Failures Show Slight Gain; Liabilities Down

| | Failures, Number | | Liabilities, Dollars (000 omitted) | |
|-----------------|------------------|--------|---------------------------------------|----------|
| | 1937 | 1936 | 1937 | 1936 |
| Jan. | 811 | 1,077 | \$8,661 | \$18,104 |
| Feb. | 856 | 14,089 | 14,089 | 14,089 |
| March | 946 | 16,271 | 16,271 | 16,271 |
| April | 830 | 14,157 | 14,157 | 14,157 |
| May | 832 | 15,375 | 15,375 | 15,375 |
| June | 773 | 9,177 | 9,177 | 9,177 |
| July | 639 | 9,904 | 9,904 | 9,904 |
| Aug. | 655 | 8,271 | 8,271 | 8,271 |
| Sept. | 586 | 9,819 | 9,819 | 9,819 |
| Oct. | 611 | 8,266 | 8,266 | 8,266 |
| Nov. | 688 | 11,532 | 11,532 | 11,532 |
| Dec. | 692 | 12,288 | 12,288 | 12,288 |



Stack Cutting Saves Time in Heavy Repairs to Freight Cars

BY B. F. ORR*

Superintendent of Car Shops, Big Four Railroad, Beach Grove, Ind.

TO MEET the demands of modern mass transportation it has been necessary for the railroads to set up heavy repair programs on production line schedules with movements or deliveries of cars within time periods of from 18 to 24 minutes. The maintenance of the production line schedules is dependent upon the ability of the fabrication department to furnish new material or parts for replacement of those which are unfit for further service, on time.

The fabrication department is

*From a paper read before the thirty-seventh annual convention, International Acetylene association, held in St. Louis.

called upon to manufacture thousands of identical pieces during the course of a regular heavy repair program and the development of stack cutting of plate material by the oxyacetylene flame cutting process has proven to be one of the greatest steps forward in fabrication methods that has been made in years.

Stack cutting, as the term infers,

means the cutting of sheets or plates piled or stacked upon one another to a definitely determined height. It is evident that the cutting torch must be moved over the stack mechanically to obtain smoothly and accurately cut edges and it is, therefore, a machine operation.

The machine installed at the Brightwood shop has a cutting range of 81 inches transversely and 24 feet longitudinally. This large capacity was provided to meet the production demands of the fabricating shop and permits the economical cutting of four different parts of large dimensions in progression.

Permanent Templates Are Used

The cutting machine is the type which is automatically guided by means of full sized templates, the guiding member being an aluminum rail suitably fixed to a base. As all of the operations being performed by the cutting machine will be repeated at intervals, permanent templates have been constructed. Due to the large size of the parts cut and the corresponding size of the templates considerable thought and study was devoted to the development of a template base which would meet the requirements of both strength and lightness. The material selected is $\frac{3}{8}$ -inch plywood properly reinforced by $\frac{1}{2}$ x 1 $\frac{1}{2}$ -inch strips attached to the under side with wood screws. The larger sized templates are made in skeleton form to reduce the quantity of material used and are so designed as to provide a secure base along the line of cut. When in use the templates are bolted to the top of the cutting machine table and only the original adjustment is required as the templates are positioned with relation to permanently located

RIVET "washing" is the first step in tearing down cars preparatory to rebuilding them from the shapes cut with oxyacetylene flame



jigs and stops. A change from one operation to another consumes but a very short time as the templates can be exchanged without further adjustment of position being required.

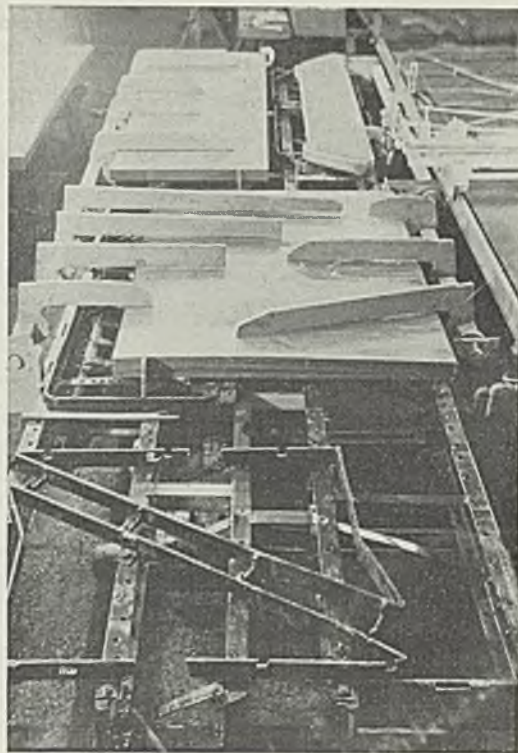
The stacks of sheets or plates are supported by jigs mounted upon channel section beams extending the full length of the machine which are supported in turn upon the work supports furnished with the cutting machine. The supporting jigs are constructed of $\frac{3}{4}$ x 3-inch steel bars in skeleton form, the outline being slightly smaller than the contour of the part to be cut. The outline of the jig is within the limits of the finished contour to provide clearance for the cutting stream and the slag of the oxy-acetylene cutting reaction. The material is placed upon these jigs by a labor gang and removable stop keys are provided to locate definitely each stack of material without any adjustment after it has been piled.

Stop Keys Locate Material

The stop keys are held in place when in use by slots permanently welded to the channel beams. One edge of the slot or keyway is vertical and the other is tapered. With this design it is not possible for the stop to move out of position. Accurate placing of the material at each loading is insured. Provision has been made to work various sizes of plate stock from the same keyways or slots by making offset keys either extending beyond or receding from the vertical edge of the keyways. All of the keys or stops are identified by markings indicating the specific operation on which they are to be used and the location of the stop slot in which they are to be placed. Change of stop arrangement can be made rapidly, while no delay in the loading operation occurs.

As previously stated, loading of the plate material is performed by a labor gang consisting of two men who also have the duties of assisting with the unloading of the cut material by overhead crane and separating the cut sheet sections for

PLATES ready for stack cutting. In the foreground are jigs for inside hopper sheets, in the middle stacked plates for inside hopper sheets ready for cutting, right rear shaped sill hood sheets and left rear cross ridge sheets ready for cutting

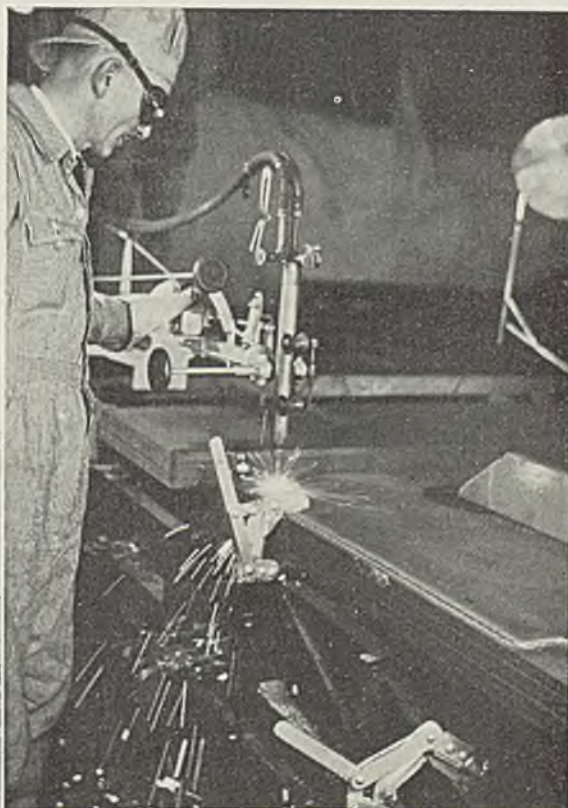


subsequent handling by punch operators. The labor gang loads the sheets on the jigs from stock piles conveniently located adjacent to them. The sheets are loaded one at a time in order that a visual inspection of the surface condition may be made, the surface can be cleaned and any matter which might prevent bringing the sheets in close contact for the cutting operation can be moved. Sheets or

plates having kinked or buckled edges are straightened before being placed in the stacks to avoid separation of the material while cutting. This preliminary preparation has a very definite value, since by careful loading a good clean cut is obtained without any interruption.

The sheets are loaded twelve high where material $\frac{1}{4}$ -inch thick is used, the stack thickness being nominally 3 inches. The reason for

BELOW—Completely rebuilt self-clearing hopper car. Accuracy of the shape cutting operation permits the plates to be placed in exact position. Right—Cutting operation on the edge of a cross ridge sheet. Method of using the hand toggle clamp is shown



stacking to this thickness has been developed through a careful study during which all the factors of time and the cost were considered. With a number of different sheet sizes and with variations in the lengths of cuts to form the various parts, it was found to be most economical to load 12 sheets in order that the loading gang could load progressively ahead of the cutting operation.

The material is loaded progressively; that is, the jigs are filled starting at one end of the machine and proceeding to the jig at the opposite end. The loading of the jigs continues, as does the unloading of them, while the cutting operation is being performed and the entire operation becomes a complete cycle of loading, cutting and unloading. As soon as possible the cut stacks are separated by the same labor gang who make certain there is no adhesion between the cut sections which might prevent easy handling through the subsequent fabricating operations. It might appear to some that due to the heat of the cutting reaction the edges of the sheets might become fused together. This action, it may be assured, does not occur under any condition. With certain improvements which have been made in cutting nozzle performance the operation of separating the cut sheets has nearly resolved itself into one of inspection in which it is only necessary to slide the sheets apart to make certain there is no adherence.

Pneumatic Clamps Devised

To insure close contact between the sheets, pneumatic clamping devices have been erected. These are so designed that pressure can be applied quickly along the line of cut. The pressure is applied through levers moved by fulcrum bars extending along the sides of the work supports. The prime movers are 10 x 12-inch brake cylinders operated from the shop compressed air supply with a pressure of 90 pounds per square inch. The pressure levers or bars are designed so they can be easily removed to permit unloading and loading. The labor of removing and applying them is performed by the labor gang.

The operator inspects the stack

in order to assure himself the preparatory work has been properly performed and a good cut will result. He then applies the clamping pressure. With the pneumatically operated clamps the pressure is applied quickly and uniformly and the stacks are securely held against the jig forms.

The cutting operation is started immediately after the clamping operation is completed, a single operator handling the machine. The driving mechanism is controlled from the blowpipe end of the machine through a lifting and revolving device. The feed or cutting speed is regulated at the motor through a governor setting and as a constant speed is used for the 3-inch stacks, very little regulation of motor speed is required. With the lifting device the machine can be moved from template to template from the front or blowpipe end of the machine and there is no need for the operator to move from the normal line of operation to perform this work.

Speed Carefully Regulated

The cut is started at the edge of the stack against the gaging stops and, if continuous, is not interrupted until the cut is completed. In cases where the lines of cut intersect and stop at the point of intersection, gates or switches are provided in the templates and when the cut reaches the point of intersection the cut is stopped until the gate can be moved into the proper position. The cut is then resumed by starting through the kerf at the point of intersection of the two lines of cut.

The speed of the machine is so regulated as to give a good smooth cut with the greatest economy. In determining the proper size of stack to be used to obtain the best and most economical results, a great deal of study was devoted to the size of nozzle, oxygen operating pressure and speed of cut, as well as to the loading factor. It was found greatest economy could be obtained with a 3-inch stack of $\frac{1}{4}$ -

inch plate which permitted using a medium-sized cutting nozzle at nearly top speed for this thickness of material.

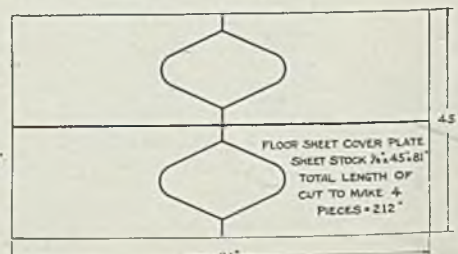
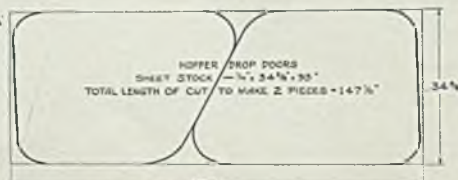
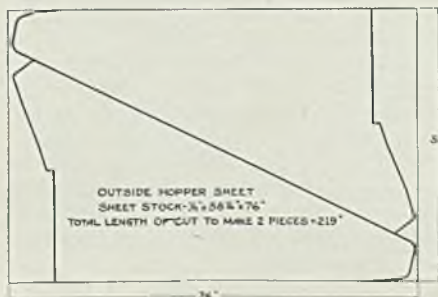
The results obtained through the use of the oxyacetylene cutting process in stack cutting of freight car parts have fully met the expectations. Cost records, which have been carefully made since the cutting machine has entered into full production, show an average saving over a 14-day period of 16 per cent in the direct cost as against doing this work by shearing methods. This comparison does not consider any factors of overhead such as maintenance of shearing machines, blades and power costs, nor does it include the saving effected by reducing the many handlings of this class of material which are required with shearing.

Salvage Value Is Large

It is evident too that the saving in direct cost will increase as better schedules of supplying the sheet material to the machine and of unloading the finished work are worked out.

There is another factor of importance which must not be overlooked in considering the saving which can be effected through the use of the oxyacetylene process in the stack cutting of steel sheet or plate material and that is the large saving or earning which is obtained from the recovery of new usable material. With shearing and coping methods it is not possible to recover much of the offal removed from the sheets in pieces large enough for use in the manufacture of the smaller parts required in car construction. This is particularly true where recesses are sheared by means of a coping shear as the material is removed in small bits which go into the scrap bins. The material removed from recesses by the oxyacetylene cutting process is in one piece and of such size as can be used for the manufacture of other parts. It is not possible to set up an average figure to represent this saving due to the variation in the work but it is recorded that usable material to the value of nearly \$200 has been recovered during a six work day period at our shop.

DIAGRAMS below show methods used in laying out shapes for the stack cutting operation so that a minimum of waste plate remains. In many cases the remaining sections of plate can be used in other operations and need not be scrapped



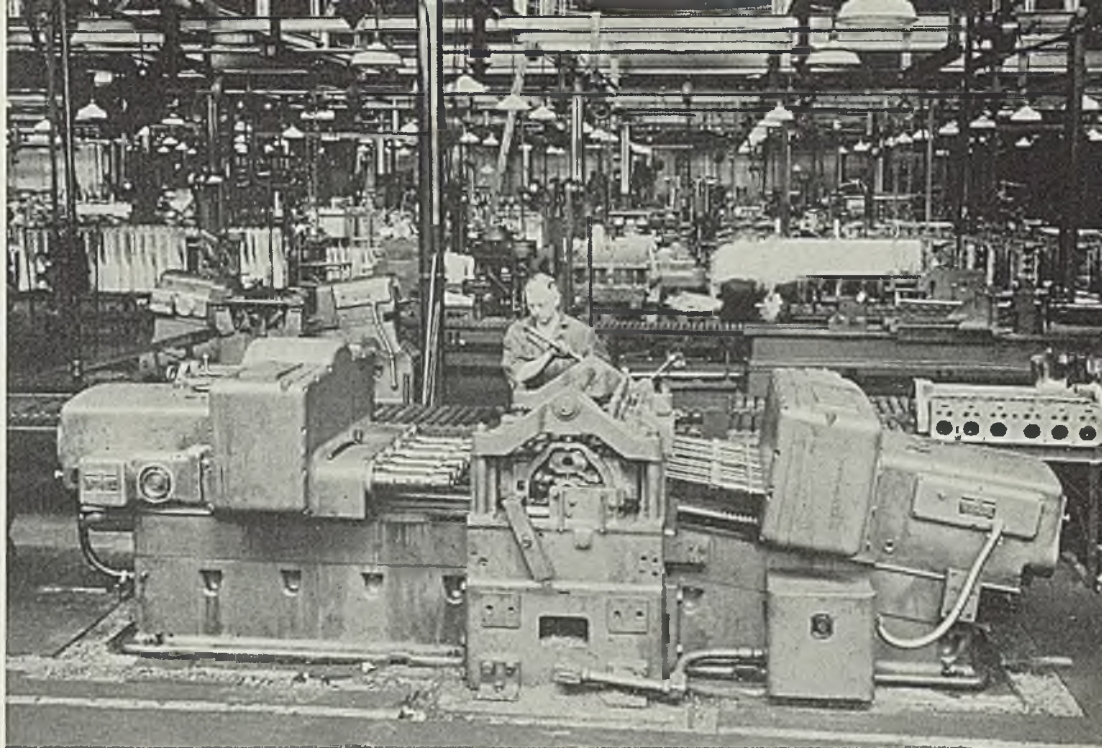


FIG. 1—Special unit designed for boring cylinders at one end, reaming and counter-boring valve guide holes at the other

Maintenance of Machine Tools

•Frequent design changes bring problems to engineers on medium speed production lines

BY

FRED B. JACOBS

+

THREE vital factors closely woven into the fabric of any manufacturing enterprise are design, production, and sales. Each division presents intricate engineering problems peculiar to itself and

one problem pertaining to production which is not always given the attention it deserves is machine tool maintenance. A new plant with new machine tool equipment presents very few serious maintenance prob-

lems. However, new plants with new equipment are scarce inasmuch as the average manufacturing plant grew and developed from small beginnings, so that the problem of machine tool maintenance has gone hand in hand with other development factors.

The term machine tool maintenance means just what it states. It refers to keeping the equipment in proper condition to keep production at a predetermined pace. In actuality, however, the task of machine tool maintenance covers a much wider field as it embraces the purchase of new tools, the rearrangement of production lines to make use of existing tools, salvaging of tools that are no longer useful production units and repairing machine tools which have been worn to a condition of inaccuracy through long use.

Engineering executives of no two

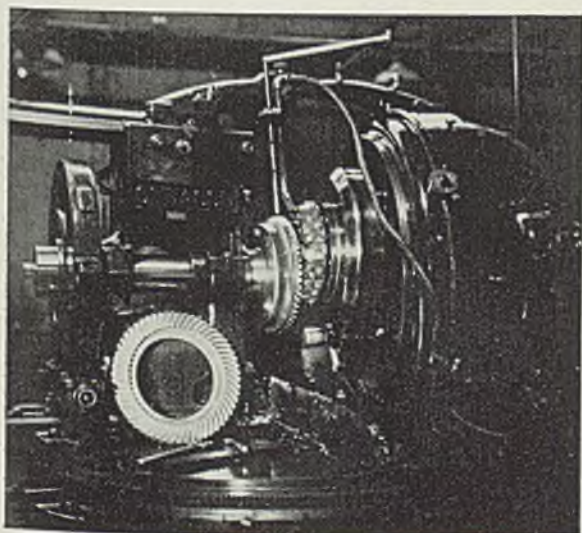


FIG. 2—Gear generating unit which can be arranged to cut gears with either straight or spiral teeth

manufacturing plants follow exactly the same routine in machine tool maintenance and in this article are outlined briefly some of the high spots encountered at the plant of the White Motor Co., Cleveland. The company rightfully enjoys the distinction of having made industrial history in the Middle West. Some sixty years ago the forerunner of the present company, the White Sewing Machine Co., was engaged in the manufacture of household sewing machines. With the advent of the bicycle craze during the gay nineties the company made bicycles which found a ready market. Over thirty years ago the company began to experiment with automobiles and marketed one of the first successful steam cars. Later they devoted their entire efforts to gas propelled vehicles and of late years the entire production facilities have been devoted to the manufacture of trucks, busses and like commercial vehicles. While the bicycle business is a thing of the past, a separate company, the White Sewing Machine Co., still is producing domestic sewing machines in large quantities.

Experience is a fine teacher and

thus through sixty years of successful manufacture involving intensive production methods a logical and practical method of maintaining the production equipment has been evolved. The present plant occupies some 42 acres of floor space and gives employment to more than 2500 men.

Models Change Rapidly

Every time a new model is brought out or drastic changes made in a present model, for instance as when the company recently brought out its pancake motor, complete retooling of many production lines is necessary. This involves among other factors the purchase of new tools, both standard and special units. The equipment must be flexible so that one production line can look after the manufacture of several like units and provision must also be made to take care of a reasonable peak demand.

The machine shown in Fig. 1 is a special unit designed for boring cylinders at one end and reaming and counterboring valve guide holes at the other end. The heads of this machine are independent units and if a certain model for which they

are designed becomes obsolete the heads can be redesigned for other work, or new heads substituted.

The machine shown in Fig. 2 is a gear generating unit. Some engineers would term such a tool a special unit, but in reality it is a versatile machine as it can be arranged to generate various kinds of gears, either with straight or spiral teeth. Thus machines such as shown in Figs. 2 and 4 can be made to cover a period of many years of usefulness provided reasonable repairs are made from time to time.

The horizontal multiple drilling machine shown in Fig. 3 essentially is a special unit designed for drilling simultaneously all stud holes in a cylinder block casting. Multiple drilling is necessary to keep production costs at a minimum. While it is true that the machine is a special unit it is flexible in that it can readily be changed as regards the location of the spindles so the machine can be adapted to another model should occasion require.

Thus while both the units shown in Figs. 1 and 3 are essentially special tools they are flexible so they can be adapted to other models at a minimum expense.

Special Tools Made General

A good example of a special tool designed to cover a wide range of work is shown in Fig. 4. This machine is a piston grinder equipped with means for generating eccentric surfaces on the piston skirts. The eccentricity is generated by means of a cam and by changing the cams the machine can be adapted to take care of a diversity of piston models.

In Fig. 5 is shown one of the cylinder block production lines devoted to light engines. The various machine tools must be flexible so they can be adapted to machine various models of blocks. It must be borne in mind trucks are not made in as large quantities as are pleasure

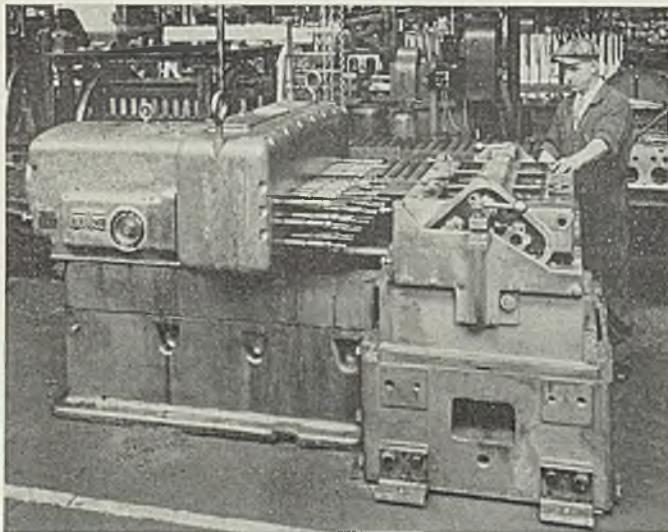
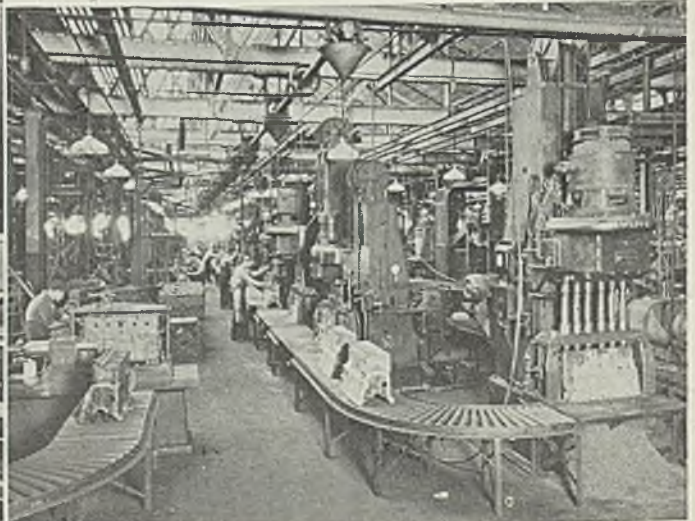
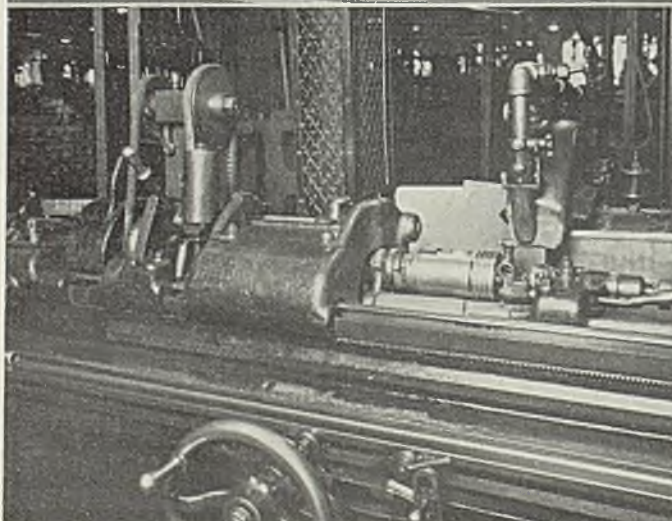


FIG. 3 (above)
— Horizontal multiple drilling machine which drills stud holes. Fig. 4 (below, left)—grinder for generating eccentric surfaces on piston skirts. Fig. 5 (below, right)—Cylinder block production line devoted to light engines



vehicles and provision also must be made for occasional runs of obsolete blocks, for it is the company's policy to provide adequate service for all its trucks, even models out of production for many years. Thus a flexible cylinder block production line is absolutely necessary.

The company's engineers who are responsible for laying out and maintaining production lines make recommendations for all new equipment as necessary. Selections are often made through knowledge of productive possibilities of existing tools on the market. It is a comparatively simple matter to purchase tools under a guarantee they will produce a given output on a specific machining operation. In purchasing special tools the same method can be followed since the builder of such tools is in a position to guarantee a given output.

Production Must Be Steady

When production lines are rearranged and existing tools are used for new purposes another problem arises as it is up to the company engineers to see to it that production lines are not bottlenecked at any point. One slow operation in a given line can pile up the work coming to that operation and ruin the productivity of the entire line. Such drawbacks can be overcome in several ways. A slow machine can be thrown out and a better one substituted; a slow machine can be retooled to make it operate more effectively; and machines can be arranged so one man can take care of two operations, thus increasing the productivity of two machine tools that otherwise might be considered slow producers. For example, it often is possible to arrange a production line so one operator can attend to both. It always grinding machine and instead of standing idle watching the machine operate, he can spend this time at a drilling operation. Again it is possible to arrange a lathe and grinding machine so that one operator can attend to both. It always is possible to arrange two milling machines so that one operator can run both. In this case two slow machines would do the work of one modern one, while a strictly modern machine might stand idle part of its time as it would turn out work faster than the production line pace, which depends on the productivity of each machine in the line. Thus it often is possible to find uses for existing tools instead of discarding them.

Retooling to increase production is one of the most interesting problems having a vital bearing on machine tool productivity. Let it be assumed that a drilling operation is slowing down a production line.

A time study man makes a survey of the problem and reports his findings. Perhaps it is shown that too much time is consumed in getting the work in and out of the jig. A multiple drilling head might be utilized to drill two or more holes in the time ordinarily taken to drill one. In such a case the tool engineers redesign the drilling equipment and furnish tools that will increase production at this particular point.

Retooling to increase production is going on constantly. While production engineers can lay out a manufacturing line intelligently, relying on past experience and a general knowledge of machine productivity as a guide, the final proof is in the performance. In actuality certain factors develop that did not reveal themselves previously. A certain amount of retooling is always necessary in the plant where intensive production must be maintained.

If a certain machine is a slow producer, as a result of a light design, it must be discarded and a more efficient tool substituted in cases where it is not possible to maintain the work flow along the line by having one man perform two operations as previously mentioned.

In any large manufacturing plant such as the White company drastic changes often are made which eliminate entire production lines. For example, some years ago the company made its own ball bearings. This called for a complete production line for finishing the inner and outer races. Now these bearings are purchased from outside sources. However, the problem of replacement remains so part of the

original production line equipment was retained to keep replacement parts on hand.

At one time the company made all its crankshafts and camshafts. Now these are procured from outside sources, but it was necessary to retain some of the production line equipment for both these units as repairs on old model trucks occasionally call for new crankshafts and camshafts. By retaining some of the more important tools, such as the grinding machines, repair parts can be made up readily as occasion requires.

When certain production lines are discontinued the problem of tool salvage arises and this problem is closely linked with maintenance. If no use can be found for specific tools they are disposed of at their market value, or as scrap.

Repairs Are Important

Machine tool repairs form an important part of machine tool maintenance. The White company operates a complete machine tool repair department in connection with the tool room. When machine tools become worn to the extent they are inaccurate they often can be rebuilt at a far less expense than would be involved through replacing such tools with new units. General repairs to machine tools call for the services of expert mechanics. It consists of rescraping worn bearing surfaces, reboring bearings, making new spindles or regrinding worn ones and all other repairs necessary to put the tools in first class shape. In rare instances such work is done by outside concerns, but as a general rule it is taken care of in the company's repair department.

Lightweight Steel Door Has Strength

NOVEL use of rolled structural steel is shown in these standard railroad doors 20 x 14 feet in size. By using lightweight stair stringer channels and interlocking them, an extremely stiff door is produced which is light enough to move by hand when mounted on ball bearing hangers. Belmont Iron Works, Philadelphia, is the builder





STREAMLINED custom built bodies for commercial vehicles similar to the one on this traveling laboratory are built through the use of the new combination wood and metal construction. Seams are visible in the side of the body, while those on the roof have been filled in

New Construction Process Eliminates Visible Joints, Bolts and Rivets

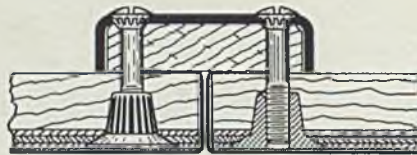
STREAMLINED metal surfaces free from bolts, rivets and similar projections are built through the use of a new fastening method devised by Ernest Schaefer, Cleveland. Since the use of heavy dies and presses is not needed in this process, it lends itself to the construction of custom built bodies for trucks and other commercial vehicles, streamlined trains and building fronts where mass production is neither necessary nor desirable and many other products.

Bolt Is Main Feature

Main feature of the new construction, which is known as Permagrip, is a special bolt which holds a thin sheet of metal over a backing of plywood. In construction by this new method, panels are built from plywood and wood backing strips. Holes to fit the special ribbed and flanged nut are bored and countersunk and then branded to exact size by a special electric branding iron designed by Mr. Schaefer. After the nuts are inserted in these holes, the outside is covered with metal sheet which is rolled over the edges. The completed panel is then applied to the frame and pulled tight by bolts which are inserted in holes countersunk in the steel frame. The ribbing on the nuts prevents them from turning as the bolts are tightened. Edges of the metal sheets are clamped between the backing strips and wood pieces inserted in the U-shaped members of the welded steel frame, as shown in the accompanying diagram. Absence of metal-to-metal contact which results from this feature, minimizes transmission

of noise. Completed panels are butted tightly together to make a neat joint, which may be filled in with solder or similar material if a continuous unbroken surface is desired.

The special bolts used have been designed by the inventor to withstand a pull of 3400 pounds. Outer metal sheathing may be of any de-



CCROSS section diagram of the method of construction. The outer metal sheet shown by the heavy black line is clamped between backing strips and wood strips inserted in the U-shaped members of the welded steel frame and held by pressure of the special hidden bolt. Absence of metal-to-metal contact minimizes noise

sired thickness, limited only by the fact that it must take a 90-degree bend. Since the metal itself is not subject to strain, any type of ferrous or nonferrous metal may be used. Buckling or waving due to unequal thermal coefficients of expansion between the metal and the plywood backing is eliminated since there is no rigid attachment between the two surfaces.

An additional feature of this type construction, according to the inventor, is that armor plate may be inserted between the metal sheeting and the plywood if protection is desired, and the same holds true for

sheet insulation against heat or noise. A set of tools, including drills, countersinks, counterbores and the electric branding iron, has been designed by the inventor for rapid and efficient use of the new construction method.

Reports Are Presented at Second Silicosis Meeting

The second national silicosis conference, held in Washington, Feb. 3, by invitation of the secretary of labor, featured the presentation of four summary reports by committees appointed at the first conference last April. Verne A. Zimmer, director, division of labor standards, department of labor, presided.

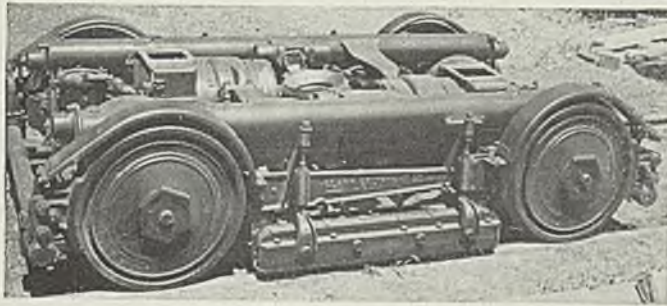
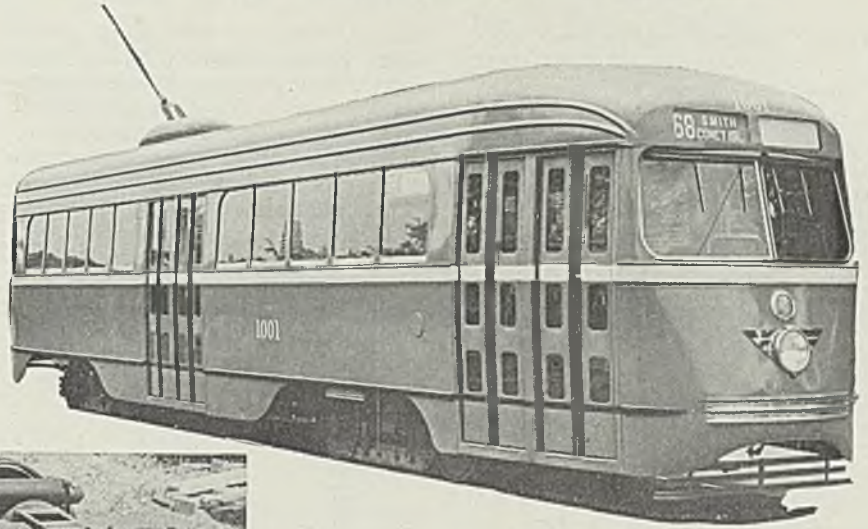
The following reports were presented: "Committee on the Prevention of Silicosis through Medical Control," by Dr. R. R. Sayers, chief, public health service; "Committee on Prevention of Silicosis through Engineering Control," by Warren A. Cook, chief industrial hygienist, Connecticut department of public health; "Committee on the Economic, Legal, and Insurance Phases of the Silicosis Problem," by V. P. Ahearn, executive secretary, Industrial Sand and Gravel association; and "Committee on the Regulatory and Administrative Phases of the Silicosis Problem," by L. Metcalfe Walling, chief administrator, Walsh-Healey act. A supplementary report to the economic, legal and insurance phases was presented by Robert J. Watt, Massachusetts federation of labor and a supplementary report to the regulatory and administrative phases was offered by the assistant attorney general of Illinois.

Department of labor expects to publish the summary reports in the near future and later will print the complete reports of the four committees.

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Upward Oxyacetylene Welding Method Increases Output and Cuts Costs

THE "upward" method of oxyacetylene welding of sheet steel developed abroad several years ago now is being widely used in France on certain kinds of production work. A typical application is the fabrication of welded gas cylinders for butane and other liquid petroleum products distributed under low pressure.

Thin steel sheets and plates to be welded by this method are not beveled or otherwise prepared for weld-

started. The hot fluid metal above slides down the sides of the hole and builds up a weld at the bottom. Welding rod is added, as also shown in Fig. 1, in sufficient quantity to produce weld reinforcement on both sides. The operation of welding is virtually one of "chasing the hole" upward to the end of the seam.

Two torches can and should be used oppositely on steel plates when thicker than about $\frac{1}{4}$ -inch. In fact, the process is limited virtually to

plates rather than against them.

When steel plates thicker than 12 millimeters (0.472-inch) are to be welded vertically they are beveled as usual and welded in two passes as shown in Fig. 3.

Acetylene consumption in the upward method is said to be less than one-third that entailed in forward and backhand welding. Consumption of welding rod is one-half and speed of welding is nearly double that for forward and backhand welding.

Announces New Material for Halting Dusting of Concrete

An annoying problem in plant maintenance often is the dusting of concrete floors. This means not only that the floors are never clean, but the dust raises into the atmosphere, settles on machinery, sifts into material in process or into finished products, and may be breathed into the lungs by workers.

Numerous means have been sought to stop dusting. Paint has been tried, chemical hardeners have been used, and other types of materials with varying degrees of success. Recently, a new type of floor hardener and dustproof, known as Granitex, has been developed by the Truscon Laboratories, Detroit. The material is neither a chemical hardener nor a paint. It is a penetrating material which fills the pores of the cement with a tough, wear-resisting binder. It not only binds down the surface, preventing sanding and dusting, but it acts as a cushion or buffer to absorb the shock of traffic, thereby saving the floor to some extent.

Such a floor is claimed to mop off easily and stay clean longer. Being free from pores, it does not absorb dirt. It is said to be stainproof, oilproof and greaseproof. The dustproofing compound is merely poured over the concrete, or mopped on, then squeegeed or brushed out of the low places with a long-handled brush.

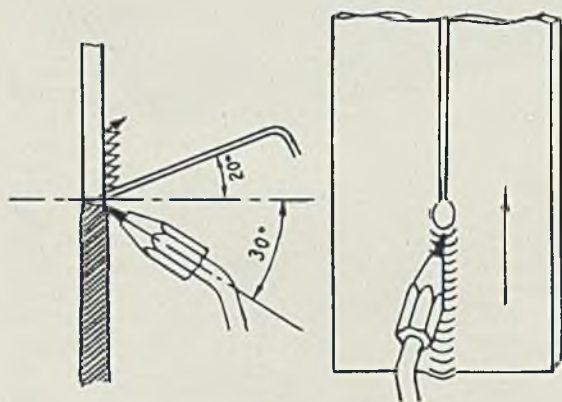


Fig. 1—Upward welding with the oxyacetylene process, using one torch

ing even if nearly $\frac{1}{2}$ -inch thick. They are simply sheared or cut with straight square edges to permit them to be set closely so as to leave an open space of average width equal to half the plate thickness. Plates $\frac{1}{4}$ -inch thick are set $\frac{1}{8}$ -inch apart and so on. Welds are made vertically, the sheets or plates being stood up and welded from the bottom or lower end of the seam.

A hole first is fused through the seam at the starting point with an oxidizing flame. The incandescent cone is held in front of the hole at an angle of about 30 degrees below the horizontal, as shown in Fig. 1, and fusion of the surrounding metal

the thinner sections if the product made is one that precludes the use of two torches working on opposite sides, as would be the case, for example, on small diameter containers. Fig. 2 shows the angles of torches and welding rods when two torches are used oppositely on unbeveled steel plates.

Claims made for upward welding are complete fusion and penetration, reinforcement of the weld on both sides and reduced warping and buckling. Tensile strength, impact value and ductility of the welds are high. Reduction of warping effects results from the fact that the flame streamers are directed through the

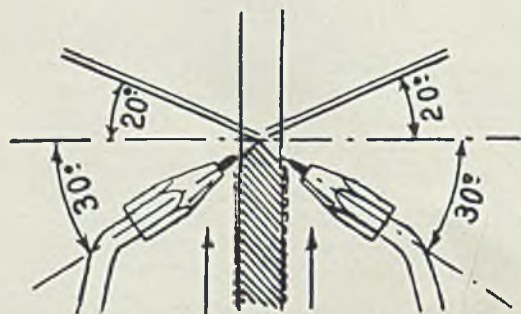
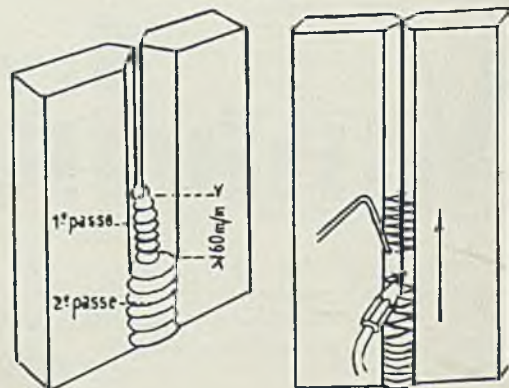


Fig. 2 (Left)—Upward welding with the oxyacetylene process, using two torches. Fig. 3 (Right)—Upward welding of beveled plates, using two torches



Sees Increasing Acceptance Of High-Strength Cast Iron

THE renaissance of cast iron witnessed in the last 15 years is likely to continue and to gain momentum as the years pass by. Thus did Dr. Paul D. Merica, vice president, International Nickel Co. Inc., New York, express himself in presenting the Howe Memorial lecture of the American Institute of Mining and Metallurgical Engineers during the 147th meeting of the institute in New York, Feb. 15-19. The title of the lecture was "Progress in the Improvement of Cast Iron and the Use of Alloys."

