

STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE
For forty-eight years—IRON TRADE REVIEW

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400,000 POUNDS

—AND THEY CALL
IT A

“Butterfly”

*That's the scale they do
things on at Boulder Dam*

OF COURSE, it's not just *size* that counts, when you're deciding what metal to use to carry out the design for a job like the butterfly valves at Boulder Dam. Every ounce of metal used had to have the stamina to withstand the onset of tons of water for a generation or longer.

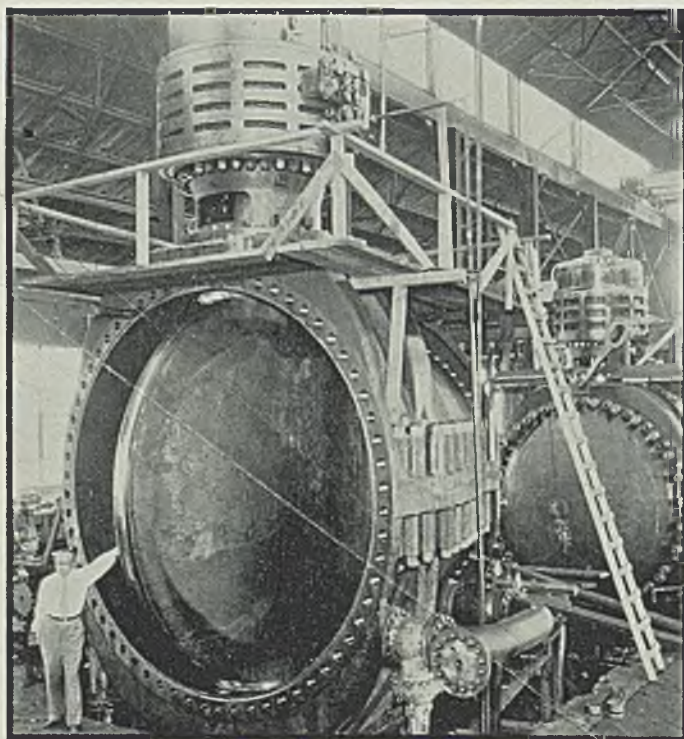
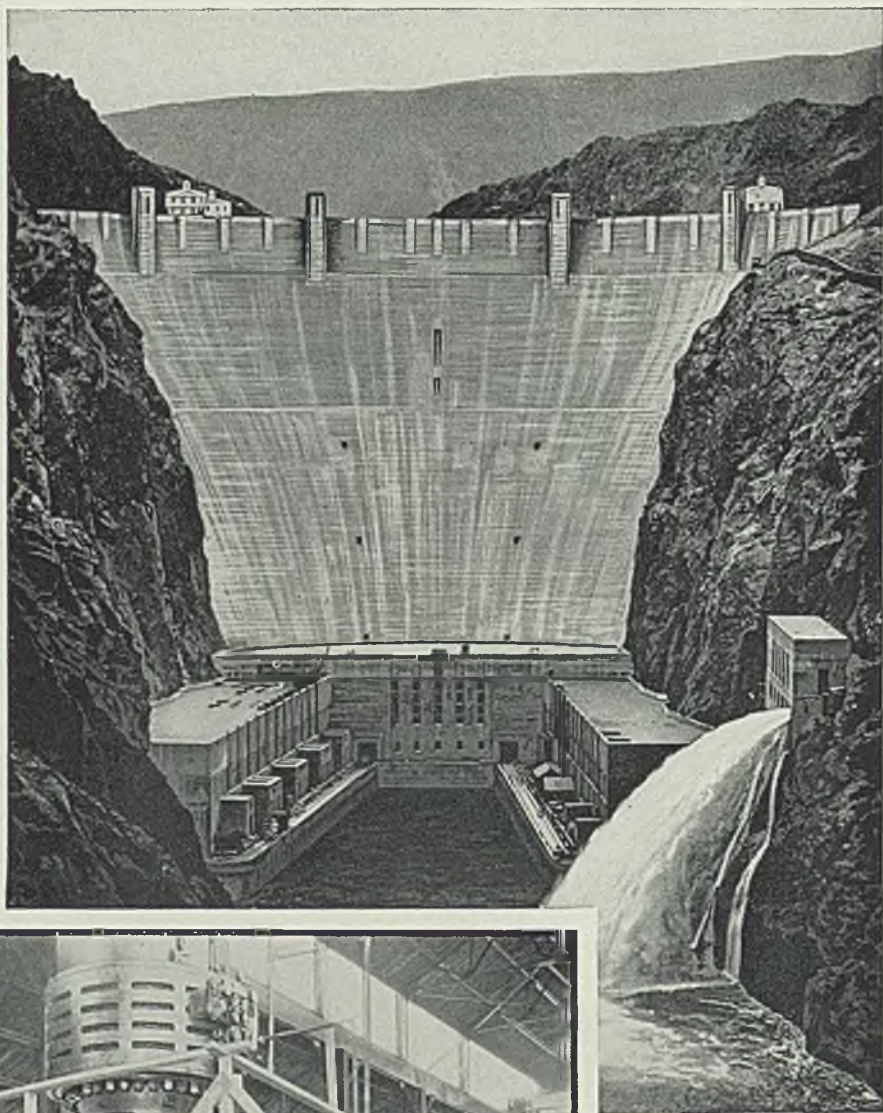
But size does matter—in more ways than one. It's more difficult to keep uniformity of grain texture, to hold the vital toughness, when your castings are 168 inches diameter, like this one. And think of the enormous cost of repairs and replacements . . . the engineers had to choose metals that would need none for years.

To assure these results, six 168-inch valves like this one were specified of a Nickel Alloy Steel, cast to this composition:

Carbon 0.25—0.35%
Manganese . . 1.00% max.
Silicon 0.40%
Nickel 1.00—1.50%

With this analysis, the valves show a minimum tensile strength of 75,000 p.s.i., and a yield point of 50,000 p.s.i.

Main holding bolts require somewhat different properties, which Boulder Dam's engineers supplied with S.A.E. 2340, a 3½% Nickel Steel. Let the Inco engineers apply their wide experience to help you find the best type of Nickel Alloy Steel to fit your particular needs.



● One of six 168-inch butterfly valves for Boulder Dam, weight 400,000 pounds. These were made by Hardie-Tynes Mfg. Co., with Nickel Steel Castings containing 1 to 1.50% Nickel supplied by the Eric Forge Co.

NICKEL ALLOY STEEL

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL ST., NEW YORK, N. Y.

As the Editor Views the News

IN RECENT weeks a number of sizable government jobs have gone begging because manufacturers, contractors and others have evidenced slight interest in bidding for the work. The stumbling block in most cases is the Walsh-Healey act, which provides that certain hours and working conditions prevail in plants which receive government contracts amounting to \$10,000 or more. The stipulations are such that few employers could abide by them without demoralizing their existing organizations or reducing efficiency to the point where no jobs would be profitable. The act is a fine illustration of legislation prompted by worthy social motives but which fails to accomplish its objective.

One of the provisions of the law is that workmen in plants producing goods sold to the government shall not work more than eight hours a day or more than 40 hours a week. Under conditions prevailing today in many divisions of industry it is impossible to hold to arbitrary limits in working schedules without losing work. Some employers are trying to increase from one to two or from two to three shifts per day, but cannot do so because qualified men are not available. Here is a situation where efforts of employers to spread work are defeated through no fault of theirs.

Walsh-Healey Act Futile

The Walsh-Healey act, like the Bacon-Davis and other acts intended to control hours and working conditions by indirection (p. 20), already has proved ineffective. Not only that, but it has brought confusion into government contracting to the point that some federal departments are asking to be exempted from the effect of the law. In other words, the act not only has proved to be a poor agency for establishing arbitrary hours and conditions but it also has interfered with

Laws Should Be Flexible

the routine of government purchasing. This probably is a fair indication of the fate that eventually will overtake many of the hastily drawn "emergency" laws. They were drafted to fit situations which do not now exist or have been changed so radically that the legislation has become impracticable. The best laws are those which are flexible enough to bridge economic changes.

In view of the attention now being given to labor relations, the question of wage incentives has a timely importance. Inland Steel Co. considers that the installation and successful operation of a bonus incentive method of wage payment has been responsible for approximately 40 per cent of the reductions made in its maintenance and repair costs since 1924. The account of how this system (p. 36) was set up, how it operates and what it has accomplished will prove interesting and suggestive to many officials who are confronted with difficulties in maintenance. The fact that about 80 per cent of Inland's repair and maintenance work is performed on incentives shows that the method lends itself to broad application.

Wage Incentive Timely Topic

Robert E. Kinkead offers some seasonable suggestions (p. 48) for preparing welding shops for next year's business. He points out that the acquisition of new men, working of extra shifts, etc. will tend to slow up the rate of production per man and in some cases "over-balance the economies which naturally may be expected from having plenty of work to do." This condition applies to many plants in the metalworking field today, and will be accentuated even more in 1937. Planning to avoid delays and confusion will pay dividends in the coming months. Preparedness for real prosperity is the big job ahead, and, appropriately, that is the theme of our next issue, The "Yearbook of Industry" number, Jan. 4.

Get Ready For 1937!

May yours be a happy and prosperous New Year

E. L. Shaner

Steel Forecasts Cheerful, Tempered by Labor Question

FORECASTS for 1937 in steel and the metalworking industries reveal a widespread opinion that the year will extend the upward trend in production, with the qualification in nearly every instance that much will depend upon the labor situation.

Unlike a year ago, when predictions were made of gains ranging from 10 to 50 per cent in steel output for 1936, this time there appears to be a dearth of specific figures, and statements are coupled with references to uncertainties in respect to what may be done at Washington, as well as to what labor may attempt to do.

Discussing the labor outlook last week Secretary of Commerce Roper said: "It will take considerable disturbance to interfere materially with the very strong movement to higher business levels that are quite evident in every section of the country."

In the steel industry itself it is felt that there is no immediate prospect of a strike. Only 8 per cent of some 3000 steel employe representatives so far have been assembled in the CIO "representatives' council." If there is any slowing in production in the early months of 1937 it is felt that it will result indirectly from labor's drive in the automobile industry.

The most cheerful forecasts come from manufacturers of industrial equipment.

"Unprecedented Demand"

"Makers of steel mill equipment and other industrial facilities are facing an almost unprecedented demand for their products in the new year," says Frank Cordes, president, Blaw-Knox Co., Pittsburgh.

"Steel, like many other industries, dropped far behind in maintenance and improvement work during the lean years. Now that the volume is expanding rapidly, they are finding that more modern facilities would be advantageous.

"While the steel industry has been operating in the neighborhood of 75 per cent of its theoretical capacity, it actually is working close to its practical capacity. Present day requirements of steel consumers are so exacting that the industry cannot work much closer to its theoretical volume than it did in the latter part of 1936.

"Realization of this has already

been seen in the sharp spurt in purchasing of rolling mill rolls as well as entirely new equipment, in addition to the great wide strip mill installations started during the year.

"The next important development will be the building of additional open-hearth furnace capacity and improvement of existing open-hearth furnaces, and this will be reflected to a marked extent in the business of companies making this type of equipment.

"It is expected that the nation's utility companies will engage in large expansion programs. This industry is expected to spend from 15 per cent to 20 per cent more in 1937 than in 1936. The rising demand for electric power is straining facilities, and this branch of the utility industry is expected to spend about \$400,000,000 for new buildings, transmission lines, and power house equipment. This would represent a gain of 40 per cent over the volume in 1936.

Railroad Purchases Increase

"The railroads also are finding their capacity overtaxed and have resumed purchases of rails and rolling stock in substantial volume.

"While all construction still is far below its former peak, it has shown impressive gains over 1935, and it would be natural to assume that the continuation of these gains will result in the purchase of more steel and equipment, such as excavating machinery, concrete mixing machinery, and allied lines.

"Construction costs have been soaring. A shortage of skilled labor is widely anticipated, and both skilled and unskilled wage rates have increased. This feature alone is moving the equipment manufacturer into a more strategic position,

Germany Trading Steel For Egyptian Onions

*E*GYPTIAN onions for German steel is a late development of the effort of the Nazi government to solve the food problem. Krupp's, the great steelworks at Essen, is furnishing steel for a bridge across the Nile and has arranged to accept large quantities of Egyptian onions as part payment. The onions will be shipped to Germany to add to food supplies.

since money will be spent for facilities to save time. The ratio of equipment purchases to construction volume will likely rise since we are in a rising market for construction services. While expenditures for public works probably will continue at about the level of 1936, a continuation of the increased rate of activity in private work is to be expected.

"The rising trend of receipts from motor vehicle fees and gasoline taxes appears likely to justify increased highway budgets, which will be further helped by federal aid for 1937 highway work provided by the last congress.

"The improvement gained so much momentum in 1936 that this impetus will carry over into the new year."

EXPECT 25 PER CENT GAIN IN PITTSBURGH STEEL LOADINGS

A 25 per cent increase in the number of cars needed for first quarter iron and steel shipments is forecast by the Allegheny (Pittsburgh) regional advisory board. Members estimate they will need 165,590 cars for iron and steel freight originating in the district, against 132,472 used in the first quarter of 1936.

The forecast for 37 commodities of various kinds estimates a 13.8 per cent carload requirement increase over the first quarter last year.

The principal gain is calculated in beehive coke, where a 220 per cent carload increase is expected.

All but four of the 37 commodity classifications anticipate larger needs. The ones which expect a moderate decline are slag, stone products, paving brick, and sanitary ware. Substantial improvement is expected in coal, by-product coke, iron and steel scrap, castings, machinery and boilers, aluminum and electrical goods.

Employment Highest For November Since 1929

Metal trades employment in 22 leading cities increased during November to the highest level for that month since 1929, according to the National Metal Trades association. Last month's index of 93 compares with 91.9 in October and with 77.4 in November.

Not since the middle of 1930 has the November average been exceeded. The low mark of the depression was 46.1 in April, 1933. While most centers reported increased employment last month, sharpest gains occurred at automotive manufacturing centers.

Steel Output Overtakes 1929; Nears Ingot Capacity

A GREATER tonnage of steel ingots has been produced in the last quarter of 1936 than in the same period of 1929.

During the latter half of 1929 production felt the first ripples of depression and tonnage began to yield from the high marks of the mid-year. Recently the industry has been feeling the upward impulse of strong demand and total monthly figures are exceeding those of 1929. Output in November and again in December was not far below the best monthly figure of 1929.

Although the steelworks operating rate recently has been 79½ per cent of 1936 capacity, on the basis of capacity as it existed in 1929 this rate would be 88.6 per cent.

How the 1936 production of steel ingots has been climbing to gradually overtake the corresponding months in 1929 is shown in the accompanying table.

Rapid shift of steel demand from heavy to light finished products has brought a problem to steelmakers. Capacity for rails, structurals, heavy plates and similar products has been and still is moderately occupied while mills producing sheets and strip are being pushed to capacity.

A study of the steelworks oper-

ating rates of various districts as presented in STEEL shows that mills in the Detroit, Cincinnati, Wheeling and Buffalo districts, largely equipped for producing light steel and with relatively little heavy capacity, have been operating at 84 to 100 per cent. Mills in eastern Pennsylvania, Pittsburgh, Chicago, Youngstown and Birmingham, in which considerable part of the rolling capacity is designed for heavy

Ingot Output, 1929, 1936

	Gross Tons	
	1929	1936
June	4,881,370	3,984,845
July	4,838,098	3,922,731
Aug.	4,927,258	4,195,130
Sept.	4,510,879	4,161,108
Oct.	4,511,650	4,545,001
Nov.	3,513,025	4,337,412
Dec.	2,737,264	*4,654,000

*Estimated.

products, are active to about 75 per cent of capacity.

Steelmakers in the latter districts are faced with the problem of ingot capacity in excess of equipment to finish it into sheets and strip. With mills which turn out these products

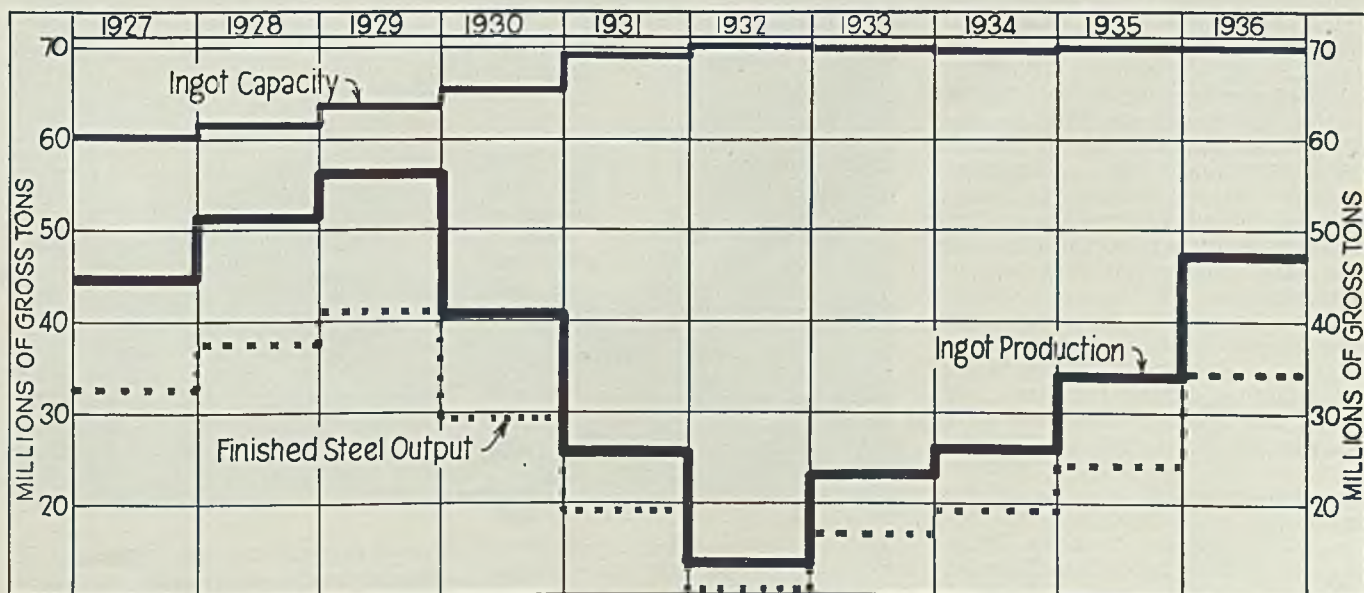
operating at full capacity they still are unable to consume ingots to the full measure of their open-hearth equipment.

As an answer to this they are building mills of the continuous type to absorb more open-hearth tonnage. Bethlehem Steel Co. is building a hot strip-sheet mill at Sparrows Point, Md.; Carnegie-Illinois Steel Corp. a strip mill at Homestead, Pa.; Jones & Laughlin Steel Corp. at Pittsburgh; Youngstown Sheet & Tube Co. at Campbell, O.; Republic Steel Corp. at Cleveland; American Sheet & Tin Plate Co. at Gary, Ind.; Granite City Steel Co. at Granite City, Ill. The total capacity of these new mills is about 4,600,000 tons per year, which will go far toward absorbing excess ingot capacity.

However, there is promise of increased demand for heavier steel. Since Nov. 1 railroads have placed more than 500,000 tons of standard steel rails, with heavy tonnages to follow shortly. This will give rail mills tonnage to work on for several months. The rail orders have been well distributed among the five producers.

The steel industry evidently does not feel that its present ability to produce steel ingots will be sufficient for coming years and some movement is being made toward greater capacity to meet the need when it appears. To this end Great Lakes Steel Corp., Detroit, has installed four new open-hearth furnaces and Inland Steel Co., Chicago, has contracted for an additional blast furnace stack, four new open hearths, an additional battery of coke ovens.

Finished Steel Output Draws Closer to Ingot Capacity



STEEL ingot capacity has ranged between 60,000,000 and 70,000,000 tons annually over the past ten years. Output of finished steel ranges about 30 per cent below ingot production, the difference being the losses due to conversion.

The chart is based on figures by the American Iron and Steel institute, in gross tons. Production of ingots carries an estimate for December, 1936, and finished steel production for all of 1936 is estimated from the ingot figure.

American Machinery Now Leads In World Markets

By Lewis M. Lind,
Acting Chief, Machinery Division,
Department of Commerce

EXPORTS in all lines of American industrial and agricultural machinery have registered highly gratifying increases during 1936.

October foreign trade figures have just been received and show that industrial machinery exports for the first ten months this year aggregate \$140,489,759, which exceeds the total for the entire year of 1935 by \$18,600,000. Overseas sales of form equipment through October were valued at more than \$37,000,000, compared with \$32,000,000 for the full 12 months of 1935.

The gains were well distributed by machinery types and in foreign market distribution, with a few exceptions. Outstanding developments might be mentioned such as the accentuated demand for machine tools in England and the stepping into prominence of Latin-American countries as buyers of American equipment.

British Trade Shows Increase

British imports of American machine tools were valued at £1,375,502 for the first three quarters of this year, which represents an increase of 113 per cent over our machine tool exports to England in the comparable period of 1935. Our participation in this trade with Great Britain has been steadily increasing. In 1932 we supplied 41 and in 1933 46 per cent of England's imported machine tools. This became 53, 53 and 58 per cent of the total in 1934, 1935, and 1936 (January-September) respectively. Our chief competitor for this trade was Germany, whose share so far this year has been slightly less than half of our own.

Latin America has been markedly more important as a market for industrial machinery of United States manufacture during the past four years, and 1936 developments have accentuated the trend. In 1931 the countries of South and Central America took 16.3 per cent of our industrial equipment exports, but the indications are that the Latin-American share for 1936 will be between 27 and 30 per cent of the total.

Not only have American equipment sales been steadily growing in the last three years of industrial recovery, but our prominence as a machinery exporting country has in-

creased until we have surpassed the other leading countries in this trade. As pointed out in previous issues of STEEL (Sept. 28 and Oct. 5), Germany sold more industrial equipment abroad in 1932 than England and the United States combined. By 1935 the export activity of these three countries was roughly equal, and during the past months of 1936 the United States has, partly due to the activity of American machinery builders and partly because of internal European demand, become the leading supplier in world machinery markets.

These 1936 developments may fairly be attributed to the excellent quality and reputation of American equipment and to the sales effort of our machinery exporting companies. Competition of cheap labor rates of other countries has been met successfully.

A forecast of the prospects for

1937 should probably include an explanation that our chief competitors in the machinery markets of the world are usually also among our best customers. The large domestic equipment market makes possible development and specialization in the United States which is of advantage in meeting foreign competition.

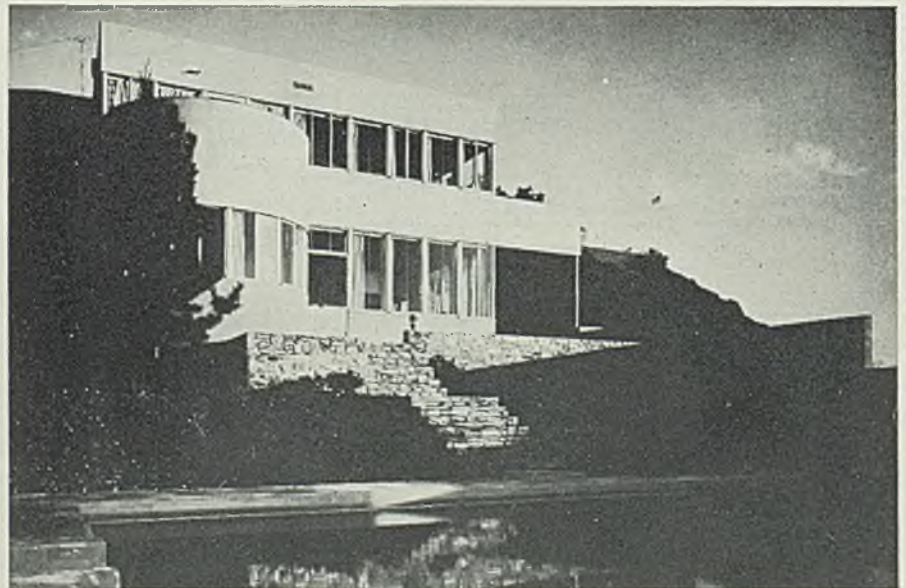
Formerly unimportant countries may come into comparative prominence as markets for American machinery. During 1936 there have been received in the bureau of foreign and domestic commerce reports of national industrialization programs in Egypt, Turkey, China, Colombia, and Mexico, as well as plans for the modernization of specific industries in Estonia, Greece, Cuba, Afghanistan, Palestine, India, New Zealand, Brazil, British Malaya, and Argentina.

Equipped Factories Required

These programs frequently result in invitations to bid on complete factories. American firms have not, up to the present time, been as active in trying to obtain this business as have British and German companies. One German firm, for example, received orders this summer for the building and equipping of factories in seven different countries.

Other attractive business opportunities of this nature are created regularly in countries which are only moderately developed indus-

Steel Sheets Envelop Star's "House Beautiful"



WHEN Anna Sten, cinema actress, decided to build a beach house at California Beach, Cal., she turned to sheet metal for the answer to the most modern type of residential construction. The exterior is stucco on sheet metal manufactured by American Rolling Mill Co., Middletown, O. All roof gutters, flashings and downspouts are of 24 gage galvanized iron. The structure is completely insulated and air conditioned. It has been awarded first prize in a "House Beautiful" competition

trially. In these cases there is rarely available in the country an adequate supply of technical knowledge for the planning and erection of such diverse installations as printing plants, flour mills, irrigation systems, tanneries, refineries, and modern laundries. Germans and Britons install complete units for foreign municipal and provincial governments, and in some cases supervise operations, taking their profits from the working establishment.

As American firms gradually become accustomed to this type of activity we may expect our own machinery exports to become more diversified geographically.

Third New Blast Furnace Planned

Hamilton Coke & Iron Co., Hamilton, O., a subsidiary of the American Rolling Mill Co., will build a blast furnace of 500 tons daily capacity.

It now operates one furnace of 700 tons capacity, which was modernized last summer. Construction work has started and the furnace will be completed in about six months. This makes the third blast furnace under construction or announced within two months, after a lapse of eight years in which no building of this type was undertaken.

Late in November Inland Steel Co. contracted for a blast furnace at Indiana Harbor, Ind., and as stated in STEEL, Dec. 21, page 24, the Hanna Furnace Corp. is planning to build a stack on Zug Island at Delray, Mich., Detroit suburb. With these three furnaces, the total number in the United States will be 255.

Berry Committee Agrees On Recommendations

The co-relating committee named by Major George L. Berry, President Roosevelt's co-ordinator for industrial co-operation, last week agreed on recommendations to be made to the President as a result of the recent discussions before the council for industrial progress in Washington.

Within the next few days, it was announced, a special committee of lawyers will meet and put the recommendations "in proper form," with the expectations that they will be ready by Jan. 10.

Following the Washington conference Major Berry said it would be "a real catastrophe to attempt to repeat the errors and rebuild the Frankenstein of NRA." He intimated his plan was to increase the size and operations of trade associations.

Steel Freight Cut \$12,000,000; Base Rates May Be Raised

EFFECTIVE Jan. 1, freight charges on finished steel will be reduced by a range of ½-cent to 2 cents per 100 pounds; on iron ore, the charges will be reduced 8.96 cents a gross ton; on coal, 3 to 10 cents a net ton; on pig iron, 7 per cent with a maximum of 25 cents per gross ton.

These reductions will result from decision by the interstate commerce commission to let emergency freight surcharges expire Dec. 31. On shipments directly created by the steel industry, it is estimated, savings will accrue at the rate of about \$12,000,000 a year.

Carriers early in January will begin seeking to justify the increases in the base rates they proposed last October (STEEL, Oct. 12 and 19) to take the place of present rates and surcharges.

Hearings are scheduled to start Jan. 6. At best, however, unless the railroads withdraw their petition, which appears improbable at present, most shippers will be confronted with months of uncertainty over the outcome.

Costs Are Still Rising

The carriers assert that heavy maintenance expenditures and considerable new equipment still are required; that they are faced with added costs of \$98,000,000 a year through the social security act and the railroad retirement act; that \$350,000,000 is still owed to the RFC; that the six-hour day, which at present is merely a threat, would cost them \$400,000,000 a year, based on operations in 1935.

The majority of the commission held that in view of increased carloadings and increased net railway operating income the emergency period has passed. Two commissioners dissented, arguing that even though traffic earnings are higher, the improvement has not gone far enough to permit the roads to restore the deferred maintenance incurred during the depression.

As far as the current improvement programs are concerned, considerable buying has been completed recently, especially in rails, where most of the requirements for next spring were allocated in late November and early December. On future expenditures the effect of the loss of the \$150,000,000 annual revenue is problematical.

The present surcharges went into

effect April 18, 1935, and were to remain until June 30, 1936, but on June 9 the commission after hearings decided to permit an extension until Dec. 31, with some modifications. Among the surcharges revised was that pertaining to iron ore. It was lowered from 11.2 cents per gross ton to 8.96 cents.

On coal and coke the present surcharge is 3 cents on rates of 75 cents or less, 5 cents on rates of 76 cents to \$1, and 10 cents on rates over \$1. Lake cargo coal carries the 10-cent surcharge.

Rates on finished steel from 3 to 10 cents per 100 pounds inclusive will be down ½-cent; from 10½ to 20 cents, 1 cent; from 20½ to 28 cents, 1½ cents, and on rates of 28½ cents and over, 2 cents.

Ore Rates Will Be Debated

When the hearings on the railroads' proposals begin, iron ore rates are expected to be debated extensively. Under the carriers' plan lake-front furnaces would pay 5 cents a net ton over the present base rate on the rail haul at the head of the lakes from mines and loading docks, but interior and Pittsburgh-Wheeling district furnaces would pay an additional 5 cents a ton on the haul from lower lake unloading dock. At present the northern railroads divide their surcharge with the lower-lake carriers on such ore as is carried to interior furnaces.

In general, the railroads' suggestions include a slight reduction in freight rates on finished steel, in the aggregate, as compared with present rates plus surcharges. A complete list of the proposed changes which are of interest to the iron and steel industry was published in STEEL, Oct. 12, page 32. It is estimated that if the plan were adopted about 70 per cent of the revenue now being received through the surcharges would be preserved for the carriers.

Rustless Iron & Steel Corp. To Increase Facilities

An expenditure of \$625,000 for expansion has been authorized by the Rustless Iron & Steel Corp., Baltimore. This includes a 12-inch merchant bar mill, and additional capacity in the melting, cold finishing and service departments.

Production

STEELMAKING operations declined sharply to an average of 68 per cent last week, a loss of 11½ points, due to suspensions over the holiday. Some mills shut down Dec. 25 only, while others remained down through to Sunday. A rebound is expected this week.

Youngstown—Off 11 points to 68 per cent. The rate will advance to 79½ per cent this week, as Republic Steel Corp. adds another unit to its active list.

New England—Unchanged at 77 per cent, with a rate of 85 per cent estimated for this week.

Cleveland-Lorain—Off 10 points to 68 per cent.

St. Louis—Remained at 80 per cent last week.

Chicago—Averaged 64 per cent, a drop of 13 points, due to recessions over the holiday. Mills resumed work Saturday, and blast furnace schedules continue at 28 out of 38.

Detroit—Down 3 points to 92 per cent. Although 20 out of 21 open-hearth furnaces were active, down-time was observed Dec. 25.

Pittsburgh—Off 13 points to 67 per cent, owing to shut downs of from one to three days over the holiday. Corporation interests began the week at 79 per cent, but with down-time from late Thursday through Sunday, the average for the week was about 58 per cent. Leading independents observed only a one-day holiday on Dec. 25 and averaged about 71 per cent. Forty-five steelworks blast furnaces continue in operation.

Wheeling—Off 4 points to 88 per cent, due to observation of the holidays. Wheeling Steel Corp. will resume operations at its Martins Ferry, O., blast furnace in January.

Central eastern seaboard—Down 3 points, due to holiday suspensions, to 47½ per cent. Higher operations are expected this week.

Buffalo—Receded sharply to 47 per cent, a loss of 37 points, owing to shutdown for Christmas. Operations will be resumed this week bringing the rate back to 84 per cent.

Birmingham—Declined 2 points to 74 per cent, due to a 24-hour cessation of operations over the holiday.

Colorado—With ten furnaces active, the rate is off 5 points to 63 per cent.

NOVEMBER SHEET SALES UP

Daily average sheet sales in November, as reported by the National Association of Flat Rolled Steel Manufacturers, Pittsburgh, amounted to 9803 net tons, compared with 7439 in October. Production averaged 7468 tons, against 7835 tons in October, while shipments were 7071 tons in November and 7462 in October. Totals for November:

District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended		Same week	
	Dec. 26	Change	1935	1934
Pittsburgh ..	67	-13	34	25
Chicago	64	-13	50	42
Eastern Pa... ..	47½	- 3	34½	19½
Youngstown..	68	-11	59	47
Wheeling	88	- 4	70	80
Cleveland	68	-10	40	61
Buffalo	47	-37	47	39
Birmingham..	74	- 2	56	26½
New England ..	77	None	77	55
Detroit	92	- 3	88	59
St. Louis	80	None	†	†
Colorado	63	- 5	†	†
Average....	68	-11½	48	39

†Not reported.

Sales, 294,080 tons; production, 224,031 tons; shipments, 212,130 tons.

Chicago Elevated Coaches May Be Steel-Reinforced

Steel reinforcement of the 633 wooden elevated coaches still operated by the Chicago Rapid Transit Co. has been proposed by the company. The work would cost \$1,000,000 and would consist of the insertion of six longitudinal, 5-inch steel

ADDITIONAL news of the steel and metalworking industries will be found on pages 71, 72 and 73.

beams in the frame of each car, extending 48 feet from bumper to bumper.

These beams would be tied together at each end with other 5-inch beams, while steel plates would be placed at intervals along the length of the car.

Agitation for the replacement or

President, Once a Laborer, Says It Can Be Done Again

LE. LEWIS, president, Harbison-Walker Refractories Co., was honored recently by business associates on the occasion of his fiftieth year with the company.

Mr. Lewis, who began his career in the fire brick business as a common laborer, stated: "There is no reason why some young laborer in one of our plants today can't hold the same position I have now at some day in the future. Opportunities are still the same; but I am a long way from quitting."

rebuilding of the wooden coaches has followed a recent collision in which 11 people were killed as a result of the telescoping of a wooden car. The remaining 882 cars of the line are all-steel or semisteel.

Ice Ties up Iron, Scrap Cargoes in New York Canal

Marine underwriters have notified state authorities of their approval of a plan to draw water from portions of the New York barge canal in which are held many cargoes of iron and steel. Hope having been abandoned for release of ice-bound cargoes, it is believed major damage to the fleets will be avoided.

The cargoes will be refloated and released next spring. It is understood about 7500 tons of pig iron is tied up on the canal, also several cargoes of scrap. The iron was east-bound from Buffalo when it was caught by the early freeze and the scrap was being shipped to Buffalo mills and yards.

9263 Ballots Cast in Weirton Steel Election

More than 97 per cent of eligible workers voted in the annual election of representatives held Dec. 18 by employes of the Weirton Steel Co. The total number that voted exceeded the number at work on election day by almost 1000. The number of eligible workers was 9539, while 9263 cast ballots and 8339 were working in the mills during the 24-hour period of the election.

The Weirton plan is operated entirely by employes. The management does not participate in any phase of the annual elections, nor does the plan include any joint committees made up of management and employes representatives.

\$3,860,000 Payroll Paid

Carnegie-Illinois Steel Corp. distributed approximately \$3,860,000 as payroll last Wednesday among employes at 19 plants in the Youngstown and Pittsburgh districts, of which \$386,000 represented the increase in wages granted Nov. 16. The \$729,000 distribution at the Homestead works was the largest.

Mayor Wants Steel Houses

Mayor John F. Aszkler, Lackawanna, N. Y., has sent to the federal housing administration a plea that steel fabricated houses be erected in the \$1,500,000 housing project which the government has approved for his community.

Employees Ask To Refute CIO Charge

EMPLLOYEE representatives of Carnegie-Illinois Steel Corp.'s Homestead works have asked to testify before the national labor relations board when it reconvenes Jan. 11 "to refute the charges . . . that in reality are aimed at employe representatives who refuse to bow to the dictatorship of John L. Lewis."

In a letter to the company's manager of industrial relations for the Pittsburgh district they referred to testimony given recently before the board by Elmer J. Maloy, chairman of the representatives at Carnegie-

Illinois Duquesne works, to the effect that the plan was a farce, and certain representatives were paid large sums for their services in addition to their regular wages.

The Homestead group asserts the testimony attempts "to cast reflection on the ability, honesty and sincerity of all representatives."

Maloy now heads a "CIO representatives' council" which claims membership in 42 plants in the Middle West and East.

The council, formed in Pittsburgh Dec. 19 proposes that "all steel workers be organized into a national industrial union" and demands \$5 minimum pay per day for steel mill labor, the 30-hour, five-day week, paid vacations, time and a half for overtime and other concessions. It advocates that "CIO employe rep-

resentatives shall remain inside the company union for reasons obvious to all."

According to present plans, the organization will seek to hold a national convention of all steel labor in Pittsburgh before April 1.

Phillip Murray, CIO leader who condemned steel companies before the national labor relations board recently, and John L. Lewis and other labor organizers will be invited to appear before the LaFollette civil liberties committee when it reconvenes for hearings after Jan. 6. They will be questioned regarding their statements to the labor board regarding collective bargaining activities in the steel industry.

On other industrial fronts last week the CIO continued active. The strikes in the plants of suppliers of automobile materials were in the limelight and CIO began pressing General Motors.

Union coal miners whose scale expires March 31, were being assessed \$1 each for January and February to add to their "war chest."

The LaFollette committee announced that it would investigate labor conditions in the automobile industry in a series of hearings starting early in January.

Lustrous, Rust-Resisting Wire Fence Developed by Five Years of Research

UNITED STATES STEEL CORP. subsidiaries in Chicago recently announced "one of the most important improvements in wire fencing in recent years."

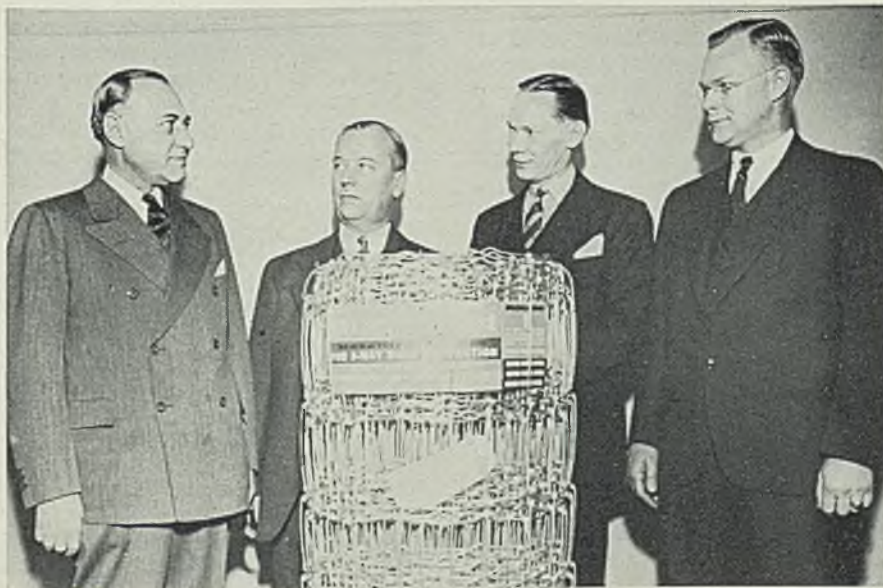
Besides being almost as lustrous as if it were chromium-plated, the new fence is highly rust-resistant, a property developed by five years of research work directed by M. W. Reed, chief engineer, and F. C. Elder, chief metallurgist, American Steel & Wire Co., Chicago, in cooperation with technicians of Tennessee Coal, Iron & Railroad Co., of Birmingham, Ala., and Columbia Steel Co., San Francisco.

The wire is made of a core of full content copper-bearing steel, a zinc iron alloy fused to the steel and

an outer coating of commercially pure zinc. This recently patented process has entailed extensive installations of machinery in plants of all three subsidiaries of the Steel corporation. The first fence is expected to be placed on the market in January.

The wire fence industry represents an investment of millions of dollars and an annual production in the United States of 300,000 miles of fencing.

Left to right in the illustration are H. A. Squibbs, assistant general manager of sales, American Steel & Wire Co.; Mr. Elder; W. H. Cordes, sales promotion-advertising manager, and Mr. Reed.



Mesta Machine Co. Gives Employes \$135,000 Bonus

Mesta Machine Co., West Homestead, Pa., has declared a bonus payment aggregating approximately \$135,000. Reporting the company as completing the most successful year in its history, Lorenz Iverson, president, said the bonus will be paid as compensation for overtime and extra efforts necessary in handling the large volume of business. Salaried employes with the company nine months or longer will receive two months' salary. Proportionate amounts will be given those employed since April 1. Employes on hourly rates were granted a 10 per cent pay increase Nov. 16.

About 3500 workers, the largest number ever employed by the company, will share in either the bonus distribution or the pay increase. The company recently announced a Christmas dividend of 50 cents and a 75-cent dividend payable Jan. 1.

King Estate \$1,650,000

Willis L. King, former executive of Jones & Laughlin Steel Corp., who died Dec. 11, distributed an estate of approximately \$1,650,000 by his will probated at Pittsburgh. Disposal was made largely to one surviving son and other immediate relatives, except several charitable bequests.

