STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

For forty-eight years—IRON TRADE REVIEW

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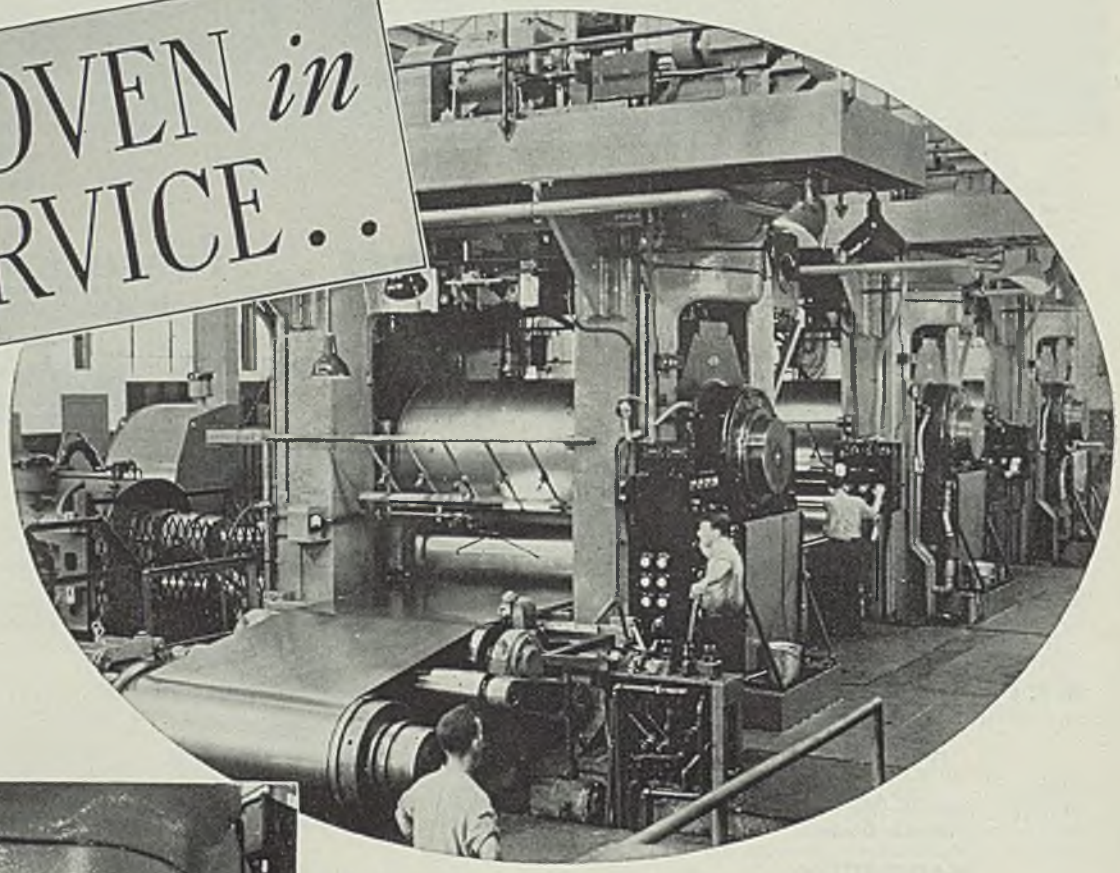

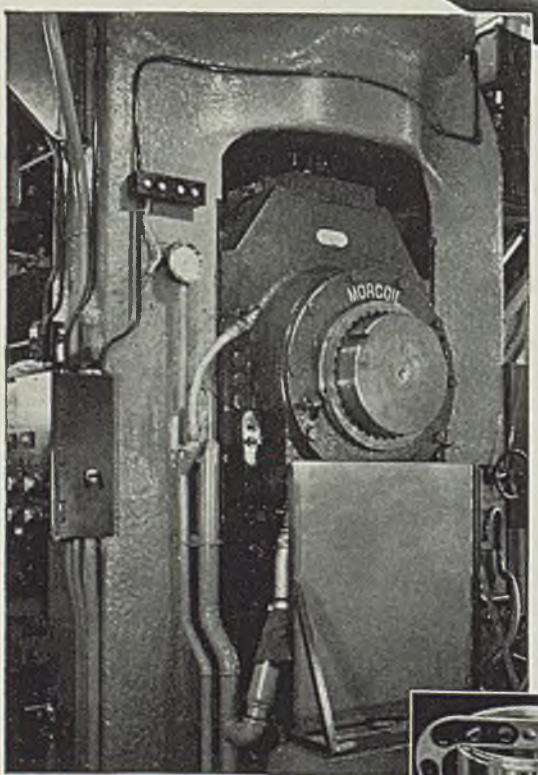

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R17

Morgoil MORGAN WORCESTER ENGINEERS AND MANUFACTURERS *Bearings*

As the Editor Views the News

AFTER reading the agreement signed Thursday by General Motors-CIO negotiators, one wonders how John Lewis can hope to retain the loyalty of the members of his unions. They have lost six weeks' wages and have gained little of value in the settlement. To them the most cheering detail is the wage increase of 5 cents an hour, and for this they must thank General Motors and not John Lewis. CIO fared almost as badly as its individual members. It will be recognized by General Motors (p. 17) as the collective bargaining agent for its own members. It could have had this privilege without striking for it.

• • •

More damning than the apparent futility of the strike itself, is the convincing manner in which the entire proceedings proved the utter worthlessness of the new deal's billion-dollar labor relations machinery. President Roosevelt, Senator Wagner and many others turned everything topsy turvy to create ideal legislation to handle labor disputes. They had unprecedented powers to do just about what they pleased. They black-jacked several pro-union laws through congress. They drafted Section 7a, created boards, assumed autocratic authority. Yet in spite of all this, the General Motors agreement was reached by the method that men used for generations before the new deal machinery was installed.

Did Not Use New Deal Laws

• • •

That is the method of negotiation. Yet there was one point in which the General Motors situation differed from some previous disputes. Disorder was held to a minimum. This was because public opinion at the moment condones lawlessness. Trespassers were not evicted because authorities were willing to be patient with lawbreakers whose minds have been warped by the idle promises of political demagogues. This restraint is commendable. But the circumstance shows the need of leading public opinion back to sanity. The man in the street must be diverted from the wiles of the Pied Pipers of Hamelin. Right now one piper is piping to pack the federal courts. He thinks he must have more power (p. 35) than he already possesses. Every patriot will be shocked at this greed for authority. Help your representatives in congress to block this colossal blunder!

Packing Court Not Necessary

• • •

One of many problems involved in the manufacture of cold drawn steel bars is that of guarding against "mixed" steel—that is, preventing bars of "A" from straying into a lot of bars of analysis "B" or "C". In addition to following the usual precautions (p. 38), such as color-code painting of bar-ends, use of identification tags, etc., one manufacturer pays a bonus of $5 to any drawbench operator, machinist, shear or saw man, grinder, straightener or other employe who detects the presence of a misplaced bar in a lot of bars in production. This is but one of many interesting items in an exhaustive article on the operations involved in cold drawing steel bars.

Bonus for Alertness

• • •

Manganese ore prices at 34c per unit (p. 108) compared with 27c in November emphasize the peculiar conditions which affect the market. Shipments of manganese from Russia have declined and increased cargoes from South Africa are being fully absorbed in Europe. Ocean freight rates have more than doubled since a year ago. The rate on Indian ore to the United States, which was 18 shillings, 6 pence, now is nominally 40 shillings. From Black sea ports the rates are 25 shillings, compared with 11 shillings formerly. Shortage of cargo space due to the Pacific coast strike and to larger grain movements is responsible. Naturally steelmakers are wondering how the advances in ore will affect the price of ferro. The recent increase to $80 per gross ton may be a forerunner of further advances when consumption touches 1927-1929 levels, at which time ferro prices topped $100.

Will Ferro Prices Rise?

E. L. Shaner

Inland Hi-Steel in process at the plant of the Union Metal Products Co., Hammond, Ind.

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Works Council Recommends Wage Raise; General Motors Releasing Steel

ALTHOUGH Carnegie-Illinois Steel Corp. employe representatives last week sharply criticized John L. Lewis and indicated they would resist to the utmost efforts being made by the CIO to organize the plants, their central council voted to recommend a general wage increase.

The council is composed of both employe and management representatives from 18 plants in the Pittsburgh district.

Wages for common labor would be raised to a minimum of $5 a day, whereas minimum now is $4.20, and the work-week would be 40 hours, instead of 48. All other wage earners would be advanced 80 cents a day.

This recommendation came shortly after the American Iron and Steel institute issued a statement concerning wages and employment generally in the steel industry. It said that wages at the beginning of 1936 averaged 65 cents an hour, while in December the average was 72.8 cents, or 11 per cent above the 1929 average of 65.4 cents. The industry-wide 10 per cent increase last November was the fourth since 1933.

The sliding scale method of determining wages, based on living costs, also put in effect in United States Steel Corp. plants in November, has not been adopted generally in the industry. Costs have not varied sufficiently to affect the Steel Corporation wage scale.

Representatives Will Vote

The council's proposal will now go to the individual plants for balloting by employe representatives. Other suggestions approved included:

A recommendation that the management define overtime for purposes of attaining uniformity in the various plants.

A code of ethics on seniority, including a stipulation that in cases of transfer from an inoperative or dismantled plant, regular employes at an operating plant will not lose their seniority standing to the transferred employes.

Adoption of a graduated vacation plan.

Request that pay day be every other Friday.

Permission for employes to subscribe for insurance over and above their present ratio to the amount of $5000 under certain terms.

Nearly 66,000 more men were employed in the steel industry at the close of 1936 than were at work during 1929, based on reports to the steel institute from companies employing about 95 per cent of the industry's workers.

Total payrolls amounted to $758,060,000 during the year, 36 per cent higher than the total of $557,794,000 in 1935, and 66 per cent above the 1934 total of $457,843,000.

Employment Top in December

December marked the year's peak in steel employment, payroll records showing that 537,000 were employed during the month, of whom 485,000 were wage earners paid on an hourly, piecework or tonnage basis.

The number of wage earners employed in December was 16 per cent above the total of 419,534 wage earners reported by the census of manufactures as employed in the steel industry in 1929. The average number of wage earners employed over the full year was 452,000, or 8 per cent above the 1929 average.

Although in 1936 both employment and average hourly earnings in the steel industry established new high records, output of the industry was about 14 per cent below the 1929 peak. This was reflected in the total payrolls of the industry for the year, which also were 14 per cent below 1929. Wage earning employes received a total of $628,900,000 in wages during 1936, compared with the total $731,000,000 in wages reported for 1929 by the census.

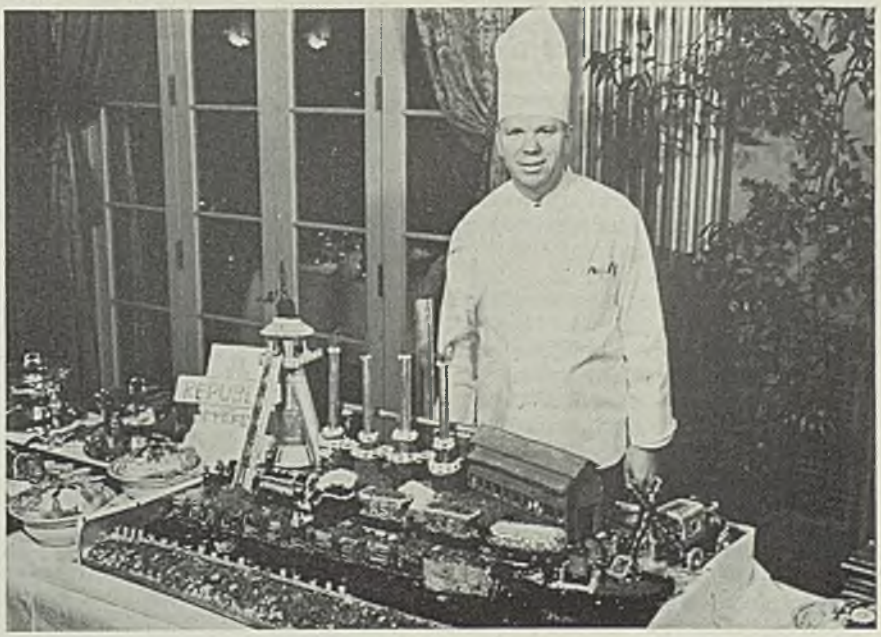
Total steel payrolls in December were nearly $76,900,000, of which more than $64,400,000 were payments to wage earners. Wages in December were at an annual rate of $773,000,000 per year, $42,000,000 more than 1929 wages.

The number of hours worked per week by wage earning employes averaged 39.8 for the year, which compares with the 1929 average of 55 hours per week.

MODERATE STEEL RELEASES FOLLOW GM SETTLEMENT

Following the settlement of the 44-day General Motors strike, steel producers began receiving first re-

Chef's Triumph for Traffic Club Is Blast Furnace in Sugar



CENTERPIECE at a buffet luncheon given recently to members of the Traffic Club of Cleveland, Hotel Cleveland, by Republic Steel Corp. was this masterpiece of the chef's art, a blast furnace done in sugar—snowy white, finely spun icing, dark chocolate for the somber tones, and plenty of cakes for trimmings. The club, like those in many other steel districts, is composed of railroad representatives and steel executives

leases late Thursday on some of the material which had been under suspension orders. The initial releases were not extensive, it was understood, but steelmakers expected more each day from now on.

Effect of the strike was far less than anticipated at the beginning of the controversy. At that time it was expected that the shutdown might have a drastic result temporarily upon steelworks operations. Instead, miscellaneous demand proved so strong, and the backlogs received before the price advances were so large that operations improved.

Some suppliers of General Motors ceased taking material for only a short time. In other cases it developed that the amount of material originally estimated to be under suspension was actually far less than the amount believed affected.

The General Motors tieup reacted to the advantage of some steel consumers who at the beginning of the year found themselves unable to obtain shipments in suitable time to satisfy their needs. Producers were able to turn their attention to orders which would have been delayed considerably had General Motors been taking shipments.

Many lines will benefit from the resumption. Demand for semifinished, which is already extremely heavy, will increase from nonintegrated mills which furnish material to partsmakers.

LEWIS AN "EGO-MANIAC," SAYS EMPLOYES' DEFENSE SPEAKER

A speakers' committee of the Carnegie-Illinois Steel Corp. employe representatives' defense council, organized to thwart John L. Lewis' committee for industrial organization, has begun conducting meetings of employes in the Pittsburgh area.

Ralph H. Martin, a member of the speaking committee, addressed several groups last week, charging that Lewis is an "ego-maniac who visions himself as a Napoleon of industry and politics."

"Mr. Lewis has made a collosal mistake," said Mr. Martin. "He has underestimated the intelligence of the American wage earner. We steelworkers have found that self representation through workers whom we elect is a very satisfactory form of collective bargaining, far better than we could ever expect should we turn over our rights to an outside dictatorial union.

"When we decide that we need help in protecting our rights against the domination of our employers, we will shout loud enough to be heard in Washington."

SUPREME COURT TAKES J. & L. CASE UNDER ADVISEMENT

The United States Supreme Court last week heard argument in four cases, all dealing with various phases of the constitutionality of the national labor relations board act.

One of these cases was that of the Jones & Laughlin Steel Corp., which was alleged to have discharged ten employes of its Aliquippa, Pa., plant for union activity.

Solicitor General Stanley Reed and J. Warren Madden, chairman of the labor board, argued that the discharge of the employes was done with "shockingly flimsy reasons."

Earl Reed, Jones & Laughlin counsel, said: "If these men could be discharged solely for reasons satisfactory to the labor board, then all freedom of contract and all employer control of labor is gone. This would raise every worker in the country to civil service status."

The court has taken the case under advisement.

Tax on Surplus Impairs Labor Security And Purchasing Power, Say Economists

LABOR'S job security and purchasing power will be impaired by enforced distribution of corporate earnings under the 1936 revenue act, according to the forecast of Allen W. Rucker and N. W. Pickering, economists for Farrel-Birmingham Co. Inc.

A recent analysis, published by the company under the title of "The Coming Effect of the Surplus Tax on Factory Employment" shows factory unemployment since 1923 concentrated in industries and states where corporation profit probabilities are lowest or declining fastest.

Pointing out that Massachusetts, New York, Rhode Island, Connecticut, Pennsylvania and New Jersey have suffered a decline in factory employment opportunity since 1923, the two economists show this shrinkage has been coincident with the shrinkage in the percentage of corporations able to earn and retain a profit in the same period.

A cross-analysis by industrial groups reveals five industries—textiles, leather, forest products, stone, clay and glass, and steam railroads—in which diminishing employment occurred during the prosperity period, 1923-1929. Without exception, those were the only industries in which the percentage of profitable corporations was below or declining faster than the national average.

"When the trend of the percentage of corporations earning a profit is compared to the trend of factory employment, it becomes quite clear that in those industries and those states wherein industry finds it most difficult to earn and retain some surplus, employment suffers directly and substantially, even in prosperous times," the report states.

"The present revenue act as now drawn must have the effect of enforcing a distribution of surplus that otherwise might be invested in either recouping losses of the depression or improving plant and equipment and providing a "cushion" for the next depression.

"At least two vital modifications and amendments to this act are required in the interests of the national economy:

"An amendment exempting from the surtax that portion of corporation earnings which have been invested during the year in capital equipment, and/or which have been applied to capital losses incurred during the periods immediately preceding.

"A revision to provide for computation of statutory loss on the basis of recognized sound accounting principles instead of the present method of arbitrarily disallowing certain expenses and losses and thereby forcing the payment of an income tax when in reality no actual income has been earned."

Canada's Iron and Steel Imports Increase Sharply

Canada's iron and steel imports for December were approximately double those in the corresponding month of 1935, with a total value of $12,172,000, compared with $6,084,000. Imports from the United States increased from $4,701,000 to $10,288,000. Biggest item on the list was automobile parts, with a value of $3,260,000, as against $1,148,000 for December, 1935.

Other imports from the United States included machinery, $2,028,000; automobiles, $833,000; engines and boilers, $690,000; plates and sheets, $688,000; miscellaneous rolling mill products, $530,000; farm implements, $491,000; castings and forgings, $121,000; tools, $93,000; tubes and pipes, $91,000; hardware and cutlery, $85,000; stamped and coated products, $84,000.

Value of the month's exports showed only a slight gain, at $4,838,000 as compared with $4,237,000 for December, 1935. Exports to the United States dropped from $599,000 to $573,000.

Thousand Managers Meet; Seek Key to Labor Peace

REFLECTING deep interest of management in industrial relations, more than 1000 business executives, the largest number ever to attend, met for the fifteenth annual personnel conference of the American Management association, Philadelphia, Feb. 9-11.

Declaring it to be a 1937 problem, highly pertinent in character, they attacked it as one that would have to be solved if leftist tendencies are to be checked and government intrusion into business halted.

"The best prevention of government intrusion in the field of industrial relations is for industry to make more rapid strides in the development of employer-employe relations," said Clarence G. Stoll, New York, vice president, Western Electric Co., and chairman of the industrial relations committee of the National Electrical Manufacturers' association.

The problem was discussed from a diversity of angles. Such questions as industrial relation trends, the formulation of labor policy and standards by industry, the practical attitude of management and current methods of employer-employe contact were among those discussed.

The economic outlook as it affects industrial relations and the division of income, the technique of wage negotiations, development of a supplementary compensation program, building of an effective evecutive organization and the establishment of profit-co-operation within an organization were other topics.

Management Has Responsibility

Virgil Jordan, New York, president, National Industrial Conference board, expressed the sentiment of many present when he charged management with the major responsibility for solving the complex industrial relations problems.

He suggested four major aspects which management should consider. First, he said, it must secure within itself a more realistic understanding of the essential nature of the enterprise-order which has prevailed to date in American industry by obtaining more extensive economic information.

Secondly, and by the same means, management, he said, must secure a clearer conception of its own essential function. "It must more firmly grasp the fact that its primary task is always to conserve and develop the basic resources of the people—their savings and their working powers."

Thirdly, Dr. Jordon continued, the responsibility of foresight and conservation puts a special challenge to management in its relation to workers and consumers. Hence, he maintained, management must reconstruct a web of contact and co-operation, to draw labor into more direct participation in the joint task of effective production.

He believed that management is backward in developing constructive co-operation with labor organizations, and must revise many of its traditional ideas and prejudices.

Dr. Jordon's fourth major item of counsel was that, above all, management must not let its forces become confused or divided. He added, it must beware of developing in itself any of the symptoms of "that destructive disease of the age—militant class-consciousness."

C. S. Ching, New York, director of industrial and public relations, United States Rubber Co., counselled business executives not to become too excited if outside labor organization threatened.

Labor Leaders Make Issues

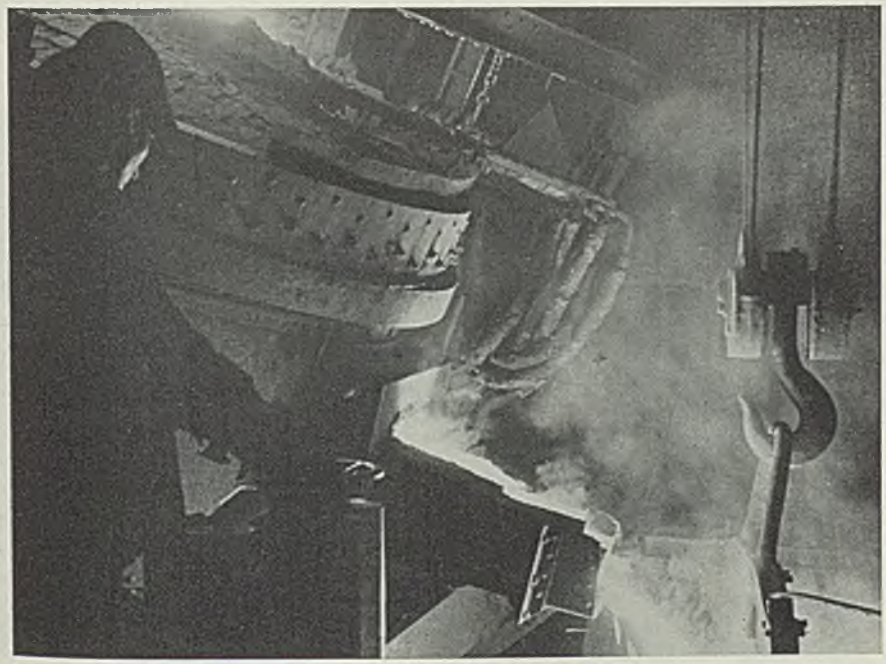
He pointed out that often labor organizers are out to make an issue, where in reality no issue exists. He warned management not "to fall into the trap" and actually create one.

That outside labor organizations are not as strong in membership today as they once were was stated in a review of trade unionism during the last quarter century by Thomas G. Spates, New York, director of industrial relations, General Foods Corp. He declared that union membership is approximately 4,000,000, as compared with 5,000,000 in 1919. In 1929, he added, the membership was 3,400,000.

While relative peace has settled over the Pacific coast, since the termination of the maritime strike, the labor situation there still constitutes a threat to stable labor relations in other sections of the country, according to Captain Edgar S. Perry, Los Angeles, industrial consultant. He declared that an attempt had been made through union organizations there to "sovietise the United States," and that these unions constitute a powerful force on the West coast.

He said that labor is going to have leadership and added that if management does not recognize conservative labor leadership, it is going to drive that leadership to the left. That, he said, is what happened on the Pacific coast.

Russians Call It "The Plant Which Makes Plants"



POURING steel in the foundry of the Ural Heavy-Machine building works, named after S. Orjonikidze, commissar of heavy industry, in Sverdlovsk, Urals, Soviet Russia. Because all parts of the largest machines for equipping plants are made here it is known as the "plant which makes plants." Sovfoto

Re-elect Gregory Galvanizers' Head

ALL officers of the American Hot Dip Galvanizers' Association Inc. were re-elected at the annual meeting of the organization held at Hotel Commodore, New York, Feb. 11. These included T. M. Gregory, Hanlon-Gregory Galvanizing Co., Pittsburgh, president; I. M. Hermann, Acme Galvanizing Inc., Milwaukee, and Miss D. R. Pearlman, Enterprise Galvanizing Co., Philadelphia, vice presidents; and Stuart J. Swensson, 903 American Bank building, Pittsburgh, secretary-treasurer.

Directors re-elected included the officers and F. P. Auxer, National Telephone Supply Co., Cleveland; A. J. Blaeser, Joslyn Mfg. & Supply Co., Chicago; W. J. Gregory, Thomas Gregory Galvanizing Works, Maspeth, N. Y.; and Phelps Ingersoll, Wilcox, Crittenden & Co., Middletown, Conn.

The association approved preparations for printing and distributing throughout the trade a booklet outlining the history and advantages of the hot dip process. It will also issue a reference folder giving technical data on processes to a selected list of architects and engineers writing specifications covering a wide range of activities.

Consensus of opinion was that the advertising campaign outlining advantages of hot dip galvanizing had exceeded expectations, therefore it will be continued throughout 1937. Association membership increased 50 per cent last year. Directors plan to meet quarterly in the future instead of at irregular intervals.

Locomotive Buying Largest since 1929

Railroads in the United States bought more steam locomotives in 1936 than in any year since 1929, according to a compilation by the Baldwin Locomotive Works. In 1929, the railroads moved more freight than in any other year.

The roads bought 427 steam locomotives last year, compared with 24 in 1935 and with 978 in 1929. Industrial companies bought seven steam locomotives and 21 electric locomotives last year. All told, 533 locomotives, including motor-driven equipment, were ordered for domestic use in 1936, against 49 in 1935.

The peak of electric locomotive purchases was reached in 1931, when 150 were ordered. This was caused by preparation for electrical operation on the Pennsylvania railroad between New York and Washington.

Including foreign orders 452 steam locomotives were ordered last year, against 67 in 1935. The grand total of locomotives of all kinds ordered for domestic and foreign use last year was 556, against 125 in 1935 and 199 in 1934.

Steel Castings Orders Show Sharp Increase

Commercial steel castings orders booked in December totaled 159,430 short tons, highest monthly figure, with one exception, since 1920, according to the bureau of census. Orders booked in 1936 totaled 909,080 tons compared with 400,157 in 1935. Production in 1936 amounted to 805,691 tons; and 398,988 tons in 1935.

Mesta Machine Co. Builds Tin Mill for Japanese

Mesta Machine Co., Pittsburgh, plans to start work immediately upon a five-stand tandem tin mill with finishing equipment for the Yawata Steel Works in Japan. The mill will be built complete at the West Homestead plant of Mesta Machine Co.

The 42-inch four-high Japanese plant will be similar to mills in this country. According to present plans, it will probably be completed in the first part of 1938.

Announcement of the contract was made at a dinner in honor of Japenese engineers in the Pittsburgh Athletic club. Officials said that part of the electrical equipment for the mill will be fabricated at the East Pittsburgh plant of Westinghouse Electric & Mfg. Co.