This was the first time in the series of lectures that iron had been chosen as the subject, but Dr. Merica felt certain that the predominant choice by previous lecturers of subjects relating to steel or metallurgy reflected no lack of respect for the material iron. Supporting the choice of this subject, the lecturer recalled that Prof. Howe had by no means overlooked or neglected cast iron in the long course of his metallurgical meditations.

Could Have Speeded Progress

Prof. Howe's attention was "early arrested by a metallurgical aspect of cast iron which he then and we now still recognize as of the most fundamental importance, namely, the genesis of graphite in gray iron and the means of control of its quantity and distribution. He made some comments over 20 years ago regarding the nature of J. E. Johnson's oxygenated iron which indicate that even then his thoughts were taking directions which today we are finding it useful to explore in connection with the theory of high-strength iron. Had we had in the subsequent years the continuing benefit of Prof. Howe's illuminating consideration of this important subject, our progress in the improvement of cast iron would undoubtedly have been even more rapid."

The last 15 years, Dr. Merica continued, have witnessed a revival of interest in this material accompanied by remarkable progress both in improvement of its properties and engineering performance as well as in renewed acceptance of it for modern engineering purposes. In 1921, A. S. T. M. specifications for light, medium and heavy gray iron castings called for arbitration bar tensile strengths of over 18,000, 21,000 and 24,000 pounds per square inch, respectively. The society's specifications for 1936 included seven

classes of gray iron ranging from 20,000 to 60,000 pounds per square inch tensile strength.

Before the war, best quality gray iron had a tensile strength no higher than perhaps 15,000-20,000 pounds per square inch, excepting small amount of semisteel which was then under development and which might have exhibited strengths as high as 30,000 pounds per square inch. Today, gray iron is produced in quantity with tensile values from 40,000 to 60,000 pounds per square inch. With special care and attention to foundry technique, tensile values as high as 70,000 to 80,000 pounds are obtained.

It is estimated, said Dr. Merica, that production of gray iron castings in this country in 1936 totaled about 10,000,000 tons. A conservative estimate is that not less than 10,000 tons of alloys were used in iron castings in the same year, yielding over 1,000,000 tons of alloy iron castings. It can be considered, therefore, that about 10 per cent or more of iron castings are alloyed.

Of the 3500 iron foundries operating in this country, some 1000 are known to be users of alloys for a portion at least of their castings production. Over 300 of these are substantial users of alloys and the proportion of alloy iron production of many of these is high—from 10 to 35 per cent. Some, particularly those serving the automotive industry, produce principally alloy iron. It is estimated, for example, that over 90 per cent of automotive engine castings are of alloy iron, and the automotive industry probably uses half of the alloy iron made today.

Finding More Applications

Gray iron responds to heat treatment in a manner quite similar to that of steel, although its tensile strength cannot be increased thereby to anything like the same levels as in the case of steel. In most industries but particularly in the field of transportation and that of machinery and machine tools, modern high-duty irons are finding increasing application. Certain types also are finding wide use because of resistance to corrosion.

In conclusion, Dr. Merica pointed out that gray iron is superior to steel in its capacity to absorb vibrational energy safely. It is well recognized that the damping capacity of gray iron is substantially higher than that of steel and may be dou-

ble or tenfold that of steels of high elastic limit. This curiously enough is largely in consequence of the effect of those structural features of cast iron which impair its gross ductility and which alter the character of the elasticity.

Need Better Refractories For Metallurgical Uses

Demand for more rapid metallurgical production, which entails higher temperatures, and the greater consideration which is being given to the thermal efficiencies of metallurgical processes are responsible for the insistent call for progress in refractory materials. This opinion was expressed by R. S. Hutton, Goldsmiths' professor of metallurgy, University of Cambridge, Cambridge, England, in presenting the Institute of Metals division lecture before the Institute of Mining and Metallurgical Engineers' meeting.

In both directions, Prof. Hutton said, "we are still only on the bottom rungs of the ladder." Subject of the lecture was "Refractories."

He asserted that while the problem of furnace refractories is not merely one of the melting points of the refractory, it is nevertheless not widely enough appreciated how vital it is for the improvement of metallurgical processes to attain temperatures higher than those at present.

Apart from the prospect of more rapid production, Prof. Hutton said, it is known from experience in electric steel melting how favorable the slag reactions can be influenced and how beneficial from the point of view of reduced inclusions and gases is the attainment of a higher temperature of melting.

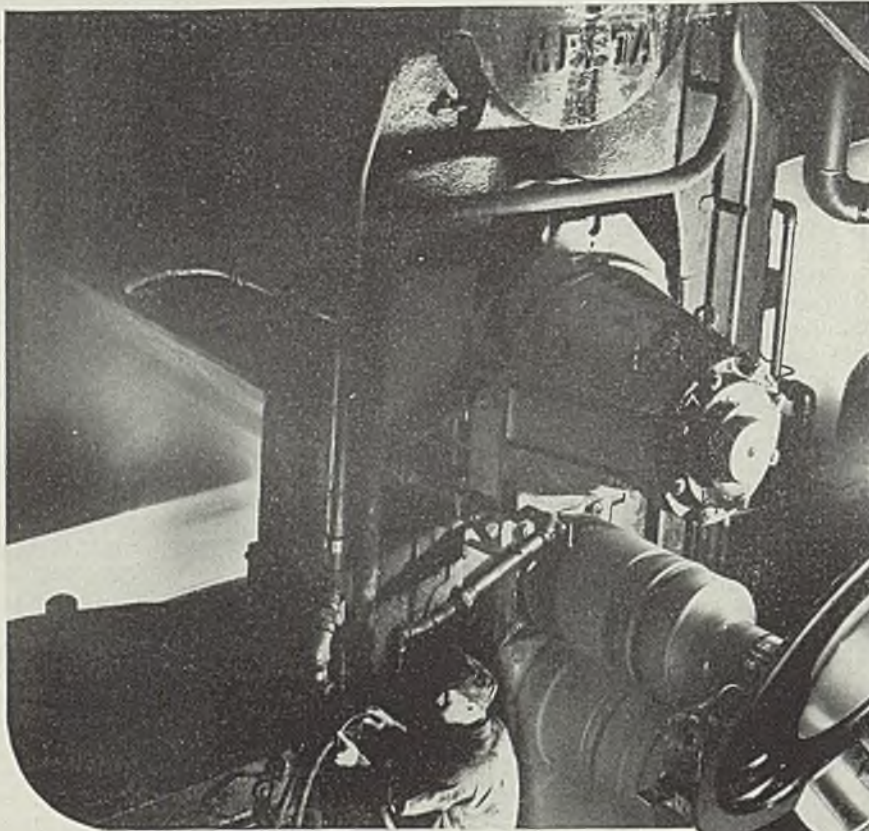
With respect to the problem of thermal efficiency, he stated it is even more obvious how important refractories are to metallurgical processes. "Whereas", he said, "in modern steam boiler practice, despite furnace chamber temperatures of 1300 degrees Cent., we have attained a 90 per cent efficiency in the utilization of the thermal units of our fuel, our metallurgical furnaces are still for the most part highly inefficient."

Shows Wire Cloth Process

In actual operation at the Pennsylvania and Atlantic Seaboard Hardware association's exposition at the William Penn hotel, Pittsburgh, Feb. 22-26, was a small loom engaged in manufacture of wire cloth. It formed a part of the exhibit of the Hanover Wire Cloth Co., Hanover, Pa., which covered all the steps involved in producing wire of all gages and the weaving of wire cloth.

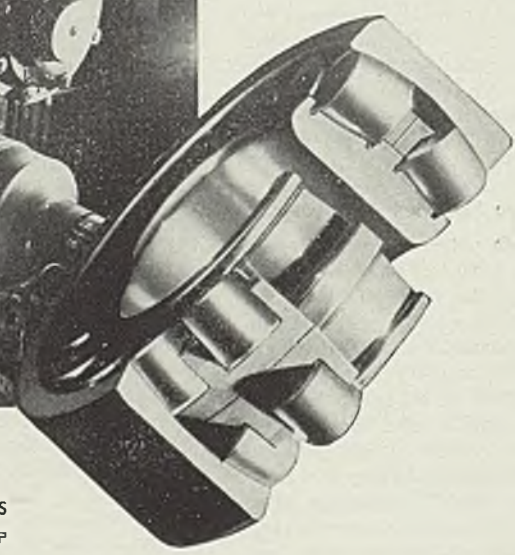


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MATERIALS HANDLING



Planned Handling Improves Inspection Of One Million Screws Per Hour

PROVIDING a materials handling system which would permit individual inspection of approximately 1,000,000 screws per hour is no small problem. Even if the manufacturer has been in business only a few years short of the century mark and has all those decades of experience upon which to rely as a guide, the problem is still not easy although it may be lessened.

It is little wonder, therefore, that when executives of the American Screw Co., Providence, R. I., added the Phillips recessed-head screw to the company's line about two years ago, it soon found that tremendously increased production would make the cost of careful inspection under older methods prohibitive. They went in two opposite directions to obtain benefits of experience. First,

they studied their own previous practices in the light of the new requirements; then they coupled results from this research with what they found out about equipment and methods in other industries. The combination of their own knowledge of manufacturing products in their same line for nearly 98 years, and the acquired data on principles and methods of modern mechanical handling aids not only solved the

difficult problem, but actually improved quality of the inspection.

Under the old method, boxes of screws were brought over to an inspector's bench and dumped thereon by truckers. An inspector then went over each screw checking for defects in head, thread and point. As each individual inspection was completed, the screw was slid off the bench into a small container resting in the inspector's lap. As soon as this smaller container was filled, it was dumped into a tote box at the side of the inspection station.

A roving inspector, assigned to a stated number of girls, this number depending upon the size and class of work, gave the screws a final inspection and lifted the box to one

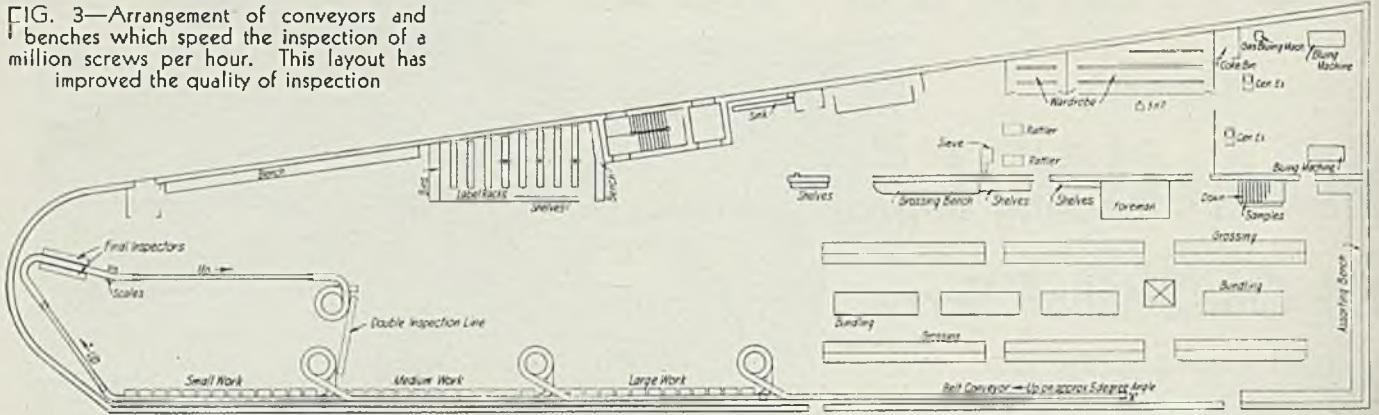
FIG. 1 (right)—Tote boxes containing screws are delivered to the inspector's bench by conveyor. Dumped onto the bench, the screws are inspected as the girl rolls them individually into the opening of the drop delivery chute. They fall into another box which is moved away on a conveyor belt. Fig. 2 (below)—Heads of recessed head screws are minutely inspected as shown here



MATERIALS HANDLING



FIG. 3—Arrangement of conveyors and benches which speed the inspection of a million screws per hour. This layout has improved the quality of inspection



side for count. Two men, with a portable scale, went up and down the inspection line, counting by weight each inspector's work. After this was done, the okayed boxes were transported by hand truck to a distribution point, where the finished product was assigned to either package or bulk handling.

Handling Now Mechanized

Roving inspectors are unnecessary under the new system and the former method of transportation has been superseded. The layout of the new system is shown in Fig. 3. Now screws are carried in tote boxes from the washing depart-

ment, where they have been separated from turnings generated in the threading operation, and washed in centrifugal washing machines.

Tote boxes are handled on skids, the latter being moved from one operation to another on lift trucks. Skids are deposited at the loading end of a conveyor. At this point screws are sorted into three classifications, small, medium and large, according to size.

Why this sorting? That's where experience enters once more. It has been found that better results are obtained in inspection work if an inspector is kept on certain ranges of screws. Most inspectors in this

plant have been with the company for many years and know a first quality product from a defective one. If they have been inspecting small screws all the time, however, a transfer to larger work would materially affect the quality of their work inasmuch as their eyes and fingers have been accustomed to the smaller work.

Tote boxes, therefore, must be sorted from the feeder line into the proper spiral conveyor according to the sizes of screws contained in the box. A loader takes care of this detail by placing a definite number of tote boxes for each class of work on the feeder line; when the boxes come to the spur leading to the spiral for which they are intended, he throws a switch which diverts the boxes into their proper spur line.

Supply Always Available

Following a tote box into one of these spurs, we find this is what happens. If the spiral is empty, the tote box will travel down the incline until it gets to the end of the straightaway in front of the inspectors. This is the middle line of conveyors shown in Fig. 4. The spiral is seldom free of boxes, which build up on the line. When the straightaway is somewhat cleared, a stop at the bottom of the spiral is depressed and the desired number of boxes run into the straightaway. This stop is controlled either by the girl

(Please turn to Page 81)

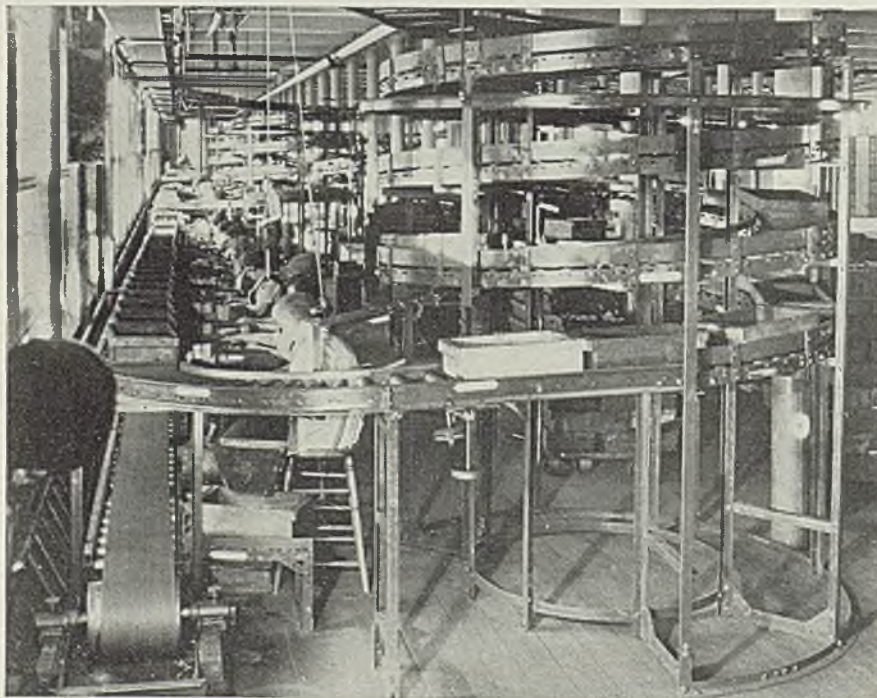
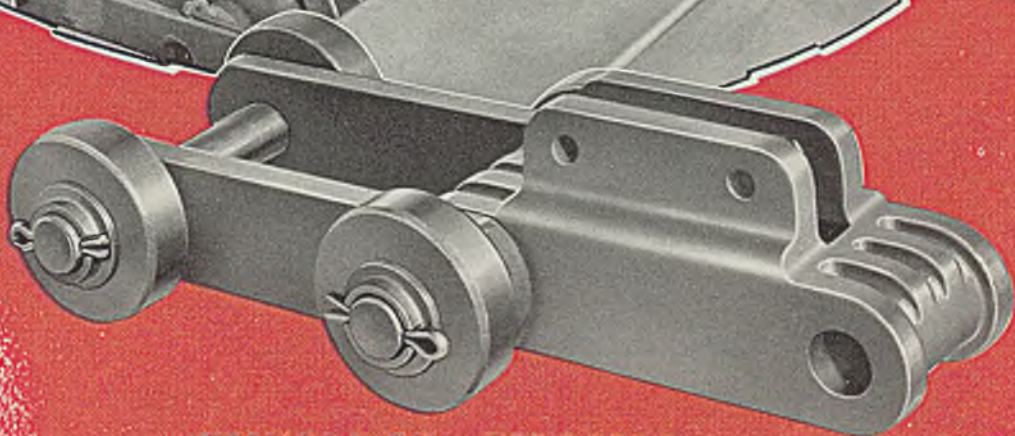


FIG. 4—A view of the inspection line showing several spiral conveyors and bottom belt conveyor which transports screws to the final inspection station

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WELDING, ETC.

BY ROBERT E. KINKEAD

A. W. S. President Elevated

ELECTION of A. E. Gibson as president of the Wellman Engineering Co., Cleveland, marks recognition in the heavy engineering industries that welding has become a dominating factor. As president of the American Welding society, Mr. Gibson is competent to bring the knowledge and experience of the welding fraternity into the service of heavy engineering. It is particularly fitting that the company which reached a high stage of perfection in riveted structures (ore and coal dock unloading equipment) recognizes welding in industry as an important field of opportunity.

Young men trying to get ahead might profitably study the unfolding of the career of A. E. Gibson to understand how a man comes to be the president of the company. This new recognition, with its added responsibility, is not a sudden and unexpected honor. The candidate had come up through the organization and had intimate knowledge of every phase of the business. He is in the prime of life and has tremendous vitality and enthusiasm. Experience, first hand knowledge, vi-

IN this column, the author, well-known consulting engineer in welding, is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL.

tality, enthusiasm, are qualifications seldom overlooked.

Welding attracts men of Mr. Gibson's qualifications. In welding, it is not necessary to wait for someone to die or be promoted to move ahead. The field is new; leaders who can take responsibility are at a premium.

♦ ♦ ♦

Plenty of Opportunities

IN WELDING as in other technical processes which are developing rapidly, there are great rewards for creative or inventive achievement. No one is barred by age, race or previous condition of servitude. Over half the inventions of welding processes and machinery have been made by men who were neither users or builders of welding

machinery and equipment before the invention was made.

Ability to use creative imagination and to conceive inventions is widely distributed. That such ability is used by comparatively few is probably due to the mistaken belief that inventions are made only by technically trained experts. At a recent chance meeting of five successful men whose creative and inventive ability is outstanding, from several different companies making rolling mill machinery, one was a graduate veterinary surgeon, one a graduate of a commercial course, one an ex-craftsman in the machinist's trade, one a doctor of science, and one who had only sales experience.

No matter what label the world puts on a man, the extent to which he uses his native creative ability and inventive genius seems to determine what life does for him. One of our classmates graduated in journalism but later invented a method of obtaining large numbers of new small accounts for a bank. He is now vice president of the bank.

Several years ago we checked up on the 26 men who received electrical and mechanical degrees the year we did. Only one other than the writer was practicing his profession. Yet the others had found important and satisfying work by following their creative and inventive inclinations.

Welding is a good field for the exercise of creative imagination. The field is comparatively new, it is moving rapidly, and while its recent past is inspiring, the greatest inventions and developments are still to be made.

♦ ♦ ♦

A new electrode holder for arc welding shunts the welding current around the handle the operator holds and stays reasonably cool for that reason. About half the electric arc welding units of the country are limited to 50 per cent to 60 per cent of their capacity by electrode holders that get too hot for the operator to hold. Thus, by failure to spend \$8 to \$10 for a good holder, a \$600 welding outfit becomes worth \$300 to \$400.

♦ ♦ ♦

The new polarizing glass will soon be tried out for gas and electric arc welding lenses. The problem of seeing the molten metal and also seeing the surrounding metal has never been satisfactorily solved so that gage lines and boundary marks can be followed. With present welding lenses, if enough darkening pigment is used to permit the hot spot to be seen comfortably, the operator cannot see anything else.

Moving Day for the Steel Home Owner



PERHAPS a slight preview into the America of the future can be gained from this scene at the plant of R. G. LeTourneau, Inc., Peoria, Ill. A newly finished all steel home is being carried from the rear of the plant to the front, using a crane powered by a conventional tractor. Three hooks anchored to the partition walls through the roof may enable the owners of these homes in the future to call for a tractor instead of a moving van when they tire of their surroundings



Whitey Sez:

"In electrodes as in drinks, it's the analysis that oftentimes brings on the 'headache'!"

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March 1, 1937



SURFACE TREATMENT AND FINISHING OF METALS

Lead Coating of Steel Described

DISCUSSING lead coating of steel before the Institute of Metals division, American Institute of Mining and Metallurgical Engineers, which held its 147th meeting in New York Feb. 15-18, J. L. Bray, head, school of chemical engineering, Purdue university, Lafayette, Ind., described a method involving zinc as a binding agent both on the steel sheet and in the molten bath. He concluded that iron and steel can be coated with lead by using zinc as a binding alloy if the temperature and composition of the bath are held within narrow limits; also, he concluded that the resistance to corrosion of such sheets is superior to that of ordinary galvanized material.

Reviewing the situation, he said

that lead coatings so far produced have not had all of the protective characteristics desired and that because of the necessity of carrying out the coating process cheaply and because lead solutions have had such poor plating characteristics, most of the efforts have been directed toward the hot dipping process rather than electroplating. However, hot dipping processes using lead have not been successful chiefly because of the lack of adherence between iron and lead.

Professor Bray said the method which he described involving zinc as a binding agent had often been suggested and tried but had not been successful because of the rough surfaces obtained as well as the presence of pin holes. He declared that this failure resulted from a lack of knowledge of the fundamentals involved in the coating process.

For one thing preliminary experiments cast some doubt on the accuracy of the commonly accepted

lead-zinc equilibrium diagram. The eutectic composition of this system has been determined by various investigators as 0.74, 1.2 and 2.3 per cent zinc. The writer consistently found it to contain about 0.55 per cent zinc.

• • •

Black Anodic Coatings on Tin Described in Reprint

Production of black anodic films on tin is described in *Technical Publication, Series A No. 48, International Tin Research and Development Council*.

The tin or tin alloy article to be coated is made the anode in a hot solution containing trivalent or quadrivalent anions such as phosphates or ferricyanides using high current density. About six minutes treatment at 195 degrees Fahr. suffices for a satisfactory blue-black coating on an article of simple contour. The coating is also suitable to decorate tinfoil or pewter and the reprint includes some illustrations of designs in black and white produced on pewter by this method.

Copies of the above reprint may be obtained free of charge from L. J. Tavener, International Tin Research and Development Council, 149 Broadway, New York.

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Paint Changes Color and Warns of Overheating

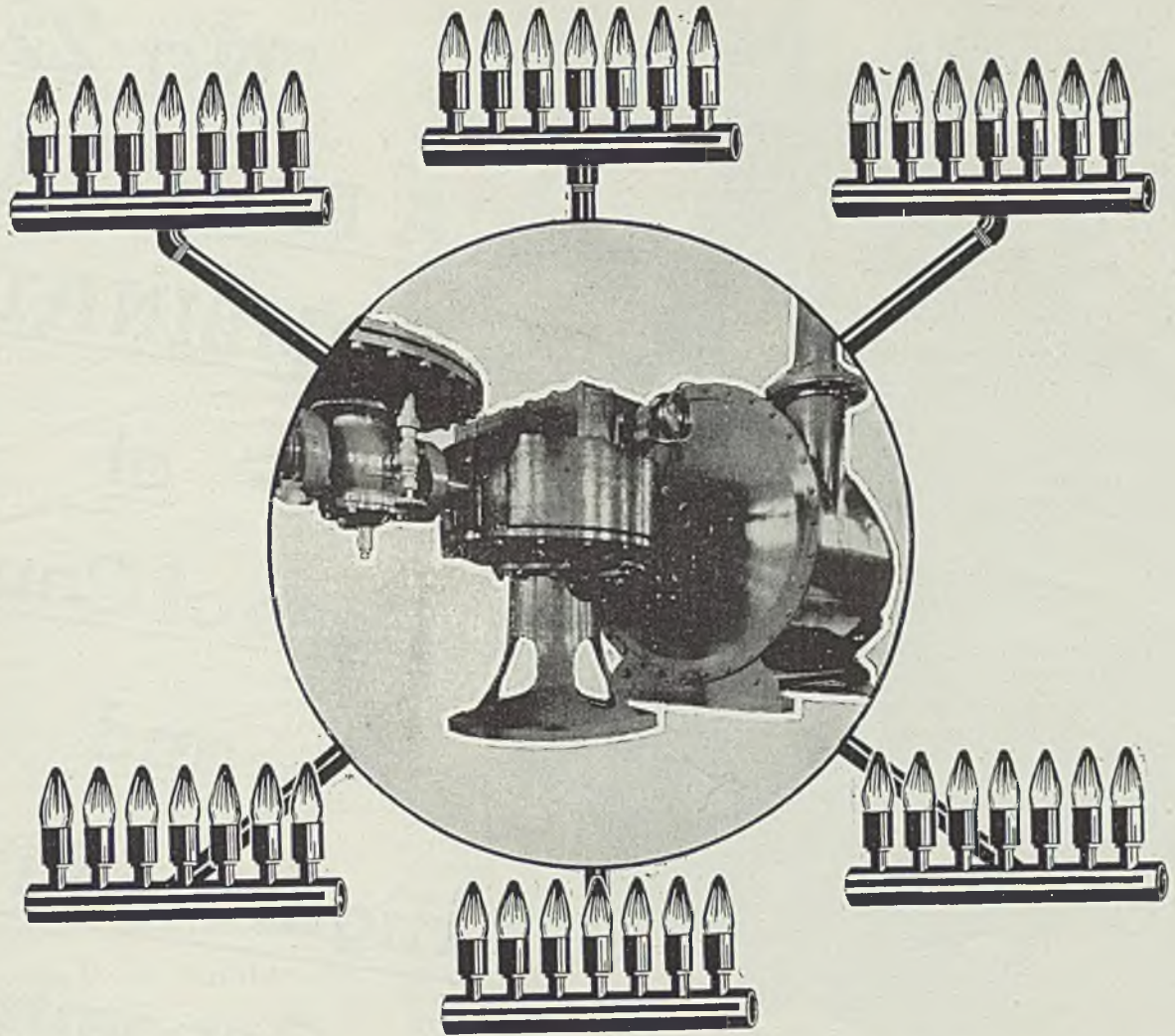
Production and maintenance engineers as well as many others will be interested in a new type of paint which changes color when exposed to heat. In this paint they have a new medium through which they can detect serious deviation in temperature in processing equipment, power machinery transmissions and many other machinery parts. Journals of railroad cars are one example.

Some of these paints will turn back to their original color when cooled while others remain permanently

Beauty, Safety and Permanence in Steel



PORCELAIN enamel on steel for the visible parts and structural steel for the invisible parts combine to make this California service station attractive, fire-safe and permanent. It was built for the Texas Co. in Los Angeles by the Pacific Steel Building Co. of that city



When the KEMP INDUSTRIAL CARBURETOR takes charge of a heating job *It Takes Charge!*

A single unit may handle half a dozen annealing covers or tin pots or both. Each of the six may require a dozen burners. Yet every flame on every burner will be *identical* in heat liberation, in pressure, in characteristics, and remain so hour after hour as long as heat is needed.

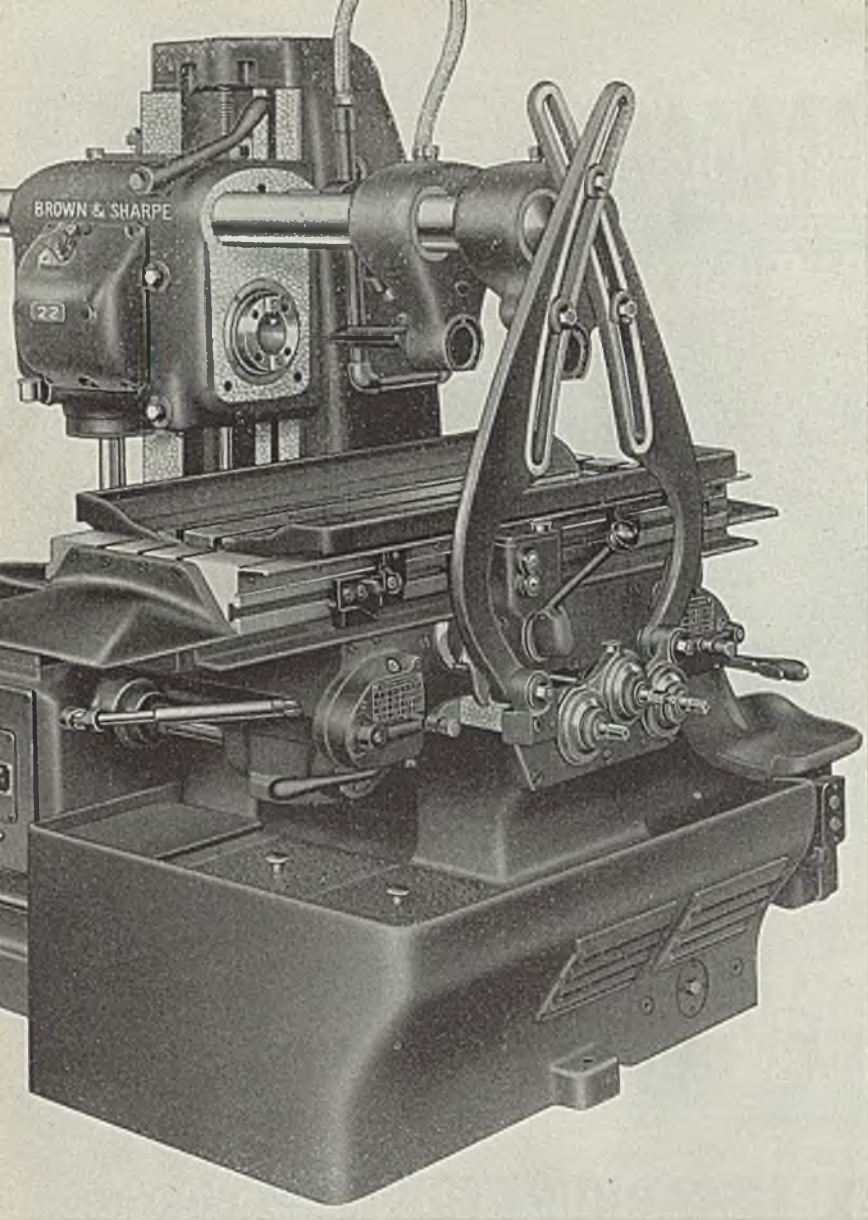
Obviously that means no more tinkering with burners, no more variation between units . . . which seems like a spacious claim until you discover that the Industrial Carburetor does its job by *completely* premixing gas and air before it goes to the burners,

that no secondary air is inspired and hence no variation is possible in the fuel mixture reaching the burners.

Perhaps you would like details. A Kemp engineer is at your service. Address **The C. M. Kemp Mfg. Co., 405 E. Oliver St., Baltimore, or Oliver Bldg., Pittsburgh.**



K E M P o f B A L T I M O R E



No. 22
A PROFITABLE
COMBINATION
of
Ease of Control
and
High Productive
Capacity

UNIQUE in giving the Flexibility of Control heretofore provided in the "Column and Knee" Design. (Quick set-ups—Reduction in non-productive time)



Ask for specifications of this cost-saving No. 22 Plain Milling Machine. Brown & Sharpe Mfg. Co., Providence, R. I.

COMBINED with the production advantages of the "Bed Type" milling machine.

(Unusual rigidity—High production with accuracy)

. . . *An Economical Investment* for both Short and Long run jobs.

BROWN & SHARPE

changed. A series of five permanent change and seven retroactive color paints are available. The former change at temperatures ranging from 300 to 734 degrees Fahr.; the latter from 122 to 464 degrees Fahr., with a safety margin of 25 degrees Fahr. Each of the temperature changes is said to be sharp and wide, leaving no room for doubt or question of the temperature of the object to which it is applied.

This type of paint is low cost insurance against loss of production, loss of time of machines and equipment and expense of many repairs. It also lends itself readily in productions where heat is used to form a perfect seal; lack of sufficient heat will be clearly indicated and rejections facilitated.

Permanent change paints require recoating after each change, while the retroactive type are good for from 25 to 50 changes. Both types of paints will remain stable in the package for 12 months if stored according to directions. Each type of paint is prepared for two classes of use, one for outdoor use and the other for indoor use. Each class, at present, will furnish 12 months protection for the surfaces to which they are applied.

Enameled Steel Jacket Improves Boiler Appearance

To improve the appearance of their line of oil-fired domestic boilers, Kewanee Boiler Corp., Kewanee, Ill. has introduced a series of steel jackets finished with a pale green, baked crinkle enamel finish. These jackets will enclose boilers equipped for either front or rear firing. Extension panels provide sufficient clearance for the longest type domestic burners.

Rugged Line of All Welded Plating Baskets Announced

Unusual strength and long life and ability to carry heavy loads without bulging under rough usage are qualities attributed to a line of dipping baskets and trays for plating of all welded construction announced by the Udylite Co., Detroit. It is stated this is obtained by eliminating all possible weakness by cross member reinforcement at points of greatest stress. Wire or mesh, bottom and side crossmembers are welded to basket or tray frame making all parts one integral unit throughout.

Udylite dipping baskets in the bail type are furnished with swivel or rigid handles. Trays are furnished with either solid or mesh

sides. Both baskets or trays can be furnished made of steel, brass, copper, aluminum, monel metal and nickel chrome in standard shapes, gages of wire and mesh. Special all welded containers can be made following specifications other than standard.

Udylite also offers a Duro-Welded reinforced rigid bail type steel basket covered with hard or soft rubber highly resistant to all acids except straight nitric and sulphuric.

New Primer Permits Spot Welding After Application

Sherwin-Williams Co. announce an air drying spot welding black primer developed primarily for automotive production manufacturers, which has won the approval of every manufacturer who has tested it. It should also have a definite appeal to all other sheet metal fabricators who utilize spot welding methods.

It prevents rusting of lapped edges to be welded—a difficulty where partially fabricated parts are shipped or stored. It also overcomes the problem of spot welding surfaces that are given coats of ordinary paint, enamel, lacquer or varnish. Such a film tends to insulate the metal surfaces and the excess current required to weld the painted spots creates so much heat the metal surrounding the painted area burns and gives a poor weld.

The following characteristics are pointed out:

Reduction 150-200 per cent with VMP naphtha. Xylol or toluol can be sprayed on sheet metal parts after the paint is thoroughly dry without injuring the finish.

Dries to touch in 10-15 minutes and handled for spot welding in 25-30 minutes.

Permits instantaneous spot welding with low voltage and low pressure. Eliminates burning away of paint surrounding the spot weld.

Prevents rust forming between the laps, the place where moisture accumulates and causes most damage to unprotected steel.

Painters Training School Class Schedule Announced

The DeVilbiss Co., Toledo, announces the schedule of their training school for the first half of 1937.

This school is open to industrial painters, master painters, automobile refinishers, and all others interested in learning the technique of spray-painting, and the use and care of spray-painting equipment.

The training period lasts for one

week. Classes will start on the following dates: Jan. 11, Feb. 1, March 1, April 5, May 3, and June 7.

Special rates in Toledo hotels and boarding houses near the plant have been secured by the company for men attending classes during any of these sessions.

These classes have been well attended in the past because of the facilities for study, otherwise unobtainable, offered by the DeVilbiss Laboratories.

It is advisable to enroll in the school as far in advance as possible, since the size of the classes must be limited, and since there will be no training periods other than those announced.

Complete information may be obtained by writing DeVilbiss Co., Toledo.

Clear Baked Primer Adheres Satisfactorily to Chromium

A clear baking primer known as Chroprime has been announced by Maas & Waldstein Co., New York. This primer can be applied to metal by spraying or dipping and is said to adhere tenaciously to chromium plate forming a foundation for any other type of lacquer or enamel. It is claimed to resist heat, remain flexible and permit the metal to be engraved after it is applied.

At present it is finding application in the production of automobile name plates and other instances where colors are desired on a corrosion resisting base.

Metal Spray Gun Retains Original Character of Wire

A metal spray gun which, it is claimed, will deposit a metal coating of the same characteristics as the feed wire is announced by Metallizing Co. of America, Los Angeles. This gun, known as the Mogul Metallizer, will operate either with 11 gage wire or 1/4-inch rod. It deposits metal more rapidly than earlier types and is simpler to operate.

The machining qualities of metal deposited with this gun are said to be superior to that from any other type. For instance, when machining tobin bronze shavings are obtained where formerly the metal came off in powder. Similar results are cited in the case of other metals. The Mogul gun has been particularly successful in applying stainless steel to worn hot oil pump plungers, eliminating many of the troubles experienced when this work was done by welding.

POWER DRIVES



Planned Maintenance Reduces Costs, Gives Workers Better Conditions

TOO many men assigned to a particular maintenance, repair or construction job may actually slow up its completion, by being in each other's way, rather than speed up the work. In all cases unnecessary help adds to the cost. Economy in such work is determined largely by the ability of the foreman to plan his work and his familiarity with the labor requirements of different projects.

In one factory in which the plant engineer is proud of his low maintenance costs and freedom from interruption, the number of men assigned to a job receives special attention. Periodic servicing and inspections are naturally one-man jobs. Periodic overhauling, which is controlled by card records, carries on the cards the number of men required. The men appreciate this as they know that one man will not be sent on a two-man job with probable danger to himself and greater possibility of damaging the equipment.

All Factors Prearranged

Orders for shifts and new installations first go to the foreman or group leader who is to do the work. He prepares a careful estimate of labor and material required with particular attention to the number of men and the tools or equipment needed. Later when the order is approved and started everything necessary—tools, equipment, material and labor—are taken to the job so that there is no waiting.

Since shortage of material or tools or an inefficient number of men to handle the work have a pronounced effect on the time required and the cost, this pre-planning has been an important factor in keeping such expenses low.

The time required for planning is

generally much less than the time which would be lost by a gang waiting because of a shortage. Planning time and accuracy are assisted by the practice of keeping records of previous jobs on file for reference on similar jobs ordered later. Also, costs are checked against such previous orders. As the group leaders and foremen know this, they have an additional incentive to equal or better previous performances.

Advantage in Standardizing

REPAIRS and replacements of equipment in plants with standardized motors, auxiliary starting equipment, and other elements of power drives, may be made at less expense by reducing the amount of spare parts and units needed in stock and in speeding up the repairs.

Where equipment of the same size and rating used for identical purposes is of a variety of makes and types, often the troubleman must make an extra return trip to the shop and back to obtain the proper unit or part for replacement, or study out the circuit diagram on unfamiliar equipment before going ahead. This is especially true on the so-called minor trouble jobs which usually constitute over 75 per cent of the breakdown repair work.

When the foreman reports the breakdown he knows, in the majority of cases, where the trouble lies. With standardized equipment the repairman can take the necessary parts or even a spare starting unit or motor with him and be practically sure that he will not have to return to the shop, thus increas-

ing the down time of the machine.

Where power drives are standardized the practice is becoming more common of removing the troublesome unit and replacing complete, easily removable unit parts, as an armature, instead of trying to repair on the job.