Views "Price Chiseling" as Cause of Restrictive Laws

BY V. G. IDEN

Secretary, American Institute of Steel Construction

INDUSTRY must be ever mindful of its relations with the public, with its employes, with its customers, and with related businesses. In some fields this relationship is especially perplexing.

We have allowed to grow up practices that are too frequently obstructive to a healthy growth of related industries. Something of this kind exists in the construction industry and between the component parts of the construction industry.

Some few years ago an honest effort was made to correct this situation by the creation of the Construction League of the United States. The league has been a good influence but its opportunities have been beclouded by the political events of the past four years and the unhealthy thinking incurred by the national industrial recovery act.

For many years industry has incurred and attempted to correct unfair trade practices. Whether reform can be had through voluntary action is a matter open for debate. It is agreed, however, that probably the most serious of all unfair trade practices is price chiseling.

Could Endorse Reform

Price chiseling is something quite different from price reduction through managerial and technological improvements. A producer guilty of chiseling the price must protect his own individual costs somehow. Usually he cannot buy his raw materials any cheaper than can other producers. Then he must buy his labor cheaper. The fact that a chiseler usually takes it out of his workmen makes this practice a social evil.

Such chiseling is cause for reform, and it is a reform which business as a whole feels it can heartily endorse. We can quarrel with the reform only when the means adopted for it are amateurish, ineffective, disruptive, or when it threatens to engraft upon industry even greater hardships than chiseling itself. Some approach to a solution was attempted under the national industrial recovery act. Last year congress took cognizance of it and enacted the Walsh-Healey act.

Under the Walsh-Healey act the government may fix only minimum

wages for workmen engaged in producing goods sold to the government. It cannot determine the wage scale on all products. It definitely limits the work day to eight hours and the work week to 40 hours, and it makes stipulations regarding the sanitary surroundings and healthful conditions under which such workmen may be engaged. As well-meaning as these stipulations are they can be applied only to contracts in amounts of \$10,000 or more. They do not apply to over-counter purchases, and they apply only to purchases made by the federal government.

Law Creates Own Evils

It has already become clear, and the law is only a few months old, that the Walsh-Healey act, in failing to accomplish what it was designed to accomplish is, in turn, creating evils of its own. Washington tells us that many responsible producers are no longer interested in taking government contracts because to do so might make it necessary to adopt many changes in management on all its business, both public and private.

How this act affects any one industry is probably quite different from how it affects other industries. Its application to construction may be unique. The word "construction" was eliminated from the act when it was passed by congress.

Construction, when done for the government, is controlled by the Bacon-Davis act, which provides for the payment of prevailing rates of wages for all workmen employed on the project. There would be no real point in fixing the minimum wages under the Walsh-Healey act on such work when the whole wage scale is controlled under the older law. Materials fabricated for such work are not affected. Under the newer law, however, that may not always be the case; much depends upon the conditions surrounding the purchase.

When the government set up a system of work-relief, rules and regulations were laid down for the employment of persons upon the government's relief rolls. The works progress administration set up a method of managing such projects in order to make certain only persons on relief were employed. This utilized what is known as the "force account." Materials are needed on

such projects and not infrequently it happens to be some fabricated structural steel. Should we engage to sell fabricated structural steel on such a project we are no longer engaged in selling "construction," but are engaged in selling "supplies." Our shops immediately become subject to regulation under the Walsh-Healey act and we are asked to sign one of these contracts carrying such a stipulation. . . .

This points a very definite problem for all trade associations. It is a type of legislation which seriously affects all of us, some probably more than others.

We know that flexibility of management is of paramount importance in the success of a business. Are we going to be robbed of that virtue just because we failed to study adequately the alleged evils of long hours and sweat-shop wages? It was cut-throat competition that brought us to this pass, not just low wages or long hours. It was price chiseling by the unscrupulous that saddled industry with the threat of restraints of the kind that are now confronting us. Unless organized industry is strong enough to effect a voluntary remedy of those evils we will be inviting further legislation of the kind that the Walsh-Healey act is proving to be.

Walsh-Healey Act Slows Bids on Government Steel

Difficulty is being met by government departments, particularly the navy, in obtaining bids on steel. In a recent opening on 8784 tons bids covered only about 25 per cent of the requirements. A number of the largest steelmakers did not submit bids.

Government officials attribute the lack of bids to application of the Walsh-Healey act which requires that firms contracting with the government must observe the 40-hour week, pay "prevailing wages" and observe other government-imposed labor standards.

While the department of labor has authority to grant exemptions from the law, Secretary of Labor Perkins states a request by the navy for blanket exemptions on its bids has been refused. The secretary attributes lack of bidders to revival of general demand for steel, making government contracts less desirable.

Attorney General Cummings at a press conference last week stated he had not been asked his opinion as to the navy's difficulty in obtaining steel and other bids. His department has been examining the act, he said, and has had conferences, but he would not state whether he contemplates recommending amendments.

Abstract of address before the recent National Industrial Council, New York.

Men of Industry

JOHAN C. HOPKINS has been elected vice president and sales manager, Wellman Engineering Co., Cleveland, effective Jan. 1. After attending Case School of Applied Science, Cleveland, Mr. Hopkins became identified with the Penn Iron & Coal Co., Buffalo Union Furnace Co., Republic Iron & Steel Co., Massillon Iron & Steel Co., and in 1911 was associated with the American Steel & Wire Co., Central furnace division, Cleveland. He held various positions at all of the latter company's blast furnace plants, and was appointed superintendent of Central furnaces in 1922. In 1929 he was made general superintendent of blast furnaces and steelworks, and served in this capacity until his appointment in 1934 as the district sales manager, General Refractories Co., Cleveland office, which position he has resigned to join the Wellman organization.



John C. Hopkins

stalled in a similar capacity for the Pittsburgh district by Carnegie-Illinois Steel Corp.

Hugh McCormick Clarke, vice president, Armstrong Cork Co., Lancaster, Pa., has been named a member of the board of trustees, Pennsylvania State college.

W. Arch Irvin, 2622 Koppers building, Pittsburgh, has been named representative in the Pittsburgh district by Aetna-Standard Engineering Co., Youngstown, O.

A. C. Hempel has been appointed eastern representative by the Lake Erie Engineering Corp., Buffalo, manufacturer of hydraulic presses and auxiliary equipment. He will be located at 512 Fifth avenue, New York.

William J. Sullivan has resigned as vice president and director, Harvester Metal Co., Empire State building, New York, to assume a new connection Jan. 1. Mr. Sullivan formerly was identified with the United States Steel Corp., New York.

Dr. Lawrence Wade, formerly director of research, Borden Co., New York, has been appointed a member of the executive staff, Mellon Institute of Industrial Research, University of Pittsburgh. He will assume his duties at the institute Jan. 1.

A. C. Wilby, assistant to the president Universal Atlas Cement Co., has been appointed manager of public relations in the Chicago district for Carnegie-Illinois Steel Corp.

William Voigt Jr. was recently in-

after college was obtained as assistant chief chemist for Texas Portland Cement Co., Dallas, Tex. In March, 1910, he returned to Detroit as assistant chemist, Packard Motor Car Co. In January, 1913, he resigned to become engineer of tests, Sheldon Axle & Spring Co., Wilkes-Barre, Pa. He again returned to Detroit in 1914 as metallurgist for Hupp Motor Car Corp. and later was promoted to metallurgical engineer.

Myron A. Wick, vice president, Republic Steel Corp., Cleveland, has been elected president, Truscon Steel Co., Republic subsidiary. Mr. Wick succeeds A. E. Walker, formerly president of Truscon and general manager of sales for Republic, who resigned recently to become executive vice president, Pittsburgh Steel Co.

F. J. Vea, former manager, New Stoughton Co., Stoughton, Wis., maker of motor truck bodies, trailers, and the like, has been appointed manager, Trailer Co. of America, Cincinnati.

A. W. McMullan, recently associated with the research staff of International Nickel Co. Inc., Bayonne, N. J., and before that chief metallurgist, Timken-Detroit Axle Co., Detroit, has become associated with Youngstown Sheet & Tube Co. as a metallurgist in the alloy division of the Indiana Harbor, Ind., plant.

George C. Reynolds has been named sales manager, George M. Reynolds & Co., jobber of signs, traffic markers, and safety equipment, Saginaw, Mich., and will cover the territory of Michigan, Indiana, Wisconsin, Illinois and Minnesota, handling municipal supplies to state, county and city officials. He formerly was connected with General Motors Corp., Detroit.

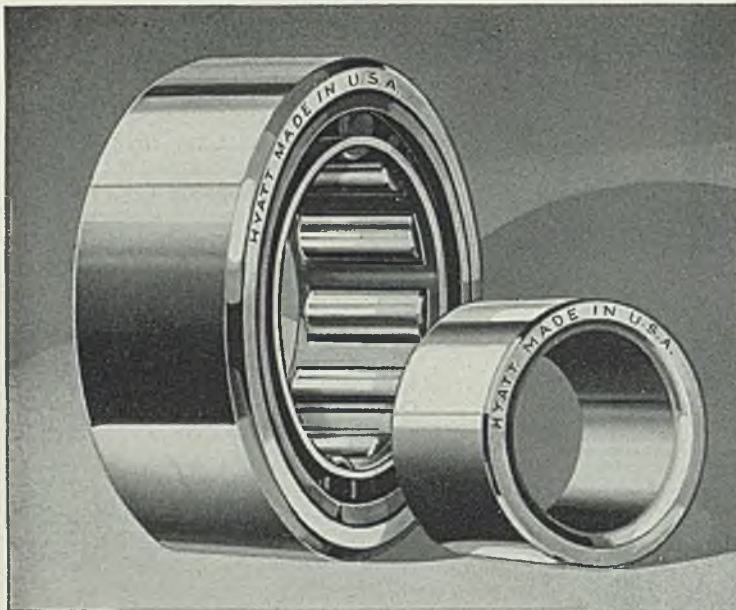
H. G. Dalton, senior partner of Pickands, Mather & Co., Cleveland, has been selected as vice president on the board of trustees for the 1937 Great Lakes exposition, which will reopen in Cleveland May 29. Last summer's exposition featured the progress of iron and steel from mines to consumer, and in the coming show it is planned to dramatize these exhibits on an even larger scale.

Walter N. Stancati has joined the staff of the Pittsburgh office, Foxboro Co., Foxboro, Mass., maker of industrial precision instruments. Mr. Stancati will work out of Pittsburgh as a sales engineer. Frank H. Herman has been added to the personnel

(Please turn to Page 26)

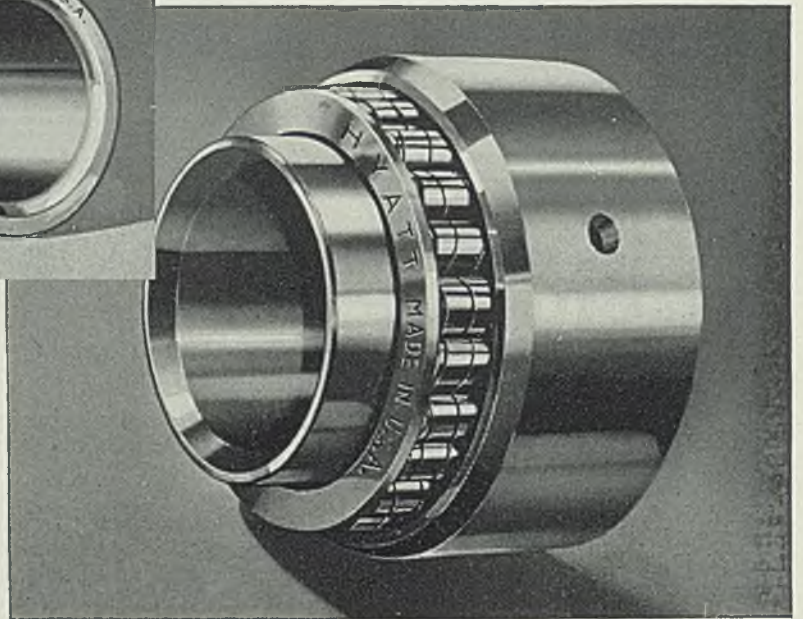


J. M. Watson



Illustrated above Hyatt Hyload Solid Roller Radial Bearing. At right, Hyatt Wound Roller Type.

There is a size and type of Hyatt Roller Bearing for every application. Machinery and equipment manufacturers build in Hyatts for better operation and longer life—but it pays to play safe and specify these dependable bearings by name.



KEEPING *Several* STRIDES AHEAD...WITH

FROM the day anti-friction bearings were first applied, down through the years, each major development in machine design finds Hyatt out in front with improvements in bearing design, manufacture, performance. And, as time goes on, the basic Hyatt characteristics of greater precision, higher capacity, and smoother operation are constantly perfected. Not only has Hyatt kept pace in producing bearings to meet specifications, but many times has introduced application innovations. The ever-increasing use of Hyatt Roller Bearings, year after year, indicates how such diligence is richly rewarded. Hyatt Bearings Division, General Motors Corporation, Newark, Detroit, Chicago, Pittsburgh, San Francisco.

**HYATT
ROLLER
BEARINGS**

MIRRORS of MOTORDOM

DETROIT

GLASS, brakes and wheels—these three important constituents of the automobile drew more attention last week than in many years.

But because they are essentials and because organized labor chose to tie up feeder plants, such as those that make glass, brakes and wheels, the assembly lines began to feel the baskwash keenly.

Where some motor makers were able to hobble through the week with assembly schedules predicated almost on hour-to-hour labor developments, others decided to cease plant activity from Thursday on.

Shutdowns were due in a measure to the desire to take inventory, or to the holiday, or to an admitted lack of some parts. Regardless of the reasons, the effect was this—the labor unions are forced out into the open.

There are those in Detroit who say last week's strikes are only the beginning. They agree that such an outlook doesn't make pleasant reading, but they predict what amounts to virtually a strike epidemic ahead.

Bonuses Are Now Paid

Those persons holding to the latter line of reasoning think that the union's sole strength lies in suddenly forcing the issue, and, since automotive Christmas bonuses have now been distributed, the workmen who have been waiting until they received the cash, might be tempted to walk out.

Too, there is some lesson to draw from the Pittsburgh Plate Glass strike, which is almost two months old. Would-be workers in this company's plants in the Pittsburgh district have grown restive without pay and there have been threats of bolting the union.

On the other side of the tussle, this coming week, with inventory time at hand, might well be the propitious moment for the motor makers themselves to take matters in their own hands. If a strike is to be inevitable, perhaps it would be better strategy for the plants to beat the union leaders to the draw.

So, it is the labor situation—not retail demand for new cars—that is the governing factor behind assemblies in the near future.

As far as the next move on the chess board is concerned, it would be logical to expect that the managements of the various motor companies would begin girding themselves against a repetition of, or more of, this trouble in parts' plants.

The tendency is for motor executives to scan the field for possible new supply sources. But so far there have been few actual shifts in the vast pattern of business relations between the assembly line and tributary suppliers.

Switches Frame Business

As a result of the Midland Steel Products strike, Plymouth has switched around on part of its frame business. The cross members are now stamped out at the Dodge press shop, and shipped to Murray Body's frame plant at Ecorse, Mich., where side rails are made up. Murray then assembles and delivers a complete unit.

Ford has withdrawn a few body dies from one of the body shops here, and a few weeks ago Buick and Cadillac joined to take their carburetor business away from Bendix and place it with Marvel Carburetor.

But, by and large, this sort of jockeying is not general. For one thing, the labor strike subject may blow over in such a time that shifting heavy dies, tools, etc., would be both expensive and unwise.

Self-sufficiency, which, in the automobile industry, is in its most advanced stage at Ford, is not a panacea. Though Ford makes part of its own glass, part of its own brakes, and a portion of its requirements on many another material and part, interruptions were felt at Dearborn last week. Thus inversely there is little to the idea that these labor troubles mean the end of the parts plants.

And for still another reason, the grape-vine system seems to supply labor leaders with the information if a contract has been shifted.

They say in Detroit that the Kel-

sey-Hayes strike was caused partly by the fact that some Bendix business was taken over when the latter was experiencing a "sit down" last Thanksgiving. Furthermore, it is no secret that the reason the Ottawa, Ill., plant of Libby-Owens-Ford went out was because some Pittsburgh Plate Glass business had been assumed for Chrysler.

Speaking of plate glass, the fact that Pittsburgh Plate Glass' plants have been down since Oct. 24 and others since, so that 90 per cent of the country's capacity is idle, has led quite a few of the automobile companies to place large orders abroad, chiefly in Belgium.

Unfortunately for them, foreign demand for plate glass is of boom proportion and the glass plants over there have all they can do to supply their own customers, let alone such an export market. Furthermore, the maritime strike is still a conflicting factor and deliveries are uncertain.

Glass Inventory Is Low

As matters now stand, the motor industry hasn't much plate glass left in its inventory. There was some advance production last fall, anticipatory to just this present condition that finds only two plate glass works in the country operating, but obviously stocks can't last forever.

Some idea of the production of plate glass this year comes from the figures just released, showing production of 190,697,602 square feet in the first 11 months of the year. Nineteen thirty-five held the previous record with 179,816,459 square feet for the entire year, whereas 1929 accounted for 150-odd million feet. In round millions of square feet, 1932 was 52; 1933, 86; and 1934, 91.

In addition, the 190,697,602 square feet for 1936 through November will be augmented by some 8,000,000 feet during December. This figure comes from operations part of the month at Libby-Owens-Ford's Toledo, O., plant, plus the output of the only two plants still running—Franklin Glass Works, Butler, Pa.,

Mirrors of Motordom

and the Crystal City, Mo., works of the Pittsburgh Plate Glass Co.

Perhaps the shortage of glass will bring on a condition similar to a few years ago when the Motor Products tieup on instrument panels did not deter new cars from coming off the assembly line without that part. In that mode they were shipped to the dealers, who subsequently supplied the missing piece.

Car Builders Prefer Peace

In brief, then, strikes may be a sign of returning prosperity, but the motor industry would rather have another year similar to 1936 and have it peaceably.

For, despite the constant efforts to get assemblies up to the point where they can keep in step with demand, there have been one or more constant deterrents ever since the first runs began on 1937 models.

Last week Ford, feeling Kelsey-Hayes Wheel Co.'s strike severely as it concerns brake drums, was forced first to close its Cincinnati and Buffalo assembly plants, and before the week was over had closed up eight branch units.

First, the night shift at Ford's headquarters on the Rouge went off, and by last Wednesday both day shifts had been sorely hit. Temporarily, all of Ford's plans for 7000 cars a day by late December, have faded.

Last week Ford took legal replevin action in Detroit to move brake-making machinery out of the Kelsey-Hayes plant to its own plants.

Chevrolet's assemblies for the week held at around 24,000 units, five days. Plymouth's total was about 9800; Dodge, 7700; Buick, 5600 units; Olds, 5100; Pontiac, 4800, and Hudson-Terraplane, 2900 units for the week. In each case, Christmas sliced a day off the week's assembly total.

Packard at 450 daily for the week, accounted for 2100 models, and like many another motor maker is now working six days weekly, cheerfully paying time and a half for overtime, just to work backlogs down.

A 25 per cent increase in production for January is planned by Packard, then a 40 per cent increase for February, at which time it is hoped the assembly rate will be 700 cars daily. Currently, about 65 per cent of Packard's output is in sixes; next month it will be about 55 per cent of the total.

Incidentally, the Packard press

Automobile Production

Passenger Cars and Trucks—U. S. Only
By Department of Commerce

	1934	1935	1936
Jan.	155,666	289,728	364,004
Feb.	230,256	332,231	287,606
Mar.	338,434	425,913	420,971
Apr.	352,975	452,936	502,775
May	330,455	361,107	460,565
June	306,477	356,340	452,955
July	264,933	332,109	440,999
Aug.	234,811	237,400	271,291
Sept.	170,007	87,540	135,130
Oct.	131,991	272,043	224,628
Nov.	83,482	395,059	*419,700
11 mo.	2,599,487	3,542,406	3,980,624
Dec.	153,624	404,528	.....

Year 2,753,111 3,946,934

*Estimated.

Estimated by Cram's Reports

Week ended:	
Nov. 28	104,283
Dec. 5	100,395
Dec. 12	119,455
Dec. 19	121,038
Dec. 26	79,019

shop is reputed to be a hot tip for new equipment. Not only is Packard thinking of going to an all-steel top, but if 700 assemblies a day are reached by February a lot of new presses and other sheet metal stamping equipment will be needed.

Since the time—almost a year ago—that General Motors went to the expense of thoroughly equipping a division for experiment on diesel motors and gave that department a home in the Cadillac-LaSalle plant on the West End of Detroit, the rumor has been recurrent that gasoline engines, as we know them, might be so supplanted.

Diesel Prospects Are Poor

Actually, this idea is far from the truth, or the thought of General Motors. Too many diesel problems await to be solved, and first off is the one of weight.

Dropping a heavy diesel motor—even the lightest type—into a motor car that weighs something around 1½ to 2 tons all told, would be a serious weight problem, yet it would be necessary since weight to withstand high compression is the No. 1 mandate of the diesel power plant.

But, assuming that such a difficult problem even in these days of weight saving from passenger cars could be circumvented, authorities on the subject claim that the alleged operating economy of diesels over

gas engines is indeed a mirage.

In no uncertain terms those close to the problem decry the popular belief that crude oil could come to be much of a saving over refined gasoline.

Would Increase Oil Tax

In theory, this contention might hold some validity; in practice it would be a fallacy. For, assuming as popular a use of the diesel motor as at present in passenger cars, it would then be an odd's-on bet that taxes would be increased to a level equal to the present gasoline cost.

Supposing, to be as liberal as possible, that taxes were not moved up to a high plane. Then, the problem would be to operate the diesel-powered car enough miles through a year so that the operating saving would begin to balance out the higher initial investment.

This is a difficult course to follow, as one of the mid-western truck lines will testify. On the Chicago-Detroit run, it found recently that the diesel-motored trucks making an average of four round trips weekly were not operating enough miles to show enough fuel saving that would pay for the heavier cost of diesels over gas engines.

Screw Machine Products Industry Shows Gains

Production and employment in screw machine products and wood screws in the United States showed substantial increases in 1935, compared with 1933, according to preliminary figures by bureau of census.

Wage earners employed in 1935 numbered 16,018, an increase of 46.7 per cent from the 10,236 reported for 1933, which was the last preceding census year. Total wages in 1935 were \$16,825,014, an increase of 88 per cent over the \$8,950,979 in 1933. Total value of products manufactured in 1935 was \$63,029,478, an increase of 88.4 per cent over the 1933 value.

Screw machine products and wood screws are also made as secondary products by establishments engaged primarily in other lines. In 1933 output from these plants was 20.1 per cent of production by the industry proper. Corresponding figures for 1935 have not yet been made available.



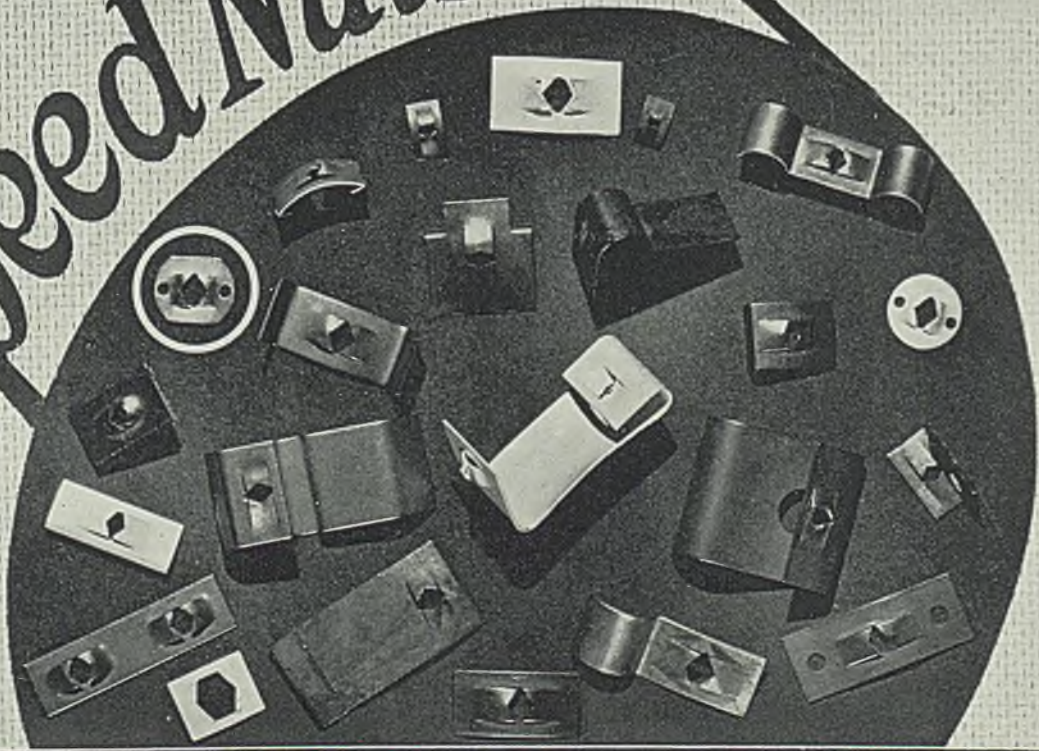
PRODUCTION NOTES

"GREATER sales than ever before"—says the electric refrigeration industry... and production problems mount in both manufacture and assembly. Soft rubber shelf-lugs must position themselves securely on rigid bolts—their long leverage held firmly by simple, fast assembly... accomplished with SPEED NUTS.

Rust resisting, these SPEED NUTS of stainless steel (see encircled illustrations) assemble with lightning speed and remain permanently tight under any conditions of vibration—lowering production costs and simplifying initial design... Write for card of assorted samples and list of their many established uses.

Speed Nuts

PATENTED



TINNERMAN STOVE & RANGE CO. • SPEED-NUT DIVISION • CLEVELAND, OHIO

Men of Industry

(Concluded from Page 21)

in the repair shops of Foxboro's Pittsburgh office.

Roger W. Allen has been appointed sales engineer in the Atlanta, Ga., office of the company, and T. R. Smiley has been added to the personnel in the repair shops, San Francisco office.

John N. Richardson, formerly associated with Frank D. Chase as foundry engineer, has established his own foundry consulting practice with offices at 332 South La Salle street, Chicago.

Dr. C. A. Barnes, J. M. Pilcher and Tom Barlow have been appointed to the technical staff of Battelle Memorial institute, Columbus, O. Mr. Pilcher and Dr. Barnes have been assigned to the fuels division, and Mr. Barlow to the division of process metallurgy.

Stanley A. Knisely, director of advertising, Republic Steel Corp., Cleveland, has been elected vice president, National Industrial Advertisers association, succeeding D. Clinton Grove, advertising manager, Blaw-Knox Co., Pittsburgh, who has resigned.

J. E. Tobey, manager, fuel engineering division, Appalachian Coals Inc., Cincinnati, has been elected chairman, Ohio Valley section, American Institute of Mining and Metallurgical Engineers. Byron Bird, chief concentration engineer, Battelle Memorial institute, Columbus, O., has been re-elected secretary.

Robert J. Grow, who has been connected with the general sales department of Gar Wood Industries Inc., Detroit, for the past several years, has been made manager of the company's branch in Baltimore. Mr. Grow succeeds S. R. Faatz, who is no longer with the company, and W. S. Blakeslee has assumed the position vacated by Mr. Grow.

George G. Treat has been elected president, Bessemer Limestone & Cement Co., Youngstown, O. Formerly executive vice president and treasurer, J. O. Adams continues as secretary and the following have been named vice presidents: Frank R. Warren, in charge of sales; R. E. Roscoe, in charge of chemical engineering, and D. C. McKee, operations vice president.

James H. Lansing has been made shop practice engineer, Malleable



A. W. Daniels

Formerly vice president in charge of sales, American Manganese Steel Co., Chicago, who, as noted in STEEL, Dec. 7, page 33, becomes the new head of the Universal Crusher Co., Cedar Rapids, Iowa, Jan. 1. In his new association, Mr. Daniels will have with him H. F. Rikhoft, formerly with the American Manganese company. Mr. Daniels also is associated with the Daniels-Murtaugh Co., Chicago, maker of dippers, drag line buckets, dipper teeth and other shovel equipment

Founders society, Cleveland. Mr. Lansing has had extensive experience in the foundry industry. In 1935 he became connected with the foundry division, Kelsey-Hayes Wheel Co., Detroit, and in 1936 was made superintendent of foundries, Massey-Harris Co. Inc., Batavia, N. Y., resigning to accept the new position.

Died:

CLAUS GREVE, 82, founder and chairman of the board of both the Cleveland Pneumatic Tool Co. and the Champion Machine & Forging Co., Cleveland, in that city, Dec. 20. Mr. Greve went to Cleveland from Germany in 1872. In 1884, in partnership with the late F. W. Bruch and the late D. R. Leurs, he formed the Acme Machinery Co., with which he was connected until 1900. He organized the Cleveland Pneumatic Tool Co. in 1899 and the Champion company in 1905.

Henry R. Evans, 65, partner, F. H. Evans & Co., Brooklyn, N. Y., maker of expansion bolts, in that city, Dec. 16.

Charles Bigelow Gale, 69, organizer and former president, Bournonville Welding Co., New York, in La Jolla, Calif., recently.

Fred Vollmer, 68, former manager, Pierce plant, American Radiator Co., Buffalo, in that city, Dec. 9.

He had been a major executive in the company's production department for many years, retiring in 1928.

James E. Hughes, at one time operator of Ireland, Hughes & Co., manufacturer of forged oil drilling tools, at Pittsburgh, Dec. 6.

H. J. White Sr., 66, member of the architectural firm of Graham, Anderson, Probst & White, in Chicago, Dec. 18.

Henry J. Bennett, 72, secretary, Superior Charcoal Iron Co., and treasurer, Antrim Iron Co., at Grand Rapids, Mich., Dec. 20. A native of Grand Rapids, he had been associated with the Superior and Antrim companies for the past 40 years.

John Day, 88, president, H. L. Judd Hardware Co., New York, and a charter member of the Hardware club of that city, in South Orange, N. J., Dec. 11. He had been in the hardware business in New York for 55 years.

F. C. Finkenstaedt, 75, for more than 40 years prominent in industrial and banking circles of Bay City, Mich., in Detroit, Dec. 3. He helped reorganize Kelvinator Corp., Detroit, and was a director of General Spring & Bumper Co., Detroit.

Mrs. Katherine A. Ferry, 65, widow of Thomas F. Ferry, founder of Ferry Cap & Set Screw Co., Cleveland, in Cleveland Heights, O., Dec. 20. Since her husband's death in 1933, she had been interested in the E. W. Ferry Screw Products Co., of which she was vice president.

James W. Gibney, active in foundry circles for nearly 40 years, at his home in Buffalo, Dec. 12. He was made manager of the Bingham & Taylor foundry, Buffalo, about 1905 where he remained until he, in company with his son and other associates, opened a consulting service several years ago. Mr. Gibney patented many devices used in connection with electric furnaces.

Walter J. Edmonds, 47, executive vice president, International General Electric Co., New York, in Scarsdale, N. Y., Dec. 17. Mr. Edmonds became affiliated with General Electric Co. in 1918. The next year he became controller of the International General Electric Co.; was appointed financial vice president in 1925, and became executive vice president and a member of the board in 1929.

WINDOWS of WASHINGTON

WASHINGTON
IN ANOTHER week, Jan. 5, the seventy-fifth session of congress will get under way and then things will begin to hum in no uncertain manner from this hub of industrial news during the New Deal administration.

There will be many new faces in both the senate and house and this, of course, means many new ideas. Whenever a new member of Congress comes to town he thinks he is a broom and must sweep clean. However, it does not take him long to find out that he is a very small frog in a very big pool.

No matter how important a member of congress may be in his home town, he is just one of the crowd here. Incidentally the two houses of Congress are probably more particular about precedent than any other like bodies in the world and everything goes by seniority of service, meaning that the new member, no matter how prominent, begins at the bottom.

Numerous Conferences Held

The President has been back from his South American trip long enough to be feeling his oats and he has started the year's work with a rush. There have been continual conferences between Mr. Roosevelt and members of the Congress here in advance to get things ready to go, and with governmental officials.

It has become known at the White House that the President is again much interested this year in delivering his message to Congress in person, as he has done before. It is possible that this message may be delivered in the evening and in that way he will doubtless broadcast the message and reach the whole country. He has not even intimated what he will say in that first message. He does not follow the precedent of his predecessors and try to put it all in one message. He usually generalizes and then sends specific messages on various phases of his program from time to time during the session, as things develop.

He has let it be known that he will follow his habit of former years

by sending his budget message to congress the day after he makes his regular recommendations. There is little hope that there will be much curtailment in the budget this year, although he stated at a recent press conference that he plans to cut every place he can and also try to hold down deficiency appropriations.

His requests for appropriations for emergency relief will probably not be made until the spring so that his first budget estimate will not include relief. He will also have to ask for an emergency relief deficiency for the first six months of 1937, and this is estimated to be about \$500,000,000, due to drought and what not.

May Seek Tariff Changes

There has been promiscuous talk here for some time that the administration might ask for revision of the still existing Smoot-Hawley tariff act. The President was asked about this at a recent White House press conference and his only reply was that he had "never heard of that tariff." That is probably true.

There seems to be some kind of a tieup between the LaFollette civil liberties committee, the CIO and the national labor relations board. No one can quite lay hands on this but one seems to fit very closely into the other. It is reported here that William Green, of the American Federation of Labor, and John Frey, president of the metals trade department of the A. F. of L., went recently to chairman J. Warren Madden of the labor relations board and told him if he did not stop playing up to the CIO in his work that the A. F. of L. would ask congress to repeal the labor act. This sounds rather far-fetched but it is being freely commented upon in well informed labor circles here.

There is an interesting dispute on now between the judge advocate general of the army and Secretary Perkins relative to the administering of the Walsh-Healey government contract law.

The story goes that the army judge told his department that it could go ahead and buy certain

things on the open market without regard to this nuisance law. Madame Perkins heard about the decision, and protested. However, it is certain that the judge advocate general merely expressed the views of the purchasing officers of not only his own department, but more especially of the navy and purchasing officers in other government departments who are still having no end of trouble because of this law.

Senator O'Mahoney who last session introduced the federal licensing bill about which so much has been written, is now reported to be revising his bill. He will not discuss the revision at this time but has given every indication that it will be ready for introduction during the early days of the coming congress.

He is now engaged in criticizing all other plans for industrial regulation which have been presented to the government, including those for the appointment of commissions. It is a foregone conclusion that the senator and Major George L. Berry, with his recommendations, are going to collide head on with their divergent industrial programs at the coming session of congress. It is not hard to guess who will come out on top because members of the senate have little use for the major.

Licensing Is Important Feature

It is reported, but not confirmed, that the senator, among other things is revising his bill to change the constitutional aspects of his bill of the last session. It is further reported that he intends to avoid the delegation of power in his new bill. He feels, that the licensing and chartering parts of his bill are the most important, with the labor angles of the bill taking on the least important aspects.

There is a definite report here that effort will be made on the part of the labor department and the labor organizations to have the \$10,000 limitation removed from the Walsh-Healey act so that it would apply to all purchases, of whatever amount. This will be opposed not only by industry but also by the purchasing officers of the govern-

ment who are beginning to be fed up with the nuisance it is causing them in their own work.

It is rumored here that the attorney general will shortly issue an opinion or ruling of some kind in connection with government purchases and the Robinson-Patman act. No one here seems to know quite how this came to the attorney general but he would not be making a ruling unless he was asked for it. The story is that he will rule that the government is not subject to that act. Of course that is merely the guess of one who claims to know what he is talking about. It is contended that the Robinson-Patman law is raising the price of purchases to the government itself.

There will be several big drives during the early days of congress for legislation that certainly will be of great interest to American industry and business. This will include the new O'Mahoney federal licensing bill, a Guffey coal bill, a bill to continue the RFC, which expires Jan. 31, for a 30-hour week bill, tax legislation, social security amendments, vocational educational training bill, and other new deal legislation which expires within the next few months.

Roper Discusses Unemployment

In his annual report Secretary of Commerce Roper, discussing the unemployment situation, calls attention to the fact that "the desirability of decreasing federal expenditures to relieve unemployment and at the same time protect those who would be without work if government assistance were withdrawn is recognized by all who are interested in this subject."

Continuing his discussion the secretary says further that "it is essential to the proper solution of this national problem that specific information be gathered as to the causes of unemployment, the experience of the unemployed, their occupational aptitudes, and availability for absorption in other phases of industry. The assembling of reliable data in this respect will permit formulation of a policy to meet intelligently and effectively present and future unemployment necessities. It is recommended that early consideration be given to this important subject both as to present needs and subsequent periodic checking of the data, and that legislation necessary to carry its conclusions into effect be enacted and necessary funds be provided."

The secretary pays a tribute in his report to his business advisory council and concludes by stating that "in view of the past record and the present vigorous activity of the council, which still retains a full and representative membership, the department is confident of its continued invaluable assistance."

It is expected that shortly after

the holidays Major George L. Berry will call to Washington the recently appointed correlating committee of his council for industrial progress to draw up a report which he intends to present to the President as the result of the recent conference held here. The correlating committee is to be assisted by a committee of lawyers in drawing up legislation.

While of course there are members of smaller industries on these two committees it is interesting to note some of the labor leaders who are also members. On the correlating committee are such men as William Green, Frank Morrison, secretary-treasurer of the A. F. of L., A. O. Wharton, president of the International Association of Machinists; Sidney Hillman, president of the Amalgamated Clothing Workers of America; John Frey, president of the metal trades department A. F. of L.; Thomas Kennedy, secretary-treasurer of the United Mine Workers of America; George Harrison, president of the Brotherhood of Railway Clerks; M. J. McDonough, secretary-treasurer of the Building trades department A. F. of L., and others.

Included on the committee of lawyers, in addition to some industrial lawyers are, Mathew Woll, vice president of the A. F. of L.; Charlton Ogburn, L. M. Ornburn, secretary-treasurer of the Union label trade department of the A. F. of L., Earl Houck, United Mine Workers of America, and others.

ANNUAL GRAB GAME BY DEPARTMENTS IS UNDER WAY

Executive departments of the government are engaged in their annual duty of getting as much money as possible from Uncle Sam. Estimates have been prepared and action is being taken for the fiscal year beginning July 1, next.

It is one of those strange things that no one can ever account for but all government departments ask for more money than they expect to receive. This applies to demands both from the budget bureau and the congress.

As a matter of pure routine, estimates are made long in advance. These estimates are then sent to the budget bureau and after they have been gone over carefully by Dan Bell's experts, hearings are held by the bureau for whatever department is involved. The budget bureau tries to pare down these appropriations. Then the estimates are incorporated in the budget message of the President.

Following on the heels of this the house of representatives appropriation committee has hearings for the department and reports out an appropriation bill. This is followed by further hearings on the part of the senate committee, so that by the time the bill is finally passed and

signed by the President, its own father is not apt to know it.

However, in some ways, this is a good thing. Everybody in the world has a crack at the appropriations and the money is supposed to be pared to the quick when it finally becomes law.

WAGNER LABOR BOARD LEANS HEAVILY TO ONE SIDE

It is now easy to see why the Wagner national labor relations board was called a "labor" board—because that is what it is, pure and simple. The industrialist has little chance of getting anything from the board.

That this is true was typically shown recently at hearings in the case of the United States Steel Corp. and its subsidiary Carnegie-Illinois Steel Corp. Practically nothing was asked for by counsel for the steel companies that they got. On the other hand the board members, and particularly its chairman, Mr. Madden, went out of their way, it seemed, to favor the labor side.

Information along these lines has been leaking out from various hearings that the board has held up to this time, and its truth was certainly borne out during the recent hearings on the steel matter, which has not yet been completed.

Unless something intervenes in the meantime further hearings in this case will be held here Jan. 11, when the steel companies will offer some witnesses of their own, and they will also then do a little cross examining of witnesses already testifying. It is really expected that it will be some time before this decision is finally handed down, following which there is little doubt but what it will go into the courts. Steel company counsel were obviously laying their case for a court record during the opening arguments.

SOCIAL SECURITY RECORDS WILL NOT BE ELABORATE

Elaborate systems will not be needed to comply with the social security records required by the treasury department, it has been announced by the social security board. It is stated that no particular forms for employers are prescribed for the keeping of wage records of employes in order to furnish the necessary information under the federal old age benefits plan.

Treasury regulations 91, the board states, specifically says that no particular form is prescribed for keeping the records, and the same regulations explain what information is to be kept by employers. This information, the board adds, is to be transcribed at the proper times from employers' records to standard forms furnished by the treasury department. These forms are then to be filed with local collectors of internal revenue.

Tin Cans, Autos; Will Small Home Be Next Mass Product?

IN RECENT issues of STEEL, frequent reference has been made to the effective manner in which many units of industry have co-ordinated their activities in developing the distinctly American technique of mass production for mass markets. In these discussions the automobile has been cited as the outstanding example of the efficacy of mass production methods and of the synchronizing of activities in numerous branches of industry to produce steadily increasing values at lower prices.

A recent survey of the tin plate container industry conducted by the Battelle Memorial institute for the International Tin Research and Development council (see p. 23, Dec. 21, 1936, issue of STEEL) furnishes a timely reminder that the humble tin can is worthy of attention as an important example of the success of mass production technique.