United Will Build 12-Inch Merchant Mill for Rustless

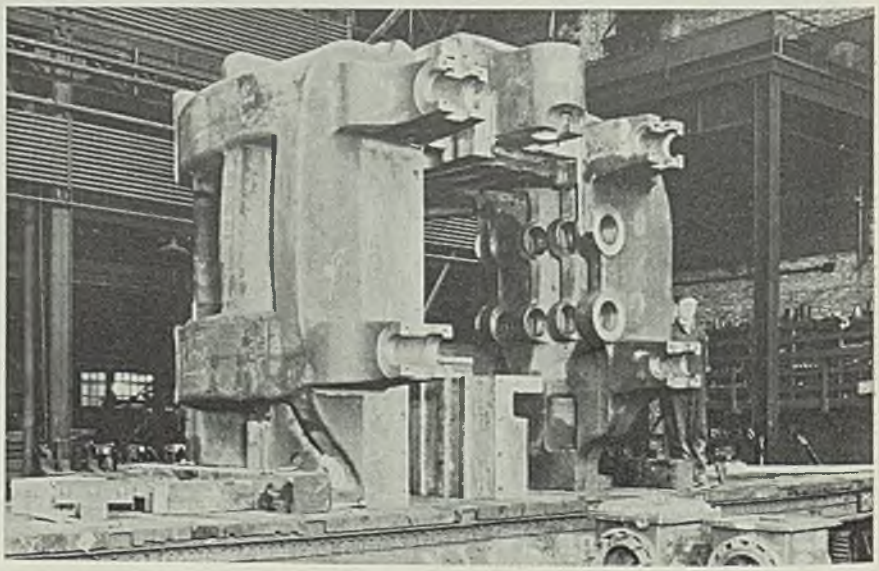
United Engineering & Foundry Co., Pittsburgh, has received an order from the Rustless Iron & Steel Co., Baltimore, for a new 12-inch three-high merchant mill, consisting of seven roll stands, and three cropping shears. The mill will be driven by a 700-horsepower motor.

A specially-adaptable mill was required because it is to be used for rolling various sections of stainless steel. It will supplement existing capacity to meet the increased demand for stainless. H. A. Brassert & Co., Chicago, are consulting engineers.

Labor Department's Action On Walsh-Healey Awaited

Difficulties encountered by the navy department in attempting to buy 12,500 tons of steel under the Walsh-Healey act had not been settled late last week. President Roosevelt at a press conference said he had not received reports from the navy, or the labor department to which the navy department appealed for a suspension of the Walsh-Healey provision on naval requirements.

Steel Casting 11 by 12 Feet Machined Successfully



THIS huge steel casting, 180,000 pounds, was machined recently by Allis-Chalmers Mfg. Co., for an eastern manufacturer of special machinery. It will form the front half bed for a 7½-inch forging machine. The machined casting shown on a flat car is 11 feet high and 12 feet wide

Ingot Output Sets January Record

TONNAGE of steel ingots produced during January was larger than in any previous January in history, according to the American Iron and Steel institute.

Output of 4,736,697 gross tons was 7 per cent above the output in the preceding month, 4,431,645 gross tons, and was more than 55 per cent above the January, 1936, production of 3,045,946 gross tons. In January, 1929, the industry produced 4,500,131 gross tons of steel.

Calculation of the tonnage of ingots produced per week during the month appears for the first time in the institute's report for January, replacing former calculations of production per day. This change was recommended by the institute's statistical committee to increase the value of the report to those who use weekly indices published by other industries.

During January, output was calculated at 1,069,232 tons per week, 81.42 per cent of capacity, which compares with 1,002,635 tons per week in December, equivalent to 76.55 per cent of capacity.

Pay-As-You-Go Plan for Pensions Recommended

Adoption of a "pay as you go" plan to eliminate dependence on actuarial reserves in the old age pension plan of the social security act is recommended in a report by a United States chamber of commerce committee. For these reserves the committee advises substitution of definite government obligations, which would be reported regularly. Great reserves are unnecessary in government operation of a pension system and would add to ultimate costs to both employers and employes, the committee believes.

Extension of the initial rate of taxation of 1 per cent on both employers and employes until 1947 would result in collection of sufficient revenue to pay all claims until that time and the interval could be used to work out problems now presented by the act, the report asserts.

Equal contributions by employers and employes in financing unemployment benefit systems, exemption from payroll taxes of earnings in excess of $3000 and establishment of merit ratings with favorable provisions for industries having stable employment also are advocated.

District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended Feb. 13	Change	Same week 1936	Same week 1935
Pittsburgh	84	+ 2	40	39
Chicago	80	+ 2	59½	63
Eastern Pa.	54½	+ 1	37	31
Youngstown	80	— 1	62	60
Wheeling	80	+ 3	84	87
Cleveland	76½	+ 1	66½	77
Buffalo	85	None	34	45
Birmingham	76	— 3	63	55½
New England	88	+14	83	63
Detroit	86	— 4	94	100
Cincinnati	30	+ 8	80	†
St. Louis	82	None	†	†
Average	81	+ 1½	54½	53

†Not reported.

Steel Ingot Statistics

Monthly Production—Complete for Bessemer; Open Hearth, Calculated from Reports of Companies Making 98.03 per cent

1937	—Open Hearth— Gross tons	Per cent of capacity	—Bessemer— Gross tons	Per cent of capacity	—Total— Gross tons	Per cent of capacity	Weekly production, all companies, gross tons	Number of weeks in month
Jan.	4,444,903	85.37	291,794	47.73	4,736,697	81.42	1,069,232	4.43
1936								
Jan.	2,849,557	54.88	196,389	32.21	3,045,946	52.50	687,572	4.43
Feb.	2,761,973	56.92	202,445	35.53	2,964,418	54.67	716,043	4.14
March	3,157,579	60.81	185,040	30.35	3,342,619	57.61	754,542	4.43
April	3,637,479	72.34	304,775	51.62	3,942,254	70.16	918,940	4.29
May	3,744,161	72.10	302,092	49.55	4,046,253	69.73	913,375	4.43
June	3,649,948	72.58	334,897	56.72	3,984,845	70.92	928,868	4.29
July	3,596,125	69.41	326,606	53.69	3,922,731	67.76	887,496	4.42
Aug.	3,844,570	74.04	350,560	57.50	4,195,130	72.30	946,982	4.43
Sept.	3,858,060	76.90	303,048	51.45	4.161,108	74.23	972,221	4.28
Oct.	4,227,291	81.41	317,710	52.11	4,545,001	78.33	1,025,960	4.43
Nov.	4,007,859	79.70	329,553	55.82	4,337,412	77.19	1,011,052	4.29
Dec.	4,127,049	79.66	304,596	50.07	4.431,645	76.55	1,002,635	4.42
Total	43,461,651	70.92	3,457,711	48.06	46,919,362	68.52	897,463	52.28

Percentages of capacity operated are calculated on weekly capacities of 1,172,160 gross tons open hearth ingots and 137,624 gross tons bessemer ingots, total 1,309,784 gross tons, for 1936; 1,175,307 gross tons open hearth, 137,994 gross tons bessemer, total 1,313,301 gross tons, for 1937; based on annual capacities as of Dec. 31, 1935, as follows: Open hearth ingots, 61,280,509 gross tons; bessemer ingots, 7,195,000 gross tons.

Production

STEELMAKING gained 1½ points last week to 81 per cent, a new high since the third week of February, 1930. Practically all steelmaking centers registered increases, with the exception of Youngstown, Birmingham and Detroit, where furnaces were down for repairs.

Cleveland-Lorain—Gained 1 point to 76½ per cent, as Otis Steel Co. resumed melting in its eighth furnace. Other producers were on steady schedules.

Detroit—Dropped to 86 per cent, as one producer took off one open hearth, leaving 11 in production, and the other continued with 7 out of 9 pouring. One of the two idle furnaces, down for repairs, will be relighted the middle of this week.

Pittsburgh—Up 2 points to 84 per cent, a new post-depression high mark. Most producers are operating above 80 per cent, with the leading interest starting off the week at 84 and the leading independent at 83. Forty-five blast furnace stacks are operating.

Wheeling—Up 3 points to 80 per cent. Rapid progress has been made in this district toward recovery from the temporary effects of the flood last month.

Chicago—Increased 2 points to 80 per cent, a new peak for recent years. On the basis of 1929 capacity, current operations are practically 100 per cent. Blast furnace schedules are steady.

New England—Up 14 points to 88 per cent with one works again at 100 per cent.

Central eastern seaboard—Up 1 point to 54½ per cent, with a continuation of this upward trend expected. Finished steel bookings are heavy.

Buffalo—Held at 85 per cent. Bethlehem Steel Co. is planning to add additional open hearths at its new plant in Lackawanna soon.

Birmingham—Down 3 points to 76 per cent.

St. Louis—Held at 82 per cent, with little change indicated.

Youngstown—Averaged 80 per cent, down 1 point. Republic Steel Corp. took off an open hearth furnace for repairs and Sharon Steel Corp. took one off at Lowellville owing to large accumulation of ingots. Sharon's furnace may resume this week.

Cincinnati—Rose 8 points to 30 per cent, on addition of two open hearths by an interest only indirectly affected by the flood. Rate will move up rapidly this week on completion of rehabilitation work.

Points to Greater Forgings Market

ADDRESSING a meeting of the Drop Forging association in the Palmer House, Chicago, Feb. 11, R. E. W. Harrison, vice president, Chambersburg Engineering Co., Chambersburg, Pa., expressed the belief that more forgings could be sold, and at more favorable prices, if manufacturers of forgings adopted an aggressive and intensive sales promotion plan.

Chief engineers of large manufacturing organizations, he said, are eager for the kind of assistance which will enable them to decide such problems as to whether to use a casting, a forging, a die casting or a stamping for a particular part.

"For some strange and unaccountable reason," said Mr. Harrison, "you are withholding from them the one answer which, as a sales asset, would provide you with the volume and continuity of business which would enable you to deal properly with your equipment and other related problems. An industry in which 85 per cent of the equipment is more than 10 years old certainly needs to overhaul its sales policy."

A step urged by Mr. Harrison would move the drop forging industry to enlist the backing of the large steel companies in setting up a program for more general recognition of the desirability of good, well designed forgings which give maximum strength without excess weight.

More Liberal Depreciation

Mr. Harrison also expressed the opinion that drop forging manufacturers could get much more liberal depreciation rates if they discussed the subject with the bureau of internal revenue officials, Washington. They follow a long view policy which is constructive and can be counted on to grant fair rates if the manufacturers can justify them, he said.

In regard to a live subject of discussion, as to whether board or steam hammers should be used, Mr. Harrison said there are some misconceptions. Although several manufacturers who converted their old steam hammers to board hammers are well pleased with the results, he urged a little closer analysis. A modern board drop hammer of 2500 pounds capacity, he said, will produce about 60 connecting rods per hour. The old style steam drop hammer made 75 but the relative down time on the two tools was disproportionately larger on the steam hammer.

The modern steam hammer of 2500 pounds, however, will make 120 to 125 of these same rods in an hour and with a great reduction in the down time. While conversion from old style steam to board is profitable, the comparison does not hold water when laid up against the performance with a new steam hammer. The new tools are simple and well designed so that modern steam and board drop hammers yield only about 25 per cent of the repair parts business that was common with old style hammers. In other words, the forging industry is under a penalty for failing to acquire the most efficient working equipment.

An interesting paper on the design and construction of drop hammers was presented by Macdonald S. Reed, Erie Foundry Co., Erie, Pa. Recounting the various design changes that have been made in hammers at different times, and the causes and effects of such changes, this paper will be published in an early issue of STEEL.

Financial

TWELVE leading steel producers, representing 56,257,720 gross tons of ingot capacity, or 82 per cent of the country's total, report an aggregate profit of $125,180,919 for 1936. This is 194 per cent over the profit for the identical 12 in 1935.

On this basis, the indicated net for the entire industry in 1936—with a total ingot capacity of 68,475,509 tons—was $152,659,600.

Production of steel ingots in 1936 was 46,919,362 gross tons, compared with 33,417,985 in 1935, an increase of 40 per cent.

Indicated average profit per ton of ingots produced by the industry in 1936 was $3.25.

LUDLUM'S SALES AND EARNINGS AT NEW HIGH

Ludlum Steel Co. announces that total sales for the year 1936 amounted to well over $10,500,000, making the largest sales year not only for the parent company but also for each of its subsidiaries.

The company's 1936 fourth quarter earnings, after federal income tax and all other charges except the undistributed earnings tax which will be determined during the course of the yearly audit now under way, amounted to $347,000, approximately double the fourth quarter earnings of 1935. This is the best fourth quarter in the company's history.

Although the total 1936 earnings will not be published until completion of audit, it is apparent that earnings for the year, after provision for all charges and taxes including the surtax on undistributed income, should approximate $1,010,000. This will represent an increase of 18 per cent over earnings of $919,531 in 1929, hitherto the company's banner year, and a 71 per cent increase over its 1935 consolidated earnings of $637,729.

One of the first three steel companies to come into black figures in the second quarter of 1933 following the depression, Ludlum's earnings have progressively increased from $161,000 in 1933, $442,000 in 1934 and $637,000 in 1935 to better than a million in 1936. Furthermore during the year Ludlum retired its outstanding preferred stock, leaving its 500,000 shares of common stock with no prior obligation.

HANNA CO.'S PROFIT UP

M. A. Hanna Co., Cleveland, reports consolidated net income, after all charges, amounting to $2,834,335 compared with $1,903,452 in 1935 and $3,646,322 in 1929. Dividend disbursements during the year amounted to $656,520 on preferred and $971,874 on common, leaving $1,205,941 to be transferred to surplus. The improved showing was due to increased dividends on stocks owned by the company and increased earnings from lake shipping.

PITTSBURGH COKE REGISTERS $3,000,000 MORTGAGE

Pittsburgh Coke & Iron Co., Pittsburgh, has filed with the securities commission in Washington a registration statement covering $3,000,000 of first mortgage 4½ per cent bonds, due March 1, 1952. The statement also covered an issue of 20,000 shares of no par value $5 accumulative convertible preferred stock, 340,000 shares of no par common stock and common stock scrip, 1948 series.

Profits for Twelve Steel Producers in 1935 and 1936

	Year 1936	Year 1935	Ingot Capacity Gross Tons
United States Steel Corp.	$50,525,684	$1,146,708	26,657,000
Bethlehem Steel Corp.	13,901,006	4,291,253	9,360,000
Youngstown Sheet & Tube Co.	10,564,501	1,597,521	3,120,000
Inland Steel Co.	12,888,647	9,417,818	2,000,000
Gulf States Steel Co.	660,112	141,269	480,000
National Steel Corp.	12,541,841	11,136,451	2,700,000
Republic Steel Corp.	9,586,922	4,455,735	6,053,000
Lukens Steel Co.†	112,206	307,729*	840,000
Wheeling Steel Corp. (est.)	4,000,000	3,497,626	1,750,000
Otis Steel Co. (est.)	2,800,000	2,228,664	828,000
Ludlum Steel Co.	1,010,000	637,000	38,000
American Rolling Mill Co. (est.)	6,500,000	4,310,129	2,431,720

†Year ending Oct. 17. *Loss.

Red Cross Unit in Machine Plant

SIGNIFICANT of how industrial concerns in the Ohio river flooded area aided the Red Cross and other relief agencies is the record of Cincinnati Milling Machine & Cincinnati Grinders Inc., Cincinnati. Its plant was above the flood line.

The company set up a complete Red Cross unit in its plant, removing machines from its show room and installing cots. For a week about 200 refugees were accommodated, men in the time-study and tool design department and women in the regular demonstration room. The conference room on the second floor was used as a clothing and storage room and another room was used as a medical room and library, with books and games for the children. A barber shop also was equipped.

In the new part of the plant a complete power-operated laundry was set up, caring for clothing of the refugees, and also washing for three hospitals. American Laundry Machinery Co. furnished and installed the equipment.

On a call for boats coming from the Red Cross, plans were obtained from the Fisher Body plant at Norwood and the pattern department was set at work building them. They were turned out complete at the rate of one every half hour, until 97 were supplied, the patternmaking force working without intermission.

The machine tool plant is supplied by several artesian wells furnishing 650 gallons of water per minute. Four special outlets were provided the building where pure water could be obtained by nearby residents and employes. Ten large welded sheet metal tanks of about 500 gallons capacity were constructed and mounted on trucks to carry water to surrounding communities, hospitals and Hotel Alms.

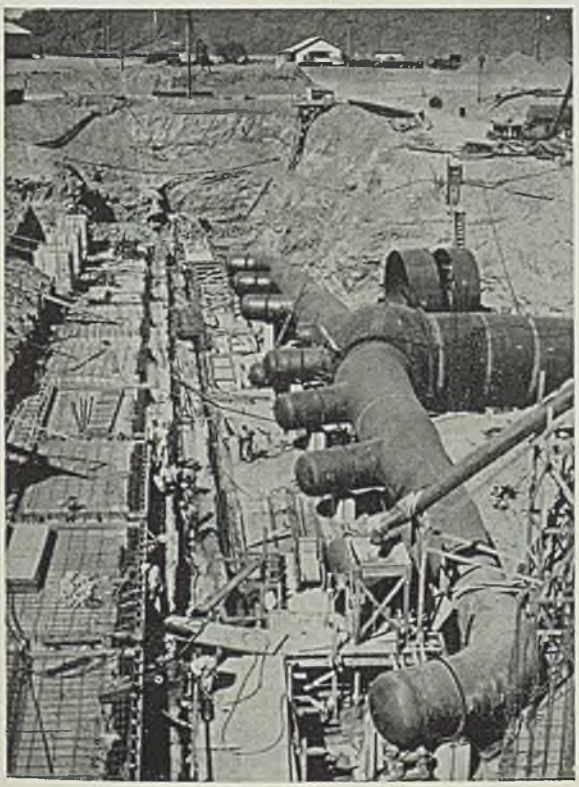
Surplus water was diverted to city mains for several days as every gallon helped. Other plants with wells gave similar aid.

President Provides for Shelter

F. V. Geier, president, is chairman of the shelter and housing division of the central office of the Red Cross and spent long hours organizing this division, assisted by members of the executive staff and some of the men from various departments.

Caterpillar Tractor Co., Peoria, Ill., shipped by motor caravan from its plant to Louisville, Ky., five compact diesel electric generating sets. The shipment included switchboards, timbers to base the units, accessories and wiring, as well as food and water. The company's corps of mechanics, electricians and engineers flew to Louisville in special planes.

Giant Steel Manifold Fabricated in Colorado River System



A BILLION gallons of water per day may eventually flow through this steel inlet manifold to the Gene pumping station on the $236,000,000 *Colorado river metropolitan water district aqueduct. It is scheduled for completion in* 1938. *The main pipe is oval,* 20 *feet across at widest portion, and made of* ⅜*-inch plate, while the seven outlet pipes are circular,* 5 *feet,* 6 *inches diameter, of* ½*-inch plates. Only three of the outlet pipes will be used at first. The manifold was fabricated by Consolidated Steel Corp., Los Angeles, by welding. Photo, courtesy Lincoln Electric Co., Cleveland*

Machinery Exports Gain 30% in 1936

EXPORTS of machinery from the United States in 1936 at $169,836,427 were 30 per cent above 1935 shipments valued at $130,272,591, according to the machinery division of the department of commerce. Foreign sales increased in all groups, ranging from 7 per cent in power-generating machinery (except electric and automotive) to 55 per cent in metalworking machinery.

Foreign sales of power-generating (except electric and automotive) during the year were valued at $9,186,820 compared with $8,564,444 in 1935. Sales increased most in steam boilers and accessories, and diesel and semi-diesel engines.

Construction and conveying machinery sold abroad during the year was valued at $11,703,131, approximately 47 per cent above the 1935 shipments valued at $7,988,067.

Exports of practically all types of power-driven metal working machinery advanced during the year, the total value reaching $41,896,692, a 55 per cent increase over 1935 shipments valued at $27,090,672. The sharpest increase took place in the shipments of sheet and plate metalworking machines which advanced by 137 per cent.

Other metalworking machinery exported in 1936 reached the value of $4,220,557, approximately 59 per cent above the corresponding shipments valued at $2,661,060 in 1935. All items showed a gain, but particularly machine-operated cutting tools in which the shipments valued at $1,602,529 were over double 1935.

Exports of machinery in December, valued at $15,810,281, were 28 per cent above December, 1935, shipments valued at $12,360,766.

The increase was fairly general and spread over all but one of the eight machinery groups, and ranged from 60 per cent in construction and conveying machinery to 9 per cent in the textile, sewing and shoe machinery group.

Textile Machinery Makers Report Employment Increase

Manufacturers of textile machinery and parts in the United States reported a slight increase in employment and production for 1935 compared with 1933, according to census figures. Wage earners in 1935 numbered 19,080, an increase of 2.7 per cent; their wages totaled $21,245,578, up 13.4 per cent.

The total value of textile machinery, parts and accessories was $64,240,350, an increase of 11 per cent.

Men of Industry

FRANK CORDES, president, Blaw-Knox Co., Pittsburgh, has been elected chairman of the board; Chester H. Lehman, vice president, has been elected vice chairman of the board and executive vice president; and William P. Witherow, for many years active in business and civic affairs in Pittsburgh, has been elected president. Messrs. Cordes and Lehman will continue to be actively engaged in the company's operations and management.

Following graduation from Yale in 1908, Mr. Witherow became associated with Jones & Laughlin Steel Corp. Next he became engineer, Truscon Steel Co., and then founded the Witherow Steel Co. After the successful development of the Witherow die rolling process, the company acquired the Dilworth-Porter Co., both of which were later acquired by Donner Steel Co., Mr. Witherow becoming chairman of the board of the latter company. Donner Steel then was absorbed by Republic Steel Corp., and Mr. Witherow was vice president of Republic until he resigned in 1932.

Mr. Witherow has been a director of Blaw-Knox for four years; he is a director, Pittsburgh Coal Co.; president and director, Steel Products Co.; trustee or director of three Pittsburgh banks, and trustee, Carnegie Institute of Technology.

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P. K. Freese has resigned from the staff of Iron & Steel Products Inc., Chicago, dealer in iron and steel.

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William B. N. Brooks, assistant to the president, Pittsburgh Steel Foundry Corp., Glassport, Pa., has been elected a director.

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John J. Campbell, formerly district sales manager at New York for Eastern Rolling Mill Co., Baltimore, has recently been transferred to Baltimore as sales manager.

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George C. Moon has been elected a vice president and director, American Chain & Cable Co. Inc., Bridgeport, Conn., with headquarters at 230 Park avenue, New York.

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Cyril S. Kimball has been elected honorary secretary, American section, Society of Chemical Industry, Brooklyn, N. Y., succeeding Dr. Foster Dee Snell, resigned.

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Edwin Mansfield has been re-elected president, Ohio Seamless Tube Co., Shelby, O. Other officers are: F. L. Benham, vice president and general manager; Clayton Mayer, assistant general manager; E. W. McNeill, secretary and treasurer; G. L. Reichert, assistant secretary and treasurer.

Frank Cordes

Chester H. Lehman

William P. Witherow

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Milton E. Clarke, formerly with the Milwaukee office, American Steel & Wire Co., has joined Superior Steel Corp. in a sales capacity at its Chicago office, and will assist Morris E. Lowder, district manager.

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Frank J. Reynolds has been appointed manager, agricultural division, American Steel & Wire Co., under the supervision of the sales promotion-advertising department, Chicago.

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Elliott G. Johnson has returned to the Homestead Valve Mfg. Co., Coraopolis, Pa., to take over his former duties as advertising manager, after a four year leave of absence, during which he was ordnance engineer with the navy.

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G. J. Bickford and J. T. Van Dorn have been elected directors, Van Dorn Iron Works Co., Cleveland. F. G. Smith has been re-elected president of the company; J. A. Boyden, vice president and secretary, and P. J. Christman, treasurer.

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Edwin T. Lorig has been appointed chief engineer, construction engineering division, Pittsburgh district, Carnegie-Illinois Steel Corp., succeeding Stephen M. Jenks, who has been transferred to Chicago. The construction engineering division has been placed in the jurisdiction of the chief engineer, Pittsburgh district, and will be confined to work in that district.

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R. H. Southworth, secretary and a director, Betz-Pierce Co., Cleveland, has retired from active duties in the company but retains his titles. Previous to joining Betz-Pierce in 1918, he was associated with the New York Central railroad. Mr. Southworth, who is nearing his sixtieth birthday, will spend several months in Florida with his daughter.

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John H. Elliott has been appointed assistant general superintendent at the Shenango works, Carnegie-Illinois Steel Corp., New Castle, Pa. Mr. Elliott went to Shenango works in 1926 as combustion engineer; was made superintendent of the annealing department in 1932, and last August was named acting master mechanic. He entered the employ of the former American Sheet & Tin Plate Co., Pittsburgh, in 1919, in the engineering department.

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Thomas Leach, Rochester, N. Y.; William F. McCann, Utica, N. Y.;

and Frank B. Floyd, Syracuse, N. Y., have been re-elected president, vice president and secretary, respectively, of the Central New York Fabricators association. G. Norman Knaus has been elected treasurer, succeeding Franklin Williams.

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H. G. McIlvried has been appointed assistant to the manager of operations, Pittsburgh district, Carnegie-Illinois Steel Corp., effective Feb. 15. He will have supervision over sheet and tin developments in that district. Mr. McIlvried's long service record with subsidiaries of the United States Steel Corp. began in the Braddock works, American Steel & Wire Co. At the time of the

H. G. McIlvried

merger creating the Carnegie-Illinois corporation, he was made assistant manager of operations, Chicago district.

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H. F. Henriques and J. J. Lincoln Jr. have been appointed assistant general sales managers, Air Reduction Co. Inc., New York, with headquarters in Cleveland and Pittsburgh, respectively; J. M. Driscoll and S. D. Edsall have been named acting managers at Cleveland and Pittsburgh, respectively; A. W. Brown has been appointed assistant railroad sales manager, with headquarters in New York, and J. F. Pryor has been made vice president, Magnolia Airco Gas Products Co., with headquarters in Houston, Tex.

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Merle N. Smith, manager of the production bureau, Pittsburgh district Carnegie-Illinois Steel Corp., since 1932, and connected with the corporation since 1895, has been appointed to the newly created post of manager, order division, Pittsburgh district.

John R. Walker, assistant manager of the service bureau, order division, has been made assistant manager of the order division, while Walter J. Weldin, who has a record of 30 years' continuous service with the company and has been manager of the service bureau, order division, since April 1935, has been made assistant to the general manager of the order division, general sales department. These latter two appointments also are new posts.