Standardization does not mean to make all units of a single size but rather to select all units of a size of the same type and make. Standardization is not so easily made with drives built into individual units, but where motors are used on lineshaft drives or attached in the plant to individual machines there is less excuse for a wide variety of makes and types.

Where inflammable liquids are used for degreasing leather belts such work is a fire hazard if performed in the plant. Detached sheds or open, easily ventilated buildings for degreasing and drying belts are safer. Where the work must be performed in the plant the use of noninflammable cleaning agents, such as carbon tetrachloride, is the only safe method.

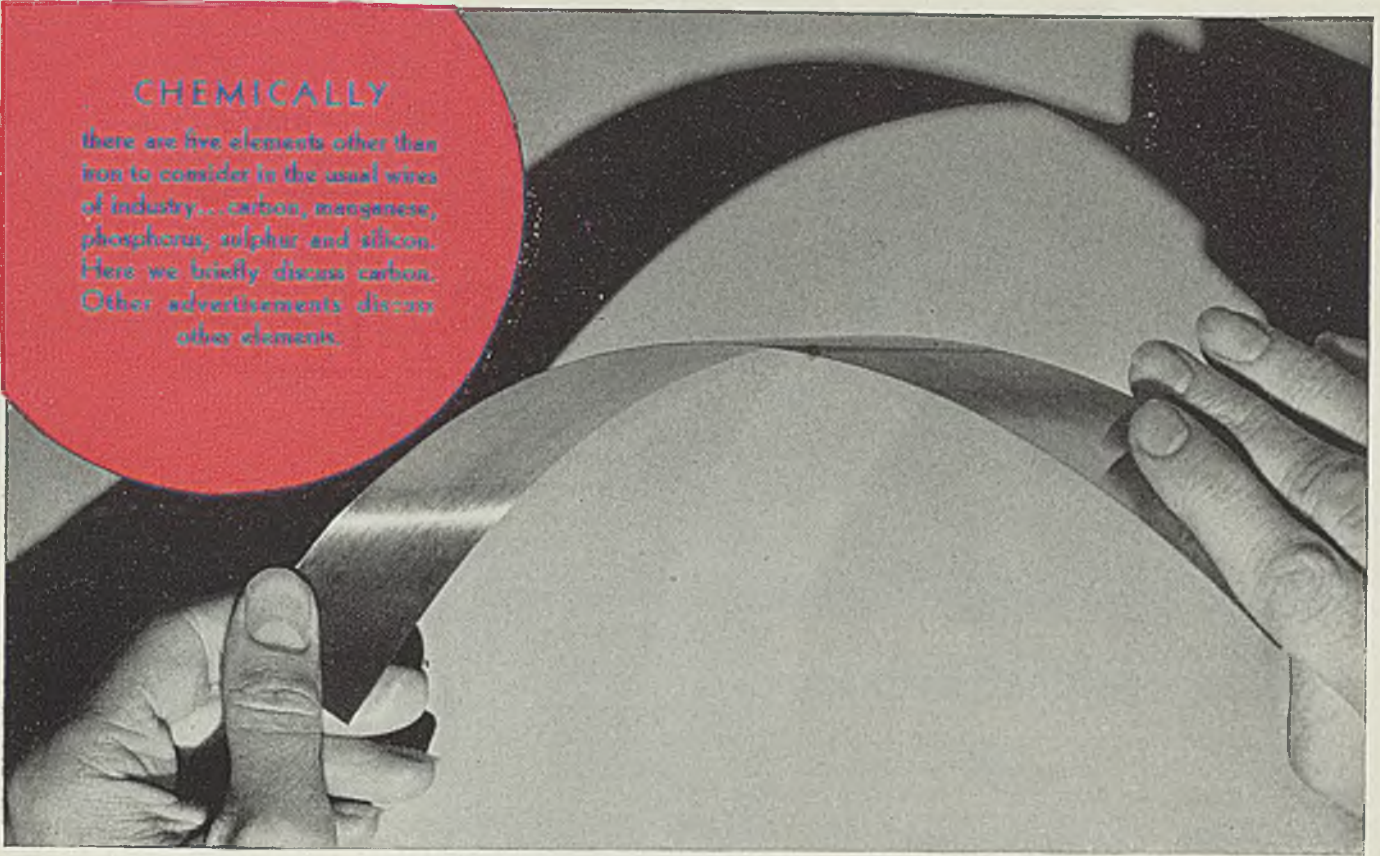
Oil seepage on the shaft is often the result of filling bearings while running. When operating, the circulating oil on the rings and on the bearings lower the oil level in the reservoir. If filled at that time the excess oil may overflow when the equipment is stationary.

Idler pulleys, if too small in diameter, cause a sharp reverse bend in the belt which results in excessive wear and short belt life. Good practice is to use such pulleys without crown and of a diameter equal to that of the driving pulley.

Carefully place lamps so that glare is not reflected from bright metal surfaces into the eyes of the operator. Glare blinds and may be responsible for serious accidents.

CHEMICALLY

there are five elements other than iron to consider in the usual wires of industry... carbon, manganese, phosphorus, sulphur and silicon. Here we briefly discuss carbon. Other advertisements discuss other elements.



CARBON IN WIRE

must be considered for both workability and application

2ND in a series of advertisements designed to help you make a better selection of wire for maximum value per unit of cost.

Carbon adds strength and stiffness to wire in approximately direct percentage to its presence.

Low carbon wires are soft and ductile, easy to work and form. Medium carbon steels give added tensile strength and qualities in direct proportion to the increased carbon content. High carbon steels produce maximum hardness and tensile strength and can be heat treated to add toughness.

Analysis is only the starting point in the choice of a steel for a given purpose and does not definitely indicate the degree of all the

properties nor the endurance that may be expected from a steel. It is an art to select a wire of exactly the right carbon content so that it will work economically yet still possess the desirable attributes of the use after fabrication. Our metallurgical and shop personnel realize the importance of uniformity and spare no effort to maintain... exactly... the carbon content specified as best for a specific use. Let us know how you use wire, we will gladly recommend the best wire for your purpose and see that you get that wire every time you order.

WICKWIRE SPENCER STEEL COMPANY
New York City, Buffalo, Chicago, Worcester, Pacific Coast
Headquarters: San Francisco. Warehouses: Los Angeles,
Seattle, Portland. Export Sales Department: New York City.

Wickwire Spencer manufactures High and Low Carbon Wires—in various tempers, grades and finishes—for your specific purpose. Hard-Drawn, soft or annealed Basic or Bessemer Wires—Hard-Drawn annealed, or oil-tempered Spring Wire, Chrome Vanadium Spring Wire—Valve Spring—Music—Clip—Pin—Hairpin—Hook and Eye—Broom—Stapling—Bookbinding—Needle—Dent Spacer Wire—Reed Wire—Clock—Pinion—Needle-Bar—Screw Stock—Armature Binding—Brush—Card—Florist—Mattress—Shaped—Rope—Welding. Flat Wire and Strip Steel, High or Low Carbon—Hard, annealed or tempered—Clock Spring Steel—Corrosion and Heat Resisting Wires. Consult the Wickwire technical man on your wire problems, however large or small.

WISSCO WIRE
by Wickwire Spencer



PROGRESS IN STEELMAKING

Strip Mill Motors and Generators Cooled by Heat Exchanger Units

MOTORS and generators installed in the new hot broad strip mill of the Carnegie-Illinois Steel Corp., Gary, Ind., are cooled by a bank of heat exchanger units, a large portion of which is shown in the accompanying illustration. A refrigerant is directed back and forth through the coils by a porting arrangement in the headers.

The coils are assembled in three groups. The largest group has a capacity of 364,000 cubic feet of air per minute, and requires some of the largest fans built at present. The heat transfer capacity of this group is 9,840,000 B.t.u. per hour, 980 gallons of water being supplied per minute at a temperature of 70 degrees Fahr. to produce the desired cooling effect. In extremely hot

weather this water is heated to 90 degrees Fahr.

The overall width of the bank of coils when assembled is 46½ feet. The total weight is approximately 23,500 pounds, of which nearly 90 per cent is pure copper, comprising the tubes and fins of the heat transfer surfaces. Each exchanger unit is 10½ feet long, 31 inches wide and 17¼ inches deep.

Small Groups Provided

In addition to the larger group are two smaller installations each supplying 60,000 cubic feet of air per minute. The coolers for each group absorb 970,000 B.t.u. per hour when supplied with 194 gallons of water per minute at 70 degrees Fahr. The weight of these small groups of coils is approximately

2952 pounds. The exchanger units were built by the Young Radiator Co., Racine, Wis.

Markets Roll Neck Coating

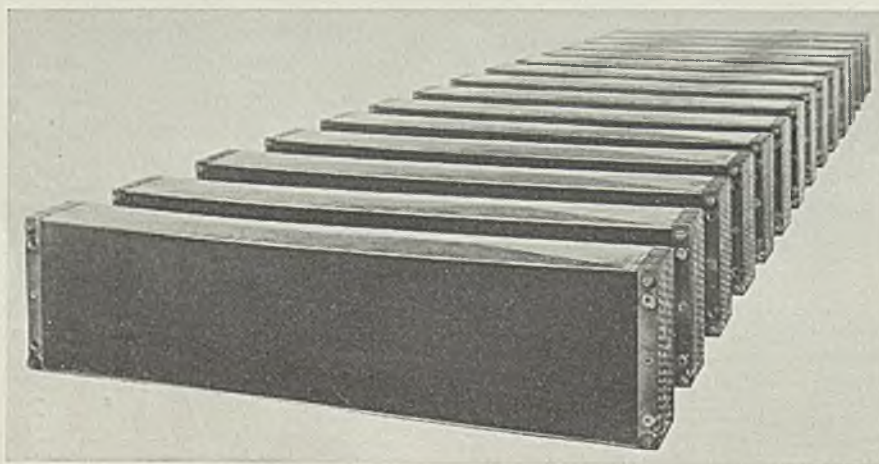
A new graphite coating for protecting the surface of roll necks while in storage now is available. It is recommended for roll necks which operate in phenolic resin and composition bearings with water as the lubricant. The new coating when applied to clean metal surfaces dries in 15 to 20 minutes and there, therefore, is no tendency to collect dust and dirt. When the roll again is placed in service it is not necessary to remove the coating from the roll neck inasmuch as it serves as a lubricant.

Employs By-Product Gas

Coke oven gas is employed by an Ohio steelmaker for heating cold or wet molds, the by-product gas lines being located at the pouring station. From 100 to 200 degrees Fahr. is considered an ideal mold temperature at the time the heat is poured. Semikilled steel poured into a cold mold causes the mold to sweat and results in a seamy ingot.

Record Books Are Kept Dry

Timekeepers at iron and steel plants will find it easy to keep their record books dry when making the rounds on a rainy day by wearing a light-weight rubber poncho having a celluloid window about 10 x 22 inches sewed in the front at an angle. This will afford visibility of the record being made under cover as well as free use of the arms. The ponchos give longer life when suspended in a closet than when stored in a folded condition.



Bank of heat exchanger units used at a hot broad strip mill for cooling motors and generators



OVERHEAD WELDING ON

**BLOWER CONNECTION
MADE EASY WITH**

PAGE

HI-TENSILE "F"

**SHIELDED ARC
WELDING
ELECTRODES**

BUY ACCO QUALITY

**A FEW OF THE 137
AMERICAN CHAIN & CABLE
INDUSTRIAL PRODUCTS**

AMERICAN CHAIN DIVISION
(DOMINION CHAIN COMPANY, Ltd., in Canada)
Weed Tire Chains • Welded and Weldless
Chain • Malleable Castings • Railroad
Specialties

AMERICAN CABLE DIVISION
Tru-Lay Preformed Wire Rope • Tru-Loc Proc-
essed Fittings • Crescent Brand Wire Rope
Tru-Stop Brakes

ANDREW C. CAMPBELL DIVISION
Abrasive Cutting Machines • Floformers
Special Machinery • Nibbling Machines

FORD CHAIN BLOCK DIVISION
Chain Hoists • Trolleys

HAZARD WIRE ROPE DIVISION
Green Strand Wire Rope • "Korodless"
Wire Rope • Preformed Spring-Lay Wire
Rope • Guard Rail Cable

HIGHLAND IRON & STEEL DIVISION
Wrought Iron Bars and Shapes

MANLEY MANUFACTURING DIVISION
Automotive Service Station Equipment

OWEN SILENT SPRING COMPANY, Inc.
Owen Cushion and Mattress Spring Centers

PAGE STEEL AND WIRE DIVISION
Page Fence • Wire and Rod Products
Traffic Tape • Welding Wire

READING-PRATT & CADY DIVISION
Valves • Electric Steel Fittings

READING STEEL CASTING DIVISION
Electric Steel Castings, Rough or Machined

WRIGHT MANUFACTURING DIVISION
Chain Hoists • Electric Hoists and Cranes

● The installation of this ventilating system was made easier by welding connections in position. The problems encountered—overhead welding and fabricating materials of different gages—were solved with Page Hi-Tensile "F" Arc Welding Electrodes.

You will find Page Hi-Tensile "F" Electrodes the answer to many welding problems. This new Page Electrode is winning favor as an all-purpose rod—efficient for production, maintenance or shop welding. It is especially effective for high speed single pass welding. It operates on straight polarity, has unusually low spatter and slag loss, and satisfactorily welds the new alloy steels, such as Cromansil, Corten and H-T-50.

For complete information regarding the technical character of Page Hi-Tensile "F" or Page Hi-Tensile "C" and other grades of Page Electrodes, call your local Page distributor. He carries an ample stock and can supply you promptly.

PAGE STEEL & WIRE DIVISION

AMERICAN CHAIN & CABLE COMPANY, Inc.

MONESSEN, PENNSYLVANIA



In Business for Your Safety

PAGE *Welding* **WIRE**

Malleable Castings Annealed in 31 Hours by Gas Fired Furnace

WITH a new, gas fired, short cycle furnace recently installed at Saginaw Malleable Iron division, Saginaw, Mich., of General Motors Corp., malleable castings are being annealed in a cycle of 31 hours. The new unit displaces a car-type furnace in which castings, packed in boxes and pots, were annealed in approximately 60 hours. The castings treated are housings, brackets, casings and other miscellaneous automotive parts. Theoretical time for annealing malleable castings of this particular analysis is computed at 20 hours. The saving in time results from the fact the castings now are protected against scaling and excessive decarburization by a reducing atmosphere so that it no longer is necessary to heat annealing boxes and pots as well as the castings. Production of annealed castings averages 55 tons per 24 hours.

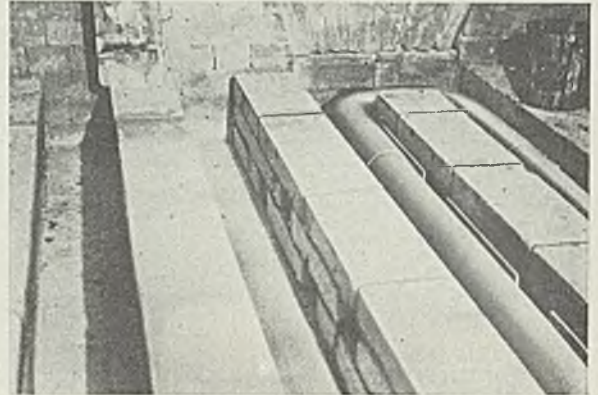
Furnace Is Continuous

Built by the Surface Combustion Corp., Toledo, O., the new furnace operates continuously and has inside dimensions of 15½ x 102 feet. It is heated by U-shaped, radiant, gas fired elements which are placed across the heating chamber. They have inside diameters of 3 and 4 inches. The flame used is of the diffusion type and is uniform throughout its length. The interior of the tube is under negative pressure equivalent to a 2-inch water column. In the event of a leak in the tube, therefore, it is impossible for the products of combustion to contaminate the reducing atmosphere in the furnace and scale the

castings in process. The reducing atmosphere is obtained from an adjacent DX generating unit also supplied by Surface Combustion Corp.

The radiant tubes are located both over and under the work and the work is pushed through the furnace in boxes which are loaded on trays.

This view of the furnace interior shows a gas fired radiant tube heating element and the method of placing it



The trays are 26 inches long and 38 inches wide and the boxes are of the same dimensions and 10 inches deep. Each box can be filled to a height of 18 inches. The trays travel 4 abreast through the furnace, each tray resting on 3 lines of roller rails, making a total of 12 lines of roller rails.

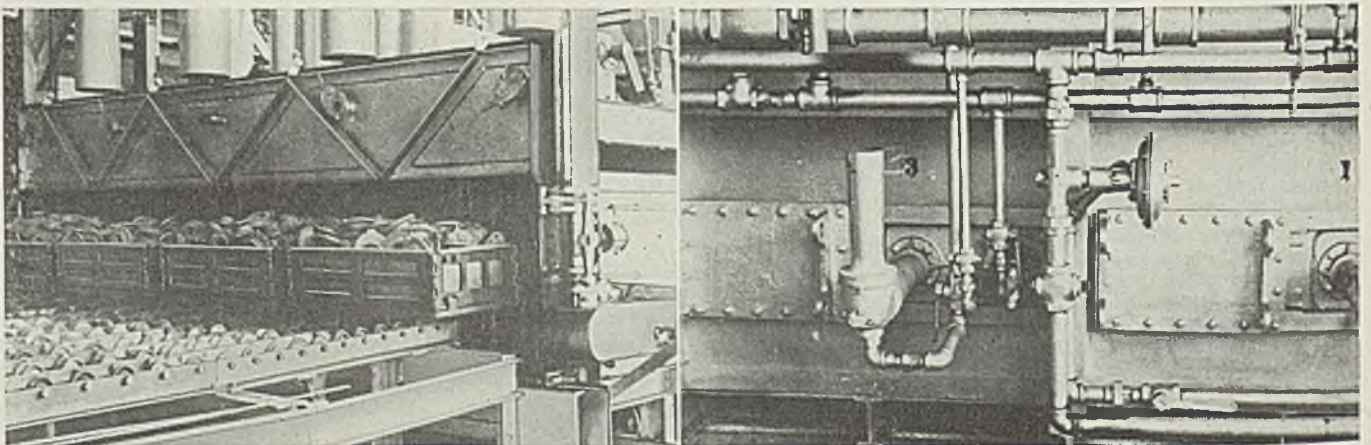
At both charging and discharging ends are vestibules for preserving the furnace atmosphere. The trays are loaded on a platform outside the entering vestibule. With the inner door closed, the outer vestibule door is opened and the loaded tray pushed along the roller rail into the

vestibule. The outer door is closed and the vestibule purged of all air by atmosphere from the DX unit. The inner door is opened and the tray engaged by a pusher mechanism and moved into the furnace, after which the inner door is closed.

The malleableizing cycle requires heating and cooling at certain rates. The work is heated rapidly to 1500 degrees Fahr., at a controlled rate from 1500 to 1750 degrees and held at 1750 for a sufficient time to complete the primary stage of graphitization. The work then is cooled rapidly to 1400, while from 1400 to below the critical temperatures the cooling usually is equivalent to a

drop of 6 to 10 degrees per hour, as desired, although the furnace is so designed as to permit control at any rate.

The pusher mechanism which actuates the work through the furnace operates hydraulically with automatic control. It pushes continuously or intermittently, depending on the time required in different parts of the annealing cycle. The furnace is zoned. The fast heating zone has radiant heating tubes both above and below the work. The holding zone has tubes only below the work, with a refractory muffle between the tubes and the work so



At left is shown charge end of new short cycle furnace with four trays loaded with malleable castings to be annealed. At right is shown a radiant tube gas burner and eductor

as to disperse all the heat evenly.

A remarkable feature of the installation is that temperatures are absolutely uniform along the length of the radiant tubes. This is due to the diffusion type flame employed. The flame reaches around the curve of each U-shaped tube, the rest of the tube being heated by the products of combustion. Products of combustion are exhausted continuously out of the tube ends, being diluted by inspired air. As a result, instead of being at a temperature of approximately 1750 degrees Fahr., the eductors and the combusted gases are kept at a temperature of about 500 degrees Fahr. This cooling feature is of great value in keeping the unit safe for the workmen.

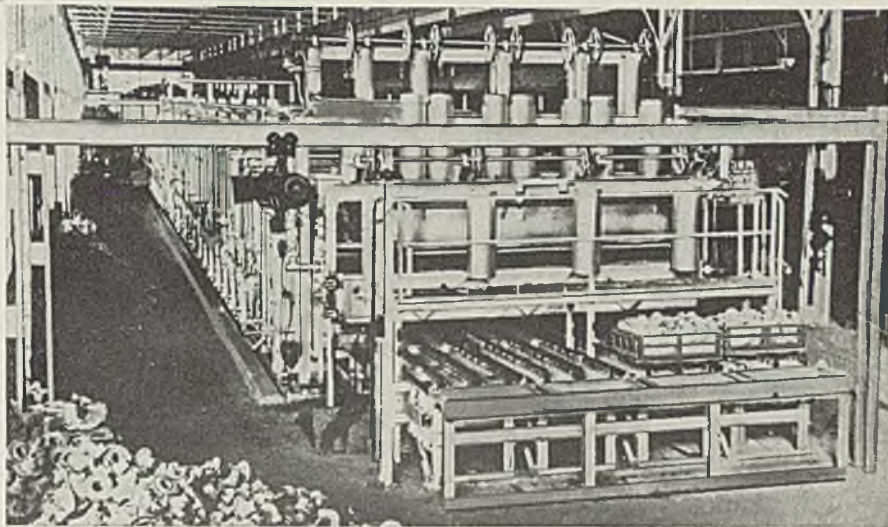
Whereas the charging vestibule is 3 feet long, the discharge vestibule is 6 feet long, thus permitting double discharges without damage to inner and outer discharge vestibule doors. Such double discharges are caused by expansion resulting from the heat inside the furnace, and also by growth of the metal under the continued action of the heat. Heating tubes, roller rails, trays and boxes all are made of heat resisting alloy.

The discharge mechanism consists of live rollers and extends from a point 2 feet inside the inner vestibule door to a point 2 feet outside the outer vestibule door. The tray comes to a stop after passing the inner door; the inner door closes, the outer door is opened, the trays roll out and the outer door closes. All these operations are controlled automatically.

The furnace is a gas tight structure consisting of a welded steel casing lined with insulating refractory of varying wall thickness depending on the requirements at various stages of the annealing cycle. The roller rails are supported on fire-brick piers. The arch is flat, consisting of insulating refractory suspended by alloy hangers, and it is built in small removable sections having a width that is half that of the furnace and a length of 4 feet. Each section is covered by a removable steel plate sealed by an oil seal.

Oil Treated Stoker Coal

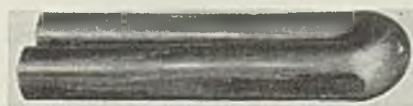
Blue Diamond Coal Co., affiliated with Appalachian Coals Inc., Cincinnati, shortly will oil treat nut-slack coals from its Mayflower mine in Lee county, Virginia. The company last year began such treatment of its nut-slack coals produced in Harlan county, Kentucky. The purpose of this treatment is to produce coals which, because of dust elimination, may be burned with maximum efficiency on all types of stokers.



Overall view of new furnace which anneals malleable castings in 31 hours at rate of about 55 tons per 24 hours. Inside dimensions are $15\frac{1}{2} \times 102$ feet

Free Machining Steels Are Ductile

MONARCH Steel Co., Indianapolis, has made a number of changes in its cold drawn, free machining, carburizing steel known as Speed Case or X1515. Originally described in STEEL of Aug. 19, 1935, page 28, this steel now contains approximately 0.25 per cent sulphur. The nature of the company's process permits this sulphur addition for maximum machinability but without any loss in ductility. In recent tests 1-inch rounds have been bent back on themselves in a 150-ton press without sign or fracture. For this reason the steel is recommended for the most severe flanging or cold forging operations, as well as for



Despite 0.25 per cent sulphur content, this 1-inch, cold drawn, free machining, 0.15 to 0.20 carbon, carburizing steel bar was bent back on itself in a 150-ton press without sign of fracture

applications in which free machining and carburizing characteristics are desirable.

Speed Case steel is made with 0.15 to 0.20 per cent carbon. The company now is placing in production two new steels, of the same analysis as Speed Case excepting that the carbon is higher. They are known as Speed Treat 0.30 to 0.40 carbon or X1535 and Speed Treat 0.40 to 0.50 carbon or X1545. These steels are designed to replace such grades as X1335, X1340, SAE 1040 and SAE

1045, because of higher machinability and ductility. The company states that the 0.30 to 0.40 carbon grade can be tied into a knot, pulled tight or bent flat on itself and smashed in a press without sign of fracture.

Labor Relations, Wages As Economic Factors

Salaries, Wages and Labor Relations, by J. O. Hopwood; cloth, 124 pages, $5\frac{1}{2} \times 8\frac{1}{4}$ inches; published by Ronald Press Co.; furnished by STEEL, Cleveland, for \$2.50, plus 15 cents postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

The author is director of employment, Philadelphia Electric Co., Philadelphia. He points out that in times past most dealings with labor have been promiscuous and that results were not always satisfactory. He stresses the fact that labor is not furnished in mass and that it is the work of individuals and that its nature should be considered comprehensively from an economic aspect. Payroll administration, he states, should be an expression of fairmindedness and that it has come into prominence as a means for reconciling the different aspects of labor and bringing order out of chaos with respect to wages and salaries.

The book takes up the subjects of payroll administration and labor relations, organization relations and job analysis, job evaluation, coordination of compensation standards, job classification and administrative procedures and records. Written from practical experience, the book should prove of value to executives who are confronted with problems pertaining to labor relations.

Powerful New Magnet Is Important Aid In Low Temperature Research Work

DEVELOPMENT by Dr. Francis Bitter at Massachusetts Institute of Technology, Cambridge, Mass., of a compact magnet capable of producing the highest permanent magnetic field ever attained opens the door to a new field of research. It was designed to produce fields of at least 100,000 gauss and in its preliminary test, in which no effort was made to develop its full capacity, a field of 75,000 gauss was produced and maintained over a considerable period of time. This is 150,000 times more intense than the earth's magnetic field.

Small Coils Are Used

Magnetic currents can be produced by two agencies, electric currents and magnetized matter. A coil of wire carrying a direct current produces a steady field at its center and the stronger the current the more intense is the field. The limitation is that high currents heat the coil and may melt it unless it is adequately cooled. By using a conductor of varying cross section the effectiveness of the current may be increased. The other source of magnetic fields is magnetized iron or one of its alloys. In order to be effective, the iron must be as near as possible to the region in which the field is to be produced and it must be magnetized in a suitable direction.

With these facts in mind, Dr. Bitter decided that the design that would serve his purpose must com-

bine small magnetic coils with high current densities and efficient water cooling. He first built a small experimental magnet consisting of a copper coil 2 inches in diameter and 1 inch thick, imbedded in a block of low carbon steel. Operating with 25 kilowatts this tiny magnet produced a field of 35,000 gauss over 1 cubic centimeter. The experience gained led to the construction of the present 100,000-gauss magnet and a still more powerful model, capable of producing an intense field over a much larger volume now is in process of design at the institute.

The present magnet is only 8 inches long and 6 inches in diameter, with an inside diameter of 1 inch. It is housed in a bronze shell through which water is circulated constantly to dissipate the enormous heat generated by a power load equal to the requirements of a small town. The first test was made in one of the large substations of the Edison Electric Illuminating Co., Boston, where, with controlled direct current up to 12,000 amperes at 250 volts available, a maximum current of 8000 amperes was used in producing the field of 75,000 gauss. The two bus bars carrying the current to the magnet each consisted of 6 strips of copper, 6 inches wide and ¼-inch thick, bolted together.

Stimulus for the present development is of two kinds. One is the desire to explore new regions without any possible prediction as to

what will result. A magnetic field distorts or changes matter and also its properties. With the new magnets greater changes can be obtained than with older magnets and at the same time the conditions of the experiment, such as temperature and pressure, may be varied and still allow ample room and time for observing accurately the changes that take place. Previous experiments have shown that at low temperatures magnetic fields can make certain salts as magnetic as nickel, and that certain metals which normally are good conductors of electricity can be made relatively non-conducting. The whole range of existing substances, from pure gases, through liquids, solids, compounds, solutions, alloys, organic and biological matter is available for experimentation. While it is not predicted that the results obtained will reveal new useful forms of matter, it is believed they will reveal inadequacies in the present theories and thus point the way to more correct thinking.

Low Temperatures to Be Studied

The second stimulus for the present investigation in magnet design is to develop a generally useful laboratory tool and to fill specific needs in a variety of investigations well under way. For example, the interesting range of temperatures below 1 degree absolute can be reached by means of a magnetic cooling cycle and the new magnets are regarded as well suited for such work. Dr. Bitter will collaborate with Dr. Frederick C. Keyes of the institute in a program of low temperature research. Attempts at accurate measurement of the Zeeman effect, the splitting up of the spectral lines by a magnetic field for the study of atomic structure, also will be made.

Absolute zero, which corresponds to 459.69 degrees below zero Fahr. is the point at which scientists believe heat ceases to exist in matter and where molecular action is reduced to a minimum. In this region every minute step down the temperature scale is of great significance inasmuch as a fraction of a degree may change matter from one state to another as heat is withdrawn. The search for new knowledge in the field of low temperature research is made possible because certain complex salts, such as ammonium chromium alum, can be made to give up heat under the influence of a magnetic field. To accomplish this most of the heat in the salt would first be absorbed while in an intense magnetic field by boiling liquid helium, a method which makes it possible to reduce the temperature to 2.34 degrees Fahr. above absolute zero. The next



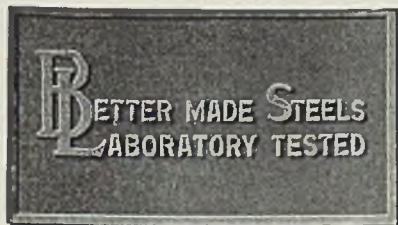
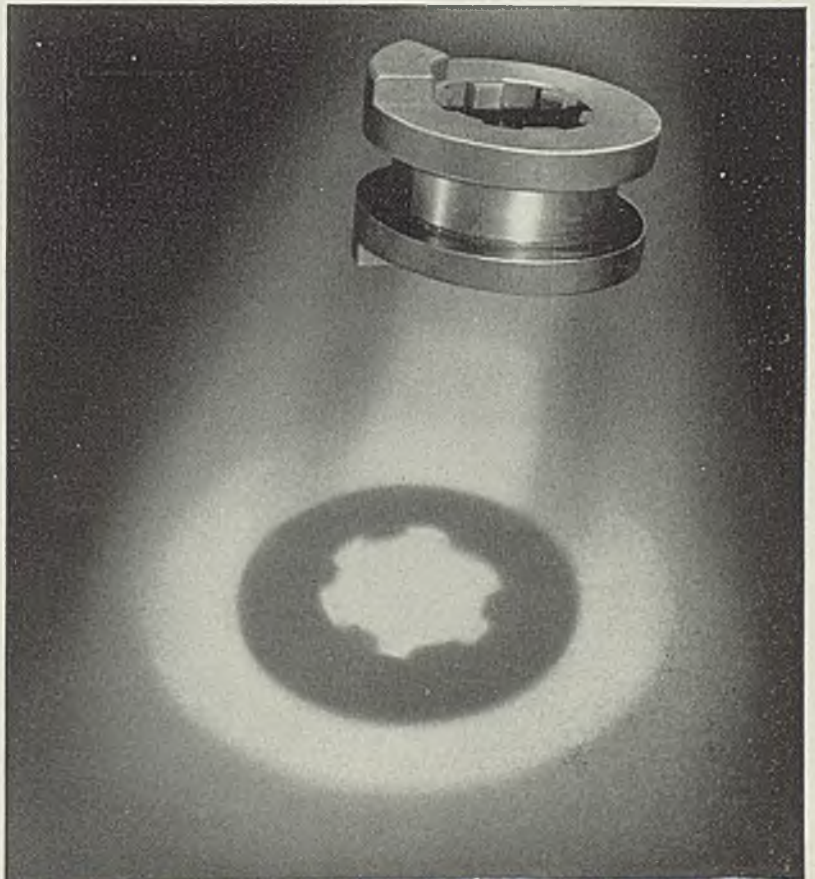
Developed by Dr. Francis Bitter at Massachusetts Institute of Technology, Cambridge, Mass., the magnet produces a permanent magnetic field with an intensity 150,000 times greater than that of the earth. It will be used for fundamental studies of the effects of intense magnetic fields on matter, especially at low temperatures in the neighborhood of absolute zero, which is 469.69 degrees below zero Fahr.



ROUBLE SHOOTERS are the unsung heroes of every great

communication system. Low in rank, as far as position is concerned but high in responsibility in maintaining service, these men brave every hardship and hazard to keep the lines open. They have their counterpart in the steel industry—the expert metallurgists and mechanical engineers who devote their lives to the study of steel—and who “know the answers” to problems in the fabrication and application of steel products. To users of Cold Finished Steels, B & L engineers offer a technical service backed by nearly a half century of experience. They can help you improve your methods by “spotting” sources of trouble in your production—and then develop the proper steel to do a better job.

In this example of “steel diagnosis,” an intricate machine part had given trouble, both by excessive failures in service, and by heavy rejections in manufacture. As the result of a survey, B & L engineers recommended a Cold Drawn Alloy, SAE 2350 Turned, Polished and Annealed. All difficulties now overcome, with a saving many times the price differential.



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step is to shut off the field, protecting the material from heat influx. From this point the temperature is still further reduced to the region of approximately 0.2-degree above -459.69 degrees or absolute zero.

As an example of the implications of this development, it may be stated that the electrical conductivity of metals and of some nonmetallic substances becomes limitless under the influence of extremely low temperatures, meaning that under ideal conditions it is conceivable that an electric current, once started, would continue to flow undiminished for all time. A similar effect is manifest in the heat conducting properties of substances. It is believed that the new magnets point the way to profound changes in the existing theories of the structure of matter.

Iron in Commerce in Its Third German Edition

Commercial Iron, by Paul Oberhoffer, revised and enlarged by W. Eilender and H. Esser; cloth, 642 pages, 6½ x 9½ inches; published by Julius Springer, Berlin, Germany; supplied by STEEL, Cleveland; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

This volume, which is in German, is the third edition of Oberhoffer's work, which, although revised and enlarged in scope, is little increased in size. The new material includes that on two and three-phase alloys, flaking in steel and precipitation

hardening and nitriding. In addition, sections on gases in steel, deoxidation, influence of temperature on properties, red shortness, cold working and recrystallization, and steel hardening, are basically reworked.

The book is divided into seven main chapters of which the first is entitled "The Definition and Classification of Commercial Iron". The second, "The Constitution of Definition and Classification of Commercial Iron". The second, "The Constitution of Iron in Relation to the Chemical Composition", discusses various iron systems such as iron-carbon, iron-silicon, etc., gases and slag inclusions in steel, quaternary and complex steels and the specific influence of the most important elements on the properties of steel.

Chap. III is devoted to the influence of temperature on the properties of steel and Chap. IV discusses the influence of working on the structure and properties of steel. Malleable cast iron is the topic of Chap. V and Chap. VI is devoted to gray cast iron. Chap. VII on hard or chilled iron concludes the book. It also contains a bibliography of literature, name index and subject index.

Puts Electric Science Into Simplest Language

Elements of Electricity, by William Esty, Robert A. Millikan and Wynne L. McDougal; cloth, 248 pages, 5½ x 8½ inches; published by the American Technical Society, Chicago; supplied by STEEL, Cleve-

land, for \$2, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

This volume deals with the fundamental laws and phenomena of electricity and their practical applications. It is intended for beginners, written in clear style by men engaged in teaching classes in these subjects.

It is illustrated by 253 drawings, halftones and charts to supplement the text. The effort has been to present the fundamentals of electricity in a manner that can be understood by those without previous knowledge.

Preparing Tin and Alloys For Microscope Examination

Improved methods of mounting and polishing of metals, such as tin and its alloys, for examination under the microscope are described in a new research report of the International Tin Research and Development council. This report has been prepared by H. J. Paffs and is No. 47 in Series A of the council's technical publications.

Although the technique of preparing hard metals is well established, there are usually difficulties if it is applied to soft metals like tin. The paper discusses the advantages and disadvantages of mountants in general use and explains the usability of bakelite, giving practical directions. Liquid synthetic resin mixed with a hardener is poured into a mold so as to surround the specimen. Normal temperatures will solidify this material, making unnecessary methods which use great pressures.

Special refinements in polishing and etching described and photomicrographed on specimens prepared by ordinary methods and also by the new technique show considerable gain in definition in the latter case.

Copies of the above publication may be obtained free of charge from the American representative of the Institute, L. J. Tavener, 149 Broadway, New York.

Sand Bibliography Issued

American Foundrymen's association, 222 West Adams street, Chicago, recently has made available a series of mimeographed sheets entitled "Bibliography on Sand Testing and Control." This bibliography contains mention of approximately 100 reports and papers on sand testing and control which have appeared in the *Transactions* of the association from 1923 through 1936.

Coal Haulage Increased by Use of Weight Saving Steel



HAULAGE of coal from the new Forsythe strip mine, in Southern Illinois, of the Truax-Traer Coal Co. has been increased by reducing the weight of the hoppers of the six trucks employed on this job and thus increasing the "revenue" load capacity. Hoppers that weighed 4600 pounds each when fabricated of plain carbon steel weigh 3500 pounds when built of Yoloy, nickel copper alloy steel of high tensile strength and resistance to atmospheric corrosion produced by Youngstown Sheet & Tube Co., Youngstown, O. The 20-ton, bottom dump Trac-Trucks, built by Euclid Road Machinery Co., Cleveland, on a recent day hauled 3850 tons, or an average of 20.6 tons per load



BUILT BY **MORGAN**
Engineering » »

Stripping Ingots—BIG END UP—AND STANDING

• Two of the Morgan 150-ton, 73'6" span, screw type Ingot Strippers at work stripping standard and big-end-up ingots in a northern Ohio mill. Efficient, rugged, dependable—such huge machines play an important part in stepping up steel pro-

distinct stripping operations without making changes in the stripping unit. Today this machine is designed to (1) strip small-end-up or standard ingots; (2) strip big-end-up ingots; (3) break small-end-up ingots loose from stools. *More easily controlled than older*

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- ★ Electric Welded Fabrication •
- ★ Steam Hammers • Steam Hy
- ★ Presses • Special Machinery f
- ★ THE MORGAN ENGINE
- ★ Alliance, Oh

Wearing Surfaces Have Longer Life When Lined with New Metal

LIFE of tool bushings and other parts is being lengthened substantially 500 to 600 per cent as a result of lining or coating them with an abrasion resisting metal known as Xaloy. About 10 months ago Wilcox-Rich, Division of Eaton Mfg. Co., Detroit and Battle Creek, Mich., under license from Industrial Research Laboratories, Ltd., Los Angeles, began investigating the possibilities for useful applications in the general industrial field of the alloy known in the oil well field as I. R. metal. One of the early results of this study was the application of Xaloy, Wilcox-Rich division's trade name, as an internal liner for honing control bushings. These bushings have a continuous wiping wear on the inside diameter, aggravated by the presence of abrasive compound; results in increased life have been exceptional.

Another early application was the lining of drill and reamer bushings. Briquetting moulds next were lined with this material, resulting in considerably increased life. A wide range of other applications followed. As a natural consequence, Wilcox-Rich has installed complete equip-

ment for the application of Xaloy to surfaces, and supplying the finished product to an increasingly diversified group.

It may be stated that Xaloy is most suitable where its unusual resistance to abrasion and its low thermal expansion can be used to advantage and where ductility and high impact values are not required. The metal has a tensile strength of 43,100 pounds per square inch, and compressive strength of 240,000 pounds per square inch. Its coefficient of thermal expansion is 7.2×10^{-6} per inch per degree Fahr. and its thermal conductivity is 7.5 B.t.u.'s per hour per square foot per degree Fahr. Its hardness is equivalent to 750 Brinell, or 68 to 70 on the Rockwell C scale.

Since the melting point of Xaloy is 2000 degrees Fahr. it is possible to line any type of steel or steel alloy tubes or coat them with the metal when it is in a molten condition. This is done by a centrifugal spinning process, when both the Xaloy and the tube are at the same temperature, resulting in a perfect fusion bond. Because of this, most of the applications so far have been on

annular surfaces. However, when prepared in the form of welding rods, it may be flowed into flat surfaces by means of any of the various welding methods.