The Battelle institute report states that the United States is the largest producer of tin plate, the largest user of canned goods and the largest user of tin. In 1935, it reports, 12 billion tin cans were produced. This is equivalent to about 100 cans for every man, woman and child in the country.

Co-ordination and Mechanization Are Responsible For Great Gains in Food Container Industry

It seems obvious that this large output is made possible by mass consumption, which in turn is due in large measure to the low cost of providing tin containers for food and other products. One wonders what the consumption of canned goods would be if cans were produced by hand methods instead of by modern mechanical means. In pondering this question, one must realize that mechanization in connection with tin containers involves not only the highly developed can-making and packing machinery, but also a nicely co-ordinated activity in almost every stage of production and manufacture from mine to finished container. As in the case of the automobile, the tin can in its quality and low price reflects the successful adaptation of many diversified facilities to mass production requirements.

Touching on this point the institute report states that no American industry has made a better record for steadiness of employment or for maintenance of returns to stockholders throughout the depression than has that of canmaking. It ascribes this enviable record to the "technical perfection of manufacturing methods," which combine high speed eco-

nomical production with high quality. "The most modern tin plate plants," it continues, "are marvels of complex, high-speed, synchronized mechanism, turning out wide strip true to gage and of superior properties at a rate unheard of a few years ago. Can-makers have shown equally remarkable achievements. Although cans are made at the rate of 300 to 400 per minute, they are so well made and so well inspected that canmakers often guarantee that at least 998 out of 1000 will show no failure of the can in service."

Reading between the lines, one can sense the fact that in the development of tin containers, as in that of automobiles, the advent of the continuous mill furnished a fresh stimulant to the mass production idea. A few years ago, when the first continuous mills still were something of a novelty in this country, a great cry of over-capacity was raised. Some authorities predicted that these new mills would be idle much of the time, that there was little hope that sufficient tonnage could be found to keep them busy.

Criticism of Over-Capacity of Continuous Mills Has Ebbed as New Opportunities Have Appeared

Today the warning about over-capacity is seldom heard, probably because it has been discovered that the continuous mill has unlocked the door to unexplored opportunities for broader markets for steel. These opportunities lie in the successful co-ordination of continuous mills and modern manufacturing methods for products that can be purchased by millions of persons.

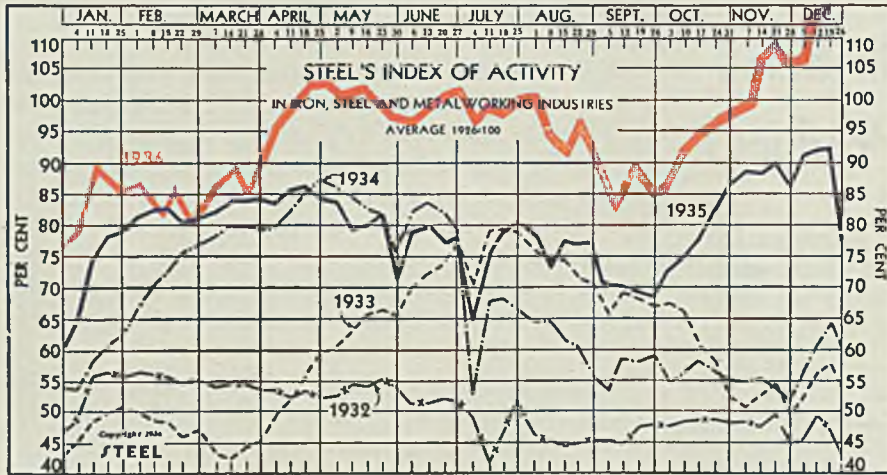
What are these products? What besides automobiles, tin cans, certain household appliances, razor blades, etc. can be manufactured on a mass production basis?

The next big mass production market probably lies in the field of house construction. Certain parts of houses, and much equipment for houses, eventually will be manufactured en masse. Only by the mass production technique can small homes be brought within the price range that will attract Americans in the low income brackets.

Home construction has not recovered as rapidly as many other lines of activity. One of the major obstacles is the high cost, which is due to inefficient methods, prohibitive unit wage rates, restrictive local racketeering and poor organization among the principals engaged in house construction. Co-ordination and efficiency—the factors which have proved so effective in the case of tin cans and automobiles—seem to offer the most practical solution of the housing problem.

That is a compelling reason why industry should get in on the ground floor in the approaching revival in building.

THE BUSINESS TREND



STEEL'S index of activity in the iron, steel and metalworking industries gained 0.7 points to 114.6 in the week ending December 19:

Week ending	1936	1935	1934	1933
Sept. 19.....	90.1	69.4	58.1	68.2
Sept. 26.....	86.2	68.5	59.3	66.9
Oct. 3.....	89.0	73.3	54.7	67.4
Oct. 10.....	93.4	74.9	56.4	66.0
Oct. 17.....	95.5	77.4	58.2	60.9
Oct. 24.....	97.1	82.4	56.3	58.0
Oct. 31.....	99.1	86.4	55.0	52.3
Nov. 7.....	102.1	88.4	54.9	50.7
Nov. 14.....	107.9	88.8	55.2	52.6
Nov. 21.....	109.9	90.9	54.4	55.4
Nov. 28.....	105.8	86.0	51.9	49.7
Dec. 5.....	108.4	91.7	56.6	52.6
Dec. 12.....	113.9†	91.8	60.6	56.0
Dec. 19.....	114.6*	91.9	64.4	58.0

†Revised. *Preliminary.

The index charted above is based upon freight car loadings, electric power output, automobile assemblies (estimated by Cram's Reports) and the steelworks operating rate (estimated by STEEL). Average for 1926 equals 100, weighted as follows: Steel rate 40, and car loadings, power output and auto assemblies each 20.

High Point of 1936 Touched In Third Week of December

ONE of the most significant features of the trend of business in December was the impressive increase in activity in the durable goods industries. Revival in demand for "heavy" materials and equipment has been noticeable since the middle of the year, but it remained for the active buying movement of November, and particularly of December, to convince observers that the persistent lag in recovery in durable goods finally is disappearing.

The participation of the railroads in the present market is made easier by the encouraging manner in which freight traffic is holding up in the final months of the year. In recent years car loadings have mounted to a peak in mid-October and then have dropped sharply to a low at the year end. In 1936 traffic climbed to a high point in October, in accord-

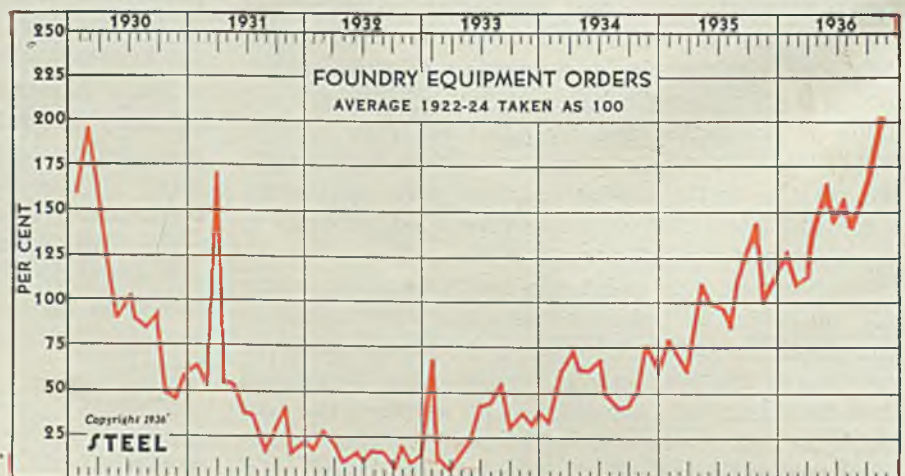
ance with the usual pattern, but the descent since that time has not been precipitous, as in former years.

Now that the railroads are assuming a role more in keeping with their predepression status, the poor showing of the building construction industry is accentuated. In the late twenties, the demand for rails, plates, shapes and bars—chiefly from the railroad and building construction fields—easily exceeded the demand for bars, sheets and strip from the automobile industry and other consumers of the so-called "light" products.

Today the reverse is true. The unbalanced condition of demand now is due largely to the lag of building construction. The volume of construction probably will increase appreciably in 1937, but not enough to lift steel consumption for buildings up to 1928 or 1929 levels. Small house construction eventually will provide a big tonnage market for steel, but it will consist largely of strip steel instead of heavy forms of steel.

Equipment orders, which furnish a fair index of activity in durable goods, continue to improve. The

	Per Cent			
	1936	1935	1934	1933
Jan.	127.0	86.6	37.2	68.4
Feb.	110.4	75.7	65.8	16.1
March ...	115.0	69.4	75.4	9.8
April	134.0	113.2	67.9	19.4
May	165.4	100.7	66.5	25.6
June	141.4	100.2	70.4	45.5
July	159.6	94.0	50.7	48.8
Aug.	144.8	113.0	43.1	56.3
Sept.	161.0	128.5	46.4	34.9
Oct.	173.8	140.0	55.3	42.5
Nov.	200.4	100.4	80.4	36.6
Dec. ....	....	118.1	66.9	43.8

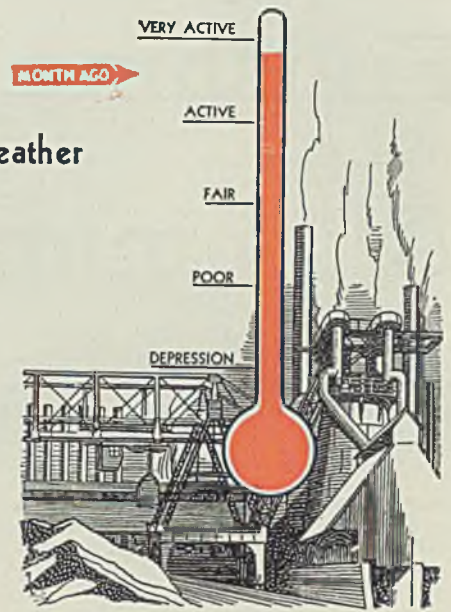


indexes of foundry equipment orders and of machine tool orders gained sharply in November. Contracts for heavy productive equipment, such as rolling mills and accessories, still are numerous. However, the placing of orders for heavy handling equipment such as car dumpers, ore bridges, etc. apparently is being held in abeyance pending a clarification of government policies on taxes, finance, etc. In brief, the log jam in the heavy industries is starting to break up, but not all of the obstacles have been cleared away.

Automobile production passed the 120,000-unit mark in the week ending Dec. 19, but then rushed headlong

Industrial Weather

TREND:
Uncertain



Where Business Stands

Monthly Averages, 1935=100

	Nov., 1936	Oct., 1936	Nov., 1935
Steel Ingot Output	161.4	156.6	112.7
Pig Iron Output	170.4	167.3	119.4
Freight Movement	124.3	135.1	103.1
Building Construction	166.7	175.1	115.1
Automobile Production	67.4	67.4	117.2
Wholesale Prices	102.3	102.3	104.1

in fresh labor difficulty, which, with holiday interruptions, will reduce output until after the turn of the year. Steelworks operations continued to mount in

the week ending Dec. 19, touching a high of 79.5 per cent of capacity. Continuation of power output at record levels and the resistance of freight traffic to seasonal trends carried STEEL'S index of activity to an estimated figure of 114.6, the highest since August, 1929. This probably will stand as the high point for 1936, as recessions undoubtedly will be noted in the weeks ending Dec. 26 and Jan. 4.

The Barometer of Business

Industrial Indicators

	Nov., 1936	Oct., 1936	Nov., 1935
Pig iron output (daily average, tons)	98,331	96,509	68,876
Machine tool index	134.0	127.5	93.8
Finished steel shipments ..	882,643	1,007,417	681,820
Ingot output (daily average, tons)	173,496	168,333	121,170
Dodge building awards in 37 states (sq. ft.)	34,947,500	36,718,900	24,120,700
Automobile output	229,989	229,989	408,555
Coal output, tons	†40,615,000	43,284,000	33,404,000
Business failures, number	611	611	898
Business failures; liabilities	\$8,266,000	\$8,266,000	\$14,384,000
Cement production, bbls. ...	12,470,000	12,470,000	7,093,000
Cotton consumption, bales ..	626,695	646,010	507,836
Car loadings (weekly av.) ..	753,619	819,125	624,946

†Preliminary.

Financial Indicators

	Nov., 1936	Oct., 1936	Nov., 1935
25 Industrial stocks	\$238.46	\$231.67	\$197.03
25 Rail stocks	\$43.26	\$45.85	\$29.48
40 Bonds	\$89.61	\$89.63	\$81.33
Bank clearings (000 omitted)	\$25,852,000	\$25,852,000	\$20,777,653
Commercial paper rate (New York, per cent) ...	%	%	%
*Commercial loans (000 omitted)	\$8,812,000	\$8,721,000	\$8,152,000
Federal Reserve ratio, per cent	80.3	80.0	77.0
Railroad earnings	†\$89,851,409	\$70,166,026	\$75,454,501
Stock sales, New York stock exchange	50,469,732	43,998,322	57,462,895
Bond sales, par value	\$290,875,900	\$337,065,500	\$301,977,000

*Leading member banks Federal Reserve System.
†October, September and October, respectively.

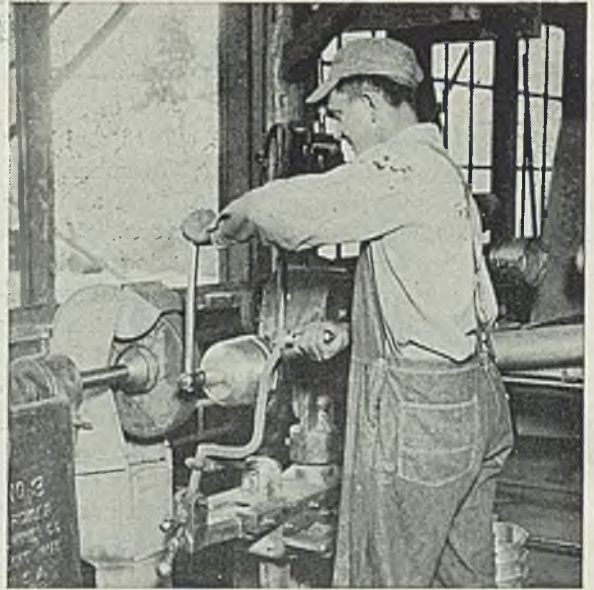
Commodity Prices

	Nov., 1936	Oct., 1936	Nov., 1935
STEEL'S composite average of 25 iron and steel prices	\$34.65	\$34.67	\$32.17
Bradstreet's index	\$10.22	\$10.22	\$10.40
Wheat, cash (bushel)	\$1.34	\$1.30	\$1.09
Corn, cash (bushel)	\$1.20	\$1.18	84c
Petroleum, crude (bbl.)	\$1.08	\$1.08	98c

Foreign Trade

	Nov., 1936	Oct., 1936	Nov., 1935
Exports	\$264,708,000	\$269,838,000	
Imports	\$212,643,000	\$162,828,000	
Gold exports	\$117,000	\$242,000	
Gold imports	\$218,929,000	\$210,810,000	

Finishing Aluminum Hollow Ware



Outside polishing of hollow ware is accomplished by means of a flexible adaption of standard polishing equipment as illustrated here

MANUFACTURE of hollow ware is one of the oldest industries in the United States it being stated on excellent authority that the first iron casting made in this country was a pot of somewhat less than a quart capacity cast by Joseph Jenks at Hammersmith, now Lynn, Mass., about the year 1645. Hollow ware consisting of pots, kettles, skillets, griddles and similar household appliances found a ready sale among the colonists, and manufacture of hollow ware in the United States has been carried on without interruption since the time of Joseph Jenks.

From the crude hollow ware cast by our forefathers to the perfected products of today is a long step. These early founders used bog ore

with which the swamps and bogs of New England abound, while modern hollow ware often is cast from practically pure aluminum.

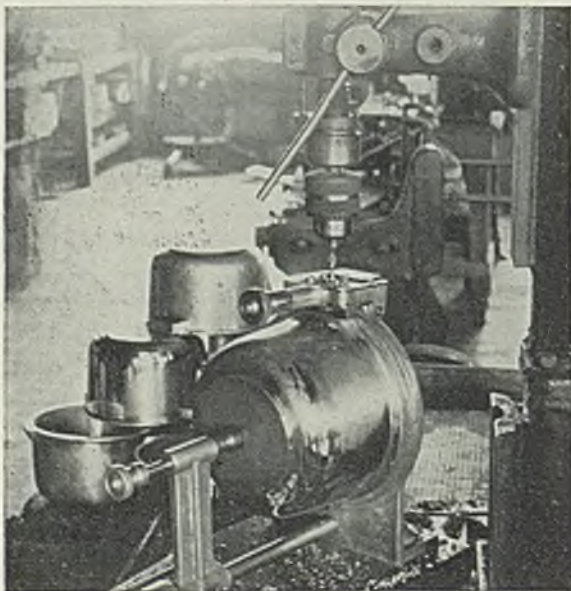
A high degree of skill is necessary to produce aluminum hollow ware and a large amount of skilled manual labor is involved in its manufacture. These factors are readily apparent after a visit to the plant of the Bremer Aluminum Corp., New Washington, O., manufacturer of cast aluminum hollow ware. The company operates a modern foundry, machine shop and polishing department. The plant is thoroughly modern and all departments are kept scrupulously clean, while natural daylight from large steel sash windows affords ideal working conditions. Adequate

dust removal systems are provided for all grinding and polishing operations so that the air is practically free from dust at all times. In this article are described several of the more important finishing operations. The product consists of kettles, skillets, sauce pans, coffee pots, griddles, muffin pans, cookers and roasters of various styles, dutch ovens, scoops, ladles, spades, and like articles, all of the highest quality, attractively finished by appropriate abrasive processes.

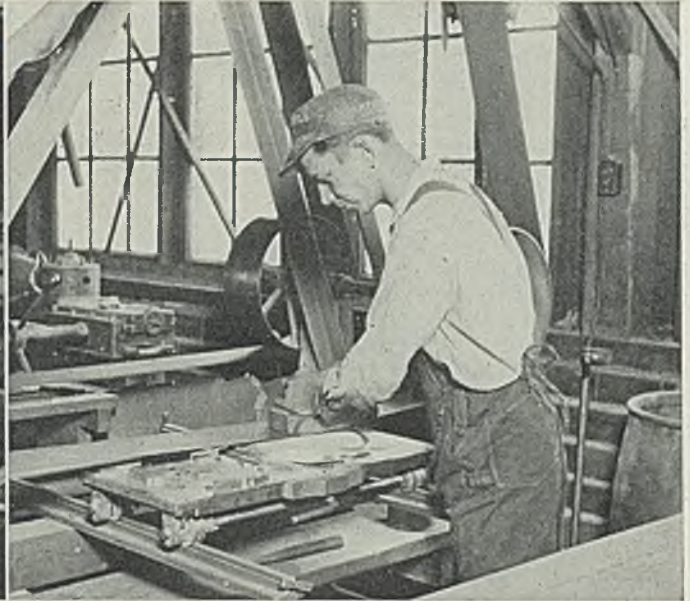
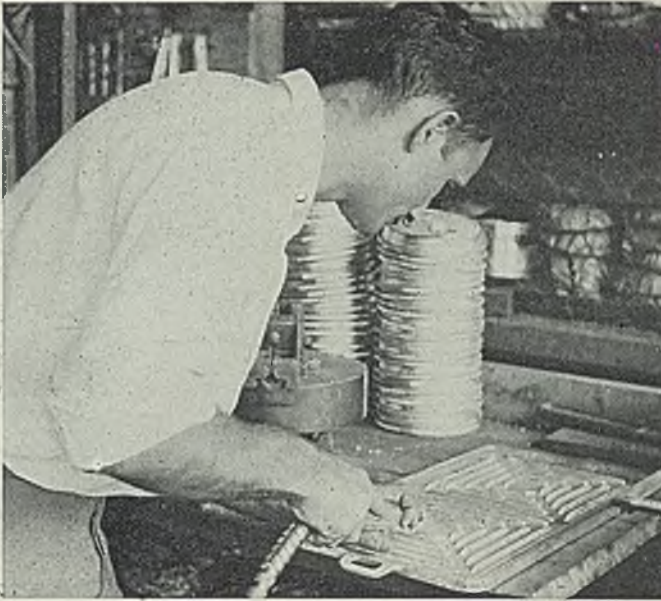
The material used for making the castings is practically pure aluminum imported from Switzerland in 100-pound pigs. The virgin aluminum is slightly alloyed at the plant to make it stain resisting. Most castings are hand made although one squeezer is used on certain operations. Cores are green sand. As may be imagined, this is first class foundry work which can be entrusted only to molders of long experience on high grade, thin section work.

Grinding Requires Care

After the castings are shaken out of the sand the first machining operation consists of removing gates and risers. This usually is done on a metal cutting band saw. Then the saw cuts must be ground smooth. This in reality is a snagging operation performed by hand with carborundum wheels, 16 inches in diameter, 2 inch face, 30 grit, M grade. The work is done on an ordinary double wheel grinding stand the wheels running at a normal surface speed of 5000 feet per minute. While it is true that this is only a snagging operation, the operators must exercise caution for a slight



Precision jigs are required to drill holes in aluminum ware. The jig illustrated here has a hardwood base and aluminum uprights, clamping device and bushing plate, making it light and easy to handle



Operator on left is cleaning up slight irregularities on the grill side of a combination grill and griddle with a rotary file or burr used on a flexible shaft machine.

Method of polishing griddle side is shown on right. Considerable skill is required in the hand operations since a slight slip of the hand will result in an imperfection

amount of carelessness in working on these comparatively thin sections would ruin the parts so that they would not machine out correctly in subsequent operations. Next the castings are wirebrushed to remove loose sand.

On first thought it may seem somewhat overdrawn to speak of precision machine work in the manufacture of hollow ware. However, precision work with modern metal working tools is part of the daily routine. For example, on cookers the body and top are turned, faced and bored on turret lathes to make a machine fit with the cover. This fit is necessary to prevent the escape of steam which would carry away the natural juices of the meat or vegetables in process of cooking, with little or no water. Again a machine fit is necessary because the design of the lids is such that the condensation runs back into the cooker.

Machined in Special Holders

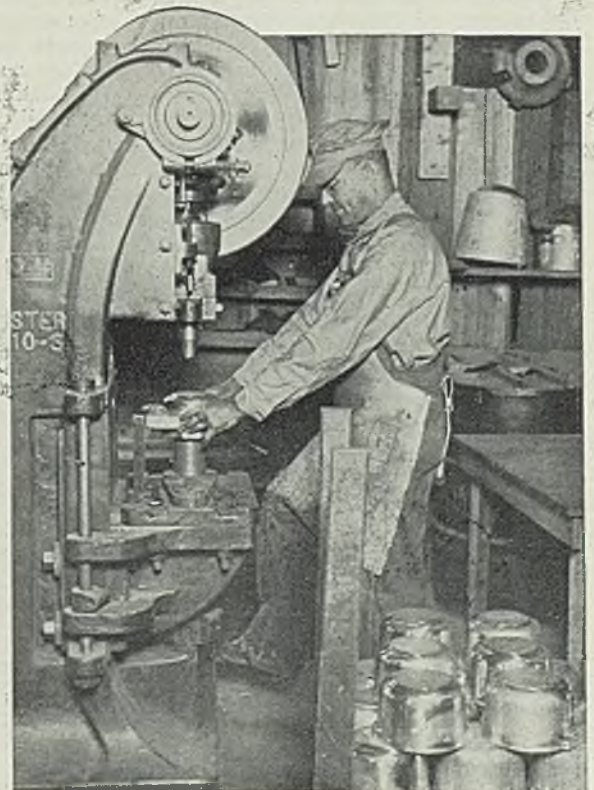
In the machining operation the work fits into a special metal holder where it is held securely by a center block. It is prevented from turning by lugs on the part which fit into recesses in the holder which is screwed onto the spindle nose of the lathe, as in ordinary practice. Located in this manner the work is turned and finished with the cross slide tools. A large number of these special holders must be provided for various sizes and classes of work. Some are laminated hard wood, but recently the practice has been to make them of special hard aluminum castings.

The natural supposition is that the chips generated in this operation, together with gates and risers,

would be melted over again. However, no scrap metal of any kind is used in the foundry. It is sold as scrap to outside dealers. While this may appear to be an economic waste, experience at this plant has proved that hollow ware cast from a percentage of scrap is not of the highest quality. Thus to maintain the highest quality product no scrap metal is used.

Precision jigs are required to drill holes in hollow ware. Shown in an accompanying illustration is a jig for drilling two holes in a

saucepan body to accommodate the handle. This jig has a hardwood base, the uprights, clamping device, and bushing plate being aluminum. In some instances brass castings are used for some of these jig parts. Referring to the illustration it is shown that the work is held against its locating seat by means of a screw with a knob handle, the screw working through a swing arm. The bushing plate is hinged so that it can be turned back for placing and removing the work. The design is efficient and com-



Trademarks are clearly and accurately stamped in press rams. This operation is carried out after polishing the outside but before polishing the inside of the aluminum ware

pares favorably with drill jigs seen in any plant devoted to production work. The use of wood and aluminum results in comparatively light construction and easy handling of the jig. Thus the fatigue element involved when heavy jigs are used is reduced to a minimum, expediting production. The bottom of the wood base is protected with wear plates.

Stamping the trademark on the bottoms of utensils is a mechanical operation. The work is held over a fixture while the stamp is located in the press ram. The impression is made more quickly and is much more accurate and clear than possibly could be done with hand stamps. This operation is carried out after the parts are polished, but before the inside is finished.

Hand Polishing Required

While semiautomatic and automatic polishing operations are used to a large extent in the finishing of aluminum cast hollow ware, a large amount of hand polishing also is necessary since the automatic machines are not used for the final finishing. A battery of 10-horsepower electrically driven polishing lathes are used for this work. These polishing lathes have a spindle speed of 200 revolutions per minute and the wheels used vary from 6 to 16 inches. They are built up of stitched muslin sections as in ordinary practice. The abrasive used in setting up these wheels is manufactured alumina. The sequence of operations is as follows: First the parts are rough polished on wheels set up with No. 46 material, followed successively with polishing with Nos. 80, 100 and 180. The last is a grease operation. Cutting down for buffing is done with tripoli on loose muslin buffs, while white polishing compound with loose muslin buffs is used for coloring. Some variations from the above grit sequences occurs in the semiautomatic polishing.

Outside diameters of hollow ware

are polished on an Acme polishing machine used in connection with a Gardner polishing lathe. As shown in an accompanying illustration, the work is held over a metal chuck and as it rotates at an approximate speed of 50 revolutions per minute it is fed past the wheel face. These machines are quite flexible in operation making it possible to get over all of the sides, but the bottom must be finished in another setup. This machine is fitted with a glued wheel made up of stitched muslin sections glued together. It is 16 inches in diameter with a 1¼-inch face set up with No. 80 grit, lionite.

In some instances it is possible to use multiple work locating fixtures as illustrated. In this case machines are fitted with the same type of wheel set up with the same abrasive as previously described. It advances to the polishing position, makes a predetermined number of revolutions and then indexes automatically to bring the next piece in position before the wheel. The work chucks rotate only while the work is in the polishing position so that

the operator has plenty of time to load and unload.

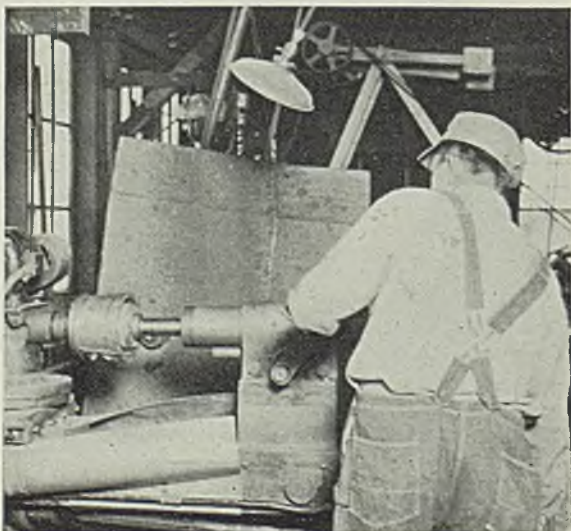
A hollow ware polishing machine arranged for finishing the inside of a two quart cooker is shown in one illustration. The work is held in a special chuck by means of clips which clamp it firmly. The wheel used is glued up muslin disks set up with No. 46 grit lionite. This is followed by polishing with No. 80 grit. These wheels are 4 inches diameter, 2¼ inch face, while the work is 6½ inches inside diameter, 4 inches deep. The wheel operates at an approximate surface speed of 5000 feet per minute, while the work makes 120 revolutions a minute. By means of one handle the operator moves the wheel in and out while another handle operates the head back and forth. Thus the entire interior surface can be reached. The head has an angular adjustment which is necessary to set it to accommodate different classes of work.

Inside Polishing Procedure

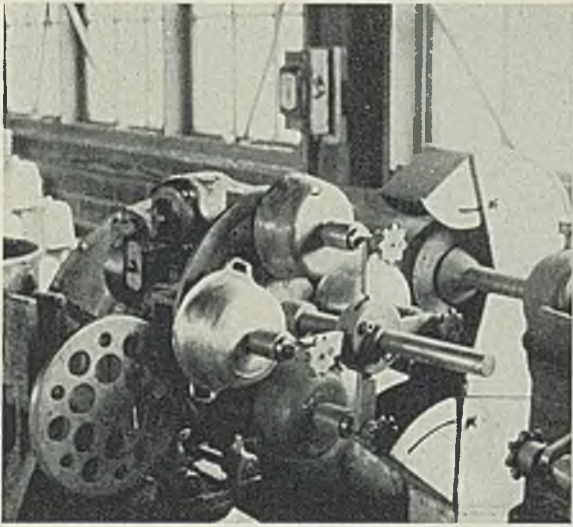
In an accompanying illustration is shown an operation technically termed "spinning" by hollow ware manufacturers. However, this term must not be misconstrued with spinning as followed in forming thin metal pieces over chucks by means of spinning tools. In this instance spinning refers to application of radial sunray finish seen on the inside surfaces of all high grade hollow ware. The work in this case is located in a special wood chuck lined with leather pads so that the outside will not be scratched. Air is exhausted from the chuck by means of a pipe passing through the lathe spindle so that atmospheric pressure holds the work firmly in place. A work speed of about 300 revolutions is used. First the surface is finished with steel wool wet with kerosene. This is followed by hand polishing with 80, and 180 manufactured alumina cloth also wet with



Applying the radial sunray finish on the inside surfaces of hollow ware is a manual process as illustrated here. This operation is known as spinning



Polishing the inside of aluminum ware is accomplished quickly and easily on this specially designed machine



Multiple work locating fixtures may be used for polishing the outside of the ware in some cases. Operator needs only to load and unload pieces on this machine

radial finish which gives the pieces eye-appeal.

Flat surfaces such as those on griddles and the like, are finished by metal sanding as shown in one of the illustrations. This machine is an ordinary belt sander fitted with a manufactured alumina belt 16 feet long, 6 inches wide, No. 40 grit run at a surface speed of approximately 2000 feet per minute. The work is held in a special fixture on a table which is passed under the belt by hand while the operator holds the belt against the work with a hand block. The result is an excellent straight line finish.

The various polishing and buffing operations grease the work to an extent that necessitates a thorough cleaning. This cleaning must be done by hand with polishing brushes. This is due to the fact that a considerable amount of hammered finish work is produced at the plant and commercial degreasing machines will not clean such ware effectively. The operators scrub the work in a hot mild soap solution, and then rinse it in hot water, dried in sawdust and inspected. After assembly the parts are color buffed and finally cleaned in naphtha solution.

From the foregoing it is apparent that the manufacture of cast aluminum hollow ware involves much manual labor and as this ware must be sold in a highly competitive market, efficiency in each operation is of the utmost importance. Polishing operations have been worked out through continual experimentation to reduce costs wherever possible without sacrificing quality.

Hard Surfaced Trimming Dies Have Long Life

Automobile hub forgings manufactured by a Michigan forge shop formerly were machined on the out-

side diameter of the hubs. That operation was less expensive than hot trimming, due largely to the short life and correspondingly high cost of trimming dies. Now, however, stellite dies are used for hot trimming these forgings and the turning operation has been eliminated.

Places Dual Drive In Production

A NEW drive for light trucks used primarily in "off the highway" service, has been developed and placed in production by F. A. B. Mfg. Co., Oakland, Calif. Known as the Fabco dual drive, it employs dual and identical rear axles. Behind the regular truck transmission is installed an underdrive and selective power unit which drives the two rear axles through separate drive shafts. The forward

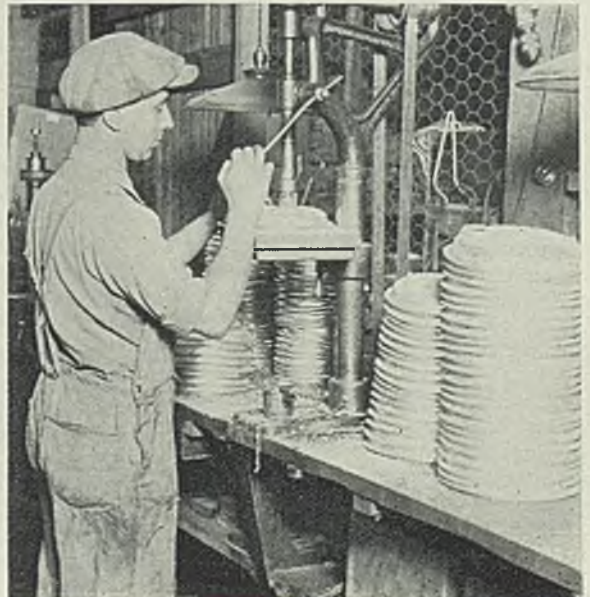
axle is driven by the standard drive shaft of the truck. The rear axle is driven through a separate driveshaft using oversize needle bearing universal joints designed for extreme angle operation.

When the truck is rolling along on the highway and only normal traction is requisite the rear or third axle simply trails, permitting greater speed and lower gasoline consumption. When the going is rougher and greater traction is necessary the driver throws a lever in the cab which engages the gears in the selective power unit and divides the power between the two drive shafts leading to the second and third axles. When encountering still rougher going, the driver throws a second lever which engages the underdrive transmission and doubles his power applied to the two rear axles.

The selective power unit, heart of the dual drive, is a transfer case with a single power inlet and two power outlets, combined with an underdrive transmission. The first power outlet is a through drive from the single power inlet to the original driving axle, and this power connection remains constant except when the underdrive transmission is used. The second power outlet is actuated by bringing the wide faced transfer gears in mesh. These gears may be engaged or disengaged at will and since their speed is alike there is no problem in meshing.

Sheet Specifications Ready

Standard permissible variation in gage weight, gage thickness, size, flatness and camber of sheets, drawn up and published by the Association of American Steel Manufacturers Technical Committees in 1929, has been revised and is now ready for distribution.



Seats for ventilators and heat indicators are machined in drill presses with special counterboring tools

Applying Wage Incentives to Steel Mill Maintenance Crews

BY B. S. BURRELL*

General Master Mechanic, Inland Steel Co., Indiana Harbor, Ind.

INSTALLATION and successful operation of a bonus incentive method of wage payment was considered responsible for approximately 40 per cent of the reductions made in maintenance and repair costs since 1924. Insistence of operating executives on greater economy in repair and maintenance work and less interrupted operation in steel mills since the turn of the century has shown the need. From 1902 to 1910, in the formative period of the organization it had been the practice to shut down one month, usually July, for a general overhauling. Everything possible was deferred until that time with the result that too much work piled up for the time available, thus tending toward rushing the work. The result was constant breakdowns and extremely heavy repair costs.

About 1910 the repair and maintenance department at Inland started to lay out a definite plan to obtain uninterrupted operation and lower costs. The first plan was to list all equipment in five classes, A, B, C, D and E, the two latter requiring immediate replacement. These two classes were too large, so the plan was changed, with a resulting program of definite, progressive improvements. This work

was slowed up by inadequate shop facilities and dependence on outside concerns for material and parts. In 1918 a full set of maintenance shops were installed, permitting rapid strides in this work.

In 1910 the plant installed a shop order system and made a start on detailed cost accounting. This work has progressed until the cost records are very valuable in the daily work. From 1913 to 1920 many auxiliary steam and hydraulic drives were replaced by electric mill motors. This program was extended to include replacement of all main mill steam engines in 1925-6 and has eliminated much of the week-end heavy maintenance and repair work. The excessive demand for labor in the peak production period during and after the war demoralized the maintenance organization until the turnover reached 40 per cent per month and costs were rising.

Incentive System Installed

It required two years after the 1921 slump to build up a capable and efficient maintenance force. The problem then was to keep these men. In 1923 the management engaged a firm of consulting industrial engineers to supervise the planning and installation of incentive and cost systems. Five men spent a year on this before putting the

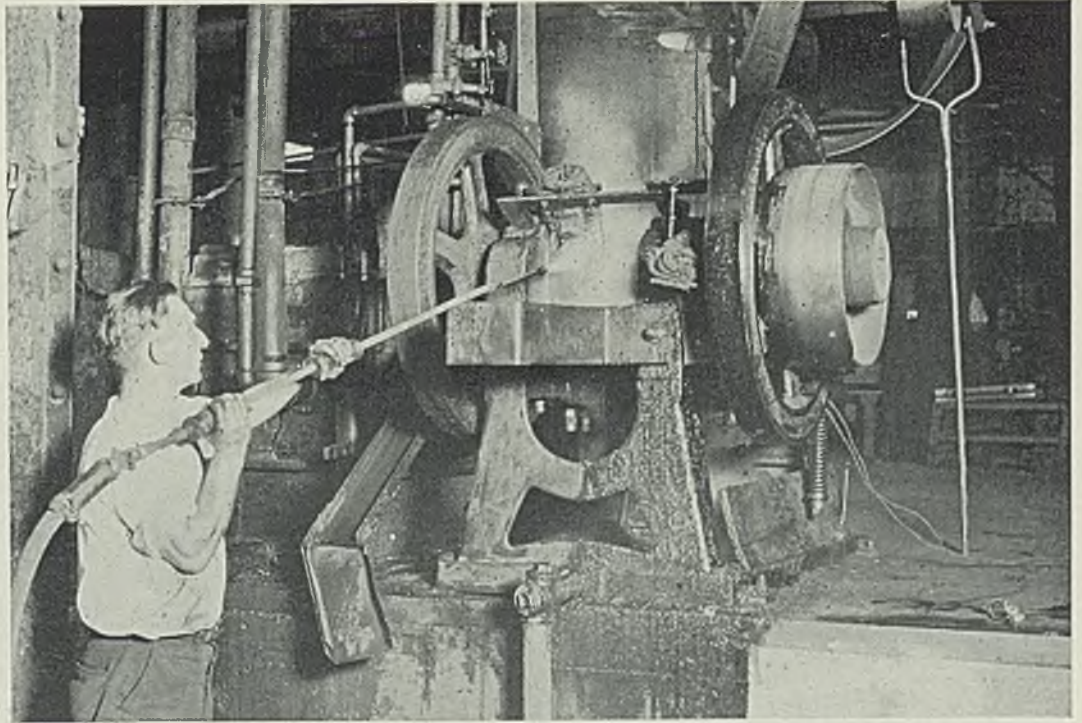
plan in operation. This was the first successful incentive system installed in steel mill repair and maintenance work. The incentive system is credited largely with cutting down labor turnover by permitting employes to increase their earnings, some to 30 per cent premium pay.

Approximately 80 per cent of the work is performed on incentives. Efforts are continually made to increase this. All premium rates are set by Inland's industrial engineering division, which is under the direction of W. Milburn, one of the original engineers who was retained to supervise this work. The staff studies a new job and submits a rate to Mr. Milburn. If approved, it must also be approved by the general master mechanic before it becomes effective.

Under this system a time limit is set for the task to be performed; for example, 10 hours are allowed. If the task is performed in 8 hours the 2 hours gained are divided, 50-50, the workman receiving pay for 1 hour at his regular hourly rate. If he fails to cut down the allowed standard time, or runs over it, he is paid for the hours worked at his regular hourly rate. He is never penalized. However, if he is continuously unable to make a premium on the work he is doing, and the organization is convinced the rate is right, he is transferred or

*From a paper presented before the Industrial Management society, Chicago, Oct. 22, 1936.

INCENTIVES raise efficiency of maintenance workers and cut down costs in procedures such as this pressure cleaning operation.



demoted to a job on which he can make the required gains.

It is very seldom that a worker possessing average intelligence and reasonably good health cannot fit in on any job. This 50-50 division is fair to both employer and employe. The employe really emerges with the greater end of the division because the employer must maintain the system and the machine or tool equipment. It is found that life of machinery is very much reduced when used on incentive-paid jobs. However, the faster a machine is worn out today, if properly handled, the better the indication to management that it has served its purpose and should be replaced. We have found that the cost of most of our shop equipment which is used on premium work is paid for from its own production returns. All mechanical shop foremen, assistant foremen, checkers, shippers, cranemen, hookers, material movement and chasers are paid a premium based on savings of labor and expense below the budget operating cost of their respective shop. For each \$100 in reduction of cost they are paid a set amount, all in proportion to their value in rank of position held.

This incentive system has now been in constant action in our mechanical shops for the past 11 years and has proven to be very successful.