Died:

HARRY E. SHELDON, 75, president and a founder, Allegheny Steel Co., Brackenridge, Pa., at his home in Brackenridge, Feb. 10. Mr. Sheldon was born in Freeport, Pa., in 1862. At the age of 14 he became an apprentice in a local machine shop and five years later was employed in the sheet mill of Kirkpatrick & Co., Leechburg, Pa. Seven years later he was superintendent of the company's sheet and tin mills, and soon afterward was general manager. In 1900, Kirkpatrick & Co. was absorbed by American Sheet & Tin Plate Co. and in the same year, Mr. Sheldon, in company with others, founded the Allegheny Steel & Iron Co., predecessor of Allegheny Steel Co. He served as general manager until 1908 when he became president. On Sept. 17 last year the various communities contiguous to the company's plants at Brackenridge and West Leechburg, celebrated "Harry E. Sheldon Day," in recognition of the philanthropies and benevolences of their leading citizen.

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David T. Wadsworth, vice president, Wadsworth Electric Mfg. Co. Inc., Covington, Ky., in that city, Jan. 15.

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Charles M. Peabody, 60, vice president, Nukem Products Corp., Buffalo, in Bordeaux, France, recently. He founded the company in 1924 to

Harry E. Sheldon

manufacture a new type of acid proof cement which was widely used in steel tank construction.

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H. C. Little, 68, formerly purchasing agent and assistant manager, Hydraulic Press Manufacturing Co., and mayor of Mt. Gilead, O., in that city, Feb. 6.

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Ray M. Cheney, associated with the foundry industry for many years, and recently connected with Atlantic Foundry Co., Akron, O., in that city, Feb. 5.

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Charles E. Stuart, 57, closely identified with the early development of the alloy steel industry in central Ohio, in Massillon, O., Feb. 6. He had been president, Central Steel Co. before it became a unit of Republic Steel Corp., and later was president, Tyson Roller Bearing Co., both of Massillon. In late years he had retired. When the Central Steel Co. was organized in 1914, Mr. Stuart was made secretary and treasurer, later becoming vice president and treasurer, and in January, 1926, president and treasurer. Previous to this he had been engaged in advertising work, at one time operating his own agency. In August, 1926, Central Steel merged with United Alloy Steel Corp., including the Berger works, to form Central Alloy Steel Corp., and in January, 1928, Mr. Stuart resigned his offices with that corporation, to transfer his interests to the Tyson Roller Bearing Corp. After being president and treasurer for five years, he resigned Nov. 1, 1934.

Charles E. Stuart

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Henry H. Giles, 46, for the past two years, general superintendent, Wood works, Carnegie-Illinois Steel Corp., McKeesport, Pa., in that city, Feb. 7.

Meetings

A. I. M. E. NAMES RECIPIENTS OF ACHIEVEMENT AWARDS

FIVE awards for distinguished service in mining and metallurgy during 1936 will be made by the American Institute of Mining and Metallurgical Engineers this week at its 147th meeting in New York. Two of these awards are of particular interest to the iron and steel industry.

John M. Hassler, chief engineer southern district, Republic Steel Corp., Birmingham, Ala., will receive the J. E. Johnson Jr. award for "meritorious work in advancing the quality and preparation of raw materials for the blast furnace." The Robert W. Hunt prize goes to William F. Holbrook, chemical engineer, bureau of mines, Minneapolis, and Thomas L. Joseph, professor of metallurgy, University of Minnesota, Minneapolis, for the best original paper presented at the meeting last year. Title of this paper was "Relative Desulphurizing Powers of Blast Furnace Slags."

The William Lawrence Saunders gold medal is to be given to Erskine Ramsay, chairman of board and general consulting engineer, Alabama By-Products Corp., Birmingham, Ala., for inventions of equipment used in bituminous coal mining and preparation and for effecting improvements in cokemaking that resulted in establishment of the steel industry in Alabama.

J. Edgar Pew, vice president, Sun Oil Co., Philadelphia, will be recipient of the first Anthony F. Lucas gold medal for his promotion of standardization of oil field equipment and use of engineering principles in oil field development.

A certificate of honorary membership in the institute will be awarded to George S. Rice, chief mining engineer, bureau of mines, Washington, for distinguished services in promoting safety in mining.

SCHEDULE SIX PAPERS FOR SYMPOSIUM ON CORROSION

A symposium on corrosion testing will feature the regional meeting of the American Society for Testing Materials to be held at the Palmer House, Chicago, March 2-3. One session, on the evening of March 2, will treat this subject.

The regional meeting is to be held during A. S. T. M. week, when some 100 meetings of the society's committees will be conducted.

Committees A-5 on corrosion of iron and steel and B-3 on corrosion of nonferrous metals and alloys are sponsoring the symposium on corrosion testing. Six papers are to be presented as follows:

"Principles of Corrosion Mechanism and Testing," by R. B. Mears, Aluminum Co. of America, New Kensington, Pa., and C. W. Rorgmann, National Tube Co., Pittsburgh; "Atmospheric Testing," by H. S. Rawdon, national bureau of standards, Washington; "Salt Spray Testing," by E. H. Dix Jr., Aluminum Co. of America, New Kensington, Pa.; "Intermittent Immersion Testing," by D. K. Crampton, Chase Brass & Copper Co. Inc., Waterbury, Conn.; "Total Immersion Testing," by R. J. McKay, W. A. Wesley and F. L. La Que, International Nickel Co., New York. and "Soil Corrosion Testing," by K. H. Logan, I. A. Dennison and Scott Ewing, national bureau of standards, Washington.

This symposium is the first step in a program to standardize methods of corrosion testing.

BORNSTEIN IS NOMINATED PRESIDENT OF FOUNDRYMEN

Hyman Bornstein, chief chemist and metallurgist, Deere & Co., Moline, Ill., has been nominated for president of the American Foundrymen's association. He now holds the office of vice president. Marshall Post, vice president and works manager, Birdsboro Foundry & Machine Co., Birdsboro, Pa., received the nomination for vice president.

Nominees for directors to serve three years: Duncan P. Forbes, president, Gunite Foundries Corp., Rockford, Ill.; H. B. Hanley, foundry superintendent, American Laundry Machinery Co., Rochester, N. Y.; C. J. P. Hoehn, president, Enterprise Foundry Co., San Francisco; Thomas Kaveny, president, Herman Pneumatic Machine Co., Pittsburgh; C. E. Sims, supervising metallurgist, Battelle Memorial institute, Columbus, O.; and James L. Wick Jr., president, Falcon Bronze Co., Youngstown, O. Mr. Wick is now president.

These selections were made by the nominating committee in Cleveland, Feb. 1. Election will be at the association's annual convention in Milwaukee, May 3-7, and nomination virtually assures election.

MANAGEMENT SOCIETY GROUP IS ORGANIZED IN DETROIT

With a nucleus of 40 members, a chapter of the Society for the Advancement of Management was established in Detroit, Jan. 25. Officers were elected as follows: President, E. S. Smith, plant executive, Fisher Body Corp., Plant No. 23; vice president, L. B. Keeler, production planning department, Hudson Motor Car Co.; and secretary-treasurer, D. J. Sublette, principal examiner, Detroit civil service commission. Since early last fall, the group has been meeting informally under the temporary presidency of Joseph A. Carlin, general manager, Hutto Machine division, Carborundum Co., who was former president of the Detroit chapter of the Society of Industrial Engineers now disbanded.

PLAN ANNUAL FOUNDRY MEETING IN BIRMINGHAM

Birmingham chapter of the American Foundrymen's association and Birmingham section of the American Society of Mechanical Engineers will conduct their fifth annual southern foundry conference at Hotel Tutwiler, Birmingham, Ala., Feb. 25-27. Featuring discussions of foundry problems of special interest to engineers, this year's meeting will include a session on safety and hygiene.

James T. MacKenzie, American Cast Iron Pipe Co., representing the A.F.A., and George R. Ozley, Alabama By-Products Corp., representing the A.S.M.E., are general chairmen of the conference. Papers scheduled for the sessions will include the following: "Reclaiming, Conditioning and Handling Foundry Sand," by L. B. Knight Jr., National Engineering Co., Chicago; and "Safety and Hygiene in the Foundry," by E. O. Jones, director, safety and hygiene section, American Foundrymen's association, Chicago.

Dan M. Avey, secretary-treasurer, American Foundrymen's association, Chicago, will be guest speaker at the luncheon Feb. 25. The conference will conclude with a banquet on the following evening.

OHIO STATE SCHEDULES ITS SIXTH WELDING CONFERENCE

Ohio State university, Columbus, O., announces its sixth annual welding conference at the university, March 3-5. The department of industrial engineering is sponsor.

This year's conference will include a special three-day course in arc welding design and practice, presenting material of interest to architects, engineers, designers, production managers, welding supervisors, foremen and operators. The course will be under direction of E. W. P. Smith, welding engineer, Cleveland.

Information concerning the conference and course can be obtained from O. D. Rickly, general chairman, department of industrial engineering, Ohio State university, Columbus, O.

Sheet & Tube Buys Mills

Youngstown Sheet & Tube Co. has awarded contract for two piercing mill units for its seamless pipe mill at Campbell, O., to Aetna-Standard Engineering Co., Youngstown. The equipment will cost about $1,000,000, as announced in December.

Activities of Steel Users and Makers

SERRICK CORP., Defiance, O., which recently acquired the Acme Machine Products Co., Muncie, Ind., has purchased the John Lees Co., Indianapolis, maker of rolled metal moldings and stampings. Machinery and equipment of the latter company is being moved to Muncie. These two companies, retaining their original names, will comprise the Muncie division of the Serrick Corp.

New officers and directors of the Serrick Corp. are: President and director, L. F. Serrick, Defiance; vice presidents and directors, J. H. Broderick, Muncie, and S. D. Murphy, former president and general manager of the Lees firm; secretary and director, M. D. Hendricks, Defiance; treasurer, H. H. Sakel, Muncie; director, Roger Daoust, Defiance.

Officers of the Muncie division are: General manager, C. R. Poole; production manager, John S. Neff; assistant production manager, John Lees division, Robert Shaffer; chief engineer, Albert F. Westlund; assistant chief engineer, Ray Wise; general plant superintendent, James Perry; superintendent, John Lees division, John Karsnak; purchasing director, Earl Wedlake.

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Continental Iron & Steel Co., New York, has moved its Pittsburgh offices from 902 Keenan building to 2717 Koppers building. H. D. Stalnaker is district manager.

♦ ♦ ♦

Ironton Fire Brick Co., Ironton, O., has appointed Interstate Supply & Equipment Co., Milwaukee, as its sales representative in the state of Wisconsin.

♦ ♦ ♦

Theodore L. Dodd & Co., Chicago, has been appointed exclusive sales representative for the Western Machine Co., Milwaukee, maker of automatic screw machine parts, in the Chicago area.

♦ ♦ ♦

Monarch Machine Tool Co., maker of lathes, Sidney, O., has opened an office in the Chamber of Commerce building, Pittsburgh, to handle sales in the Pittsburgh territory. Elmore L. Ross is in charge.

♦ ♦ ♦

Harry W. Dietert Co. has moved into its new manufacturing plant and research laboratory at 9330 Roselawn avenue, Detroit.

♦ ♦ ♦

Weiman & Ward Co., Pittsburgh, has been appointed distributor of pig iron in the Pittsburgh district for Struthers Iron & Steel Co., Struthers, O.

♦ ♦ ♦

J. I. Case Co., Racine, Wis., has purchased the 82-year old Rock Island Plow Co., Rock Island, Ill. No details have been announced except that a new firm will start operations soon at the Rock Island plant.

♦ ♦ ♦

Standard Stamping Co., 530 West Lovett street, Charlotte, Mich., organized about a year ago to make bushings, spacer tubes and other small metal stampings, recently has added spring clips and screw machine products to its line.

♦ ♦ ♦

Pressed Steel Car Co. Inc. has moved its New York city offices from 80 Broad street to the New York Central building, 230 Park avenue.

♦ ♦ ♦

Fostoria Pressed Steel Corp., Fostoria, O., has been appointed distributor in Ohio for a new type of welded tubular steel scaffold manufactured by Uecker Equipment Co., Wauwatosa, Wis., and distributed throughout the Mid-West by Safway Scaffolds Inc., Detroit. The Fostoria company has opened an office and provided warehouse facilities at 12910 Taft avenue, Cleveland, in charge of E. L. Frase, associated with the company for 19 years, most of this time as purchasing agent.

♦ ♦ ♦

Tennison Mfg. Co., Houston, Tex., manufacturer and wholesale distributor, is now under new ownership. Liquidation of the company was mandatory under the will of the late H. B. Tennison. The new owner, Edward W. Kelley, will continue to operate the business under the same policy that has been followed since Mr. Tennison's death, and N. A. Fitch will continue in the capacity of general manager. Under the new ownership the company will have additional capital to expand its sales and manufacturing activities. No change in the firm name will be made.

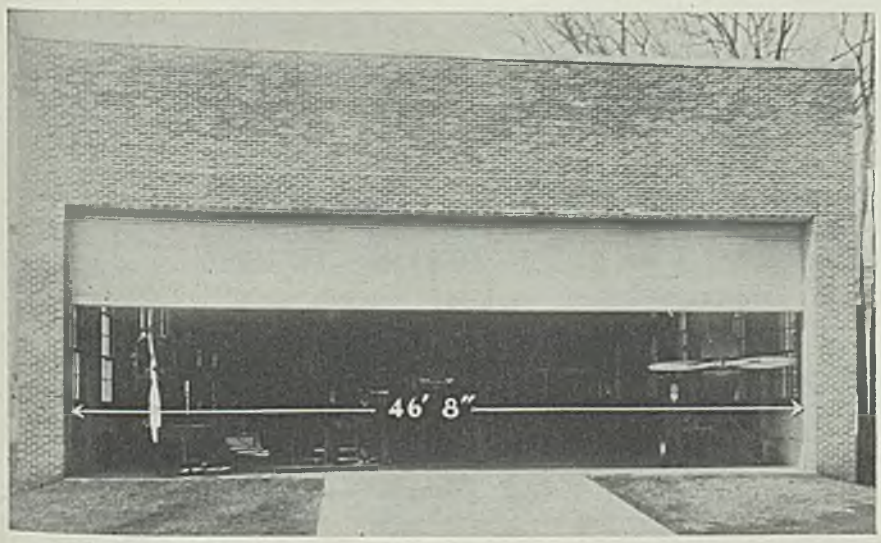
♦ ♦ ♦

Superheater Co., New York, has transferred certain functions and personnel of its industrial department to Combustion Engineering Co. Inc., New York, with a view to promoting closer co-ordination in handling the details of complete steam generating units. This concerns the sales, engineering and servicing of "Elesco" superheaters and economizers for stationary plant installations, the manufacture and inspection of which will be handled, as heretofore, at the East Chicago works of Superheater.

♦ ♦ ♦

Compressed Industrial Gases Inc., Chicago, announces a change in the name of its nine subsidiary companies. Heretofore a holding company, it now is an operating company and the subsidiary companies, namely, Burdette Oxygen Co., Detroit; Butler Gas Products Co., Pittsburgh; Burdett Oxygen Co. of Texas; Burdett Oxygen Co., Chattanooga, Tenn.; Burdett Oxygen & Hydrogen Co., Chicago; Burdett Oxygen Co. of Oklahoma; Wisconsin Oxygen-Hydrogen Co., Kenosha, Wis.; Mo-Ark Oxygen Co., Fort Smith, Ark.; Welders Supply Co., will now operate under the name of Compressed Industrial Gases Inc.

One Man Operates 10-Ton Rolling Steel Door



ALTHOUGH weighing approximately 10 tons, this steel rolling door installed recently in the aeronautical laboratory, University of Alabama, can by opened and closed easily by one man. It is composed of interlocking steel slats and is raised and lowered by means of hand chains operating through reduction gears. In a barrel above the lintel are 26 large oil-tempered torsion springs telescoped in groups of three around a solid steel shaft, which counterbalance the door at all points. Photo courtesy Kinnear Mfg. Co., Columbus, O.

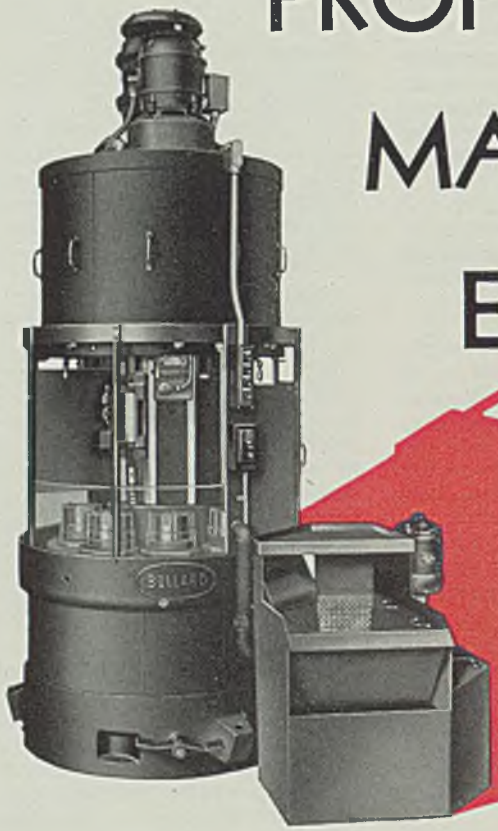
FORE THOUGHT

IN THE PURCHASE OF

PROFITABLE

MANUFACTURING

EQUIPMENT



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We call your attention to this fact because in the design and construction of Type "J-7" and "J-11" Mult-Au-Matics, Bullard Engineers considered forethought as a Prime requisite for your Profitable Investment and afterthoughts.

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BULLARD

MIRRORS OF MOTORDOM

DETROIT

SETTLEMENT of the General Motors strike was welcome news to motordom last week, as tension all over the state, especially in Flint, drew near the breaking point.

Perhaps it was fortunate for all concerned that John L. Lewis contracted influenza, which may have accounted for his relenting from his original demand to represent all employes of the corporation. He was far from a fiery dictator as he reached across the bed-sheets to sign the final agreement ending the 43-day strike.

Naturally, of course, Lewis claimed the settlement a great victory for labor—"another milestone on labor's march." But analysis of the terms discloses the union to have received no further recognition than that accorded in settlement of strikes in glass plants. Probably one of the chief reasons for the delay in finally reaching a settlement was the union's attempt to stall for time, permitting the enrollment of more members.

It is understood new union members are being accorded the privilege of foregoing dues payments for three months. The same proposal is being offered to new members in the CIO's drive on the steel industry.

There is good authority for the belief that Lewis intends to turn his efforts next to the steel industry, and probably sooner than is generally anticipated.

Opinion here is that General Motors conceded nothing beyond its original position of being willing to acknowledge the UAW as representative of its members only. As in all labor difficulties, neither side won anything. The men lost millions of dollars in wages; the corporation millions in car sales. The only person to gain was red-headed Gov. Frank Murphy who emerged as a "hero," just as many expected.

You can say this for Murphy, however: His steady stream of statements exuding sweetness and light during the course of the negotiations did much to keep the situation calmed and to avoid serious violence. He was in constant touch with the White House and probably was guided closely by instructions from there.

It is said that the governor has aspirations for the presidency. His personal build-up following the strike settlement was terrific and certainly should not hurt his cause. But close students of the political situation will bet you 20 to 1 that Murphy will never be President, no matter how great a hero he is today.

TIMING of the Chrysler wage increase announcement was the cause of considerable speculation. Appearing some 36 hours before the strike was settled, it seemed to some as a disturbing influence on the General Motors negotiations. Probably, if the truth were known, Chrysler officials had received word that a settlement was imminent and therefore released details of the general $13,000,000 wage advance to forestall a possible move on Chrysler plants by the UAW.

Following conclusion of strike negotiations, General Motors also announced a 5-cent increase in hourly rates for all employes, effective this week.

General Motors will have to open up wide to make up the ground lost in production the past six weeks. Estimates are that the various GM divisions are anywhere from 150.000 to 200,000 cars behind production schedule. Buick claimed a few days ago to have 29,419 unfilled orders at the plant, 30,000 more with dealers.

All GM production, except for 1400 trucks and commercial cars, was idle last week. Chrysler held output at the same level as that of previous weeks, the total being 26,575. Ford likewise showed little change, with 29,775 units, including Lincoln. Total for the industry is estimated to be 72,850, increase of 555 over the previous week.

SYMPTOMATIC" is the word Kelvinator used to describe the strike which a handful of MESA union members called in the company's Plymouth road plant, forcing cessation of all operations.

The men in the plant barricaded all doors, including those in the administration building, and refused to allow anyone to enter. They even went so far as to place steel bars across plant doors on the inside and weld them into place. When the men are ready to leave it might be a good tip for some of the welding equipment people to stop around and sell the men a few torches to cut their way out.

"Symptomatic" aptly describes much of the labor difficulty in this section today. In other words, sit-down strikers are not closing these plants because they are determined to better their wages, hours, working conditions or the like. The strikes are symptomatic of the times, indicative of the fact that a certain section of labor believes that re-election of Roosevelt has given them license to make disturbances.

Strike Instruction Booklets

The men who occupy the plants on sit-down strikes make elaborate plans for their daily routine. They form orchestras, set up tribunals to enforce "laws," congregate on plant roofs and sing, deride any passerby who even resembles an officer of the law, and eagerly look forward not to returning to their jobs, but to "marching in a victory parade."

The UAW is reported to have compiled a special booklet for their men giving full details of how to conduct a sit-down strike, how to picket, and other instructions. Included are such details as how many women to have in a picket line, how many children and how many babies, where to congregate, what songs to sing and how to barricade a plant as a defense against eviction.

Investigation of the CIO and its affiliated UAW has convinced many that the organizations bear a definite stamp of communism and socialism. It will be recalled that on the occasion of the recent attack on the Chevrolet plant in Flint, a band of women, all wearing red berets, was a central figure. Two of the union's

MIRRORS OF MOTORDOM

legal counsel staff have been active in communistic and socialistic circles for a number of years. One of Lewis' lieutenants is a former official of the socialist party and in 1919 was convicted and sentenced to prison for 20 years in connection with violation of the espionage act.

A "most unfortunate" incident occurred here Wednesday noon when three unidentified men seized a union sound truck, drove it to an outlying district and set it on fire, destroying the amplifying equipment. It is small wonder this has not happened long before, in view of the "rabble-rousing" tactics of union organizers who man these trucks.

TAKE a long look at any typical passenger car, 1937 model. Note its sleek, well proportioned lines. Note its smooth, steel-encased body. Note (on many) the "Burlington Zephyr" radiator design treatment. Note the quiet, powerful motor; the quick, sure brakes; the numerous accessories for comfortable, fatigueless driving. You will likely agree to the claim that it is a marvel of engineering achievement.

Now look back 45 years, back four and one-half decades to 1892. Observe what the automobile was in those days. If you are able to get hold of a copy of the Eaton Mfg. Co.'s silver anniversary booklet chronicling the automotive industry from its inception in this country, scan through the pages for your own amazement. See Charles Duryea's single-cylinder Buggyaut; George B. Selden in his first car; the Autocar of 1897 with its rope tires; Henry Ford at the tiller of one of his first models; Elmer and Edgar Apperson in an early runabout; Alexander Winton, Elwood Haynes and J. W. Packard—men who made automotive history.

Only a Few Remain

Follow the procession of automotive vehicles down through the years. Note how the designs have progressed from the first "buggy without a horse" to your streamline marvel of today. Read the list of 1501 names of automobiles which have been manufactured in this country, only 75 of which can answer the roll call in 1937.

The questions automatically arise: What brought about this tremendous advance in automotive styles and performance? Did steady technological advances produce the car of today, or did the hard-pressing automotive industry force the technical changes, the improvements in materials, the speeding up of production? If you can answer these questions you can probably answer the old one about which came first, the chicken or the egg? Certainly, however, a glance back over half a century of automobiles is enlightening and infers a fulsome tribute to American industry and labor.

Projected changes in automobiles, that is, plans for new models, constitute information which manufacturers guard with all the secrecy of wartime army maneuvers. The reason for this is readily recognizable. Sales at the moment might be sacrificed if information on improvements for the next year's models were placed in the hands of car buyers. Another logical supposition might be that such plans are kept "locked in the safe" because of the danger of competitors discovering them and revising their own plans accordingly. But it seems each year, along about show time when the canvases are dragged back from the glistening new models for the ensuing year, the general resemblance is too close to be merely a coincidence.

Consider the sudden widespread appearance some years ago of fender skirts or valances as they used to be called. Consider the previously mentioned "Burlington Zephyr" style of radiator and hood designs, now so popular. Consider the die-cast radiator fronts, streamlining, four-wheel brakes, and other innovations. While naturally there are exceptions, in the opinion of some seasoned observers the trend in automotive design and construction moves ahead about uniformly over the entire industry. What is secret today is commonplace tomorrow; and in some cases may not even be a secret today. Leaks will appear in the best of design and planning departments.

Forecasting Changes

One student of trends in Detroit has doped it out that the even years — 1932, 1934, 1936 — are the years when mechanical changes predominate in new models; and that the odd-numbered years mark the appearance of important body changes. By this reasoning, next year's cars should feature mechanical changes rather than revisions in outward appearance. This seems to check pretty well with the thinking in this district, but the above theory is probably more happenstance than any set rule adopted by car builders.

Looking at automobile design from the aircraft engineer's viewpoint, Ralph H. Upson at the recent S.A.E. meeting in Detroit suggested six possibilities for reduction of drag and weight: Improved streamlining of necessary exposed parts, particularly underneath; use of curved glass in the windshield, and lightening of all window material; reduction of the frame to the status of an assembly unit, with structural significance only in combination with the body; more effective distribution of flange material around doors; lightening of skin by use of internal stiffeners, particularly on top; and development of a smaller, more efficient radiator, with lightening of various engine parts. Present experimental work is of course related to several of these suggestions.

Automobile Production

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

	1935	1936	1937
Jan.	300,335	377,306	*344,000
Feb.	350,346	300,874	.....
March	447,894	438,992	.....
April	477,059	527,726	.....
May	381,809	480,571	.....
June	372,085	469,355	.....
July	345,297	451,474	.....
Aug.	245,075	275,951	.....
Sept.	92,728	139,785	.....
Oct.	280,316	229,989	.....
Nov.	408,550	405,702	.....
Dec.	418,317	519,132	.....
Year	4,119,811	4,616,857	.....

*Estimated.

Calculated by *Cram's Reports*

Week ended:	
Jan. 16	91,685
Jan. 23	81,395
Jan. 30	74,148
Feb. 6	72,295
Feb. 13	72,850

DETROIT and vicinity are stealing Akron's thunder as a tire manufacturing center. As reported previously in these pages, Goodyear is completing a new plant at Jackson, Mich., and Ford is building a plant to handle half of the Ford tire needs. Last week two other tire companies made plans to invade the district. Firestone took steps to acquire a 30-acre manufacturing site near Detroit, and Goodrich announced the establishment of a branch plant at Cadillac, Mich., to employ 500. Operations in the latter plant will be under way by midsummer.