At the present time applications on irregular surfaces are not regarded as practicable unless Xaloy is cast in a sand mould. The difficulty with this procedure is that this metal is not machinable and requires rather difficult grinding. In the annular form internal surfaces generally are finished by honing, while external surfaces are ground. The application of the metal to steel is held to exceedingly close tolerances and the surface calls for very little finishing. A feature of the linings and coatings obtained is that they are of uniform hardness throughout the section and all over the surface. As a result of experience, the company has standardized on a lining or coating thickness of 1/16-inch which offers adequate abrasion resistance. Where special requirements make a thicker layer necessary linings can be made up to 1/2-inch thick.

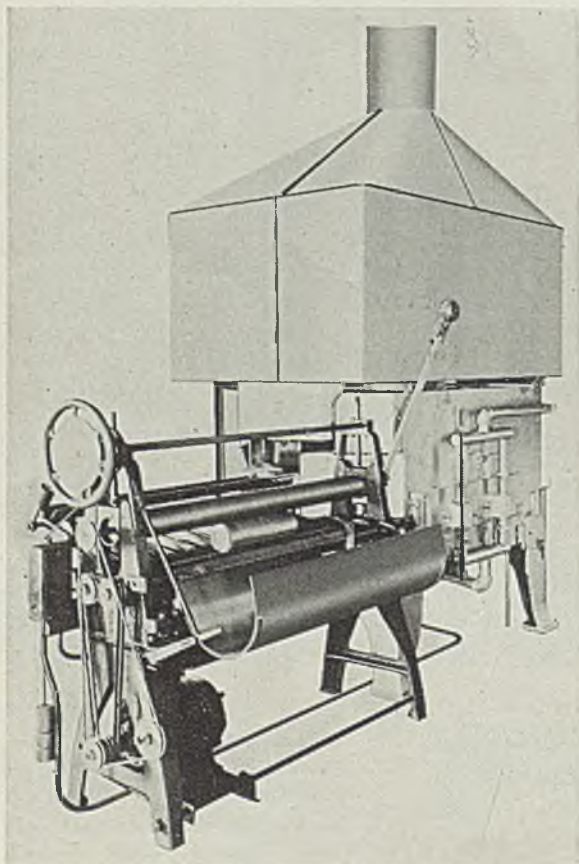
Rolls Are Hard Faced

In one interesting application this metal is used as a coating on the periphery of rolls used to slit rubber fabrics. High speed steel rotary knives operate on the surface of these rolls, and since facing them with Xaloy a considerable increase in surface life has resulted with the additional benefit to the manufacturer of being able to remove the rolls, refinish the surface and remount them a number of times. This is a distinct advantage over a chilled surface on this application, or any of the chilled, hardened, or plated surfaces, owing to the uniformity of Xaloy for the full depth of the layer.

Another application which is quite similar to the above in that it is an external coating is its use on packing glands handling abrasive materials. A rather unusual application has been the lining of cylinders and valves pumping mixed concrete, resulting in an amazing increase in life. Work rest blades of Xaloy are proving to have exceptional merit, and it is believed that one of the largest fields will be the use of this material as a liner for both wire drawing and deep drawing dies. Considerable development work also is being done on ring and plug gages.

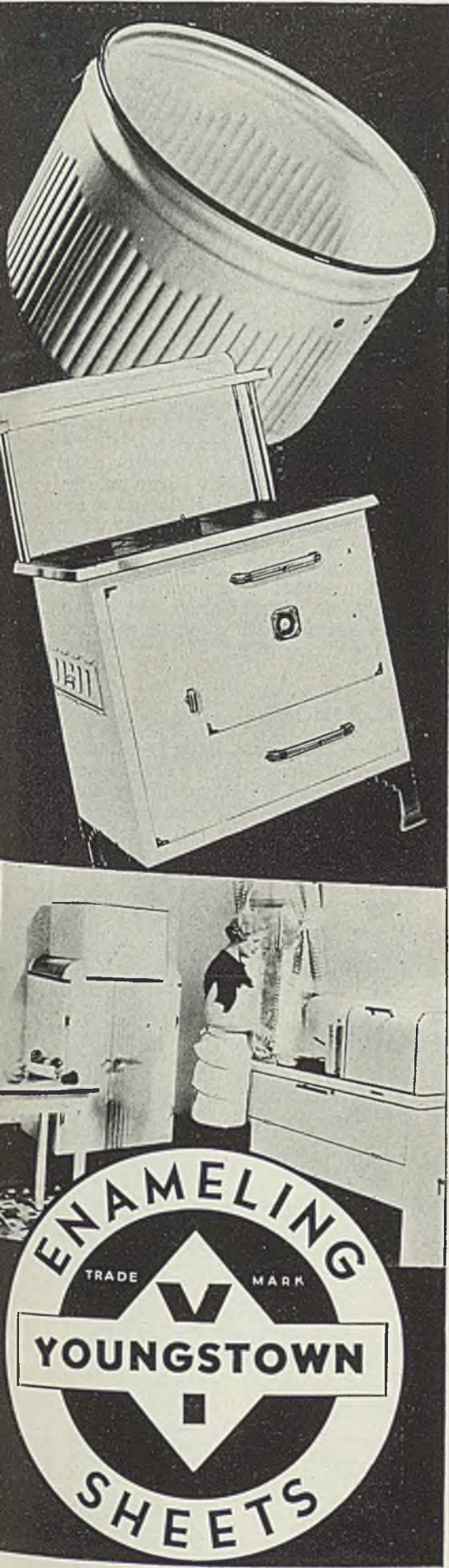
Founders Issue Directory

Gray Iron Founders' Society, Inc. will issue shortly a directory of its membership, which it says should prove useful to purchasers of gray iron castings. Copies will be available at the society's office, 1010 Public Square building, Cleveland.



Xaloy metal is cast centrifugally for lining steel tubes. For this purpose a gas fired furnace of the roller type is employed

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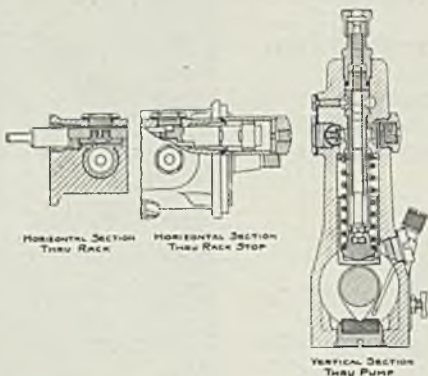


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NEW EQUIPMENT

Fuel Injection Pump—

Timken Roller Bearing Co., Canton, Ohio, has just announced two sizes of multiple unit, integral camshaft pumps, one using a 4-9 millimeter range of plunger sizes and the second, a 5-11 millimeter range. At present, these pumps are being made for 1, 2 and 6-cylinder engines. Pumps are of the cam operated helical plunger type, the metering being adjusted at the fac-



Construction diagrams of the new Timken fuel injector pump for diesel engines

tory and sealed. At the lowest position of the plunger, the cylinder receives a charge of oil from the feed line, which is kept filled by a special



Front view of the new integral camshaft injector pump designed for production line installation on diesel engines up to 250 horsepower

feed pump connected to the fuel tank. Delivery of the fuel to the engine starts as soon as the piston covers the inlet port and ends when the upper helical edge of the annular groove in the piston opens the overflow or bypass port on the opposite side of the pump cylinder wall, releasing the pressure through the discharge line. The effective delivery stroke of the piston may be regulated by turning the piston in its cylinder or barrel to vary the point of the delivery stroke in which the motor-flow port is uncovered. For convenience in installation and in line with American practice, the pumps are all made to fit standard bases and all connecting parts conform to standard dimensions. Likewise all parts are made on the American production plan, being interchangeable and easily replaced when necessary direct from conveniently located stock. The small pump is adapted for use on diesel engines up to approximately 150 horsepower and operates at speeds up to approximately 4000 revolutions per minute. The larger size is ordinarily used on engines from 110 to 250 horsepower, operating at speeds up to approximately 3000 revolutions per minute.

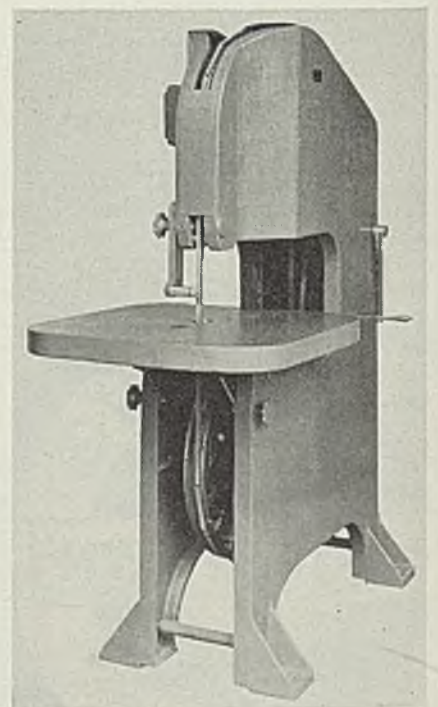
Midget Contactors and Line Starters—

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., is offering a line of remote control, reversing and non-reversing magnetic starters for small single phase and polyphase, squirrel-cage induction motors. The non-reversing contactors are particularly adapted for use with motors driving air conditioning equipment, small compressors, pump, oil burners and the like. These units are designed to fit in small spaces. Coin silver contracts provide long life and maximum conductivity. The operating mechanism is mounted on an insulated base and may be removed as a unit from the cabinet. A thermal-overload relay provides protection and minute control current permits operation from two-

end three-wire thermostats, pyrometers, pressure gages and other delicate instruments as well as from small push buttons and float switches. Contactors are available for ½ horsepower, 110 volts or 1 horsepower, 220 volts, single pole or double pole for use either as a remote controlled line switch or as a motor starter. Reversing line starter consists of a reversing contactor plus a single pole overload relay for single phase motors and a two pole overload relay for three-phase motors.

Filing Machine—

Grob Brothers, Grafton, Wis., have recently placed on the market a new large throat, floor type heavy duty filing machine. The new machine is designated as type D-3 and has a throat of 24 inches. The file chain



Grob Bros. are the builders of a new large throat, heavy duty floor type filing machine

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A leading manufacturer states . . . "It is positively wasteful for any company to produce parts for its finished products when such parts can be purchased at less cost from an outside source." • Truscon states . . . "It is highly practical for most companies to concentrate their mass production requirements for pressed steel parts in Truscon's Pressed Steel Division here in Cleveland." • That's what we mean when we offer YOU the facilities of our 13 acres of plants and the experience of our organization of pressed steel specialists to produce your requirements with speed, accuracy and economy. • The only capital investment required on *your* part is "the price of a telephone call." (A letter or telegram will receive the same prompt action).

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determine what can
or cannot be done in
pressed steel



TOOL AND DIE MAKERS
save you time and
money and assure
accuracy



LABORATORIES
conduct thorough
tests to predetermine
vital factors



PRESSES
from light pressure
to 2500 tons meet all
mass production needs



INSPECTION
verifies uniformly
high standards of
manufacturing



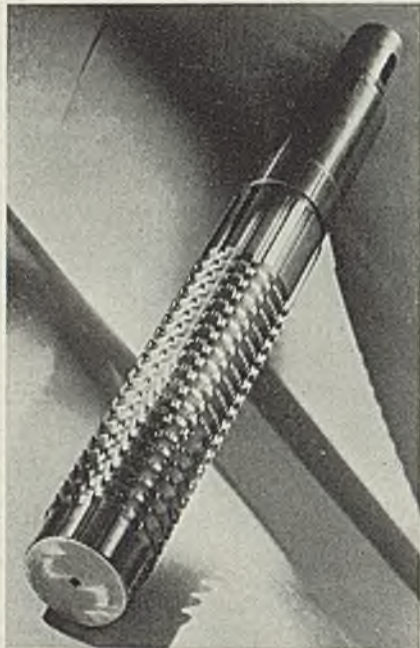
SHIPPING
expedites deliveries &
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costs to a minimum

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is equipped with a positive drive so that slippage is eliminated. Thickness of the files is held to an accuracy of 0.002-inch, and the files are furnished in flat, oval and half round shapes. The machine is also arranged for chains of abrasives stones which are used to lap dies after they have been hardened. All revolving members are mounted on ball bearings, and the machine is driven by a ½-horsepower motor through a V-belt drive, three speeds being provided.

◆ ◆ ◆
Broaches—

Connecticut Broach & Machine Co., New London, Conn., has recently placed on the market a new



Newly designed Connecticut broach of extra hardness for broaching hardened alloy steels

line of broaches especially designed to cut hard alloy steels with greater broach life. The new tools, accord-

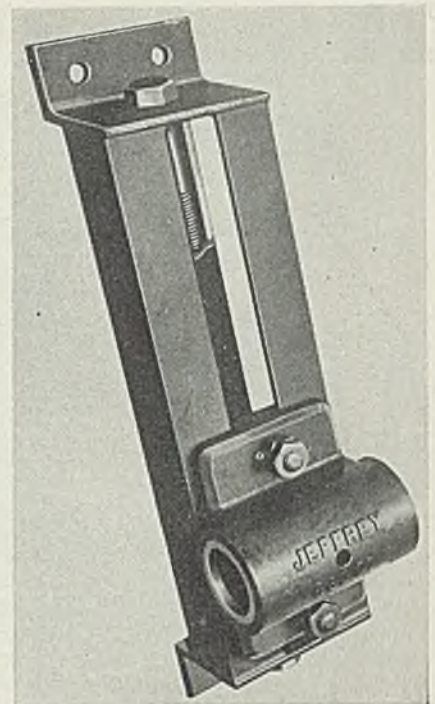
ing to the company, enable the user to broach steel after treating. The hardness of each broach is not a surface phenomenon, but is the result of using a special alloy steel and a heat treatment which gives the surface material and the material at the core of the broach the same qualities. A particularly successful application of the new broaches is in working SAE 6150 which is commonly used in making airplane propellor hubs.

◆ ◆ ◆
Threading Machine—

Landis Machine Co., Waynesboro, Pa., is now marketing an improved design 2-inch threading machine. Power is delivered to the belt driven machine through tight and loose pulleys mounted on the main drive shaft, and a belt shifter is provided for starting and stopping the machine. Speed changes are affected through a pick-off gear box conveniently located on the headstock, and covers a range of 31 to 118 revolutions per minute. In the motor driven model, the motor is mounted on a plate attached to the top of the headstock. Motor and gear box are connected by a silent chain drive. Bed is strengthened through the use of heavier reinforcing webs, and the headstock is mounted directly on the top of the bed. Coolant pump is mounted close to the bed to avoid overhang and interference with floor space.

◆ ◆ ◆
Conveyor Screw Takeup—

Jeffrey Mfg. Co., Columbus, Ohio, has announced a new protected screw takeup for conveyors and elevators. The adjusting screw is protected from dust and dirt by an inverted U-shaped shield which extends from end to end of the takeup frame. The sliding base casting is cored out in such a way that it slides freely over the shield, relieving the shield of any function other than that of protecting the screw. The adjusting screw does not travel but



Jeffrey protected screw takeup for conveyors and elevators is shielded from dust and dirt

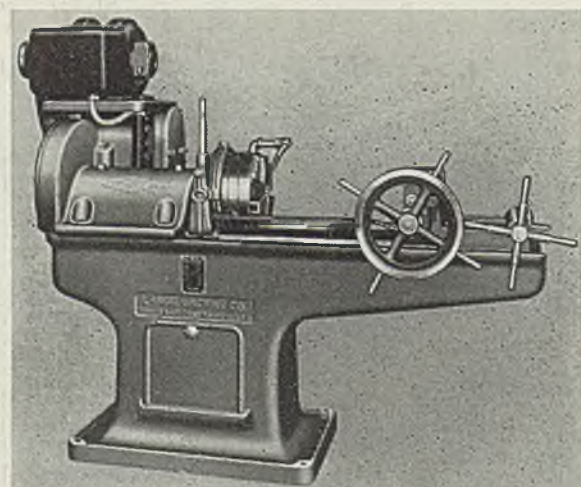
remains inside the frame, where it is protected from damage of all kinds. The screw is also protected from operating strains and shocks, since the bearing is rigidly clamped to the steel frame.

◆ ◆ ◆
Arc Welder—

Electric Heat Control Co., 9123 Inman avenue, Cleveland, has recently placed on the market a new arc welder designed for service work in the shop or on the job. This model has been designed for operation for either on 110 or 220 volts



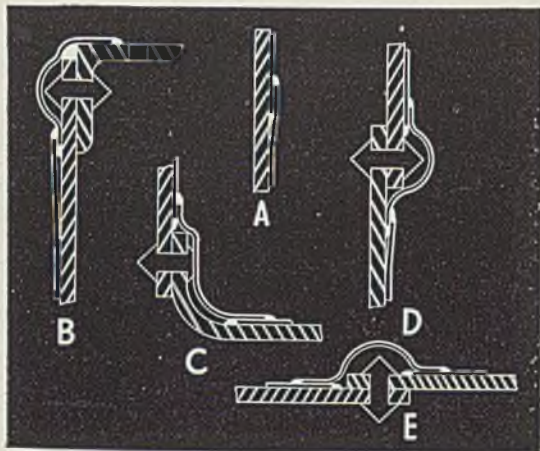
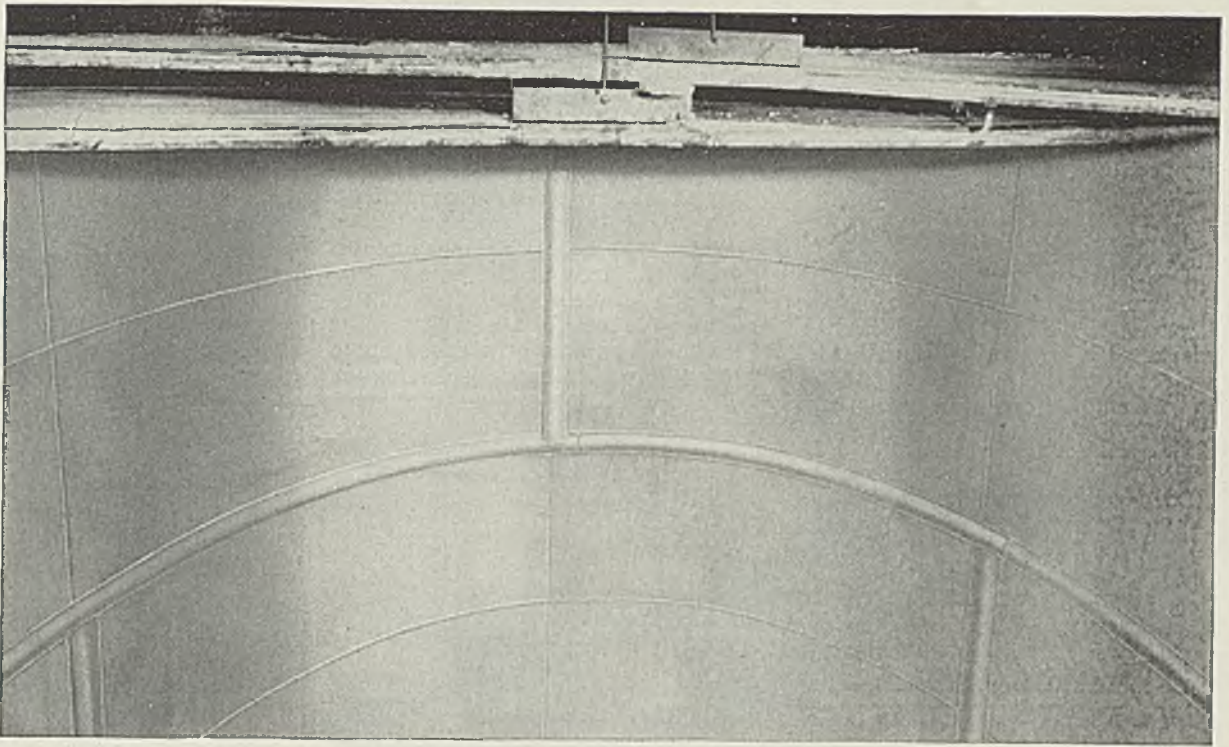
Arc welder model W-2 built for service work by Electric Heat Control Co. It is portable and operates on conventional currents



Landis redesigned 2-inch threading machine available in either belt driven or direct motor driven models

alternating current, 60 cycles, without any special wiring. It has a capacity of 20 to 75 amperes, constant service and a high tap of 100 amperes for intermittent use. The machine is mounted on casters for easy handling and is provided with two handles for lifting. The unit

Large soap kettle lined with 16-gauge IngAclad. Wide seam indicates method of covering existing rivets. This installation was made for a large manufacturer of toiletries.



DETAIL A—Lap-weld construction for side wall and bottom of tank.

DETAIL B—Method of forming IngAclad over top reinforcing angle and top course of rivets.

DETAIL C—Forming IngAclad around corners.

DETAIL D—Illustrates formed section of IngAclad covering rivets on side walls.

DETAIL E—Shows formed section of IngAclad covering rivets on bottom of tank.

NOTE: Simple inexpensive lap-welding is used throughout. No "fit-up" troubles.

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18-8 Stainless-Clad Steel**

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J. R. Kindig, Red Rock Bldg., Atlanta, Ga.

is shipped complete with hand shield, electrode holder, welding cables, rubber-covered lead-in cord and small quantity of assorted welding rods. Materials from 20 gage to ¼-inch can be welded, using coated rods 1/16-inch to 1/8-inch.

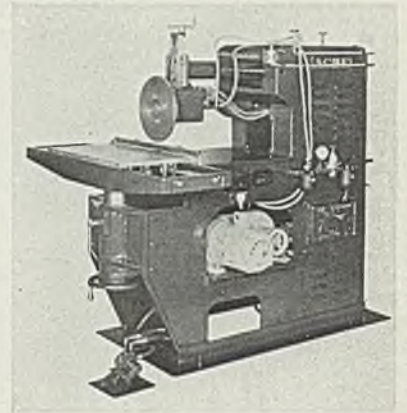
♦ ♦ ♦

Roll Welder—

Acme Electric Welder Co., Huntington Park, Calif., has recently marketed a new semiautomatic roll welder of the vari-speed motor driven and air operated type. Weld-

ing capacity of the new machine is approximately from 3/64 to ¼ inch either round or flat steel cross wires, jointed to selvage or supporting steel wire of ½ inch round or spiral, and of light wires as well as extremely heavy wires. Standard length of throat is 24 inches from the center line of the roll to the face of the base. The opening between the face of the square copper bar electrode and free roll is adjustable up to 2½ inches. The machine operates at a speed up to 100 feet per minute, depending on pressure, thickness, quality of stock

and coatings on both selvage and cross wires. Rolls are ball bearing, the lower rolls being power driven through a worm gear reduction from a three phase varidrive motor.



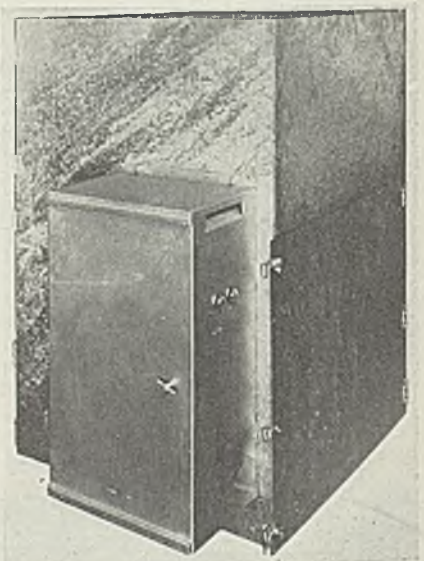
Acme semiautomatic roll welder designed for joining wires of various types

Control is through a valve, which is a spring return type connected to a flexible air hose.

♦ ♦ ♦

Electrostatic Precipitator—

Pangborn Corp., Hagerstown, Md., has recently announced a new electrostatic precipitator for general industrial air cleaning. The new device is particularly suitable for salvaging valuable dust, mass air cleaning, or removing objectionable particles from gas or vapor and similar applications. The unit is small in size, and is equipped with a small vacuum tube power pack attached directly to the precipitator cabinet, eliminating the need for separate high voltage generating equipment.



Pangborn electrostatic precipitator designed for all general industrial air cleaning purposes

**YOU CAN'T
CUT...
PRODUCTION
COSTS with
DULL TOOLS**

Keep your tools sharp the easy, speedy, dependable way with LeBlond Universal, *consistently accurate*, precision Grinders, that will grind any face on any shape cutter, faster, better, more economically, and get tools back in production without delay.

Rugged, simple in design, completely protected against emery dust, every operating part of LeBlond No. 1 and No. 2 Grinders is built to give extra years of trouble-free service; to effect genuine savings in grinding costs and return the greatest value per dollar invested.

Literature will be sent on request.

Write for illustrated brochures containing complete specifications of LeBlond No. 1 and No. 2 Grinders.



For grinding all kinds of cylindrical, internal, face and angular work—face mills; end mills; reamers; counter bores; circular saws; snap gauges; internal gauges; gear cutters; rose reamers; adjustable blade reamers; flat surfaces; formed cutters, cylindrical or flat; jig bushes; mandrels; all tool room grinding.

The R. K. LE BLOND
MACHINE TOOL CO., CINCINNATI, O.
 20 North Wacker Drive, Chicago 103 Lafayette St., New York
HALF CENTURY OF SERVICE TO INDUSTRY

MATERIALS HANDLING



Improves Inspection of Million Screws Per Hour

(Concluded from Page 56)

at the end of the inspection line nearest the spiral or by the foreman by means of remote control.

Tote boxes, filled with work, are delivered directly in front of an inspector as shown in Fig. 1. The inspector reaches over her bench—an easy reach—and pulls a box from the line, tipping it over as it comes to the edge of the conveyor, and spilling the screws on the bench.

One simple yet effective device is rigged up at the end of the straightaway to overcome the difficulty of boxes pressing against each other so tightly that an inspector is unable to pull one from the line. The straightaway, being an inclined roller conveyor, caused boxes to push against a bumper at the end of the line, and sometimes boxes were pushed against each other so hard that it was necessary to push them all back to slide off a box. To prevent this, a double spring bumper was installed at the end of the line. Being compressed but slightly the springs kick the line of boxes back as it hits, thus relieving the end pressures. It is now so easy to slide out boxes that even a slightly-built inspector experiences no trouble in the operation.

Work Removed by Conveyor

After the work has been dumped out on the bench, the inspector pulls each screw toward an opening in the bench as shown in Fig. 1. A screw, in its progress towards the opening, turns over and over, thus allowing the inspector to examine thread, point and head. Upon reaching the drop delivery chute, the layout of which was planned only after exhaustive motion analysis studies, screws slide down into a box at the right or left-hand side of the inspector. When the benchful of work has been inspected, the box on the lower section is pushed forward until it meets the bottom belt conveyor shown in Fig. 4.

This bottom belt conveyor transports inspected screws up to and past the final inspector. The latter rakes over every box and if he finds any screws whatever that may be on the borderline, they are so tagged and the box sent along on its

journey. Work that has passed final inspection travels around to the final weigh-off station, where screws are counted while still in tote boxes, the conveyor being integral with weighing and counting mechanism.

After the counting operation, screws pass on to an inclined belt conveyor, which carries them up to another spiral which acts as a distributing point. Incidentally, screws which have not passed the final inspector go over this same line but are not counted, a tag in the box indicating that they must be reinspected by another group of inspectors. At the distribution point on the spiral, okayed work is sent to be stored either in bulk or packaged in gross lots. Work to be reinspected is placed on another short conveyor line where the other group of inspectors gives it a thorough examination. Such screws must go again past the final inspector and if passed may be counted and distributed.

The system just described satisfactorily handles inspection in the American Screw plant. It is a combination of lift-trucks; skids; tote boxes; spiral gravity, roller and belt conveyors and controls, all carefully

co-ordinated. Executives of the company state it has saved money, but more than anything else has improved the quality of inspections, an important item in building good will. Furthermore, it has resulted in an orderly flow of work, with accompanying better control over work in process.

The recessed head screw, the company's new product, also is inspected on this system. Heads are "skimmed", or minutely inspected, as illustrated in Fig. 2. An executive of the company declares: "If it were not for this new system, the cost of inspecting the new line of screws would be almost prohibitive. The precision employed in manufacturing is now continued right through to final distribution, and the new materials handling system is considered an important aid in producing the desired results."

Builds Dissolving Machine

Designed for handling materials from high to low viscosity, a new dissolver has recently been announced by the Patterson Foundry & Machine Co., East Liverpool, O. Dangers from explosions have been minimized and loss of solvent during the dissolving operation has been eliminated, according to the company. The new machine is built in both plain and jacketed type, also for internal working pressures up to 100 pounds per square inch. It is obtainable in plain steel, stainless steel, aluminum, and other metals and is built in a wide variety of sizes.

**For all
Purposes**

LESCHEN WIRE ROPE

ESTABLISHED
1857

A. Leschen & Sons Rope Co.
5909 Kennerly Avenue
ST. LOUIS, MO.

New York 87 to 90 West Street
Chicago 810 W. Washington Blvd.
Denver 1554 Wazee Street
San Francisco 520 Fourth Street

Round Strand

Flattened Strand

"P. F. S."

Non-Rotating

Preformed

Steel Clad

Locked Coil

Regular Lay

Lang's Lay

Hemp Center

Wire Rope Center

Metallic Core

Seale - Filler Wire

Warrington



RECENT PUBLICATIONS OF MANUFACTURERS

Copies of any of the literature listed below may be obtained by writing directly to the companies involved, or by addressing STEEL, in care of Readers' Service Department, 1213 West Third Street, Cleveland

Production Grinders—Sawyer Electrical Mfg. Co., Los Angeles. Catalog describing its high speed heavy duty and portable grinders.

Burner Equipment—Surface Combustion Co., Toledo, O. Bulletin No. 79, describing proved economies from correct burner equipment.

Gas Ranges and Appliances—Garland division, Detroit-Michigan Stove Co., Detroit. Catalog 37-29, describing its gas ranges and gas appliances.

Lathe Accessories—Monarch Machine Tool Co., Sidney, O. Catalog describing accessories obtainable with the various types of monarch lathes.

Research Illustrated—E. F. Houghton & Co., 240 West Somerset street, Philadelphia. Booklet presenting thoughts on current metal-working and heat-treating problems.

Coordinated Process Control—Bristol Co., Waterbury, Conn. Bulletin No. 460 describing a new development in automatic process control.

Wheels—Geneva Metal Wheel Co., Geneva, O. Catalog No. 20, illustrating and describing its various sizes and wheel designs, including detailed specifications and prices.

Grinding Wheel Specifications—Norton Co., Worcester, Mass. Booklet of grinding wheel specifications, corrected to latest revised standard of U. S. department of commerce, for grinding machines.

Step-tapered Tubes—Summerhill Tubing Co., Bridgeport, Conn. Folder illustrating typical step-taper sections and how diameter of tube and wall thickness can be reduced as desired by the designer.

Drop Forged Cover Assemblies—Steel Improvement & Forge Co., 960 Addison road, Cleveland. Folder giving technical data and general information on Diamond S drop forged handhole and manhole cover assemblies.

Feed Control Panel—Vickers Inc., 1400 Oakman boulevard, Detroit. Bulletin No. 36-10, illustrating its series C2-1237 feed control panel for those hydraulic circuits with which remote electric control may be used advantageously.

Flow Meters—Brown Instrument Co., Philadelphia, Catalog No. 2004, covering the complete line of its flow meters, indicating, recording and integrating, in both electrical and mechanical types, explaining their

application to power plant, water works and gas generation service.

Floor Resurfer—Stonhard Co., 813 Terminal Commerce building, Philadelphia. A folder calling attention of industrial executives to losses from poor floor surface and advantages of its resurfacing material to repair worn spots and holes; questions as to the material and its application are answered, to make clear its advantages.

Refractories—Portsmouth Refractories Co., Portsmouth, O. Two booklets on Titanic quartz, one presenting the geological origin, history and refractory qualities and the other a history of its development as a base for the company's super-silica brick; much convincing information is arrayed to show the high refractory qualities it imparts to this brick.

Carboloy Grinding Chart—Carboloy Co. Inc., 2967 East Jefferson avenue, Detroit. Chart No. GC-71, presenting in condensed form the most efficient methods for grinding single-point carboloy tools, and includes recommendations on grinding wheels, diamond wheels, diamond lapping disks, wheel speeds, rough and finish grinding procedure and methods for hogging off stock rapidly.

Switchboard Watthour Meters—Westinghouse Electric Mfg. Co., East Pittsburgh, Pa. Catalog section 42-104, describing type OB switchboard watthour meters of the single phase, polyphase and three element types; section 32-165, describing bicycle type switchgear for indoor service with manually or electrically-operated breakers; section 42-210, describing polyphase detachable meters suitable for any application where a two element watthour meter is required; two leaflets, Nos. L 20626 and L20627, describing de-ion combination linestarters and de-ion non-reversing linestarters.

Gray Iron Diagrams as They Illustrate Structure

Metallographic Atlas (Atlas Metallographicus) Vol. II, Parts 1 to 4, by Hannemann and Schroeder; paper, 164 pages, 7½ x 10½ inches; published by Gebrueder Borntrager, Berlin, Germany; supplied by STEEL, Cleveland; in Europe by Penton

Publishing Co. Ltd., Caxton House, Westminster, London.

This volume is devoted to gray iron and contains 32 tables and 229 illustrations. The text is in German and discusses equilibrium or constitutional diagrams and their applications in gray iron, structure of gray irons, polishing of specimens, graphite, graphite under polarized light, form and arrangement of solid solution and graphite in relation to degree of saturation and section thickness, manganese sulphide, arrangement of manganese sulphide in hypo and hypereutectic specimens, graphite eutectic formations, steadite, phosphorus eutectic, dissociation of "segregated" graphite and crystallization of the stable eutectoid, ferrite formation by annealing, graphite formation in freezing, structure of the matrix in ferritic gray irons of various section thicknesses, and structures of plain and alloy gray irons for specific applications.

The numerous micrographs are excellent reproductions, and include unetched and etched specimens ranging from 50 to 1200 diameters. The pages containing the micrographs are loose, and facing each is a table that contains all the information relating to each micrograph such as the etchant, specimen number, chemical composition, "degree of saturation," diameter of the test specimen, and a detailed description of the illustration.

Gear Design Made Easy By Rules and Diagrams

Gear Design Simplified, by Franklin D. Jones; fabrikoid, 134 pages, 8½ x 11 inches; 201 illustrations; published by Industrial Press, New York; supplied by STEEL, Cleveland, for \$3, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

This book consists exclusively of working rules, formulas and data actually required by the designer and shop man in producing various types of gears. The theoretical side of gear design has been excluded in order to condense and simplify the book. Types include spur, internal, straight-tooth bevel, spiral bevel, helical, herringbone and worm gears. A section is devoted to figuring speeds and ratios, including various transmissions of planetary type. Another section deals with rules and formulas for determining power-transmitting capacities of various types of gears.

All problems are presented in simple chart form, illustrated by a drawing or diagram; opposite this is the rule and equivalent formula for determining that dimension, angle or other value.

Pig Iron Advanced; Steel Rise Expected

Mill Sold to April;

Scrap Exports in Jam;

Heavy Ore Year

A STRONGER, more active market has developed in steel, with producers sold into April and June, and an advance of \$3 to \$5 per ton on finished products expected shortly.

Late last week Carnegie-Illinois Steel Corp. announced it would not open second quarter books until March 5, when it will announce its prices for that delivery.

The world steel situation is having a pronounced effect on the domestic market, drawing heavy tonnages of steelmaking scrap and causing prices to rise. Inquiry from European countries for pig iron and finished steel also is active. Premium prices are being offered. Imports of foreign ores have virtually stopped, prices being prohibitive.

So great is the movement of export scrap to eastern seaboard points that sufficient vessels are not available and congestion has resulted. About 1000 cars are on track at one point and some 20,000 tons of scrap at another, unable to unload until ships arrive. Some railroad embargoes have been imposed to prevent further congestion.

Scrap prices are reaching levels not attained for many years, a sale in the Pittsburgh district of No. 1 heavy melting steel being reported at \$21.25, the highest price in that district since 1925. Some observers believe the peak is practically reached and that prices will not move much higher.

Some large buyers of finished steel have placed tonnage without a definite price being named. Sheet mills have the heaviest backlogs and in some grades have nothing to offer before April or May.

An advance of \$1 per ton on all grades of pig iron in all centers, effective immediately, is a reflection of the high price of steelmaking scrap.

Indications point to an advance in the price of Lake Superior iron ore, the first in eight years, 50 cents per ton being considered. Preparations are being made to bring down 60,000,000 tons of ore this season, the total being limited only by lake transportation facilities.

Wire producers have announced increases of \$3 to

MARKET IN TABLOID

DEMAND *Strong for domestic and export.*

PRICES *Pig iron advanced \$1; Steel price advanced imminent.*

PRODUCTION . . *Operations gain one point to 84 per cent.*

SHIPMENTS . . . *Steady, backlogs little reduced.*

\$6 per ton on a number of products, including nails, staples, barbed wire and woven fencing, effective immediately for March only. Plain wire is not included. This is done to bring these products into line with others, a discrepancy having existed. Negotiations are under way between steelmakers and employe representatives looking to further wage adjustments.

Heavy orders on books and resumption of production by mills in the flood districts have pushed the operating rate to 84 per cent of capacity, one point above the preceding week. Pittsburgh gained a point to 87, Youngstown 1½ points to 81½, Wheeling 14 points to 94, New England 11 points to 97, Detroit 3 points to 97 and Cincinnati 4 points to 64. No change was made in other districts, Chicago remaining at 80½, Eastern Seaboard at 56, Cleveland at 79½, Birmingham at 77 and St. Louis at 82.

Automotive production last week rose to 111,915 units, compared with 95,698 the preceding week, a gain of 16,217. General Motors contributed 38,500 to this total, its gain of 15,400 over the preceding week accounting almost exactly for the increase. Total output is still considerably under what is expected.

Sales of structural steel are increasing as the winter nears its end, the total reported last week being 22,708 tons, compared with 18,291 tons the preceding week. This is considerably below the 33,125 tons placed in the corresponding week of 1936. The leading purchase is 10,000 tons for a federal building at Los Angeles.

Advances in steelmaking scrap at Pittsburgh and Chicago caused the composite price of scrap to rise 41 cents, to \$19.66. Higher prices on pig iron and scrap carried the iron and steel composite up 24 cents to \$36.95 and the higher price of wire nails added 50 cents to the finished steel composite, making it \$56.30.