This system has much value to our shop foremen and assistants. The foreman outlines to the planning foreman in general the work

he wishes done, specifying the order in which it is wanted. The planning foreman handles the details and places the jobs in the racks provided for each machine and floor workman. A full week's work can be placed in this rack for any or all machines; the job nearest the outside of the pocket is the work next to be given that particular workman. All details and particulars, including a drawing, are combined in a folder and passed out to the workman by a clerk as soon as he appears at the office window to punch his card out on the job he has just finished. By being relieved of a lot of detail the foreman is free to look over his shop and make improvements, consult cost books and develop short cuts and better methods.

Week-End Holiday Given

The year 1925 found us in good condition as regards the necessary mechanical spare equipment. This was due to the results obtained after the installation of large and well-developed mechanical shops in 1918. Up to this time we had operated in all our shops on a 24-hour day, 7 days a week, which was certainly a poor way to handle workmen, but it had to be done. A recommendation to close all our mechanical shops at noon Saturday and open them again Monday morning was made to our management and approved for a trial period of approximately three months; proving successful, it has been continued for the past 11

years. This arrangement gives these forces time off each week-end to spend with their families and enjoy life more freely, and in general creates more satisfied and active employees.

Starting in 1924 and continuing to date a cost accounting book has been furnished to all shop foremen and departmental master mechanics. These cost books contain a detailed cost of all labor and material charged against their particular department each month. For generations back such actual cost data was considered private and sacred information and was never shown to the working forces. These books are audited by our main plant auditing department and by our industrial engineering division, this work being done between the fourth and twelfth of each month. All books are turned in on the fourth and returned to my office for distribution on the twelfth of each month. A conference is held with any foreman or departmental master mechanic whose department is found to be running out of line on repair and maintenance costs. His books are gone into a detail to determine the cause, suggestions and instructions are issued for a correction and he is furnished his cost book to consult and ponder over until the fourth of the next month. These cost books, which show actual cost in detail, have been the means of educating our mechanical department heads to a very high degree. It is the practical method for progressive improvement, as today

each man largely measures his movements in dollars and cents.

All mechanical shop work is billed against the department ordering it as soon after the work is completed as it is possible to compile the figures. Such a bill rendered to them on each shop order of work done keeps the recipient in constant touch with the cost of such work and a comparison can be made against previous charges for similar work. This keeps our shop executives constantly watching and ever endeavoring to keep costs in a downward trend. Each departmental mechanical foreman or master mechanic is furnished with a book showing the stores of material items used in his department and the approximate cost of each, per dozen or per hundredweight, as the case may be. This has been the means of educating him to the dollars and cents values of such items and results in less waste when the value is known.

Operation of Maintenance Incentive

In 1927 all outside or mill mechanical department employes were placed on a cost bonus system and have operated under this system to date. The bonus paid is approximately 10 per cent of the savings or reductions made under the allowable limits of expenditure in repair and maintenance work in line with the tonnages produced in their respective departments. These allowable limits of expenditure at the time of starting this system were fixed at 15 to 20 per cent less than the best average costs obtained in the preceding years, 1925 and 1926. The allowable limits are reset by our industrial engineering division whenever justified due to improved installations of machinery or improved methods or operation that are not directly due to the individual efforts of the forces involved. This same procedure affects bonuses paid on a mechanical shop cost basis from time to time.

A separate tonnage bonus is paid to outside or mill mechanical forces based on increase in tonnages produced in their respective departments over a certain fixed production tonnage. The division of the grand total bonus paid these men amounts to approximately 50 per cent on a cost basis and 50 per cent on a tonnage basis. Thus they are encouraged to get out the highest possible tonnages at the lowest possible costs in repair and maintenance work. We have had a rule in use for many years that eliminates any persons from participating in our cost bonuses for a period of 6 months to 1 year if they are found to be unduly holding down the repair and maintenance expenditures in order to raise their bonus earn-

ings. To date no one has been found to have done this.

Other outstanding items worthy of mention that have contributed to reductions in our repair and maintenance costs are listed as follows: The general substitution and addition throughout the plant of heat-treated and hardened gearing, alloy steel shafting, bolts and such parts; alloy steel castings; heat resisting castings and machinery parts and manganese castings. The metal ingredients are constantly being changed to give longer life and a more satisfactory service on any machinery requiring such changes. The co-operation given us by manufacturers is of the highest character and is appreciated in a very high degree.

Improvements in the lubricants used and their method of application have been under constant study and practice for the past 15 years and have given us a very fine return for the effort. Gearing in general is giving us more than double the life and in many cases more than 10 times the service formerly received. Extra credit should be given to improved lubrication as it has played a large part in reducing repair and maintenance costs. A strong effort is made to keep dust and dirt out of bearings and gear housings; the dirt and dust are recognized as enemies of long life of moving machinery, especially in steel plants.

Furnace Maintenance Efficient

Repair, maintenance and rebuilding of all classes of furnaces at our plant have been handled very efficiently; improvements in design, quality of material used and workmanship constantly are being accomplished by our mason or brick-laying department. This department has shown constant reductions in repair and maintenance costs.

Reconditioning of worn and broken machinery parts by welding is done in a department which we have been gradually building up. We purchased oxyacetylene torches and thermit welding equipment in 1910 and our first electric welding unit in 1914. Today it is one of our very best paying departments. Reclamation work is permitted to be performed by this department when the total cost of such work done does not exceed 50 per cent of the new value of the article and consideration is given to its age. When costs run over this amount of the new value special permission must be given from my office before a start is made to reclaim the article. Fifty men are now employed in this work and the results are an asset to the lowering of repair and maintenance costs.

A strict crusade has been carried

on by our management since 1920 as regards the careful operation of our rolling mill equipment. In 1926 we started using an equipment damage report, made out against any person in the plant who was the cause of delays and breakdown to equipment. This report gives a description of the damage, the actual cause and the money lost due to such damage. It directly charges the person responsible for same without fear or favor to anyone. A copy of this report is sent to our management and a copy given to the person causing the damage. It is not the purpose of this report to try and find reasons to discharge any employe, its sole purpose is to create a general careful handling of equipment. It has had the desired result as no employe cares to get himself on record as causing us to lose money. Its use has also contributed to the lowering of repair and maintenance costs.

Users Recommend Machines

Our management is very liberal in permitting the various department heads to interview representatives of manufacturing firms and to recommend for purchase the class of equipment that best meets their particular needs. This is an item well worth mentioning as the close contact between the manufacturer and the user is a means of keeping the user informed at first hand of new and worthwhile equipment on the market. These contracts help us to find out what we need and they often start new developments of great value to us, as efficient machinery properly handled is a fine asset to repair and maintenance costs.

The fine and forceful action of our plant management and the co-operation of all of our various departmental superintendents, has contributed in a very large degree towards the stabilizing and lowering of repair and maintenance costs. Each mill department is operated on a budget allowance for repair and maintenance of the department and is cut off on future expenditures each month when it reaches the limits set per ton of product manufactured. Any further expenditures must be authorized by the plant management. Thus the entire plant is checked daily by departments on their expenditures. This is an excellent system and gives very good returns for the effort.

Repair and maintenance cost per ton of rolled products shipped showed a drop of 40 per cent in 1929 as compared with 1924, and a drop of 28.3 per cent to 1936 as compared with the 1924 cost. The incentive system is credited with approximately 40 per cent of the total reduction in cost.

A Step in the Right Direction



EVERY step that your employes take on CENTRAL'S "ALL-WAY-GRIP" Rolled Steel Floor Plate means—*A Step in the Right Direction*—for its *all-directional* design guarantees a perfect tread of safety.

Check carefully the facts that "ALL-WAY-GRIP" floor plate provides rugged, long lived floors—little affected by hard service . . . withstands the shocks of hard knocks and heavy trucking . . . is more easily kept clean and sanitary. Then, in addition, and of utmost importance—the *all-directional* design permits maximum economy and minimum wastage in shearing . . . each diamond projection centering the next one at right angles.

CENTRAL Rolled Steel Floor Plate comes in three leading patterns: the "ALL-WAY-GRIP," "KNOBBY" and the "KNOBBYETTE"—each designed for a specific use. Write for one of our complete booklets—illustrative and descriptive of each type. It's a valuable source of information for *it's a step in the right direction.*

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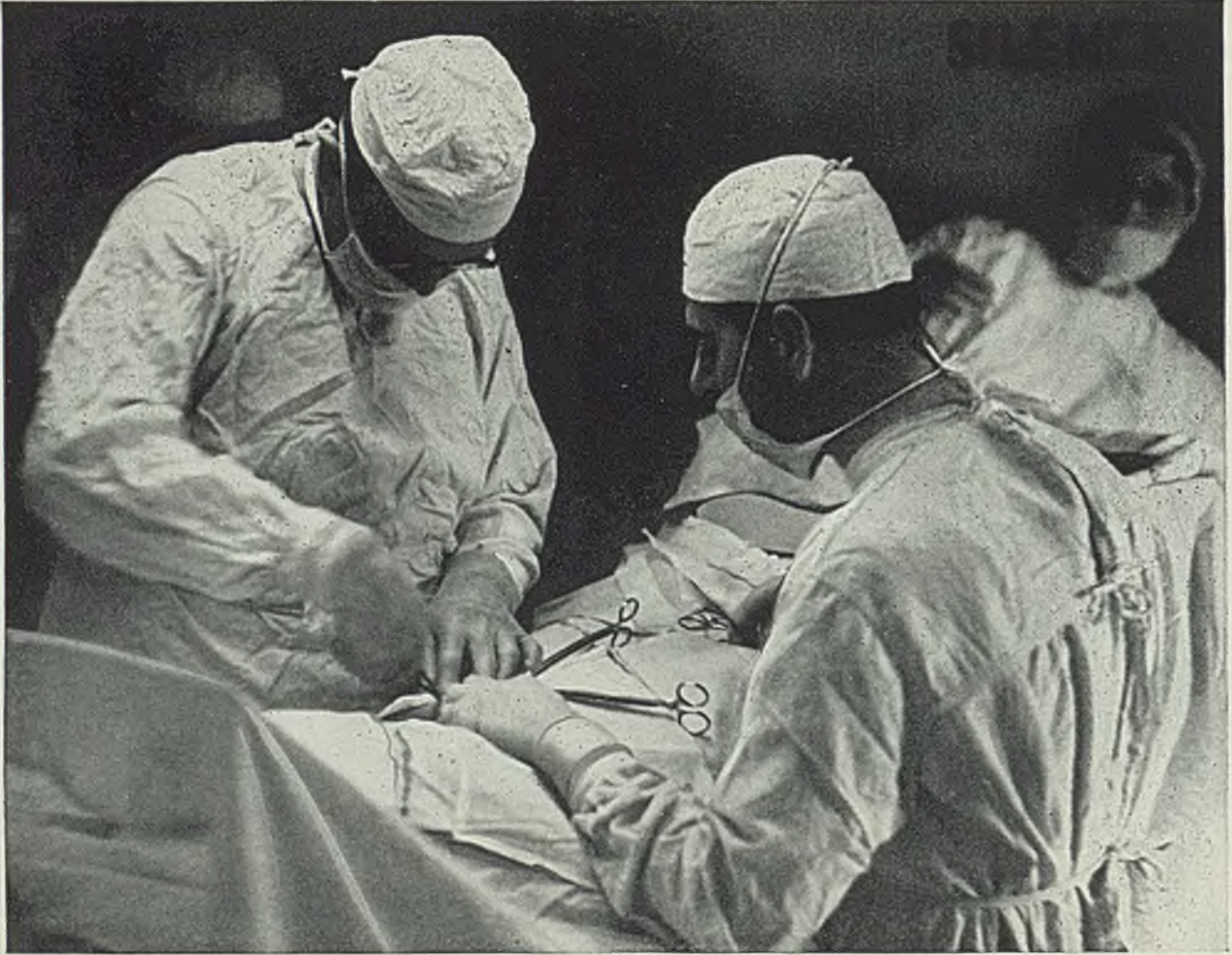
"Knobby" "All-way-grip"
"Knobbyette"

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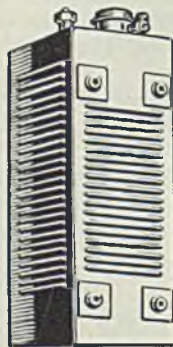
PENNSYLVANIA

EMERGENCY OPERATIONS



... out of place in steel mills

When sudden failure cripples an industrial truck, the emergency starts trouble and hold-ups for a number of men. It is possible for such an emergency to cost thousands of dollars ... especially in mills where the production is "in a line". Experienced men agree that Edison Steel-Alkaline Batteries do not fail unexpectedly. It's no wonder, then, that Edisons power 70% of the battery industrial trucks in America's great



steel mills. Just the opposite of ordinary batteries, the Edison will not suddenly "drop dead" on the job. Its life can be forecast in advance, accurately. Even as it approaches the last of its service days, it is not subject to sudden failure. Edisons keep industrial trucks highly reliable. In length of active service, Edisons outlive other batteries... 2 to 5 times. Offices in principal cities.

EDISON STORAGE BATTERY

DIVISION OF THOMAS A. EDISON, INC., WEST ORANGE, NEW JERSEY

Materials Handling

Accessibility Features Design Of New Switching Locomotive

A RETURN to conditions which are again taxing the ingenuity of plant managers to keep customers satisfied on deliveries has brought a renewal of interest in plant switching operations, both on the part of the industrial executives and of the railroad management. This is reflected in signs of greater activity on the part of manufacturers of locomotive equipment.

One of the most recent indications of this activity is the introduction by the Baldwin Locomotive Works, Eddystone, Pa., of a new diesel-electric locomotive, designed particularly for switching service and with a view to decreasing cost of inspection and repairs. This locomotive is shown in an accompanying illustration. Many features have been incorporated in this new design.

The general arrangement of the engine and all major assemblies, as

well as of the subassemblies, is such as to make all parts readily accessible. The main and auxiliary generators, engine, radiators, cooling fan and traction motor blower are all mounted on a common sub-base. The truck design permits dropping a pair of wheels and boxes without removing the traction motor. All electrical equipment is concentrated in an equipment box mounted underneath the main frame.

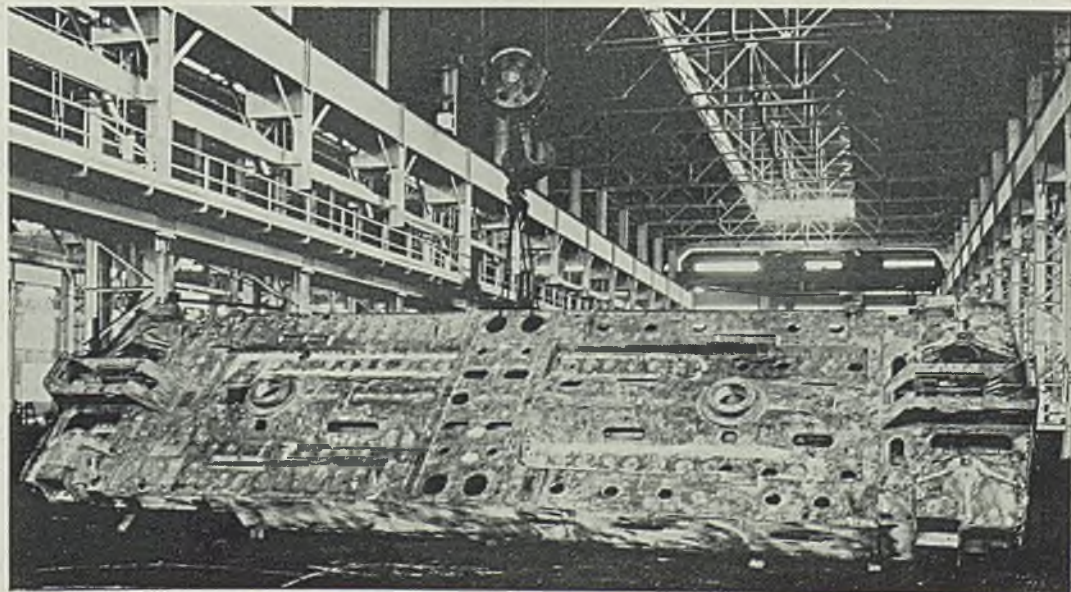
The locomotive underframe, also shown in an accompanying illustration, is an integral steel casting with bolting lugs for the engine-generator sub-base, a 500-gallon fuel oil tank, storage battery compartment, sand boxes, cab steps, traction motor air ducts and housings for draft gear and truck center pins. Trucks are of the four-wheel swivel type and have cast-steel frames. The wheels are of rolled steel and 40 inches in diameter. Tim-

ken roller bearings are used on the journals. The pedestal ways of truck frame and boxes are lined with manganese steel and provided with oil pockets to lubricate the wearing faces.

The engine hood has a removable top with sliding hatches and removable hinged doors give access to parts. The hood is of steel plate and its entire roof and sides can be removed if desired. The cab is of steel and entirely lined and floored with cork. Pressed steel is used for the doors and extruded aluminum for window frames.

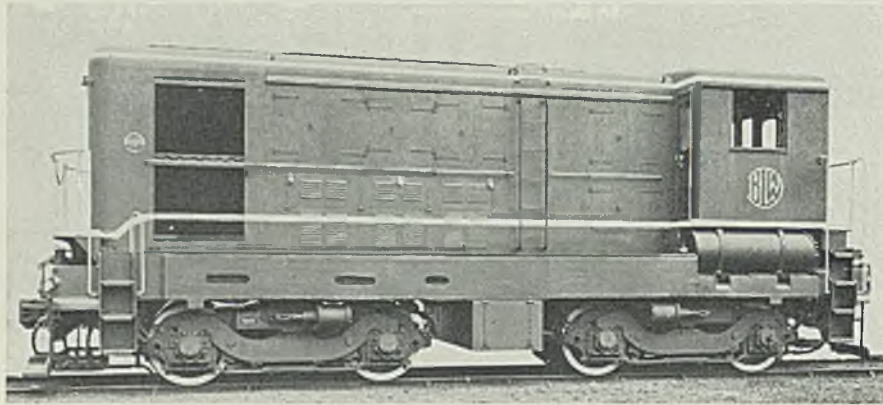
Statistics on Locomotive

The general characteristics of the locomotives are as follows: Weight on drivers, loaded, 212,000 pounds; weight on drivers, light, 200,000 pounds; length inside knuckles 39 feet 6 inches; height to top of cab 14 feet 3 inches; height of engine hood 14 feet; width overall 10 feet 2 inches; width of engine hood 5 feet 6 inches; rigid wheel base 8 feet; total wheel base 26 feet; fuel oil capacity 500 gallons; lubricating oil capacity 130 gallons; water capacity 248 gallons; sand capacity 2200 pounds; tractive effort, 30 per cent adhesion, 63,600 pounds; trac-



A STURDY overhead electric crane is required to handle such a unit, but here is a crane operation that permits a top view of the cast-steel underframe of the new Baldwin locomotive

MATERIALS HANDLING



SIDE view of new 660-horsepower diesel locomotive designed for plant switching operations

tive effort at continuous rating of motors 29,900 pounds; maximum speed 45 miles per hour.

The locomotive is powered with a De LaVergne four-cycle, six-cylinder solid-injection, cold-starting, full diesel engine direct connected with the main and auxiliary generators. Electrical equipment was furnished by Allis-Chalmers Mfg. Co., Milwaukee, but the locomotive manufacturer states that any standard type of electrical equipment may be furnished.

Skid Platforms Have New Corner Construction

YOUNGSTOWN PRESSED STEEL CO., Warren, O., has introduced a line of all-steel skid platforms with a corner construction feature on which the company has made application for patent. The new construction, shown in the accompanying illustration, is said to provide greater factors of stability and resiliency in the platform than were possible before this design was incorporated in the units.

It is claimed that actual physical

tests, conducted and recorded by metallurgical and engineering experts, showed that this integral twin-ribbed section is from 1.7 to 2.3 times stronger than its predecessor. It is also claimed that weakness through metal fatigue caused by work-hardening in the process of fabrication is minimized in the shape of this new corner, and that long life and safety in service are obtained.

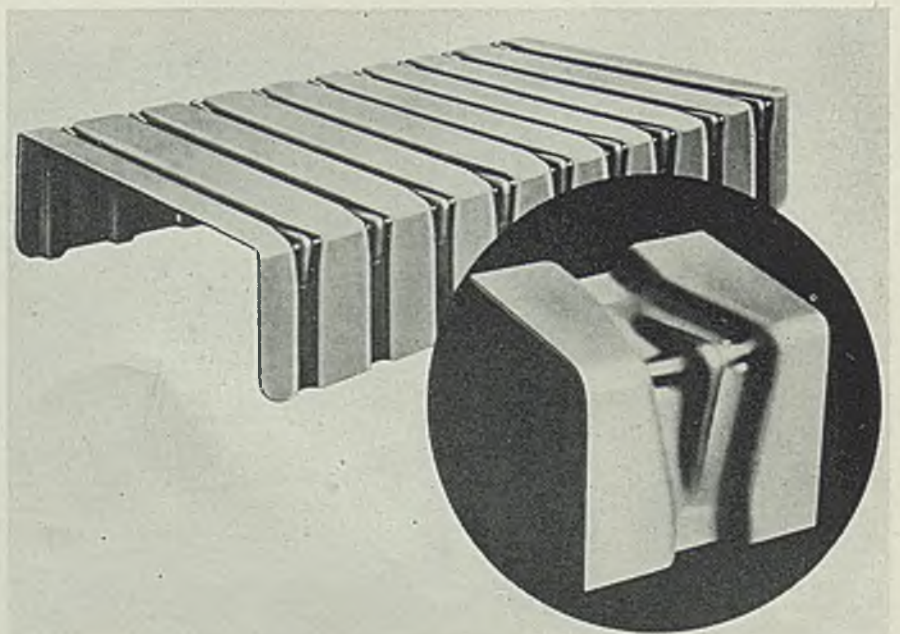
Interesting Salvage Job

DIVISION of canals and waterways, State of New York, recently completed salvaging operations in raising an \$18,000 cargo of scrap iron from two barges which had sunk in the barge canal after a collision with a bridge abutment. H.

O. Schermerhorn, commissioner of canals and waterways, states that this operation was carried out as a matter of routine work.

The scrap iron was transferred by use of a 1½-ton capacity magnet handled by one of the department's regular maintenance derrick boats. The rate of handling of the scrap iron was approximately 12 tons per hour. Power for the magnet was furnished by a 25-kilowatt, portable, gasoline-driven generator operating on 220 volts direct current.

Insurance underwriters interested in the cargo estimated that approximately 95 per cent of the original cargo was salvaged. The scrap was loaded on three 100-foot barges and returned to Buffalo. The salvage scene was near the Clyde locks, the barges sinking being on their way from Fort Edward to Buffalo.



NEW design of skid platform introduced by Youngstown Pressed Steel Co. Inset shows a close-up of the twin-ribbed corner section

Plant Expanded to Fill Rapidly Growing Demand for Die Castings

LARGEST and most highly mechanized die casting plant in the world, it is said, is under construction by the Doehler Die Casting Co., New York City, at Pottstown, Pa. Properties of the company there are being completely revamped at an estimated cost of more than \$400,000, with the work expected to be finished by February of next year. These expanding facilities at Pottstown are in addition

jections unless they are conformed with, made it essential that electroplaters devise methods of control, which have proved an especially important step in metallic finishing.

Indicating the broadening use of die castings, Mr. Pillion pointed out that originally they were produced mostly for the automobile industry. Now, he said, notwithstanding the fact that this industry continues to consume an increasing amount, new

ed, will go into household appliances of one description or another, 15 per cent into office equipment and clocks, meters and recording instruments and the like, and the remainder, about 15 per cent, into still newer fields which he believed hold much promise for the future.

These latter fields include radio and television, textile machinery, oil burners, air conditioning equipment, plumbing fixtures and small precision tools, such as micrometers (illustrated in STEEL, Nov. 30).

The broadening use of vending machines here, in line with the trend in certain European countries, is leading to heavier demands for die castings. Typical of these requirements are the parts shown in the accompanying illustration. Twenty in all, they enter the assembly of the vending machine shown on the right.

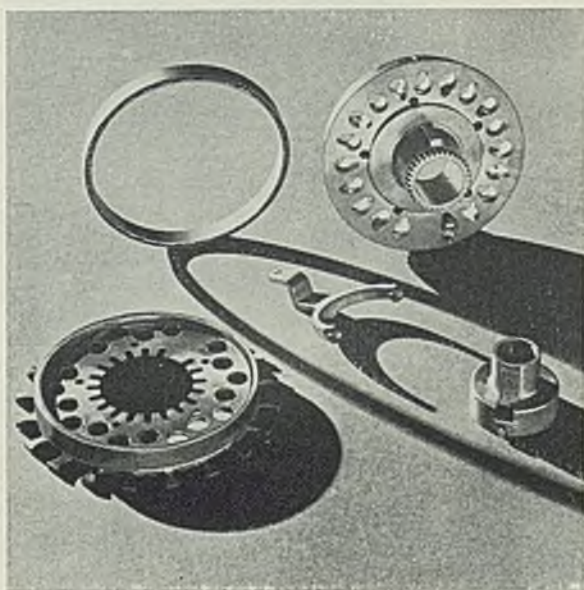
Modernization of railroad equipment is making fresh demands not only for outward styling, but for vital mechanical parts. Air brakes, one time made in part of malleable iron, are now employing zinc die castings. In no case perhaps is the increasing confidence in die cast alloys better illustrated.

The air conditioning field has developed an important opening for die castings, particularly in the intricate design of the blower fan. Here the economy of substituting an assembly of die cast parts for single sand castings has proved advantageous.

Die castings and plastics are finding common ground in a number of cases, where the strength of the metal casting is required to supplement the finish obtainable in plastics. Various office appliances and ornamental pieces fall into this category.

Despite the fact that automotive requirements now constitute less than 50 per cent of the outlet for die castings, Mr. Pillion estimates that automobile needs in 1936 will be

(Please turn to Page 54)



Absolute accuracy is required of these die cast parts used in the automatic tuners of Philco radios

to plants in Toledo, O., and Batavia, N. Y., and focus attention to the rapid growth in the application of die castings.

Commenting in a recent interview with STEEL, Lester A. Pillion, executive vice president of the Doehler company, attributed this expanding application principally to increasing confidence in die casting alloys and to better finishes, which are now available both in the metallic and organic fields.

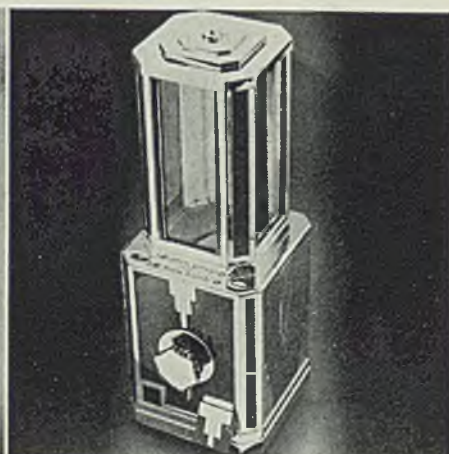
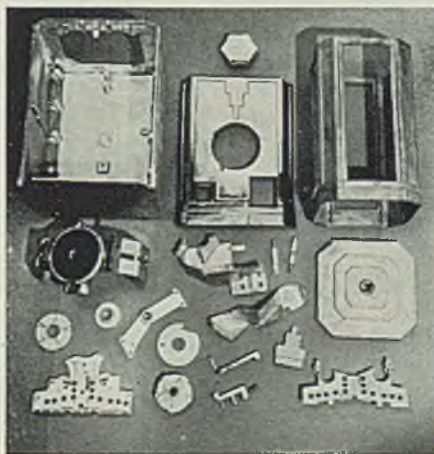
This growing confidence in the alloys, he added, has been richly earned by metal producers and the die casting industry, which in recent years have spent heavy sums in research and promotional education.

Improved finishes have come with scientific strides in electroplating and with such developments in the organic field as the present-day air dry lacquers and low baked enamels.

Exact specifications for various forms of plated finish, particularly in the automobile field, involving re-

applications have expanded so rapidly in other directions that less than 50 per cent of the die castings produced this year will be for the automobile industry.

More than 20 per cent, he estimat-



Twenty die cast parts shown left enter into the assembly of the vending machine shown right. The use of die castings in this case is typical of the growing confidence in die cast parts

SURFACE TREATMENT

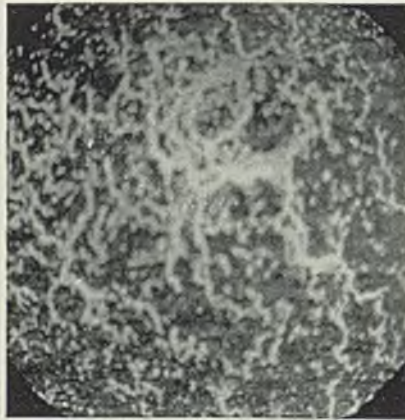
AND FINISHING OF METALS

Rust Inhibiting of Structural Steel Accomplished Soundly, Scientifically

UP TO the present, the most satisfactory method for preserving steel surfaces has been to apply in the fabricating shop, a coating of red lead linseed oil paint and after erection, one or two field coats of high grade linseed oil paint. Regardless of the type of paint used, this method of treatment has never given complete satisfaction. After the shop painted steel is shipped to the erection site, it is subject to abuse during unloading and erection, which invariably necessitates careful examination of the entire structure and spot painting in the field before the final field coats are applied. In many cases, almost complete re-coating of the structure is necessary. From this standpoint alone, the present treatment largely fails to accomplish its purpose economically. Worse than that, it involves applying paint to surfaces usually unfitted to receive it.

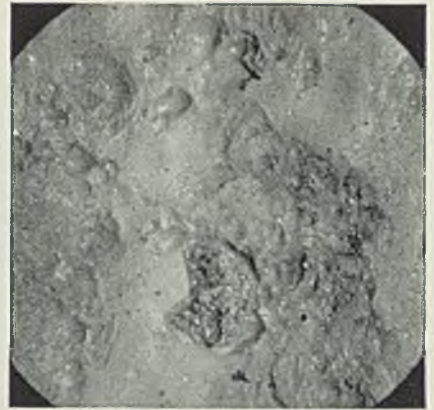
Consider the type of surface to be coated and the punishment it

must take before the protective coat is applied. In the rolling of structural steel, two kinds of mill scale form on the surface at different times. When the billets are heated in the furnace, a light scale forms on them. This light scale falls off when the billets first pass through



Rusty scaly steel after treatment with inhibitor. X100

the rolls. During the further process of rolling and finishing the plates and shapes, a heavy blue secondary scale forms on the surface of the steel. This scale becomes cracked and porous in spots. Moisture and chemicals in the atmosphere get into these cracks and porous spots in the scale and attack the surface of the steel itself, forming rust. This rust occupies about four times the volume of the steel it replaces and blisters and cracks off portions of the secondary scale which pop off and carry away the paint covering applied over top

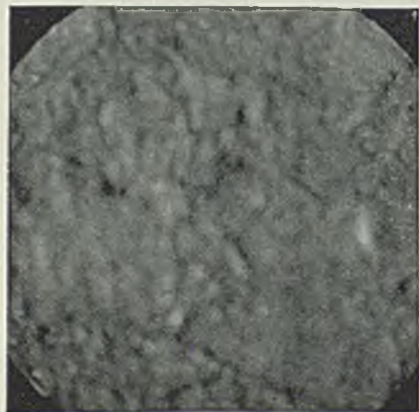


Steel painted with one coat of standard red lead primer after 240 hours exposure to salt spray, X100

of it. That portion of the secondary scale which is tight is beneficial to the preservation of the steel.

When the rolled steel leaves the mill, it travels in open freight cars to the fabricating shop, where it is unloaded and either processed immediately thereafter, or stored in the fabricating yards. During this time, it is exposed to weather and rust begins to form on the surface and in the cracks and crevices of the scale. The normal painting schedule then follows and after a short time, due to the progressive action of the rust under the scale, the protective coating is loosened and re-painting of the structure is necessary, for the customary linseed oil base paints offer a partially porous film through which minute quantities of moisture and oxygen can pass and accelerate the growth of the rust which is already present on the surface.

Thompson & Co., Pittsburgh, have developed the Synhibit process for preserving structural steel and preventing this occurrence. It also provides for the steel, a rust free surface to which more efficient, longer-lived, better adhering protective coatings may be applied. This new method consists of a scientific,



Photomicrograph of bare, rusty, scaly steel. X100

CRANE RAILROAD UNIONS

STRONG and TIGHT
Despite
SEVERE SERVICE
REPEATED USE

CAN
"Take It"

● Made originally to withstand the excessive vibration on railroad rolling stock, Crane Malleable Iron Railroad Unions have definitely proved their value to iron and steel mills on important and complicated piping assemblies for steam, air, water, oil and gas. They speed up assembly and dismantling, save time when alterations, repairs or replacements of equipment are necessary, and may be taken apart and reassembled repeatedly without affecting their strength or tightness.

Built of tough malleable iron they withstand with ease the strains resulting from making-up joints, expansion, contraction and vibration. No gasket is necessary as the brass-to-iron ground joint is non-corrosive and makes a tight seat very easily. The brass ring is forced in under heavy pressure and will not loosen. Each union is given an air-under-water test and is generously proportioned to insure a high factor of safety. All parts are interchangeable on unions of the same size and style and with similar parts of Crane Malleable Iron Railroad Union Fittings.

The judicious use of these unions and union fittings will reduce the material required on complicated piping assemblies, the number of joints and the time and labor involved in making them. Try a few and learn their many advantages.

The Crane branch or distributor in your city can supply you. Each carries a large stock of Crane quality valves and fittings and is your nearest, most convenient source of supply.

Let Profits Pay
for Plant Im-
provements.
Use the Crane
Finance Plan.

236 CRANE

Railroad Unions

Malleable Iron

WORKING PRESSURES
3-inch and smaller — 250 pounds steam
— 500 pounds cold water, oil, gas or gasoline non-shock
3½ and 4-inch — 200 pounds steam
— 300 pounds cold water, oil, gas or gasoline non-shock

FEATURES
Brass to Iron Seat — Ground Joint
Air Tested

List Prices, Unions

Size	Inches	¾	1	1 ½	2	2 ½	3	3 ½	4																		
No. 814, Female	Black	Each	35	50	65	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500
	Galv.	Each	41	56	71	86	106	126	146	166	186	206	226	246	266	286	306	326	346	366	386	406	426	446	466	486	506
No. 815, Male and Female	Black	Each	38	53	68	83	103	123	143	163	183	203	223	243	263	283	303	323	343	363	383	403	423	443	463	483	503
	Galv.	Each	44	59	74	89	109	129	149	169	189	209	229	249	269	289	309	329	349	369	389	409	429	449	469	489	509

List Prices, Air Pump Unions

Size	Inches	¾	1	1 ½	2	2 ½	3	3 ½	4
No. 817, Straight	Black	Each	1.40	2.34	3.28	4.22	5.16	6.10	7.04
	Galv.	Each	2.30	3.24	4.18	5.12	6.06	7.00	7.94
No. 817, Reflexing	Black	Each	1.70	2.64	3.58	4.52	5.46	6.40	7.34
	Galv.	Each	2.60	3.54	4.48	5.42	6.36	7.30	8.24

Service recommendations: Crane Railroad Unions and Union Fittings are recommended for making service on pipe lines carrying steam, water, oil, air, gas, gasoline, or other fluids. They are especially suitable for railroad work and are used on general locomotive, car, shop and yard service.

Dependable construction: All parts are heavy and ruggedly constructed and will withstand strains resulting from making up joints, expansion and contraction, vibration, etc.

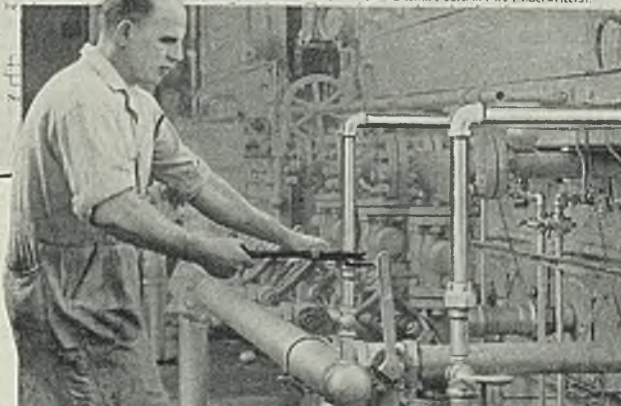
Brass to iron seat, ground joint: No gasket is necessary. The brass to iron ground joint is non-corrosive and makes a tight seat very easily. It can

affecting its strength or tightness. The brass ring is forced in under high pressure; it will not loosen in service.

Test: Each union and union fitting is given an air-under-water test.

Interchangeability: Unions and union rings are interchangeable with similar parts of the union fittings shown on the following page.

Listed by Underwriters' Laboratories: Crane Railroad Unions and Union Fittings have been inspected and are listed by the Underwriters' Laboratories (National Board of Fire Underwriters).



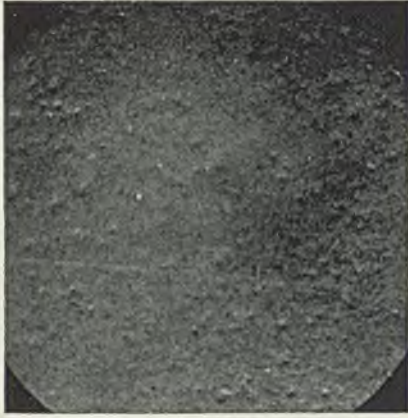
For complete description, working pressures, prices and dimensions on Crane Malleable Iron Railroad Unions see page 236, new Crane No. 52 Catalog

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Steel painted with one coat of inhibiting primer after 480 hours exposure to salt spray. X100

chemical, and metallurgical pre-treatment of the metal surface.

Loose rust or loose scale on the surface is removed by wire brushing. That portion of the scale which is tight and remains, is a protection to the metal surfaces and aids in the retention of the paint. This wire brushing is followed by a treatment of the wire brushed surfaces with an inhibitor which is claimed to dissolve the remaining rust and prevent it from forming again. It also penetrates into the minute cracks in the scale "kills" embedded rust and inhibits further rusting under the surface of the scale or the protective covering.

In addition, the inhibitor forms a surface to which paints adhere well and also insulates and prevents the formation of galvanic electric currents which would start corrosion and destroy the paint film.

Zinc Chromate Primer Used

Inhibitor treatment is followed by application of a zinc chromate, iron oxide, synthetic vehicle primer. Aluminum finish coat is recommended by this company in most cases for the final coating, as it has proven somewhat more durable than graphite or other pigment base films. This company manufactures its own line of inhibitive paints.

Cleaning of metal surfaces is possible by three methods. Namely; pickling, sand blasting, or wire brushing, but for general practice and economy, only the wire brushing method is satisfactory. Pickling, which completely removes all scale, both good and bad, leaves a surface which rusts very readily and for heavy pieces of steel, is apt to cause embrittlement due to hydrogen absorption. Sand blasting removes all scale, leaves a surface which rusts readily and which is covered with smooth rounded hillocks to which paint does not adhere well. The type of wire brushing required for

the inhibiting process removes the loose scale and rust, leaves the protective scale in place and supplies a surface rough enough so that paint ties to it tightly. This type of wire brushing does not involve polishing the surface or removing all rust and is cheaply and economically done. The saving in cost in this type of wire brushing over that necessary on surfaces to be coated with old style lead and oil paint, is sufficient to pay for the application and cost of the inhibitor. A more permanently rust resisting surface is the result.

The inhibitor contains, in addition to solvents and dispersing agents, both phosphoric acid and a chromium compound. In treating the metal surface, it is claimed, the rust is destroyed or rendered passive and in addition to this, there is deposited on the treated surface, a complex iron chromium phosphate to



Steel painted with standard red lead, two coats, and standard aluminum paint, one coat, after 744 hours exposure to salt spray. X100

which primer and paint adhere with great tenacity. Its mechanical qualities, it is said, involve the ability to penetrate deeply into cracks and crevices, however minute, and to dissolve and disperse any grease or oil which may be on the surface. It is applied to the surface in varying degrees of dilution, depending upon the condition and the type of surface to be treated. When it is used in preparing old painted surfaces for repainting, it does not harm or loosen up the old paint. When to bare metal surfaces, the reaction occurs within a very few minutes and as soon as the solvents used as a carrying medium have evaporated, and the surface become completely dry, which is generally in less than two hours, the primer may be applied.

With slight modifications in the vehicle used, depending upon the particular application involved, the process can be adapted to almost

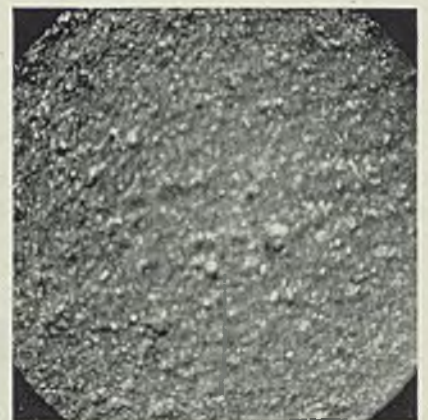
any given set of corrosive conditions. It is especially applicable to the reconditioning and repainting of railway bridges as it is unaffected by brine drippings from refrigerator cars which damage so greatly the floor systems of these bridges.