WINDOWS OF WASHINGTON

WASHINGTON

PRESIDENT ROOSEVELT has asked a complete report from both the navy and labor departments on the purchase of steel by the former under the Walsh-Healey act. He made the announcement at a press conference last week.

It is evident that the request by the navy to Secretary Perkins for exemption in the purchase of steel has been thrown overboard either through the influence of John L. Lewis, who has been active in the matter, or through Miss Perkins. While there has been a feeling among the well-informed that the exemption would be granted for certain grades of steel, in view of the action taken by the President it is now believed that any such action is some distance off, if it will ever be taken.

There is every reason to believe that the navy report will not be unfavorable to the steel industry, because the navy seems to understand the situation. On the other hand, this will be counterbalanced by the labor department report which undoubtedly will be antagonistic and blame the steel industry.

Navy Opposed Bill

All of this goes back to the days when the bill was going through Congress. At that time the navy department did not like the looks of the measure and its officials said so frankly. On the other hand there is a well authenticated story that the navy was informed that there would be an exemption clause which would meet the navy's needs. It is true there is, but the navy cannot get action from Miss Perkins on this exemption.

At the White House press conference the President was asked if any action had been taken in connection with the law. He stated that none had and all he knew about it at that time was that the navy was not getting the steel that it needs. At this point he announced his request for the reports.

In the meantime it became known that the navy, acting with the labor department, has asked some of the principal producers if they were prepared to bid on several million pounds of steel needed in the navy shipbuilding program. It is stated at the navy department that it has asked for 25,000,000 pounds of steel within the past month or so and that it has been able to make awards on only some 7,000,000 pounds. The report is that if steel is not forthcoming by the middle of next month the naval shipbuilding program will be seriously held up.

In the meantime Secretary of Commerce Roper stated at his press conference that he had had a conference on this subject with Assistant Secretary of Labor Edward M. Grady. Asked if he intended to call a conference of steel manufacturers to discuss the situation, Mr. Roper said that he had not gone that far yet.

ICKES STILL FIGHTING IDENTICAL STEEL BIDS

Secretary of the Interior Ickes is still getting identical steel bids for his projects, which has led to another outburst on this subject. He has announced award of a contract covering reinforcing steel for the Bartlett dam of the Salt river federal reclamation project in Arizona to the Sheffield Steel Corp., Kansas City, Mo.

In connection with this award the secretary said: "I regret that the practice of identical bidding still prevails in some quarters. It is noticeable that the occurrence of identical bidding has been less frequent since the rule was adopted that the bidder farthest distant should receive the award in such cases. Protests that this rule operates, especially in the case of the contracts of the bureau of reclamation, against those bidders in the west, who generally are comparatively near the point of destination, can best be answered by the reply that the practice of submitting identical bids defeats the purpose of the government in advertising its work for free and open competition."

In this case both the Sheffield company, which ships from Kansas City, Mo., and the Bethlehem Steel Corp., which would ship from Los Angeles, Calif., submitted bids of $28,991.84, f.o.b. destination, with a net delivered cost to the government in each case of $26,124.54.

Three bids were received by the bureau of reclamation at its Denver office; the two bids which were identical and also lower than the third bid.

The award was made to the Sheffield Steel Corp., the department states, because its shipping point is farther removed from the point of delivery than that of the Bethlehem Steel Corp. and because while no advantage in cost was obtained, additional employment will result since the transportation distance is greater.

The interior department has also announced that an award has been made for high pressure gates for the outlet works at Bartlett dam to the Consolidated Steel Corp., Los Angeles, at $53,211.83. Bids were received Jan. 18.

JUDICIAL REFORM OPPOSED BUT WILL PASS, IS BELIEF

The news behind the news here last week was of much more interest than the news itself. It usually is. It dealt with the message of the President in connection with the reorganization of the judiciary, more properly, of the United States Supreme Court.

There was a general revulsion of feeling on Capitol Hill and in the executive departments against the judicial message. However, that is as far as it is going.

Predictions are being made in well informed circles that while there may be some opposition that the present rubber-stamp congress will go through with it and while it is true that some of the members of

both houses are talking privately against the proposed change they will probably vote for it when the time comes, even if the reactions from their home districts and states are unfavorable. They will feel that they have to stay in line with the administration.

It was another red-letter day for the newsmen, the day on which the judicial message went to congress. It was such a day as some months ago when the famous "horse and buggy" press conference was held.

The President stepped entirely out of his usual custom and read the major part of both his message and proposed bill to the newspaper correspondents. This is the first time in history that this has been done. In the meantime, also, the President was making a running comment on various parts of the message. He was obviously nervous. At certain points in his message, during which he took particular pains to point out what he considered telling statements , he d e l i b e r a t e l y waited for laughs. He probably did not get as many as he thought he would. That also will probably be the case of the public in general.

There was a decided feeling that the President went out of his way to show animus to the nine old men of the Supreme Court. There was also a feeling among members of congress that the President did not do a good job of disguising his efforts to get at the Supreme Court through the whole judicial system. On the other hand, some felt that he did this deliberately and was not trying to disguise anything.

There is a decided difference of opinion among members of congress. Even some of the influential Democrats do not see eye to eye with the President on this subject. However, the guess is that he will get what he wants.

AMERICAN SUPPLIERS LOSE CHINESE RAILROAD MARKET

During recent years China, recognizing the imperative need, has been making a determined effort to improve her transportation facilities. About five years ago an intesive program for interprovincial road building was started and today something over 60,000 miles of roads are open to traffic.

Coincidentally, but more slowly, a railroad program was started. It is estimated by department of commerce representatives in China that during the past two years over 700 miles of new railroad lines have been put into operation. The commercial attache in Shanghai in a recent report stated that "during 1936 new railway construction and the rehabilitation of existing lines represent the outstanding economic achievement in China. For the next five years the program for new construction anticipates 960 miles annually. Unfortunately American participation has been almost negligible because of failure to provide long term credit facilities similar to those of international competitors who are now eagerly grasping the opportunity to take fullest advantages of all prospects, although the Chinese are favorably inclined to American equipment and track materials. Unfortunately the longer Americans remain out of the market, the more difficult will be their efforts to reenter, because other standards of equipment will have become established."

During the past 12 months purchases or contracts have been arranged with German, English, French and Belgian interests totaling well toward $100,000,000, which is rather substantial proof that competing countries consider the terms necessary to secure the business as reasonably safe. The United States has not participated at all in this business and it begins to look very much as though we in this country had "missed the boat."

TRADE AGREEMENT BILL WILL ESCAPE AMENDMENT

The house last week passed the trade agreement bill which would extend for a period of three years the act enabling the President to make trade agreements without reference to the senate. Effort was made in the lower house to have the bill amended to make it necessary for ratification by the senate but this had no chance against the administration.

The senate finance committee has held hearings on this measure and it is believed that the way is clear to get quick action on this bill in the senate. It is reported that another effort will be made in that body to put in a ratification provision but that will not hold even in the upper house. When the bill is finally enacted into law the prediction is that it will read much the same as it did when it was favorably reported from the house ways and means committee. It makes no change in the present act, but simply extend it for the three year period.

WOULD BUILD ALL NAVAL CRAFT IN NAVY YARD

Members of congress from the state of Washington evidently are determined to get as much work as possible for the Seattle navy yard. A couple of weeks ago Senator Bone, of that state, made an effort to have an amendment made to a pending appropriation bill providing that all navy ships should henceforth be built in navy yards and not in private yards. That was voted down.

Now Representative Magnuson, also of Washington, introduces a separate bill (H. R. 4344) "providing for the construction of naval vessels and materials used therein in navy yards."

This bill, which has been referred to the house committee on naval affairs, provides that all naval vessels and "the main engines", in the future shall be constructed or manufactured in government navy yards, naval stations, naval gun factories, naval ordnance plants, or arsenals of the United States. It is provided that this shall include "the making of castings, forgings, machining the parts, both roughing and finishing", and it further provides "that raw materials from which castings and forgings are made, fabricated materials, such as sheet metal, rods, bars, and tubing out of which parts are made, and minor appurtenances, * * * may be purchased in the open market."

LABOR BLAMES MACHINES FOR MUCH UNEMPLOYMENT

Announcement was made last week by the A. F. of L. that its unemployment figures showed that in December 8,917,000 persons were without work.

"It is significant," says the labor organization, "that after nearly four years of recovery, when activity in our producing industries is approaching normal, we still have nearly 9,000,000 who have found no place in normal industrial work. The army of jobless is being increased steadily by labor-saving devices and we estimate that since 1929 at least 2,250,000 jobs have been eliminated in our industries by a general increase in productivity amounting to 10 per cent. These losses are offset in part by about 1,000,000 new jobs in government, education, wine and beer industries, and self employment, but our labor need today even at 1929 levels of business, appears less by 1,250,000 jobs than in 1929."

The federation, in its statement said further that, "since our working population is increasing at the rate of about 500,000 persons per year, industry must provide for these new workers as well as those already unemployed. Thus since the depression low point, March, 1933, nearly 2,250,000 workers have joined the ranks of those seeking employment. This constant increase in our work force while industry is displacing workers with machines, makes immediate reduction of work hours essential."

Reports from the department of labor show that in December 3,500,000 of the unemployed had work on PWA and WPA projects.

Editorial

Proceed With Caution! Danger Ahead! High Explosives!

SINCE March 4, 1933, many persons have had frequent occasion to question the wisdom of many of the actions and policies of the administration of the federal government. Some critics were competent, others incompetent. Much of the criticism sprung from honest convictions and constructive aims; some of it from vindictive spirits and destructive motives. Dissent was uttered by men of all political parties, of all religions, of all races and of all stations in the economic scale.

Such protest against drastic changes in policies is to be expected in a democratic government. The more aggressive an administration, the better the target it presents to its opponents. A healthy state of criticism is an asset in any country where a popular form of government exists.

But since March in 1933, something has happened to the safety valve of criticism. Hundreds of the ablest citizens in the country—many of them competent to speak with the highest authority on current national problems—today are curiously silent. Why?

The answer is obvious. New dealers, headed by President Roosevelt, have been able, by the clever expedient of branding certain critics as "economic royalists" and "princes of privilege," to smear, discount and ridicule all critics so effectively that the words of hundreds of competent, able and patriotic men no longer carry weight with a large portion of the American public.

Nation Is Deprived of Wholesome Check of Conservative Criticism Against Radical Excesses

What is the result? In this land where we pride ourselves on the freedom of speech, in reality speech is not free. Here, where the voice of conservatives should be serving as a wholesome check against the excesses of liberalism and radicalism, that voice is stilled almost as effectively as the voices of the great patriots of Germany and Italy who lie in prison cells or exist in exile because "infallible" dictators cannot afford to permit these able men to talk to their public.

Next to freedom of expression, the most important requisite of popular government is a legislative body sufficiently independent of the executive department to provide the "balance" envisioned by the founders of this nation. The new dealers have utilized the patronage facilities provided by the emergency of a depression to make the congress so subservient that it functions largely as a rubber stamp for the executive branch. One of the most pitiful spectacles of the present era is the abject servility with which some congressmen and senators (who know better and whose hearts rebel at the indignity of it) pay daily obeisance to the new deal to save their poor political skins.

Having stifled criticism from certain quarters and put the legislative branch in chains, the Executive now proposes to take over the judiciary—lock, stock and barrel. He hopes to accomplish this by inducing the subservient congress to authorize him to "pack" the federal courts. If he succeeds in this bold venture, then he will be complete master of the situation.

From this point it should be comparatively easy to fill in the other details essential to absolute dictatorship. It should not be difficult for Charlie Michelson to think up a term of reverence for the Chief Executive to compare with "Il Duce" or "Der Fuhrer." Others could be relied upon to change the "Stars and Stripes" to some sort of "Swastika" design. Other lieutenants would gladly revise the educational system so that the youth of the land would learn nothing inimical to new deal policies. An efficient minister of propaganda could write a few rules governing the utterances of newspapers and magazines so that the public would not be poisoned by anti-new deal opinions. The "princes of privilege," "economic royalists" and a few editors could be sent to Alcatraz.

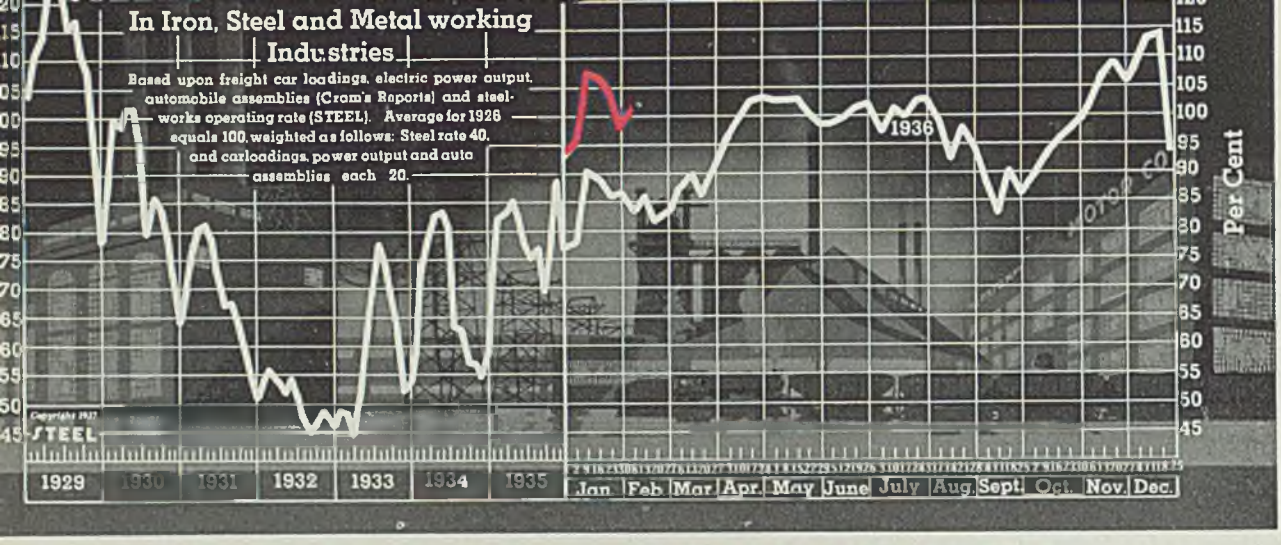
Why Tempt Fate? Why Discard Safeguards Which History Many Times Has Shown To Be Useful?

A nifty national salute would be in order. By all means we ought to have a universal sign of recognition and of loyalty to the dictator. Unfortunately European countries already have pre-empted the straight-arm salute with open palm extended. Some smart new dealer might improve on that by perfecting a more elaborate display of servility—something involving a kneeling posture and bowing of the head.

Right now these things can be written in the light vein of fantasy. Probably there is no danger that anything approaching the status of an absolute dictatorship will occur in this country.

But why tempt fate? Why destroy the valuable system of checks and balances provided by the executive, legislative and judiciary? Why permit the momentary zeal of new dealers to wreck the work of 161 years?

Your job, industry's job, everybody' job is to spike this colossal blunder. Contact your representatives and your senators. Show them the danger of this step. This crisis calls for Paul Reveres and minute men. Do your share!



THE

STEEL'S index of activity increased 1.1 point to 101.1 in the week ending Feb. 6

Week ending	1936	1935	1934	1933	1932	1931	1930	1929
Dec. 19	114.8	91.9	64.4	58.0	46.9	52.3	67.3	79.7
Dec. 26	93.3	77.3	60.8	53.7	42.9	46.8	52.3	64.9
	1937	1936	1935	1934	1933	1932	1931	1930
Jan. 2	96.6	78.2	65.4	53.6	45.3	48.8	58.5	74.3
Jan. 9	107.8	90.2	73.8	58.1	48.6	55.8	69.2	88.1
Jan. 16	106.7	89.3	78.1	60.9	49.8	56.2	72.1	91.8
Jan. 23	104.0	86.0	79.5	62.3	50.8	55.8	72.9	96.3
Jan. 30	99.0†	86.5	81.8	66.9	49.9	56.2	72.9	97.4
Feb. 6	101.1*	83.8	82.7	70.7	48.7	56.0	74.9	100.8

†Revised. *Preliminary.

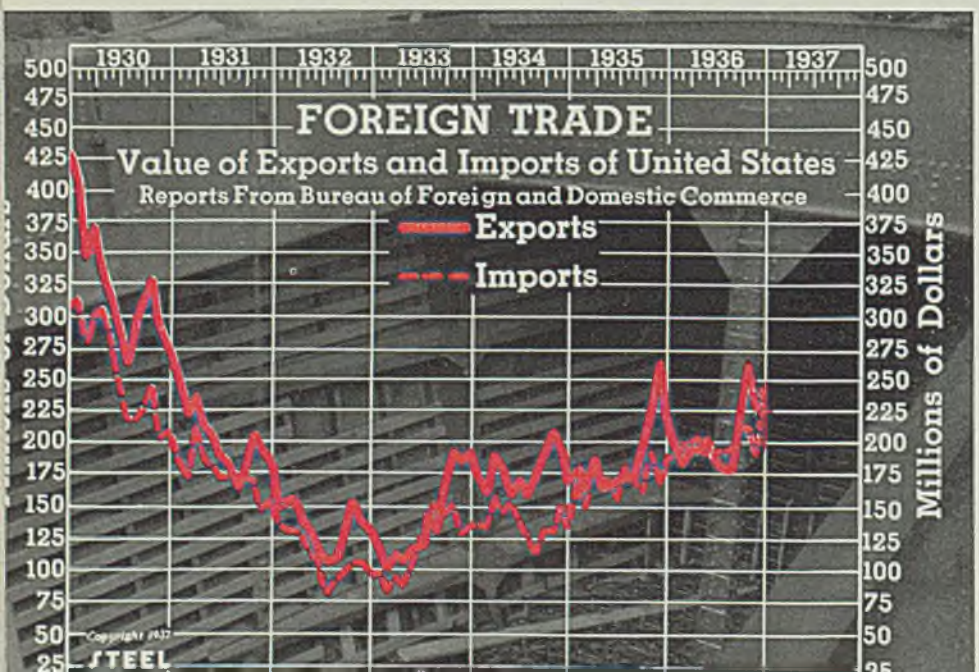
Industry Regaining Ground Lost by Floods, Strikes

ALTHOUGH buffeted roughly by floods and strikes, industry in the week ending Feb. 6 registered a slight gain in activity. STEEL'S index stands at 101.1 compared with 99.0 in the week ending Jan. 30.

This slightly more favorable showing was made possible by moderate increases in revenue freight car loadings, steelworks operations and automobile production. Electric power output, still affected by flood and strike difficulties, was the only one of the four key barometers to show a decline during the week.

Some buoyancy was reflected in the rebounds of freight traffic and steelworks activity from the preceding week. Car loadings on roads affected by the floods in the Ohio valley were up sharply. Traffic on the Illinois Central and other Mississippi lines remained below normal. Total loadings for the week ending Feb. 6 were expected to fall short of 700,000 by a slight margin. The rate of steelmaking leaped back to 79.5 per cent and was poised to cross the 80 per cent line in the week ending Feb. 13.

The attempt of the federal administration to "pack" the Supreme Court has implications which may tend to "chill" business enterprise in some fields. The fight in congress will bear close scrutiny.

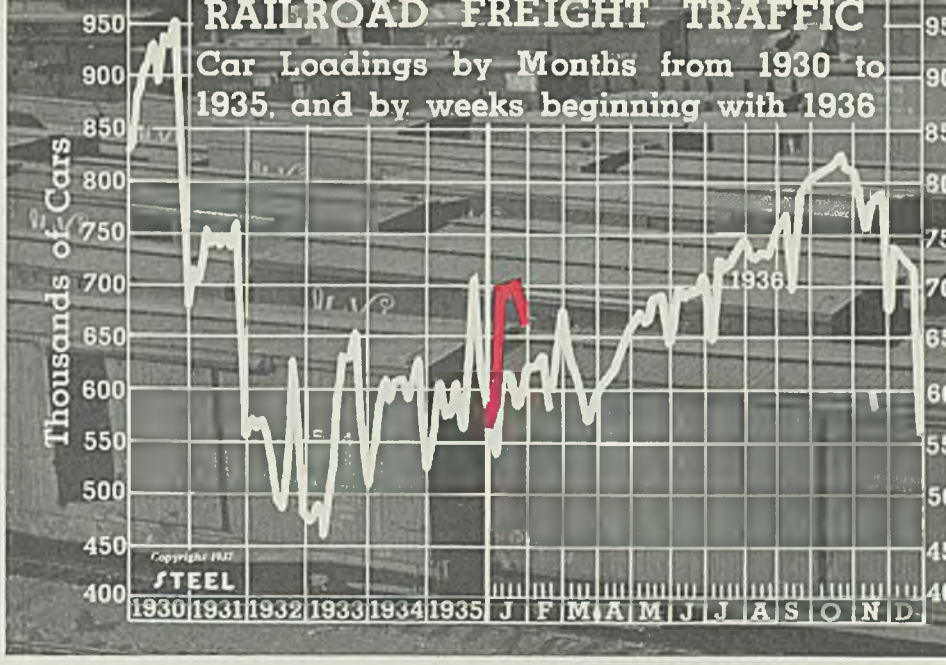


	Dollars (000 omitted)			
	—1936—		—1935—	
	Exports	Imports	Exports	Imports
Jan.	198,654	187,482	176,223	166,993
Feb.	182,030	192,771	162,999	152,491
March	194,790	198,686	185,603	177,279
April	193,490	202,437	164,350	170,567
May	201,042	191,110	165,457	170,207
June	185,188	192,233	170,193	156,756
July	178,324	193,409	173,371	177,698
Aug.	178,249	195,016	172,128	169,030
Sept.	219,976	215,525	198,189	161,653
Oct.	264,708	212,001	221,215	189,240
Nov.	225,766	196,423	269,400	168,955
Dec.	229,739	244,321	223,737	186,648

BUSINESS TREND

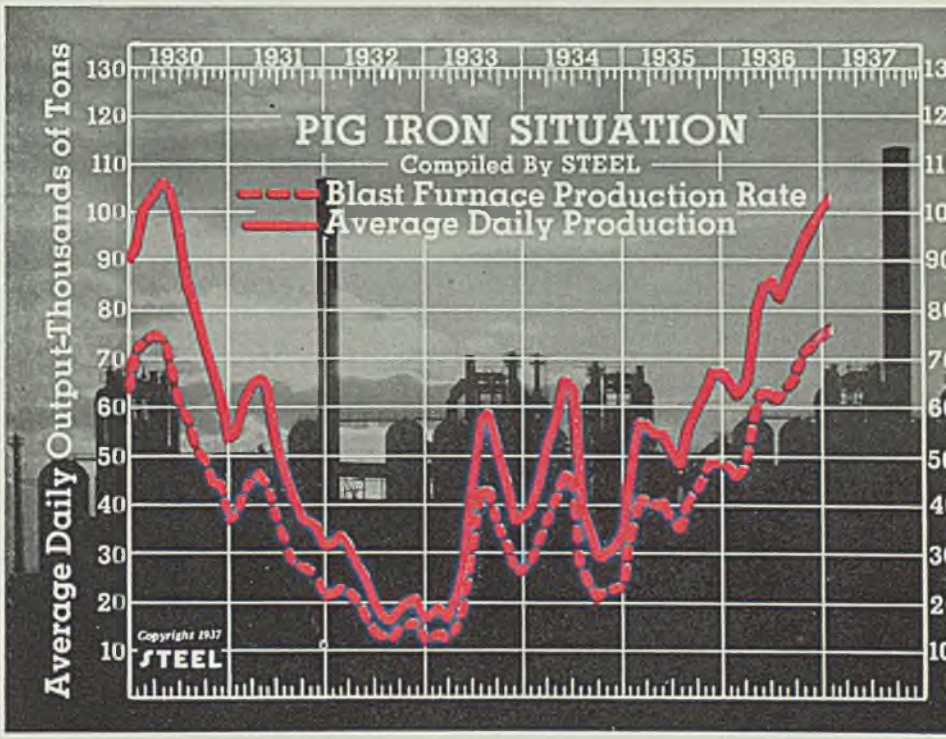
Freight Car Loadings Feel Effect of January Floods

	1937	1936	1935
Jan. 30.....	659,790	621,839	598,200
Jan. 23.....	670,376	584,691	555,800
Jan. 16.....	700,238	611,408	562,900
Jan. 9.....	698,529	615,028	553,700
Jan. 2.....	587,953	541,984	498,100
	1936	1935	1934
Dec. 26.....	562,218	466,679	425,100
Dec. 19.....	729,696	599,534	547,900
Dec. 12.....	738,747	615,237	579,900
Dec. 5.....	744,957	637,133	551,000



Pig Iron Production Continues To Gain in First Month

	Daily Average, Tons		Blast Furnace Rate, Per Cent	
	1937	1936	1937	1936
Jan.....	103,863	65,461	76.1	48.2
Feb.....	.....	63,411	....	46.6
March...	.....	66,004	....	48.5
April....	.....	80,316	....	59.1
May.....	.....	85,795	....	63.1
June....	.....	86,551	....	63.6
July.....	.....	83,735	....	61.5
Aug.....	.....	87,475	....	64.3
Sept.....	.....	90,942	....	66.9
Oct.....	.....	96,509	....	71.0
Nov.....	.....	98,331	....	72.3
Dec.....	.....	100,813	....	74.2



Iron and Steel Exports Rise In Final Month of 1936

	Gross Tons			
	—1936—		—1935—	
	Imports	Exports	Imports	Exports
..	50,489	241,564	22,784	262,740
..	43,358	213,802	28,905	228,537
.	56,720	264,337	21,409	323,035
.	49,621	301,987	28,866	205,336
.	59,391	314,950	47,719	286,598
.	59,910	294,951	33,208	286,333
	47,940	296,738	31,894	296,782
	60,697	295,341	32,312	247,312
	59,993	235,571	53,158	244,419
	64,509	261,882	59,569	238,358
	61,970	203,297	56,637	205,242
	52,584	244,156	53,678	239,268

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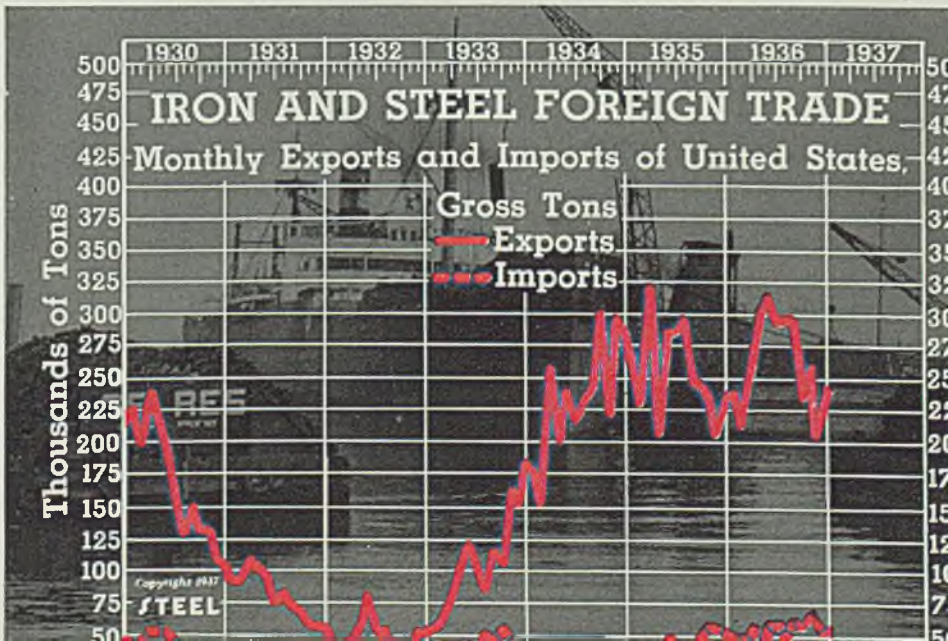


BY H. E. MACK
Vice President, LaSalle Steel Co., Chicago

History and Development of the

COLD finished steel bars are being more generally used, and in increasing amounts, each year and yet little has been published about this important branch of the steel industry. As a matter of fact authoritative production figures for cold finished steel bars in the United States were not readily available in any complete form prior to the advent of the Steel Code in August, 1933.