COMPOSITE MARKET AVERAGES

| | Feb. 27 | Feb. 20 | Feb. 13 | One Month Ago Jan., 1937 | Three Months Ago Nov., 1936 | One Year Ago Feb., 1936 | Five Years Ago Feb., 1932 |
|---------------------|---------|---------|---------|-----------------------------|--------------------------------|----------------------------|------------------------------|
| Iron and Steel | \$36.95 | \$36.71 | \$36.67 | \$36.55 | \$34.65 | \$33.48 | \$29.24 |
| Finished Steel | 56.30 | 55.80 | 55.80 | 55.80 | 53.90 | 53.70 | 46.72 |
| Steelworks Scrap.. | 19.66 | 19.25 | 19.08 | 18.12 | 16.05 | 13.83 | 7.89 |

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

| Finished Material | Feb. 27, | Jan. | Nov. | Feb. | Pig Iron | Feb. 27, | Jan. | Nov. | Feb. |
|--------------------------------------|----------|----------|----------|----------|-------------------------------------|----------|--------|-------|-------|
| | 1937 | 1937 | 1936 | 1936 | | 1937 | 1937 | 1936 | 1936 |
| Steel bars, Pittsburgh | 2.20c | 2.20 | 2.05 | 1.85 | Bessemer, del. Pittsburgh | \$23.26 | 22.26 | 20.81 | 20.81 |
| Steel bars, Chicago | 2.25 | 2.25 | 2.10 | 1.90 | Basic, Valley | 21.50 | 20.50 | 19.00 | 19.00 |
| Steel bars, Philadelphia | 2.49 | 2.49 | 2.36 | 2.16 | Basic, eastern del. East Pa. | 23.26 | 22.26 | 21.06 | 20.81 |
| Iron bars, Terre Haute, Ind. | 1.95 | 2.10 | 1.95 | 1.75 | No. 2 fdy., del. Pittsburgh | 23.21 | 22.21 | 20.31 | 20.31 |
| Shapes, Pittsburgh | 2.05 | 2.05 | 1.90 | 1.80 | No. 2 fdy., Chicago | 22.00 | 21.00 | 19.75 | 19.50 |
| Shapes, Philadelphia | 2.25 1/2 | 2.25 1/2 | 2.11 1/2 | 2.01 1/2 | Southern No. 2, Birmingham ... | 18.38 | 17.38 | 15.75 | 15.50 |
| Shapes, Chicago | 2.10 | 2.10 | 1.95 | 1.85 | Southern No. 2, del. Cincinnati .. | 21.69 | 20.69 | 19.69 | 20.20 |
| Tank plates, Pittsburgh | 2.05 | 2.05 | 1.90 | 1.80 | No. 2X eastern, del. Phila. | 24.135 | 23.135 | 21.93 | 21.68 |
| Tank plates, Philadelphia | 2.23 1/2 | 2.23 1/2 | 2.09 | 1.99 | Malleable, Valley | 22.00 | 21.00 | 19.50 | 19.50 |
| Tank plates, Chicago | 2.10 | 2.10 | 1.95 | 1.85 | Malleable, Chicago | 22.00 | 21.00 | 19.75 | 19.50 |
| Sheets, No. 10, hot rolled, Pitts... | 2.15 | 2.15 | 1.95 | 1.85 | Lake Sup., charcoal, del. Chicago | 27.54 | 26.54 | 25.87 | 25.25 |
| Sheets No. 24, hot ann., Pitts... | 2.80 | 2.80 | 2.60 | 2.40 | Gray forge, del. Pittsburgh | 22.17 | 21.17 | 19.67 | 19.67 |
| Sheets, No. 24, galv., Pitts... | 3.40 | 3.40 | 3.20 | 3.10 | Ferromanganese, del. Pittsburgh | 84.79 | 84.79 | 80.13 | 80.13 |
| Sheets, No. 10, hot rolled, Gary ... | 2.25 | 2.25 | 2.05 | 1.95 | | | | | |
| Sheets, No. 24, hot anneal., Gary .. | 2.90 | 2.90 | 2.70 | 2.50 | Scrap | | | | |
| Sheets, No. 24, galvan., Gary | 3.50 | 3.50 | 3.30 | 3.20 | Heavy melting steel, Pittsburgh .. | \$20.75 | 18.95 | 17.40 | 14.80 |
| Plain wire, Pittsburgh | 2.60 | 2.60 | 2.50 | 2.30 | Heavy melt. steel, No. 2, east Pa. | 17.75 | 16.40 | 13.75 | 12.00 |
| Tin plate, per base box, Pitts... | \$4.85 | 4.85 | 5.25 | 5.25 | Heavy melting steel, Chicago | 20.25 | 18.25 | 16.50 | 14.30 |
| Wire nails, Pittsburgh | 2.50 | 2.25 | 2.05 | 2.40 | Rail for rolling, Chicago | 21.75 | 19.40 | 17.25 | 15.50 |
| | | | | | Railroad steel specialties, Chicago | 21.75 | 19.65 | 18.25 | 15.75 |
| Semifinished Material | | | | | Coke | | | | |
| Sheet bars, open-hearth, Youngs.. | \$34.00 | 34.00 | 32.00 | 30.00 | Connellsville furnace, ovens | \$4.00 | 4.00 | 4.00 | 3.50 |
| Sheet bars, open-hearth, Pitts... | 34.00 | 34.00 | 32.00 | 30.00 | Connellsville, foundry, ovens | 4.25 | 4.25 | 4.25 | 4.20 |
| Billets, open-hearth, Pittsburgh... | 34.00 | 34.00 | 32.00 | 29.00 | Chicago, by-product foundry, del. | 10.25 | 10.25 | 9.75 | 9.75 |
| Wire rods, No. 5 to 3/4-inch, Pitts. | 43.00 | 43.00 | 40.00 | 40.00 | | | | | |

Steel, Iron, Raw Material, Fuel and Metals Prices

Except when otherwise designated, prices are base, f.o.b. cars.

| | | | |
|--|---|--|--|
| Sheet Steel | Tin Mill Black No. 28 | Corrosion and Heat-Resistant Alloys | Structural Shapes |
| Prices Subject to Quantity Extras and Deductions (Except Galvanized) | Pittsburgh | Pittsburgh base, cents per lb. | Pittsburgh |
| Hot Rolled No. 10, 24-48 in. | Gary | Chrome-Nickel | Philadelphia, del. |
| Pittsburgh | St. Louis, delivered | No. 302 No. 304 | New York, del. |
| Gary | Cold Rolled No. 10 | Bars | Boston, delivered |
| Chicago, delivered | Pittsburgh | Plates | Bethlehem |
| Detroit, del. | Gary | Sheets | Chicago |
| New York, del. | Detroit, delivered | Hot strip | Cleveland, del. |
| Philadelphia, del. | Philadelphia, del. | Cold strip | Buffalo |
| Birmingham | New York, del. | | Gulf Ports |
| St. Louis, del. | Pacific ports, f.o.b. cars, dock | | Birmingham |
| Pacific ports, f.o.b. cars, dock | St. Louis | | Pacific ports, f.o.b. cars, dock |
| Hot Rolled Annealed No. 24 | Cold Rolled No. 20 | Straight Chromes | |
| Pittsburgh | Pittsburgh | No. No. No. No. | Bars |
| Gary | Gary | 410 430 442 446 | Soft Steel (Base, 3 to 25 tons) |
| Chicago, delivered | Detroit, delivered | Bars | Pittsburgh |
| Detroit, delivered | Philadelphia, del. | Plates | Chicago or Gary |
| New York, del. | New York, del. | Sheets | Duluth |
| Philadelphia, del. | St. Louis | Hot strip | Birmingham |
| Birmingham | Enameling Sheets | Cold stp. | Cleveland |
| St. Louis, del. | Pittsburgh, No. 10 | | Buffalo |
| Pacific ports, f.o.b. cars, dock | Pittsburgh, No. 20 | | Detroit, delivered |
| Galvanized No. 24 | Gary, No. 10 | | Pacific ports, f.o.b. cars, dock |
| Pittsburgh | Gary, No. 20 | Steel Plate | Philadelpia, del. |
| Gary | St. Louis, No. 10 | Pittsburgh | Boston, delivered |
| Chicago, delivered | St. Louis, No. 20 | New York, del. | New York, del. |
| Philadelphia, del. | Tin and Terne Plate | Philadelphia, del. | Pitts., forg. qual. |
| New York, delivered | Gary base, 10 cents higher. | Boston, delivered | |
| Birmingham | Tin plate, coke base (box) Pittsburgh | Buffalo, delivered | Rail Steel |
| St. Louis, del. | Do., waste-waste | Chicago or Gary | To Manufacturing Trade |
| Pacific ports, f.o.b. cars, dock | Do., strips | Cleveland, del. | Pittsburgh |
| | Long ternes, No. 24 unassorted, Pitts. | Birmingham | Chicago or Gary |
| | Do., Garv | Coatesville, base | Moline, Ill. |
| | | Sparrows Pt., base | Cleveland |
| | | Pacific ports, f.o.b. cars, dock | Buffalo |
| | | St. Louis, delivered | |

Iron

| | |
|-------------------------|------------|
| Terre Haute, Ind. | 2.10c |
| Chicago | 2.15c |
| Philadelphia | 2.39c |
| Pittsburgh, refined ... | 2.75-7.50c |

Reinforcing

| | |
|--|-------|
| New billet, straight lengths, quoted by distributors | |
| Pittsburgh | 2.25c |
| Chicago, Gary, Buffalo | |
| Cleve., Birm., Young... | 2.30c |
| Gulf ports | 2.65c |
| Pacific coast ports f.o.b. car docks | 2.70c |
| Philadelphia, del. | 2.54c |
| Rail steel, straight lengths, quoted by distributors | |
| Pittsburgh | 2.10c |
| Chicago, Buffalo, Cleveland, Birm., Young... | 2.15c |
| Gulf ports | 2.50c |

Wire Products

Prices apply to straight or mixed carloads; less carloads \$4 higher; less carloads fencing \$5 over base column

| | |
|---|---------|
| Base Pitts.-Cleve. 100 lb. keg. | |
| Standard wire nails..... | \$2.50 |
| Cement coated nails..... | \$2.50 |
| Galv. nails, 15 gage and coarser | \$4.50 |
| do. finer than 15 ga. | \$5.00 |
| (Per pound) | |
| Polished staples | 3.20c |
| Galv. fence staples..... | 3.45c |
| Barbed wire, galv. | 3.05c |
| Annealed fence wire..... | 3.10c |
| Galv. fence wire..... | 3.50c |
| Woven wire fencing (base column, c. 1.) .. | \$67.00 |
| To Manufacturing Trade | |
| Plain wire, 6-9 ga | 2.60c |
| Anderson, Ind. (merchant products only) and Chicago up \$1; Duluth up \$2; Birmingham up \$3. | |
| Spring wire, Pitts. or Cleveland | 3.20c |
| Do., Chicago up \$1, Worc. \$2. | |

Cold-Finished Carbon Bars and Shafting

Base, Pitts., one size, shape, grade, shipment at one time to one destination

| | |
|--|---------|
| 10,000 to 19,000 lbs. | 2.55c |
| 20,000 to 59,999 lbs. | 2.50c |
| 60,000 to 99,999 lbs. | 2.45c |
| 100,000 to 299,999 lbs. ... | 2.42½ c |
| 300,000 lbs. and over | 2.40c |
| Gary, Ind., Cleve., Chi., up 5c; Buffalo, up 10c; Detroit, up 15c; eastern Michigan, up 20c. | |

Alloy Steel Bars (Hot)

(Base, 3 to 25 tons)

| | |
|--|-------|
| Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem | 2.75c |
|--|-------|

| Alloy | Diff. | Alloy | Diff. |
|---|--------------|------------|-------|
| S.A.E. | 0.35 | 3100 | 0.70 |
| 2000 | 0.75 | 3200 | 1.35 |
| 2100 | 1.55 | 3300 | 3.80 |
| 2300 | 2.25 | 3400 | 3.20 |
| 2500 | 0.15 to 0.25 | Mo. | 0.55 |
| 4100 0.15 to 0.30 Mo. 150-2.00 Ni. | 1.10 | | |
| 5100 0.80-1.10 Cr. | 0.45 | | |
| 5100 Cr. spring | 0.15 | | |
| 6100 bars | 1.20 | | |
| 6100 spring | 0.85 | | |
| Cr. Ni., Van. | 1.50 | | |
| Carbon Van. | 0.85 | | |
| 9200 spring flats | 0.15 | | |
| 9200 spring rounds, squares | 0.40 | | |

Piling

| | |
|------------------------|-------|
| Pittsburgh | 2.40c |
| Chicago, Buffalo | 2.50c |

Strip and Hoops

(Base, hot rolled, 25-1 ton)
(Base, cold-rolled, 25-3 tons)

| | |
|--|-------|
| Hot strip to 23½-in. | |
| Pittsburgh | 2.15c |
| Chicago or Gary | 2.25c |
| Birmingham base | 2.30c |
| Detroit, del. | 2.35c |
| Philadelphia, del. | 2.44c |
| New York, del. | 2.48c |
| Copperage hoop, Pittsburgh | 2.15c |
| Chicago | 2.25c |
| Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland | 2.85c |
| Detroit, del. | 3.05c |
| Worcester, Mass. | 3.05c |
| Cleve. Worces- | |
| ter, Mass. | 3.05c |

Rails, Track Material

(Gross Tons)

| | |
|--|-------------|
| Standard rails, mill | 39.00 |
| Relay rails, Pittsburgh, 20-100 lbs. | 25.50-28.00 |
| Light rails, billet qual. Pittsburgh, Chicago .. | \$38.00 |
| Do., rerolling quality .. | 37.00 |
| Angle bars, billet, Gary, Pittsburgh, So. Chicago | 2.70c |
| Do., axle steel | 2.25c |
| Spikes, R. R. base | 2.90c |
| Track bolts, base | 4.00c |
| Tie plates, base | 2.10c |
| Base, light rails 25 to 40 lbs.; 50 to 60 lbs., inclusive up \$2; 16 and 20 lbs. up \$1; 12 lbs. up \$2; 8 and 10 lbs. up \$5. Base railroad spikes 200 kegs or more; base tie plates 20 tons. | |

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists:

| | |
|---|--------------|
| Carriage and Machine | |
| ½ x 6 and smaller | 70 off |
| Do. larger | 65-10 off |
| Tire bolts | 50-5 off |
| Plow Bolts | |
| All sizes | 65-10-10 off |
| Stove Bolts | |
| In packages with nuts attached 72½ off; in packages with nuts separate 72½-5 off; in bulk 81½ off on 15,000 of 3-inch and shorter, or 5000 over 3-inch. | |
| Step bolts | 60 off |
| Elevator bolts | 60 off |

| | |
|---|-------------|
| Nuts | |
| S. A. E. semifinished hex.: ½ to ¾-inch | 60-20-5 off |
| Do., ½ to 1-inch. | 60-20-5 off |
| Do., over 1-inch. | 60-20-5 off |
| Hexagon Cap Screws | |
| Milled | 50-10 off |
| Upset, 1-in., smaller | 60 off |
| Square Head Set Screws | |
| Upset, 1-in., smaller | 75 off |
| Headless set screws | 75 off |

Rivets, Wrought Washers

| | |
|---|----------|
| Structural, Pittsburgh, Cleveland | 3.25c |
| Structural, Chicago | 3.35c |
| ¾-inch and smaller, Pitts., Chi., Cleve. | 70-5 off |
| Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs. | \$6 off |

Cut Nails

| | |
|--|--------|
| Cut nails, Pitts. (10% discount of size extras) .. | \$3.10 |
|--|--------|

Do. less carloads, 5 kegs or more, no discount on size extras... \$3.40
Do., under 5 kegs, no disc on size extras... \$3.55

Pipe and Tubing

Base \$200 net ton, except on less boiler tubes under 2 inches and cold drawn seamless.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2½ less. Wrought pipe, Pittsburgh.

| | | | |
|--|------|-------|--|
| Butt Weld Steel | | | |
| In. | Blk. | Galv. | |
| ¼ and ½ | 60 | 44½ | |
| ¾ | 64½ | 55 | |
| 1 | 67½ | 59 | |
| 1-3 | 69½ | 61½ | |
| Iron | | | |
| ¾ | 27 | 10½ | |
| ¾ | 32 | 16 | |
| 1-1½ | 35 | 21 | |
| 2 | 38½ | 23 | |
| Lap Weld Steel | | | |
| 2 | 62 | 53½ | |
| 2½-3 | 65 | 56½ | |
| 3½-6 | 67 | 58½ | |
| 7 and 8 | 66 | 56½ | |
| 9 and 10 | 65½ | 56 | |
| Iron | | | |
| 2 | 32½ | 18 | |
| 2½-3½ | 33½ | 20½ | |
| 4-8 | 35½ | 24 | |
| Line Pipe Steel | | | |
| ¾, butt weld | 56 | | |
| ¾ and 1, butt weld | 59 | | |
| ¾, butt weld | 63½ | | |
| ¾, butt weld | 66½ | | |
| 1 to 3, butt weld | 68½ | | |
| 2, lap weld | 61 | | |
| 2½ to 3, lap weld | 64 | | |
| 3½ to 6, lap weld | 66 | | |
| 7 and 8, lap weld | 65 | | |
| Iron | | | |
| ¾-1½ inch, black and galv. take 4 pts. over; 2½-6-inch 2 pts. over discounts for same sizes, standard pipe lists, 8-12-inch, no extra. | | | |

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

| | | | |
|---|----|-------------|----|
| Boiler Tubes | | | |
| C. L. Discounts, f.o.b. Pitts. | | | |
| Lap Weld Charcoal Iron | | | |
| 2-2¼ | 33 | 1% | 8 |
| 2½-2¾ | 40 | 2-2¼ | 13 |
| 3 | 47 | 2½-2¾ | 16 |
| 3½-3¾ | 50 | 3 | 17 |
| 4 | 52 | 3½-3¾ | 18 |
| 4½ | 52 | 4 | 20 |
| 4¾-5 | 42 | 4½ | 21 |
| Lapwelded steel: 200 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 lbs., 2 pts. under base. | | | |

Seamless Boiler Tubes
Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and

per pound. Less-carloads revised as of July, 1, 1935, card.
Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices being on lb. and 100 ft. basis.

Seamless Tubing

| | |
|--------------------------------|-----|
| Cold drawn; f.o.b. mill disc. | |
| 100 ft. or 150 lbs. | 32% |
| 15,000 ft. or 22,500 lbs. | 70% |

Cast Iron Water Pipe

| | |
|-------------------------------|---------------|
| Class B Pipe-Per Net Ton | |
| 6-in. & over, Birm. | \$41.00-42.00 |
| 4-in., Birmingham | 44.00-45.00 |
| 4-in., Chicago | 52.00-53.00 |
| 6 to 24-in., Chicago. | 49.00-50.00 |
| 6-in & over, east. fdy. | 45.00 |
| Do., 4-in. | 46.00 |
| Class A pipe \$3 over Class B | |
| Stnd. ftgs., Birm. base. | \$100.00 |

Semifinished Steel

| | |
|--|---------|
| Billets and Blooms | |
| 4 x 4-inch base; gross ton | |
| Pitts., Chi., Cleve., Buffalo and Young. | \$34.00 |
| Philadelphia | 39.30 |
| Duluth | 36.00 |
| Forging Billets | |
| 6 x 6 to 9 x 9-in., base | |
| Pitts., Chicago, Buffalo .. | 40.00 |
| Forging, Duluth | 42.00 |
| Sheet Bars | |
| Pitts., Cleve., Young. | 34.00 |
| Slabs | |
| Pitts., Chicago, Cleveland, Youngstown. | \$34.00 |
| Wire Rods | |
| Pitts., Cleve., No. 5 to ¾-inch incl. | 43.00 |
| Do., over ¾ to 1¼-inch incl. | 47.00 |
| Chicago up \$1; Worcester up \$2. | |
| Skelp | |
| Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt. 1.80c | |

Coke

| | |
|------------------------------|-------------|
| Price Per Net Ton | |
| Beehive Ovens | |
| Connellsville, fur. | \$3.90-4.10 |
| Connellsville, fdry. | 4.50-4.75 |
| Connell prem. fdry. | 5.50 |
| New River fdry. | 6.00 |
| Wise county fdry. | 4.45-5.00 |
| Wise county fur. | 4.00-4.50 |
| By-Product Foundry | |
| Newark, N. J., del. | 10.17-10.60 |
| Chi., ov., outside del. | 9.50 |
| Chicago, del. | 10.25 |
| New England, del. | 12.00 |
| St. Louis, del. | 10.50-11.00 |
| Birmingham, ovens | 6.50 |
| Indianapolis, del. | 9.65 |
| Cincinnati, del. | 9.75 |
| Cleveland, del. | 10.30 |
| Buffalo, del. | 10.50 |
| Detroit, del. | 10.70 |
| Philadelphia, del. | 9.85 |

Coke By-Products

| | |
|--|--------|
| Spot. gal. Producers' Plants | |
| Pure and 90% benzol. | 16.00c |
| Toluol | 30.00c |
| Solvent naphtha | 30.00c |
| Industrial xylol | 30.00c |
| Per lb. f.o.b. Frankford | |
| Phenol (200 lb. drums) .. | 15.00c |
| Do., (450 lbs.) | 14.00c |
| Eastern Plants, per lb. | |
| Naphthalene flakes and balls, in bbls., to jobbers | 7.25c |
| Per 100-lbs. Atlantic seaboard | |
| Sulphate of ammonia. | \$1.35 |
| Western prices, ¼-cent up. | |

—The Market Week—

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sll.; 25c diff. for each 0.25 sll. above 2.25; 50c diff. for each 0.25 below 1.75. Gross tons.

| Basing Points: | No. 2 Fdry. | Malle- able | Basic | Besse- mer |
|---------------------|----------------|----------------|---------|---------------|
| Bethlehem, Pa. | \$23.00 | \$23.50 | \$22.50 | \$24.00 |
| Birdsboro, Pa. | 23.00 | 23.50 | 22.50 | 24.00 |
| Birmingham, Ala.† | 18.38 | 18.38 | 17.38 | 22.50 |
| Buffalo | 22.00 | 22.50 | 21.00 | 23.00 |
| Chicago | 22.00 | 22.00 | 21.50 | 22.50 |
| Cleveland | 22.00 | 22.00 | 21.50 | 22.50 |
| Detroit | 22.00 | 22.00 | 21.50 | 22.50 |
| Duluth | 22.50 | 22.50 | 22.00 | 23.00 |
| Erie, Pa. | 22.00 | 22.50 | 21.50 | 23.00 |
| Everett, Mass. | 23.75 | 24.25 | 23.25 | 24.75 |
| Hamilton, O. | 22.00 | 22.00 | 21.50 | 22.00 |
| Jackson, O. | 21.25 | 21.25 | 20.75 | 22.00 |
| Neville Island, Pa. | 22.00 | 22.00 | 21.50 | 22.50 |
| Provo, Utah | 19.50 | 19.50 | 19.00 | 20.00 |
| Sharpsville, Pa. | 22.00 | 22.00 | 21.50 | 22.50 |
| Sparrows Point, Md. | 23.00 | 23.00 | 22.50 | 23.00 |
| Swedeland, Pa. | 23.00 | 23.50 | 22.50 | 24.00 |
| Toledo, O. | 22.00 | 22.00 | 21.50 | 22.50 |
| Youngstown, O. | 22.00 | 22.00 | 21.50 | 22.50 |

†Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:

| | | | | |
|--|---|-------|-------|-------|
| Akron, O., from Cleveland | 23.26 | 23.26 | 22.76 | 23.76 |
| Baltimore from Birmingham | 23.58 | 23.58 | 22.46 | 23.46 |
| Boston from Birmingham | 24.37 | 24.37 | 23.87 | 23.87 |
| Boston from Everett, Mass. | 24.25 | 24.75 | 23.75 | 25.25 |
| Boston from Buffalo | 24.25 | 24.75 | 23.75 | 25.25 |
| Brooklyn, N. Y., from Bethlehem | 25.27 | 25.27 | 24.77 | 25.27 |
| Brooklyn, N. Y., from Brngm. | 25.05 | 25.05 | 24.55 | 25.05 |
| Canton, O., from Cleveland | 23.26 | 23.26 | 22.76 | 23.76 |
| Chicago from Birmingham | 22.22 | 22.22 | 21.72 | 22.22 |
| Cincinnati from Hamilton, O. | 22.07 | 22.79 | 21.07 | 21.07 |
| Cincinnati from Birmingham | 21.69 | 21.69 | 21.19 | 21.69 |
| Cleveland from Birmingham | 22.12 | 22.12 | 21.62 | 22.12 |
| Mansfield, O., from Toledo, O. | 23.76 | 23.76 | 23.26 | 23.26 |
| Milwaukee from Chicago | 23.00 | 23.00 | 22.50 | 23.00 |
| Muskegon, Mich., from Chicago | 24.90 | 24.90 | 24.40 | 25.40 |
| Toledo or Detroit | 24.90 | 24.90 | 24.40 | 25.40 |
| Newark, N. J., from Birmingham | 24.01 | 24.01 | 23.51 | 24.01 |
| Newark, N. J., from Bethlehem | 24.39 | 24.89 | 23.89 | 24.39 |
| Philadelphia from Birmingham | 23.38 | 23.38 | 22.88 | 23.38 |
| Philadelphia from Swedeland, Pa. | 23.76 | 24.26 | 23.26 | 23.76 |
| Pittsburgh district from Neville Island | Neville, base plus 63c, 76c, and \$1.13 switch'g charges | | | |
| Saginaw, Mich., from Detroit | | 24.25 | 24.25 | 23.75 | 23.75 |
| St. Louis, northern | 22.50 | 22.50 | 22.00 | 22.50 |

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

| Copper | | | Straits Tin | | Lead | Lead | Alumi- | Antimony | Nickel | |
|-----------------|-----------|---------|-------------|---------|-------|--------|--------|-------------|--------|-------|
| Electro, | Lake, | | New York | | East | St. L. | num | Chinese | Cath- | |
| del. | del. | Castng. | Spot | Futures | N. Y. | St. L. | 99% | Spot. N. Y. | odes | |
| Feb. 20 14.00 | 14.12 1/2 | 13.70 | 54.25 | 54.00 | 6.50 | 6.35 | 6.80 | *19.00 | 14.25 | 35.00 |
| Feb. 22—Holiday | | | | | | | | | | |
| Feb. 23 15.00 | 15.12 1/2 | 15.00 | 55.75 | 55.40 | 6.50 | 6.35 | 6.80 | *19.00 | 16.00 | 35.00 |
| Feb. 24 15.00 | 15.12 1/2 | 15.25 | 54.50 | 54.35 | 6.50 | 6.35 | 6.80 | *19.00 | 16.00 | 35.00 |
| Feb. 25 15.00 | 15.12 1/2 | 15.75 | 55.25 | 54.90 | 7.00 | 6.85 | 6.80 | *19.00 | 16.50 | 35.00 |
| Feb. 26 15.00 | 15.12 1/2 | 15.75 | 54.75 | 54.50 | 7.00 | 6.85 | 6.80 | *19.00 | 16.50 | 35.00 |

*Nomlinal range 19.00 to 21.00c.

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 15.00.

Conn. copper

Sheets

- *Yellow brass (high).....20.12 1/2
- *Copper, hot rolled.....22.62 1/2
- *Lead, cut to jobbers.....10.50
- *Zinc, 100-lb. base....11.50-12.00

Tubes

- *High yellow brass.....22.87 1/2
- *Seamless copper.....23.37 1/2

Rods

- *High yellow brass.....16.50
- *Copper, hot rolled.....19.37 1/2

Anodes

- *Copper, untrimmed.....19.87 1/2

Wire

- *Yellow brass (high).....20.37 1/2

OLD METALS

Deal. buying prices, cents lb.

No. 1 Composition Red Brass

- *New York.....10.75-10.87 1/2
- *Cleveland.....12.00-12.25
- *Chicago.....10.75-11.25
- *St. Louis.....10.50-11.00

Heavy Copper and Wire

- *New York, No. 1....12.87 1/2-13.00
- *Chicago, No. 1....13.00-13.25
- *Cleveland, No. 1....12.75-13.00
- *St. Louis, No. 1....12.50-13.00

Composition Brass Borings

- *New York.....10.25-10.37 1/2

Light Copper

- *New York.....10.75-10.87 1/2
- *Chicago.....10.75-11.25
- *Cleveland.....10.75-11.00
- *St. Louis.....10.50-11.00

| Delivered from Basing Points: | No. 2 Fdry. | Malle- able | Basic | Besse- mer |
|-------------------------------|----------------|----------------|-------|---------------|
| St. Louis from Birmingham | \$22.12 | 23.94 | 21.82 | 24.44 |
| St. Paul from Duluth | 23.94 | 23.94 | 21.82 | 24.44 |
| †Over 0.70 phos. | | | | |

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., \$26.50, Phila. base, standard and copper bearing, \$27.63.

Gray Forge

| Valley furnace | Lake Superior fur. |
|----------------------------|-----------------------------|
|\$21.50 |\$24.50 |
| Pitts. dist. fur.....21.50 | do., del. Chicago.....27.54 |
| | Lyles, Tenn.....24.50 |

Silvery†

Jackson county, O., base: 6-6.50 per cent \$24.50; 6.51-7—\$25.00; 7-7.50—\$25.50; 7.51-8—\$26.00; 8-8.50—\$26.50; 8.51-9—\$27.00; 9-9.50—\$27.50; Buffalo \$1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base: Prices are the same as for silveries, plus \$1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, \$1 per ton add. Each unit over 3%, add \$1 per ton.

Refractories

Per 1000 f.o.b. Works

| Fire Clay Brick | Super Quality |
|------------------------------|---------------|
| Pa., Mo., Ky..... | \$58.90 |
| Pa., Ill., Md., Mo., Ky..... | \$45.60 |
| Alabama, Georgia..... | \$38.00-45.00 |
| Pa., Ill., Ky., Md., Mo..... | 40.85 |
| Georgia, Alabama..... | 36.10 |
| Ohio | |
| First quality..... | \$40.85 |
| Intermediary..... | 38.00 |
| Second quality..... | 29.45 |
| Malleable Bung Brick | |
| All bases..... | 54.15 |
| Silica Brick | |
| Pennsylvania..... | \$45.60 |
| Joliet, E. Chicago..... | 54.15 |
| Birmingham, Ala..... | 45.60 |
| Ladle Brick | |
| (Pa., O., W. Va., Mo.) | |
| Dry press..... | \$25.00 |
| Wire cut..... | 23.00 |
| Magnesite | |
| Imported dead-burned | |
| grains, net ton f.o.b. | |

| Chester, Pa., and Baltimore bases (bags)... | \$45.00 |
|---|---------|
| Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)... | 42.00 |
| Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk)... | 24.00 |
| Base Brick | |
| Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa. | |
| Chrome brick..... | \$47.00 |
| Chem. bonded chrome.. | 47.00 |
| Magnesite brick..... | 67.00 |
| Chem. bonded magnesite | 57.00 |

Fluorspar, 85-5

| | |
|---|---------|
| Washed gravel, duty paid, tide, net ton..... | \$23.00 |
| Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail..... | \$18.00 |
| Do., for barge..... | \$18.50 |

Ferroalloys

Dollars, except Ferrochrome

| | |
|---|------------|
| Ferromanganese, 78-82% | |
| tidewater, duty paid.. | 80.00 |
| Do., Baltimore, base.. | 80.00 |
| Do., del. Pittsburgh.. | 84.79 |
| Spiegelisen, 19-20% dom. | |
| Palmerston, Pa., spot. † | 26.00 |
| Do., New Orleans..... | 26.00 |
| Ferrosilicon, 50% freight allowed, c. l. | 69.50 |
| Do., less carload..... | 77.00 |
| Do., 75 per cent. | 126-130.00 |
| Spot, \$5 a ton higher. | |
| Silicomana, 2 1/2 carbon .. | 89.00 |
| 2% carbon, 94.00; 1%, | 104.00 |
| Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del. | 10.00 |
| Ferrotungsten, stand., lb. | |
| con. del. | 1.30-1.40 |
| Ferrovanadium, 35 to 40% lb., cont. | 2.70-2.90 |
| Ferrotitanium, c. l., prod. plant, frt. all., net ton | 137.50 |
| Spot, 1 ton, frt. allow., lb. | 7.00 |
| Do., under 1 ton, lb. | 7.75-8.25 |
| Ferrophosphorus, per ton, c. l., 17-19% Rockdale, Tenn., basis, 18%, \$3 unitage..... | 58.50 |
| Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% \$3 unitage.. | 75.00 |
| Ferromolybdenum, stand. 55-65%, lb. | 0.95 |
| Molybdate, lb. cont. | 0.80 |
| †C—loads. Quan. diff. apply | |

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS

| | |
|-----------------------|-------------|
| Baltimore | 3.50c |
| Boston†† | 3.55c |
| Buffalo | 3.10c |
| Chattanooga | 3.71c |
| Chicago (j) | 3.35c |
| Cincinnati | 3.55c |
| Cleveland | 3.25c |
| Detroit | 3.43 1/4 c |
| Houston | 3.10c |
| Los Angeles | 4.00c |
| Milwaukee 3.46c-3.61c | |
| New Orleans | 3.70c |
| New York† (d) | 3.62c |
| Pitts. (h) | 3.30c-3.45c |
| Philadelphia* | 3.45c |
| Portland | 3.85c |
| San Francisco | 3.85c |
| Seattle | 4.10c |
| St. Louis | 3.59c |
| St. Paul | 3.60c-3.75c |
| Tulsa | 3.35c |

IRON BARS

| | |
|---------------------|-------|
| Portland | 3.50c |
| Chattanooga | 3.71c |
| Baltimore* | 3.10c |
| Cincinnati | 3.55c |
| New York† (d) | 3.15c |
| Philadelphia* | 3.45c |
| St. Louis | 3.59c |
| Tulsa | 3.35c |

REINFORCING BARS

| | |
|--------------------------------------|-------------|
| Buffalo | 2.60c |
| Chattanooga | 3.71c |
| Cleveland (c) | 2.25c |
| Cincinnati | 3.40c |
| Houston | 3.25c |
| Los Angeles, c.l. | 2.45c |
| New Orleans* | 2.84c |
| Pitts., plain (h) | 3.25c |
| Pitts., twisted squares (h) | 3.40c |
| San Francisco. 2.72 1/4 c | |
| Seattle | 3.75c |
| St. Louis | 3.49c |
| Tulsa | 3.25c |
| Young. | 2.30c-2.60c |

SHAPES

| | |
|----------------------|-------|
| Baltimore | 3.50c |
| Boston†† | 3.57c |
| Buffalo | 3.35c |
| Chattanooga | 3.81c |
| Chicago | 3.45c |
| Cincinnati | 3.65c |
| Cleveland | 3.56c |
| Detroit | 3.65c |
| Houston | 3.10c |
| Los Angeles | 4.00c |
| Milwaukee | 3.56c |
| New Orleans | 3.80c |
| New York† (d) | 3.62c |
| Philadelphia* | 3.30c |
| Pittsburgh (h) | 3.40c |
| Portland (l) | 3.85c |
| San Francisco | 3.75c |
| Seattle (i) | 4.05c |
| St. Louis | 3.69c |
| St. Paul | 3.70c |
| Tulsa | 3.60c |

PLATES

| | |
|--------------------------------------|-------|
| Baltimore | 3.60c |
| Boston†† | 3.58c |
| Buffalo | 3.47c |
| Chattanooga | 3.81c |
| Chicago | 3.45c |
| Cincinnati | 3.65c |
| Cleveland, 1/4-in. and over | 3.56c |
| Detroit | 3.65c |
| Detroit, 1/8-in. | 3.85c |
| Houston | 3.10c |
| Los Angeles | 4.00c |
| Milwaukee | 3.41c |
| New Orleans | 3.80c |
| New York† (d) | 3.65c |
| Philadelphia* | 3.30c |

| | |
|----------------------|-------|
| Phila. floor | 4.95c |
| Pittsburgh (h) | 3.40c |
| Portland | 3.85c |
| San Francisco | 3.75c |
| Seattle | 4.05c |
| St. Louis | 3.69c |
| St. Paul | 3.70c |
| Tulsa | 3.60c |

NO. 10 BLUE

| | |
|----------------------|------------|
| Baltimore | 3.45c |
| Boston (g) | 3.70c |
| Buffalo | 3.72c |
| Chattanooga | 3.66c |
| Chicago | 3.60c |
| Cincinnati | 3.50c |
| Cleveland | 3.46c |
| Det. 8-10 ga. ... | 3.43 1/4 c |
| Houston | 3.45c |
| Los Angeles | 4.15c |
| Milwaukee | 3.46c |
| New Orleans | 3.85c |
| New York† (d) | 3.82c |
| Portland | 3.95c |
| Philadelphia* | 3.45c |
| Pittsburgh (h) | 3.50c |
| San Francisco | 3.95c |
| Seattle | 4.10c |
| St. Louis | 3.59c |
| St. Paul | 3.60c |
| Tulsa | 3.80c |

NO. 24 BLACK

| | |
|----------------------|-------------|
| Baltimore*† | 4.10c |
| Boston (g) | 4.30c |
| Buffalo | 3.35c |
| Chattanooga* | 3.56c |
| Chicago | 4.10c-4.75c |
| Cincinnati | 4.05c |
| Cleveland | 4.31c |
| Detroit | 4.33 1/4 c |
| Los Angeles | 4.35c |
| Milwaukee | 4.16c |
| New York† (d) | 4.47c |
| Philadelphia*† | 4.15c |
| Pitts.** (h) | 3.90c-5.20c |
| Portland | 4.65c |
| Seattle | 4.85c |
| San Francisco | 4.65c |
| St. Louis | 4.29c |
| St. Paul | 4.30c |
| Tulsa | 4.85c |

NO. 24 GALV. SHEETS

| | |
|----------------------|-------------|
| Baltimore*† | 4.20c |
| Buffalo | 4.10c |
| Boston (g) | 4.80c |
| Chattanooga* | 4.16c |
| Chicago (h) | 4.70c-5.35c |
| Cincinnati | 4.65c |
| Cleveland | 4.91c |
| Detroit | 5.00c |
| Houston | 4.50c |
| Los Angeles | 4.60c |
| Milwaukee | 4.76c |
| New Orleans* | 4.09c |
| New York† (d) | 5.75c |
| Philadelphia*† | 4.80c |
| Pitts.** (h) | 4.75c-5.00c |
| Portland | 5.35c |
| San Francisco | 5.25c |
| Seattle | 5.35c |
| St. Louis | 4.89c |
| St. Paul | 5.10c |
| Tulsa | 5.20c |

BANDS

| | |
|---|-------|
| Baltimore | 3.50c |
| Boston†† | 3.70c |
| Buffalo | 3.52c |
| Chattanooga | 3.91c |
| Cincinnati | 3.75c |
| Cleveland | 3.66c |
| Chicago | 3.60c |
| Detroit, 1/8-in. and lighter. 3.68 1/4 c | |
| Houston | 3.35c |
| Los Angeles | 4.30c |
| Milwaukee | 3.71c |
| New Orleans | 4.25c |
| New York† (d) | 3.82c |

| | |
|----------------------|-------|
| Philadelphia* | 3.55c |
| Pittsburgh (h) | 3.50c |
| Portland | 4.60c |
| San Francisco | 4.45c |
| Seattle | 4.60c |
| St. Louis | 3.84c |
| St. Paul | 3.85c |
| Tulsa | 3.55c |

HOOPS

| | |
|--|-------|
| Baltimore | 3.75c |
| Boston†† | 4.70c |
| Buffalo | 3.52c |
| Chicago | 3.60c |
| Cincinnati | 3.75c |
| Detroit, No. 14 and lighter. 3.68 1/4 c | |
| Los Angeles | 6.25c |
| Milwaukee | 3.71c |
| New York† (d) | 3.66c |
| Philadelphia* | 3.80c |
| Pittsburgh (h) | 4.00c |
| Portland | 5.95c |
| San Francisco | 6.50c |
| Seattle | 5.95c |
| St. Louis | 3.84c |
| St. Paul | 3.85c |

COLD FIN. STEEL

| | |
|------------------------|------------|
| Baltimore (c) | 4.15c |
| Boston* | 4.30c |
| Buffalo (h) | 3.70c |
| Chattanooga* | 4.51c |
| Chicago (h) | 3.95c |
| Cincinnati | 4.15c |
| Cleveland (h) | 3.95c |
| Detroit | 4.03 1/4 c |
| Los Ang. (f) (d) | 6.35c |
| Milwaukee | 4.06c |
| New Orleans | 4.75c |

| | |
|--------------------------|--------|
| New York† (d) | 4.22c |
| Philadelphia* | 4.18c |
| Pittsburgh | 3.80c |
| Portland (f) (d) | 5.35c |
| San Fran. (f) (d) | 6.30c |
| Seattle (f) (d) | 5.35c |
| St. Louis | 4.19c |
| St. Paul | 4.20c |
| Tulsa | 4.80c |
| COLD ROLLED STRIP | |
| Boston | 3.495c |
| Buffalo | 3.39c |
| Chicago | 3.52c |
| Cleveland (b) | 3.00c |
| Cleveland (b) | 3.20c |
| Detroit | 3.43c |
| New York† (d) | 3.57c |
| St. Louis | 3.61c |

TOOL STEELS
(Applying on or east of Mississippi river; west of Mississippi 1c up.)

| | |
|---|----------|
| Base | 62c |
| High speed | 62c |
| High carbon, high chrome | 41c |
| Oil hardening | 24c |
| Special tool | 22c |
| Extra tool | 18 1/4 c |
| Regular tool | 15c |
| Uniform extras apply. | |
| BOLTS AND NUTS (100 pounds or over) | |
| Discount | |
| Chicago (a) | 85 |
| Cleveland | 70 |
| Detroit | 70-10 |
| Milwaukee | 65 |

New Orleans.....70-10
Pittsburgh.....65-5

(a) Under 100 lbs., 60 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Quantity base; (e) New mill classif. (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less; (i) Under 3 in.; (j) Shapes other than rounds, flats, fillet angles, 3.50c.