Process Confirmed by Engineers

The soundness of the reasoning involved in the development of the process and its invention has been confirmed by many chemists, metallurgists and engineers. Within the knowledge of the inventors, there is no other inhibitor which can be applied without necessitating wiping off to remove excess acid and Synhibit primer and finish coats are the only ones which can be applied over the Synhibit inhibitor without wiping or washing, and be unaffected by it. Patents have been applied for covering the process in whole and in part and as omission of any stage of the process would entirely defeat its purpose, it will only be sold to be applied complete. The materials, including the inhibitor, primers, and finish coats, and complete instructions and information regarding application, can be obtained from Thompson & Company, Box 6757, Pittsburgh, or Industrial Chemical Products Co., 3777 Bellevue Ave., Detroit.

Prefinished Cold Rolled Steel Strip Now Offered

Cold rolled strip steel prefinished in color with flexible lacquer is now offered by Acme Steel Co., Chicago. This material, known as Acme Colorstrip, is claimed to withstand bending, forming and drawing operations which should have an important cost bearing on products for which it can be used. A wide variety of color is offered.



Steel treated with chemical inhibitor, inhibiting primer and specially formulated aluminum paint after 3408 hours exposure to salt spray. X100

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increase production
with this long light source**

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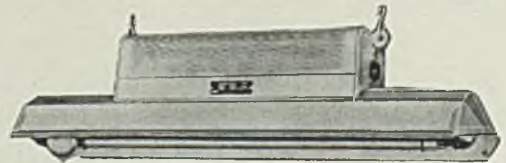
Where perception of detail is the most important factor, the restful yellow-green rays of Cooper Hewitt light alone is the finest illumination obtainable. For operations that require perception of color, incandescent lamps can be added to the mercury. The resulting illumination is a very close approximation to daylight.

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VAPOR LAMP COMPANY**

750C

WELDING, etc.

by Robert E. Kinkead

Preparing Welding Shops For Next Year's Business

THE most difficult problem management will have in connection with a welding department in 1937 will be to realize that the forces operating on the department are entirely different than they were in, say 1933. In most cases the personnel will be the same, there will be more floor space in use and some additional welding equipment, the same shop accounting system will be in use and there will be a vast increase in the demand for the output of the department.

The average skill and good will of production personnel will be lower as a result of taking on new men and night shift work. The average of design skill will be less for the same reasons. Field failures and dumb blunders will increase. Costs will increase and in many cases over-balance the economies which naturally may be expected from having plenty of work to do. Due to these causes, many distress calls are being made as this is written;

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.

they will become louder and more frequent as the year 1937 opens up.

The same old welding department in many cases, cannot be merely expanded to keep costs controlled under conditions likely to occur in 1937. Automatic welding machinery will be needed. Instrument qualification of operators continuously and better shop inspection will be required. Material handling equipment, manipulators and position finders for welding will have to be installed. Safe incentive systems will have to be used. Design methods will have to be rationalized and made easier for new men to follow. Adequate methods of representing

welds on drawings will have to be introduced.

Management, in many cases, will be reluctant to introduce these innovations until the damage has progressed to such a degree that it is difficult to get control of the situation. That will mean long sleepless nights for those responsible for the welding.

Considerable shopping around will be needed to get the welding department organized for 1937. The time to start is now.

♦ ♦ ♦

Automatic Gas Welding

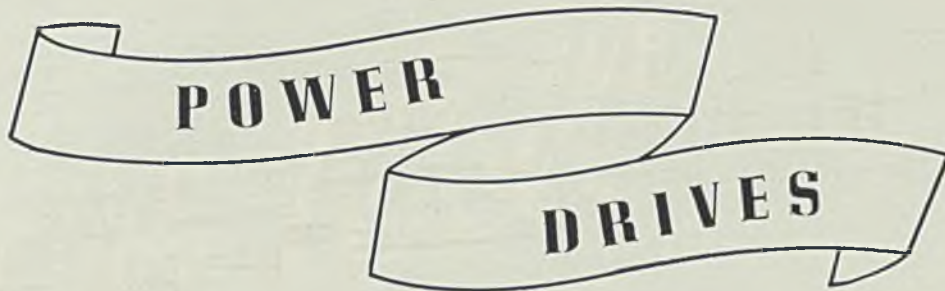
Among the automatic welding processes, the automatically operated gas flame for butt welding thin metal sheets has many interesting possibilities. In some applications a multiple tip blow pipe is applied to the top side of the butt weld joint and a single tip on the underside. The top and bottom blow pipes are carried on independent carriages which travel at uniform speed, although the speed may be pre-adjusted to suit the conditions for welding of various thicknesses of metal. For ordinary purposes, no metal is added to the plain butt joint.

A particular feature of the process is the photo-electric cell control. Application of the welding heat is controlled by radiation effect on the cell. If the heat is too low, the cell actuates a mechanism which raises or lowers the welding flames from the surface of the sheets. In this respect, the apparatus is unique among all of the automatic welding processes. In fact, it is the only one which is truly automatic, since in all others the variable elements are preadjusted and if the conditions are different from what they seemed to be, the operator must try to correct the machine adjustment while the operation is in progress. In many cases, the time is so short for the completion of the welding cycle that the operator can only guess right as to what should be done once in four or five times.

Large Welded Trailer Rolls on Rubber



ROLLING on the rubber tired wheels of what is believed to be one of the largest trailers so equipped, steam shovels and other heavy equipment move easily and rapidly. Of all welded construction, the new trailer has capacity of 30 tons and is 47 feet 9 inches long and 11 feet 6 inches wide. Rogers Bros. Corp., Albion, Pa., is the builder. Photo courtesy Lincoln Electric Co.



Variable Speed Drives Increase Efficiency of Production Machines

ANY machine producing a variety of products, materials, alloys or gages can use variable speed transmission to advantage. Even though step cones or change gears are available the close adjustments to obtain the best and most productive speeds are not so easily and quickly made as with modern variable speed units. The tendency, therefore, is for the operator to remain at what he assumes to be a close speed.

A few examples show the advantage of variable speed. On one coil winding machine provided with three step cones, often one step was too low and the next too high. The installation of a variable speed transmission, lineshaft driven in place of the countershaft, permits obtaining an increase in production on one type of work of 16 per cent and on another of 20 per cent and still maintain the necessary tolerances. One important advantage here is the ease in making slight increments or adjustments until the maximum operating speed is obtained.

Other Applications

Conveyor type furnaces or heating units permit easy adjustments of conveyor travel as the furnace warms up or with a change in dimension, material, or amount of heating required by the product.

Punch and forming presses, because of the different gages, materials and complexity of product, have wide variation in best productive speeds on different jobs. The same is true of many other types of machines. Operating speed is usually a guess and with fixed speed ratios the operator has no means of knowing how far he is short of the maximum for best output.

With the wide variety of types, models and sizes of variable speed

transmission units available from the different manufacturers such drives can easily be applied to practically any type of machine or work.

For lineshaft drives the variable speed unit replaces the countershaft. On direct driven units motor pulleys of the variable diameter type serve in many cases, using a special motor base to maintain belt tension. Where variable speeds are desired over a wider range several different types may be used, some even having the motor built into the transmission unit. Usually the mounting of such a unit on a machine is no more difficult than is changing over to individual motor drive. On some equipment the variable speed unit may be floor mounted alongside or under the machine, thus occupying a minimum of floor space.

On short runs where complete time and speed studies might not be economical, easily adjusted variable speed transmission permits quickly obtaining a satisfactory speed for the work by test.

Even a small increase in production by obtaining better operating speeds will soon pay for the additional cost of the variable speed unit. Obtaining maximum output per machine is one of the best methods of reducing costs of production to meet the rising costs of operation. Since production varies with speed (within limits of accuracy and tool abuse) some method of adjusting speed to obtain maximum output on all operations is a prime necessity for economy.

♦ ♦ ♦

Nameplate Significance

Generally trouble with belt drives results from undersized belts for the work to be done. The common method of selecting a belt for a motor

drive is to take the motor nameplate rating as the power requirement. For example, for a 5-horsepower motor a 5-horsepower belt is selected according to the tables of the belt manufacturer. Such a drive is satisfactory only when the maximum load always remains under the 5-horsepower rating, that is, when the motor always is underloaded. Some drives are like that and could be operated just as well by a 3-horsepower motor.

The present tendency of drive engineers, however, is to load motors to operate at a load as near as possible to the nameplate rating and depend upon the characteristics of the motor to take care of starting and other short overloads. Starting requirements and sometimes operating peaks are 50 to 100 per cent above normal operating load. The characteristics of the motor will take care of this under normal conditions.

Belt ratings ordinarily do not include such overload capacity. Therefore, in selecting the belt the better practice is to consider maximum motor load as the power to be delivered by the belt. Maximum starting torque of the motor is easily obtainable from the motor manufacturer. When belt drives are rated to take care of this starting load, longer belt life and comparative freedom from trouble may be expected.

♦ ♦ ♦

Before condemning any type of power transmission equipment because of its reputation a number of years ago, look into the quality of the product today. No one would compare the automobile of today with the car of 20 years ago. Transmission equipment has developed too.

♦ ♦ ♦

At one time the practice of placing an unsightly can under bearings to catch dripping oil was considered necessary. With the development of modern oil retainers, improved lubricants and better lubrication practices oil catchers should not be necessary.

PROGRESS IN STEELMAKING

Influences Rimming Action

Cross section of an ingot relative to its height influences the rimming action of the steel considerably, according to an open-hearth superintendent. Better rimming action is secured when pouring a 21 x 30-inch ingot to a height of 75 inches than when pouring to a height of 90 inches.

♦ ♦ ♦

Greasing System Flexible

Necessary flexibility required for the lubrication of the various mill units is provided by a system of centralized grease lubrication employed throughout the hot and cold mill and pickling departments of a recently completed stripsheet mill. The system is one of the most complete and modern ever installed. Machinery bearings requiring lubrication at infrequent intervals are

equipped with hand-operated trippers which take the grease supply from the main pressure pipes and grease is fed through the indicating valves to the bearings by manually operating the trippers. This system is employed on isolated machinery which does not warrant electric operators, such as mill tables and individual machines in the pickling department. Advantages to be gained by a system of this type are positive application of grease to the bearings in exact quantity requirements to suit each bearing at proper time intervals, constituting a trouble-free operation with a minimum amount of labor as compared to old style methods heretofore employed.

♦ ♦ ♦

New Tool for Draftsman

Steelworks draftsmen will be interested in a new type eraser which

is suitable for removing India ink from tracings. The eraser is composed of hundreds of spun glass fibers bonded together with a flexible solution. It is mounted in a molded plastic holder of about the same size and weight as a small fountain pen and is fed from one end of the holder by revolving the top section.

♦ ♦ ♦

Devises New Return System

A revolutionary method of returning steam and condensate to steel plant boilers at higher temperatures than ever before possible is announced. The return system is motor driven with one moving part. It is closed to the atmosphere from the boiler, through the steam using equipment and directly back to the boiler at any pressure and temperature ranging from 275 to 350 degrees Fahr.

New Liner for Box Cars Protects Shipments of High-Grade Sheets

ASK any steel mill claim agent about the number of shipments of sheets damaged in transit through lack of proper protection. See page through cracks, contamination by contact with other materials left on the floor of the box car by previous loadings and rain damage through cracks are only a few of the small factors that cause claims for adjustment to arise.

Of recent development is the car liner shown in the accompanying illustration. It was designed for the protection of automobile body sheets, bars and other high-grade steel in transit.

On account of its light weight, one man can line a box car in a few minutes. The bottom forms a complete tray; the sides are one solid piece that lines the car and fits snugly into the bottom tray. Both the sides and bottom of the liner are water-resistant. By reason of its being in two pieces, economies are possible by having different weights for sides and bottom. There are no overlapping edges to tear that later might lead to damage of the shipment.

No cutting is necessary as each liner is made specifically for standard freight

cars. The liner is manufactured by Hummel-Foley Corp., Hopewell, Va.





All's Well

when you specify
VANCORAM BRAND
FERRO ALLOYS

Vancoram Brand Ferro Alloys are produced from the highest grade raw materials, are refined to exceptionally high standards of purity, and are available to the steel and iron maker in the various forms required to meet a wide range of metallurgical uses.

FERRO-VANADIUM

Open Hearth, Electric and Crucible Grades

FERRO-SILICON

15%, 50%, 75%, 80-90%,
90-95%

FERRO-TITANIUM

High, Medium and Low Carbon Grades

FERRO-CHROMIUM

High Carbon Grade (4 to 6% carbon). Low Carbon Grades (from maximum .06% carbon to maximum 2% carbon).

Special Iron Foundry Grade

CHROMIUM METAL

ALSIFER

The Ferro-Silicon-Aluminum Deoxidizer Without a Disadvantage

Large stocks are always maintained ready for prompt shipment. Specify Vancoram Brand.

VANADIUM CORPORATION OF AMERICA

420 LEXINGTON AVENUE, NEW YORK, N. Y.

Plants at Bridgeville, Pa., and Niagara Falls, N. Y.
Research and Development Laboratories at Bridgeville, Pa.



NEW EQUIPMENT

Skid Carrying Trailer—

Mercury Mfg. Co., Chicago, has designed a new trailer to link together the lift-truck-skid and the tractor-trailer systems of materials handling. The unit is designated as Model A-310-119-M and is of caster steer type with a steel channel frame. The load and caster wheels are of the molded-on rubber type, size 12 x 3½ inches and 10 x 3 inches, respectively, and are equipped with Hyatt roller bearings. Lubrication of wheels and ball bearing plate type casters is by means of Alemite-Zerk lubrication fittings. The running gear is protected by heavy plate guards which serve as guides for the entrance of the lift truck trailing axle. The clearance of the trailer is 11 inches to permit operation with a standard 11-inch platform truck trailing axle. The unit is equipped with Mercury standard hook hitch and towing eye, has an overall width of 38 inches, overall length of 66 inches and overall height of 22 inches. It accommodates a box skid, 66 inches long, 40 inches wide and 24 inches deep. The capacity is two to three tons. In use, a corrugated box skid with cutaway supports can be packed up at either end or side by a lift-truck, and deposited on the supporting steel plate bolsters of the trailer, these bolsters being designed to facilitate depositing of skid loads. The truck can lower the loaded skid on the trailer from either side or from

the rear end in order to meet varying plant conditions.



Pressure Regulator—

DeVilbiss Co., Toledo, O., announces a new low capacity regulator type HFS, designed for sensitive regulation of air pressures below 30 pounds. The 4-inch diaphragm of the new regulator provides a much greater sensitivity than that of the standard model, which is usually much smaller, it is claimed. Regulated pressure can be graduated up to 30 pounds with a variation of one ounce for each 10 pounds variation in the main line. The diaphragm is clamped in the regulator body between two brass cast-



DeVilbiss type HFS low capacity regulator for air pressures under 30 pounds

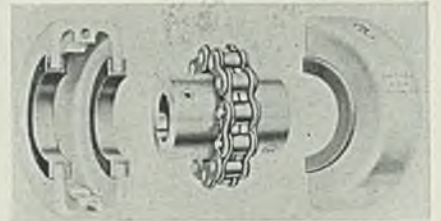
ings fastened together by radially spaced bolts. Special valve design and construction prevent the valve

seat from cutting into the rubber valve.



Covered Flexible Coupling—

Whitney Chain & Mfg. Co., Hartford, Conn., is the maker of a new covered flexible coupling made in the special wide chain design to give



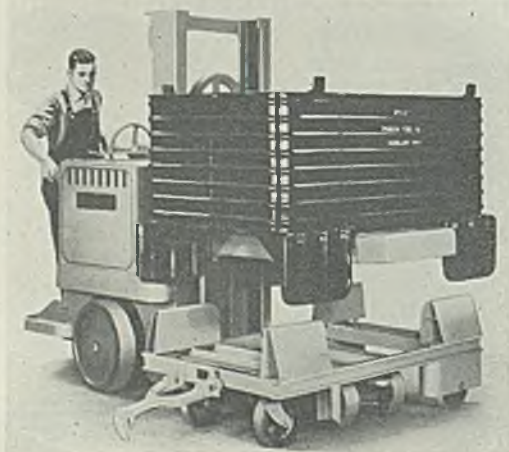
Whitney flexible coupling and cover disassembled to show construction

maximum chain roll and sprocket tooth bearing area which is the factor affecting coupling life. The single chain design allows the shearing stresses to be taken by the combined cross section of the chain pin, bushing and roll. The improved coupling cover is of cast aluminum and is designed to provide proper lubrication. Coupling and cover can be disconnected without distributing shafts or bearings, and the cover has a smooth surface for safety. Covers can be installed or removed after the coupling is in place. Positive cover drive is insured by means of internal cast lugs. Leather washers are attached to the cover to retain grease and align the metal correctly. Cover halves are connected with machine screws and lock washers and the oil tight gaskets are cemented to the cover halves.



Nonlubricated Compressors—

Sullivan Machinery Co., Michigan City, Ind., has developed an oilless compressor cylinder construction wherein the piston is provided with special self-lubricating rings and the cylinder is provided with a cylinder liner having an accurate bore, honed to a satin smoothness, for use where the presence of oil in the

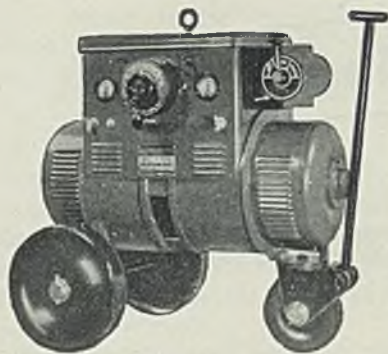


High lift platform truck depositing corrugated box skid on new Mercury trailer

airline is objectionable. This oil-less cylinder construction is available in two new types of Sullivan single stage compressors, the WGO-8 for belt drive and the WAO-8, a steam driven machine. Other features of these compressors worthy of note are: The use of Timken double row tapered roller main bearings, automatic type thin shell easily replaceable connecting rod bearings, a one-piece nonadjustable crosshead with tinned wearing surfaces, a removeable liner type crosshead guide of special cast alloy having a honed mirror finish, a slip fit cylinder liner of special cast alloy. The air passage and air valve design on these new compressors are such that air friction is reduced to a minimum and unusual single stage compressor economy obtained. They are built to provide continuous heavy duty service with minimum attention.

Arc Welder—

Hobart Bros., Troy, O., have recently placed on the market a new



Hobart arc welder featuring current saving motor control

arc welder known as the model MN, embodying, in addition to an improved type of wheel mounting with a low center of gravity, an economical control of the motor as well as the generator. According to the company, only 1/3 the usual starting current is required and the power factor of the machine and its efficiency are materially improved. A convenient latch locks the handle in the low position, where only half the rated motor horsepower is used for starting and for welding up to 1/2 the rated generator capacity in continuous manual arc welding. When it is desirable to operate at higher rates, a convenient lever releases the handle for turning easily to the high position where the full rated horsepower of the motor is available for full load and overload welding. At the same time it is possible, when so desired, to start and weld in the high position without turning the handle to low position at

any time. The new models are available in rates of 75 to 600 amperes, 1 1/2 to 40 horsepower.

Circuit Breakers—

General Electric Co., Schenectady, N. Y., announces a new line of 15,000-volt oil circuit breakers, utilizing the oil blast principle and incorporating a simpler operating mechanism, simpler internal mechanism and fewer bearing points. The new breakers are identified as types FLO-1A, FLO-1B, and FLO-1C. Interrupting ratings are 50,000, 100,000, and 175,000 kilovolt amperes respectively. The new breaker has a horizontal break with the three poles in a single rectangular steel tank. Oil blast ports provide an extremely rapid extinction of the arc with little burning of the heavy arcing contacts. A horizontal oil baffle divides the tank into two parts interconnected by three parts, one opposite each pair of contacts. Main contacts are of the heavy wedge and finger type with silver to silver contact surfaces. The stationary contacts are pivoted so they are self-aligning with the wedge-shaped copper blades which are securely attached to the horizontal contact carrier.

Stock Handling Cart—

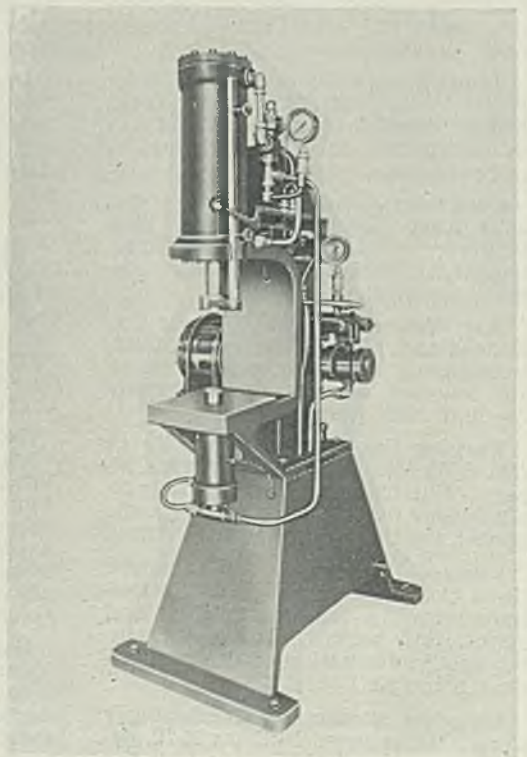
Lyon Metal Products, Aurora, Ill., announces a new stock handling cart designed to speed up order filling. Cart is 32 inches high, 30 inches long and 16 inches wide. Small size permits its use between aisles

and bins where skids cannot easily be moved in the smaller spaces. The cart is equipped with four rubber tired casters. Front casters are swivel, rear stationary. The two shelves supplied as standard are 3 inches deep. A third shelf may be provided if desired. Finish is green enamel.

Hydraulic Press—

Edwin E. Bartlett Co., Nashua, N. H., announces a new Greenerd hydraulic press known as No. W60, designed for clamping, assembling and riveting. The special feature of this press is the additional ram that operates through the working table and which works in conjunction with the top ram. Operation of both rams are in one cycle. Press is equipped with a stop rod which regulates the length of travel of the top ram in either direction and the top ram has an automatic or manual reverse. Frame is of cast semisteel. A 3-horsepower motor and hydraulic pump are mounted on opposite sides of the main housing and the pump is connected between a 20-gallon pump and a pair of hydraulic valves. Top and bottom pistons are made of steel with cast iron piston rings and sealed with chevron type packings with bleeder pipe to take seepage. The press is equipped with two hydraulic gages, one to show pressure exerted by top ram and the other to show pressure exerted by bottom ram. Top ram exerts 10 tons pressure on down stroke and bottom ram exerts 8-ton upward pressure.

Greenerd W60 hydraulic press designed for clamping, assembling and riveting operations



Use of Die Castings Grows In Many Applications

(Concluded from Page 43)

up 30 to 35 per cent over last year. Automobile trailer requirements, such as cabinet hardware and trim, are contributing to an interesting degree to the potentialities of this field.

Die castings for radiator grills, which made their initial appearance on certain of the 1936 models, are produced in greater refinement of detail. It is noteworthy, Mr. Pillion pointed out, that in the latest designs not only have the vertical vanes been produced as an integral part of the casting but the connecting or horizontal vanes are now included, despite the many problems involved in securing the fine finish required and the difficulty of removing the fins and ejector marks from the highly polished front face of the entire casting.

Die cast grills in the main have

been confined to date to the heavier and more expensive cars, such as the Cadillac grill which is 15½ by 32 inches and weighs 19 pounds. Dimensions, of course, depend upon the design. The La Salle and Lafayette grills, also produced by the Doehler company, are, for instance, 12 by 32 inches and 13.8 pounds and 17 by 32 inches and approximately 14 pounds, respectively. All are made of zinc castings and are chromium plated and highly polished, with medallions in color.

Accuracy Is Required

A particularly noteworthy job in die casting, Mr. Pillion pointed out, is the "Automatic Timer" now used in Philco radios. Absolute accuracy is necessary and the fact that die castings meet these requirements is not only attributed to the precision character of the work that can be done, but, to the dependability of the zinc alloys used in their construction. The delicate work involved is revealed in the accompany-

ing illustration which shows the vital parts prior to assembly.

Another example is the Lynn power oil burner, of which the entire blower housing is made of zinc die castings produced by the Doehler company. Here the burner manufacturer is quoted as saying that the substitution of die castings for sand castings has resulted in greater efficiency and has substantially reduced assembling and finishing costs.

The three die castings which comprise the blower housing weigh a total of 15 pounds and 14 ounces, and, assembled, are approximately 9½ inches in depth, 13¼ inches in lengths and 13¼ inches in height.

Type of alloys in die castings naturally depend upon the requirements of the individual problem. Mr. Pillion stated that at present 50 per cent of his company's requirements is for zinc base alloys, 35 per cent aluminum and the remaining 15 per cent, tin, lead and brass alloy.

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.

Presses—E. W. Bliss Co., 1420 Hastings street, Toledo, O. Catalog describing the Bliss inclinable open-back presses.

Lubrication—Texas Co., 135 East Forty-second street, New York. Folder devoted to selection and use of lubricants in ice refrigeration compressors.

Controllers—Johnston Mfg Co., 2825 East Hennepin avenue, Minneapolis. Bulletin No. 1020B, dematic controllers.

Arc Welder—General Electric Co., Schenectady, N. Y. Folder No. 20M, introducing the tungar arc welder for low-cost fabrication and repair of light steel parts.

Forging Equipment—Kropp Forge Co., 5301 West Roosevelt road, Chicago. Illustrating and describing facilities for making drop forgings, die blocks, heat treating and machining.

Pumps—American Manganese Steel Co., Chicago Heights, Ill. Bulletin covering line of standard and counterflow pumps, fittings and cutter heads; discussion of the counterflow principle.

Switcher Crane—Harnischfeger Corp., Milwaukee. Bulletin X-12, describing a new light-weight unit for

use in a private switch yards; with an all-welded tubular boom, the crane uses clamshell, hook or magnet for handling many kinds of materials.

Presses—Colonial Broach Co., 147 Jos. Campau avenue, Detroit. Bulletin No. 104-9E, describing nine general purpose hydraulics for medium duty broaching and press work; bulletin No. 104-9G, describing heavy duty pullup broaching machines.

Refractories—Harbison-Walker Refractories Co., Pittsburgh. Folder "Ladrillos Refractorios" with English and Spanish texts for use in Spanish speaking countries. Folder "Firebrick With a Reputation" is intended primarily for domestic consumer use.

Metal Problems—International Nickel Co. Inc., 67 Wall street, New York. Booklet describing the solution to actual metal problems as encountered by the engineer. Prepared primarily as a guide book to monel and other non-ferrous nickel alloys in the fields of engineering applications.

Galvanized Paintgrip Sheets—American Rolling Mill Co., Middletown, O. A folder describing advantages of galvanized paintgrip sheets, including forming qualities, soldering practice, welding, cleaning

and finishing operations; readily paintable without special acid treatments or weathering.

Stationary Engine Compressors—Clark Brothers Co., Olean, N. Y. Catalog presenting the company's line of stationary compressors for diesel, gas and steam engines and electric drive, portable engine-driven compressors, drilling and pumping engines, and vertical natural gas engines for driving generators.

Electromil—Sundstrand Machine Tool Co., Rockford, Ill. Booklet No. 2EL, describing automatic No. 2 electromil, electrically controlled for high-speed economical operation on small work-pieces; illustrations and brief descriptions of other products, such as rigidmils, automatic stub lathes, centering machines and 3-wheel tool grinders.

Drills—Worthington Pump & Machinery Corp., Harrison, N. J. Booklet No. W-1200-B8B, describing the Worthington rock master, developed to handle drilling calling for a light, mobile drilling rig; booklet No. W-1200-B21, describing Worthington screw-feed drifters, model 87M horse-shoe valve type, models 125 and 150 circular valve type, for light, medium and heavy duty, wet and dry patterns.

Activity in Raw Materials Features Market

Steelworks Rate

Drops to 68 Due to

Christmas Holiday

STEELWORKS operations were curtailed by observance of the Christmas holiday last week, the national average declining 11½ points to 68 per cent of capacity, but today (Monday) producers expected to be operating again at substantially the same high levels as early last week.

In comparison with the heavy buying earlier this month, new business at present is light, but moderate purchasing has been reported at the higher prices for preferential deliveries. Requests are still numerous for coverage in plates, shapes and reinforcing bars where protections are being granted for specific and identified building jobs with bid closing dates in January.

Pittsburgh pig iron producers will increase prices of all grades 50 cents a ton effective Jan. 1 and it is expected that other districts will follow. Shortages of coke and the possibility of price increases in iron ore and coal are among the reasons given for the decision. Pig iron prices generally were advanced \$1 a ton effective Dec. 1.

Scrap Index Up 37 Cents

GREAT demand for scrap has forced prices still higher, STEEL'S index advancing 37 cents to \$17.58. This index held at \$16.54 from the middle of September to the middle of October, declined to \$16 and then started rising in the last week of November. Thus, in only a little more than a month a gain of \$1.58 has been made. When the scrap index stood at \$16, basic pig iron was \$19 a ton, a difference of \$3, but at present with pig iron at \$20 and scrap at \$17.58 the spread has been narrowed to \$2.42.

Scrap prices advanced in all districts last week. At Chicago heavy melting steel was up 50 cents on a sale at \$18; and at Pittsburgh the market advanced 50 cents to \$19.25-\$19.75.

The interstate commerce commission's refusal to extend the emergency freight rate surcharges beyond Jan. 1 will result in the lowering of charges on finished steel by a range of ½-cent to 2 cents per 100 pounds. On iron ore the surcharge of 8.96 cents a gross ton will be lifted; on coal 3 to 10 cents a net ton will be saved; and on pig iron the present 7 per cent surcharge with a maximum of 25 cents a ton will be eliminated. On shipments directly created by the steel industry it

MARKET IN TABLOID

DEMAND Fair.

PRICES Scrap higher. Pig iron to advance.

PRODUCTION Operations temporarily average 68.

SHIPMENTS Steady.

is estimated savings will accrue at the rate of about \$12,000,000 a year.

From the standpoint of the carriers' equipment programs, at this time it is difficult to estimate the overall effect of the loss of the \$115,000,000 annual revenue provided by the surcharges. As far as rails are concerned, most of the requirements for the spring were allocated in late November and early December.

Assemblies Drop Sharply

AUTOMOBILE production dropped sharply, from 121,038 units to an estimated 79,019, the result of the labor situation and the Christmas shutdown.

Shape awards were up about 13,000 tons to 27,617. Reinforcing bar awards increased from 2810 tons in the week before last to 6795 tons last week. Two tankers which will require more than 10,000 tons of hull steel have been ordered by Standard Oil of California.

Output of ingots in the last quarter of 1936 will exceed that of the corresponding months of 1929. In October and November of 1929 the industry produced 8,024,675 gross tons of ingots and in the same months this year 8,882,413 tons. Output this month is already well ahead of the 2,903,063 tons produced in December, 1929.

Japan Seeks More Pig Iron

JAPAN is reported negotiating for further heavy pig iron tonnage in addition to the 40,000 tons recently ordered.

The composite of iron and steel prices compiled weekly by this magazine is up 15 cents to \$35.33. The current finished steel index is unchanged at \$53.90.

Operations in the Wheeling district were down 4 points to 88 per cent; Cleveland 10 to 68; Buffalo 37 to 47; Birmingham 2 to 74; Pittsburgh 13 to 67; eastern Pennsylvania 3 to 47½; Youngstown 11 to 68; Detroit 3 to 92; Chicago 13 to 64.

Iron	
ferre Haute, Ind.	1.95c
Chicago	2.00c
Philadelphia	2.26c
Pittsburgh, refined.	2.75-7.50c

Reinforcing	
New billet, straight lengths, quoted by distributors	
Pittsburgh	2.05c
Chicago, Gary, Buffalo, Cleve., Birm., Young	2.25c
Gulf ports	2.45c
Pacific coast ports f.o.b. car docks	2.45c
Philadelphia, del.	2.26c-2.36c
Rail steel, straight lengths, quoted by distributors	
Pittsburgh	1.90c
Chicago, Buffalo, Cleve., Birm., Young	2.10c
Gulf ports	2.30c

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.	\$2.25
Cement coated nails	\$2.25
Galv. nails, 15 gage and finer	\$3.25
do. finer than 15 ga.	\$4.75
(Per pound)	
Polished staples	2.95c
Galv. fence staples	3.20c
Barbed wire, galv.	2.75c
Annealed fence wire	2.90c
Galv. fence wire	3.30c
Woven wire fencing (base column, c. 1.)	\$63.00
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.	2.35c
20,000 to 59,999 lbs.	2.30c
60,000 to 99,999 lbs.	2.25c
100,000 to 299,999 lbs.	2.22½c
300,000 lbs. and over.	2.20c
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	2.55c		
Alloy			
S.A.E.	Diff.	S.A.E.	Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20
4100 0.15 to 0.25 Mo.	0.50		
4600 0.20 to 0.30 Mo. 1.25-1.75 Ni	1.05		
5100 0.80-1.10 Cr.	0.45		
5100 Cr. spring	base		
6100 bars	1.10		
6100 spring	0.70		
Cr., Ni., Van.	1.40		
Carbon Van.	0.85		
9200 spring flats	base		
9200 spring rounds, squares	0.25		

Piling

Pittsburgh	2.25c
Chicago, Buffalo	2.35c

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.	2.46c	
New York, del.	2.50c	
Cooperage hoop, Pittsburgh	2.15c	
Chicago	2.25c	
Cold strip, 0.25 carbon and under, Pitts., Cleveland.	2.85c	
Detroit, del.	3.06c	
Worcester, Mass.	3.05c	
Cleve- Worces- ter, Mass.		
Carbon	Pitts.	
0.26—0.50	2.85c	3.05c
0.51—0.75	3.70c	3.90c
0.76—1.00	5.45c	5.65c
Over 1.00	7.50c	7.70c

Rails, Track Material

(Gross Tons)	
Standard rails, mill	\$39.00
Relay rails, Pitts.	
20—100 lbs.	25.50-28.00
Light rails, billet qual. Pitts., Chi.	\$35.00
Do., reroll. qual.	34.00
Angle bars, billet, Gary, Pitts., So. Chi.	2.70c
Do., axle steel.	2.10c
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	
¾ x 6 and smaller	70 off
Do. larger	65-10 off
Tire bolts	50 off
Plow Bolts	
All sizes	65-10 off
Stove Bolts	
In packages with nuts attached 72½ off; in packages with nuts separate 75-5 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

Struc., c. 1, Pittsburgh, Cleveland	3.25c
Struc., c. 1, Chicago	3.35c
¾-in. and smaller, Pitts., Chi., Cleve.	70-5 off
Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs.	\$6.00 off

Cut Nails

Cut nails, Pitts.; (10% discount on size extras)	\$2.90
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Do., less carloads, 5 kegs or more, no discount on size extras... \$3.20
Do., under 5 kegs; no disc. on size extras... \$3.35

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	31½	15	
1	36½	20½	
1-1½	39½	25½	
2	41½	26	
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	37	22½	
2½-3½	38	25	
4-8	40	28½	
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.			
Boiler Tubes			
O. L. Discounts, f.o.b. Pitts.			
Lap Weld Steel			
2-2½	33	1½	8
2½-2¾	40	2-2½	13
3	47	2½-2¾	16
3½-3¾	50	3	17
4	52	3¾-3½	18
4½-5	42	4	20
		4½	21

Iron			
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		
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		

Sheet Bars			
Pitts., Cleve., Young, Sparrows Point	34.00		
Slabs			
Pitts., Chicago, Cleveland, Youngstown	\$34.00		
Wire Rods			
Pitts., Cleve., No. 5 to ½-inch incl.	43.00		
Do., over ½ to ¾-inch incl.	45.00		
Chicago up \$1; Worcester up \$2			
Skelp			
Pitts., Chi., Young, Buff., Coatesville, Sparrows Pt.	1.80c		

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.

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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	52.40-53.40
6 to 24-in., Chicago	49.40-50.40
6-in. & over, east. fdy.	45.00
Do., 4-in.	46.00
Class A pipe \$3 over Class B	
Std. fits., 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	37.67
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, Sparrows Point	34.00

Slabs	
Pitts., Chicago, Cleveland, Youngstown	\$34.00

Wire Rods	
Pitts., Cleve., No. 5 to ½-inch incl.	43.00
Do., over ½ to ¾-inch incl.	45.00
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.	10.20-10.65
Chi., ov., outside del.	9.00
Chicago, del.	9.75
New England, del.	12.00
St. Louis, del.	10.00-10.50
Birmingham, ovens	6.50
Indianapolis, del.	9.40
Cincinnati, del.	9.50
Cleveland, del.	10.30
Buffalo, del.	10.50
Detroit, del.	10.70
Philadelphia, del.	9.88

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)	15.50c
Do., (450 lbs.)	14.50c
Eastern Plants, per lb.	
Naphthalene flakes and balls, in bbls., to jobbers	8.25c
Per 100 lbs. Atlantic seaboard	
Sulphate of ammonia	\$1.30
+Western prices, ½-cent up.	

Pig Iron

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

Basing Points:	No. 2	Malle-	Besse-	
	Fdry.	able	Basic	mer
Bethlehem, Pa.	\$21.50	\$22.00	\$21.00	\$22.50
Birdsboro, Pa.	21.50	22.00	21.00	22.50
Birmingham, Ala.†	16.88	.....	15.88	22.00
Buffalo	20.50	21.00	19.50	21.50
Chicago	20.50	20.50	20.00	21.00
Cleveland	20.50	20.50	20.00	21.00
Detroit	20.50	20.50	20.00	21.00
Duluth	21.00	21.00	.....	21.50
Erie, Pa.	20.50	21.00	20.00	21.50
Everett, Mass.	22.75	23.25	22.25	23.75
Hamilton, O.	20.50	20.50	20.00	.....
Jackson, O.	20.25	20.25	19.75	.....
Neville Island, Pa.	20.50	20.50	20.00	21.00
Provo, Utah	18.50	.....	18.00	.....
Sharpsville, Pa.	20.50	20.50	20.00	21.00
Sparrows Point, Md.	21.50	.....	21.00	.....
Swedeland, Pa.	21.50	22.00	21.00	22.50
Toledo, O.	20.50	20.50	20.00	21.00
Youngstown, O.	20.50	20.50	20.00	21.00

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

Delivered from Basing Points:

'Akron, O., from Cleveland	21.76	21.76	21.26	22.26
'Baltimore from Birmingham	22.08	.....	20.96	.....
Boston from Birmingham	22.87	.....	22.37	.....
Boston from Everett, Mass.	23.25	23.75	22.75	24.25
Boston from Buffalo	23.25	23.75	22.75	24.25
'Brooklyn, N. Y., from Bethlehem	23.93	24.43	.....	.....
Brooklyn, N. Y., from Bmghm.	23.55	.....	.....	.....
Canton, O., from Cleveland	21.76	21.76	21.26	22.26
Chicago from Birmingham	†20.72	.....	20.60	.....
'Cincinnati from Hamilton, O.	20.82	21.58	21.08	.....
'Cincinnati from Birmingham	20.44	.....	19.82	.....
'Cleveland from Birmingham	20.62	.....	20.12	.....
'Cincinnati from Hamilton, O.	22.17	22.77	22.27	.....
Mansfield, O., from Toledo, O.	22.26	22.26	21.76	22.76
Milwaukee from Chicago	21.57	21.57	21.27	22.07
Muskegon, Mich., from Chicago,				
Toledo or Detroit	23.60	23.60	23.10	24.10
Newark, N. J., from Birmingham	22.61	.....	.....	.....
Newark, N. J., from Bethlehem ..	22.99	23.49	.....	.....
'Philadelphia from Birmingham ..	21.93	.....	21.81	.....
'Philadelphia from Swedeland, Pa.	22.31	22.81	21.81	.....
Pittsburgh district from Neville				
Island	1.21	switching charges		
'Saginaw, Mich., from Detroit	22.75	22.75	22.25	22.25
'St. Louis, northern	21.00	21.00	20.50	.....

Delivered from Basing Points:	No. 2	Malle-	Basic	Besse-
	Fdry.	able		mer
St. Louis from Birmingham	20.68	.....	20.50	.....
St. Paul from Duluth	22.94	22.94	.....	23.44
†Over 0.70 phos.				

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., \$25.00, Phila. base, standard and copper bearing, \$26.13.

Gray Forge

Valley furnace	\$20.00	Lake Superior fur.	\$23.00
Pitts. dist. fur.	20.00	do., del. Chicago	26.25
		Lyles, Tenn.	23.50

Silvery†

Jackson county, O., base: 6-6.50 per cent \$24.00; 6.51-7—\$24.50; 7-7.50—\$25.00; 7.51-8—\$25.50; 8-8.50—\$26.00; 8.51-9—\$26.50; 9-9.50—\$27.00; 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		Chester, Pa., and Baltimore bases (bags) ..	\$45.00
Super Quality		Domestic dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags) ..	40.00
Pa., Mo., Ky.	\$55.00	Domestic dead - burned gr. net ton f.o.b. Chewelah, Wash. (bulk) ..	22.00
First Quality		Base Brick	
Pa., Ill., Md., Mo., Ky.	\$45.00	Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.	
Alabama, Georgia.	\$38.00-45.00	Chrome brick	\$45.00
Second Quality		Chem. bonded chrome ..	45.00
Pa., Ill., Ky., Md., Mo.	40.00	Magnesite brick	65.00
Georgia, Alabama	35.00	Chem. bonded magnesite	55.00
Ohio		Fluorspar, 85-5	
First quality	\$40.00	Washed gravel, duty paid, tide, net ton.	\$23.00
Intermediary	37.00	Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	\$18.00
Second quality	28.00	Do., for barge	\$19.00
Malleable Bung Brick		Ferroalloys	
All bases	50.00	Dollars, except Ferrochrome	
Silica Brick		Ferromanganese, 78-82% tidewater, duty paid ..	80.00
Pennsylvania	\$45.00	Do., Baltimore, base ..	80.00
Joliet, E. Chicago	54.00	Do., del. Pittsburgh ..	85.13
Birmingham, Ala.	48.00	Spiegeleisen, 19-20% dom. Palmerston, Pa., spot.	†28.00
Ladle Brick (Dry Press)		Do., New Orleans	28.00
Pa., O., W. Va., Mo.	\$24.00	Ferrosilicon, 50% freight allowed, c. l.	69.50
do., wire cut	22.00	Do., less carload	77.00
Magnesite		Do., 75 per cent.	126-130.00
Imported dead - burned grains, net ton f.o.b.		Spot, \$5 a ton higher.	