Careful study of production figures compiled by the American Iron and Steel institute for 1933, 1934, 1935 and the first half of 1936 shows a steadily increasing ratio between the production of hot rolled bars for sale and that of cold finished bars, in favor of the latter product. When measured against the total yearly output of semifinished steel, the production of cold finished bars has shown an increase each year from 10.41 per cent in 1933 to 12.39 per cent in the first part of the current year.

The cold finished bar industry is, of course, a development of the wire drawing industry which extends far back into time. References are made to wire in China about 2200 B. C. and in India about 2000 B. C. Wire actually has been discovered dating back to 1700 B. C. and in the British Museum is a specimen of wire made by the Ninevites about 800 B. C. The wire of early times was flat and not round as most generally visualized today. While the Venetians and Italians are said to have known the method of drawing wire through holes in drawplates sometime between the sixth and tenth centuries, the most definite trace of the early development of wire drawing comes about 1340 A. D. when a machine driven by water power was developed by one Rudolph of Nuremberg for drawing wire through a die. The process probably was known before that time because wire drawing was a thriving industry in Paris in 1350 A. D. In the Musee de Cluny in Paris is a German designed wire drawing machine built in 1564 for Anne of Denmark.

In this country wire drawing was introduced in 1666 or 1667 at or near Lynn, Mass., probably by Joseph Jenks. All of this early wire was of course copper, brass, bronze, iron or noble metal as the process of converting iron into steel was not developed until early in the seventeenth century.

Research reveals a dearth of information regarding cold drawn bars and, generally speaking, little is known outside the industry about the process of producing this material which is used so extensively today—in manufacturing automobiles, agricultural implements, household and office appliances, and in prac-

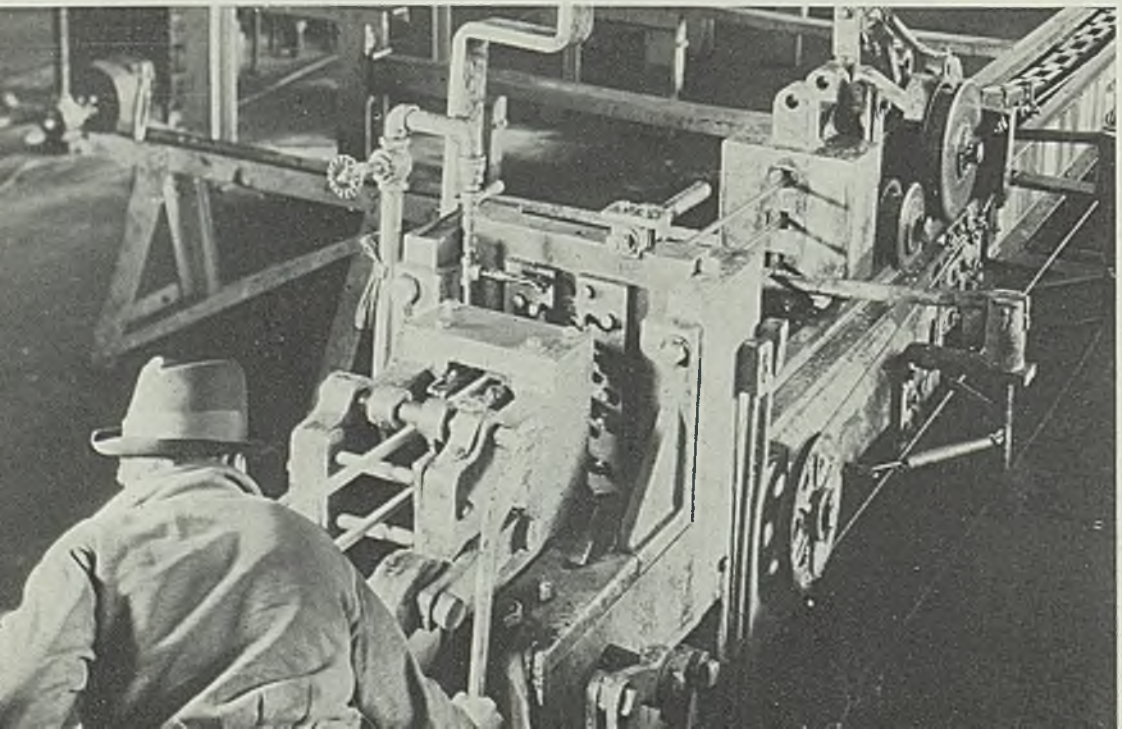


FIG. 1—Pusher t drawbench signed to draw t bars at one time vertical positio

mports
166,993
152,491
177,279
170,567
170,207
156,756
177,693
169,030
161,653
189,240
168,955
186,648

Art of Cold Drawing Steel Bars

tically every type of machinery. Using the wire drawing industry as a guide, experiments were being made in 1885 with the pickling of bars and the perfecting of dies for bar drawing, and in 1889 the first cold drawn bar was produced in America. Since that time the industry developed steadily to its present pre-eminence.

Early efforts in the industry were toward improvement in surface finish and dimensional accuracy of hot rolled bars, but recent years have found producers of cold finished bars pioneering in developing the inherent qualities of steel as well as perfection of surface, trueness to size, concentricity and accuracy to meet exacting demands.

The cold finished bar mill uses as raw material hot rolled bars produced by merchant bar mills; consequently the first concern is the proper raw material. From a vast library of trial and error results of performance in the ultimate user's plant, the cold finished bar producer determines exactly the chemical analysis, grain size, and structure of the hot rolled steel wanted as well as the size and length of the bar, surface condition and in critical cases the billet size, number of reducing passes, rolling temperatures, discard, deoxidizers, etc., and incorporates all these points in his specifications to the hot mills. The hot mills in turn, must make many tests to insure the rolled material meeting specifications, and final inspection must be rigid and complete before shipment.

When the hot rolled bars arrive for cold drawing a representative number of samples is taken from each item of the shipment to the laboratory for chemical and metallurgical tests to determine whether or not the material meets the specification. Having passed this laboratory inspection, the hot rolled bars are unloaded into the raw material warehouse by overhead cranes. Extensive inside storage space is provided to protect the raw material from the elements as excessive rusting of the material will make the surface unsuitable for cold drawing and result in surface imperfections in the drawn bar.

In the raw material warehouse each lot by size, grade, heat number and length, must be carefully identified and kept separated from other lots to maintain identity and prevent mixed steel. This is a relatively costly procedure, but necessary and, in most modern plants, it is accomplished not only by identification tags and by color code painting on the ends of the bars but also by allowing the chains used in unloading the lifts from the car to remain around each lot as it is

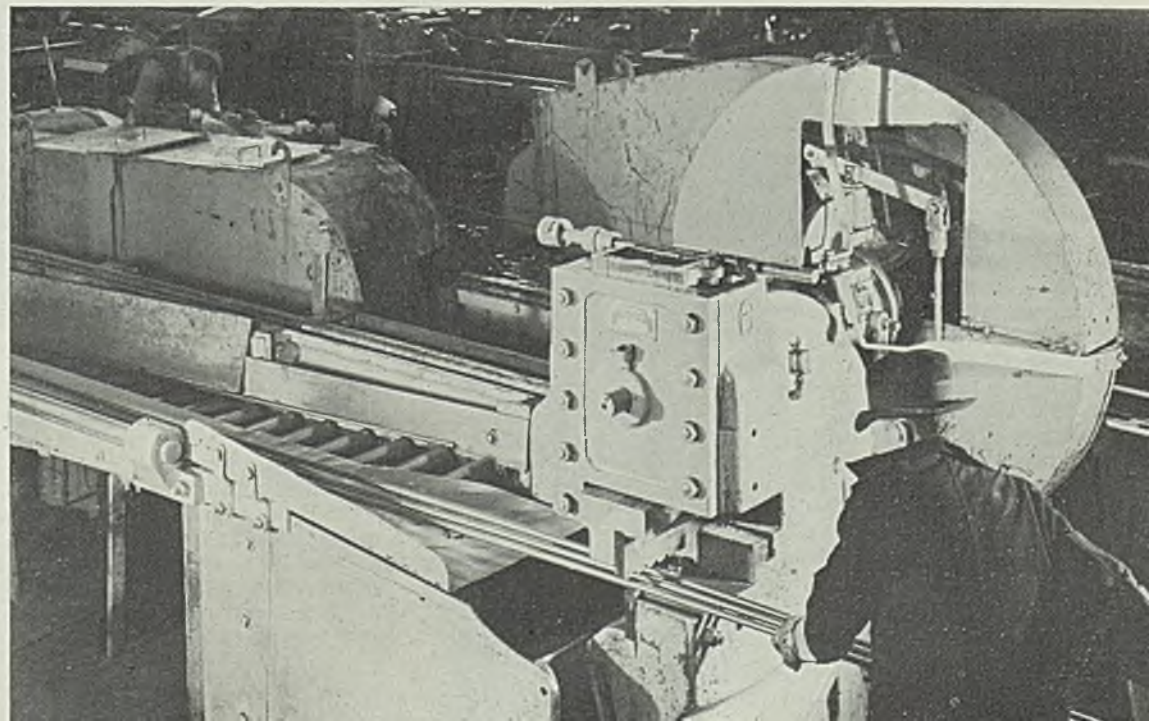


FIG. 2—If bars are to be shear cut, they are fed into this shear prior to the straightening

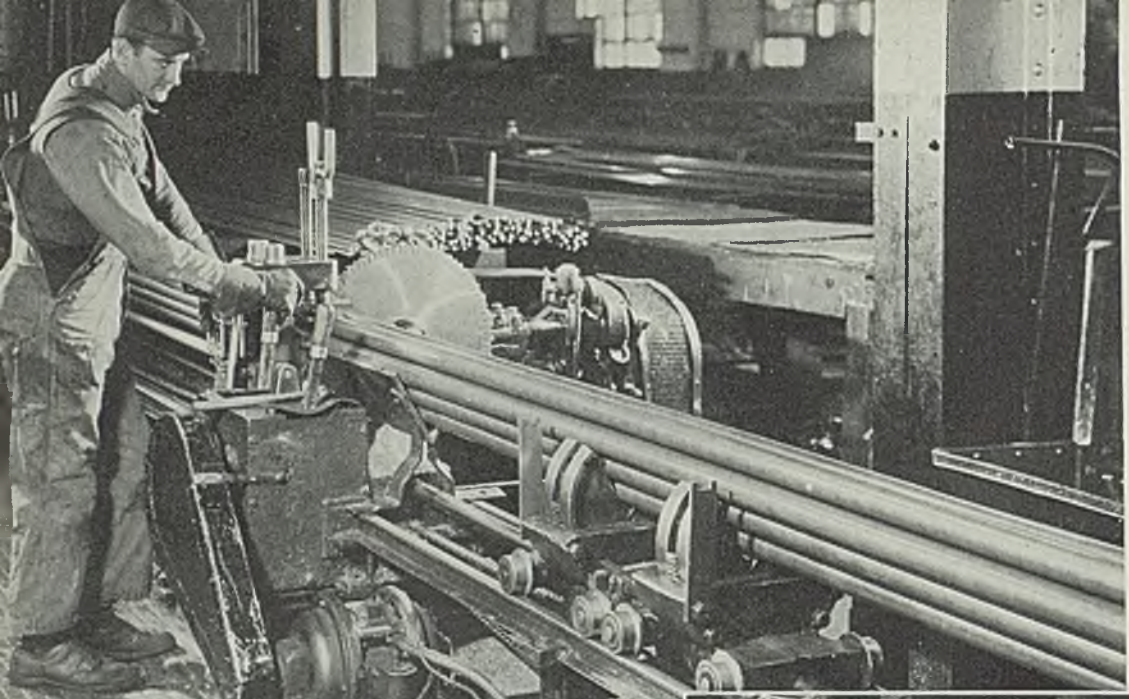
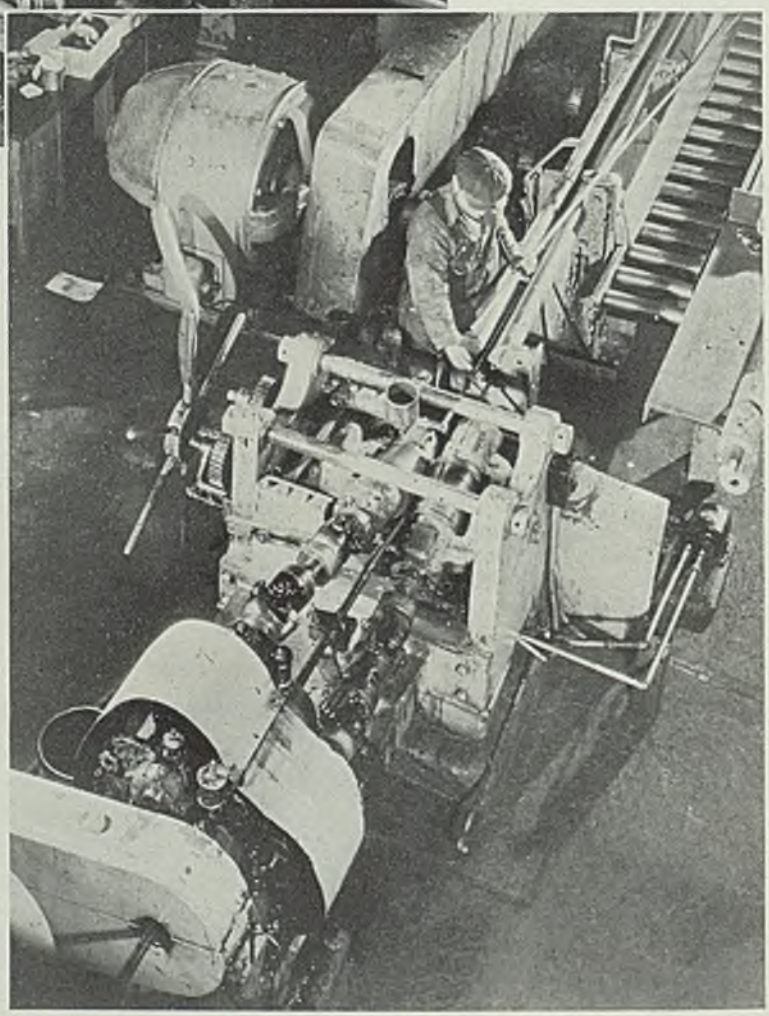


FIG. 3 (left)—Several small diameter bars are cut square at one time by this inserted-tooth power saw. Fig. 4 (below) — Bars are fed into straightening rolls where much of the sizing and finish is gained



stored, resulting, of course, in a considerable investment in chains for this purpose alone.

When raw material starts into production the first step is the weighing of the amount sent in and the rechecking of the analysis to be sure the proper steel is being used. This check is done by "spark testing." A small portable electric grinder is used and the end of practically every bar is sparked. The "sparker" over a period of time develops the ability to tell from the spray of sparks thrown from the bars by the contact with the grinding wheel, the approximate analysis of the bar in question, including approximate carbon content and the presence of different alloying elements. The intensity of the spark spray, the volume and length, and the manner in which the sparks burst, all are important in this visual analysis of the material. This procedure is one of several modern nondestructive methods of determining analysis.

The first actual production operation is pickling and, being a basic operation, it is fundamentally important to provide the proper foundation for subsequent production steps. All scale, rust and dirt on the hot rolled bars must be removed before drawing, since this scale would mar the surface of the drawn bar or clog the dies resulting in die scratches on the bar. The manner in which this cleaning or pickling is done to a great extent controls the finish on the drawn bar.

The pickle room contains large brick, cement, rubber lined or wood vats in which are baths of dilute sulphuric acid, water, and hydrated lime solution, and the hot rolled bars are subjected to these baths in succession. In the first bath the strength of the sulphuric acid solution, commonly about 5 per cent is determined by a competent chemist as this bath actually removes the scale, rust and dirt. The time of immersion varies but is usually from 30 to 45 minutes at a temperature about 150 degrees Fahr. and during the time the bars are in the sulphuric acid bath they are agitated intermittently to insure the entire surface of each bar being

properly exposed to the cleaning action of the acid.

Acid baths are usually kept hot by the introduction of live steam; however, some modern pickling tanks are equipped with a recently developed patented gas burner which is actually installed in the solution in the tub. The gas burns while submerged in the various baths and the force of the flame is so great that it is not quenched by submersion in the liquid bath. Efficiency of this method of heating is high and it also provides a forceful agitation of the solution which aids the pickling, resulting in a reduction of pickling time.

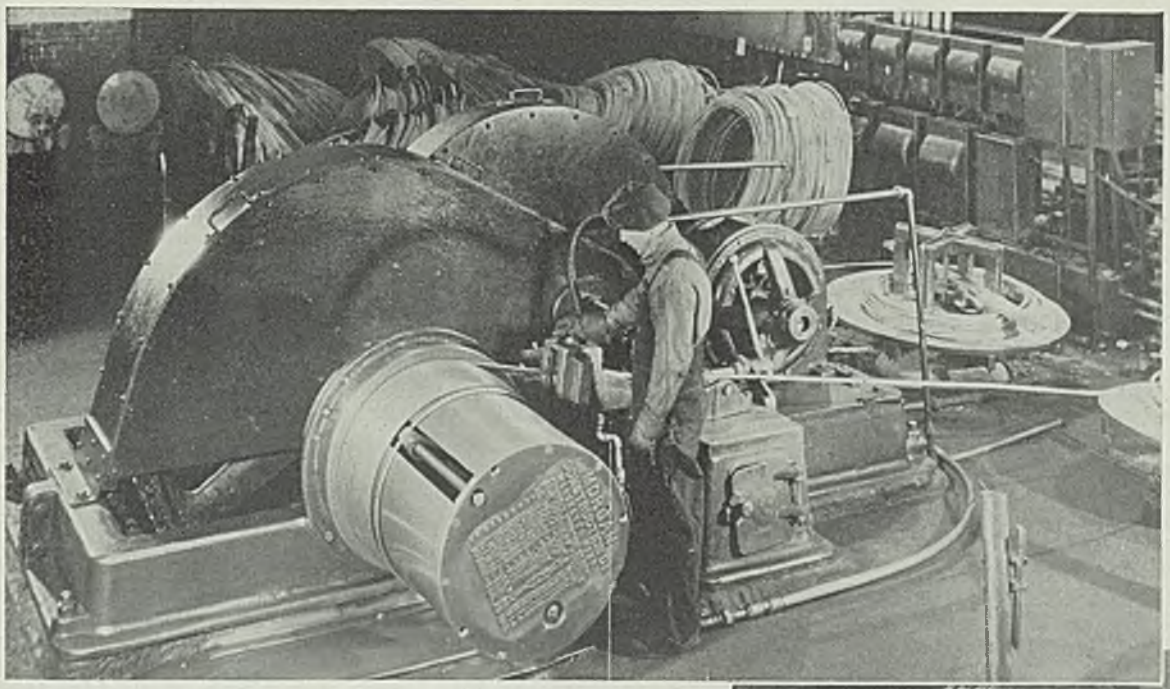
While it is imperative to obtain in the acid bath a complete removal of all scale, it is likewise most important to prevent the acid from eating into the surface of the steel. This is accomplished by the use of an inhibitor and the removal of the steel from solution at the proper time. The steel is then transferred into a combined water bath and hydraulic spray which removes most of the acid and scum, after which it is placed in a lime solution held at a temperature about 175 degrees Fahr. This neutralizes the action of the acid, thoroughly removing it, prevents further rusting and assists in minimizing any acid brittleness. When the bars leave the pickle room they are, therefore, lime coated and this aids as a lubricant in the subsequent die drawing operation.

At this point it is interesting to note that the first pickle tank in this country for pickling bars for cold drawing was rough hewn from a large log—the same as Indians sometimes used to make canoes—and only one or two bars were pickled at a time.

Small sizes, generally speaking 9/16-inch diameter and under, are drawn from coils and consequently must be handled separately throughout the plant. However, the same general procedure applies to both coils and bars in the pickle room.

The next operation is the one around which the cold drawn bar industry is built, namely, die drawing. It is a standard method for producing all sizes of squares, hexagons, flats and special shapes and usually for all rounds up to 2 15/16 inches in diameter. Round bars 2 15/16 inches in diameter and larger can be readily cold drawn and frequently are so drawn, even up to 6 inches in diameter; however, the customary practice on these larger sizes is to produce them by the turning and polishing method. Range of sizes in the modern bar plant is considerable. For example, the following range of sizes is typical of those produced: Squares and hexagons from ⅛-inch to 4 inches; flats from ⅛ x 3/16-inch to 2 x 12 inches; rounds from 1/16-inch to 2⅞ inches by cold drawing, and 2 15/16 to 24 inches by turning and polishing; also special profile shapes of a wide variety of sizes and contours by cold drawing.

Preparation of drawing dies is, of course, a most important function, requiring expert diemakers. In the case of round bars, solid dies are used while sectional dies are used to produce hexagon and rectangular sections. Life of the dies varies considerably, depending upon the size of the bar being produced and the amount of reduction given the raw stock. The usual reduction or



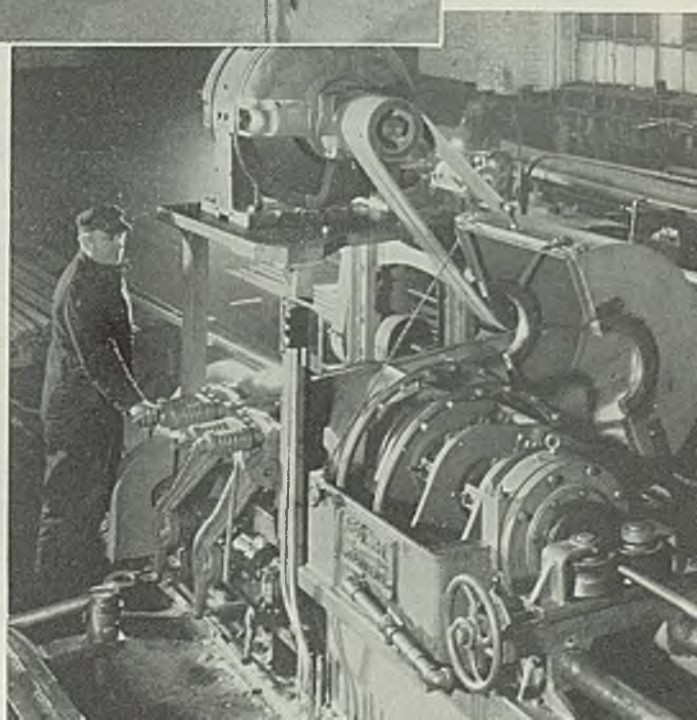


FIG. 5 (above)—Larger sizes are drawn in coils on this machine, known as a "bull block". Fig. 6 (right)—Rough and finish cuts are made in one carriage travel by two tools on turning machines similar to this one

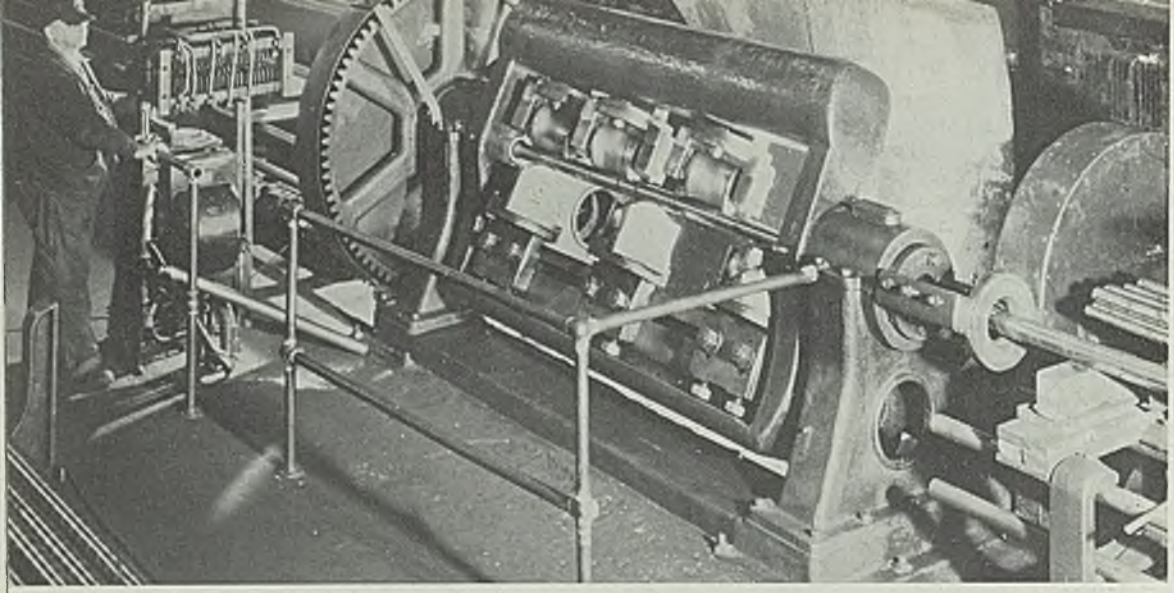


FIG. 7 — Rotary straighteners or "flyers" are used in straightening and polishing large bars up to 6 inches in diameter

draft is 1/16-inch, that is, to produce a 1-inch round cold drawn bar a hot rolled bar 1 1/16 inches round is used. However, in regular production the draft varies from 1/32 to ⅛-inch, depending upon the type of material to be produced and the purpose for which the cold drawn bar is to be used. Dies formerly were of cast iron, but now are of specially adapted tool steel, and in many cases of tungsten carbide.