On plates, shapes, bars, hot strip, and blue annealed quantity extras and discounts as follows: Under 100 lbs., add \$1.50; 100 to 399 lbs., add 50c; 400 to 3999 lbs., base; 4000 to 9999 lbs., deduct 10c; over 10,000 lbs., deduct 15c. At Cleveland, under 400 lbs., add 50c, with \$1 minimum invoice.

† Domestic steel;
* Plus quantity extras;
** Under 25 bundles;
*† 50 or more bundles;
† New extras apply;
†† Base 8000 lbs., extras on less.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Feb. 25

Export Prices f. o. b. Ship at Port of Dispatch—(By Cable or Radio)

| | British gross tons | | Continental Channel or North Sea ports, metric tons | Quoted in gold pounds sterling |
|-----------------------------------|--------------------|---------|---|--------------------------------|
| | U. K. ports | £ s d |  |  | Quoted in gold pounds sterling |
| PIG IRON | | | | |
| Foundry, 2.50-3.00 Silicon | \$19.23 | 3 18 6* | \$18.30 | 2 5 0 |
| Basic bessemer | 19.23 | 3 18 6* | 14.23 | 1 15 0 |
| Hematite, Phos. .03-.05 | 21.48 | 4 7 6 | ..... | ..... |
| SEMIFINISHED STEEL | | | | |
| Billets | \$30.69 | 6 5 0 | \$24.40 | 3 0 0 |
| Wire rods, No. 5 gage | 47.16 | 9 12 6 | 41.68 | 5 2 6 |
| FINISHED STEEL | | | | |
| Standard rails | \$41.65 | 8 10 0 | \$44.74 | 5 10 0 |
| Merchant bars | 2.19c | 9 10 0 | 1.63c | 4 7 6 |
| Structural shapes | 2.00c | 9 2 6 | 1.52c to 1.63c | 4 2 6 to 4 7 6 |
| Plates, 1 1/4 in. or 5 mm. | 2.23c | 10 3 9 | 2.00c to 2.05c | 5 9 6 to 5 12 0 |
| Sheets, black, 24 gage or 0.5 mm. | 2.85c | 13 0 0 | 2.86c | 7 15 0†† |
| Sheets, gal., 24 gage, corr. | 3.45c | 15 15 0 | 3.41c | 9 5 0 |
| Bands and strips | 2.20c | 10 0 0 | 1.75c to 1.89c | 4 15 0 to 5 2 6 |
| Plain wire, base | 2.31c | 10 10 0 | 2.49c | 6 15 0 |
| Galvanized wire, base | 2.75c | 12 10 0 | 2.94c | 7 17 6 |
| Wire nails, base | 2.64c | 12 0 0 | 2.39c | 6 10 0 |
| Tin plate, box 108 lbs. | \$ 4.85 | 0 19 9 | ..... | ..... |

British ferromanganese \$80 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d (\$43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

| | £ s d | | French Francs | Belgian Francs | Reich Marks | | | |
|---|---------|-----------|---------------|----------------|-------------|---------|-----------|-------|
| Fdy. pig iron, Si. 2.5 | \$19.89 | 4 1 0 (a) | \$17.61 | 378 | \$22.24 | 660 | \$25.36 | 63 |
| Basic bessemer pig iron | 20.25 | 4 2 6 (a) | 12.84 | 275 | 14.66 | 435 | 29.97 (b) | 69.50 |
| Furnace coke | 7.00 | 1 4 6 | 5.93 | 127 | 5.73 | 170 | 7.65 | 19 |
| Billets | 30.69 | 6 5 0 | 27.55 | 590 | 21.57 | 640 | 38.84 | 96.50 |
| Standard rails | 1.82c | 8 5 0 | 1.64c | 780 | 1.73c | 1,150 | 2.38c | 132 |
| Merchant bars | 2.19c | 9 10 0 | 1.68c | 800 | 1.16c | 775 | 1.98c | 110 |
| Structural shapes | 2.01c | 9 3 0 | 1.64c | 780 | 1.16c | 775 | 1.93c | 107 |
| Plates, 1 1/4 in. or 5 mm. | 2.16c | 9 16 9 | 2.12c | 1,010 | 1.43c | 950 | 2.29c | 127 |
| Sheets, black | 2.64c | 12 0 0 † | 2.84c | 1,350 ‡ | 1.83c | 1,220 † | 2.59c | 144 † |
| Sheets, galv., corr., 24 ga. or 0.5 mm. | 3.08c | 14 0 0 | 4.41c | 2,100 | 2.85c | 1,900 | 6.66c | 370 |
| Plain wire | 2.52c | 11 10 0 | 2.77c | 1,320 | 2.02c | 1,350 | 3.11c | 173 |
| Bands and strips | 2.26c | 10 5 0 | 1.92c | 915 | 1.43c | 950 | 2.29c | 127 |

*Basic. †British ship-plates. Continental, bridge plates. \$24 ga. † to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel, a del. Middlesbrough. b hematite. ††Close annealed. **Gold pound sterling carries a premium of 67 per cent over paper sterling.

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices

HEAVY MELTING STEEL

| | |
|------------------------|-------------|
| Birmingham† | 12.50-13.50 |
| Bos. dock, No. 1, exp. | 16.25-16.50 |
| N. Eng. del. No. 1 | 16.00 |
| Buffalo, No. 1 | 18.50-19.00 |
| Buffalo, No. 2 | 17.00-17.50 |
| Chicago, No. 1 | 20.00-20.50 |
| Cleveland, No. 1 | 17.50-18.00 |
| Cleveland, No. 2 | 16.50-17.00 |
| Detroit, No. 1 | 16.00-16.50 |
| Eastern Pa., No. 1 | 18.50-19.00 |
| Eastern Pa., No. 2 | 17.50-18.00 |
| Federal, Ill. | 15.25-15.75 |
| Granite City, R. R. | 17.50-18.00 |
| Granite City, No. 2 | 15.25-15.75 |
| New York, No. 1 | 15.00-15.50 |
| N.Y. dock, No. 1 exp. | 15.50 |
| Pitts., No. 1 (R. R.) | 20.75-21.25 |
| Pitts., No. 1 (dir.) | 20.50-21.00 |
| Pittsburgh, No. 2 | 18.00-18.50 |
| St. Louis, R. R. | 17.50-18.00 |
| St. Louis, No. 2 | 15.25-15.75 |
| Toronto, dtrs. No. 1 | 9.75-10.50 |
| Toronto, No. 2 | 8.75- 9.50 |
| Valleys, No. 1 | 19.00-19.50 |

COMPRESSED SHEETS

| | |
|------------------|-------------|
| Buffalo, dealers | 17.00-17.50 |
| Chicago, factory | 18.50-19.00 |
| Chicago, dealer | 17.50-18.00 |
| Cleveland | 17.50-18.00 |
| Detroit | 16.00-16.50 |
| E. Pa., new mat. | 18.50-19.00 |
| E. Pa., old mat. | 16.00-16.50 |
| Pittsburgh | 20.50-21.00 |
| St. Louis | 16.00-16.50 |
| Valleys | 19.00-19.25 |

BUNDLED SHEETS

| | |
|------------------|-------------|
| Buffalo | 14.50-15.00 |
| Cincinnati, del. | 13.00-13.50 |
| Cleveland | 14.00-14.50 |
| Pittsburgh | 18.50-19.00 |
| St. Louis | 12.00-12.50 |
| Toronto, dealers | 6.00 |

SHEET CLIPPINGS, LOOSE

| | |
|------------|-------------|
| Chicago | 14.00-14.50 |
| Cincinnati | 12.00-12.50 |
| Detroit | 12.25-12.75 |
| St. Louis | 13.00-13.50 |

STEEL RAILS, SHORT

| | |
|-------------------------|-------------|
| Birmingham | 16.00-16.50 |
| Buffalo | 21.50-22.00 |
| Chicago (3 ft.) | 22.00-22.50 |
| Chicago (2 ft.) | 23.00-23.50 |
| Cincinnati, del. | 21.00 21.50 |
| Detroit | 19.00-19.50 |
| Pitts., open-hearth, | |
| 3 ft and less | 24.50-25.00 |
| St. Louis, 2 ft. & less | 19.50-20.00 |

STEEL RAILS, SCRAP

| | |
|------------------|-------------|
| Boston district | 14.50-15.00 |
| Buffalo | 18.50-19.00 |
| Chicago | 19.50-20.00 |
| Pittsburgh | 21.00-21.50 |
| St. Louis | 18.25-18.75 |
| Toronto, dealers | 9.00 |

STOVE PLATE

| | |
|-----------------------|-------------|
| Birmingham | 9.00- 9.50 |
| Boston district | 10.00-10.25 |
| Buffalo | 14.50-15.00 |
| Chicago | 10.50-11.00 |
| Cincinnati, dealers | 11.75-12.25 |
| Detroit, net | 10.50-11.00 |
| Eastern Pa. | 15.00 |
| New York, fdry. | 11.00 |
| St. Louis | 11.75-12.25 |
| Toronto, deal'rs, net | 7.50- 8.00 |

SPRINGS

| | |
|---------------|-------------|
| Buffalo | 20.50-21.50 |
| Chicago, leaf | 21.50-22.00 |
| Chicago, coil | 23.00-23.50 |
| Eastern Pa. | 24.50-25.00 |
| Pittsburgh | 25.50-26.00 |
| St. Louis | 20.00-20.50 |

ANGLE BARS—STEEL

| | |
|-----------|-------------|
| Chicago | 21.00-21.50 |
| St. Louis | 18.00-18.50 |
| Buffalo | 14.50-15.00 |

RAILROAD SPECIALTIES

| | |
|---------|-------------|
| Chicago | 21.50-22.00 |
|---------|-------------|

LOW PHOSPHORUS

| | |
|---------------------------------|-------------|
| Buffalo, billet and bloom crops | 21.50-22.50 |
| Cleveland, billet, bloom crops | 22.00-22.50 |
| Eastern Pa., crops | 24.50-25.00 |
| Pittsburgh, billet, bloom crops | 26.00-26.50 |
| Pittsburgh, sheet bar crops | 25.50-26.00 |

FROGS, SWITCHES

| | |
|----------------|-------------|
| Chicago | 19.50-20.00 |
| St. Louis, cut | 18.00-18.50 |

SHOVELING STEEL

| | |
|--------------------|-------------|
| Chicago | 19.50-20.00 |
| Federal, Ill. | 15.25-15.75 |
| Granite City, Ill. | 15.25-15.75 |
| Toronto, dealers | 7.50 |

RAILROAD WROUGHT

| | |
|----------------------|--------------|
| Birmingham | 9.00-10.00 |
| Boston district | †10.00-10.25 |
| Buffalo, No. 1 | 17.00-17.50 |
| Buffalo, No. 2 | 18.50-19.00 |
| Chicago, No. 1, net. | 16.75-17.25 |
| Chicago, No. 2 | 19.50-20.00 |
| Cincinnati, No. 2 | 17.00-17.50 |
| Eastern Pa. | 19.00 |
| St. Louis, No. 1 | 15.00-15.50 |
| St. Louis, No. 2 | 17.50-18.00 |
| Toronto, No. 1 dir. | 8.00 |

SPECIFICATION PIPE

| | |
|-------------|-------------|
| Eastern Pa. | 17.00-17.50 |
| New York | 12.50-13.00 |

BUSHELING

| | |
|-----------------------|-------------|
| Buffalo, No. 1 | 17.00-17.50 |
| Chicago, No. 1 | 18.25-18.75 |
| Cincin., No. 1, deal. | 12.25-12.75 |
| Cincinnati, No. 2 | 9.00- 9.50 |
| Cleveland, No. 2 | 13.00-13.50 |
| Detroit, No. 1, new. | 15.50-16.00 |
| Valleys, new, No. 1 | 18.50-19.00 |
| Toronto, dealers | 7.00 |

MACHINE TURNINGS

| | |
|---------------------|-------------|
| Birmingham | 6.00- 6.50 |
| Buffalo | 12.00-12.50 |
| Chicago | 10.50-11.00 |
| Cincinnati, dealers | 10.50-11.00 |
| Cleveland | 12.00-12.50 |
| Detroit | 11.00-11.50 |
| Eastern Pa. | 13.00-13.50 |
| New York | †8.50- 9.00 |
| Pittsburgh | 14.25-14.75 |
| St. Louis | 9.50-10.00 |
| Toronto, dealers | 6.25- 7.00 |
| Valleys | 14.25-14.75 |

BORINGS AND TURNINGS

| | | |
|------------------------------|------------|--|
| <i>For Blast Furnace Use</i> | | |
| Boston district | 8.25- 8.50 | |

| | |
|---------------------|-------------|
| Buffalo | 12.25-12.75 |
| Cincinnati, dealers | 10.50-11.00 |
| Cleveland | 13.00-13.50 |
| Detroit | 11.00-11.50 |
| Eastern Pa. | 11.50-12.00 |
| New York | †7.00- 7.50 |
| Pittsburgh | 14.00-14.50 |
| Toronto, dealers | 6.25 |

CAST IRON BORINGS

| | |
|------------------------|-------------|
| Birmingham | 6.00- 6.50 |
| Boston dist. chem. | †9.50- 9.75 |
| Boston dist. for mills | 8.25- 8.50 |
| Buffalo | 12.00-12.50 |
| Chicago, dealers | 11.00-11.50 |
| Cincinnati, dealers | 10.50-11.00 |
| Cleveland | 13.00-13.50 |
| Detroit | 11.00-11.50 |
| E. Pa., chemical | 13.00-13.50 |
| New York | †8.00- 8.50 |
| St. Louis | 8.00- 8.50 |
| Toronto, dealers | 6.75 |

PIPE AND FLUES

| | |
|---------------------|-------------|
| Cincinnati, dealers | 11.00-11.50 |
| Chicago, net | 13.00-13.50 |

RAILROAD GRATE BARS

| | |
|--------------|--------------|
| Buffalo | 14.50-15.00 |
| Chicago, net | 12.50-13.00 |
| Cincinnati | 11.50-12.00 |
| Eastern Pa. | 15.00 |
| New York | †10.50-11.00 |
| St. Louis | 12.50-13.00 |

FORGE FLASHINGS

| | |
|-----------------|--------------|
| Boston district | †12.25-12.75 |
| Buffalo | 17.00-17.50 |
| Cleveland | 17.00-17.50 |
| Detroit | 15.00-15.50 |
| Pittsburgh | 18.00-18.50 |

FORGE SCRAP

| | |
|-----------------|-------------|
| Boston district | †6.50- 7.00 |
| Chicago, heavy | 22.50-23.00 |
| Eastern Pa. | 16.50-17.00 |

ARCH BARS, TRANSOMS

| | |
|-----------|-------------|
| St. Louis | 18.00-18.50 |
|-----------|-------------|

AXLE TURNINGS

| | |
|---------------------|-------------|
| Boston district | †9.50-10.00 |
| Buffalo | 14.50-15.00 |
| Chicago, elec. fur. | 18.00-18.50 |
| Eastern Pa. | 17.50-18.00 |
| St. Louis | 11.50-12.00 |
| Toronto | 6.25 |

STEEL CAR AXLES

| | |
|-----------------|--------------|
| Birmingham | 17.00-18.00 |
| Buffalo | 21.00-22.00 |
| Boston district | †18.50-19.00 |
| Chicago, net | 22.50-23.00 |
| Eastern Pa. | 25.00 |
| St. Louis | 22.00-22.50 |

SHAFTING

| | |
|-----------------|--------------|
| Boston district | †18.00-18.50 |
| Eastern Pa. | 23.50 |
| New York | †19.00-19.50 |
| St. Louis | 15.00-15.50 |

CAR WHEELS

| | |
|-----------------------|--------------|
| Birmingham | 16.00-17.00 |
| Boston dist. iron | †13.00-13.50 |
| Buffalo, iron | 17.50-18.00 |
| Buffalo, steel | 20.50-21.50 |
| Chicago, iron | 20.00-20.50 |
| Chicago, rolled steel | 21.50-22.00 |

| | |
|--------------------|-------------|
| Cincinnati, iron | 17.50-18.00 |
| Eastern Pa., iron | 19.00 |
| Eastern Pa., steel | 24.50-25.00 |
| Pittsburgh, iron | 19.00-19.50 |
| Pittsburgh, steel | 25.50-26.00 |
| St. Louis, iron | 17.00-17.50 |
| St. Louis, steel | 19.00-19.50 |

NO. 1 CAST SCRAP

| | |
|----------------------------|-------------|
| Birmingham | 13.00-14.00 |
| Bos. dis. No. 1 mach. | 13.75-14.00 |
| N. Eng., del. No. 2 | 15.00 |
| N. Eng., del. textile | 16.50 |
| Buffalo, cupola | 16.50-17.00 |
| Buffalo, mach. | 17.75-18.25 |
| Chicago, agri. net. | 15.00-14.00 |
| Chicago, auto | 14.75-15.25 |
| Chicago, mach. net. | 16.50-17.00 |
| Chicago, railr'd net. | 15.50-15.50 |
| Cincl., mach. cup. | 16.50-17.00 |
| Cleveland, mach. | 19.00-19.50 |
| Eastern Pa., cupola | 19.00-19.50 |
| E. Pa., mixed yard. | 16.00-16.50 |
| Pittsburgh, cupola | 18.50-19.00 |
| San Francisco, del. | 13.50-14.00 |
| Seattle | 11.00-12.00 |
| St. Louis, No. 1 | 14.00-14.50 |
| St. L., No. 1, mach. | 15.30-16.00 |
| Toronto, No. 1, mach., net | 10.50-11.00 |

HEAVY CAST

| | |
|--------------------------|--------------|
| Boston dist. break | 13.00-13.25 |
| New England, del. | 15.00-15.50 |
| Buffalo, break. | 14.50-15.00 |
| Cleveland, break | 14.50-15.00 |
| Detroit, No. 1 mach. net | 13.50-14.00 |
| Detroit, break. | 12.50-13.00 |
| Detroit, auto net | 14.25-14.75 |
| Eastern Pa. | 18.00-18.50 |
| New York, break. | †13.50-14.00 |
| Pittsburgh | 16.00-18.50 |

MALLEABLE

| | |
|---------------------|-------------|
| Birmingham, R. R. | 15.00-15.50 |
| New England, del. | 18.50 |
| Buffalo | 18.50-19.00 |
| Chicago, R. R. | 22.00-22.50 |
| Cincl., agri. del. | 15.50-16.00 |
| Cleveland, rail. | 20.00-20.50 |
| Detroit, auto, net. | 16.00-16.50 |
| Eastern Pa., R. R. | 18.50-19.00 |
| Pittsburgh, rail | 20.00-20.50 |
| St. Louis, R. R. | 18.00-18.50 |

RAILS FOR ROLLING

| | |
|------------------------|-------------|
| <i>5 feet and over</i> | |
| Birmingham | 16.00-16.50 |
| Boston | 15.00-15.50 |
| Buffalo | 20.50-21.50 |
| Chicago | 21.00-21.50 |
| Eastern Pa. | 19.00-20.00 |
| New York | 16.50-17.00 |
| St. Louis | 18.50-19.00 |

LOCOMOTIVE TIRES

| | |
|------------------|-------------|
| Chicago (cut) | 22.00-22.50 |
| St. Louis, No. 1 | 19.00-19.50 |

LOW PHOS. PUNCHINGS

| | |
|--------------------|-------------|
| Buffalo | 21.50-22.00 |
| Chicago | 22.50-23.00 |
| Eastern Pa. | 24.00-25.00 |
| Pittsburgh (heavy) | 24.75-25.25 |
| Pittsburgh (light) | 23.00-23.50 |

Iron Ore

| | | |
|--------------------|--------|--|
| Lake Superior Ore | | |
| Gross ton, 5 1/2% | | |
| Lower Lake Ports | | |
| Old range bessemer | \$4.80 | |
| Mesabi nonbess. | 4.50 | |
| High phosphorus | 4.40 | |
| Mesabi bessemer | 4.65 | |
| Old range nonbess. | 4.65 | |

| | | |
|---------------------------------|-------------|-------|
| Eastern Local Ore | | |
| <i>Cents, unit. del. E. Pa.</i> | | |
| Foundry and basic | | 10.00 |
| 56.63% con. (nom.) | | |
| Cop-free low phos. | | |
| 5S-60% (nom.) | 11.00-11.50 | |

| | | |
|--|--|--|
| Foreign Ore | | |
| <i>Cents per unit, f.a.s. Atlantic ports (nominal)</i> | | |
| Foreign manganifer- | | |

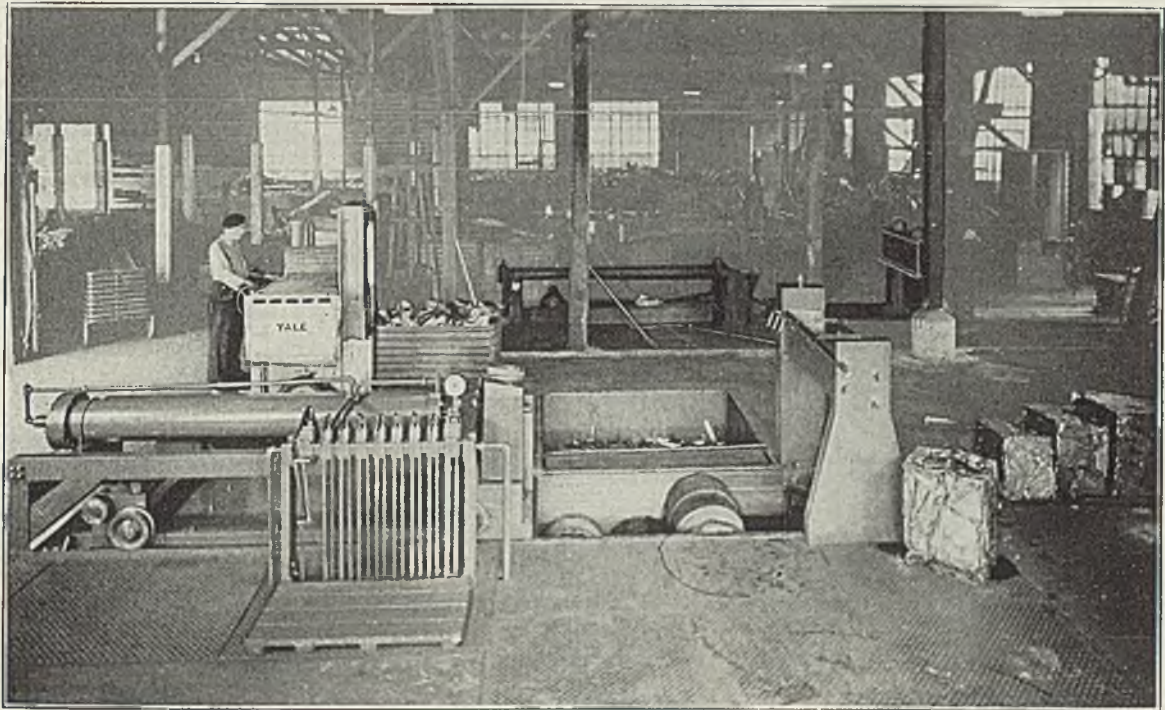
| | | |
|--------------------|---------------|--|
| ous ore, 45.55% | | |
| iron, 6-10% man. | 16.00 | |
| No. Afr. low phos. | 16.00 | |
| Swedish low phos. | nominal | |
| Spanish No. Africa | | |
| basie, 50 to 60% | 15.50 | |
| Tungsten, spot sh. | | |
| ton unit, duty pd. | \$15.85-16.00 | |
| N. F., fdy., 55% | 7.00 | |
| Chrome ore, 48% | | |
| gross ton, c.i.f. | 22.00-22.50 | |

Manganese Ore

| | |
|---|-------|
| <i>(Nominal)</i> | |
| Prices not including duty, cents per unit cargo lots. | |
| Caucasian, 50-52% | 34.00 |
| So. African, 50-52% | 34.00 |
| Indian, 50-52% | 34.00 |

LOGEMANN

Metal Baling Presses



Steel mills, automobile manufacturers, stamping plants and scrap yards bale their sheet scrap in LOGEMANN scrap metal presses. Baled scrap pays substantial dividends saves space can be more economically handled and loaded is practically free from corrosion and saves much heat in remelting can be held for favorable price periods.

LOGEMANN scrap metal presses are built in many sizes and several types, to meet specific conditions. The illustration shows two LOGEMANN installations in a prominent automobile plant in the background a two-ram unit for ordinary scrap a triple-compression press with special large box in foreground for bulky scrap, drums and large forms.

The LOGEMANN line includes baling presses for all materials high pressure pumps hydraulic straighteners hydraulic presses and fittings. Write for descriptive bulletins.

LOGEMANN BROTHERS COMPANY
3126 W. Burleigh St. Milwaukee, Wis.

Bars

Bar Prices, Page 84

Pittsburgh—Bar consumers have been awaiting an announcement on prices and in some quarters it is anticipated that an advance of possibly \$3 a ton may be made. Pressure for deliveries is constant, with shipments ranging from four to six weeks. Specifications are well maintained up through second quarter unless un-

New Prices March 5

Carnegie-Illinois Steel Corp. late last Friday issued the following statement:

"Carnegie-Illinois Steel Corp. will not open its books for second quarter business until March 5, at which time prices will be announced."

predictable disruptions, such as labor controversies, arise. Most of

the material being bought apparently is for immediate consumption.

Chicago—Pressure for delivery of steel bars remains heavy as automotive, farm implement and tractor plants continue brisk schedules. Best deliveries on bars average around 30 days with some mills booked four to six weeks.

Cleveland—Most mills are now out of the market on first quarter and in some cases are not taking more tonnage until second quarter prices have been definitely announced. Shipments of alloy steel bars to machine tool builders and auto parts-makers have improved over the last few weeks, particularly since General Motors resumed active operations.

New York — As some bar mills were able to offer some March delivery consumers bought heavily before an impending price advance on second quarter shipments became effective. Practically all bar mills now are out of the market for March as the week ended, although some had been out for at least a fortnight.

Philadelphia — Commercial steel bar consumers, looking for a further advance in prices shortly, specified actively last week, with a result that some mills now have nothing to offer under five weeks and in some cases are unable to do that. Some tonnage is available for shipment this month, however.

Plates

Plate Prices, Page 84

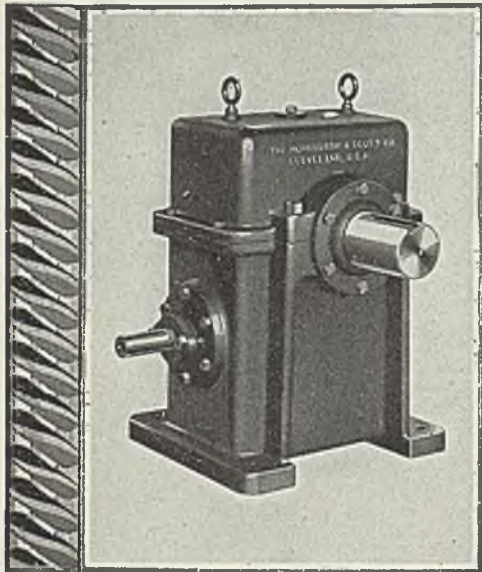
Pittsburgh—Plate deliveries generally are well extended, averaging around five weeks, and longer in some instances. Specifications from most of the heavy consumers have continued and operations should be good during second quarter. Foreign demand has been a feature recently, with instances reported where plates for export have commanded \$4 a ton higher than domestic.

Cleveland — Plate requirements have declined somewhat, due to the general lag in structural activity. However, mills have backlogs extending some eight weeks and the general outlook offers much encouragement.

Chicago — Heavy demand from railroads, car builders and tank and structural fabricators is placing pressure on plate mills for delivery. While freight car builders constitute the leading outlet for plates, requirements of tank and structural fabricators are increasing.

New York — Miscellaneous plate buying took a spurt last week in view of the possibility that higher

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prices would be announced around March 1 and would, in the case of most mills, be made effective at once. At the end of the week only two plate mills, as far as could be learned, were able to make March delivery and then only late in the month.

Philadelphia—Two boats, instead of three, will be built by the Philadelphia-Norfolk Steamship Co., for which approximately 900 tons of plates each will be required. As noted in a previous issue, Pusey & Jones, Wilmington, Del., were low on the construction contract. With higher prices in prospect, miscellaneous buying over the past week was heavy.

Birmingham, Ala.—Plate mills are busy and demand is active. Plate fabricators have specifications for considerable tonnage for tanks, railroad cars and other work.

San Francisco—While demand for plates in small tonnages is holding up well, projects involving larger lots are slow in coming out. So far this year only 8087 tons have been placed, compared with 44,611 tons for the same period last year.

Seattle—Lake Washington Shipyards, Seattle, has the contract to build a 200-foot, all-welded purse seiner, involving more than 200 tons of plates and shapes. Inquiry for plate work is more active and several sizable projects are developing.

Contracts Placed

900 tons, tanks and bins, West-Vaco Chlorine Products Corp., Newark, Calif., to Western Pipe & Steel Co., San Francisco.

350 tons, curbing, north tube Mid-town-Hudson tunnel, New York, to Bethlehem Steel Co., Bethlehem, Pa.

250 tons, bearing plates, electrification work, Pennsylvania railroad, Philadelphia, to By-Products Steel Corp., Coatesville, Pa.

240 tons, bearing plates, for Pennsylvania railroad's electrification program between Paoli and Harrisburg, Pa., to By-Products Steel Corp., Coatesville, Pa.

155 tons, 16 tanks, 10 x 50 feet, National Oil Products Co., Harrison, N. J., to Dover Boiler Works, Dover, N. J.

140 tons, for 300,000-gallon elevated tank, Salisbury, Md., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

100 tons, or more, 300,000-gallon elevated steel tank, air field, Sacramento, Calif., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

Unstated tonnage, 72-inch welded pipe, Bartlett dam bureau of reclamation, Denver, to Chicago Bridge & Iron Works, Chicago.

Contracts Pending

200 tons, two steel mattress barges, 100 x 32 x 4 feet; bids to army engineers, Omaha, Nebr., Feb. 26.

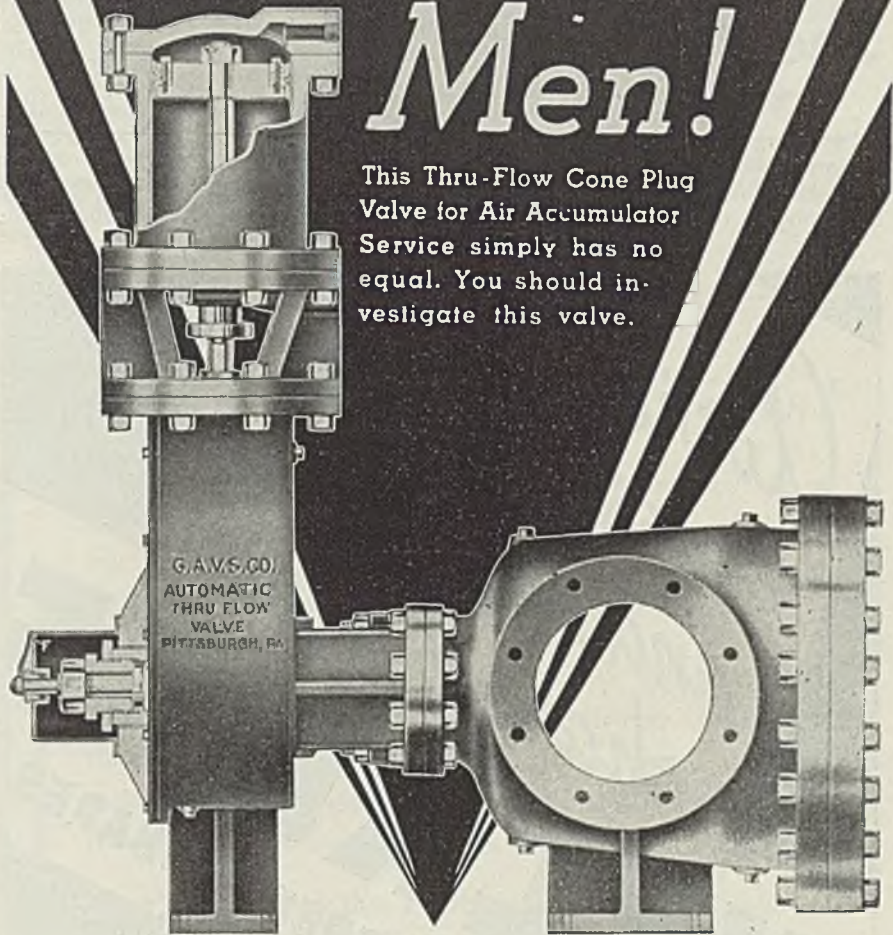
Unstated, three large digesters for Soundview Pulp Co., Everett, Wash.; bids soon.

Unstated, pass drain and inlet piping for Coulee dam; bids at Denver, March 10.

Unstated tonnage, 35-ton whirler derrick

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boat for United States engineer, Huntington, W. Va.; Charles Hegewald Corp., New Albany, Ind., low; Ingalls Iron Works, Birmingham, Ala., low on wrought iron welded barge for same buyer.

Sheets

Sheet Prices, Page 84

Pittsburgh — Discussion centering on probable new prices has been rife, but the delivery situation in steel sheets overshadows all. The

sold-out condition of mills has been troublesome to many consumers, who find producers showing an increasing disposition to go slow on promises and to exercise care in acceptance of tonnage. Shipments are well into the second quarter on many grades, with buyers willing to abide by the price prevailing at time of delivery.

Cleveland—New business continues at a relatively high rate, as consumers, particularly those whose needs are more or less constant, attempt to get an advantageous posi-

tion on rolling schedules. This tonnage is only accepted at prices prevailing at time of shipment.

Chicago—Sheet mills still are unable to reduce backlogs despite capacity production, and deliveries are extending farther into second quarter. Automotive shipments are increasing and specifications from other consumers are steady or heavier. A portion of recent bookings is attributed to consumers' desire to obtain protection on deliveries.

New York—Sheet consumers last week continued to buy heavily, even though prospective price increases would have to be paid as mills generally were out of the market for March. Some buyers broke a policy in placing orders without knowing definitely what the ultimate price would be. The alternative was delay in delivery and price became secondary. While deliveries on some grades, such as heavy gage hot-rolled are available in April, those on other grades run into May and in some cases into June.

Philadelphia — Impending higher prices on sheets were of academic interest last week to consumers as there was little chance of getting in tonnage at old prices, as all mills were out of the market for the remainder of this quarter, except possibly on a few scattered items. Primary interest still centered in getting specifications on rolling schedules as quickly as possible and in some grades this means June. Not in recent years have rolling schedules been so far extended, with producers, as a result, choosing their tonnage carefully.

Buffalo—Sheet producers here are operating both hand and strip mills at close to capacity. Heavy bookings assure similar rates through second quarter. There is increasing pressure for shipment and many consumers are believed to be acquiring inventories in addition to material for immediate needs.

Cincinnati — Except for a small tonnage of special grades, sheet mills are booked solidly for this quarter and may be forced to carry over deliveries on commitments made before the flood. Second quarter bookings on popular grades extend into May, with the flow of new orders continuing heavy.

St. Louis—Demand for sheets has gained in volume, numerous users having placed orders for second quarter, or when deliveries can be made, subject to prices obtaining at the date of shipment. Substantial orders have been entered by warehouse interests, whose stocks have been heavily reduced.

Birmingham, Ala.—Sheet mills are producing at capacity. New sheet

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mills for the Tennessee Coal, Iron & Railroad Co. will be under construction shortly.

Pipe

Pipe Prices, Page 85

Pittsburgh — Announcement on pipe prices is expected momentarily. Advances are likely. Gulf Pipe Line Co. is laying 8½ miles of 8-inch welded line from Shreveport, La., to Rodessa. Skelley Oil Co., Tulsa, Okla., has completed 11 miles of 6-inch welded pipe line from Ellsworth county, Kansas, to Barton. Southern Liberty Pipe Line Co. will install a gathering system in the Texas Rodessa field, including 14 miles of 4- and 6-inch pipe. Construction of a 150-mile pipe line from Starr county, Texas, to Brownsville or Port Isabel, Texas, is planned later this year.

Cleveland—Pipe requirements for industrial expansion and repair work continue to dominate the market. However, domestic demands are expected to show considerable improvement this spring. Jobbers report active stock turnover and some anticipate a price advance April 1. Cast pipe requirements improved last week. Liberty Center, O., announced they will take bids Feb. 27 on a waterworks involving 225 tons, and James B. Clow & Son Co., Cleveland, was awarded 110 tons for water distribution works at Springfield, O. While no definite announcement has been made prices are expected to be adjusted soon, due to general increase in pig iron.

Chicago—Cast pipe inquiries are increasing gradually and expansion is anticipated with approach of spring. Most new projects are small; recent orders have included few large lots. Low bidders have been announced on 2350 tons for Chicago.

New York—Cast pipe buying is confined mostly to small miscellaneous fill-in lots. Foundry operations are off slightly. Panama closes this week on a fair tonnage of galvanized and black welded steel pipe, about 50,000 feet of 5-inch and under.

Buffalo—Inquiries for pipe for natural gas lines for western New York and northern Pennsylvania this spring and summer have been issued. Several large water main extension projects in this area also will add to pipe tonnage.

Birmingham, Ala.—Cast iron pipe manufacturers are maintaining fairly good operating schedules. Western coast has been taking a little pipe recently. Southern ter-

ritory demands are not as brisk as several weeks ago when many applications for federal aid were made.

San Francisco — Cast iron pipe lettings are confined to small lots and the market remains quiet for this time of the year. Cheyenne, Wyo., has taken bids on 1389 tons of 8 to 18-in. pipe. Emsco Derrick & Equipment Co., was awarded 131 tons of 18-in. steel pipe for the metropolitan water district, Los Angeles.

Cast Pipe Placed

378 tons, 4 to 12-inch, South Gate,

Calif.; United States Pipe & Foundry Co., Burlington, N. J., low. 110 tons, water distribution, Springfield, O., to James B. Clow & Son Co., Cleveland.

Cast Pipe Pending

2355 tons, 6, 8 and 12-inch, Chicago; Alabama Pipe Co., Glamorgan Pipe & Foundry Co. and Lynchburg Foundry Co. low on various sizes.

550 tons, 2 to 8-inch for Tacoma, Wash.; bids in.

225 tons, water works, Liberty Center, O.; bids due Feb. 27.

138 tons, 8 to 12-inch, Grass Valley, Calif.; bids opened.

100 tons, 4-inch for Taholah Indian Agency, Wash.; bids in.

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Transportation

Track Material Prices, Page 85

Domestic freight car bookings for February were down substantially from the preceding month and from December as well. Heavy awards were announced during the first week of February but most of this business fell in the preceding week prior to Jan. 30, at which time steel price protections expired. Final results for February are expected to be compiled shortly.

Outstanding in the east are 150 suoway cars for the New York board of transportation, on which bids are to be opened March 5. The freight car market is quiet but both car builders and steel producers anticipate renewed demand by mid-year. In the meantime current backlogs of equipment builders are sufficient to support brisk operations. Chicago Rapid Transit Co. is taking bids on two new articulated trains for experimental purposes. Twenty railroads in the United States and Canada have plans in preparation, or work actually under way, for air-

conditioning 800 passenger cars, according to the Air-Conditioning Manufacturers' association.

Placing of 100 gondolas with Magor Car Corp., New York, by Grand Trunk Western marks the only award to a builder in this country by a Canadian railroad or its affiliate. Steelmakers in this country have received a substantial tonnage for cars to be built in that country. Canadian mills were given as much as they could handle and the remainder was placed in this country.

Car Orders Placed

Burlington, four coaches and two coach-dinette cars, to E. G. Budd Mfg. Co., Philadelphia.
Lehigh Valley, 20 caboose cars, to own shops.
Grand Trunk Western, 100 gondolas, to Magor Car Corp., New York.
Phelps Dodge Corp., 30 30-cubic yard dump cars, to the Differential Steel Car Co., Findlay, O.
St. Louis Southwestern, 10 passenger cars to Pullman-Standard Car Mfg. Co., Chicago.

Car Orders Pending

Chicago Rapid Transit Co., two 5-unit articulated trains.