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

Copper			Straits Tin		Lead		Zinc	Alumi- num	Antimony	Nickel
Electro, del.	Lake, del.	Casting, refnery	Spot	Futures	Lead N. Y.	East St. L.				
Dec. 17 11.00	11.12½	10.62½	52.65	52.20	5.50	5.35	5.45	*19.00	12.75	35.00
Dec. 18 11.00	11.12½	10.62½	52.25	51.90	5.50	5.35	5.45	*19.00	12.75	35.00
Dec. 19 11.00	11.12½	10.62½	52.25	51.90	5.50	5.35	5.45	*19.00	12.75	35.00
Dec. 21 11.00	11.12½	10.62½	52.00	51.50	6.00	5.85	5.45	*19.00	12.75	35.00
Dec. 22 11.62½	11.75	11.25	51.95	51.60	6.00	5.85	5.45	*19.00	12.75	35.00
Dec. 23 11.62½	11.75	11.25	51.90	51.55	6.00	5.85	5.45	*19.00	13.25	35.00

*Nominal range 19.00 to 21.00c.

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 11.62½c Conn. copper

Sheets	
*Yellow brass (high)	17.25
*Copper, hot rolled	19.37½
*Lead, cut to jobbers	9.50
Zinc, 100-lb. base	10.00
Tubes	
*High yellow brass	19.50
*Seamless copper	19.87½
Rods	
*High yellow brass	15.25
*Copper, hot rolled	16.12½
Anodes	
*Copper, untrimmed	16.87½
Wire	
*Yellow brass (high)	17.50

OLD METALS

Deal. buying prices, cents lb.

No. 1 Composition Red Brass	
*New York	8.25-8.37½
*Cleveland	8.25- 8.50
Chicago	7.50- 7.75
*St. Louis	7.62½-7.87½
Heavy Copper and Wire	
*New York, No. 1	9.62½-9.87½
*Chicago, No. 1	9.37½-9.62½
*Cleveland, No. 1	9.50-9.87½
*St. Louis, No. 1	9.25- 9.50
Composition Brass Borings	
*New York	7.62½- 7.75
Light Copper	
*New York	8.62½- 8.75
Chicago	7.37½-7.62½
*Cleveland	7.75- 8.00
*St. Louis	7.50- 7.75

Light Brass

Chicago	4.75- 5.00
*Cleveland	5.00- 5.25
*St. Louis	4.62½-4.87½
Lead	
New York	4.90- 5.00
*Cleveland	4.75- 5.00
Chicago	4.25- 4.50
*St. Louis	4.37½-4.62½
Zinc	
*New York	3.25
*St. Louis	3.00- 3.25
*Cleveland	3.00- 3.25
Aluminum	
Borings, Cleve.	9.75-10.00
Mixed, cast, Cleve.	13.25-13.50
Mixed, cast St. L.	13.00-13.25
Clips, soft, Cleve.	14.75-15.00
SECONDARY METALS	
*Brass, ingot, 85-5-5-5, l.c.l.	12.25
*Stand. No. 12 alum.	17.00-17.50

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid ..	80.00
Do., Baltimore, base ..	80.00
Do., del. Pittsburgh ..	85.13
Spiegeleisen, 19-20% dom. Palmerston, Pa., spot.	†28.00
Do., New Orleans	28.00
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.	
Silicomane, 2½ 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	7.50
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
†Carloads. Quan. diff. apply.	

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.	†13.00
N. Eng. del. No. 1.	13.50
Chicago, No. 1	17.50-18.00
Buffalo, No. 2	15.00-15.50
Chicago	17.50-18.00
Cleveland, No. 1	17.50-18.00
Cleveland, No. 2	16.50-17.00
Detroit, No. 1	14.50-15.00
Eastern Pa., No. 1.	16.00-16.50
Eastern Pa., No. 2.	14.50-15.00
Federal, Ill.	14.25-14.75
Granite City, R. R.	15.50-16.00
Granite City, No. 2.	14.25-14.75
New York, No. 1.	†11.50-12.25
N. Y. dock, No. 1 exp.	†11.25-11.75
Pitts., No. 1 (R. R.)	20.00-20.50
Pitts., No. 1 (dir.)	19.25-19.75
Pittsburgh, No. 2.	17.00-17.50
St. Louis, R. R.	16.25-16.75
St. Louis, No. 2	14.25-14.75
Toronto, dlrs. No. 1.	10.50-11.00
Toronto, No. 2	9.50-10.00
Valleys, No. 1.	17.75-18.25
COMPRESSED SHEETS	
Buffalo, dealers	15.00-15.50
Chicago, factory	16.50-17.00
Chicago, dealer	14.50-15.00
Cleveland	17.00-17.50
Detroit	15.00-15.50
E. Pa., new mat.	15.50-16.00
E. Pa., old mat.	13.50
Pittsburgh	19.25-19.75
St. Louis	12.00-12.50
Valleys	17.50-17.75
BUNDLED SHEETS	
Buffalo	13.00-13.50
Cincinnati, del.	11.00-11.50
Cleveland	13.50-14.50
Pittsburgh	17.50-18.00
St. Louis	10.00-10.50
Toronto, dealers	4.50
SHEET CLIPPINGS, LOOSE	
Chicago	11.50-12.00
Cincinnati	10.00-10.50
Detroit	11.50-12.00
St. Louis	9.50-10.00
STEEL RAILS, SHORT	
Birmingham	15.00-16.00
Buffalo	19.00-19.50
Chicago (3 ft.)	19.50-20.00
Chicago (2 ft.)	21.50-22.00
Cincinnati, del.	18.50-19.00
Detroit	17.50-18.00
Pitts., open-hearth,	
3 ft. and less	22.00-22.50
St. Louis, 2 ft. & less	17.00-17.50
STEEL RAILS, SCRAP	
Boston district	†12.25-12.75
Buffalo	16.50-17.00
Chicago	17.50-18.00
Pittsburgh	20.00-20.50
St. Louis	16.50-17.00
Toronto, dealers	8.50
STOVE PLATE	
Birmingham	8.50- 9.00
Boston district	†7.75- 8.25
Buffalo	13.00-13.50
Chicago	9.00- 9.50
Cincinnati, dealers.	10.25-10.75
Detroit, net	10.00-10.50
Eastern Pa.	13.50-14.00
New York, fdry.	†10.00
St. Louis	10.00-10.50
Toronto, deal'rs, net	5.50- 6.00

SPRINGS	
Buffalo	18.00-18.50
Chicago, leaf	19.00-19.50
Chicago, coil	21.50-22.00
Eastern Pa.	20.50-21.00
Pittsburgh	23.00-23.50
St. Louis	18.00-18.50
ANGLE BARS—STEEL	
Chicago	19.00-19.50
St. Louis	16.75-17.25
Buffalo	14.50-15.00
RAILROAD SPECIALTIES	
Chicago	19.00-19.50
LOW PHOSPHORUS	
Buffalo, billet and bloom crops	20.00-21.00
Cleveland, billet, bloom crops	21.00-21.50
Eastern Pa., crops	21.50
Pittsburgh, billet, bloom crops	23.00-23.50
Pittsburgh, sheet bar crops	21.50-22.00
FROGS, SWITCHES	
Chicago	17.50-18.00
St. Louis, cut	16.00-16.50
SHOVELING STEEL	
Chicago	17.50-18.00
Federal, Ill.	14.25-14.75
Granite City, Ill.	14.25-14.75
Toronto, dealers	6.50
RAILROAD WROUGHT	
Birmingham	9.00-10.00
Boston, district	†8.00- 8.25
Buffalo, No. 1	15.00-15.50
Buffalo, No. 2	16.00-16.50
Chicago, No. 1, net.	15.00-15.50
Chicago, No. 2	17.50-18.00
Cincinnati, No. 2.	15.50-16.00
Eastern Pa.	16.50-17.00
St. Louis, No. 1.	13.50-14.00
St. Louis, No. 2.	16.00-16.50
Toronto, No. 1 dir.	7.00
SPECIFICATION PIPE	
Eastern Pa.	15.00
New York	†10.00-10.50
BUSHELING	
Buffalo, No. 1	15.00-15.50
Chicago, No. 1	15.50-16.00
Cincin., No. 1, deal.	12.25-12.75
Cincinnati, No. 2.	7.50- 8.00
Cleveland, No. 2.	12.00-12.50
Detroit, No. 1, new.	14.50-15.00
Valleys, new, No. 1.	17.00-17.50
Toronto, dealers	6.00
MACHINE TURNINGS	
Birmingham	6.00- 6.50
Buffalo	9.75-10.25
Chicago	8.50- 9.00
Cincinnati, dealers.	8.50- 9.00
Cleveland	11.00-11.50
Detroit	9.50-10.00
Eastern Pa.	11.00-11.50
New York	†5.00- 5.50
Pittsburgh	14.00-14.50
St. Louis	7.25- 7.75
Toronto, dealers	4.00- 4.50
Valleys	10.75-11.25
BORINGS AND TURNINGS	
For Blast Furnace Use	
Boston district	†6.40- 7.90

Buffalo	10.50-11.00
Cincinnati, dealers.	7.50- 8.00
Cleveland	12.00-12.50
Detroit	10.50-11.00
Eastern Pa.	10.00-10.50
New York	†6.00
Pittsburgh	14.50-15.00
Toronto, dealers	4.00
CAST IRON BORINGS	
Birmingham	6.00- 6.50
Boston dist. chem.	†7.50- 7.75
Boston dist. for mills	†7.50- 7.75
Buffalo	10.50-11.00
Chicago, dealers.	8.75- 9.25
Cincinnati, dealers.	7.50- 8.00
Cleveland	12.00-12.50
Detroit	10.50-11.00
E. Pa., chemical.	11.50-13.00
New York	†6.00- 6.50
St. Louis	8.00- 8.50
Toronto, dealers	4.50- 5.00
PIPE AND FLUES	
Cincinnati, dealers.	9.75-10.25
Chicago, net	10.50-11.00
RAILROAD GRATE BARS	
Buffalo	11.50-12.00
Chicago, net	11.50-12.00
Cincinnati	10.25-10.75
Eastern Pa.	13.50-14.00
New York	†8.00- 8.50
St. Louis	11.50-12.00
FORGE FLASHINGS	
Boston district	†11.25-11.50
Buffalo	15.00-15.50
Cleveland	16.50-17.00
Detroit	14.00-14.50
Pittsburgh	17.50-18.00
FORGE SCRAP	
Boston district	†6.50- 7.00
Chicago, heavy	19.00-19.50
Eastern Pa.	15.50-16.00
ARCH BARS, TRANSOMS	
St. Louis	16.50-17.00
AXLE TURNINGS	
Boston district	†7.50- 8.00
Buffalo	13.00-13.50
Chicago, elec. fur.	16.50-17.00
Eastern Pa.	14.50-15.00
St. Louis	11.50-12.00
Toronto	4.50
STEEL CAR AXLES	
Birmingham	15.50-16.00
Boston district	†15.50-16.50
Buffalo	19.00-20.00
Chicago, net	19.50-20.00
Eastern Pa.	21.50
St. Louis	19.00-19.50
Toronto	8.50
SHAFTING	
Boston district	†16.25-16.50
Eastern Pa.	22.00
New York	†17.00
St. Louis	15.00-15.50
CAR WHEELS	
Birmingham	15.00-15.50
Boston dist. iron.	†11.00-11.50
Buffalo, iron	16.50-17.00
Buffalo, steel	19.00-19.50
Chicago, iron	18.00-18.50
Chicago, rolled steel	19.00-19.50

Cincinnati, iron	14.75-15.25
Eastern Pa., iron	18.00-18.50
Eastern Pa., steel	20.50-21.00
Pittsburgh, iron	18.75-19.25
Pittsburgh, steel	23.00-23.50
St. Louis, iron	15.50-16.00
St. Louis, steel	17.75-18.25
Toronto, net	8.50
NO. 1 CAST SCRAP	
Birmingham	13.75-14.50
Bos. dis. No. 1 mach.	†12.00-12.25
N. Eng., del. No. 2.	11.50
N. Eng., del. textile	14.00
Buffalo, cupola	15.00-15.50
Buffalo, mach.	16.00-16.50
Chicago, agri. net.	12.50-13.00
Chicago, auto	13.50-14.00
Chicago, mach. net.	15.00-15.50
Chicago, railr'd net.	14.00-14.50
Cincl., mach. cup.	15.25-15.75
Cleveland, mach.	17.50-18.00
Eastern Pa., cupola	17.50-18.00
E. Pa., mixed yard.	14.00-14.50
Pittsburgh, cupola	17.50-18.00
San Francisco, del.	13.50-14.00
Seattle	10.00-11.00
St. Louis, No. 1.	13.25-13.75
St. L. No. 1, mach.	13.50-14.00
Toronto, No. 1, mach., net	9.50-10.00
HEAVY CAST	
Boston, dist. break.	†11.00-11.25
New England del.	13.00
Buffalo, break.	13.50-14.00
Cleveland, break	13.50-14.00
Detroit, No. 1 mach. net	13.50-14.00
Detroit, break.	12.50-13.00
Detroit, auto net	13.50-14.00
Eastern Pa.	16.50-17.00
New York, break.	†11.50-12.00
Pittsburgh	15.00-15.50
MALLEABLE	
Birmingham, R. R.	14.00-14.50
New England, del.	†16.25-17.50
Buffalo	17.50-18.50
Chicago, R. R.	19.50-20.00
Cincl., agri. del.	14.75-15.25
Cleveland, rail.	18.00-18.50
Detroit, auto, net.	14.50-15.00
Eastern Pa., R. R.	17.00-18.00
Pittsburgh, rail	18.50-19.00
St. Louis, R. R.	16.50-17.00
Toronto, net	7.00
RAILS FOR ROLLING	
5 feet and over	
Birmingham	15.00-15.50
Boston	†12.50-13.00
Buffalo	17.50-18.50
Chicago	17.50-18.00
Eastern Pa.	18.50-19.00
New York	†12.00-12.50
St. Louis	17.00-17.50
LOCOMOTIVE TIRES	
Chicago (cut)	19.00-19.50
St. Louis, No. 1.	14.50-15.00
LOW PHOS. PUNCHINGS	
Buffalo	18.75-19.25
Chicago	20.50-21.00
Eastern Pa.	20.50-21.50
Pittsburgh (heavy)	22.00-22.50
Pittsburgh (light)	21.50-22.00

Iron Ore

Lake Superior Ore	
Gross ton, 51 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	
Cents, unit, del. E. Pa.	
Foundry and basic	8.50- 9.00
56-63% con. (nom.)	8.50- 9.00
Cop.-free low phos.	
58-60% (nom.)	10.00-10.50
Foreign Ore	
Cents per unit, f.a.s. Atlantic ports (nominal)	
Foreign manganif-	

erous ore, 45.55%	
iron, 6-10% man.	13.50
No. Afr. low phos.	13.50
Swedish low phos.	11.50
Spanish No. Africa	
basic, 50 to 60%.	12.50
Tungsten, spot sh.	
ton unit, duty pd.	\$15.85-16.00
N. F., idy., 55%	7.00
Chrome ore, 48%	
gross ton, cif.	20.00-21.00

Manganese Ore

<i>(Nominal)</i>	
Prices not including duty, cents per unit cargo lots.	
Caucasian, 50-52%	30.00
So. African, 50-52%	30.00
Indian, 50-52%	30.00

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS	Cincinnati	3.25c	Buffalo	3.47c	Pittsburgh (h) ..	3.05c	COLD FIN. STEEL
Baltimore*	Houston	3.25c	Chattanooga ..	3.66c	San Francisco ..	3.95c	Baltimore (c) ...
Boston††	Los Angl., cl. ...	2.45c	Chicago	3.30c	Seattle	4.05c	Boston*
Buffalo	New Orleans...*	2.67c	Cincinnati	3.52c	St. Louis	3.40c	Buffalo (h)
Chattanooga ..	Pitts., plain (h)	3.05c	Cleveland, ¼-in.		St. Paul	3.40c	Chattanooga* ..
Chicago (j)	Pitts., twisted		and over	3.41c	Tulsa	3.80c	Chicago (h)
Cincinnati	squares (h) ...	3.175c	Detroit	3.52c	NO. 24 BLACK		Cincinnati
Cleveland	San Francisco ..	2.45c	Detroit, ¾-in. ...	3.85c	Baltimore*† ..	3.80c	Cleveland (h) ...
Detroit	Seattle	3.65c	Houston	3.10c	Boston (g)	4.35c	Detroit
Houston	St. Louis	3.35c	Los Angeles ..	3.60c	Buffalo	3.35c	Los Ang. (f) (d) .
Los Angeles ..	Tulsa	3.25c	Milwaukee	3.41c	Chattanooga* ..	3.36c	Milwaukee
Milwaukee 3.31c-3.46c	Young	2.30c-2.60c	New Orleans... .	3.80c	Chicago	3.55c-4.55c	New Orleans... .
New Orleans... .			New York† (d) ..	3.50c	Cincinnati	3.97c	New York† (d) ..
New York† (d) ..	SHAPES		Philadelphia* ..	3.10c	Cleveland	4.01c	Philadelphia* ..
Pitts. (h)	Baltimore*	3.10c	Phila. floor	4.95c	Detroit	4.14c	Pittsburgh
Philadelphia* ..	Boston††	3.59c	Pittsburgh (h) ..	3.25c	Los Angeles ..	4.35c	Portland (f) (d) .
Portland	Buffalo	3.35c	Portland	3.75c	Milwaukee	4.16c	San Fran. (f) (d) .
San Francisco ..	Chattanooga ..	3.66c	San Francisco ..	3.75c	New Orleans* ..	3.52c	Seattle (f) (d) ...
Seattle	Chicago	3.30c	Seattle	3.90c	New York† (d) ..	4.10c	St. Louis
St. Louis	Cincinnati	3.52c	St. Louis	3.55c	Philadelphia*† .	3.85c	St. Paul
St. Paul	Cleveland	3.41c	St. Paul	3.55c	Pitts.** (h) 3.65c-4.95c		Tulsa
Tulsa	Detroit	3.52c	Tulsa	3.60c	Portland	4.30c	COLD ROLLED STRIP
	Houston	3.10c	NO. 10 BLUE		Seattle	4.80c	Boston
	Los Angeles ..	3.80c	Baltimore*	3.20c	San Francisco ..	4.65c	Buffalo
	Milwaukee	3.41c	Boston (g)	3.75c	St. Louis	3.30c	Chicago
IRON BARS	New Orleans... .	3.80c	Buffalo	3.72c	Tulsa	4.10c	Cincinnati (b) ..
Portland	New York† (d) ..	3.47c	Chattanooga ..	3.46c	NO. 24 GALV. SHEETS		Cleveland (b) ...
Chattanooga ..	Philadelphia* ..	3.10c	Chicago	3.15c	Baltimore *† ..	3.90c	Detroit
Baltimore*	Pittsburgh (h) ..	3.25c	Cincinnati	3.32c	Buffalo	4.10c	New York† (d) ..
Cincinnati	Portland (l)	3.75c	Cleveland	3.21c	Boston (g)	4.35c	St. Louis
New York† (d) ..	San Francisco ..	3.75c	Det. 8-10 ga. ...	3.24c	Houston	3.96c	TOOL STEELS
Philadelphia* ..	Seattle (l)	3.90c	Houston	3.45c	Los Angeles ..	3.90c	(Applying on or east
St. Louis	St. Louis	3.55c	Los Angeles ..	3.90c	Milwaukee	3.26c	of Mississippi river;
Tulsa	St. Paul	3.55c	Milwaukee	3.26c	New Orleans... .	3.85c	west of Mississippi l
	Tulsa	3.60c	New Orleans... .	3.85c	Cincinnati	4.82c	up).
	PLATES		New York† (d) ..	3.41c	Cleveland	4.61c	
	Baltimore*	3.10c	Portland	3.85c	Detroit	4.82c	
	Boston††	3.61c	Philadelphia* ..	3.20c	Houston	4.50c	

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Dec. 22

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

	British gross tons U. K. ports		Channel or North Sea ports, metric tons		Continental gross tons	
	£	s d	Quoted in dollars at current value	Quoted in gold pounds sterling	£	s d
PIG IRON						
Foundry, 2.50-3.00 Silicon	\$15.34	3 2 6*	\$15.25	1 17 6		
Basic bessemer	15.34	3 2 6*	11.79	1 9 0		
Hematite, Phos. .03-.05	18.41	3 15 0				
SEMI-FINISHED STEEL						
Billets	\$28.85	5 17 6	\$19.10	2 7 0		
Wire rods, No. 5 gage	43.94	8 19 0	36.61	4 10 0		
FINISHED STEEL						
Standard rails	\$40.50	8 5 0	\$44.74	5 10 0		
Merchant bars	1.86c	8 10 0	1.29c to 1.48c	3 10 0 to 4 0 0		
Structural shapes	1.81c	8 5 0	1.29c to 1.48c	3 10 0 to 4 0 0		
Plates, ½-in. or 5 mm.	1.94c	8 17 6	1.60c to 1.84c	4 7 6 to 5 0 0		
Sheets, black, 24 gage or 0.5 mm.	2.24c	10 5 0	2.49c	6 15 0††		
Sheets, gal., 24 gage, corr.	2.79c	12 15 0	2.76c	7 10 0		
Bands and strips	2.08c	9 10 0	1.48c	4 0 0		
Plain wire, base	2.30c	10 10 0	1.94c	5 5 0		
Galvanized wire, base	2.74c	12 10 0	2.15c	5 17 6		
Wire nails, base	2.63c	12 0 0	1.75c	4 15 0		
Tin plate, box 108 lbs.	\$ 4.60	0 18 9				

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)	\$16.43	351	\$16.56	490	\$25.37	63
Basic bessemer pig iron	18.41	3 15 0(a)	13.47	275	14.70	435	27.98 (b)	69.50
Furnace coke	5.28	1 1 6	5.94	127	4.63	137	7.65	19
Billets	30.07	6 2 6	23.73	507	19.60	580	38.85	96.50
Standard rails	1.81c	8 5 0	1.49c	711	1.73c	1,150	2.38c	132
Merchant bars	2.05c	9 7 0	1.46c	695	1.05c	700	1.98c	110
Structural shapes	2.06c	9 7 0	1.43c	680	1.05c	700	1.93c	107
Plates, ½-in. or 5 mm.	2.12c	9 13 9	1.84c	875	1.28c	850	2.29c	127
Sheets, black	2.63c	12 0 0§	2.42c	1,150†	1.39c	925†	2.59c	144†
Sheets, galv., corr., 24 ga. or 0.5 mm.	3.07c	14 0 0	3.47c	1,650	2.85c	1,900	6.66c	370
Plain wire	2.19c	10 0 0	2.50c	1,190	1.95c	1,300	3.11c	173
Bands and strips	2.21c	10 2 0	1.66c	790	1.28c	850	2.29c	127

*Basic. †British ship-plates. Continental, bridge plates. ‡24 ga. †1. to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. § del. Middlebrough. b hematite. ††Close annealed. **Gold pound sterling carries a premium of 66.5 per cent over paper sterling.

Portland	4.30c	Seattle	4.80c	San Francisco ..	4.65c	St. Louis	3.30c	St. Paul	4.60c	Tulsa	5.20c
NO. 10 BLUE											
Baltimore*	3.20c	Boston (g)	3.75c	Buffalo	3.72c	Chattanooga ..	3.46c	Chicago	3.15c	Cincinnati	3.32c
Boston (g)	3.75c	Buffalo	3.72c	Chattanooga ..	3.46c	Chicago	3.15c	Cincinnati	3.32c	Cleveland	3.21c
Buffalo	3.72c	Chattanooga ..	3.46c	Chicago	3.15c	Cincinnati	3.32c	Cleveland	3.21c	Det. 8-10 ga. ...	3.24c
Chattanooga ..	3.46c	Chicago	3.15c	Cincinnati	3.32c	Cleveland	3.21c	Det. 8-10 ga. ...	3.24c	Houston	3.45c
Chicago	3.55c-4.55c	Cincinnati	3.97c	Cleveland	4.01c	Detroit	4.14c	Los Angeles ..	4.35c	Milwaukee	4.16c
Cincinnati	3.97c	Cleveland	4.01c	Detroit	4.14c	Los Angeles ..	4.35c	Milwaukee	4.16c	New Orleans* ..	3.52c
Cleveland (h) ...	3.75c	Detroit	3.84c	Los Ang. (f) (d) .	6.10c	Milwaukee	3.86c	New Orleans... .	4.55c	New York† (d) ..	3.96c
Detroit	3.84c	Los Ang. (f) (d) .	6.10c	Milwaukee	3.86c	New Orleans... .	4.55c	New York† (d) ..	3.96c	Philadelphia* ..	4.01c
Los Ang. (f) (d) .	6.10c	Milwaukee	3.86c	New Orleans... .	4.55c	New York† (d) ..	3.96c	Philadelphia* ..	4.01c	Pittsburgh	3.60c
Milwaukee	3.86c	New Orleans... .	4.55c	New York† (d) ..	3.96c	Philadelphia* ..	4.01c	Pittsburgh	3.60c	Portland (f) (d) .	6.25c
New Orleans... .	4.55c	New York† (d) ..	3.96c	Philadelphia* ..	4.01c	Pittsburgh	3.60c	Portland (f) (d) .	6.25c	San Fran. (f) (d) .	6.30c
New York† (d) ..	3.96c	Philadelphia* ..	4.01c	Pittsburgh	3.60c	Portland (f) (d) .	6.25c	San Fran. (f) (d) .	6.30c	Seattle (f) (d) ...	6.35c
Philadelphia* ..	4.01c	Pittsburgh	3.60c	Portland (f) (d) .	6.25c	San Fran. (f) (d) .	6.30c	Seattle (f) (d) ...	6.35c	St. Louis	4.00c
Pittsburgh	3.60c	Portland (f) (d) .	6.25c	San Fran. (f) (d) .	6.30c	Seattle (f) (d) ...	6.35c	St. Louis	4.00c	St. Paul	4.27c
Portland (f) (d) .	6.25c	San Fran. (f) (d) .	6.30c	Seattle (f) (d) ...	6.35c	St. Louis	4.00c	St. Paul	4.27c	Tulsa	4.80c
San Fran. (f) (d) .	6.30c	Seattle (f) (d) ...	6.35c	St. Louis	4.00c	St. Paul	4.27c	Tulsa	4.80c	COLD ROLLED STRIP	
Seattle (f) (d) ...	6.35c	St. Louis	4.00c	St. Paul	4.27c	Tulsa	4.80c	COLD ROLLED STRIP		Boston	3.495c
St. Louis	4.00c	St. Paul	4.27c	Tulsa	4.80c	COLD ROLLED STRIP		Boston	3.495c	Buffalo	3.39c
St. Paul	4.27c	Tulsa	4.80c	COLD ROLLED STRIP		Boston	3.495c	Buffalo	3.39c	Chicago	3.27c
Tulsa	4.80c	COLD ROLLED STRIP		Boston	3.495c	Buffalo	3.39c	Chicago	3.27c	Cincinnati (b) ..	3.22c
COLD ROLLED STRIP		Boston	3.495c	Buffalo	3.39c	Chicago	3.27c	Cincinnati (b) ..	3.22c	Cleveland (b) ...	3.00c
Boston	3.495c	Buffalo	3.39c	Chicago	3.27c	Cincinnati (b) ..	3.22c	Cleveland (b) ...	3.00c	Detroit	3.18c
Buffalo	3.39c	Chicago	3.27c	Cincinnati (b) ..	3.22c	Cleveland (b) ...	3.00c	Detroit	3.18c	New York† (d) ..	3.36c
Chicago	3.27c	Cincinnati (b) ..	3.22c	Cleveland (b) ...	3.00c	Detroit	3.18c	New York† (d) ..	3.36c	St. Louis	3.41c
Cincinnati (b) ..	3.22c	Cleveland (b) ...	3.00c	Detroit	3.18c	New York† (d) ..	3.36c	St. Louis	3.41c	TOOL STEELS	
Cleveland (b) ...	3.00c	Detroit	3.18c	New York† (d) ..	3.36c	St. Louis	3.41c	TOOL STEELS		(Applying on or east	
Detroit	3.18c	New York† (d) ..	3.36c	St. Louis	3.41c	(Applying on or east		(Applying on or east		of Mississippi river;	
New York† (d) ..	3.36c	St. Louis	3.41c	(Applying on or east		of Mississippi river;		of Mississippi river;		west of Mississippi l	
St. Louis	3.41c	(Applying on or east		of Mississippi river;		west of Mississippi l		up).		Base	
St. Paul	4.27c	up).		Base		High Speed	59 ½ c	High carbon, high		chrome	39c
Tulsa	4.80c	Base		High Speed	59 ½ c	High carbon, high		chrome	39c	Oil hardening	23c
TOOL STEELS		High Speed	59 ½ c	High carbon, high		chrome	39c	Oil hardening	23c	Special tool	21c
(Applying on or east		High carbon, high		chrome	39c	Oil hardening	23c	Special tool	21c	Extra tool	17 ½ c
of Mississippi river;		chrome	39c	Oil hardening	23c	Special tool	21c	Extra tool	17 ½ c	Regular tool	14 ½ c
west of Mississippi l		Oil hardening	23c	Special tool	21c	Extra tool	17 ½ c	Regular tool	14 ½ c	Uniform extras apply	
up).		Special tool	21c	Extra tool	17 ½ c	Regular tool	14 ½ c	Uniform extras apply		BOLTS AND NUTS	
Base		Extra tool	17 ½ c	Regular tool	14 ½ c	Uniform extras apply		BOLTS AND NUTS		(100 pounds or over)	
High Speed	59 ½ c	Regular tool	14 ½ c	Uniform extras apply		BOLTS AND NUTS		(100 pounds or over)		Discount	
High carbon, high		Uniform extras apply		BOLTS AND NUTS		(100 pounds or over)		Discount		Chicago (a) .....	.65
chrome	39c	BOLTS AND NUTS		(100 pounds or over)		Discount		Chicago (a) .....	.65	Cleveland .....	.70
Oil hardening	23c	Chicago (a) .....	.65	Cleveland .....	.70	Detroit .....	.70	Milwaukee .....	.70	Pittsburgh .....	.65-5
Special tool	21c	Cleveland .....	.70	Detroit .....	.70	Milwaukee .....	.70	Pittsburgh .....	.65-5		
Extra tool	17 ½ c	Detroit .....	.70	Milwaukee .....	.70	Pittsburgh .....	.65-5			(a) Under 100 lbs..	
Regular tool	14 ½ c	Milwaukee .....	.70	Pittsburgh .....	.65-						

Bars

Bar Prices, Page 56

Pittsburgh—Bar consumers are still taking advantage of the current price of 2.05c on hot-rolled carbon bars and 2.55c on hot-rolled alloy steel bars and continue to augment bar producers' backlogs, although it is evident that this trend to forward buying reached its peak about the week of Dec. 7-14. In a few cases bar users have willingly paid the higher first-quarter market of 2.20c, Pittsburgh, in return for certain and preferential rolling schedule and shipment. Under the same market condition, alloy steel bars will become quotable at 2.75c, Pittsburgh, and rail steel bars to the manufacturing trade, 2.05c, Pittsburgh.

Cleveland—Advanced prices are now being quoted on all grades of hot-rolled bars. While new tonnage at the increased figures is relatively light, producers are firm in their belief that, barring labor disturbances and similar irregularities, the first quarter will prove to be best since 1929.

Chicago—Bar producers are booking some first quarter business at the higher prices but are unable to accept additional tonnage for delivery before Feb. 1. Both shipments and operations are heavy, while consumption is well maintained. The market now is quoted 2.25c for billet bars and 2.10c for rail steel.

New York—Leading sellers are withdrawing from the market at fourth quarter prices. As many leading consumers are now covered there is a lull in new orders which has been accentuated by holiday influences. Elimination of the surcharge Jan. 1 will reduce the delivered price here 2 cents per 100 pounds.

Boston—A number of bar sellers have booked some additional fairly good sized orders even though a large amount of tonnage was booked on the strength of the mill advance. This indicates that consumption is being maintained at a heavier rate than anticipated earlier in the month.

Plates

Plate Prices, Page 56

Pittsburgh—Nashville Bridge Co., Nashville, Tenn., has been awarded a contract for a large towboat for the River Terminals Corp., New Orleans, for service on the lower Mississippi river. Fowler-Wolfe Co., Paducah, Ky., has been awarded the boilers and Shelton Bros. Foundry Co. will install other machinery.

Predominance of private inquiry for plates, as against specific building projects which will close in January, has been the heaviest in some years, and in many cases, long dormant projects have been revived. The market remains 1.90c until the effect of the higher asking price of 2.05c for the first quarter.

Cleveland—Plate mills report considerable activity due principally to the price advance effective Jan. 1. Inquiries have shown a marked decline as the deadline of Jan. 1 draws near, thus giving some fabricators the first breathing spell in over two weeks. Most awards consisted of small tonnages.

Chicago—Plate bookings continue heavy and while most tonnage is coming from railroad equipment builders, there is a fair demand from miscellaneous users. Both structural fabricators and tank builders are looking forward to an active first quarter. Some mills are declining new business for delivery before Feb. 1. The market on unprotected tonnages is 2.10c, base.

New York—Plate sellers are withdrawing from the market at fourth quarter prices. However, most consumers are fairly well protected. The elimination of freight surcharges at the end of this month will result in a reduction in the delivered price here of 1 cent per 100 pounds, making the new price Jan. 1 2.33c, delivered New York, allowing for the \$3 a ton increase on base prices.

New plans for a large liner have been submitted to the maritime commission, which is expected to announce a date for bids shortly.

Philadelphia—While steelmakers are out of the market on most products some fourth quarter capacity on plates is available and some moderate orders are being booked for that delivery.

It is estimated over 10,000 tons of hull steel will be required for two tankers just placed by Standard Oil of California with Sun Shipbuilding & Dry Dock Co., Chester, Pa.

With Philadelphia consumers now practically covered on their nearby requirements at fourth quarter prices and with the holiday season at hand, plate business over the past week has tapered. Elimination of freight surcharges will bring the delivered price Jan. 1 to 2.23½c. This allows for a reduction of a half cent per 100 pounds in freight charges and an increase of \$3 a ton in the base price.

Boston—Demand for plates is strong as for a number of weeks. Lukens Steel Co. has booked 700 tons of plates for three fishing trawlers, and Bath Iron Works is understood to have booked three additional trawlers for which the plate

contracts are pending. Boiler and tank fabricators are maintaining a high rate of activity.

Birmingham, Ala.—Activity in plate mills, following the limited lay off for the holiday, is continued and the final week of the year will see heavy output in mills at Fairfield and Gadsden. Most of output for some time has been for actual consumption, the stock in warehouses or on yards at mills in this district is reported small.

Seattle—The year's largest job in the Pacific Northwest, 8500 tons for the water system extension, Everett, Wash., has been awarded to Western Pipe & Steel Co., San Francisco, low bidder at \$1,257,366.

Contracts Placed

10,000 tons, two tankers for Standard Oil Co. (Calif.), to Sun Shipbuilding & Dry Dock Co., Chester, Pa.

8500 tons, 19 miles 30 to 52-inch water pipe for Everett, Wash., to Western Pipe & Steel Co., San Francisco.

700 tons, three fishing trawlers for Bay State Fisheries Inc. and 40 Fathom Fisheries Co., to Lukens Steel Co., Coatesville, Pa., through Bath Iron Works, Bath, Me.

Unstated tonnage, towboat, for River Terminals Corp., New Orleans, to Nashville Bridge Co. Nashville, Tenn.

Contracts Pending

250 tons, siphon, Yakima, Wash.
Unstated tonnage, three fishing trawlers for unnamed interests, to Bath Iron Works, Bath, Me.

Sheets

Sheet Prices, Page 56

Pittsburgh—Closing from Dec. 25 through Dec. 27, operations of sheet mills underwent a drastic temporary reduction. All major sheet consuming industries are still running at a high pace and definitely assure capacity operations for some time, so that activity will again resume early this week. In numerous cases important buyers in the automotive industry have contracted at the higher first-quarter price on sheets as a form of premium for preferential delivery in the early part of first quarter. The market is quoted f.o.b. Pittsburgh, 2.15c for heavy hot-rolled; 2.80c on No. 24 hot-rolled; 3.40c for galvanized, and 2.95c on tin mill black. Cold-rolled sheets are quoted 2.80c for 10 gage and 3.25c for 20 gage.

Cleveland—Automotive builders continue to specify as far in advance as they can be reasonably safe in forecasting requirements. Other large consumers are following a similar practice to obtain preferred delivery position on mill schedules. However, in the automotive field production continues to be hampered

by strikes in a few important parts concerns.

Chicago—Sheet backlogs are so far extended that some mills are able to sell only limited tonnages for March delivery. In some grades and sizes producers have withdrawn from the market because of their sold-out condition for first quarter. Production continues at capacity but was reduced last week by the holiday. The higher prices are steady on new business.

Philadelphia—Threat of possible labor trouble in the steel industry is stimulating further interest in sheets, particularly because of extended deliveries.

With freight surcharges off after Dec. 31 the delivered prices on No. 10 hot-rolled sheets will be 2.64c; on No. 24 hot-rolled annealed, 3.29c; on No. 24 galvanized 3.89c; and on No. 10 cold-rolled 3.29c and No. 20, cold-rolled 3.74c. These prices allow for an increase of \$4 a ton in the base price.

Boston—Based on the new price of 2.57c, delivered, Boston, on No. 10 hot-rolled sheets, and 3.22c, delivered, Boston, on No. 24 gage, some new business has been booked by several sellers. Not all sellers have indicated the closing date for receipt of specifications on orders booked at fourth quarter prices for delivery at mill convenience.

New York—The sheet market is succumbing to seasonal influences, with new orders over the past week relatively light. Prices on all leading grades of sheets will be reduced 2 cents per 100 pounds Jan. 1 because of elimination of freight surcharges.

St. Louis—There has been a noticeable falling off in buying of sheets as users covered their needs extensively at the current prices. Shipments are on a large scale, with pressure for delivery as strong as ever.

Birmingham, Ala.—Two days idleness for the holiday is to be followed by renewed activity by sheet mills in Southern territory. It will be several months before addition to the Tennessee Coal, Iron & Railroad Co. mill at Fairfield, Ala., is finished and ready for production.

eous lines have all been frequent participants in the market.

Transportation

Truck Material Prices, Page 57

Award of 3950 freight cars by three subsidiary roads of the United States Steel Corp. furnished the most important purchase in the railroad field in the past week. Bessemer & Lake Erie distributed 2000, Union railroad 900 and Duluth, Missabe & Northern 1050. Norfolk Southern has placed 25 automobile cars.

Elgin, Joliet & Eastern will award 1050, probably this week.

Rail buying seems to be about at its end. Boston & Maine has awarded 9500 tons and New York, New Haven & Hartford 5000 tons, both to unidentified mills. St. Louis & San Francisco has placed 13,500 tons with Tennessee Coal, Iron & Railroad Co. Rail mills are well booked as a result of the heavy tonnages placed late this year and will be busy well into 1937. The mill at Lackawanna, N. Y., booked about 75,000 tons in December, part of which may be transferred to another Bethlehem mill as ingot supply at Lackawanna may not be sufficient to supply all demands. Mills of the Tennessee Coal, Iron & Railroad Co. at Ensley, Ala., will have about 120,000 tons on books at the beginning of the year.

Car Orders Placed

Bessemer & Lake Erie, 2000 cars: 1000 ninety-ton hoppers to Pullman-Standard Car Mfg. Co., Chicago; 500 seventy-ton hoppers to American Car & Foundry Co., New York; 500 fifty-ton hoppers to Greenville Car Co., Greenville, Pa.

Duluth, Missabe & Northern, 1000 ore cars to Pullman-Standard Car Mfg. Co., 50 to Ryan Car Co., Chicago.

Norfolk Southern, 25 automobile box cars, to Magor Car Corp., New York. Union railroad, 900 cars: 600 seventy-ton gondolas to Pressed Steel Car Co., Pittsburgh; 200 of same type to Magor Car Corp., New York; 100 of same type to Ralston Steel Car Co., Columbus, O.

Rail Orders Placed

Boston & Maine, 9500 tons, to unstated maker.

New York, New Haven & Hartford, 5000 tons, to unidentified mill.

Buses Booked

American Car & Foundry Motors Co., New York: Eight 35-passenger to Eastern Massachusetts Street Railway Co., Boston; six 30-passenger to Chicago & Calumet District Transportation Co., Hammond, Ind.; four 35-passenger to Evanston & Niles Center Bus Co., Evanston, Ill.