Two Drawing Machines Used

Two major types of machines are used for drawing bars, one requiring a pointed bar, the point being started through the die by hand; and the other a self-pointing or pusher-type machine. If the drawbench requires a pointed bar this is accomplished in the raw material storage by a pointing machine, or in the case of larger bars by a special type of air hammer. In special sections the pointing is most frequently done by "over pickling" or immersion of the ends of the bars in a strong acid solution which reduces the diameter of the section sufficiently to enable the end of the bar to enter the die. With the pusher-type drawbench, the bars are gripped firmly by jaws about 12 inches from the front end of bar which is forced through the die in the head of the drawbench so that about 3 or 4 inches extends out on the opposite side of the die and head.

Some drawbenches are designed to draw one bar at a time, others as many as six at a time. The bench shown in Fig. 1 is the pusher type with an installation designed to draw three bars at a time in a vertical position. A drawbench has a track or bed extending between 20 and 50 feet straight away beyond the die head upon which travels a carriage which holds the jaws to grip the bar points as they protrude through the dies and to which by means of an endless rectangular linked chain is applied the power to draw the bars through the dies. The power required varies greatly and is dependent on the tensile strength and size of the steel being drawn. When the bars have passed through the dies they are released automatically from the carriage jaws and are discharged from the draw bench ready for the next operation.

To cold draw bars it is essential to have a lubricant and this generally consists of a mineral or soluble oil, or a grease. Often the grease is held in a box just ahead of the die; however, the more universal method today is to use an oil which is directed on the bar as it enters the die. The lime coating on the stock acts as a carrier to assist in holding the lubricant on the surface.

At this point note the changes that have occurred in the hot rolled bar. For example, a hot rolled bar of 1 1/16 inches diameter, 33 feet long will be reduced in diameter to 1 inch and elongated to slightly over 36 feet. The cold drawing operation, of course, does not skim off a portion of the surface of the hot rolled bar but actually makes the cold metal flow as it passes through the die, resulting in an increase in strength and an improvement in the machining qualities of the bar by about 15 to 20 per cent. This improvement in the product is not due to any change in chemical analysis of the material but simply to the cold working of the metal by drawing through the die.

Ends Cut by Shear or Saw

The next step in the manufacturing routine varies depending upon what type of cutting to length is desired by the customer. If shear cut ends are desired, the cutting to length precedes the straightening, but if saw or machine cut ends are required the straightening precedes the cutting operation. In the case of shear cutting, the bars as they are discharged from the drawbench, are within reach of the operator of the shear and thus require no conveying or handling to the next operation. First the points are cut off and then the bars are sheared to the length required as shown in Fig. 2. A cold drawn bar 36 feet 9 inches long will produce three 12-foot bars after the point and other end are cut off. Large bars and special shafting material are usually saw cut on large disk-type, inserted tooth power saws. Also all small sizes specified with square cut ends are cut to length by the saw cutting machine such as illustrated in Fig. 3. This view also shows how several smaller diameter bars are cut at one time by being firmly wedged into the V-type carriage.

Straighteners Give Finish

The straightening operation in the case of cold drawn rounds from ½ to 2 11/16 inches diameter usually is done on straighteners which have one concave and one straight roll, revolving the bar to be straightened. Fig. 4 shows such a machine in operation and gives a closeup view from above of the bars being fed into the straightening rolls. Much of the sizing of the bar and the brightness of the finish is accomplished in this operation. In general, steels have a tendency to swell in varying amounts after being straightened; consequently, careful planning of preceding operations is necessary to compensate for the variations resulting in the straightening. When the bar has been drawn, cut to length, and straightened it is commercial cold drawn stock ready for critical inspection.

As stated previously, certain sizes are generally made from coiled rods instead of from bars. The pickling operation is virtually the same as described for bars except for the handling equipment. Cold drawing of coil stock, rounds as well as squares, hexagons, and flats in small sizes, differs from the method em-

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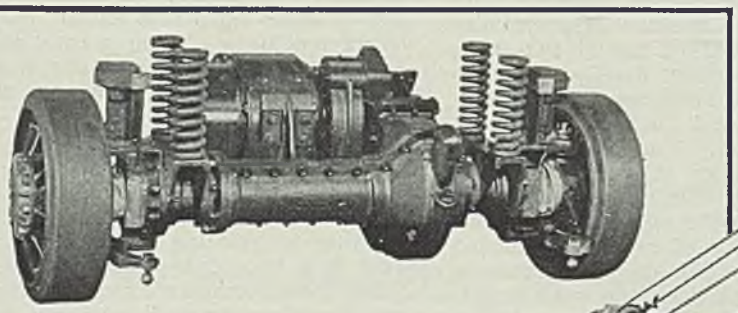

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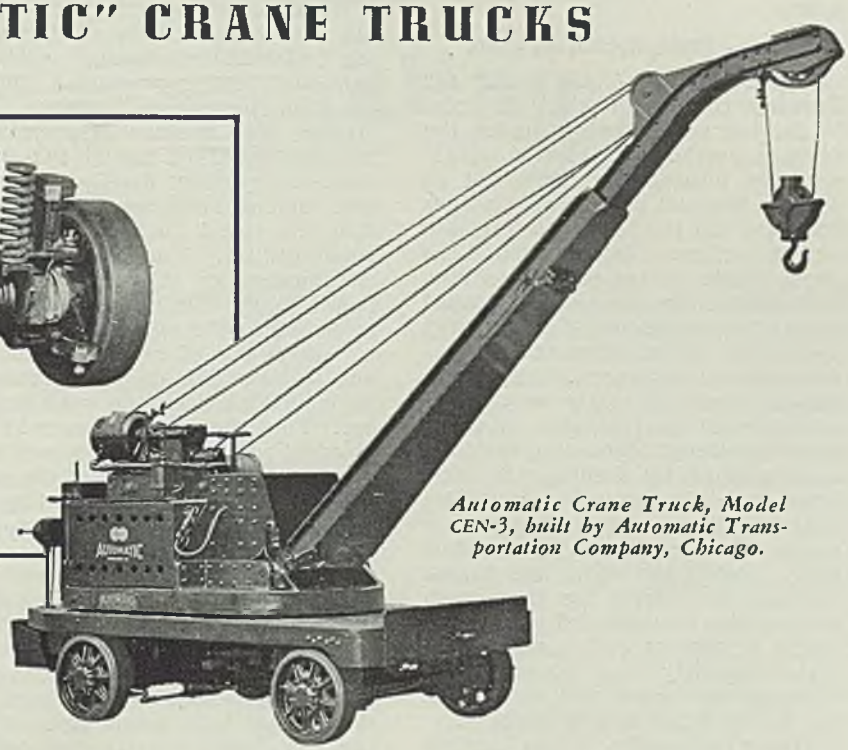

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ployed for bars in that after the end of the coil has been pointed and passed through the die, the power to draw the steel is applied to a drum instead of to a straightway drawbench carriage, and as the drum or block revolves the cold drawn stock is recoiled around the drum.

Large Sizes Drawn in Coils

Fig. 5 shows a "bull block" for drawing the larger sizes in coils. While the coil is being drawn the finished portion of course is tightly wrapped around the drum but as soon as the end of the coil emerges from the die the tension is released and the coil rests loosely around the drum which makes removal a simple matter. In the case of coiled stock, the straightening and cutting operations are all done at one time on a coil straightener. In this case the bars cannot rotate as the unstraightened part is still in coils; therefore the straightening action is accomplished by feeding the steel from the coils through a revolving barrel with a series of alternate guides which rotate around the steel bar. When the steel has passed through the barrel for the length desired the straight end of the bar comes in contact with a stop which instantaneously and automatically operates the cutoff and shears the bar to the exact length specified.

Where unusually bright surface in small diameter rounds is required the straightened and cut bars are put through a second operation such as a small polishing machine.

The straightening machine for coil stock is similar to that used in straightening hexagon, square, and flat bars and also other irregular shapes which cannot revolve. Bars travel through a series of horizontal and vertical rolls providing pressure from two directions. These machines vary considerably in design and are frequently developed and rebuilt by the individual producer. This operation is usually one of the most costly in the cold drawing plant as it is dependent to a great extent on the technique of the machine operator as well as the speed at which he can do the work. Certain types of bars and sections have to be straightened on a punch press which is an even slower and more costly operation.

The other basic method of producing cold finished bars is the turning and polishing method which is generally used in producing rounds about 3 inches in diameter and larger. This method is essentially a lathe operation, except that it is done on specially designed production turning machines and the outside hot rolled surface is actually machined off. For this reason it is unnecessary to pickle the hot rolled stock. The usual amount of reduction in the size of the hot bar is ⅛-inch and of course the turned and polished bar does not increase in length as does the cold drawn bar. Thus there is no change in the physical properties of a turned and polished bar from those of the original hot rolled bar. The turning operation simply adds a bright polished finish, accuracy and concentricity. Turning machines such as shown in Fig. 6 are equipped with one roughing tool and one finishing tool and thus two cuts are made on the bar with one travel of the tool carriage. The bar does not turn but the cutting tools rotate around the bar. The machines are designed to handle stock up to 40 feet in length.

Straightening and polishing of these large turned bars up to about 6 inches in diameter is generally done on a rotary straightener, or flyer as shown in Fig. 7. However, they are sometimes straightened by a polishing unit incorporated in the turning machine. In the case of the flyer the bar does not rotate but the whole flyer revolves around the bar applying pressure through the concave rolls set alternately on either side of the bar and at an angle as illustrated. The bar can be moved forward and backward through this machine until the desired straightness and polish are produced. There are other methods of straightening these large rounds such as by use of power press or hand press straighteners and the like.

In the case of cold finished rounds larger than 6½ inches in diameter, the usual method of production is identical with that of the commonly known lathe operation except that larger machines with long beds are used. The lathe shown in Fig. 8 is capable of producing rounds to 30 inches in diameter.

Accurate Shafting Is Ground

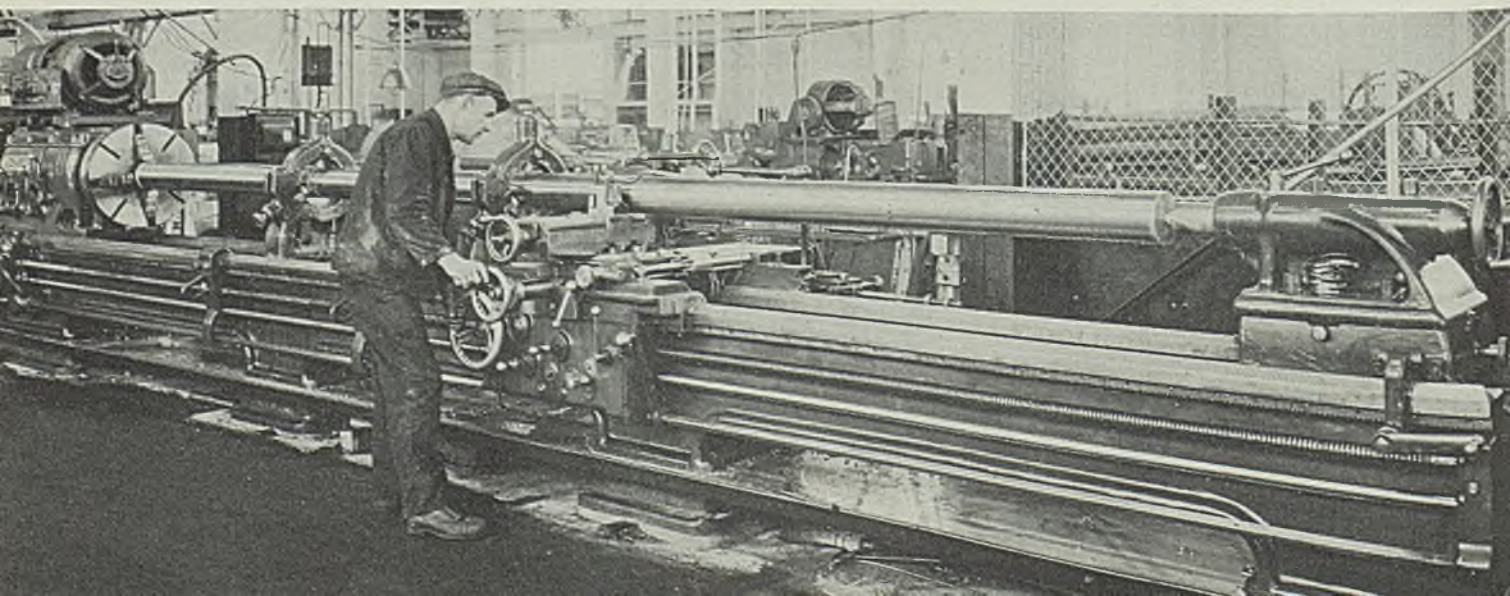
Still a further operation in the production of accurate precision shafting is grinding and polishing. This is a procedure usually subsequent to either drawing or turning and therefore ground bars can be produced either from cold drawn or turned stock, resulting in what is generally known as drawn "ground and polished" or "turned and ground" rounds. This type of stock has trueness to size in smaller diameters of plus or minus 0.00025-inch and a satin smooth as well as highly polished surface. The grinder shown in Fig. 9 is one type of machine for producing ground rounds.

After the production of the material a final inspection takes place before releasing for shipment or to finished stock. Early in this discussion care exercised in the selection and rigid inspection of the raw material were stressed. During the production of the cold drawn steel a careful check is, of necessity, exercised by each operator, for size, accuracy and finish. The cutting operations likewise are carefully checked during production to keep material to the proper length and the ends within standard cutting practice.

An interesting safeguard against mixed steel has been adopted in the

(*Please turn to Page* 80)

FIG. 8—Lathes with special long beds are used in cold finishing bars larger than 6½ inches in diameter



Materials Handling

Employ Specially-Designed Conveyors To Facilitate Handling of Strip Steel

PRESENT-DAY practices in production of strip steel have brought many interesting and some novel applications of materials handling equipment. Most of these applications naturally center around special-duty conveyors of the roller type. So many intermediate steps in strip mills are related to operations broadly classified as handling that a substantial percentage of the efficiency of the mills would be offset were it not for the ingenuity engineers have shown in designing and constructing conveyors to perform these exacting operations.

Delivery of steel strip to cross-cut shears and removal of stacks of sheets are typical problems whose solution has been made easier by mechanical handling devices. Fig. 5 shows cross conveyors and tilting tables for packs of strip steel, a recent installation in a large steel mill. Lateral roller lines may be seen in the foreground. Raised sections in the center portion are tilting units in position for delivering the material to a skewed live roller conveyor, which in turn delivers to cross-cut shears. The live roller automatically brings strips to one side of the conveyor so that entrance into the cross-cut shears is constant so far as positioning of the strip is concerned.

Another interesting application is that shown in Fig. 4, where a roller conveyor feeds between slitting shears and leveler and recoiler. The problem of removing stacked sheets from points of finished operation and still permitting movement of completed stack is solved through use of a stake type piler shown in Fig. 1. The roller conveyor on the floor is constructed with each roller mounted in a separate steel bar. This permits chains or other lifting devices to be slipped under the load for removal of the completed pack.

Operator Makes Up Stack

In the left center portion of Fig. 1 is a wheel conveyor line, which supports one side of the sheet as it comes from the shears. The operator works on the other side, and by means of this wheel conveyor his effort is limited strictly to that of guiding the sheet onto the stack being made up on the stake-type conveyor.

In Fig. 2 is a multiple width belt conveyor receiving strips from skin

FIG. 1 (below)—Stake-type piler for removing stacked sheets of steel from points of finished operation

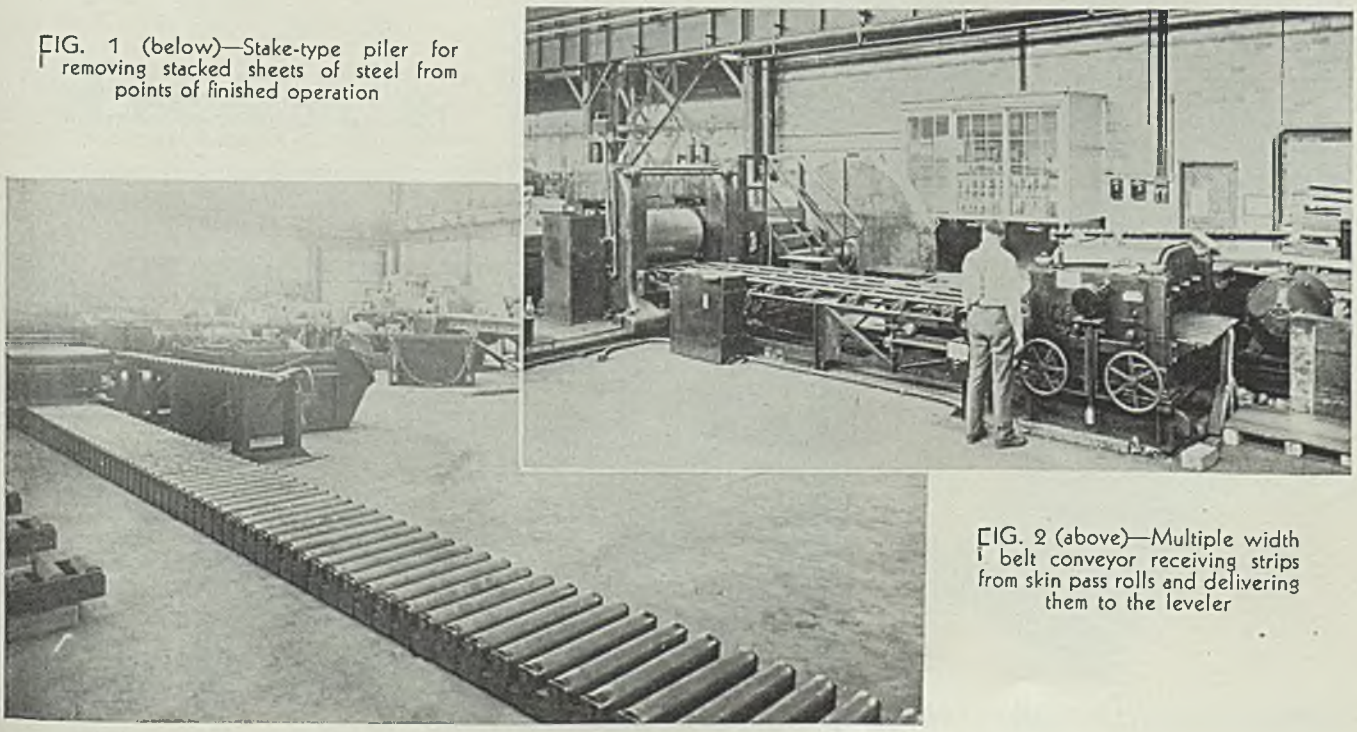


FIG. 2 (above)—Multiple width belt conveyor receiving strips from skin pass rolls and delivering them to the leveler

MATERIALS HANDLING

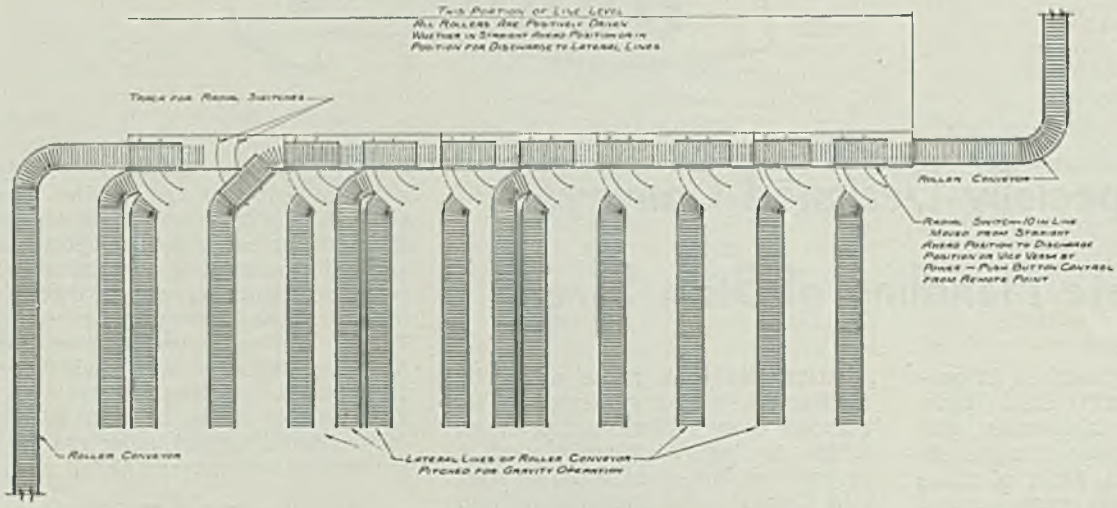


FIG. 3 — Sketch showing typical layout of conveyors equipped with new radial switch permitting intermediate discharge at desired points

tecting the finish of the finished product.

One recent innovation in handling is a new, full-powered radial switch, Fig. 3, for which patent application has been made by the Standard Conveyor Co., North St. Paul, Minn. This switch was designed to permit intermediate discharge of commodities at any one or at numerous points without manual attention other than pressing a push button. There are many commodities whose nature prevents them from being readily diverted from power belt or slat conveyors. The new switch is said to overcome such difficulties.

The rollers are power driven, and the arrangement makes possible application of power to all rollers regardless of the position of the switch. In other words, the rollers are driven positively whether the switch is in position for straight ahead travel, or in position for discharge to a lateral line. The switch is available for heavy or light commodity handling.

• • •

Open Top Car Experiment

DURING discussion of a paper on "Materials Handling Facilities" in steel mills at the convention of the Association of Iron and Steel Engineers last September, G. S.

(*Please turn to Page* 83)

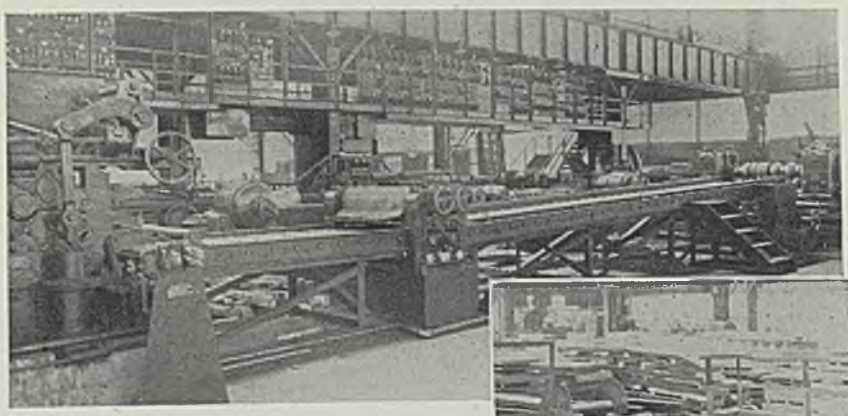


FIG. 4 (left)—Roller conveyor feed between slitting shear and leveler and recoiler

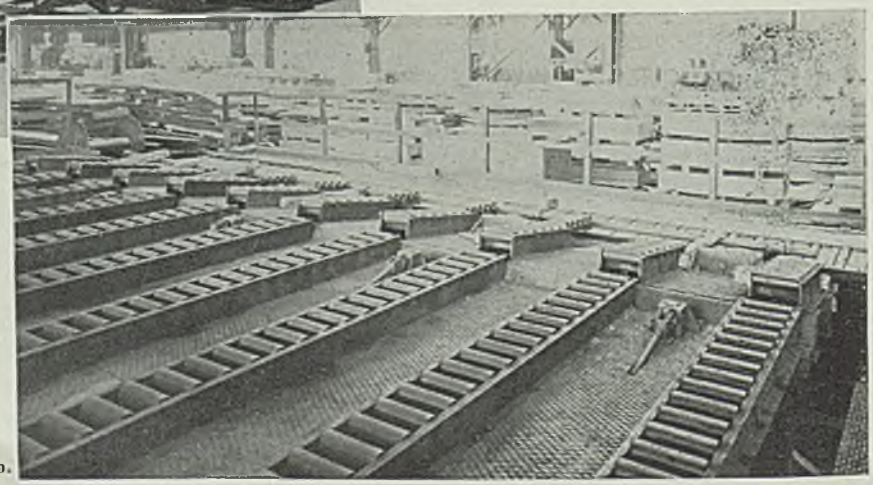
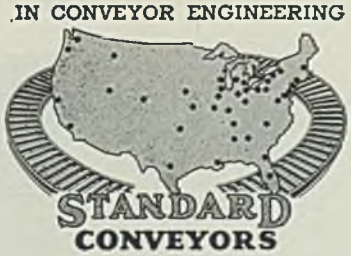


FIG. 5 (right)—Cross conveyors and tilting table for packs of strip steel. Lateral roller lines may be seen in the foreground

—Illustrations courtesy Standard Conveyor Co.

IN steel mills, particularly, the careful planning of production traffic is vital . . . because the heavy concentrated loads of coils, sheets, packs, bars, or moulds mean *heavier loads*, the pace of production in the mill requires *higher speeds*, and the constant demand for lower handling costs commands *engineering precision* throughout the job . . . For more than 31 years Standard Conveyor Company has met the exacting requirements of steel mills—as hundreds of successful installations in this industry prove . . . There is a Standard Engineer near you to study the special handling needs of your mill. Call him in or write for Bulletin S-2 "Conveyors by Standard for Steel Mill and Foundry."

A NATION-WIDE SERVICE IN CONVEYOR ENGINEERING



STANDARD CONVEYOR COMPANY

GENERAL OFFICES: NORTH ST. PAUL, MINNESOTA

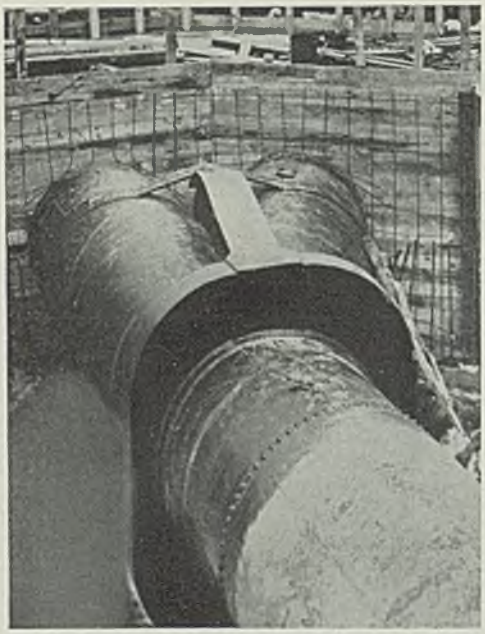


Fig. 1—Large reinforced design, arc welded steel Y and reducer section installed in a main mill water line in a Michigan industrial plant

Arc Welded Design of Water Line Y and Reducer Permits Reinforcement

BY F. G. SHERBONDY
Vice President, Biggs Boiler Works Co., Akron, Ohio

A LARGE Y and reducer section, weighing 32,870 pounds and fabricated entirely of steel, arc welded to a design requiring unusual reinforcements, recently was completed by Biggs Boiler Works Co., Akron, O., and installed in an industrial plant at Dearborn, Mich., for a main mill water supply line.