Locomotives Placed

Chicago & North Western, 8 type 4-6-4 locomotives to American Locomotive Co., New York.
Elgin, Joliet & Eastern, six diesel-electric locomotives, to Electro-Motive Corp., Chicago.

Buses Booked

A. C. F. Motors Co., New York: Twelve 35-passenger and six 42-passenger for Eastern Massachusetts Street Railway Co., Boston; sixteen 30-passenger for Pittsburgh Motor Coach Co., Pittsburgh; six 30-passenger for Connecticut Co., New Haven, Conn.; six 35-passenger for Cincinnati Street Railway Co., Cincinnati; two 40-passenger for Boston, Worcester & New York Street Railway, Framingham, Mass.
J. G. Brill Co., Philadelphia, 38 single motor 40-passenger trackless trolleys, 21 for the Cincinnati, Newport & Covington Street Railway, Covington, Ky., and 17 for Chicago Surface Lines, Chicago; the latter is a repeat order.

Strip

Strip Prices, Page 85

Pittsburgh—With an announcement anticipated on a general steel price increase, strip buyers have been exerting strong pressure for shipments recently. A few instances of consumers seeking to protect themselves have been in evidence, but most of the material apparently is desired for immediate use. Deliveries range from five to six weeks on hot-rolled to around seven weeks on cold-rolled. Operations hold promise of continuing at a high rate. Some mills have been exercising cau-



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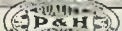
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tion in promises, selecting tonnage carefully.

Cleveland—Strip mills are operating close to capacity with shipments exceeding those during January. Practically all this tonnage is for immediate consumption, there being little opportunity for stocking as most deliveries are limited to average needs. New business continues at a high rate for most consumers are anxious to obtain advantageous delivery position on rolling schedules.

Chicago—Strip bookings are increasing and mills still have substantial backlogs which assure heavy operations for 60 days. Stocks of users have been increased only moderately.

Boston—Cold strip producers are booking second quarter business at open prices, prevailing quotations to apply at time of shipment. Most mills are out for first quarter. Operations are at capacity in many cases and buying has increased, halting reduction in backlogs with few exceptions.

New York—Narrow strip deliveries were pushed into April by recent buying by consumers who saw a chance of obtaining old prices by virtue of the fact some mills were able to offer March shipment.

Philadelphia—Narrow strip is still available in some quarters for delivery this month, this being the only light, flat rolled product that is to be had before second quarter.

Wire

Wire Prices, Page 85

Pittsburgh — Anticipated adjustments in wire and nails were announced and placed in effect last Wednesday. Nails are up \$5 a ton, staples \$5 a ton, barbed wire \$6, fence \$4, light fence \$6, and bale ties \$3. Wire rods, No. 5 to 9/32-inch inclusive are \$43 a ton, over 9/32-inch to and including 47/64-inch, \$47 a ton. No change was made in plain wire except on size extras, which are 10 cents per 100 pounds on gages No. 6 to and including 1/4-inch. The new prices, subject to change without notice, are expected to bring more satisfactory alignment with production costs. Demand from most consumers is steady and wire mills are under pressure for deliveries.

Cleveland—Wire producers report new business holding well, with improvement noted in some lines, particularly spring wire and fencing requirements. Deliveries are extended four weeks on the average. Although second quarter prices have not definitely been announced, increases in rods, bale ties, barbed and

fence wire were put in effect last week for spot business only.

Chicago—Wire products have been advanced \$3 to \$5 a ton. New quotations apply to spot business but have not been extended to second quarter contracts. Plain wire is unchanged at \$2.65c, Chicago, with a new extra of 10 cents applied to sizes coarser than 6-gage to and including 1/4-inch, and a 20-cent extra on sizes coarser than 1/4-inch. Wire rods now are priced \$44, Chicago, for No. 5 to and including 9/32-inch and \$48 on sizes of 9/32 to and including 47/64-inch.

This is a \$2 increase on the larger sizes.

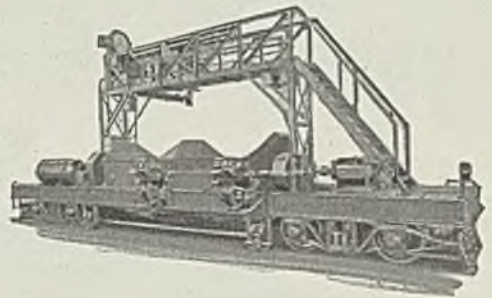
Boston—Higher prices on several wire products including nails, staples, fencing, barbed wire and bale ties are accompanied by a new size extra on plain wire and rods, making the latter \$49 a ton, Worcester, on 9/32-inch and over. Rods, No. 5 to 9/32-inch are \$45. Steel wire finishing mills are still near capacity in many departments and pressed for delivery. Buying of plain steel wire by manufacturing trade has increased during the last week.

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Shapes

Structural Shape Prices, Page 84

New York—Tonnage involved in structural contracts has declined, but includes 1750 tons for three projects in New Jersey. About 20,000 tons still pends in this district. An increasing volume is being done at higher prices. Most specified projects have been bought.

January bookings of fabricated structural steel, according to tabula-

tions of the American Institute of Steel Construction, was seasonally down in comparison with recent months but comfortably in excess of the record last year. Shipments during January amounted to 39.3 per cent of normal, as compared with 34.2 per cent of normal recorded in the same month last year. Totals were: Bookings 130,651 tons, and shipments 92,020 tons.

Philadelphia—Structural awards over the past week were the lightest in some time. However, a fair total is being figured and spring expan-

sion is expected, particularly in view of the strength in shape prices.

Pittsburgh—Inquiries include 3000 tons for the International bridge at Thousand Island, Clayton, N. Y., 2400 tons for a municipal garage for New York City, and 1100 tons for a bridge for the state of Kentucky at Frankfort, Ky.

Cleveland—Structural awards and inquiries continue disappointing. The market has shown little activity since the first of the month, even in small awards from private sources. Considerable tonnage now pending should be placed within the next few weeks.

Chicago—Structural fabricators have fairly heavy backlogs which will support operations at a relatively high rate but new awards and inquiries are light. Outstanding among new inquiries are 2000 tons each for blast furnaces for the Great Lakes Steel Corp., Detroit, and the Hamilton Coke & Iron Co., Hamilton, O.

San Francisco—The structural shape market continues active and awards were the largest for any week this year, 14,199 tons being placed and bringing the aggregate to 32,613 tons as compared with 15,971 tons for the corresponding period in 1936. Featuring the market was the placing of 10,000 tons for the Federal building, Los Angeles, with Consolidated Steel Corp., Los Angeles. Bids on the structure were opened last September.

Seattle—Fabricating shops are proceeding with contracts that have been delayed by lack of materials, as stocks are now being replenished upon resumption of water traffic.

Shape Contracts Placed

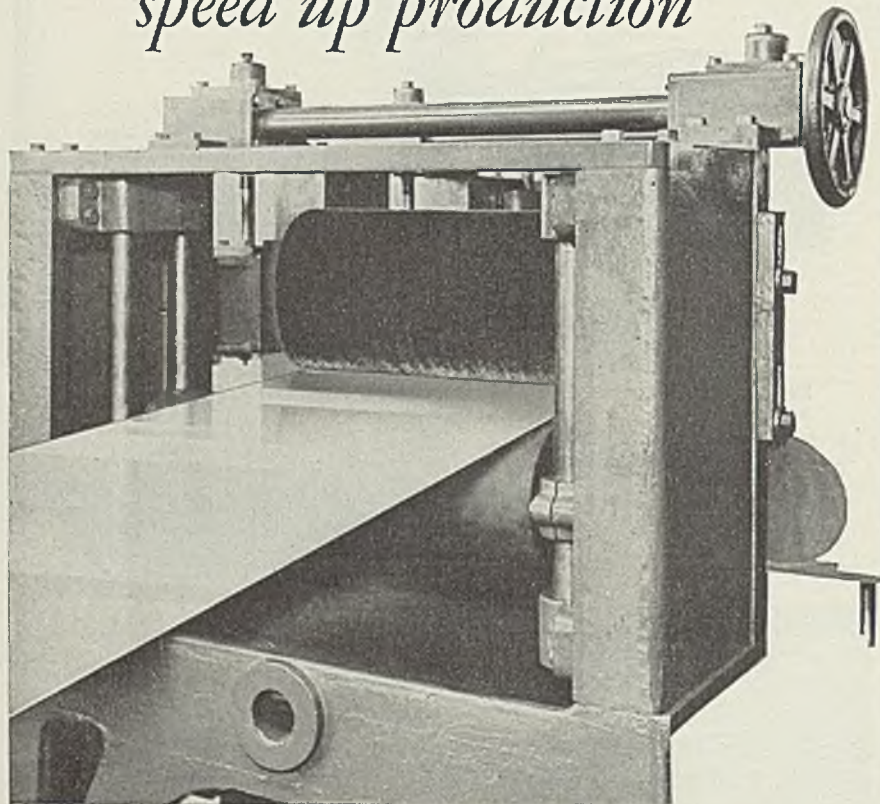
- 10,000 tons, Federal Building, Los Angeles, to Consolidated Steel Corp., Los Angeles.
- 1550 tons, bridge, Atchison county, Kansas, to Wisconsin Bridge & Iron Co., Milwaukee.
- 1000 tons, shop, garage, etc., for Indianapolis Railways Co., Indianapolis, Ind., to R. C. Mahon Co., Detroit.
- 980 tons, building, Carbide & Carbon Chemical Co., South Charleston, W. Va., to unstated fabricator.
- 800 tons, building, Coca Cola Co., Kearny, N. J., to Lehigh Structural Steel Co

Shape Awards Compared

| | Tons |
|-----------------------------------|---------|
| Week ended Feb. 27 | 22,708 |
| Week ended Feb. 20 | 18,291 |
| Week ended Feb. 13 | 30,470 |
| This week, 1936 | 33,125 |
| Weekly average, 1936 | 16,332 |
| Weekly average, 1937 | 15,128 |
| Weekly average, January | 31,148 |
| Total to date, 1936 | 214,062 |
| Total to date, 1937 | 146,993 |

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Allentown, Pa., James Stewart & Co., Inc., general contractor.
 800 tons, state armory, West Orange, N. J., to Oltmer Iron Works, Jersey City, N. J.
 650 tons, paper mill, for Chesapeake Camp Corp., Franklin, Va., to Ingalls Iron Works, Birmingham, Ala.
 600 tons, plant extension, Soundview Pulp Co., Everett, Wash., to Isaacson Iron Works, Seattle; Austin Co., Seattle, general contractor.
 570 tons, bridge, Benton county, Missouri, to Vincennes Bridge Co., Vincennes, Ind.
 525 tons, shaft caisson, North Tube Midtown Hudson tunnel, to Federal Ship Building & Drydock Co., Kearney, N. J.
 475 tons, Physicians and Surgeons building, Columbia-Presbyterian medical center, New York, to Harris Structural Steel Co., New York; through Eidlitz Marc & Son Inc., New York.
 450 tons, metal work, highway bridge, stations 1635 and 1930, for All-American Canal, bureau of reclamation, Denver, to Milwaukee Bridge Co., Milwaukee.
 450 tons, buildings, state normal school, Geneseo, N. Y., to Bethlehem Steel Corp., Bethlehem, Pa., T. C. Brown Co., Inc., Schenectady, N. Y., general contractor.
 440 tons, testing building, for Washburn Wire Co., New York, to Karl Koch Erecting Co. Inc., New York; Fort Pitt Bridge Works, Pittsburgh, to fabricate, John H. Deeves & Bro. Inc., New York general contractor.
 405 tons, shop building, Rustless Iron Corp., of America, Baltimore, to Baltimore Steel Co., Baltimore.
 400 tons, bridges, for All American Canal project, Calif., Spec. 718, to Wisconsin Bridge & Iron Co., Milwaukee.
 390 tons, platforms and shelters, Thirtieth street station, Pennsylvania railroad, Philadelphia, 225 tons for shelters going to the Phoenix Bridge Works, Phoenixville, Pa., and 165 tons for platforms to the Bethlehem Steel Corp., Bethlehem, Pa.
 300 tons, bus terminal for Atchison, Topeka & Santa Fe Railroad, Fourth street, San Francisco, to Minneapolis-Moline Power Implement Co., Minneapolis.
 250 tons, Pasco-Kennewick bridge, Pasco, Wash., for state of Washington, to Poole & McGonigle.
 200 tons, additional sound stage, Metro-Goldwyn-Mayer studio, Los Angeles, to Consolidated Steel Corp., Los Angeles.
 180 tons, Junior High School, Darien, Conn., to Topper & Griggs, West Hartford, Conn.; includes reinforcing bars awarded to Bethlehem Steel Corp., Bethlehem, Pa., Genovese & Rich Inc., Stamford, Conn., general contractor.
 155 tons, turbine supports, Public Utility Engineering Service Corp., San Diego, Calif., to Minneapolis-Moline Power Implement Co., Minneapolis.
 155 tons, bridge, over West Shore railroad, North Bergen, N. J., to Phoenix Bridge Co., Philadelphia; through J. P. Burns, New York.
 150 tons, switch racks, metropolitan water district, Los Angeles, Spec. 2210, to International Derrick & Equipment Co., Los Angeles.
 150 tons, school, Wantage township Sussex county, New Jersey, to Selbach-Meyer Co., Union City, N. J.
 135 tons, warehouse, Crosley Corp., Cincinnati, to Oregon Bridge Co., Lebanon, O.
 120 tons, channels, electrification work, Pennsylvania railroad, Philadelphia, to Belmont Iron Works, Eddystone, Pa.
 120 tons, six tainter gates, Ebasco Services Inc., Buhl, Idaho, to American Bridge Co., Pittsburgh.
 108 tons, Brand boulevard bridge, United States Engineer Office, proposal 249,

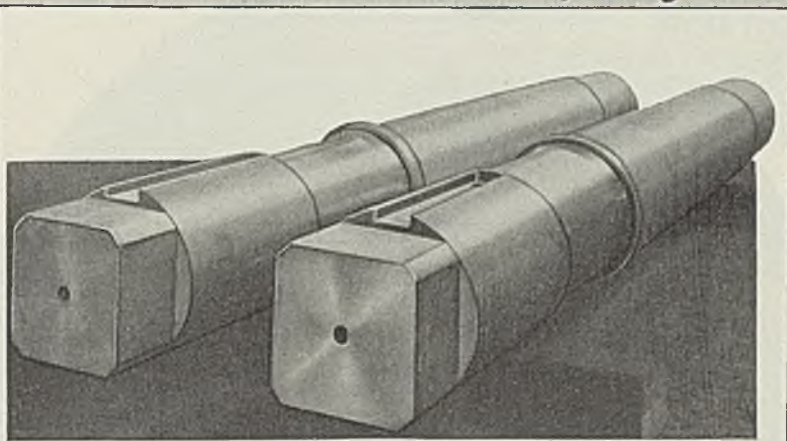
Los Angeles, to Consolidated Steel Corp., Los Angeles.
 100 tons, Post office, South Norwalk, Conn., to New England Iron Works, New Haven, Conn.; through W. J. Loyons, Norwalk, Conn.
 100 tons, theater, Newton, Mass., to West End Iron Works, Cambridge, Mass.

2000 tons, school, Sixty-seventh street and Elmwood, Philadelphia, bids expected to be opened April 1; approximately 1000 tons of reinforcing bars for foundation work now being actively figured with opening shortly.
 2000 tons, rock tunnel and river shaft, New Jersey side Midtown Hudson Tunnel; Underpinning & Foundation Co., New York, subcontractors.
 2000 tons, blast furnace, Great Lakes Steel Corp., Ecorse, Detroit, Mich.
 2000 tons, blast furnace, Hamilton Coke & Iron Co., Hamilton, O.
 1100 tons, state bridge over Kentucky river, Frankfort, Ky.
 600 tons, Mississippi river bridge approach, Cedar Rapids, Iowa.
 500 tons, washer, Carnegie-Illinois Steel Corp., Braddock, Pa.

Shape Contracts Pending

3000 tons, American crossing, International bridge, for Thousand Island Bridge, authority, Clayton, N. Y.
 3000 tons, three schools, for board of Education, New York, bids due March 8.
 2600 tons, cadet armory warehouse garage and storage unit, West Point Military Academy; bids due March 15 and 16.

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COMPANY

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Philadelphia
 Portland, O.

District Offices

Chicago
 St. Louis

San Francisco

495 tons, Alameda street bridge, United States Engineer Office, proposal 262, Los Angeles; Bethlehem Fabricators, Bethlehem, Pa., low.
 450 tons, power house, Public Utility Engineering Service Corp., San Diego, Calif.; bids opened.
 450 tons, material for Pennsylvania station, Philadelphia, for Pennsylvania railroad.
 450 tons, express highway viaduct, West 177th to 180th streets, New York, for New York Central railroad.
 400 tons, fabricated structural steel, three-span steel truss and one-span bridge, Armstrong and Westmoreland counties, Pennsylvania; bids to state highway department, Harrisburg, Pa., March 5.
 400 tons, dope shop and extension to

building No. 171, Norfolk, Va., for U. S. government.
 400 tons, alterations to Dock street freight station, Philadelphia, for Pennsylvania railroad.
 380 tons, bridge, Defiance, O.; bids March 2.
 350 tons, state bridge on Washington avenue, Middlesex county, New York.
 350 tons, farm machinery buildings, for Industrial Exhibit authority, Syracuse, N. Y.
 320 tons, through truss bridge, Sullivan county, Pennsylvania; Central Builders Supply Co., Sunbury, Pa., low at \$99,190.13 on Feb. 19 bids to the state highway department, Harrisburg, Pa.
 300 tons, garage and tunnel, extension to parcel post building, Worcester, Mass., Edmund J. Rappoli Co., Inc.,

Cambridge, Mass., low.
 300 tons, state bridge on Wheat road, Atlantic county, New Jersey.
 250 tons, Preston-Fairfax building, for Southwestern Bell Telephone Co., Houston, Texas.
 200 tons, state bridge, Ludlow-Wilbraham, Mass.; bids March 2.
 180 tons, state bridge, Souhegan river, Greenville, N. H.; John Iafolla Construction Co., Dedham, Mass. low
 173 tons, bridge, Las Animas county, Colorado; bids opened.
 157 tons, five bridges for Southern Pacific Co., San Francisco; bids rejected.
 111 tons, plant alterations, Kimberly-Clark Co., Neenah, Wis.
 100 tons, two I-beam bridges, Blair county, Pennsylvania; A. G. Andrew Engineering Co., Tyrone, Pa., low at \$24,711.25 on Feb. 19 bids to Pennsylvania state highway department, Harrisburg, Pa.
 100 tons, extension of Ohio Bell Telephone building, Cleveland; bids March 9.
 100 tons, state grade crossing elimination, Zoarville, O.; bids in.

Reinforcing

Reinforcing Bar Prices, Page 85

Pittsburgh—Pending projects are confined generally to small tonnages, but this is not unexpected because of the amount of business placed during January. This trend should improve soon.

Cleveland—Reinforcing requirements are seasonally dull with little improvement anticipated over the next 30 days. Mills are fairly active on backlogs accumulated during the January protection period. Considerable tonnage is pending in two grade crossing eliminations one in Akron, O., and the other in Cleveland, aggregating close to 800 tons.

Chicago—Most reinforcing bar inquiries involve small lots, but pending business is heavy and sellers anticipate a more active building season. Prices still lack firmness but are tending toward greater stability.

New York—Approaching 2000 tons, reinforcing concrete bar contracts are heavier, 1100 tons for a building for Coca Cola Co., Kearny, N. J.,

Concrete Awards Compared

| | Tons |
|-------------------------|--------|
| Week ended Feb. 27 | 6,993 |
| Week ended Feb. 20 | 2,968 |
| Week ended Feb. 13 | 4,858 |
| This week, 1936 | 5,080 |
| Weekly average, 1936 | 6,005 |
| Weekly average, 1937 | 3,457 |
| Weekly average, January | 3,787 |
| Total to date, 1936 | 81,182 |
| Total to date, 1937 | 31,113 |



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being the largest individual award. Recent buying has been ahead of new inquiry.

Philadelphia—Approximately 1000 tons of foundation work for a school at Sixty-seventh street and Elmwood is outstanding in the local reinforcing bar market. Prices show increasing strength.

San Francisco—Reinforcing bar awards last week were the largest this year, aggregating 3211 tons, and increasing the total to 7699 tons, compared with 52,060 tons in 1936. The outstanding letting involved 1500 tons for the Union Terminal, Los Angeles, placed with an unnamed interest. The bureau of reclamation has placed nine projects in California, Arizona, Idaho and Wyoming requiring a total of 1393 tons. Pending business exceeds 9800 tons.

Seattle—Construction inactivity is reflected in the dearth of new reinforcing business. No important tonnages are up and new work includes mostly school buildings and other structures requiring less than 100 tons. However, local mills are operating close to capacity with a backlog that will run to the end of March.

Reinforcing Steel Awards

2000 tons, plant, for Kraft Phenix Cheese Corp., Chicago, to unstated fabricator.

1500 tons, Union Terminal, Los Angeles, to unnamed interest.

1100 tons, building, Coca Cola Co., Kearney, N. J., to Joseph T. Ryerson & Son Inc., New York, James Stewart Co., New York, general contractor.

260 tons, warehouse, for Interboro News Co., New York, to Bethlehem Steel Corp., Bethlehem, Pa., through Turner Construction Co., New York.

253 tons, bureau of reclamation, invt. 42,620, Phoenix, Ariz., to Sheffield Steel Corp., Kansas City, Mo.

250 tons, garage, department of sanitation, Twelfth avenue and Fifty-sixth street, New York, to Joseph T. Ryerson & Son Inc., New York; O'Driscoll & Grove Inc., New York, general contractors.

250 tons, power house, Public Utility Engineering Service Corp., San Diego, Calif., to unnamed interest.

250 tons, for American Commerce building, to Inland Steel Co., Chicago.

185 tons, mesh, for North Tube Midtown Hudson Tunnel, to Joseph T. Ryerson & Son Co. Inc., Chicago; through Mason & Hanger Co. Inc., New York.

180 tons, mesh, for Spencertown-Austerlitz highway, Columbia county, New York, to Truscon Steel Co., Youngstown, O.; through Oneglia & Gervasini Inc., Torrington, Conn.

165 tons, bureau of reclamation, invt. 22,431-A, Casper, Wyo., to Colorado Fuel & Iron Co., Pueblo, Colo.

160 tons, bureau of reclamation, invt. 22,434-A, Casper, Wyo., to Bethlehem Steel Corp., Bethlehem, Pa.

120 tons, mesh, state highway, Westchester county, New York, to Pittsburgh Steel Co., Pittsburgh; through Malloy & Murray Contracting Co. Inc., Yonkers, N. Y.

120 tons, Treasury department, invitation 3387, San Francisco, to Soule Steel Co., San Francisco.

100 tons, bureau of reclamation, invt. 42,653-A, Phoenix, Ariz., to Colorado Fuel & Iron Co., Pueblo, Colo.

100 tons, gymnasium, University high school, Los Angeles, to Soule Steel Co., Los Angeles.

Reinforcing Steel Pending

928 tons, bureau of reclamation, Phoenix,

Ariz.; bids opened.

500 tons, yard facilities, San Francisco-Oakland bridge, Oakland, Calif.; bids opened.

250 tons, plant extension Soundview Pulp Co., Everett, Wash.; bids in; Austin Co., Seattle, general contractor.

225 tons, gymnasium and swimming pool, University of California, Davis, Calif.; bids opened.

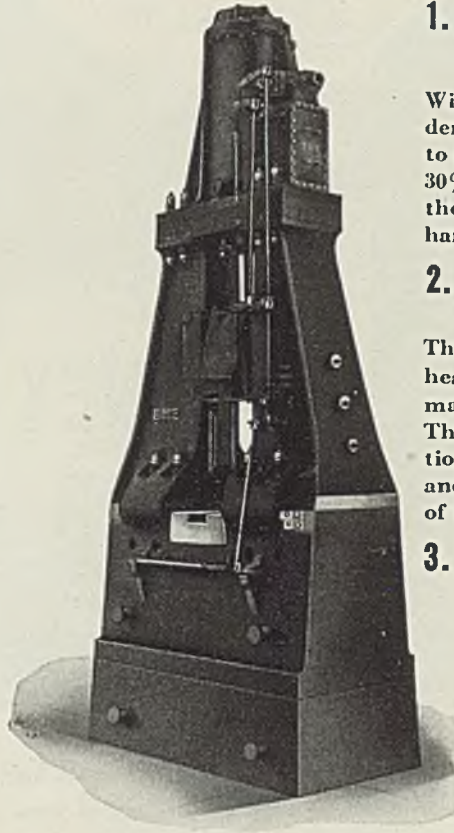
150 tons, Black Canyon reclamation project; bids at Boise, Idaho, March 12.

123 tons, bridge in Las Animas county, Colorado; bids opened.

102 tons, agriculture department, delivery New York or Puerto Barrios, Guatemala and Pedregal, R. of P., schedule 8954; bids March 2.

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Pig Iron

Pig Iron Prices, Page 86

New York — Following advance last week of \$1 a ton on all grades, eastern pig iron trade is awaiting action of producers in opening books for second quarter, when another increase is possible. Advance last week applied only to shipments for remainder of current quarter. This general situation has stimulated no

little buying, although the impetus has not been as great as upon certain previous occasions when more time was allowed consumers.

Prices on imported pig iron also have been advanced and prices of one large European exporter to this country are now, generally speaking, higher than the domestic market.

England is reliably reported to have placed a heavy tonnage in the past few days, although details are temporarily withheld. As noted in

a recent issue, England had an inquiry here for 50,000 tons of basic for shipment at the rate of 5000 tons a month over the remainder of 1936. Whether England's import duty of 33 1/3 per cent was waived in this case was not known. However, English prices are already substantially higher than American prices and it is possible that waiving the duty is not so important as would otherwise be the case. Scandinavian interests have recently bought 8000 to 9000 tons, all foundry iron, it is said.

Pittsburgh — Pig iron prices will be advanced \$1 a ton in this district, in line with action taken by producers in other centers, but no formal announcement has been made yet. Shipments are heavy and there has been little opportunity to replenish stocks recently. In some cases consumers who attempted to cover requirements before last price advance already have been forced to reorder, and it is apparent that other contracts are likely to run out before the end of this quarter. High scrap prices have been forcing an increasing number of malleable foundries to turn to pig iron. Foreign demand has been increasingly strong.

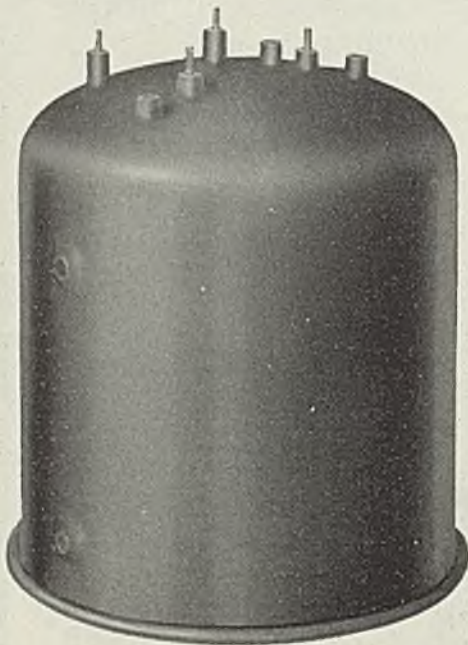
Cleveland—The most important incident in the market last week was the general advance of \$1 a ton on all grades of pig iron, for delivery this quarter only. This move was generally expected, due to the constant rise in scrap prices and an anticipated 50 cent increase on iron ore. Considerable tonnage is expected to be placed over the next few weeks, as consumers feel that prices will again advance for second quarter, particularly if the increase in iron ore becomes a reality.

Chicago — Pig iron prices have been advanced \$1 a ton. The market on No. 2 foundry and malleable grades now is \$22, Chicago, and \$22.50, Duluth. Demand is heavy and current bookings will take furnace output during the remainder of this quarter. Foundries are permitting some leeway in specifications in attempts to obtain sufficient iron. February shipments were well ahead of January movement and a further increase is seen for March.

Boston — While pig iron buying was fairly active before the \$1 advance, a good part of the covering was normal protection against early second quarter needs for shipment before end of March. Some purchasing against the advance was done last week before the announcement.

Philadelphia—Advance of \$1 a ton last week on pig iron for delivery over the remainder of this quarter

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has added further impetus to buying, particularly with the possibility that there may be a still further increase when sellers open books for second quarter. It is expected that some will start taking this action early this week, although there are no definite indications as to what prices will be named. Among foreign inquiries current here is one from Sweden for 1000 tons of foundry iron.

Buffalo—Order books are well loaded for this quarter and heavy inventory buying for March shipment will be impossible. Shipments have increased during past two weeks.

Cincinnati—Prices of both northern and southern iron are up \$1 a ton, effective immediately. For delivery at Cincinnati this puts quotations on No. 2 foundry at \$22.07 for northern and \$21.69 for southern. Delayed deliveries indicated shortage. Shipments are already tending upward as melters move to take a heavy tonnage on old contract before April 1, the current increase giving added incentive to piling.

St. Louis—Pig iron has been advanced \$1 per ton, effective Feb. 24 through March 31. The new price, however, does not extend through second quarter. Owing to the recent sharp advance in scrap, heavy backlogs held by mills and foundries and a continued flow of new orders, demand for pig iron is active and all classes of melters are apparently anxious to build up stocks.

Birmingham, Ala.—Production is at high rate with 15 furnaces active and some iron is being accumulated. However, demand is strong and is expected to absorb all that can be made.

Toronto, Ont.—New business continues brisk and furnace representatives state that sales now are at the highest level since 1930 with production on its way to a new peak. Melters are placing frequent repeat orders. While most sales are for spot delivery inquiries are being received for substantial tonnages and some orders are in prospect for long term contracts.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 85

Nut, bolt and rivet manufacturers are operating at a high level, under steady demand from the principal consumers. Order backlogs extend well into March. Requirements of railroad equipment manufacturers are expected to show gains in the near future. Tank fabricators, the automotive industry and farm equipment manufacturers are taking good-sized shipments.

Scrap

Scrap Prices, Page 88

Pittsburgh—No. 1 heavy melting steel is reported to have been purchased by a mill consumer at around \$21.25, the highest price in this district since January, 1925.

Pittsburgh—Scrap prices are at the highest level in 12 years, with No. 1 heavy melting steel quoted \$20.50 to \$21.00, as a result of a recent sale. Demand is strong and

material scarce, the latter situation caused by the exceptionally high prices commanded for export in the east, making it almost impossible to bring scrap here. Dealers at present are not anxious to sell the market short.

Cleveland—Dealers are not seeking business and in some cases not accepting it. Shipments on contracts are steady. Supplies are restricted. Closing of two important railroad lists this week is expected to give an insight into prices.

Chicago—While most prices are



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Guaranteed end to end straightness. B type machines now cover range from 3/16" to 16".

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unchanged, strength predominates the market. No. 1 heavy melting steel is steady at \$19.50 to \$20 following mill purchases at \$20, but dealers are paying still higher prices in covering. Scrap is coming out in heavy volume but supplies are more than balanced by requirements of consumers.

Boston—Scrap prices are the highest in years, most grades advancing 50 cents to \$1 a ton. About 20,000 tons for export are held up on cars at Boston and Portland, Me., by temporary railroad embargo due to an

accumulation of cars, several ships having been delayed in loading. For New England delivery, heavy melting steel, cast grades and railroad malleable are higher and more in line with prices paid for export and outside shipment.

Philadelphia—Further price increases have been made in cast grades and in certain railroad specialties, with the general situation exceedingly strong. Steel scrap for domestic consumption is nominally unchanged, but dealers' buying prices for export are up 25 cents to

\$18.25 and \$17.25, dock, on No. 1 and No. 2, respectively. Railroad embargoes went into effect last week at some eastern ports on export scrap, but no such action has yet been taken here. Approximately 1000 cars loaded with scrap are on sidings at Port Richmond here.

New York—Following an advance of 50 cents per ton in heavy melting steel for export and domestic shipment brokers predict a further equal advance this week. Shipments to eastern mills are heavy as are tonnages for export, with supplies coming out less freely.

Buffalo — Prices of scrap specialties have moved steadily higher. Steel car axles have brought better than \$22 in this district and scarcity of billet and bloom crops forced the price to \$22.50 or possibly more. The whole market is strong, especially No. 1 machinery cast, which has been sold during the past week at \$18 or better.

Detroit—In spite of greatly enlarged production by automotive builders scrap prices have advanced 25 cents to \$1 per ton. Demand is strong and it is believed the top of the market has not been reached. Probable opening of lake navigation March 1 will widen the consuming area for Detroit scrap and strengthen the market.

Cincinnati — Dealers in iron and steel scrap are offering higher prices and considerable material is being made available. Activity is nearing normal with movement on contract and miscellaneous sales to two mills. Foundries are taking steadily.

St. Louis—Both mills and foundries are seeking scrap but offerings continue light and because of the rapid upturn in prices, brokers and dealers are slow to accept any business for which they have not the material on hand or in immediate prospect. There were additional advances, ranging from 25 to 50 cents per ton.

Birmingham, Ala.—Dealers are able to meet needs of consumers and scrap movement is heavy at steady prices. Some speculative buying is being done in expectation of a higher price.

Seattle—Japan's unsettled political situation is retarding inquiry from that source for steel scrap. Buyers will consider prompt shipments but they will not contract for April and May. Meanwhile with ocean freights double normal levels, \$7.50 for melting and \$6 for rails, exporters find it almost impossible to interest Oriental markets. Local mills are buying freely, No. 1 being firm at \$12, all desirable tonnages finding ready sale.

Toronto, Ont.—Trading in iron and steel scrap is following the trend

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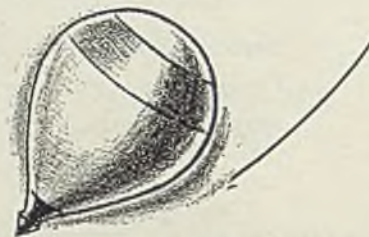
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of improvement in all branches of the iron and steel industry. Local dealers find persistent demand for most grades and have difficulty in filling orders on machinery cast. Montreal dealers also report brisk demand. Prices are firm and while unchanged, higher levels are in prospect.

Warehouse

Warehouse Prices, Page 87

Pittsburgh—Prices on all sheets and track spikes will be advanced \$5 a ton, effective March 1, by warehouses in this district. Demand for all lines is good. Sheets in particular are exceptionally active, with many buyers forced to turn to warehouses through inability to obtain deliveries from mills.

Cleveland—Warehouse distributors report continued improvement in daily average sales. This is particularly noticeable in sheets, strip and other light material on which the mills are far extended in deliveries. Industrial requirements still predominate.

Chicago—Sheet prices have been advanced \$4 a ton, effective Feb. 24. An increase on merchant wire products is anticipated following recent mill revisions and quotations on other items are unchanged, pending developments in second quarter mill lists.

New York—Heavy and improved demand for steel products out of warehouse is met with difficulty by numerous jobbers, unable to replace stocks, because of delayed deliveries by mills. Some finishes of sheets can not be promised before June. Jobbers are frequently attempting to buy from other distributors to fill orders. Steel is moving out of warehouses in heavier volume than it can be received from mills.

Philadelphia — February may prove to be the best in the local warehouse market in many years, some jobbers declare. March should show further expansion. Prices for the moment are unchanged.

Detroit—Market for warehouse products continues strong but featureless. No quotations are being made for second quarter since mills may advance prices.

Cincinnati — Warehouse business is back to normal. Level of sales is close to early January rate and expanding, partly through orders for rehabilitation work.

St. Louis—Steel warehouse interests report further expansion in sales, with indications pointing to February being the largest month in point of volume in recent years. Demand is well diversified, and has

been augmented by deferred deliveries.

Seattle—Improved weather conditions have stimulated the jobbing trade and volume has increased after a month of slow business. Sheets plates and bars are in best demand, moving in small lots. Portland, Oreg., dealers expect to raise prices next week in conformity with Seattle stores. This will mean an advance of 10c on plates and shapes and 15c on bars. For some time Portland jobbers have been shading prices.

Tin Plate

Tin Plate Prices, Page 84

New York—In addition to heavy domestic buying, tin plate sellers are confronted with further brisk inquiry from abroad. The official quotation on export tin plate for this quarter is \$4.72, but as no one has any tin plate to offer for shipment in this period the price is purely nominal. As a matter of fact, premiums over past weeks have been done, depending upon de-



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livery and credit arrangements. Premiums with respect to shipments are officially 6 cents above the nominal current quarter export price for every three months beyond the close of this quarter.

Pittsburgh — In the most active first quarter in years, tin plate mills, operating at around 100 per cent, are hard pressed for shipments. One local producer found it necessary to operate 18 turns during the past week, due to necessary adjustments. Unusual foreign demand has stimulated activity on top of the heavy domestic requirements, and tin plate

for export apparently is approaching the premium stage.

Metallurgical Coke

Coke Prices, Page 85

Despite the fact that more ovens are in operation now than in many years in the Connellsville, Pa., district, including more than 3120 independent ovens, demand for beehive coke is so great that considerable additional capacity could be utilized advantageously. The Bortz Coal Co., which recently leased the Youngs-

town mine from H. C. Frick Coke Co., is reported to have put some ovens on line there. It was announced recently that manufacture of beehive coke in the fifth bituminous district increased approximately 400 per cent during 1936, gaining from 44,669 tons in 1935 to 194,880 tons last year. Output so far this year is well ahead of the corresponding period of 1936.

Coke By-Products

Coke By-Product Prices, Page 85

New York—Coke by-products are active with prices firm and unchanged, there being a shortage on some materials with most production moving directly into consumption. Industrial demand for benzol is brisk, notably to rubber tire makers and chemical users. Phenol is going in good volume to the resin trade and demand from drug and dyestuff intermediate consumers has improved. Naphthalene gains momentum as the seasonal shipping season to jobbing and retail disinfectant outlets improves.

Semifinished

Semifinished Prices, Page 85

Under adjustments made last Wednesday, wire rods, No. 5 to 9/32-inch inclusive are \$43 a gross ton, Pittsburgh or Cleveland; while over 9/32-inch to 47/64-inch inclusive are \$47 a ton, Pittsburgh or Cleveland. On top of the strong domestic situation, foreign interests are exceptionally active in seeking to procure whatever spare supplies there are. Indicative of the interest from abroad, offers of \$55 to \$60 a gross ton for wire rods for export are reported.

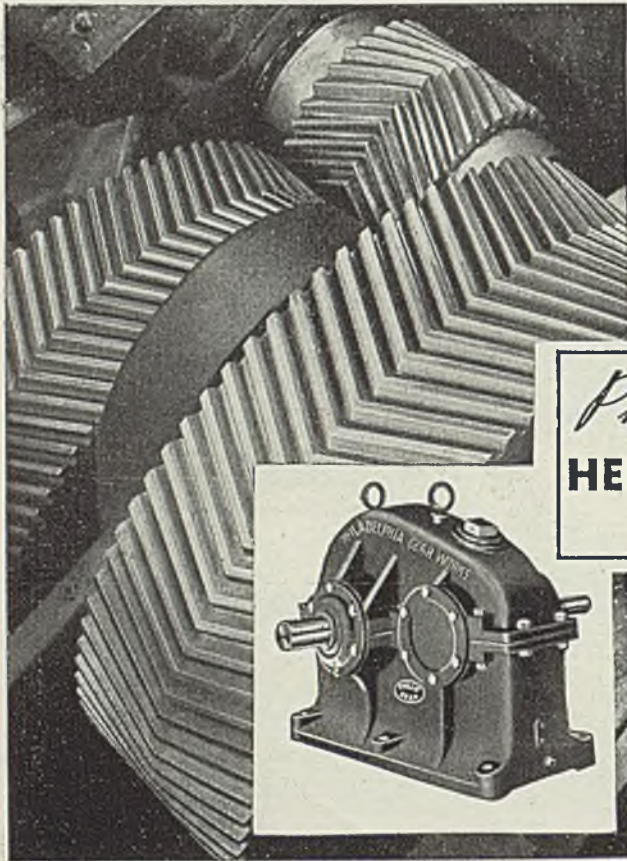
Ferroalloys

Ferroalloy Prices, Page 86

New York — The ferromanganese trade expects an advance for second quarter. Demand is heavy and the ore situation is becoming increasingly complicated, with little manganese ore available at the moment at any price. The current market of 34 cents, not including duty, is purely nominal.