Twin Coach Co., Kent, O.: Sixteen 23-passenger to Motor Transit Co., Jack-

sonville, Fla.; fifteen 41-passenger to Capital Transit Co., Washington; fourteen 23-passenger to Miami Beach Railway, Miami, Fla.; ten 30-passenger to Virginia Electric Co., Richmond, Va.; ten 25-passenger to Canton City Lines Inc., Canton, O.; eight 23-passenger and five 31-passenger to Mill-Power Supply Co., Charlotte, N. C.; five 29-passenger to Milwaukee Electric Railway & Light Co., Milwaukee; four 24-passenger to Georgia Power Co., Atlanta, Ga.; four 28-passenger to Kahului Railroad Co., Maui, T. H.; four 31-passenger to Los Angeles Motor Coach Co., Los Angeles.

Pipe

Pipe Prices, Page 57

Pittsburgh—Construction has been completed on the 113-mile Peoples Natural Gas Co. line from northern Pennsylvania to the Pittsburgh district, involving 12,000 tons of 12¼-inch seamless pipe. This is reported to be the largest natural gas pipe line construction in western Pennsylvania for a number of years.

Cleveland—Jobbers' stocks are turning over at about average rate with the trade confident that prices will remain firm and unchanged at the present levels through January. However, some are anticipating a small adjustment in fittings around the first of the year. Industrial and domestic requirements are showing the effect of the holiday and inventory period.

Chicago—Cast pipe shipments continue at the reduced rate noted recently. While sales and inquiries also are light, there is a fair amount of business in prospect, though deliveries are expected to continue restricted by the season during the next 60 days.

Boston—Awards total more than 1000 tons as municipalities move to complete water projects before extremely cold weather sets in. Demand for 6-inch sizes continues strong. Prices are firm at the higher level. Shipments can be made fairly promptly.

New York—The cast iron pipe market is seasonably quiet. Figures are being taken on considerable tonnage with a view to placing contracts for spring delivery. This is a protection against the possibility that further advances in pig iron will force up cast pipe prices again.

Ponca City, Okla.—Continental Pipe Line Co. has awarded contracts to Williams Bros. Corp. for a 16-mile six-inch line from Guthrie to Crescent, Okla., and a 5½-mile four-inch line from Orlando to Lucien, Okla., all to be Lindewelded.

Seattle—While immediate demand is nominal, projected improvements are materializing and cast pipe will show a larger turnover early in 1937. Seattle is plan-

Cold Finished

Cold Finished Prices, Page 57

Pittsburgh—Users of cold-finished steel bars are still able to negotiate purchases at 2.35c, Pittsburgh, base, and have still been entering orders through the past week which will be shipped at mills' convenience through first quarter, thus further delaying a test of the 2.55c price. Automotive partsmakers, jobbers, and manufacturers of many miscellan-

ning a \$22,000 extension project on Magnolia Bluff. Circle, Joliet and Ronan, Mont., are planning water systems totaling \$125,000, bids at Circle, Dec. 28, and Joliet, Dec. 30.

Cast Pipe Placed

500 tons, water project, Swanton, Vt., to Central Foundry Co., Newark, N. J.
483 tons, private water project, South Bridge, Mass., to United States Pipe & Foundry Co., Burlington, N. J.
100 tons, water department, Rockland, Mass., to Warren Foundry & Pipe Corp., Phillipsburg, N. J.

Cast Pipe Pending

200 tons or more, 4 to 8-inch, Medical Lake, Wash.; bids Jan. 4. Weile & Scott, Hutton building., Spokane, Wash., engineers.
145 tons, treasury department, Boston; bids Dec. 30.

Strip

Strip Prices, Page 57

Pittsburgh—The fact that a large amount of hot and cold-rolled strip steel which has been purchased against the first-quarter price increase has been virtually balanced by heavy consumption among consumers, indicates that when the mills' unfilled orders are worked down that these strip tonnages will go into actual use and not stock. Analysis of mills' backlogs indicates a predominant share which stamping interests have placed, and in spite of certain strike threats in the automotive field, there have been few hold-ups or cancellations. The market on the basis of some test for first quarter is now quoted 2.15c, Pittsburgh, for hot-rolled strip and 2.85c, Pittsburgh or Cleveland, on cold-rolled strip.

Cleveland—If the numerous orders on mill books at the increased prices can be taken as a practical forecasting medium, the first quarter outlook offers much promise to producers here. At present deliveries on cold-rolled finished material are in some cases extended into March.

Specifications from miscellaneous consumers showed a slight falling off, principally due to seasonal influences. However, mills report continued forward buying, more noticeable among larger consumers.

Chicago—While deliveries constitute the chief problem of strip producers, some new business is being booked for first quarter at the higher prices effective for that period. With full schedules in view for January, current buying is largely to obtain protection on shipments later in the first quarter. Strip consumption is holding well.

Philadelphia — Stripmakers are practically out of the market for

fourth quarter and are unable to accommodate further business for this year.

Elimination of the freight surcharge of 2 cents per 100 pounds Dec. 31 will establish the delivered Philadelphia price on hot-rolled strip at 2.64c and on cold-rolled strip at 3.39c. These prices allow for a \$4 increase on hot strip and \$5 on cold strip.

Wire

Wire Prices, Page 57

Pittsburgh—Some report of a further \$5 per ton, or 25 cents per keg, increase in standard wire nails with proportionate increases in other merchant wire products has been heard but it is doubtful if such a move would be taken before another 20 or 30 days. However, the sold-out condition in merchant wire and manufacturing wire products and the success of the Dec. 1 advance indicates that such an advance is a possibility.

Effective Jan. 1 the market on cut nails is being advanced \$4 a ton, or 20 cents per keg, to \$3.10 per keg for straight carload lots, f.o.b. Pittsburgh, or for mixed, joint and pool or less carload. A 10 per cent discount on extras is allowed on straight carload lots only. A jobber of cut nails is now defined as one who purchases cut nails in carload quantities for resale purposes and is allowed a 20-cent per keg allowance on straight carloads, with 10 cents off for less, mixed, joint and pool cars. On cut nails sold direct by the mills, or through qualified jobbers to the trade, or to jobbers not qualifying as cut nails jobbers, \$3.40, base, applies on 5 kegs and over, and \$3.55, base, on less than 5 kegs.

Cleveland—Miscellaneous requirements continue heavy from the farm equipment and specialty manufacturers, but bolt and nut concerns and auto partsmakers still set the pace among consumers here. Those serving the automobile trade report considerable forward buying, some going into stock but the majority to be used in immediate production. The question of higher prices is of little importance in the present sellers' market, with deliveries so far extended.

Chicago—Wire demand continues fairly active, with the higher prices effective Dec. 1 steady on new bookings. Production has been increased in some instances, with deliveries of manufacturers' wire at a relatively better rate than those of merchant products. A favorable outlook for farm buying of barbed wire, fencing, etc., is seen for next year and

dealers in some districts are acquiring heavier stocks.

Boston—Demand for wire nails is strong, with early shipment desired in a number of instances. Mills are asking for specifications by Dec. 31 on business at the old prices with a view to completing shipments by Jan. 31.

Tin Plate

Tin Plate Prices, Page 56

Pittsburgh—Tin mill operations underwent a temporary reduction to about 83 per cent of capacity last week as most mills, scheduling only 10 out of 17 turns, closed down late Dec. 24 until the 11 p.m. turn Dec. 27. With the definite trend of can-makers to anticipate their requirements, tin plate producers are assured of capacity operations again beginning this week and for some time to come. The market at \$4.85 per base box, net, f.o.b. Pittsburgh, is quoted unchanged into 1937, with the higher price of 3.70c on No. 24 unassorted long ternes scheduled to take effect early in the quarter.

New York—Within a week the world price on tin plate has been advanced about 30 cents. This figures back to between \$4.50 and \$4.85, Pittsburgh, depending on freight differentials. Sellers look for foreign prices shortly to exceed the Pittsburgh domestic equivalent.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 57

Chicago—December bolt and nut shipments continue to compare favorably with those of November, while heavier deliveries are in sight for next quarter as a result of scheduled increases in operations of farm and railroad equipment builders. Higher prices of bolts and nuts have yet to be tested. Rivets are

Ferroalloys

Ferroalloy Prices, Page 58

New York — Ferromanganese shipments continue at the highest rate this year, with prices holding at the recently announced increase of \$5 a ton duty paid. Domestic spiegeleisen is also moving briskly with new contracts being entered at \$28, Palmerton, Pa., on lots up to 50 tons and \$26 on 50 tons and over.

Cooper Bessemer Corp., Grove City, Pa., has announced that its Mt. Vernon, O., foundry will be reopened, due to several large orders for gas compressors and diesel engines.

Shapes

Structural Shape Prices, Page 56

Pittsburgh—Leading inquiry is for extensions to the Middle river plant at Baltimore, involving 7000 tons for the Glenn L. Martin Co. American Bridge Co. closed on 1285 tons for a New York state bridge at Corona, Long Island. Plain structural shapes are still being protected on specific building jobs through January at 1.90c, Pittsburgh, but unprotected orders are now being quoted at the first-quarter price of 2.05c.

Cleveland—No awards were made last week, but considerable tonnage is involved in jobs expected to be placed between now and the first of the year. At present mills are operating close to capacity, working down heavy backlogs. However, some fabricators report improved deliveries over a month ago. Inquiries are light, consisting of a few small jobs of well under 100 tons.

Chicago—Structural inquiry continues fairly active as fabricators rush to obtain protection at old prices. Several industrial buildings are included among new inquiries, though most projects are for small work, taking less than 100 tons at a time. Lakeside Bridge & Steel Co. is low on 1150 tons for the Mississippi river dam at Red Wing, Minn.

Philadelphia—Featuring structural award is the placing of 4700 tons for the Easton, Pa., toll bridge, with Bethlehem Steel Corp., Bethlehem, Pa. Bids went in Dec. 22 on substantial tonnage believed to represent in part requirements of Pennsylvania railroads electrification program. Mills continue to book orders at fourth quarter prices.

Elimination of the freight surcharge will result in a reduction of 1 cent after Dec. 31. This, combined with a \$3 advance in the base price, will place the delivered Philadelphia price at 2.25½c.

Boston—Fabricators have been busy submitting bids on a large number of identified public projects

and some private work as the deadline on bookings at fourth quarter prices nears. Bridge replacements constitute the bulk of the work. Awards totaled about 2000 tons.

Seattle—Fabricators are handicapped by lack of materials. Several jobs awarded weeks ago have not begun, awaiting water shipments of steel. U. S. engineer, Portland, has called bids Dec. 22 for 40 sections of steel frames for the main dam fishway, Bonneville project, tonnage unstated.

Shape Contracts Placed

- 5025 tons, carbon black plant, Witco Carbon Co., Sunray, Texas, to Colorado Fuel & Iron Co., Denver.
- 4700 tons, Eastern Pennsylvania toll bridge, to Bethlehem Steel Corp., Bethlehem, Pa.
- 1610 tons, highway bridge, Point of Rocks, Md., to American Bridge Co., Pittsburgh.
- 1285 tons, state highway bridge on Northern boulevard, Corona, Long Island, N. Y., to American Bridge Co., Pittsburgh.
- 1250 tons, state highway bridge, WF-36-3, Queens, N. Y., to American Bridge Co., Pittsburgh, through Tully & Di Napoli Inc., New York.
- 930 tons, state highway bridge No. 146, Boscobel, Wis., to Midland Structural Steel Co., Cicero, Ill.
- 870 tons, bridge FAP 809-C, Burnet & Lano counties, Texas, to Pittsburgh-Des Moines Steel Co., Pittsburgh; and North Texas Iron & Steel Co., Fort Worth, Tex.
- 800 tons, plant addition, for Owens Illinois Glass Co., Streator, Ill., to Bethlehem Steel Corp., Bethlehem, Pa., through Hughes Foulkrod Co., Philadelphia.
- 755 tons, bridge section 1616VF, Cook county, Illinois, to Mississippi Valley Structural Steel Co., Decatur, Ill.
- 735 tons, highway bridge 428, Lorain county, Ohio, to Burger Iron Co., Akron, O.
- 695 tons, bridge 438-E WPSS, route SA, Benton county, Missouri, to Vincennes Steel Corp., Vincennes, Ind.
- 650 tons, warehouse, for Owens Illinois Glass Co., Gas City, Ind., to Bethlehem Steel Corp., Bethlehem, Pa.
- 600 tons, steel piling, Haverhill, Mass., to Jones & Laughlin Steel Corp., Pittsburgh.
- 590 tons, bridge over Kiskiminitas river in Pennsylvania to Fort Pitt Bridge Works, Pittsburgh.
- 588 tons, bridge over Sacco river, Buxton-Hollis, Me., to Boston Bridge Works Inc., Cambridge, Mass.
- 574 tons, bridge over Sacco river, West Buxton-Hollis, Me., to Harris Structural Steel Co., New York.
- 440 tons, radial gates for Imperial dam, Potholes, Calif., for United States bureau of reclamation, to Lakeside Bridge & Steel Co., Milwaukee.
- 375 tons, Gerard avenue group bridges over New York Central railroad, Bronx, N. Y., to American Bridge Co., Pittsburgh.
- 350 tons, bridge Central of New Jersey, Avon, N. J., to Phoenix Bridge Co., Philadelphia.
- 350 tons, building, for F. W. Woolworth Co., Brooklyn, N. Y., to Joseph T. Ryerson & Son Inc., Chicago.
- 350 tons, sound stage, for Twentieth Century Fox Film Corp., California, to Consolidated Steel Corp., Los Angeles.
- 350 tons, addition, Lever Bros. Co., Cambridge, Mass., to New England Struc-

- tural Steel Co., Cambridge, Mass.
- 320 tons, turbine support, Union Electric Light & Power Co., Cahokia, Ill., to Mississippi Valley Structural Steel Co., Decatur, Ill.
- 310 tons, bridge 475-F-WPMH, route 40, St. Louis, Mo., to Stupp Bros. Bridge & Iron Co., St. Louis.
- 300 tons, warehouse, Denver, to E. Burkhardt & Sons Steel & Iron Works Co., Denver.
- 300 tons, bridge Nos. 612, 614 and 492, Thurmont and Keymar, Md., for Western Maryland railroad, to Bethlehem Steel Corp., Bethlehem, Pa.
- 300 tons, Central school, Canlsteo, N. Y., to Anthracite Bridge Co., Scranton, Pa.
- 240 tons, sound stage No. 16, for Twentieth Century Fox Film Corp., California, to Bethlehem Steel Corp., Bethlehem, Pa.
- 200 tons, taxpayer, Eighth avenue and Twenty-third street, New York, to Dreler Structural Steel Co., New York.
- 185 tons, highway bridge No. 1430, Huntington, W. Va., to Vincennes Steel Corp., Vincennes, Ind.
- 180 tons, state bridge, Hammonton, N. J., to Bethlehem Steel Corp., Bethlehem, Pa.
- 175 tons, eight grain buildings, Kreuger Brewing Co., Newark, N. J., to Dover Boiler Works, Dover, N. J.
- 163 tons, Milwaukee avenue viaduct, Portland, Oreg., to Northwestern Equipment Co., Vancouver, Wash.
- 135 tons, addition, Armstrong Cork Co., Lancaster, Pa., to A. B. Rote Co., Lancaster, Pa.
- 135 tons, Cambridge Isanti county bridge, Minnesota, to Minneapolis Moline Power Implement Co., Minneapolis.
- 135 tons, Sugar City bridge, Crowley county, Colorado, to Midwest Steel & Iron Works Co., Denver.
- 120 tons, postoffice, Upper Darby, Pa., to Bethlehem Fabricators Inc., Bethlehem, Pa.
- 120 tons, building, Seaboard Paper Co., Buxport, Me., to New England Structural Steel Co., Cambridge, Mass.
- 115 tons, store, Montgomery-Ward Co., Glens Falls, N. Y., to Belmont Iron Works, Philadelphia.
- 115 tons, bridge WPPH 657-F, San Pardo county, Texas, to Virginia Bridge & Iron Co., Roanoke, Va.
- 100 tons, state bridge, Foxboro, Mass., to Boston Bridge Works Inc., Cambridge, Mass., through Coleman Bros. Corp., Boston.
- 100 tons, Salem, Oreg.; postoffice, to Poole & McGongle, Portland.

Shape Contracts Pending

- 55,230 tons, cast iron tunnel rings, for Queens—midtown tunnel; United States Pipe & Foundry Co., East Burlington, N. J., low.
- 7000 tons, extensions to Middle river plant, for Glenn L. Martin Co., Baltimore.
- 3500 tons, telephone building, for Southern New England Telephone Co., New Haven, Conn.
- 2000 tons, railroad viaduct, New York; Thomas Crimmin Contracting Co., New York, low, includes 200 tons bars.
- 1700 tons, piling, for Flushing Bay, New York; no bids submitted.
- 1500 tons, building extensions, to plant No. 2, Amptill, Va., for E. I. DuPont de Nemours.
- 1200 tons, bridges, various locations, for Chicago, Milwaukee, St. Paul & Pacific railroad.
- 1150 tons, dam, Red Wing, Minn.; Lakeside Bridge & Steel Co., Milwaukee, low.
- 1100 tons, bridge, Austin, Tex.
- 1000 tons, warehouses, for Central New York Regional authority, Syracuse, N. Y.

Shape Awards Compared

	Tons
Week ended Dec. 25	27,620
Week ended Dec. 18	13,667
Week ended Dec. 11	26,985
This week, 1935	17,295
Weekly average, 1935	17,081
Weekly average, 1936	21,765
Weekly average, November	19,043
Total to date, 1935	897,319
Total to date, 1936	1,131,730

1000 tons, office and factory building, for Cleveland Twist Drill Co., Cleveland; inquiry increased from 500 tons noted in STEEL, Dec. 21.

1000 tons, bridge, city of Manchester, N. H.; bids taken Dec. 23.

800 tons, bridge, Orford, N. H.; bids taken Dec. 23.

700 tons, Suffolk county courthouse, Boston; substructure bids Dec. 29; about 1800 tons involved in superstructure.

700 tons, bridge, Merom, Ind.

453 tons, deck plate girder bridge, Chester county, Pennsylvania; S. J. Greves & Sons Co., Ridgefield, N. J., low bidder at \$286,756.90, on Dec. 18 letting.

430 tons, High street bridge, Muncie, Delaware county, Ind.

402 tons, through truss bridge, Cambria county, Pennsylvania; bids to state highway department, Harrisburg, Pa., Jan. 8; included, 12 tons of plain bars.

400 tons, bridge over Connecticut river, Lyme, N. H.

390 tons, state bridge, Tillamook county, Oregon; Philpott Bros., Portland, low; includes 55 tons of reinforcing bars.

375 tons, West Jackson street bridge, Delaware county, Muncie, Ind.

370 tons, grade crossing elimination bridge, Yonkers, N. Y., for New York Central railroad.

370 tons, Elm street bridge, Delaware county, Muncie, Ind.

350 tons, bridge over Nasel river, Pacific county, Washington.

350 tons, bridge, Springfield, Mass.; bids taken Dec. 22.

300 tons, service bay structure, Pickwick Landing power house, Alabama, for Tennessee Valley authority.

300 tons, bridge over Androscoggin river, Turner-Center, Me.; bids to be taken Dec. 30.

280 tons, East Jackson street bridge, Delaware county, Muncie, Ind.

275 tons, bridge Turner-Green, Me.; bids to be taken Dec. 30.

250 tons, Oregon state capitol; Ross B. Hanford, Portland, general contractor.

250 tons, bridge over Watershops, Springfield, Mass.

250 tons, barracks for Floyd Bennett field, Brooklyn, N. Y., for United States government.

246 tons, through truss bridge, Clinton county, Pennsylvania; bids to state highway department, Harrisburg, Pa., Jan. 8; included, 25 tons of plain bars.

229 tons, truss bridge, Huntingdon county, Pennsylvania; bids to state highway department, Harrisburg, Pa., Jan. 8; included, 29 tons of plain bars.

220 tons, Romy street bridge, Delaware county, Muncie, Ind.

215 tons, I-beam underpass, Chester county, Pennsylvania; McNichol Paving & Construction Co., Philadelphia, low bidder at \$278,067 on Dec. 18 letting.

210 tons, Walnut street bridge, Delaware county, Muncie, Ind.

200 tons, bridge over Merrimac river, Boscowen-Canterbury road, N. H.

200 tons, Balaban & Katz theater, Chicago.

200 tons, Forty-seventh street subway, Chicago; bids to Chicago park board Jan. 8.

200 tons, elementary and junior high school, Covington, Ky., for board of education.

170 tons, through truss bridge, Somerset-Cambria counties, Pennsylvania; Guy Trimpey, Listle, Pa., low bidder at \$44,431.87 on Dec. 18 letting. Included, 25 tons of plain steel bars.

168 tons, pony truss bridge, Bedford county, Pennsylvania; bids to state highway department, Harrisburg, Pa., Jan. 8; included, 41 tons of plain steel bars.

153 tons, truss bridge, Jefferson county,

Pennsylvania; Edward Kean, Pittsburgh, low bidder at \$49,716.55 on Dec. 18 award. Included, 38 tons of plain steel bars.

111 tons, pony truss bridge, Jefferson county, Pennsylvania; bids to state highway department, Harrisburg, Pa., Jan. 8; included, 19 tons of plain bars.

Unstated, bridge over Skagit river, Washington, for Seattle light department; bids soon.

Brown Fence & Wire Co., Cleveland, declared dividends of 50 cents a share on old class B stock unexchanged, and 15 cents on the new \$1 par common stock, both payable Nov. 30, to stock of record Nov. 16.

Reinforcing

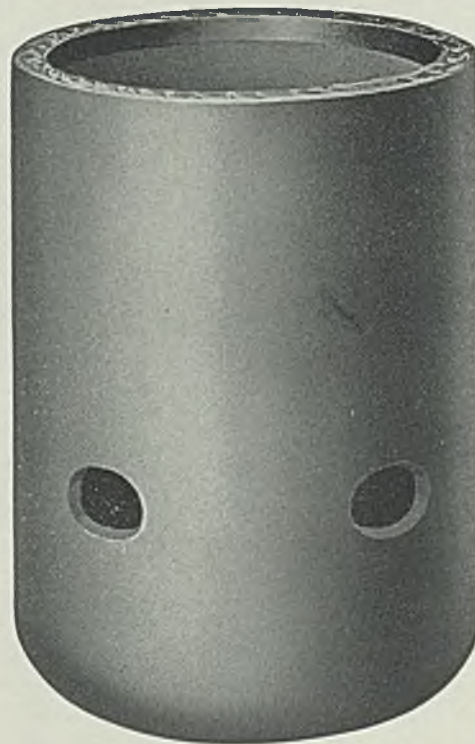
Reinforcing Bar Prices, Page 57

Pittsburgh—A large quantity of specific and identified building jobs was signified for a closing date through January just prior to the deadline Dec. 23 on such projects. These structures will continue to take the former price on reinforcing bars at 2.05c, f.o.b. Pittsburgh, as quoted by distributors for carload lots. The higher price is not likely

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to become subject to test much before another month. Several hundred tons of reinforcing bars are put on inquiry for a number of counties in the Pennsylvania state highway letting to close Jan. 8.

Cleveland—Market is quiet with few jobs awarded last week, and those well under 100 tons. The \$3 a ton advance announced last week, to go into effect Dec. 23, drove in little additional tonnage. Mills are active getting out old orders, but are expected to decline slightly over the next month.

Chicago—While producers instituted advances of \$3 a ton on billet and rail steel bars last week, the market has yet to be established at the higher levels on tonnage sales. Producers' backlogs are declining, but brisk shipments for this period are in sight the next 30 days. Small lots predominate new inquiries.

Boston—As mills put into effect the new prices on Dec. 23, a number of identified bridge projects were bid and considerable work from private sources involving less than 100 tons was booked. Joseph T. Ryerson &

Son Co. Inc., Chicago, has booked 500 tons for the Liberty Mutual building, Boston.

Philadelphia—The largest reinforcing bar award involves 1200 tons for an addition for Campbell Soup Co., Camden, N. J., to Bethlehem Steel Corp., Bethlehem, Pa. The new distributor's price of 2.56c, base, Philadelphia, has not yet been tested.

Reinforcing Steel Awards

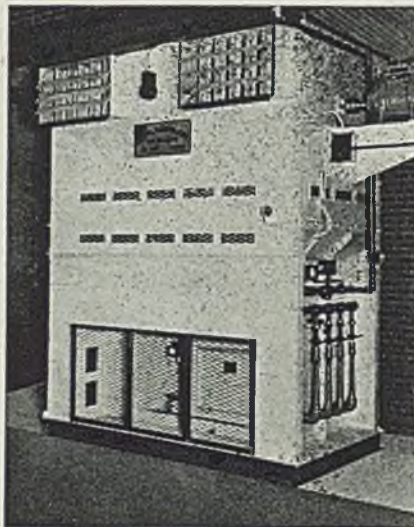
- 2000 tons, steel rods, Salem, Oreg., concrete water pipe line, to unnamed interest; American Concrete & Steel Pipe Co., Tacoma, Wash., general contractor.
- 1200 tons, addition to building, Campbell Soup Co., Camden, N. J., to Bethlehem Steel Corp., Bethlehem, Pa.
- 920 tons, Oregon capitol building, to Soule Steel Co., Portland; Ross B. Hammond, Portland, general contractor.
- 800 tons, Union avenue crossing, Portland, to Bethlehem Steel Co.
- 500 tons, Liberty Mutual building, Boston, to Joseph T. Ryerson & Son Inc., Chicago.
- 400 tons, Schuyler viaduct, Portland, to Soule Steel Co., Portland.
- 325 tons, bridge, WF-36-3, Queens, N. Y., to Bethlehem Steel Co., Bethlehem, Pa., through Tully Di Napoli Inc., New York.
- 250 tons reservoir Salem, Oreg., to Mercer Steel Co., Portland.
- 150 tons, postoffice, Salem, Oreg., and Milwaukee street viaduct, Portland, to Mercer Steel Co., Portland.
- 150 tons, building, Pittsburgh Plate Glass Co., Newark, N. J., to Truscon Steel Co., Youngstown, O.
- 100 tons, grade crossing elimination, Montrose, N. Y., to Jones & Laughlin Steel Corp., Pittsburgh.

Reinforcing Steel Pending

- 1513 tons, Yakima Ridge unit, Roza reclamation project, Washington state; J. A. Terteling & Sons, Boise, Ida., low.
- 350 tons, building, Swift & Co., Jersey City, N. J.; asking bids now.
- 230 tons, Mississippi river dam, Red Wing, Minn.; A. Guthrie & Co., St. Paul, low for general contract.
- 220 tons, courthouse, Jamaica, N. Y.; Lexington Construction Co., New York, low.
- 173 tons, viaduct, Aberdeen, Wash., bids soon.
- 113 tons, paving work Chester county, Pennsylvania; McNichol Paving & Construction Co., Philadelphia, low bidder at \$278,067 on Dec. 18 letting.
- 108 tons, highway work, Chester county, Pennsylvania; S. J. Greves & Sons Co., Ridgefield, N. J., low bidder at \$286,756.90 on Dec. 18 letting.

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Concrete Awards Compared

	Tons
Week ended Dec. 25	6,795
Week ended Dec. 18	2,810
Week ended Dec. 11	2,141
This week, 1935	3,965
Weekly average, 1935	6,862
Weekly average, 1936	6,005
Weekly average, November	3,757
Total to date, 1935	363,708
Total to date, 1936	312,237

Pig Iron

Pig Iron Prices, Page 58

Pittsburgh—All grades of pig iron have been advanced 50 cents per ton, effective Jan. 1, by producers in this territory. Shortage of coke and probable higher prices of coal and lake ore are factors in the increase. The new prices, Neville Island furnace, will be \$21 for No. 2 foundry and malleable, \$20.50 for basic and \$21.50 for bessemer.

New York—With the holidays at hand pig iron sellers experienced a quiet week and look for little improvement until after the first of the year, unless by chance higher prices are announced for the near future. Elimination of surcharges Jan. 1 will bring the delivered price on No. 2 foundry to \$23.77, Brooklyn, and \$22.89, Newark, N. J., and malleable to \$24.27, Brooklyn, and \$23.39, Newark. The reduction in freight charges will result in little revision in existing contracts as most carry a clause which provides that any reduction in freight rates will redound to the advantage of the buyer. In addition to Japan, China is now inquiring for pig iron, although for only 500-ton lots and with specifications confined to foundry grades. This is the first interest in pig iron here by China in several years.

Japan recently reported as having purchased 40,000 tons of pig iron in this country is negotiating for further heavy tonnage. Participating in the recent purchases by Japan are two northern furnaces, one of which booked 15,000 tons and two southern furnaces. The purchases are said to have comprised various foundry grades, including a substantial amount of so-called pipe iron. Some business is reported sold on a basis of \$18, Mobile, Ala., with an f.a.s. price in the North of \$1 or so higher. It is believed that any further business will be at higher levels.

Cleveland—Producers report little change in activity, with prices holding firm and the general run of miscellaneous orders coming from foundries serving the auto, machine tool, farm equipment and railroad fields. Contracts for fourth quarter aggregate considerable tonnage and some buyers have come into the market for additional tonnage for shipment at once. Advance in scrap prices recently has helped to strengthen the higher price of pig iron.

Chicago—New pig iron business consists principally of small lots for fill-in purposes and for those buyers who previously did not anticipate first quarter needs. Con-

sumption is equal to or in excess of foundries' previous estimates, but tonnage now moving against old contracts will cover consumers' needs beyond first quarter. December shipments will set a new high mark for the year.

Philadelphia — With indications pointing more definitely than at any time toward a further advance, probably by Jan. 1, pig iron consumers are placing further substantial tonnages, thus mitigating holiday influences. The Swedeland, Pa., producer has blown in a larger furnace but instead of shutting down

the smaller stack as originally expected, is planning to continue it in operation for at least another 60 days.

With freight surcharges off after Dec. 31 the new delivered Philadelphia price on No. 2 foundry will be \$22.26; on malleable \$22.76; and on basic \$21.76.

Buffalo — Fourth quarter contracts are now cleaned up and no trouble was experienced in getting consumers to take full deliveries. First quarter buying has been generally completed or at least partly covered by all leading consumers.

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Purchases have been of such size as to indicate there is an excellent prospect for long runs of consuming industries at high rates. Producers hope to accumulate a little iron in the next two weeks especially in grades which have been running low in their reserves. All of the 12 blast furnaces now in operation here will run in January. This operation represents practically the full available capacity of the Buffalo area.

Boston—Some new business has developed to test the new price of

\$22.75, base Everett, Mass. Although practically all consumers had covered before the price advances, it is thought these new orders represent additional business booked by foundries. A number of large consumers are fairly well covered on first quarter requirements.

St. Louis—The movement of pig iron to consumers continues at the high levels which have marked the past several weeks, and the total for the month will be the largest for the year, and for any December since 1929. According to sellers, vir-

tually all tonnage contracted for last quarter delivery will have reached its destination by Jan. 1

Birmingham, Ala. — Shipments were light in comparison with several weeks before, caused by the holiday, but resumption of activity this week will see a fairly good start on what promises to be a period of activity.

Scrap

Scrap Prices, Page 59

Pittsburgh—With consumers of remelting scrap having paid \$19.50 for ordinary No. 1 steel and willing to negotiate further purchases at the same price, the market has advanced another 50 cents a ton and is now quoted \$19.25 to \$19.75 on this grade for Pittsburgh district shipment. Evidence of a shortage of standard furnace coke, both by-product and beehive, is having an immediate effect on cast iron borings and mixed borings and turnings, where \$15 a ton has been paid by consumers here, making for a wide quotable advance. Carried along by the strength of the market on all open-hearth scrap specialties, cast grades and virtually all classifications have recorded new high price ground in the past week, which is at a level not touched since early 1929.

Cleveland — On the currently strong iron and steel scrap market here, quotations on half a dozen grades of old material again have been marked up 50 cents a ton. Scrap still is difficult to obtain in anything like tonnage lots. The Youngstown district market also appears strong but without the exuberance indicated at other centers.

Chicago—Heavy melting steel is up 50 cents to a new high for the movement on a sale at \$18. Railroad offerings of heavy melting are bringing close to \$18.50, while other grades continue strong. Supplies of old material continue scarce and sellers find difficulty in covering at a profit. Foundry grades continue active.

Boston—Brokers' buying prices for iron and steel scrap have been advanced 25 cents to \$1 per ton as the wave of heavy domestic buying continues and causes practically all classifications to share in the increases. Axle turnings are up \$1 to the spread \$8.50-9.00. In line with domestic prices, export prices have been boosted but foreign demand remains fairly even. Textile cast for New England delivery is up \$1 to a flat \$13.

New York—Brokers have lifted their buying price on steel shafting to \$17, up from \$15.50 to \$16. Cast iron borings also gained strength,

Behind the Scenes with STEEL

World Wags On

METALS on the world front: In Detroit 12 prisoners hawksawed their way out of cells, but their saws balked at the alloy steel bars of a corridor door. . . A Pittsburgh department store has installed 1500-pound aluminum floodgates in its display windows which can seal the store against floodwaters up to 48 feet. . . Barbed wire and mechanical trench excavators are enjoying peak sales in Europe, especially Spain. . . Hundreds of tons of horseshoes are being exported to China each year for conversion into razors and razor blades (we used one of these blades this morning). . . Automobile manufacturers are currently using about 125 different types of steel. . . The Ilva Steel Co. in Rome forked over a million lira to Mussolini to celebrate the founding of the empire (the Duce you say!) . . . Laboratory microscopes and microscopic cameras have been streamlined to meet the demands of the day (probably so they won't be gone with the wind).

Coast-to-Coast

STATEMENT written for the Oct. 12 issue of STEEL by Mr. Ben Fairless, who runs a moderate-size steel business, met favor with the editors of *Western Machinery & Steel World*. They requested permission to reprint Mr. F.'s remarks about the savings possible through use of alloys; this was readily extended, and the article appears in the December issue of the above journal, for the benefit of all West Coast industrial interests. Probably many of them read the material when it was originally published in these pages, since STEEL is read widely in Los Angeles, San Francisco, Portland, Seattle and other Pacific centers.

Greatest of Ease

THE Meinke-Eldred Flying Service of Willoughby, O., wants to show us how one of their "up-to-the-minute" airplanes can cut away many profitless hours spent between points of business." Not only that but "travel by air is a pleasure to be looked forward to rather than a necessary evil. . . and you get the benefits of the

rarefied air of a mountain resort with every trip."

Headline in the evening paper calmly reports, "Seven Feared Lost as Plane Crashes in West." Probably those seven had little chance to enjoy the rarefied mountain air. But even if a person contents himself with walking, his chances are about 1 in 20 that some hit-skip will mash him into a lamp-post.

For the Long Pull

A RECENT new 2-year subscriber to STEEL in New England asked our circulation representative the price on a 25-year subscription. Caught off his guard by this smashing request, our man mumbled something about social security, Dr. Townsend and the 5-year plan, finally concluding that he would have to take the matter up with headquarters.

The vice president in charge of quarter-century subscriptions now comes out flatly and says that he can extend a bargain price on 25-year orders of \$75, and may even whittle that down to \$69.95. Line forms on the right.

Response

WITHIN two weeks of publication of an article in one of the early December issues of STEEL, the company whose process was described had received over 50 inquiries regarding the method. With such a responsive audience, STEEL was immediately recognized as a profitable advertising medium by this company. Their schedule will start shortly after the first of the year.

Grittings

WE TRUST our vallant army of Behind the Scenes readers managed to keep on the alkaline side over the Christmas holiday, and will continue to do so for the rest of this week. Further, we hope your Yule logs have burned more brightly this year, and as the old year breathes its last we sincerely hope you can look forward to a New Year full of enjoyment and prosperity.

—SHIRDLU

being quoted at \$6.00 to \$6.50. The continued heavy domestic demand has caused a disparity to arise between domestic and export prices. The weather last week was favorable to easy movement of material.

Philadelphia—Scrap prices continue to rise, with No. 1 heavy melting steel now at \$16 to \$16.50, delivered. Increases have been made in a number of grades, due largely to higher dealer offers. Some leading consumers continue to hold back. Export interests are decidedly more active with possibility of a heavy aggregate tonnage being placed soon.

Buffalo — New strength of heavy melting steel in the Pittsburgh and other areas has caused Buffalo dealers to withdraw from making sales at this time, especially unless prices are advanced drastically by melters. Dealers purchased No. 2 heavy melting steel at \$15.25 or better during the past week in contrast to a local consumer's offer of \$16 for No. 1. Some dealers think a Buffalo price of \$17.50 for No. 1 steel is justified by developments in other markets. Billet and bloom crops have sold for \$21 or better in the Buffalo territory, it is claimed, while other low phosphorus grades also are higher. There is a disposition on the part of dealers to stay out of the market until a going price for heavy melting steel is established in tonnage transactions here. Meantime the list has again become largely nominal as dealers will not accept top bids offered.

Detroit—Further advances of 50 cents to \$1 a ton have raised the market to new high ground for 1936, finding No. 1 steel quoted \$14.50 to \$15; hydraulic compressed sheet scrap, \$15 to \$15.50, and blast furnace scrap, of which there is a noticeable scarcity, \$10.50 to \$11. Strikers in many of the automobile plants indicate a lower volume of offerings in January.

St. Louis—Energies displayed by the short interest in iron and steel scrap during the past several days has resulted in further advances, with heavy melting steel and steel specialties leading the upturn. Heavy melting steel has advanced to a new high and current quotations are the highest recorded since 1929.

Birmingham, Ala.—Inquiries are in hand for considerable iron and steel scrap with indications of numerous orders, though in small tonnages, placed in the turn of the year. Available stock for dealers is still limited but so far all demands have been met. Heavy melting steel holds most interest with \$12.50 to \$13.50 being asked.

Seattle — In spite of interruption to export trade, the market retains its recent activity as mills and foundries are buying in fair vol-

ume. In anticipation of the expected settlement of the maritime strike dealers are preparing for a strong demand from Japan. Stocks are low at tidewater and shipments from the interior are not large. The market has every appearance of firmness. No. 1 melting is holding steadily at \$10.50.

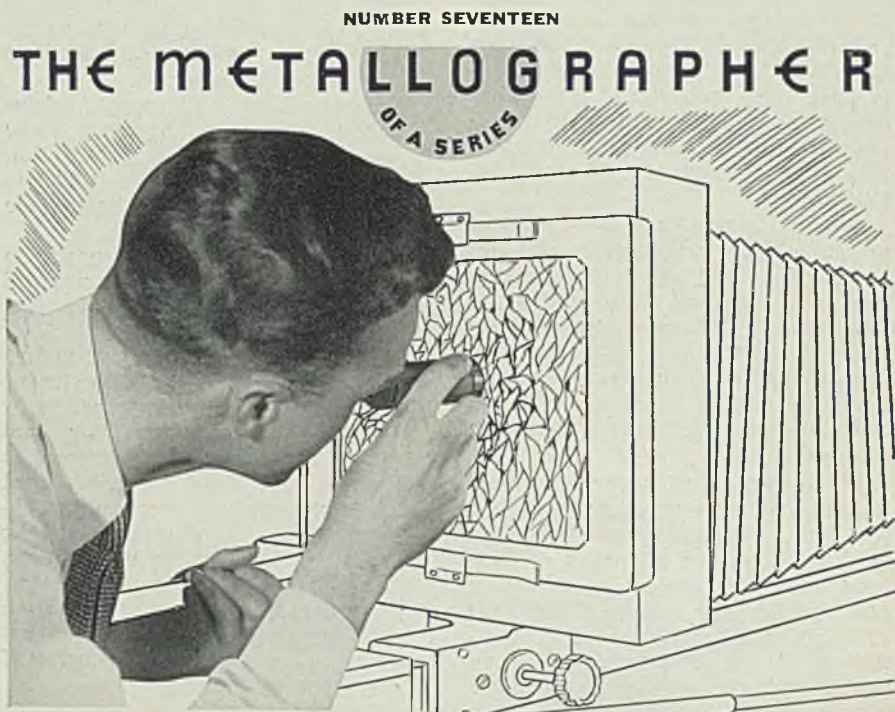
Metallurgical Coke

Coke Prices, Page 57

Active sales of standard beehive

furnace coke, now taking a minimum of \$3.90, f.o.b. ovens, Connellsville, in some cases involve sales ranging up to as high as \$4.15. As in furnace coke, a lack of supply is evidenced in common foundry coke, which is also firm at the advanced level of \$4.50 to \$4.75, f.o.b. ovens.

One adverse repercussion, at least as far as revenues for the county treasurer's office are concerned, has resulted from the recent coal and coke boom in Fayette county, which is the heart of the Connellsville, Pa., soft coal district. Increased mine



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and oven operations may have meant bulging pay envelopes for thousands of workmen, but with the removal of huge seams of coal, the resulting valuation of the lands, which is a big source of tax revenue, will be decreased about \$3,000,000, according to John W. Rankin, county commissioner.

Warehouse

Warehouse Prices, Page 60

New York—Consumers are stocking in anticipation of an expected price advance. Despite the fact that this material may be on hands during inventory, consumers apparently have not demurred at immediate delivery. Not all jobbers have advanced the cold strip price to 3.61c, which represents the \$5 mill advance.

Boston—Prices have been marked up on all products except cold finished items and the base quantity has been reduced from 40,000 to 8000 pounds. These prices, effective Dec. 21, will apply until Dec. 31, with the probability that prices will be lowered about 40 cents per ton as the railroad freight surcharges are dropped.