This large Y, shown in Fig. 1, had an overall length of 20 feet 4½ inches and a diameter ranging between 54 and 60 inches. The Y was designed for arc welded steel construction. It provided good hydraulic characteristics, permitted desirable flexibility of design to accommodate unusual conditions of installation, insured maximum safety against rupture in service, and provided the required structural strength to resist water hammer and overburden.

Construction of the Y utilized ½-inch steel plate with all seams electrically butt welded. A total of 600 feet of welding was required. This was all done by the shielded arc process with electrodes and equipment supplied by Lincoln Electric Co., Cleveland.

Design of the Y embodied unusual reinforcements as can be seen in Figs. 1 and 2. The method and computation of the shell reinforcement is of interest.

Considering Section *A-A* in Fig. 3, it is observed that the design of the 60-inch 30-degree lateral is statically correct when: (1) Thickness of the shell is equal to the thickness required for an ordinary pipe; (2) when the tangential tension components of *T*, or their resultant *R*, are taken care of by a suitable reinforcement at point *X*. As these loads *R* occur along line *a-a*, Fig. 4, the most economical reinforcement is a horseshoe beam along *a-a*. For larger laterals such as this, it is

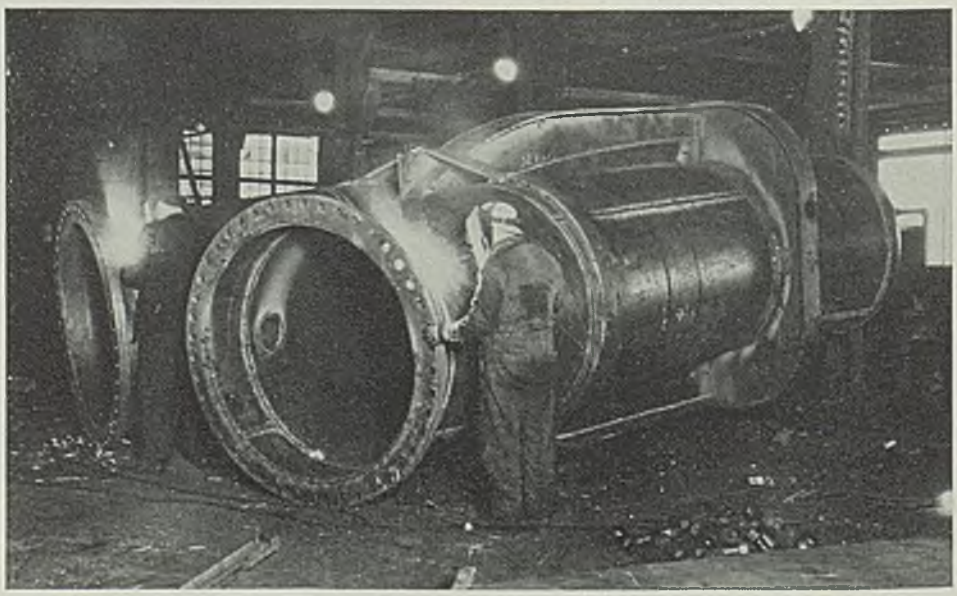


FIG 2—This illustration shows the Y and reducer section as it neared completion on the fabricating floor. Having a length of over 20 feet and a maximum diameter of 5 feet, the unit weighed in excess of 16 tons

★ He knows his steel. He knows when it goes through the shop smoothly and efficiently and comes out with the right stuff in it. He is not a metallurgist but he has worked with steel for years. He has put it through many processes, watched it on a thousand jobs and recognizes good steel behavior when he sees it. He is the type of man who prefers Union Cold Drawn Steels.

UNION DRAWN STEEL CO.

MASSILLON, OHIO

A SUBSIDIARY OF REPUBLIC STEEL REPUBLIC STEEL CORP

Cold Drawn Steels

more economical to support the heels at point *Y* with a ring support at *Y*, or with a tension member through the pipe at *Y*.

Referring to Fig. 4, the computation of the shell reinforcement is:

$$T = \frac{pD}{2} \text{ per unit length}$$

$$R = 2T \frac{SD}{2L} \times \frac{1}{D/2} = \frac{2TS}{L}$$

$$= \frac{pDS}{L} \text{ per unit length.}$$

This means that the loading is of a triangular shape as shown in Fig. 5. The computed stress of the reinforcing horseshoe is 14,000 pounds per square inch for a working pressure of 90 pounds per square inch.

Method Outlined

In constructing the Y, all parts were first cut to proper size, then rolled and pressed to correct shape and contour. The parts were then tack welded together for assembly. Welding was done in multiple beads by the step-back method of welding, that is, the welds were made in short lengths at alternate points along the seam. This method prevented accumulation of stresses and distortion.

The completed structure was not thermally stress relieved but peening was used on all welds to aid in reducing stresses. To insure conformity with the procedure control followed by the builder, specimens were cut and tested at intervals. Following final welding, done with ¼-inch and 5/16-inch shielded arc type electrodes, the section was tested under 250 pounds hydrostatic pressure. No leaks were found and no rewelding was required.

Considerable savings in weight, materials and time were permitted by use of arc welded plate construction. Weight was kept at a minimum since in arc welded steel no connecting members are needed and no excess material is needed to obtain necessary strength and rigidity. Electric welding by the shielded arc process obtains, in the welded joints, strength, ductility and other physical properties equal to or better than the parent steel. This high-quality joint metal makes arc welded steel construction an excellent method of producing a structure such as the Y described in this article.

A.S.T.M. Standards for 1936 in Two Volumes

A.S.T.M. Standards, 1936, Part 1, relating to metals, 898 pages; Part II, to nonmetallic materials, 1477 pages; published by the American Society for Testing Materials, Philadelphia; and supplied by STEEL, Cleveland, for $7.50 for each part in blue cloth binding, plus 15 cents postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

Part I contains 181 standards, 109 of which deal with ferrous metals, steel, wrought iron, pig iron and iron castings and ferroalloys, while 60 relate to nonferrous metals including aluminum and magnesium alloys, copper and copper alloys, lead, nickel, zinc, bearing metals, solder metal, deoxidizers, electrical-heating and electrical-resistance alloys. Twelve of the standards involve metallography and general testing methods.

Part II contains 335 standards, of which 91 cover cement, lime, gypsum, concrete and clay products, 239 relate to miscellaneous materials, such as coal, timber, paint, petroleum, etc., and five apply in general to these materials.

Specifications for a particular class of material are given first, followed directly by the test methods, definitions, etc. A complete subject index lists each standard under the principal subject covered with the key words in alphabetical sequence. Two tables of contents, one listing standards by the materials and the other in the order of sequence of serial designations, also facilitate the use of the volume.

Issued triennally, the standards are assembled in a sequence determined by the specific materials or products to which they apply. For convenience, each part is provided with two tables of contents, one a listing of the standards in the order in which they appear and the other a listing in numerical sequence of their serial designations. Explanatory notes, illustrations and diagrams make these volumes unusually valuable.

Production Machinery Is Insulated by Rubber

Rubber suspensions for heavy factory units have recently been perfected by the B. F. Goodrich Co., Akron, O., following their use on large machinery in the Goodrich plant. A line of standard units known as Vibro-Insulators, which consist of blocks of live rubber mounted to steel forms, has recently been placed on the market. There are three standard types available which will cover 95 per cent of all field requirements, it is claimed by the company.

Three main factors are to be considered in selecting these rubber insulators. They consist of methods of mounting, load, and frequencies of vibration to be suppressed. Standard models will carry loads up to 3000 pounds, and special types are available which have been designed for greater loads than this.

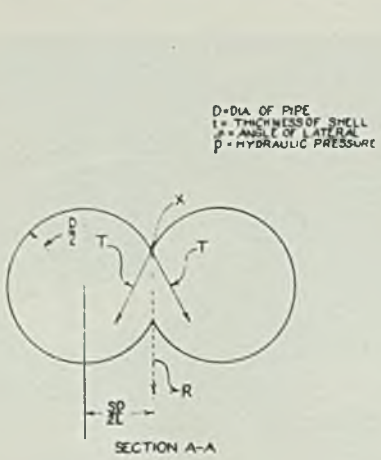


FIG. 3

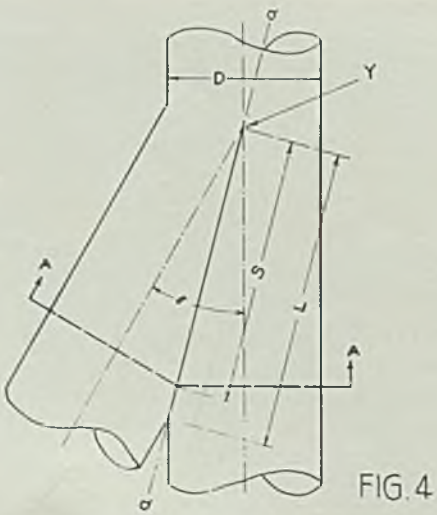


FIG. 4

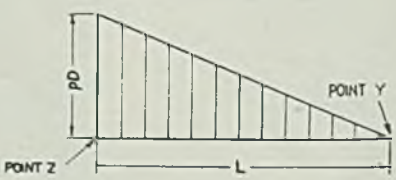


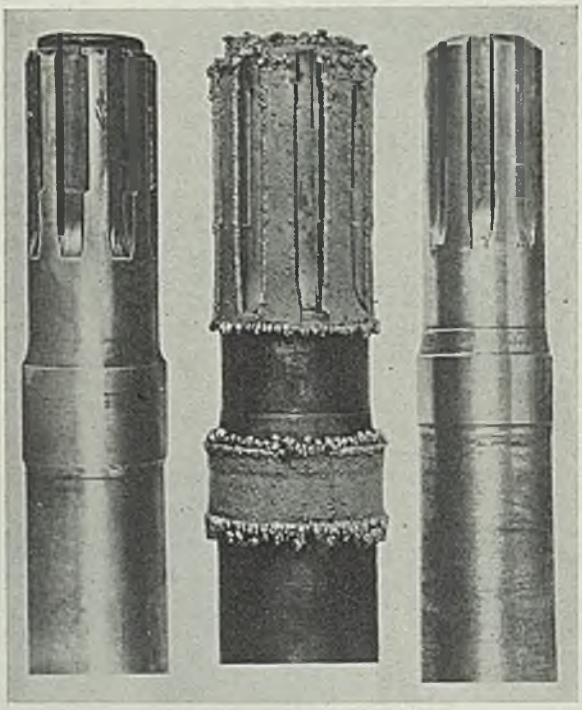
FIG. 5

Fig. 3—Design detail of arc welded steel lateral. Fig. 4—Loads R *of lateral occur along line* a-a. *Fig. 5—Triangular shape which represents the loading of the 60-inch 30 degree lateral*

SURFACE TREATMENT AND FINISHING OF METALS

Heavy Machine Parts Built Up By Nickel Plating

BY G. F. GEIGER
Development and Research Department, International Nickel Co., New York



Illustrating a spline shaft as worn (left), after being built up with nickel (center), and as machined and finished (right). The center photograph has been slightly enlarged with reference to the other two

NICKEL plating generally is thought of as a thin deposit of nickel, rarely over 0.002-inch in thickness, used chiefly for appearance or for protection against corrosion. Although this is generally correct, a process has been developed in Great Britain during the past 15 years in which heavy nickel deposits are used to build up worn or undersized metal parts. Known under the trade name of "Fescolizing," this process has been applied to heavy as well as small equipment. As this process has not been patented some details employed abroad have not been revealed. Some progress has been made in the development of a similar process in this country.

"Fescolizing" has been applied to carbon and alloy steel, case hardened steel, cast iron, malleable iron and the ordinary brasses and bronzes. It is also possible, when required, to build up nickel on such alloys as stainless steel and monel metal. The greater part of the work, however, is done on steel.

The part to be salvaged is first thoroughly cleaned to remove all traces of oil or grease. Since it is seldom that the whole article is to be built up, it is next dipped in a tank of molten low melting point wax and upon removal carries a film of wax over the entire surface. The wax is carefully removed from the part to be built up and the exposed area is cleaned in an electrolytic cleaner which removes foreign matter and traces of oxides.

The electrolytic cleaning operation, upon which the bond or adherence between the nickel and the basic metal depends greatly, must be carried out with great care. It is claimed that properly cleaned surfaces will give a bond between nickel and iron equal to the strength of the metals. The cleaning operation is followed by a rinse and, while still wet, the work is placed in the plating tank.

The plating is conducted cold, about 80 degrees Fahr., in still tanks which will accommodate machine parts weighing up to two tons, depending, of course, upon their shape.

The time required for deposition will depend upon the thickness desired and several days are sometimes required. Deposits are usually in the order of a few thousandths of an inch, but if necessary, may be built up to a half-inch.

After plating, the wax is removed by immersion in hot water and the built up area is machined or ground to size. For lathe work, the proper tool angles must be used to prevent tearing of the nickel. In some cases, grinding has been found advantageous.

The process holds definite advantage for engineers because it is

SALADIN DUMFOUNDS CRUSADER RICHARD THE LION HEART WITH THE KEENNESS OF DAMASCUS SWORDS.

THE FIRST IN A SERIES OF DRAWINGS DEPICTING INCIDENTS IN THE HISTORY OF FAMOUS STEELS.

DAMASCUS or HARRISBURG STEELS...

Both Made for a Particular Purpose

In Damascus, ancient city of Syria, the sword makers had developed a steel, the like of which had never been seen before.

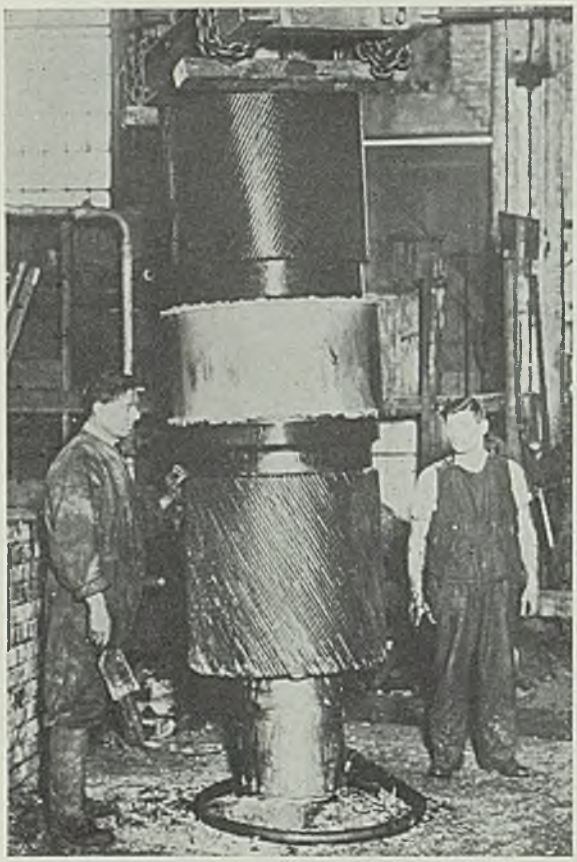
Above the artist pictures Saladin, sultan of the Saracens, demonstrating the keenness of his Damascus blade to Richard the Lion Heart, a leader of the crusading Christians. The Damascus steel was able to attain such an amazing keenness that a sword made of it could cut through the most delicate gossamer fabric floating in the air.

Though separated by a span of centuries, Damascus and Harrisburg steels have a common characteristic—an exceptional quality that results in products of exceptional merit . . . Damascus in the interest of war and destruction —Harrisburg in the interest of peace and construction.

Harrisburg steels are always made for a particular use. We welcome the opportunity to demonstrate to you how this practise of making products, from steels that suit, assures you greater value in these Harrisburg units: seamless steel pipe couplings, bull plugs, pump liners, gas cylinders; drop forged pipe flanges; coils and bends; drop and hollow forgings; carbon and alloy steels.

HARRISBURG, PENNA.

HARRISBURG STEEL CORPORATION



WORN section in center of the 8-ton turbine gear shaft was built up by means of the Fescol process

carried out at room temperatures and thus does not set up local stresses which may, in turn, cause distortion.

Nickel deposits may be varied in hardness up to 60 Scleroscope and, therefore, require no heat treatment.

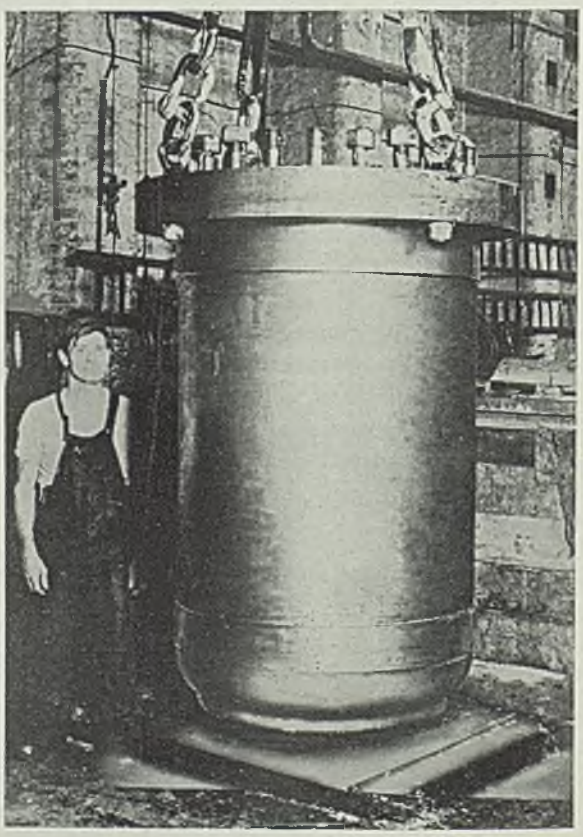
Wear Resistance is High

Restored parts offer favorable comparison with the original material. They remain bright and clean in storage and when exposed to any alkaline solutions or many acid and salt solutions, the nickel surface effectively resists corrosion. Numerous plant tests on crankshafts, pump shafts, impeller shafts, valve spindles, splines and similar parts have shown the wear resistance of the deposited nickel to be better in many cases than the underlying original metal.

Use of this process is not limited to restoring worn machinery parts. The nickel plated interiors of vats used in various food and chemical industries also may be restored without difficulty.

In the power field especially considerable saving has been effected by restoring worn parts which were then replaced in service in superheated steam at 800 degrees Fahr. The highest temperature to which rebuilt parts have been subjected is approximately 900 degrees Fahr. It may be found that they can be used at even higher temperatures. The coefficient of expansion of nickel (0.00000695) and steel (0.00000683) are so nearly the same that no difficulty has been experienced due to the slight difference that does exist between the two metals.

PLATING with nickel 0.03-inch thick made it possible to replace this 9-ton hydraulic cylinder in service at a fraction of the cost of a new cylinder



Metal Cleaners Improved To Cover Wider Field

E. F. Houghton & Co., Philadelphia announces an entirely new series of metal cleaners to be known as the Houghto-Clean, 100 Series. They replace the earlier series of the same name and cover a wider range of operations than the older type.

The 100 Series is made up of nine compounds covering light, medium and heavy duty cleaning. They are said to do an efficient and rapid cleaning job in any operation where an alkaline cleaner is desired, and to remove all kinds of oils and greases—animal, vegetable and mineral. One grade is specially designed for cleaning after carburizing.

This series is adaptable to tank, high pressure washing, steam gun, electrolytic and many other cleaning operations. It is said to leave the metal surfaces in the proper condition for japanning, galvanizing, electroplating, lacquering or any other type finishing. Each is a balanced cleaner, free rinsing and is claimed by the manufacturers to be exceptionally efficient at low temperatures.

A folder has been prepared which describes the individual members of the Series and gives their properties and uses. This folder can be had by writing to E. F. Houghton & Co., 240 West Somerset St., Philadelphia.

Butane Gas Burning Systems Include Many Improvements and Safety Devices

FOLLOWING research and development work, the butane gas burning systems designed and built by Southern Steel Co., San Antonio, Tex., have received approval for listing by the Underwriters Laboratories, Chicago, as safe systems. The company now is manufacturing and selling approximately 175 of these systems per month, as compared with approximately 100 a year ago.

Covered by patents and by patent applications pending, the latest improvements include several features. One of them is a combination safety relief, cut off and excess flow valve; in the event of a break or leak in the service line, the excess flow valve closes automatically, preventing fire and explosion hazards as well as preventing wastage of fuel. Another is a device which prevents overfilling of the underground butane storage tank beyond the safe liquid level. Another feature is a housing or protective casing formed of 10-gage sheet steel. It houses and protects the pressure regulator and valve assembly. This casing serves as a shipping case and makes it possible to ship the unit fully assembled, with no danger of damage during shipment. The housing is attached to the shell by means of bolts and lugs and it is provided with a hinged steel cover, fitted with a padlock to prevent tampering. Steel pipe and high-pressure valves which are specially designed for liquefied petroleum gases comprise the filling and discharging system. The regulator valve reduces the tank pressure, 40 to 50 pounds per square inch, depending on temperature, to 6 ounces for the service line.

Range of Sizes Available

These butane units are made in six sizes, from 2 to 4 feet in diameter, from 116 to 1109 gallons in capacity and from 450 to 2250 pounds in weight. The tanks are fabricated in accordance with the code of the American Petroleum institute and American Society of Mechanical Engineers covering unfired pressure vessels for petroleum liquids and gases. The tank shells are made of boiler steel plate ranging from 3/16 to 5/16-inch thick, while the flanged and dished heads are of ¼ to ½-inch boiler plate. Shells are formed on bending rolls while the heads are obtained from outside sources. All joining is done by the electric arc welding process, with subsequent hydrostatic tests to conform with code requirements and to detect any possible leaks.

On the site of installation, these units are buried underground so that only the top of the housing shows above ground level. The house service line is connected to the lower part of the valve assembly unit, about 2 feet underground.

This means that the underground storage tank must be thoroughly protected against soil corrosion. The method followed is to apply two coats of red lead, followed by one coat of refined asphalt paint. Finally, the tank is wrapped in burlap or builders' paper to protect these coatings against abrasion while lowering it into the ground. Based on experience, it is believed that this treatment will protect the tank against corrosion for a minimum period of 10 years.

Air Conditioning Reduces Colds in Machine Shop

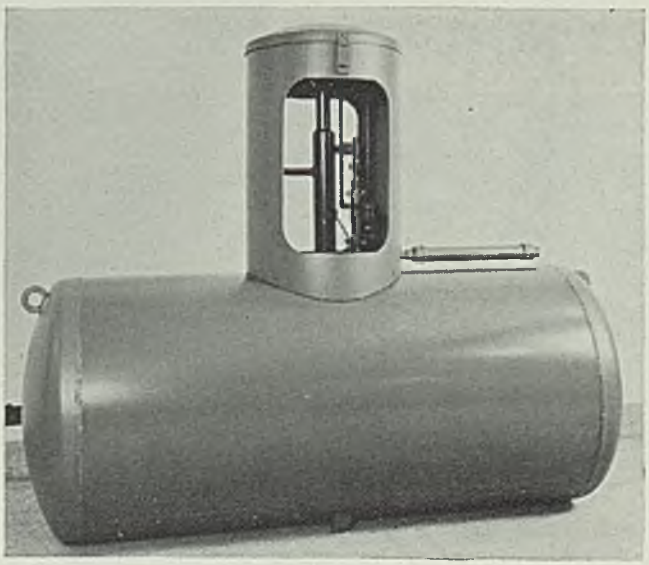
Health conditions have been improved in the machine shop of International Business Machines Corp., Endicott, N. Y., as a result of the installation of air conditioning apparatus. This apparatus, installed purely for the comfort of the workmen, consists of 29 self contained units, 6 of which are fresh air units and 23 are recirculating units. All units are automatically controlled from thermostats, both as to temperature and humidity. The air passing through each unit is filtered.

Both heating and cooling are accomplished by the use of exhaust steam at 2 pounds pressure. Cooling temperatures are obtained by passing this steam through a decalorator, which creates a vacuum in a flash tank. By this means, water at 52 degrees Fahr. is cooled to approximately 46 degrees Fahr. Normally the higher temperature water would be sufficiently cool for temperature control, but to obtain accurate humidity control it has been found necessary to cool it to 46 degrees Fahr. Peculiarly enough, it has been found that due to the heat load in the machine shop caused by occupancy and heat thrown off by the machine tools, this system operates on "cooling" with outside temperatures as low as 50 degrees Fahr.

Due to the fact that all piece work was done away with at about the same time the air conditioning was introduced, there are no figures to indicate whether or not the improved conditions speeded up production. However, by going over back records, it has been found that there was a very large decrease in time lost due to ordinary head colds. Men suffering from hay fever were also afforded much relief.

New Furnaces of Steel

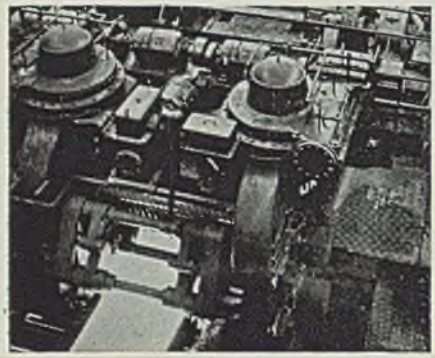
Pacific Gas Radiator Co., Huntington Park, Calif., has placed on the market a new line of forced air furnaces built as complete units for year-round heating and air conditioning. They are enclosed in compact all steel cabinets finished in two tones, ivory with tobacco brown trim, or gray-green with black, trim. They have built-in features for completely automatic operation. While the company uses copper bearing steel for its heating element, the latter is rustproofed as a precaution.



Butane gas burning system for underground installation includes a number of recent improvements. Sales of such units have nearly doubled in past year.

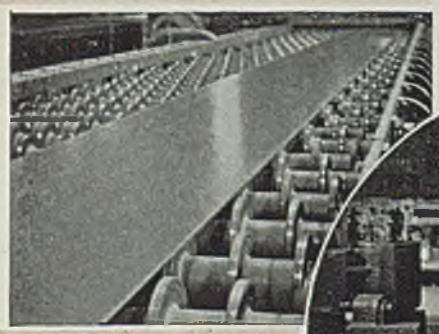
LAST WORD IN PLATE

The magazine feeder saves space, time.