Ferromanganese shipments in February showed an increase over January, as consumers worked off stocks accumulated in early December prior to the price advance.

The current market is \$80 duty paid, Atlantic and Gulf ports. Domestic spiegeleisen prices, 19 to 21 per cent, are strong at \$26, Palmeton, Pa.



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Iron Ore

Iron Ore Prices, Page 88

New York—So little supply is now available that foreign iron ore prices here are purely nominal. This is also true of manganese ore, with virtually no material to be had in any quarter. Should it be possible to pick up an odd cargo, it is believed that at least 4 or 5 cents above the current nominal price of 34c, not including duty, would have to be paid.

This squeeze in foreign iron ore is making for a difficult position for some eastern furnaces particularly furnaces now out of blast and which, due to this shortage, are having to delay plans for getting back in. Where iron ore is still available in some sources, prices are considered prohibitive. Even the present nominal prices of 16 cents on some grades is considered too high for domestic pig iron producers with iron at existing levels.

The principal reasons for the growing shortage of ore supplies on the other side, and also of pig iron, are continued suspension of operations of mines in Spain and expanding requirements of leading European powers for armament programs.

Adding further complications to the ore market are sharply increasing ocean rates. Within a half year these rates have gone up 100 to 150 per cent. Meanwhile, alloy ore prices generally are advancing sharply. As noted last week chrome ore prices jumped \$2 a ton and further increases are expected soon.

Cold Finished

Cold Finished Prices, Page 85

Pittsburgh — Cold-finished producers are operating at a high rate under strong pressure for deliveries from all users. Shipments range from four to six weeks. Producers generally are in a good position to supply ordinary material, but when special finishes and grinding are required some difficulties are encountered. Operations are better as a result of settlement of labor controversies. Producers are watching all price developments closely.

Iron and Steel Imported

Philadelphia—Substantial arrivals of chrome ore and pig iron are reported here for the week ending Feb. 20. Pig iron importations comprised 1209 tons from British India and 511 from the Netherlands; chrome ore arrivals, 4017 from

South Africa and 3247 from Cuba. Three hundred tons of ferromanganese came in from Czechoslovakia.

Finished steel arrivals comprise 457 tons of shapes, 280 tons of steel bars, 116 tons of bands and 15 tons of steel sheets from Belgium; 112 tons of steel bars, 49 tons of steel billets, 48 tons of steel tubes, 45 tons of steel forgings and 23 tons of wire rods from Sweden.

Baltimore—Arrivals of iron and manganese ore at this port with iron ore amounting to 51,199 and man-

ganese ore 33,280 tons continue heavy. Iron ore arrivals include 21,500 tons from Cruz Grande, Feb. 1; 21,800 from the same port Feb. 4; 6700 tons, Whyalla, Australia, Feb. 4; 11,500 tons, Daiquiri, Cuba, Feb. 6; and 7096 tons, Narvik, Sweden, Feb. 7. Other iron ore arrivals included 9101 tons, Narvik, Sweden, Feb. 7 and 11,500 tons, Daiquiri, Cuba, Feb. 9.

Manganese ore arrivals are: 1500 tons, Calcutta, India, Jan. 29; 8850 tons, Rio de Janeiro, Brazil, Jan. 30; 8180 tons, Poti, Russia, Feb. 6;



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and 8150 tons, Poti, Russia, Feb. 7.

Other importations include 1800 tons of Ilmeite sand from Hoilthotam, India; 350 cases of ferromanganese, Yokahama, Japan; 2000 tons of Ilmeite sand, Colachel, India, Feb. 7; 1100 tons of chrome ore from Bolo, Greece; and 17,581 bags magnesite, Trieste, Italy.

Nonferrous Metals

Nonferrous Metal Prices, Page 86

New York—Copper, lead and an-

timony prices advanced sharply last week while tin fluctuated widely. Zinc held unchanged but the market tone was strong. The domestic market was bewildered by the spectacular boom in nonferrous metals in London which carried prices there well above levels prevailing in this country. Producers here reluctantly advanced quotations in order to protect supplies from the threat of exportation. The rise in London was attributed to heavy speculative buying which was stimulated further by the British rearmament program. Actual sales of metals

were restricted due to limited supplies and unwillingness of some sellers to do business below the European level.

Copper—Electrolytic copper advanced 1 cent to 15.00c, Connecticut, while export copper rose to a peak of 17.00c, c.i.f. European ports, but closed around 16.40c. Casting copper soared to 15.75c, f.o.b. refinery. Copper and brass rolled products, brass ingot, copper wire and cable, and scrap prices advanced. The price trend immediately ahead will be determined by developments in the London market.

Lead—Prices jumped \$10 per ton to 6.85c, East St. Louis, the highest level attained since April 25, 1929. Consumer demand was heavy. Refined lead stocks were reported 2080 tons lower at the end of January. Lead pigment, oxide, sheet, and pipe prices advanced.

Zinc—Prime western held strong at 6.80c, East St. Louis. Consumers did not press for metal since they realized that sellers would be able to care for only limited inquiry at current levels. Offerings of nearby metal were extremely tight. Tri-State zinc ore stocks totaled only about 8200 tons at the end of the Feb. 20 week.

Tin—Wide price fluctuations were recorded, reflecting the changes on the London Metal Exchange. Straits spot closed at 54.85c compared with a high of 55.75c and a low of 54.25c for the week. Consumers bought actively around the latter level.

Antimony—Chinese spot jumped to 16.50c, duty paid New York, while futures rose to 14.50c. American metal was quoted nominally higher at 15.75c for spot and 15.50c for futures. The advances reflected higher levels abroad and the general excitement in the entire nonferrous metal market.

Steel in Europe

Foreign Steel Prices, Page 87

London—(By Radio)—Stringency in pig iron and scrap is acute and pig iron exports have been drastically reduced as stocks are practically depleted. Foreign ore prices are rising. Steelworks are booked to capacity, some now booking contracts into third quarter. Tin plate, sheets and galvanized sheets are active in domestic and export trade. New Zealand has placed a contract for 8000 tons of steel rails and Egypt has bought a tonnage of steel for sluice gates.

The Continent reports its steel output inadequate to meet the combined home and export demand and new contracts are therefore limited.

Behind the Scenes with STEEL

No Mystery

OLD Chinese philosophers, they say, practiced the policy of sitting quietly throughout the day, in contemplation of their navels. This seems a bit foolish to us, specializing as we do in contemplation of fire extinguishers, imagining ourselves in some roaring inferno, calmly directing a foamy stream from a nearby extinguisher onto the leaping flames, as women and children flee to safety.

Imagine our surprise, therefore, when we noticed one of the extinguishers hanging near our office carried the strange inscription: ECNARUSNI EXTINGUISHER. Wondering about the identity of Mr. Ecnarusni or the Ecnarusni Co., we set about quietly to track down the mystery of this strange name.

Our efforts received a sad blow, however, when an observant elevator operator said, "Skip it, buddy, that's just the word INSURANCE spelled backwards."

Kipler

DRESS agents, or public relations counsels as they prefer to be called, are always bubbling over with ideas to crack someone's attention—great builder-uppers. The trick seems to be to develop something original and different, something that will wow 'em, something that will lay 'em in the aisles.

One industrious publicity gent we know carries the system even to his own business, each of his letterheads carrying across the bottom this gem from Kipling:

*And they asked me how I did it,
and
I gave 'em the Scripture text,
"You keep your light so shining a
Little in front o' the next!"
They copied all they could follow,
But they couldn't copy my mind,
And I left 'em sweating and steal-
ing
A year and a half behind.*

Can you hear that, up there in the 10-cent seats?

Critique

REMINISCING the other day with one of the country's better-informed steel salesmen, or "peddler" as he styles himself, he related details of the career of a former steel company president, now dead, whose distinctive trait

was a more or less exalted opinion of himself.

After meeting this president for the first time, a certain gentleman was asked by our friend what he

INQUISITIVE CAMERA DEPT. XXIV



THREE hard-working junior members of STEEL'S advertising production staff, these lads—from left to right, Walter Staab, Ed Lewis and Bob Nock—have been associated with the company for three years or less and have come up through the ranks of mailroom assistants.

thought of "the old man." To which came the quick reply, "Well, he appears to be a self-made man with a high regard for his maker."

Phooley

A HECKLER berates us for saying in this department last week that the name of Washington is perpetuated in "a city." Our erudite admonisher says that there are one or more Washingtons in every state in the union; and what about streets, buildings, parks, counties, townships, boats, railroads, rivers and a lot of other stuff?

Nuts, we say, pointing a trembling finger at the indefinite article in our paragraph.

No Splinters

FROM a Baltimore concern comes the abrupt request: "Kindly send us a copy of your magazine. Also a subscription plank."

Maybe they think our subscription planks are hewn from the board of directors.

—SHIRDLU

Students' Bridge Design Contest Judges Selected

Designs in the ninth annual students' bridge design contest sponsored by the American Institute of Steel Construction, New York, will be judged April 20. Judges are Dr. D. B. Steinman and Jay Downer, consulting engineers, Kenneth W. Murchison and Alfred Fellheimer, architects, and F. E. Schmitt, editor, *Engineering News-Record*.

Competition is open to all students of engineering or architecture in technical schools and colleges. Three prizes of \$150, \$100 and \$50 will be awarded for the best designs for a highway bridge to carry a roadway in a straight line over a 300-foot stream, connecting a parkway on high land to the south with a boulevard on a plateau to the north. Proposed bridge would have four lanes 40 feet between curbs, with one five-foot sidewalk.

G. E. Rewards 33 Employees For Extraordinary Service

Thirty-three employees of General Electric Co., Schenectady, N. Y., recently received Charles A. Coffin foundation awards for extraordinary service to the company. Since the establishment in 1922 of the foundation as a tribute to the memory of the company's founder and first president, 484 awards have been made.

Among this year's recipients was Mrs. Sophia Baikusis, widow and mother of two children, who has offered 89 suggestions for improved manufacturing methods, 54 of which have been accepted by the company.

Awards consist of a certificate and cash.

Bicycle Revival Brings Increased Steel Demand

Revival of bicycling during 1936 brought orders for 30,000,000 pounds of steel to mills, estimates the American Iron and Steel institute. This is by far the largest amount of steel ever bought in one year by bicycle makers.

More than 1,200,000 "bikes" were manufactured during the year, which is close to if not actually an all-time record. The total is twice the 1935 output and nearly four times the average number made yearly between 1928 and 1934.

In 1899, the previous record bicycle year, 1,182,700 "bikes" were built, but the weight of steel consumed was far less than the 1936 total because today's streamlined and sturdier bicycle uses much more

steel than the earlier and simpler styles.

About 12½ pounds of steel were enough for one "bike" 50 years ago, but about 25 pounds, mostly tubing and strip steel, go into the rugged frames and streamlined mudguards, headlamps and horns of the up-to-date bicycle.

Compiles Tank Vessel Rules

A 126-page book entitled "Tank Vessels," containing general rules and regulations prescribed by the board of supervising inspectors, just

has been published by the bureau of marine inspection and navigation, department of commerce, Washington. Copies may be obtained from the government printing office, Washington.

"Verity Parkway" Named To Honor Community Leader

Application to the steel business of "Christian principles in which selfish purpose has no place" last week brought public recognition to George M. Verity, founder and chair-

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That **PAYS**

MANIPULATORS

OPEN HEARTH CHARGERS

The smooth speed of these giant electrically operated steel hands shows the outstanding character of Wellman's creative engineering.

Let us solve your charging problems.

WELLMAN PRODUCTS INCLUDE:

Steel Mill Equipment . . . Charging Machines, Cars and Boxes . . . Manipulators . . . Coal and Ore Handling; Bridges . . . Gantry Cranes . . . Special Cranes . . . Clamshell Buckets . . . Car Dumpers, all types . . . Blast Furnace Skip Hoists . . . Gas Producers, Flues . . . Gas Reversing Valves . . . Mining Machinery . . . Safety Stops for Traveling Structures . . . Welded Steel Construction . . . Castings and Machine Work to customers' drawings.

THE WELLMAN ENGINEERING CO.
ENGINEERS CONSTRUCTORS MANUFACTURERS
CLEVELAND, OHIO
WELLMAN
BIRMINGHAM NEW YORK MEXICO CITY

man of the board of the American Rolling Mill Co.

By official proclamation of the city commissioners of Middletown, O., a new three-mile highway traversing the route of the former Miami and Erie canal through the city, was named "Verity Parkway" in recognition of Mr. Verity's leadership in community development and his "pioneer work in promoting harmonious relations between management and employes in the steel industry."

Last June 25,000 citizens turned out to celebrate "Verity Day". Every factory and store in the community closed for the occasion and workmen from steel mills and other industrial plants paraded with business and professional men and women along the parkway that has been named for the town's leading citizen.

Metal Trades Employment Reaches Eight-Year Peak

Metal trades employment in 22 leading cities increased during January to the best level since late 1929, according to the National Metal Trades association.

The January index of 96.2, based

on the 1925-1927 monthly average, compares with 94.4 in December, 79.3 a year ago and 68.3 in January, 1935. Except for an interruption last July, metalworking employment has risen steadily since June, 1935, and somewhat irregularly since the depression low of 46.1 in April, 1933.

Indian Steel Concerns in Merger; New Plant Planned

Merger of the Indian Iron & Steel Co. Ltd., and the Bengal Iron Co. Ltd., both located in Bengal, India, is assured by financing to the extent of £3,750,000 to enable the former to absorb the latter. (STEEL, April 13, 1936, page 26). The Indian Iron & Steel Co. Ltd., has had a working arrangement with the Bengal company since 1925 and now will acquire the entire assets and will redeem bonds of the latter. The Indian company was formed in 1918 and the Bengal company 1919, acquiring the business of a predecessor of the same name which had been in existence since 1890.

Present output of the combined works is 645,000 tons per year and this will be increased to about 790,000 tons per year when the second blast furnace stack of the Bengal

company is blown in. Production costs are the lowest in the world, it is claimed, except for the Tata Iron & Steel Co. Ltd., the only other iron and steel manufacturer in India.

A plan is being considered for formation of a company to build a steel plant adjacent to that of the Indian Iron & Steel Co. Ltd. at Hirapur, India, to take its iron from the latter on contract, thus assuring a steady market. Interests behind this move include Tata Iron & Steel Co. Ltd., Indian Iron & Steel Co. Ltd. and others.

Steel Companies Will Hire 1000 College Graduates

Nearly 1000 college trained men are expected to find jobs in the steel industry when they are graduated this spring, according to estimates by the American Iron and Steel institute.

The number of such youths entering the steel industry this year will be larger than ever before, reflecting expanding operations and increased employment. Most of them will be from technical and engineering schools.

A number of steel companies have organized plans for recruiting college trained men, and have maintained close contacts with universities. Likely candidates are selected from graduating classes. Some companies also will offer opportunities for summer training in mills to undergraduates.

More than 70 per cent of the college men hired by one leading steel company in the past 13 years have held degrees in engineering. The degree most commonly held was that of mechanical engineer.

A large majority of college men want "overalls" jobs at the outset in preference to "white collar" work.

20,000 Green Saplings Used by Steelmakers

Buying a wagonload of green saplings from a neighboring farmer is almost as routine to purchasing agents of some steel companies as buying half a million tons of iron ore.

During 1936 about 20,000 green saplings were consumed by the steel industry, it is estimated by the American Iron and Steel institute. They were used to "pole" or stir molten open-hearth and bessemer steel in order to reduce the amount of carbon present in the steel.

Saplings used are from 16 to 20 feet long, and from three to four inches in diameter at the butt end.

New 13oz.

WELDIT

MODEL W

WELDING TORCH

with *BUILT-IN Automatic GAS AVER*

SAVES fuel—reduces welding cost—eliminates idle flame hazards. As operator grasps handle of torch placing thumb on lever in natural position, full welding flame is instantly on. Release thumb, and automatically flame is reduced to pilot size. No re-lighting or re-adjusting flame between welds. Weighs only 13 ounces, no mechanism in handle, fuel control valves are conveniently located in front of torch handle. Actual savings will soon pay for torch.

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Automatically ON IN USE

Automatic LEVER CONTROL GAS AVER

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Elm, ash, oak and hickory saplings are most generally used.

Stirring molten steel with green saplings produces a violent boiling agitation in the steel as carbon in the sapling and oxygen in the metal react chemically. This agitation mixes the steel thoroughly with the layer of molten limestone or slag floating on top of the steel, and the excess carbon absorbed in the slag.

River Freight Traffic Increases 25 Per Cent

Pittsburgh's three rivers carried 25 per cent more freight during 1936 than during the previous year, according to a tabulation by the United States engineer's office.

Last year's total was 39,733,020 tons of freight, compared with 30,344,405 tons in 1935. Two-thirds of the traffic, mostly for steel mills, was carried on the Monongahela river.

The 25 per cent increase was recorded despite the fact river activity was hampered during last February and March by flood conditions.

1936 Electricity Output Sets All-Time Record

Total production of electricity for public use in the United States in 1936 is estimated at 113,473,000,000 kilowatt hours, an increase of 14 per cent over the previous maximum, set in 1935, in an analysis by the federal power commission.

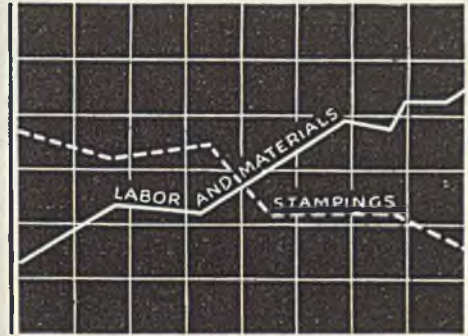
Of the total, 40,893,000,000 kilowatt hours, an increase of 2 per cent over 1935, were produced by use of water power, indicating that despite the drought water power held its relative position with other sources of power. Preliminary data indicates fuel rate for 1936 will be about 1.45 pounds per kilowatt hour compared to 1.46 pounds in 1935.

Stahleker Steel Corp., Cambridge, Mass., jobber in iron and steel rolled products, welding rods and related products, has doubled its warehouse capacity and now is installing the machinery for cutting steel plates to sketch, additional cranes and other equipment.

Equipment

Chicago—Machine tool inquiries are more numerous following slight lull and while February sales were under January, volume was comparable to late 1936. A few small inquiries are pending for railroads, including the Milwaukee and Santa Fe. Most activity, however, is on

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Highly personalized, Brighton service is flexible enough to match your size and fit your needs—no matter how large—no matter how small.

Bank on Brighton's 33-year-old record in the Steel Industry—place your next order with Brighton and get the extra dividend of personal service.

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New Brighton, Pa.

(Pittsburgh district)

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Since 1903

the part of miscellaneous users. Machine tool deliveries are no better, heavy sales of the past 90 days offsetting gains made in production. Price advances on most machine

tools now are in effect, one exception being hacksaws which will rise 10 per cent, effective March 1.

Cleveland—Although post-strike caution retarded machine tool and

equipment inquiries and sales last week, a fair volume of business in presses, lathes and scattered items for diversified industries was reported. Several new inquiries were circulated near the end of the week. Deliveries remain slow, especially from Cincinnati district.

Seattle—Inquiries increase as weather conditions improve. Logging and lumber industries are active and making replacements. Mining equipment and electrical machinery are in good demand. Diesel engine plants are busy. Tacoma, Wash., will open bids March 1 for electrical equipment. Puget Sound Power & Light Co. is extending substation at Beverly Park, Wash., to house a 25,000 kilowatt condenser.

Construction and Enterprise

Ohio

AKRON, O. — Mechanical Mold & Machine Co. is taking bids for construction of a 1- and 2-story, 120 x 170-foot machine shop at 946 South High street, estimated to cost \$60,000. H. M. Glazier, 634 East Buchtel avenue, is engineer.

ELYRIA, O. — Timms Spring Co., W. B. Timms, president, plans construction of a 1-story, 60 x 200-foot factory and office building, estimated to cost \$40,000. Silsbee & Smith, Turner block, are architects.

GALION, O.—City council has authorized Service Director Jay F. Nichols to ask bids for two boiler feed pumps with sufficient capacity for feeding 3000-horsepower boiler at municipal power plant.

LEWISBURG, O.—Village is considering construction of a sewage disposal plant to cost \$60,000, of which village would supply \$15,000, to be raised through bonds. Engineer is Steller Engineering Co., Dayton, and R. G. Sever is city attorney.

MINERVA, O.—Village plans to purchase a turbine pump for its waterworks plant. J. H. Lippincott is village clerk.

NEW WASHINGTON, O.—Village is taking bids, due noon, March 5, for construction of a water treatment plant. W. E. Kibler is clerk of board of public affairs, Municipal building, and Jennings-Lawrence Co., 538 Rowlands building, Columbus, is engineer.

POMEROY, O.—Meigs Water Co., Kerr's Run, plans to repair flood damage, and water plant will be electrified and a new filtration system built.

RIPLEY, O.—Village waterworks and light plant were severely damaged by the recent floods and will be rebuilt. Charles Lemon is superintendent.

Michigan

ANN ARBOR, MICH.—City is taking bids March 15 for construction of a water softening and purification plant.

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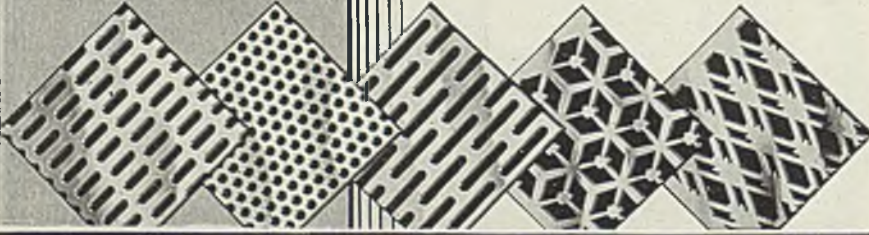
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—Construction and Enterprise—

Russell A. Dodge is president of the board of water commissioners, and engineers are Ayres, Lewis, Norris & May, 506 Wolverine building.

ECORSE, MICH.—Bowen Products Corp., 2760 West Warren street, Detroit, plans to install motors and controls, electric hoists, conveyors, transformers, accessories and other equipment and new 1-story metal stamping works at Ecorse. Cost will be over \$500,000. Christian W. Brandt, Madison Theater building, Detroit, is architect.

KALAMAZOO, MICH.—Peter Eckrich & Sons Inc., meat packer, plans installation of electric power equipment in new plant addition costing \$130,000. Company headquarters are at Fort Wayne, Ind.

Pennsylvania

BEAVER FALLS, PA. — Babcock & Wilcox Tube Co. will take bids March 5 for a 1-story, 300 x 900-foot manufacturing plant on Morado street, estimated to cost over \$40,000.

NEWCASTLE, PA.—Pennsylvania Power Co., Youngstown, O., plans construction of a steam-operated electric generating plant on a site acquired in Newcastle. Transmission lines in the vicinity will also be extended. Total cost will be nearly \$2,500,000.

New York

BROOKLYN, N. Y. — Sicilian Asphalt Co., Brant street and Paige avenue, will alter its asphalt manufacturing plant at a cost of \$150,000. Architect is A. Schwartz, care of the company.

BUFFALO, N. Y. — National Aniline & Chemical Co., Abbott road, is taking bids for construction of a factory addition estimated to cost \$40,000.

DUNKIRK, N. Y.—Van Raalte Co. Inc. will install electric power equipment in addition to local silk mill, 65 x 150 feet. Cost will be close to \$100,000. Company main offices are at 295 Fifth avenue, New York.

JOHNSON CITY, N. Y. — City plans to build a sewage disposal plant cost-

ing \$60,000, as recommended by C. A. Holmquist, director of state board of health, State building, Albany.

ROCHESTER, N. Y. — Delco Appliance Corp., 379 Lyell avenue, will take bids in April for a 5-story manufacturing plant costing \$150,000.

New Jersey

MANVILLE, N. J. — Johns-Manville Co., 22 East Fortieth street, New York, plans to build additions to its plants at a cost of \$1,232,000, to be financed by stock issue.

SOMERVILLE, N. J. — City has postponed consideration of bids received Feb. 5 for construction of a sewage disposal plant estimated to cost around \$210,000, and bids will be asked again. Remington & Goff, 509 Cooper street, Camden, are engineers.

Rhode Island

WOONSOCKET, R. I. — Argonne Worsted Co., 148 Hamlet avenue, is taking bids for a 1-story power plant costing \$40,000.

Connecticut

DERBY, CONN.—Derby Gas & Electric Co. is arranging a fund of about \$260,000 to finance improvements and extensions to its properties in 1937, to include construction of a generating plant, power substations and transmission lines.

HARTFORD, CONN.—Hartford Electric Steel Co., 540 Flatbush avenue, plans installation of electric power equipment in 1-story addition to local mill, at a cost of over \$50,000.

MIDDLETOWN, CONN.—Connecticut Power Co., V. E. Bird, president, 366 Pearl street, Hartford, plans to build a 66,000-volt power substation costing \$300,000.

STAMFORD, CONN. — Connecticut Power Co., 366 Pearl street, Hartford, plans construction of a power substation costing \$275,000.

WEST HARTFORD, CONN. — Pratt & Whitney division of Niles-Bement-



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Some bearing metals carry sharp projections (like microscopic mountains) and these do NOT present good bearing surfaces simply because they do not hold the lubricant.

Cadman Metals are different, minute recessions (like the lake above) carry a soft matrix, forming an ideal turning surface.

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Pond Co., C. R. Burt, president, Hartford, has acquired 110 acres on North Park avenue, and will build a plant costing over \$40,000.

Massachusetts

BOSTON—Commonwealth Ice & Cold Storage Co., 220 Northern avenue, plans construction of an 8-story, 100 x 240-foot plant which is estimated to cost \$750,000 with equipment. Thomas D. MacInerney is company engineer in charge.

WEBSTER, MASS. — City plans to build a sewage disposal plant costing \$40,000, and Fay, Spofford & Thorn-dike, 11 Beacon street, Boston, are en-

gineers.

Illinois

CHICAGO — Chicago Flexible Shaft Co., 5600 West Roosevelt road, plans to construct a 1-story plant addition costing \$50,000 at 228 North LaSalle street.

CHICAGO — A. B. Dick Co., 720 Jackson boulevard, will take bids in March for a 5-story, 165 x 175-foot plant addition estimated to cost \$500,000. Nimmons, Carr & Wright, 33 North Michigan avenue, are architects.

WAUKEGAN, ILL. — Johns-Manville Corp., 22 East Fortieth street, New York, plans to make improvements to

its local plant, at an estimated cost of \$273,000, to be financed by issue of stock.

Indiana

INDIANAPOLIS — Indiana Farm Bureau Co-operative association, 309 West Washington street, plans to install electric power equipment in its proposed oil refining plant at Kentucky avenue and Henry street. Work will begin in the spring and is expected to cost over \$150,000.

ST. JOE, IND. — City plans construction of a waterworks system costing \$42,500, and Lennox & Matthews, 537 Architects and Builders building, Indianapolis, are engineers.

Maryland

HAGERSTOWN, MD.—Potomac Edison Co. has been allotted \$172,000 by REA for erecting 160 miles of rural transmission lines in Hardy and Hampshire counties, W. Va.

Florida

JACKSONVILLE, FLA.—National Container Corp., Starr and Review avenues, Long Island City, N. Y., plans to build a \$3,275,000 pulp and paper plant in Jacksonville. Samuel Kipnis is president.

Georgia

WAYS, GA.—Ford Motor Co., Detroit, will build an automobile parts factory on the Ogeechee river, 19 miles from Savannah, Ga., and preliminary plans are being prepared.

Kentucky

SPRINGFIELD, KY.—REA has allocated approximately \$315,000 for erection of rural lines in Washington, Nelson, Bullitt and Spencer counties, and a diesel power plant may be built.

Louisiana

OPELOUSAS, LA.—City plans to purchase a \$75,000 electric generating unit for the municipal light plant. Dave Holler is mayor.

SHREVEPORT, LA. — Bird & Son Inc., East Walpole, Mass., plans construction of a roofing manufacturing plant costing \$200,000.

SHREVEPORT, LA. — Compound Industrial Gases Inc., 221 North LaSalle street, Chicago, plans construction of a plant costing between \$50,000 and \$60,000.

Mississippi

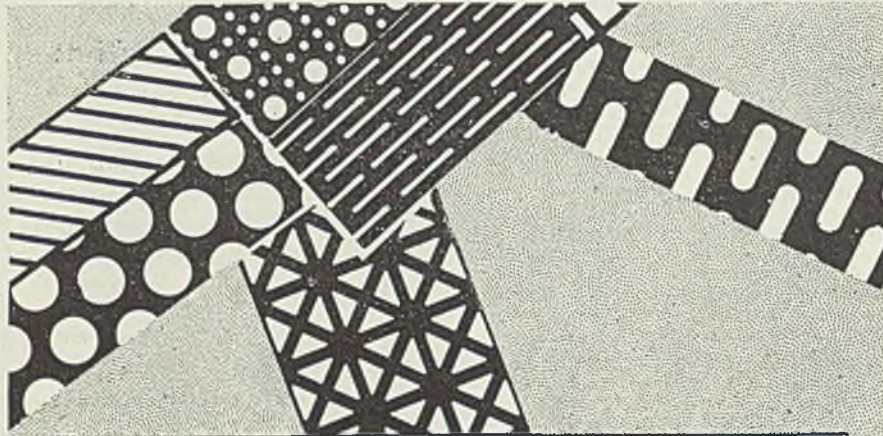
JACKSON, MISS.—REA has allotted \$100,000 for rural electrification lines in Marshall, Pontotoc, Union and Lafayette counties, power to come from TVA.

NEW ORLEANS—Sewerage and water board, City Hall, is taking bids for construction of an auxiliary pumping station at the Panola street plant, at a cost of \$220,000.

NEW ORLEANS—American Mfg. Corp. Inc., 334 Chartres street, has leased portion of a building at 1020 Constance street and will make improvements and install additional machinery. C. N. Epstein is correspondent.

North Carolina

CHARLOTTE, N. C.—Armour & Co. present plant 301 East Fifth street, is reported planning to erect another \$200,000 packing plant and warehouse.



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BRIDGEPORT CONN.



CHARLOTTE, N. C.—Dayton Rubber Mfg. Co., Dayton, O., with branch plant in Charlotte on West Morehead street, has acquired the former McClaren tire plant, West Palmer street, and will consolidate all manufacturing activities there.

OXFORD, N. C.—J. T. Doster Sr., 2707 Hanover Circle, and B. B. Burton, 2511 Aberdeen road, Birmingham, Ala., have acquired the plant of the Oxford Ice & Milling Co., and will install new machinery and operate it as the Oxford Ice & Fuel Co.

SPRAY, N. C.—Carolina Cotton & Woolen Mills Inc. plans installation of electric power equipment in two multi-story additions to its local mills, and in a 2-story addition at Draper, N. C. Cost will be about \$300,000. Company is operated by Marshall Field & Co., Chicago.

Tennessee

CHATTANOOGA, TENN.—Combustion Engineering Co., 1032 West Main street, will spend \$175,000 for improvements to its Hedges-Walsh-Weldner boiler plant, and will install heavier crane equipment.

MEMPHIS, TENN.—Memphis Light & Water Co., Goodwyn Institute building, will ask bids in several weeks for construction of South Gateway electric substation.

MEMPHIS, TENN.—Lehon Co., South Oakley avenue and West Forty-fourth street, Chicago, plans installation of motors and controls, conveyors, electric hoists and regulators in new branch asphalt roofing manufacturing plant to be built in North Memphis. Cost is estimated at \$175,000, and A. G. Leonard is president.

NASHVILLE, TENN.—Washington Mfg. Co., 208 Public Square, has leased a building from the Sain Mfg. Co., and will install new machinery.

Missouri

KANSAS CITY, MO.—Brown-Strauss Corp., 1446 Gulnotte avenue, plans to install electric power equipment in connection with extensions and improvements to its structural steel fabricating plant. Electric hoists and other handling equipment will also be needed. Cost will be about \$75,000.

ST. LOUIS, MO.—Mississippi Valley Equipment Co., dealer, Chamber of Commerce building, is in the market for a vertical diesel engine, 200-horsepower, 3-cylinder, with or without generator; a steam engine generator set, 400-kilowatt, alternating current; and an oil engine, 100 or 120-horsepower.

Oklahoma

ENID, OKLA.—Pepper Gasoline Co. plans to build a natural gasoline plant at Fiftieth and Lincoln streets, Oklahoma City, to cost about \$50,000.

OKLAHOMA CITY, OKLA.—Phillips Petroleum Co., Bartlesville, plans to build two gasoline absorbers at its Twenty-seventh street pumping station, at a cost of about \$30,000.

Texas

AMARILLO, TEX.—Shell Petroleum Corp., Shell building, Houston, and Sinclair Prairie Oil Co., Sinclair building, Tulsa, Okla., will construct a gasoline plant in Moore county. Daily output will be 20,000 gallons of gasoline and 65,000,000 cubic feet of sour gas will be processed daily.

DALLAS, TEX.—Willard Storage Battery Co., P. H. Voth, equipment engineer, plans to erect a plant at Maple and Norwood streets, to be 2-story, 130 x 300 feet. E. C. Martin is architect, 4906 Reiger street.

GREENVILLE, TEX.—Texas State Rural Electrification board has been allotted \$170,000 by REA for erection of 180 miles of rural transmission lines in Hunt and Collins counties.

HOUSTON, TEX.—Houston Milling Co. will start immediate construction on a \$220,000 expansion program at Manchester Docks. J. T. Best is production manager.

VAN ALSTYNE, TEX.—G. V. Bray, Celina, Tex., is temporary chairman of proposed farm electric project for Collins and Grayson counties, and a REA loan will be sought. Engineers are Hawley, Freese & Nichols, Capps building, Fort Worth.

WACO, TEX.—Tri-County Electric Co. has been allotted \$360,000 by REA for erection of 400 miles of rural lines in Hunt, Rains and Hopkins counties.

Wisconsin

EAU CLAIRE, WIS.—Eau Claire county board is considering plans for immediate construction of a new county headquarters building to replace the shop and warehouse which was damaged by fire recently.

GREEN BAY, WIS.—Green Bay Soap Co., E. A. Meyer, president, plans construction of a power plant in connection with its new plant addition. Equipment needed includes two boilers, 150-horsepower each, stokers, and a generating unit.

KAUKAUNA, WIS.—Fox River Machine Co. plant was damaged by fire recently, and repairs will be made at once. Daniel McCarty is secretary.

MADISON, WIS.—Gudgeon-Wemmer Mfg. Co. has been incorporated to manufacture pumps and other automobile parts and accessories, by S. A. Gudgeon

and J. B. Wemmer, of La Farge, Wis. Plans are being made for leasing and equipping a machine shop in Madison.

MILWAUKEE—Hell Co., 3000 West Montana street, maker of motor truck tank and hoist equipment and other utility products, has given general contract for construction of a 1- and 2-story shop extension, 95 x 335 feet, to Klug & Smith Co., 111 East Wisconsin avenue.

WAUKESHA, WIS.—General Malleable Corp. plant was damaged recently when boilers and annealing ovens exploded as flood waters swept into the plant. Repairs will be started at once. L. K. Harkrider is president and general manager.

WAUSAU, WIS.—Marathon Rubber Products Co. will build a 1-story, 60 x 87-foot addition. Architects are Oppenhamer & Obel, Wausau.

Kansas

GOODLAND, KANS.—City plans construction of a complete new light plant and distribution system at a cost of \$200,000. E. T. Archer & Co., 609 New England building, Kansas City, Mo., is engineer.

North Dakota

HATTON, N. DAK.—City will vote on bond issue in March for financing construction of proposed municipal waterworks system. J. A. Tele is clerk.

MANDAN, N. DAK.—City plans to construct a filtration plant costing \$110,000, with WPA aid. E. R. Griffin is city engineer.

South Dakota

ELK POINT, S. DAK.—Union County Rural Power Co., Elk Point, has been allotted \$105,000 by REA for erection of rural power lines in Union county.

HARTSVILLE, S. C.—Sonoco Products Co. plans to install motors and controls, regulators, conveyors, and other equipment in 1- and 2-story additions to its paper board products plant, to be 60 x 325 feet and 125 x 425 feet, respectively. A new steam-electric power plant will

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also be built. Entire cost will be about \$500,000.

NISLAND, S. DAK.—City has applied to PWA for aid in financing proposed waterworks system construction. E. Matson is city clerk.

Iowa

ANAMOSA, IOWA—Jones County Rural Electrification Co-operative has applied for permission to erect rural lines in Jones and Jackson counties at a cost of about \$210,000. K. R. Brown, Rockford, Ill., is engineer.

DAVENPORT, IOWA—Eastern Iowa Light & Power Co-operative has been allotted \$100,000 for erection of 100

miles of rural transmission lines. H. J. Strong, Davenport, is manager.

HOPKINTON, IOWA—City is taking bids until March 15 for construction of a complete power plant and distribution system. A. W. McDonald is city clerk, and A. S. Harrington, 503 Baum building, Omaha, Nebr., is engineer.

KNOXVILLE, IOWA—Veterans administration, Arlington building, Washington, is taking bids March 23 for construction of a boiler plant and installation of equipment.

Nebraska

BEATRICE, NEBR. — Black Bros. Flour Milling Co. plans to rebuild its

burned mill and elevator. Cost is estimated at \$150,000.

LINCOLN, NEBR. — Chicago, Burlington & Quincy Railroad Co., A. W. Newton, chief engineer, 547 West Jackson boulevard, Chicago, plans to reconstruct its live steam plant at a cost of \$150,000.

Wyoming

BASIN, WYO.—Greybull Valley Power Co-operative Inc., recently organized, plans to construct an outdoor substation and erect rural transmission lines, financing to be arranged through federal aid. Cost will be about \$105,000.

GARLAND, WYO.—Garland Light & Power Co. has been allotted \$50,000 by REA for construction of rural transmission lines in Park county.

WORLAND, WYO.—Washakie Rural Electrification association has been allotted \$50,000 by REA for erection of rural power lines in Washakie county.

Pacific Coast

LOMPOC, CALIF. — Johns-Manville Corp., 22 East Fortieth street, New York, plans to make improvements at its local plant at a cost of \$81,000.

LOS ANGELES—Square D Co., 1318 East Sixteenth street, will build a 60 x 110-foot addition. Architects are John C. Austin and Frederic M. Ashley, Chamber of Commerce building.

LOS ANGELES—Swift & Co., Union Stock Yards, Chicago, plans to install controls, conveyors, regulators, accessories and other equipment in new multi-unit packing plant at 3750 Jewel avenue, which will cost nearly \$1,000,000. Company engineering division, Chicago, is in charge.

REDDING, CALIF. — City plans to apply to PWA for a grant of \$153,800 as part of cost of construction of municipal waterworks system which is estimated to cost \$364,000. Bonds will be issued for the remainder.

ROSAMOND, CALIF. — Western Barium Corp., Russ building, San Francisco, has purchased 55 acres where a new barium refining plant will be built soon.

WHITTIER, CALIF.—Howell Foundry has been established at 718 West Penn street, and Henry W. Howell, 419 West Newmark street, Monterey Park, Calif., is correspondent.

EVERETT, WASH. — Puget Sound Power & Light Co. is building an addition, 40 x 50 feet, to its Beverly Park substation, to house a 25,000-kilowatt condenser.

LUCERNE, WASH.—Chelan Copper Mining Co., John P. Lee, chief engineer, plans immediate construction of a concentration mill. A diesel electric railroad will be constructed to handle 100 tons of concentrates daily.

NEHALEM, OREG.—Nehalem Valley Hydro-Electric association has retained W. R. Gracie, Portland, to prepare plans for an electric system, for which REA has granted \$65,000.

PORTLAND, OREG.—Pacific Fence & Wire Co. will construct a factory. E. Kroner is architect.

PUYALLUP, WASH.—Brew Mfg. Co. whose wood working plant was recently damaged by fire, will rebuild at once. The company also plans to construct a reinforced concrete warehouse at Sumner, Wash.

Canada

FORT FRANCES, ONT.—Plant of Russell Bros. Ltd., boat and engine manufacturers, was damaged recently by fire.

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