Philadelphia—Advances of several dollars a ton are scheduled for Jan. 1. On all leading grades, except cold finished bars, advances will exceed mill increases by \$1 a ton. In cold finished the scheduled advance to 4.18c which will allow for elimination of freight surcharge, is on parity with the mill increase. Sales

for December are expected to be off 5 to 10 per cent from November.

Cleveland—Sales so far this month have fallen a little behind November, but not to the degree many anticipated because of inventory and general holiday influences. The proportionate demand for most products is unchanged. In some heavier structural grades a slight improvement has been felt. Prices remain firm, with the expected increases conforming with mill advances still unannounced.

Chicago—Retarding influences of the season continue to have less than the usual effect on warehouse sales. While part of current buying may be attributed to anticipation of higher prices next month, a good first quarter is expected.

Detroit—Steel warehouse jobbers indicate they will announce their higher selling schedule about Jan. 1. Demand continues at a high level, for some sellers the best since 1929.

St. Louis—A moderate recession in volume of sales from warehouses is reported but of considerably less than the usual proportions. New prices will not be announced before Jan. 1 and will be in adjustment with the recent mill advances.

Seattle—Turnover is fair, considering conditions. Best demand is for sheets and light materials used in repair work and overhauling. Increase in volume of private buying is noted. Price lists in Washington are being generally maintained at the higher levels. Portland dealers are trying to adjust the price situation in their territory as stocks of imported steel disappear.

Iron Ore

Iron Ore Prices, Page 59

Cleveland—Stocks of iron ore at lower lake ports and furnaces Dec. 1, were approximately 1100,000 tons more than on a comparable date last year, according to Lake Superior Iron Ore association.

The association's report follows:

	Tons
Consumed in October.....	4,384,809
Consumed in November.....	4,269,049
Decrease in November.....	115,760
Consumed in November, 1935.	3,025,694
On hand at furnaces, Dec. 1..	30,459,720
On Lake Erie docks, Dec. 1...	4,918,348
Total on hand at furnaces and Lake Erie docks, Dec. 1....	35,378,068
Reserve total, Dec. 1, 1935...	34,276,968

Semifinished

Semifinished Prices, Page 57

Buffalo—Canadian interests are reported inquiring for skelp for shipment as soon as Great Lakes navigation reopens in 1937. The early inquiry is the result of disappointment of Canadian consumers of this material in efforts to buy American made skelp for shipment in October and November. While orders for more than 15,000 tons were placed much more was sought but could not be obtained because of inability of mills on this side of the border to produce the material before the close of navigation. According to reports here Canadian consumers are now seeking to line up tonnage for deliveries throughout the spring and summer, planning to place the business in ample time to get the material on books of American works.

Pittsburgh—A definite sellers' market in wire rods, rerolling billets, sheet and tin bars continues as most integrated mills prefer to cater to the needs of their own finishing mills rather than offer supplies on the open market. Inquiries for rerolling billets, sheet bars and slabs find the market quoted generally at \$34, Pittsburgh, on future buying, and on wire rods at \$43 and \$45 for respective bases. Still lacking a first-quarter price announcement, both sizes of skelp remain unchanged at 1.80c, Pittsburgh, base.

Nonferrous Metals

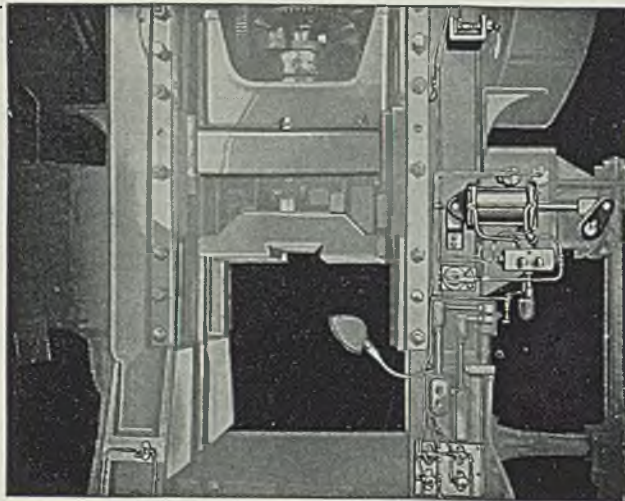
Nonferrous Metal Prices, Page 58

New York—Copper and lead prices rose sharply early last week, reflecting directly the steady advance in prices in London to new highs for recent years. A steadier price tone developed Wednesday and the recent upswing in metal prices was believed to have been halted at least

SAFETY OPERATING SYSTEMS FOR PRESSES

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May we send you our Bulletin describing these systems?



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JACKSON, MICHIGAN

temporarily. Antimony advanced ½-cent while tin eased fractionally.

Copper—Electrolytic copper advanced ¼-cent suddenly on Tuesday with export copper advancing to a high of 11.75c, c.i.f. The new domestic price of 11.62½c, Connecticut, was the highest since Nov. 15, 1930. As consumers were not allowed to cover at the former price, sales were not extremely heavy. Brass ingot, copper wire and cable, copper and brass rolled products, and metal scrap prices advanced proportionately.

Lead—Fairly active business was done in lead through midweek at 6.00c, New York, and 5.85c, East St. Louis, the highest level attained since March 5, 1930. Prices advanced Monday on the further advance in London due to actual scarcity of supplies in that market with no immediate relief foreseen.

Zinc—Sellers continued to restrict sales due to limited supplies. Consumers did not press for metal and prices held unchanged at 5.45c, East St. Louis. Efforts to stabilize the market at current levels were apparently successful at least for the present.

Tin — Consumers continued to show little buying interest and prices eased to around 51.90c on Straits spot. Production is still well below the level permitted by the International Tin committee despite continued light supplies available on the market.

Antimony—Prices advanced ½-cent to the basis of 13.25c for both American and Chinese spot. Buying continued light.

Collective Bargaining Fails To Aid Employment

Collective bargaining in important heavy industries failed to increase either employment opportunity or labor purchasing power during the prosperous period ending in 1929. This fact is pointed out by Allen W. Rucker and N. W. Pickering, business economists, in a study of employment and wage conditions in industry for the Farrel-Birmingham Co., Ansonia, Conn.

In the rising period of prosperity ending in 1929, none of the six union industries studied increased purchasing power more than 2.5 per cent over 1923, as compared with 11.8 per cent average increase in all manufacturing. In that same period, these six union industries "accounted for a total loss of employment opportunity which reached the impressive figure of 637,696 fewer jobs than in 1923."

The study includes anthracite and bituminous coal mining, glass manufacturing, railway repair shops,

railway transportation and shipbuilding.

Purchasing power increases were nominal in three instances and showed serious declines in three instances, notably anthracite and bituminous coal mining and railway repair shops, all strongly unionized.

"In the depression period, 1929-1933, none of the industries studied maintained employment opportunity as well as the average in all manufacturing, and only two sustained labor's aggregate purchasing power better than the general manufacturing average," according to the report. The heaviest declines in purchasing power occurred in anthracite and bituminous coal mining, the indices of which dropped respectively to 48.9 per cent and 33.9 per cent of the 1923 level.

"The performance of unionism in these heavy industries when viewed in the combined light of total employment opportunity and total purchasing power generated in boom and depression periods, compels the conclusion that the end results do not confirm the claims made for unionization. There is, instead, ample ground for labor as a whole to thoroughly distrust unionism and the entire theory of wage and hour regulation borrowed from feudal European philosophy."

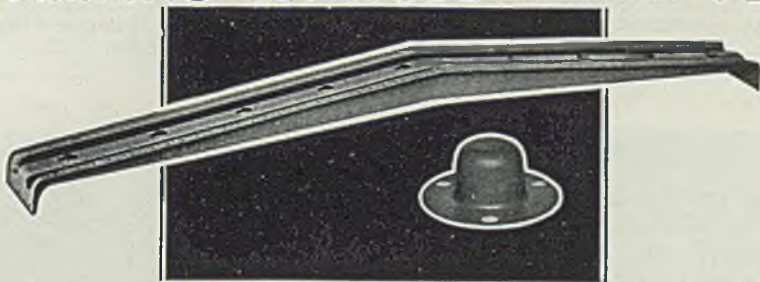
Meetings

RESEARCH WORKERS WILL MEET IN MASSACHUSETTS

BENEFITS of co-operation in research in metals through investigation of fundamental problems will be discussed by metallurgists, chemists and physicists at a meeting to be held at Massachusetts Institute of Technology, Cambridge, Mass., Jan. 28-29, under auspices of the institute and the American Institute of Physicists.

Among the more general papers to be presented are the following: "Research Problems in the Steel Industry," by Dr. E. C. Bain, United States Steel Corp., New York; "Inclusion in Ferrous Alloys," by Dr. A. B. Kinzel, Union Carbide & Carbon Co., New York; "Flow Phenomena in Heavily Stressed Metals," by Prof. P. W. Bridgman, Harvard university, Cambridge, Mass.; "Electronic Structures in Metals and Alloys," by Prof. J. C. Slater, Massachusetts Institute of Technology; "Corrosion," by Dr. J. R. Burns, Bell Laboratories Inc., New York; "Elastic Properties of Ferrous Alloys," by Prof. A. V. de Forest, Massachusetts Institute of Technol-

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ogy; and "Chrome-Nickel-Iron Alloys," by Dr. V. N. Krivobok, Allegheny Steel Co., Brackenridge, Pa.

In another group of papers, various techniques and their applicability are to be presented, while in the third group some especially complex scientific problems met with in ferrous alloys will be discussed.

SYMPOSIUM ON CORROSION TESTING AT A.S.T.M. MEETING

One of the features of the 1937 regional meeting of the American Society for Testing Materials to be held at the Palmer House, Chicago, during the week of March 1, will be a symposium on corrosion testing. For some time committees A-5 on corrosion of iron and steel and B-3 on corrosion of nonferrous metals and alloys have considered steps toward standardization of methods of corrosion testing.

A joint committee was appointed and is arranging the symposium as a starting point. Plans call for an introductory paper on the underlying principles of testing, to be followed by other papers dealing with tests under gaseous, immersion and soil conditions.

ELECTROPLATERS PLANNING INTERNATIONAL CONFERENCE

Announcement is made of the first International Electrodeposition conference to be held in London, March 3-4. This conference was organized by the Electrodepositors' Technical society and will devote one session to each of the four topics: Electrodeposition practice abroad; electrodeposition of base metals; properties of electrodeposits; and electrodeposition of base

metals; properties of electrodeposits; and electrodeposition of precious metals.

Papers have been accepted from eight countries including the United States which will contribute seven prepared by well-known authorities. H. Wynne-Williams, 12A, Raleigh House, Larkhall Estate, London, S.W.8, is honorary secretary.

SOUTHERN FOUNDRYMEN TO GATHER IN BIRMINGHAM

The fifth joint foundry practice meeting of the American Society of Mechanical Engineers and the American Foundrymen's association will be held at the Tutwiler hotel, Birmingham, Ala., Feb. 25-27. Safety, hygiene and equipment for foundries are subjects which will feature the 1937 meeting.

PREPARE FOR CANNING SHOW IN CHICAGO IN JANUARY

Equipment used in the canning industry will be displayed at the Canning show to be held at the Stevens hotel, Chicago, Jan. 24-29. The show is to be held in connection with the annual conventions of the National Cannery association and the Canning Machinery and Supplies association. S. G. Gorsline, Merchandise Mart, Chicago, is secretary of the latter organization.

Wholesale Sales in 1935 41 Per Cent Over 1933

Wholesale sales in the continental United States during 1935 by 176,062 wholesale establishments

amounted to \$42,203,815,000, representing an increase of 41 per cent over 1933 according to a census bureau report just released.

In 1933 there were 163,583 establishments with sales of \$30,005,157,000. With an 8 per cent increase in the number of places of business and a 41 per cent gain in total sales, the average sales per establishment rose from \$183,000 to \$240,000. The sales increase is in sharp contrast to a 55 per cent decrease in total sales from 1929 to 1933.

The average number of employees, full-time and part-time combined, increased 7 per cent, from 1,187,604 in 1933 to 1,274,508 in 1935. Employment is still short of the 1929 total by 14 per cent.

Pay rolls increased 23 per cent from \$1,659,391,000 in 1933 to \$2,049,251,000 in 1935. The average annual earnings per employe increased from \$1397 to \$1608.

Safety Code Adopted For Scrap Employes

A safety code has been put in effect for the members of the institute insurance pool, operating under the New York state fund by the Institute of Scrap Iron and Steel Inc. The regulations require that every member supply his employes with safety shoes, with steel reinforced toes, with safety goggles and other safety measures.

The executive committee of the insurance group, which approved the regulations, will shortly announce a safety contest.

Mingo Junction Employes Ask for Plant Expansion

Sixteen hundred workers at Carnegie-Illinois Steel Corp.'s Mingo Junction, O., works are urging that the corporation divert part of its expansion program to their plant.

Reminding Myron C. Taylor, chairman, United States Steel Corp., and B. F. Fairless, Carnegie-Illinois president, that they are "loyal to the company," they request that "a plant expansion be considered" soon.

In a letter to Mr. Fairless the workmen, acting through their employe representatives, declared that:

"All employes are now, and will continue to be, loyal to the company and to their present employe representation plan and will take a firm stand to a man against outside organizations, which we believe to be detrimental and hazardous to the welfare of our company and the employes.

"Mingo works has immediate access to most convenient transportation, the Ohio river and four railroads. The company owns sufficient

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TOOL STEEL TUBING
NON-SHRINK OIL HARDENING
FOR
Ring Dies — Spacers — Bushings
Stock up to 12" O. D. 2" Wall
Larger sizes available
Complete Stocks of Ball Bearing Tubing
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THE BISSETT STEEL COMPANY
CLEVELAND
CHICAGO CINCINNATI
FINE TOOL STEELS
TUNGSTEN CARBIDE DIES & TOOLS

unoccupied property at Mingo for future development. The plant is located in one of the best labor markets in the United States."

Honor 25-Year Service

Eleven employes of Jessop Steel Co., Washington, Pa., were honored recently at a dinner for having completed 25 years' service. Jessop Steel Co. was established in 1901 by interests of Sheffield, Eng., and among the 11 men honored recently was one whose family had been employed by the original William Jessop & Sons, Sheffield, Eng., for six generations, beginning in 1774.

Ore and Scrap Imported

Philadelphia—Iron and steel imports here during the week ended Dec. 19 were featured by the arrival of 9250 tons of manganese ore from the Gold Coast, 2850 tons of chrome ore from Cuba and 1937 tons of scrap from the Dominion Republic, the latter being the first arrival of foreign scrap at this port in considerable time.

Other arrivals include 58 tons of steel bars, 52 tons of cold-drawn steel wire, 21 tons of steel tubes, 20 tons of steel forgings and one ton of steel sheets, all from Sweden and 124 tons of steel sheets from Germany.

Equipment

Chicago—Price advances on machine tools are thought likely to have only a temporary retarding effect on sales next quarter in view of the large number of purchases under consideration. With deliveries on many tools in the most extended position of the year, manufacturers are assured of active production during the next three months. December sales have been affected less than usually by the season, due in a measure to the situation in deliveries and prices. Brisk operations in a number of the leading branches of the metalworking industry are sustaining demand for small tools, it is reported.

Seattle—Seasonal conditions and effects of the maritime strike have contributed to the present dull state of the equipment and machinery market. While lumber plants will make some replacements during the holidays, as usual, demand from the logging and lumber industry is less than normal with many plants idle because of inability to ship, 17,000 workers in the camps and mills being unemployed on account of the tieup in shipping.

Construction and Enterprise

Ohio

ASHTABULA, O. — Cleveland Electric Illuminating Co. will install 50,000-kilowatt turbo-generator unit in its power plant here. Cost is estimated at \$1,500,000. Eben G. Crawford is president.

BELLEVUE, O. — Village rejected bids for construction of raw water pumping station at an estimated cost of \$8,000. Engineer is revising plans and specifications. C. A. Williams is service director; Geo. B. Gascoigne, 1140 Leader building, Cleveland, is consulting engineer.

CARROLLTON, O. — Board of public affairs, Sam Poole, clerk, is taking bids, due Jan. 2, for construction of electric transmission lines for 3-phase, 4000-volt operation.

CINCINNATI — Newton Products Co., 323-33 Lock street, is taking bids for general contract for construction of extensive alterations to factory building. Jos. L. Fay is president; Fosdick & Hilmer, Union Trust building, are engineers.

CLEVELAND — Cleveland Production Co., 2112 West 106th street, will start work soon on construction of \$25,000 foundry addition. J. W. Jackson is prominent in the company. J. C. F. Shafer Co. is general contractor.

CLEVELAND — Cleveland Druggists Specialties Co., Bernard H. Stalzman, president, 10018 East St. Clair avenue, is remodeling warehouse at 1664 Ansel road. Louis Skolnik, 3580 East 118th street, is architect.

CLEVELAND — Cleveland Pneumatic Tool Co., 3734 East Seventy-eighth street, is building two-story plant addition on top of present structure. Ernest Mc-

George, 1900 Euclid avenue, is engineer.

DAYTON, O. — Office of contracting officer, Wright field, Dayton, receives bids until Dec. 31 for various quantities and sizes of structural steel H-columns and anchor bolts, circular 37-418, for delivery Wright field.

DAYTON, O. — American Dry Ginger Ale Co., 536 Keowee street, plans construction of addition to warehouse and office building at an estimated cost of \$11,000. Russell Fisher is president; Geyer & Neuffer, Ludlow Arcade building, are architects.

FREMONT, O. — Standardized Aircraft Co., recently established for the manufacture of two-place, high-wing monoplanes, has purchased former plant of Fremont Metal Body Co. Paul W. Kridler, Fremont, is president.

MOUNT VERNON, O. — Cooper Bessemer Corp., 200 Thomas avenue, will reopen its foundry here for the production of engine castings. Modern machine tools have been purchased and are now being installed.

NORWALK, O. — City is taking separate bids, due Jan. 5, for furnishing and installing municipal light plant equipment, including one 2500-kilowatt turbo-generator and auxiliaries and surface condenser. W. C. Saladin is service director; W. C. Kammerer & Associates, 1001 Huron road, Cleveland, are consulting engineers. (Noted Oct. 19).

NORWALK, O. — Joyce Products Co., Columbus, has plans nearing completion for construction of factory building here. J. Edgar Outcalt, 23 North High street, is architect.

SANDUSKY, O. — Kelly Island Lime & Transport Co., E. Schmidt, plant superintendent, Leader building, Cleveland, has preliminary plans for construction of

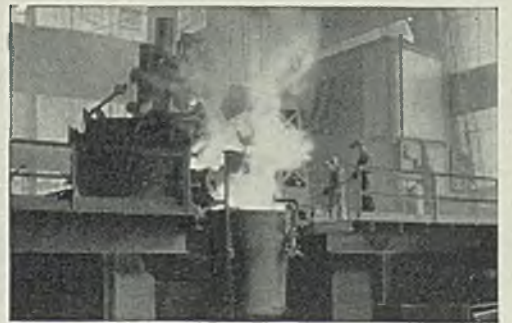
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CARBON-ALLOY
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BASIC ELECTRIC
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COMPLETE control of all processing from selection of the melting charge to the finished condition is the N. F. & O. guarantee of quality in forgings furnished to your specifications — Smooth Forged, Hollow Bored, Rough or Finish Machined.

Die Blocks and Piston Rods

stone crushing plant at Kelly Island. Cost, including equipment, is estimated at \$100,000.

UHRICHSVILLE, O. — City plans to appoint committee to investigate construction costs and possibility of PWA assistance in proposed municipal light plant project. Theodore Schug is president of the council.

VERSAILLES, O. — Village rejected bids received Dec. 3 for furnishing cast iron pipe, valves and fittings, and will take new bids, due Jan. 1. R. D. Showalter is clerk.

WILLOUGHBY, O. — Wolwin Chair Co. plans construction of one-story, fire-proof plant building to replace the one destroyed by fire recently. Samuel M. Winograd, 2489 Overlook road, Cleveland Heights, is president. (Noted Dec. 21).

New York

BINGHAMTON, N. Y. — City plans extension and improvement of existing water supply system, including alteration of boiler plant, pumping unit, reservoir, mains and filtration facilities. Cost of total project is estimated at \$984,831. J. A. Giles is city engineer.

BROOKLYN, N. Y. — Modern Machine Corp., 285 North Sixth street, manufacturer of machinery and parts, has leased space in building of Weill Lithographing Co., South Third street, for plant expansion.

BUFFALO — Gilbert Klinek Brewing Co., 10-24 West Bennett street, has awarded general contract to C. H. Everitt Inc., 295 Auburn avenue, for construction of superstructure for brewery units as part of program estimated to cost \$125,000.

BUFFALO — Spencer Kellogg & Sons, Niagara square, manufacturer of linseed oil products, has plans for extensions in bin department of its plant at 309 Ganson street. Cost is estimated at over \$50,000, with equipment.

DEFERIET, N. Y. — Board of trustees will take bids until Dec. 30 for construction of well, pump house, mains and elevated tank. W. T. Field Engineers Inc., Watertown, N. Y., are engineers.

LOCKPORT, N. Y. — City hospital will sponsor \$200,000 addition and remodeling program under WPA allotment.

NEW YORK—Hobel & Gorin Machine & Fixture Co., Manhattan, has been organized by Murray R. Paris, 521 Fifth avenue, to deal in electrical machinery. Capital is \$10,000.

NIAGARA FALLS, N. Y. — Hooker Electro-Chemical Co., Buffalo avenue and Forty-seventh street, manufacturer of industrial chemicals, plans one-story addition to plant, to cost about \$50,000.

ROCHESTER, N. Y. — Foxhill Products Inc. has been formed by Arthur L. Mepham, 309 Ellwanger & Barry building, to deal in tools and machinery. Capital is \$60,000.

TONAWANDA, N. Y. — E. I. du Pont de Nemours & Co. Inc., manufacturer of rayon and cellophane, has permit for expansion of its River road plant here, including construction of \$18,000 boiler house and two warehouses to cost approximately \$10,000 each.

WYOMING, N. Y. — Taxpayers have approved plans for construction of new central school to cost \$170,000.

New Jersey

ALPHA, N. J. — Mayor and council have PWA allotment of \$80,000 for con-

struction of water supply system, including erection of storage standpipe.

TRENTON, N. J.—L. A. Young Spring & Wire Co., Detroit, has signed contract for erection of \$250,000 building as first step in its contemplated plant expansion here. (Noted Nov. 16)

Pennsylvania

PITTSBURGH — Pennsylvania Electric Repair Co. is having plans completed for construction of manufacturing building on Saw Mill Run boulevard. Bids will be taken soon. Paul Richard Scheunaman, Magee building, Pittsburgh, is architect.

PITTSBURGH—U. S. Engineer office, Federal building, will receive proposals until Jan. 4 for furnishing and delivering hydroelectric plant for Emsworth locks and dam on the Ohio river.

SHARPSVILLE, PA. — Western Steel Products Mfg. Co., this city, maker of seamless steel tubing, has plans for one-story mill to cost over \$350,000. A. B. Small is general manager. (Noted Nov. 16).

Connecticut

COLCHESTER, CONN. — Town will construct municipal waterworks system, including steel storage tank and pipe lines at an estimated cost of \$90,000. G. L. Bllderbeck, State street, New London, is engineer.

NEW BRITAIN, CONN. — Progressive Iron & Metal Co. Inc., 81 West Main street, has been incorporated here. Edward Menus is president.

Massachusetts

BOSTON—Commonwealth Ice & Cold Storage Co., 220 Northern avenue, will award contracts soon for construction of eight-story, 100 x 240-foot steel fish-freezing and storage building extension at the corner of Northern avenue and D street. Cost is estimated at \$750,000.

Vermont

SWANTON VILLAGE, VT. — Village will take bids soon for construction of municipal waterworks system. L. E. Jordan is village superintendent.

Illinois

CHICAGO — Sanitary district, J. J. Sullivan, clerk, 910 South Michigan avenue, will take bids until Dec. 30 for construction of southwest sewage treatment works, division Q, in the village of Stickney. Project will consist of 12 preliminary settling tanks, two operating galleries, six control houses, and conduits, pipelines and other equipment.

CHICAGO — Radlo Steel & Mfg. Co., 6501 West Grand avenue, has awarded contract for construction of one-story plant addition, to cost about \$50,000, to A. T. Herlin & Son, Inc., 6816 Clyde avenue, Abell-Howe Co., 53 West Jackson boulevard, is architect.

CHICAGO—Dauchy Iron Works Inc., 223 West Illinois street, has been organized by G. V. Dauchy and associates, to deal in steel, iron and other metals. Kirkland, Fleming, Green, Martin & Ellis, 33 North LaSalle street, are correspondents.

EAST PEORIA, ILL.—Village will soon take bids on construction of \$80,000 waterworks system. Kinsey Engineering Co., 515 Court street, Pekin, Ill., is engineer.

ST. CHARLES, ILL. — St. Charles Mfg. Co., maker of steel kitchen cabinets, has work under way on one-story addition which will more than double

present capacity. Estimated cost is \$60,000.

Indiana

MUNCIE, IND. — EMCA Corp., name changed from Acme Machine Products Corp., 1300 Batavia avenue, has been organized by J. H. Broderick and associates to engage in general manufacturing.

Alabama

LEIGHTON, ALA. — Town has plans for construction of municipal waterworks system at an estimated cost of about \$32,727. Funds for this purpose have been secured from PWA. J. B. McCrary Co., 22 Marietta street building, Atlanta, Ga., is engineer.

TUSKEGEE, ALA. — City receives bids Jan. 4 for construction of waterworks and filtration plant, including reservoir, distribution system and appurtenances. G. B. Edwards is mayor. (Noted Nov. 2).

Delaware

WILMINGTON, DEL. — George W. Baker Machine Co. plant suffered serious damage by fire recently.

Maryland

BALTIMORE—City will have plans ready by Jan. 1 for construction of \$5,300,000 Loch Raven-Montebello water tunnel project. Bids will be opened Jan. 20. Bernard L. Crozier is chief engineer for the city.

BALTIMORE — Flynn & Emerich Co., 301 North Holliday street, manufacturer of stokers and parts, has let contract to Edward L. Walsh, 1508 Bolton street, for construction of foundry addition at an estimated cost, with equipment, of \$40,000. W. S. Austin, Maryland Trust building, is consulting engineer.

District of Columbia

WASHINGTON — Procurement division, Treasury department, will take bids until Dec. 30 for one flat bottom type, adjustable ditcher, Invitation No. RA-1777-F, delivered prepaid to Davis Mosby, Barboursville, Va.; until Jan. 4 for one 10-horsepower gasoline engine, invitation No. 222-1786-A, for delivery prepaid to E. R. Lloyd, Starkville, Miss.; until Jan. 5 for miscellaneous quantities of machine screws, nuts, stove bolts and galvanized iron, invitation No. 6893-RSP, for delivery Post Office, St. Paul, Minn.

WASHINGTON — Panama Canal, Office of the general purchasing officer, will open bids Jan. 6 for miscellaneous quantities of steel, steel floor plates, billets, pipe, lead pipe, screws, nuts, coil chain, links, copper tacks, insulated cable, flexible cords, magnet wire, electric motors, electric heaters, meters and fuses, schedule 3209, for delivery either Cristobal or Balboa, Canal Zone, Isthmus of Panama.

Florida

TAMPA, FLA.—Continental Can Co. Inc., 100 East Forty-second street, New York, has purchased 45-acre site here and will start work soon on construction of can manufacturing plant estimated to cost \$500,000. Austin Co., 16112 Euclid avenue, Cleveland, is in charge of construction.

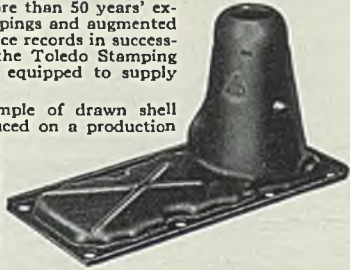
Georgia

ATLANTA, GA.—Edgewood Shoe Factories, care Candler W. Butler, 16 Yonge street S. E., will soon call for bids for construction of factory at Caroline street and Moreland avenue, S. E., estimated to
(Please turn to Page 76)

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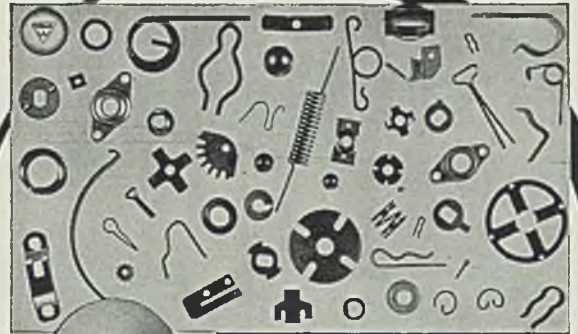
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(Concluded from Page 74)

cost \$150,000. Robert & Co., Bona Allen building, are engineers.

AUGUSTA, GA. — City is having plans prepared for construction of additions and improvements to waterworks system, including reconstruction of filter plant. Cost is estimated at \$400,000. E. E. Pund is city engineer.

Kentucky

DAYTON, KY.—Perry & Derrick Co., 906 Central avenue, Cincinnati, paint manufacturer, has plans nearing completion for erection of four-story factory building here. E. C. Landberg, 114 Garfield place, Cincinnati, is architect.

Louisiana

BATON ROUGE, LA. — North Baton Rouge waterworks, district No. 1, has applied to PWA for funds totaling \$281,320 for construction of system estimated to cost \$625,157. E. G. Blakewood, 419 Louisiana National Bank building, is engineer.

CHALMETTE, LA. — Chalmette Petroleum Corp. has plans for expansion and improvement of local refinery, including installation of additional handling and cracking equipment. Cost of entire program is estimated at \$400,000.

NEW ORLEANS — Sewerage and water board is having plans completed and will call for bids soon on construction of proposed auxiliary water pumping plant on Carrollton avenue. Cost is estimated at \$215,000.

TALLULAH, LA. — Chicago Mill & Lumber Co., 111 West Washington street, Chicago, plans rebuilding local veneer mill, recently damaged by fire.

North Carolina

DRAPER, N. C. — Marshall Field & Co., Chicago, receives bids Dec. 31 for construction of addition to mill here. Robert & Co., Bona Allen building, Atlanta, Ga., are engineers.

RALEIGH, N. C.—K. E. Stahl Mfg. Co., 521 South Blount street, manufacturer of refrigeration equipment, plans erection of plant on 150 x 300-foot site in Fuller Heights.

WILMINGTON, N. C. — Atlantic Refining Co., 260 Broadway, Philadelphia, is receiving bids until Jan. 15 for five 100,000-gallon tanks with pontoon floating rafts for gasoline storage. Entire unit estimated to cost \$1,000,000.

Virginia

FRANKLIN, VA. — Chesapeake-Camp Corp., recently organized with \$3,500,000 capital, will erect pulp and board mill, according to H. W. Ellerson, president, Albemarle Paper Mfg. Co., Tredegar, Richmond.

Arkansas

BRADFORD, ARK. — Town receives bids Dec. 29 at State Capitol, Little Rock, for furnishing tools, materials and constructing waterworks system, including well and pump, 50,000-gallon steel tank and distribution system. G. C. Twyford is mayor; K. W. Lefever, 215 Gazette building, Little Rock, is engineer. (Noted Nov. 30).

PINE BLUFF, ARK.—White River Power Co., subsidiary to Arkansas Power & Light Co., has major license from federal power commission for construction of hydroelectric plant at Wild Cat bend on White river, including two generating units having an installed capacity of 33,000-horsepower.

STEVENS, ARK. — Town receives

bids Dec. 29 at State Capitol, Little Rock, for construction of complete sanitary sewer system, including pumping station, collecting system and outfall system. R. E. Williams, 1007 Southern building, Little Rock, is engineer. G. N. Cannon is mayor.

Missouri

KANSAS CITY, MO.—Fruehauf Trailer Co., 10940 Harper street, Detroit, manufacturer of truck trailers, plans erection of assembly plant in Fairfax industrial district here. Initial investment will be \$300,000. Charles E. Keyser, Kansas City, Kans., designed the building.

Oklahoma

TULSA, OKLA. — Dow Inc., subsidiary of Dow Chemical Co., Midland, Mich., is building research laboratory at King and Atlanta streets. Cost is estimated at \$20,000. Dana G. Hefley is chemical engineer in charge; Long Construction Co., Philtower building, is general contractor.

TULSA, OKLA. — Vinson Supply Co., Hunt building, distributors of power plant and refinery equipment, is erecting 100 x 140-foot building, one-story, at Boston avenue and Cameron street, to cost \$20,000.

Texas

EDCOUCH, TEX.—City voted in favor of issuing \$35,000 bonds for purchase and improvement of water system and \$25,000 bonds for installation of gas system in Rio Grande valley. (Noted Dec. 7).

HANDLEY, TEX. — Tarrant County water control and improvement district No. 2 awarded contract at \$16,500 for construction of sewage treatment plant to Frank Parrott, 3014 Canton street, Dallas. Hawley, Freese & Nichols, Capps building, Fort Worth, are engineers. (Noted Nov. 30).

JACKSONVILLE, TEX.—Ozark Mountain Canning Co. plans additions to plant to double production capacity.

SHERMAN, TEX. — Texas Power & Light Co., Dallas, will construct three rural electric lines southeast of Sherman, on highway 75 and between Sherman and Denison.

Minnesota

SHAKOPEE, MINN. — Consumers Malt & Grain Co., affiliated with Albert Schwill & Co., Chicago, plans construction of multistory plant for malt production. Cost, with equipment, is estimated at over \$250,000.

Iowa

CEDAR FALLS, IOWA—Viking Pump Co., maker of rotary pumps and gauges, plans construction of \$100,000 plant addition.

MAQUOKETA, IOWA—City will take bids until Jan. 7 for construction of \$55,600 waterworks improvements. R. W. Gearhart, Cedar Rapids, is engineer.

Arizona

MAMMOTH SPRINGS, ARIZ. — Town plans construction of waterworks system at an estimated cost of \$36,364. PWA has granted \$16,364 toward this project.

Utah

SOUTH JORDAN, UTAH—Town has plans for construction of waterworks improvements estimated to cost \$19,000. H. Bletzacker, 50 East Fifth South street, Salt Lake City, is engineer. PWA project.

Montana

JOLIET, MONT. — Bids will be received Dec. 30 for construction of \$50,911 waterworks system, to include reservoir, well, pumps and pipe line.

Pacific Coast

HOLLYWOOD, CALIF. — Columbia Broadcasting Co., 485 Madison avenue, New York, has awarded contract for construction of its million dollar plant on Sunset boulevard between Gower and El Centro streets, to William Simpson Construction Co., 816 West Fifth street, Los Angeles. Earl Heltschmidt, Los Angeles, is architect participating in development.

MODESTO, CALIF. — Slodene Bros., care G. N. Hilburn, architect, 1213 T street, plans erection of one-story, 14,000-square foot warehouse.

PORTLAND, OREG. — American Sheet Metal Works Inc. is increasing capital stock from \$60,000 to \$100,000. Amendment filed by Estes Snedecor, Portland, who is attorney.

PORTLAND, OREG.—Northwest Steel Fabricating Co. Inc., Portland, has been organized by Roy B. Hantlinger and associates.

CATHLAMET, WASH. — U. S. Engineers have approved plans for proposed bridge from here to Puget Island, Columbia river, for which bond issue has been authorized and state and federal funds secured. Plans call for three-span steel structure, with approaches 2460 feet in length.

COLFAX, WASH. — R. W. Stockman, Baker, Wash., has been engaged by city to prepare plans and supervise construction of proposed sewage disposal plant.

EVERETT, WASH. — Puget Sound Power & Light Co. has asked Whatcom county for 25-year franchise in preparation for construction of 95 miles distribution lines.

PUYALLUP, WASH. — Brew Mfg. Co. plans to rebuild planing mill destroyed by fire Nov. 29. (Noted Dec. 14).

SEATTLE — Seattle Times Co. plans extension and improvement to plant facilities with an estimated expenditure of \$240,000.

SEATTLE — Radio station KOL has purchased Olympie Theatre building and plans expenditure of \$30,000 for remodeling and installation of new equipment.

SEATTLE — Port of Seattle construction of frame shop, 100 feet, to serve Salmon Bay fish fleet terminal.

SEATTLE — City Light department has hired 27 technical workers to prepare plans for proposed \$8,500,000 Ruby dam improvement, Skagit river project.

SNOHOMISH, WASH. — Frank Nickerman, distributor for Associated Oil Co., will build corrugated iron warehouse, 80 x 28 feet.

WENATCHEE, WASH. — East Wenatchee Domestic Water Service Co. has been granted permit to take water from Columbia river and plans waterworks system estimated to cost \$100,000.

Canada

SCARBORO, ONT. — Township has plans for \$60,000 improvements to waterworks system. E. M. Baird, 1683 Kingston road, Toronto, is engineer.

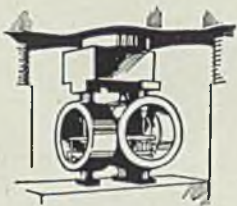
WEST LORNE, ONT. — Village plans construction of waterworks system at an estimated cost of \$50,000. Bids will be taken in January by R. Hagey, Kitchener, Ont., who is engineer.

Preference

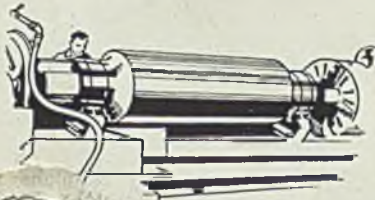
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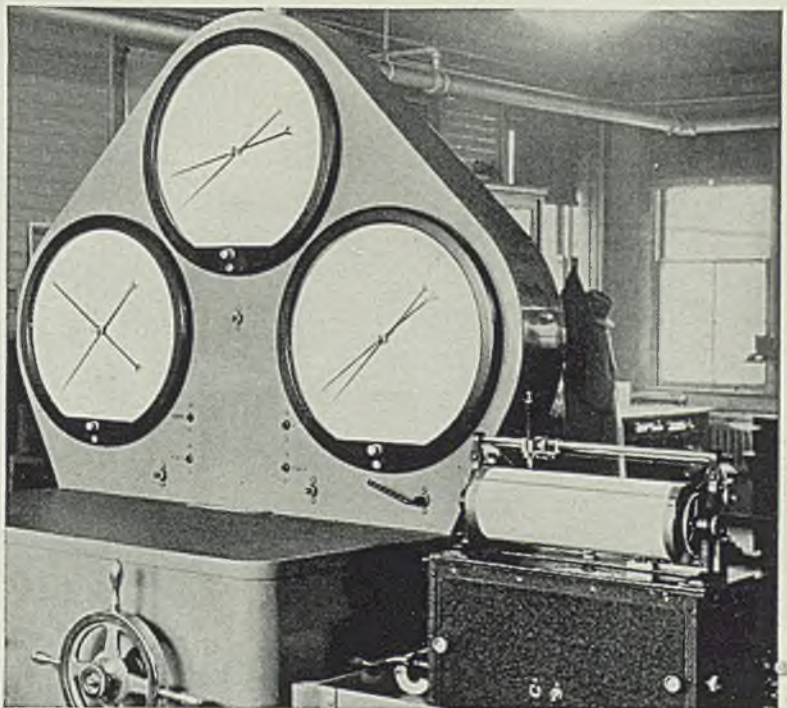
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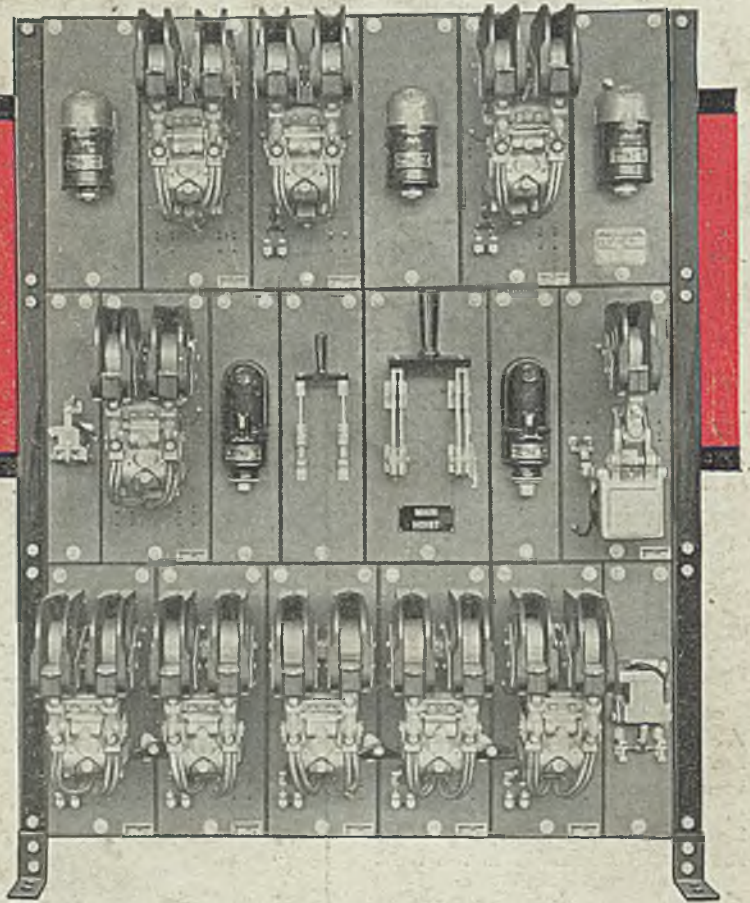
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