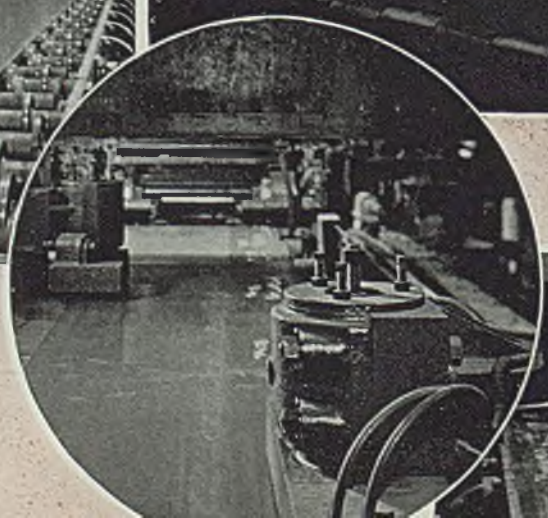


The most modern equipment gives the plates uniformity.

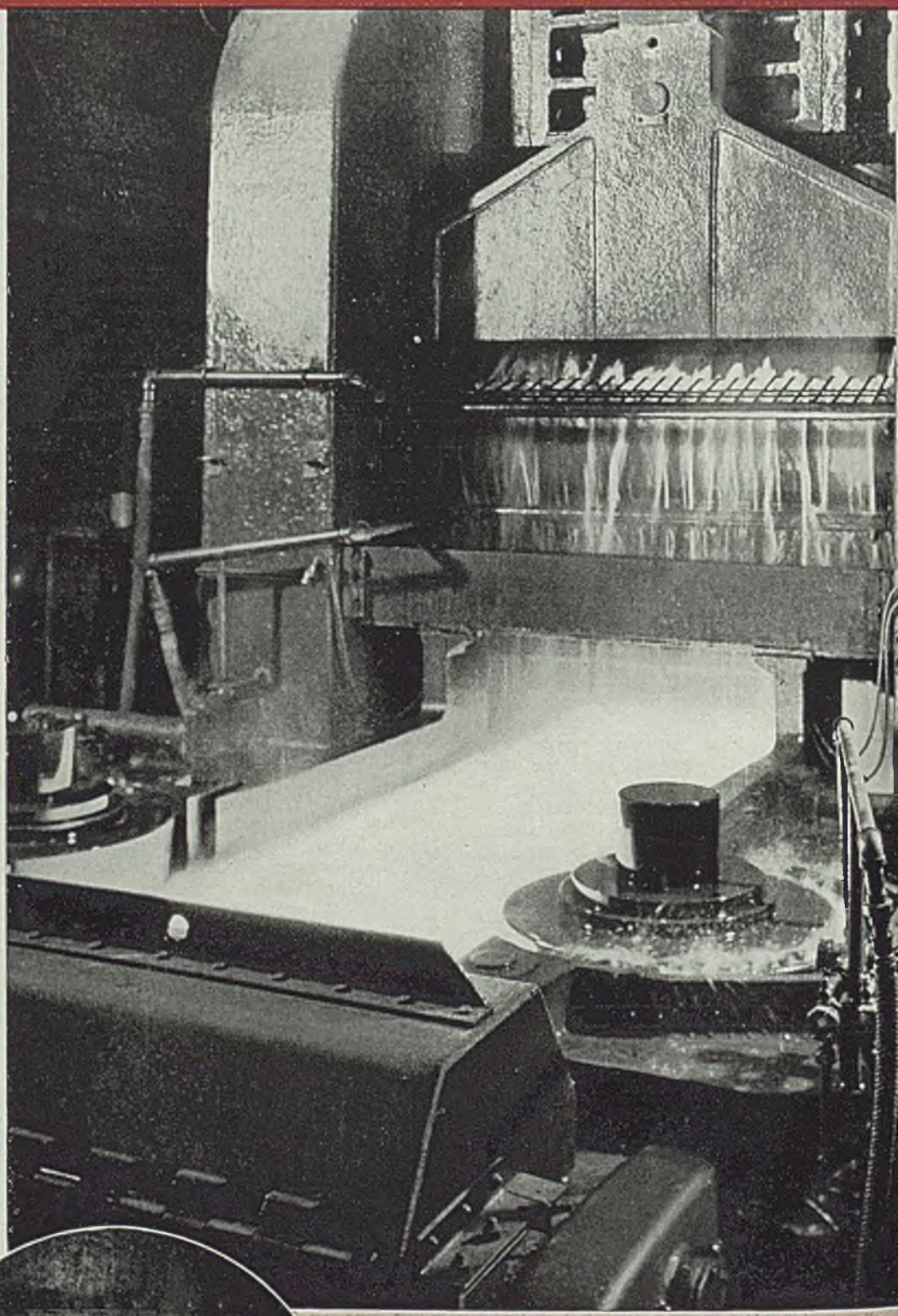
The Four High Finishing Stands give the plate its superior finish.



On conveyor tables the plate cools off.



At the right, electromagnets are guiding a plate through the rotary shear.

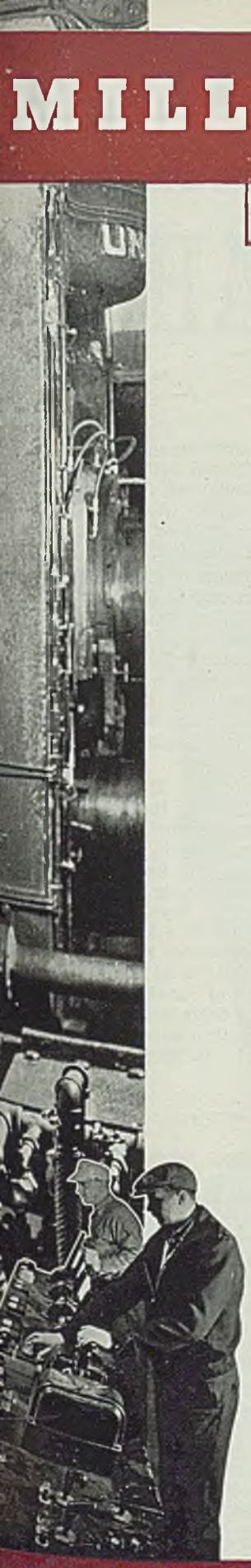


These operators are craftsmen, worthy of the metal they work.

Below is a Carnegie-Illinois invention, the rocking shear, designed to eliminate shear bow.

MILLS

Opens at Homestead



100" Semi-continuous . . . . Built to Satisfy the modern demand for Finer Plates and the heavier gauge Sheets

IMAGINE a plate mill 861 feet longer than the Normandie (1890 feet overall), so designed as to obtain maximum efficiency from every square foot of floor space . . . a mill with the most modern equipment of its kind ever built. What does this mean to you in quality? In service?

Plates with a satin-smooth finish. An experienced workman operates the magazine feeder, an innovation which saves space and time in transferring piles of steel slabs from the storage floor to the three reheating furnaces. Skilled observers continually watch and control the temperature of the slabs as they pass through the furnaces. Other workmen, high above the mill in their pulpits, direct the movement of the steel through the mill stands. Rolls of the finest quality in the Scale Breaker, the Four High Spreading Stand, the Reversing Rougher and the four Finishing Stands . . . plus the control of craftsmen . . . give the steel plates and sheets their clean, uniform, bright finish.

Plates of the gauge and width you specify. Modern rolling mill machinery is set to fractions of an inch—as the steel passes through . . . is squeezed, squared, stretched, elongated, finished . . . all under the direction of men who know their jobs. Electromagnets line up the plates as they are cut to the widths you want. Then the rotary shear trims the edges.

Plates free from shear bow. A rocking shear, invented by Carnegie-Illinois engineers, cuts the steel plates to length and eliminates shear bow. The curved rocking blade, our own invention . . . never before used in a steel mill . . . does away with the frictional drag of a straight blade . . . saves an extra flattening operation . . . because these plates have no arch in them.

Plates of the kind you want, when you want them. The new mill is designed to roll high tensile steels (COR-TEN, MAN-TEN, SIL-TEN), alloy steels, and all types of commercial carbon plates, as well as skelp and heavy gauge sheets. Thus we can supply you with any type of plate you specify, in a variety of finished widths and gauges. Also, with the opening of this new mill, we have increased our total capacity so that you can have your orders filled more rapidly . . . and at the same time be sure of superior quality and finish.

This new mill is one of the numerous sheet and plate mills operated by Carnegie-Illinois in the Pittsburgh and Chicago districts.

As the new mill turns out plates finer than you'd believe possible, our furnaces, finishing stands, shears and stackers are operated by men worthy of the metal they work. Behind them is our technical staff, thoroughly experienced in steel, ready to help you with your plate problems. Call on them. Visit the new mill. We are ready to give you the service and the quality in steel for which USS is justly famous.

CARNEGIE-ILLINOIS STEEL CORPORATION

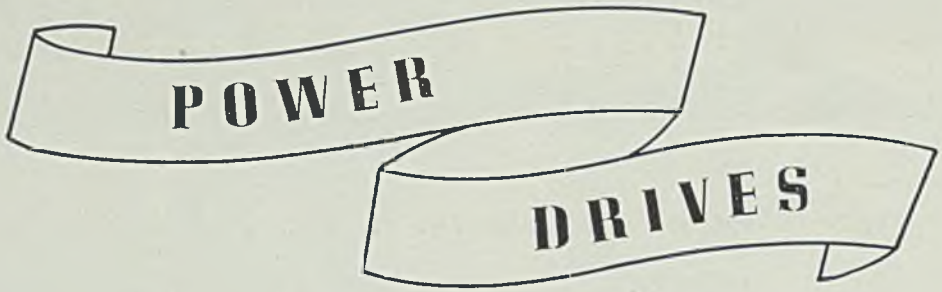
Pittsburgh

Columbia Steel Company, San Francisco, *Pacific Coast Distributors*

Chicago

United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL



Proper Regrouping of Machines Will Balance Load and Cut Power Costs

ORDINARILY the grouping of machines to drive from a single lineshaft smooths out extreme fluctuations in power requirements and provides a fairly smooth, continuous demand on the motor. This results, if properly planned, in more efficient operation at more nearly the motor full load rating with a better power factor.

Sometimes, however, motors on group drives of machines operating the same fluctuating cycles, such as automatic punch presses on identical work, operate badly as group drives, since the machines get in step and pyramid the peaks and valleys of power requirements. Such was the condition in an eastern plant.

Cites Case in Point

On one small group of 3 large eyelet machines driven by a 10-horsepower motor difficulty was experienced when operating on heavy steel stock due to the high peak loads slowing down the motor. Also, probably the flywheels were not heavy enough to provide sufficient momentum for the heavy stock. Another group of 4 small eyelet machines, also driven by a 10-horsepower motor, operating on light brass stock, was much underloaded.

Combining the two groups on a single shaft driven by a 15-horsepower motor "diluted" the peak loads and provided a more powerful motor to absorb the shocks or peaks and resulted in a lower percentage of fluctuation in the demand. These changes were made after a careful analysis of the load and operating cycles as pictured in a graphic recording meter.

The results of this change were an improvement in the power factor of from 59 to 85 which made a saving of $64.70 annually, and an additional saving in energy consumption and demand charge of $46.80, or a total annual saving of $111.50, as well as improving the operation.

In still another group of 11 identical blanking machines the charts showed similar pyramiding of load and corresponding overloading and slowing of the motor at peak points. This also was remedied by regrouping of dissimilar machines with corresponding savings and advantages.

For years shop practice has advocated grouping of identical machines on similar work, largely for the advantage in supervision. More modern studies of machine loads indicate that re-grouping to include different machines or machines on different operation cycles often provides a better and more even power load, seldom with any increased problems in supervision.

Often two other advantages are obtained by proper re-grouping. Placing second or third operation equipment beside blanking presses, thus making the entire group a complete and self-contained manufacturing unit, results in lessened materials handling as work progresses from machine to neighboring machine. Also, by mixing the operations and subdividing the groups it is generally possible to shutdown one or more groups to meet varying production requirements. In other words, each group is made as nearly as possible a complete production unit in itself, or, as sometimes called, "a shop within a shop." These advantages are in addition to the better operating characteristic of the drive. A careful study of conditions determines whether these changes are improvements.

♦ ♦ ♦

Builders of Goodwill

NO OTHER group of plant personnel has as extensive contact with the various departments and workers as the men engaged in inspection, servicing and maintenance of equipment. Obviously, therefore, no other group has as wide an opportunity to spread good will, or the opposite, as these men.

The most important consideration in selecting maintenance and servicing personnel is, of course, the ability of the men to perform their work. Another factor, particularly important in the foremen and group leaders, is their ability to get along with all types of men. Firmness, with diplomacy, are requisites for this.

Troublemakers, either of the surly, quarrelsome type or those with distorted views on the world in general, can irritate, disturb and dissatisfy workers to an extent far greater than is ordinarily appreciated. Similarly a loyal, level-headed man can exert a beneficial influence as he goes about his work.

Careful consideration of the personal attributes of maintenance men as well as of their trade qualifications may well be given in their employment and assignment to duties.

♦ ♦ ♦

When planning across-the-line starting for motors consider the ability of the machine to withstand the shock of sudden pick-up of load and speed and the effect of machine inertia on belts or other power transmission connecting equipment, such as backlash in gears. Also, from the electrical standpoint see that the feeder circuits are of sufficient size to carry the heavy current demanded.

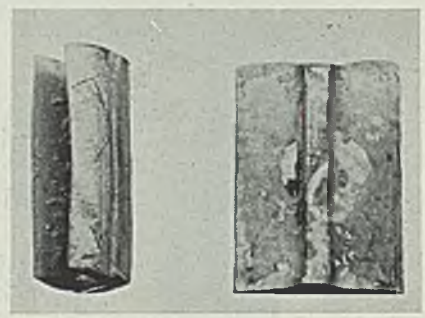
♦ ♦ ♦

Do not overfuse. However, fuses should be of sufficient rating to take care of momentary overloads. Where equipment is subjected frequently to sudden, unpreventable peak loads or stoppages the use of automatic protective devices which can be manually reset by the operator after the cause of the overload is cleared, make it unnecessary to call an electrician at each stoppage.

Manual Operations Predominate in Manufacturing High Quality Axes

HIGH grade axes are not made by special machinery. Their production involves manual skill developed only through long practice. Another curious fact regarding ax manufacture is that in the production of high grade goods, the methods followed and the sequence of operations have changed very little during the past century. However, modern ax manufacturers are keenly alive and are more than willing to adopt innovations that prove beneficial. Among the improvements adopted since the first ax factories were established can be mentioned the forming of the ax head from solid stock under a heavy press, drop forging the ax as a final forging operation to insure all axes of a like pattern being symmetrical, the substitution of abrasive grinding wheels to replace grindstones, and the introduction of modern heat treating methods to replace the open fires of former times. In this article is illustrated and described the processes followed in making high grade hand forged axes at the plant of the Warren Axe & Tool Co., Warren, Pa. This company has a capacity of approximately 2000 axes per day. More than 30 varieties are made.

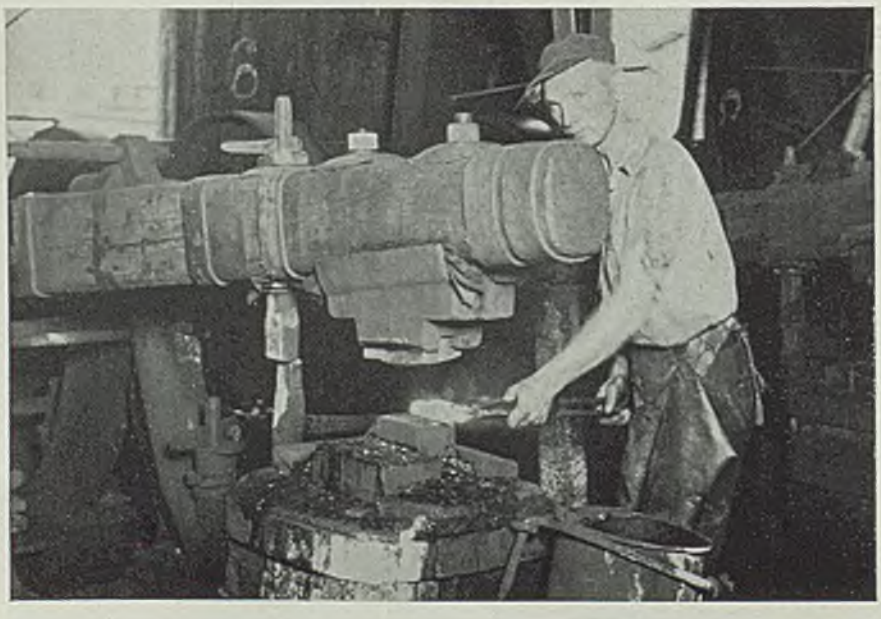
The first step in making an ax is to form the head. The material used is high grade low carbon steel, which replaces the wrought iron formerly used. The blank is cut off cold from bar stock in an alligator shear. These blanks are heated in a gas fired furnace. The red hot stock is passed by the heater to the head press operator. He puts the stock between dies which fold in to hold it, then a punch descends and punches out the hole. The head press is a tandem unit. After the hole is punched the stock is shaped on the outside under a series of dies with which the press is provided, resulting in the finished head. Previously the head was forged from flat stock and bent over to shape to form the eye. In the early days of ax manufacture when this was a hand forging operation one smith and two strikers required from five to ten minutes to forge a single head.



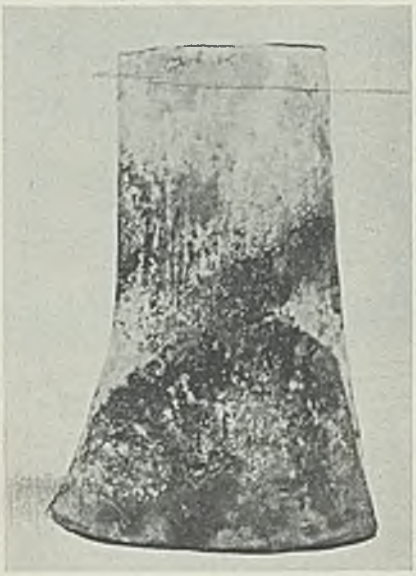
AT right is shown a piece of so-called overcoat steel as it comes from the mill—The part at the left has been heated and bent into shape

While the ax head is soft steel, the bit must be high quality tool steel. Modern axes generally are made by the so called over coat process, wherein the bit overlaps the head. The bit stock is called "overcoat steel." The stock cut off to the correct length is heated in a gas fired furnace and forced through a die which bends it into shape.

The next step is to heat both the head and the bit and to draw out the bit under a trip hammer. This operation is termed "bit drawing" and calls for a high degree of skill which is developed only through long practice. This is a two-man operation calling for a bit drawer and a heater. The heater heats several heads and bits in a small gas fired furnace; then at the correct welding heat the heater places the head of an anvil and puts the bit in place using borax as a flux. The bit drawer drives the bit over the



BIT drawing is a fine art calling for considerable practice—The design of the trip hammer has not been changed materially in the last century although improved types of hammers are seen in some shops



BIT has been drawn and the ax roughly formed by inserting a mandrel in the eye and subjecting it to a drop forging operation

head with a few hammer blows, takes the bit and head to his trip hammer, which makes 400 strokes a minute. Both the anvil and head are fitted with steel dies. The bit drawer must manipulate the work wholly by hand to draw out the bit properly so as to be neither under nor over drawn.

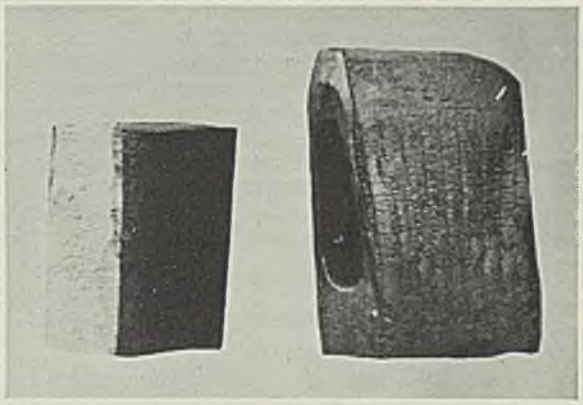
While the trip hammer may seem crude when compared with modern forging appliances, nothing better has been devised in the opinion of the ax makers. The lower die is fastened to the anvil which is mounted on a wood block, set firmly on a foundation two feet underground. The hammer beam is hard wood, iron bound, with the head held in place with bolts. The hammer beam swings on trunnions and is actuated by trips set on the drive shaft. These trips come in contact with another trip on the back of the hammer beam.

Bit drawing performs two important functions, shaping the bit properly and refining the steel. Such a process results in a hand forged ax since the bid drawer manipulates the work wholly by hand. Trip hammers seen in ax factories today are almost exact replicas of those used a century ago. The ax manufacturer informs us that the wooden beam and anvil block afford a certain abount of elasticity which is essential for good work. Trip hammers have been improved during the last century, but many makers of high grade axes prefer the old style hammer.

After the bits are drawn the axes are reheated and subjected to a forging process, termed "dropping." A steel mandrel of the desired shape is driven into the hot ax which is then placed in the lower die of a heavy board drop forge hammer. One stroke of the hammer is sufficient to bring the ax to the correct shape. It is necessary to have a large number of dies on hand to accommodate different pattern axes. These dies are made of a special drop forge die steel. Axes always are spoken of by the ax maker in terms of dozens. As some time necessarily is consumed in setting up a drop hammer for a given pattern of ax, they are "dropped" in lots of several hundred dozen whenever possible. While its exterior is somewhat rough, the desired symmetrical shape has been imparted.

The dropping process has been in use for over half a century and it leads the layman into confusion as it gives the impression that axes are formed by the drop forging process. Cheap axes are made wholly by drop forging, but a few blows of the drop forge hammer cannot refine the bit to the extent possible through the bit drawing process under a trip hammer as previously described. Such axes are satisfactory for splitting wood or cutting down an occasional tree or for any intermittent work where a high grade tool is not essential. However, the lumberman who uses an ax all day long, felling immense trees, demands the highest grade ax possible to produce. His ax must be highly refined steel, tempered correctly, so it will hold its edge for a reasonable time between grindings.

With the "dropping" process previously described, the forging work on the ax is complete. Such an ax properly tempered and sharpened would cut wood, but the rough sides of the ax would lessen the force of the axman's blows as the rough ax would bind in the wood. Further, rough axes would not sell in competition with highly finished ones, so careful grinding and polishing are necessary.



ROUGH stock for an ax head is shown at the left—At the right is the head after it emerges from the head press with the eye punched and the sides roughly formed

AX bits and heads are heated in a small brick gas fired furnace by an operator technically called a heater who works in conjunction with the bit drawer

WELDING, etc.

by Robert E. Kinkead

Welding Foremen

AS CONDITIONS change rapidly in the ascending spiral of industrial production the importance of welding foremen who know their jobs is becoming evident. The welding foreman is the shock absorber between management in the accomplishment of its purposes and the men working at the job of earning a living. The foreman deals with the problem of applying science and common sense in spite of the more or less irrational behavior of both management and men who are both actuated by the perfectly legitimate desire to get more profit or more money.

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.

Successful management is achieved only by long years of experience. The smart young men with their clever systems for this and that gain wisdom when they live on the job with the men for a few years and get greater understanding of how human beings behave. Forebearance, tolerance and understanding are usually not a part of any system.

Not long ago we sat in on a conference with a successful general manager and two of his welding foremen. One of the latter damned everything about the company from the front gate to the shipping floor and quit. The general manager talked to that man for a few minutes as an understanding human being and he went back on the job, not only a better foreman but a better man. The general manager knew enough about the man's home conditions to understand why he "flew off the handle."

There are two conditions, either of which almost always wreck a welding department. First, the men believe the foreman is harassing and grinding them down to make a show to management; and second, management believes the foreman is fomenting discontent among the men and unduly championing their cause at the expense of the company.

Able welding foremen may be had by choosing men who are temperamentally adapted to the job, then training them properly in the responsibilities involved.

♦ ♦ ♦

Pipe Welding

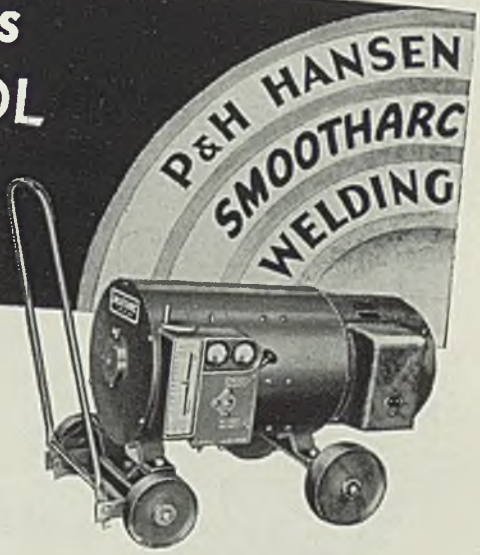
TRANSCONTINENTAL pipelines are welded by the oxyacetylene or electric arc process, methods which unfailingly arouse admiration in the minds of manufacturers who believe in precision and safety. There are no codes or public regulations, yet the operations are carried out with almost perfect precision. Climate, soil, elevation and a hundred other factors change from mile to mile but the welds made by fallible human beings remain high in quality above the lowest tolerable limit. The methods employed involve supervision, inspection and random testing.

Streamlined Design Saves Time

SEVEN weeks were required to construct two 92-foot tugs, recently completed at the yard of the Gulfport Boiler and Welding Works, Port Arthur, Texas. The yard reports the fast construction was obtained by utilizing a unique streamlined design which saved approximately 20 per cent in time. The vessels are reported to be the largest all welded tugs ever constructed in the Gulf Coast district. Vessels are to be used for towing oil barges in coastwise service and were designed by George B. Drake, naval architect, New York. Photo courtesy Lincoln Electric Co.

MODERN ARC WELDING DEMANDS

- SINGLE CURRENT CONTROL
- SELF-EXCITATION
- INTERNAL STABILIZATION



THE SMOOTHARC WELDER IS DESIGNED AND PATENTED TO MEET THESE REQUIREMENTS

The patented P&H Hansen Smootharc generator gives you advantages that no other welder can give you . . . single current control with built-in self-excitation and internal stabilization. The P&H Hansen Smootharc Welder with its simple control equips you for a wider and more varied range of work.

NO AWKWARD DUAL CONTROLS

The patented P&H Hansen Smootharc Welder provides a generator with pole shoes specially designed for simple brush-shifting single current control. Easier, faster, superior welding is the result.

NO SEPARATE EXCITERS JUST HUNG ON

Self-excitation is obtained through the unique application of special built-in auxiliary exciter brushes . . . an arrangement that provides proper excitation at all current settings . . . assures high open circuit voltage with resulting ease in striking the arc.

NO TROUBLESOME FIELD RHEOSTAT OR CIRCUIT ADJUSTING SWITCHES. The amount of current desired is quickly obtained by adjusting the one control, conveniently located . . . and this micromatic device provides for an infinite number of current settings. The current setting is automatically and positively maintained by the Smootharc generator — without further attention from the operator.

Get the complete facts on Smootharc Welding with Smootharc Welders — write for bulletin.

HARNISCHFEGER CORPORATION, 4411 W. NATIONAL AVE., MILWAUKEE, WIS.

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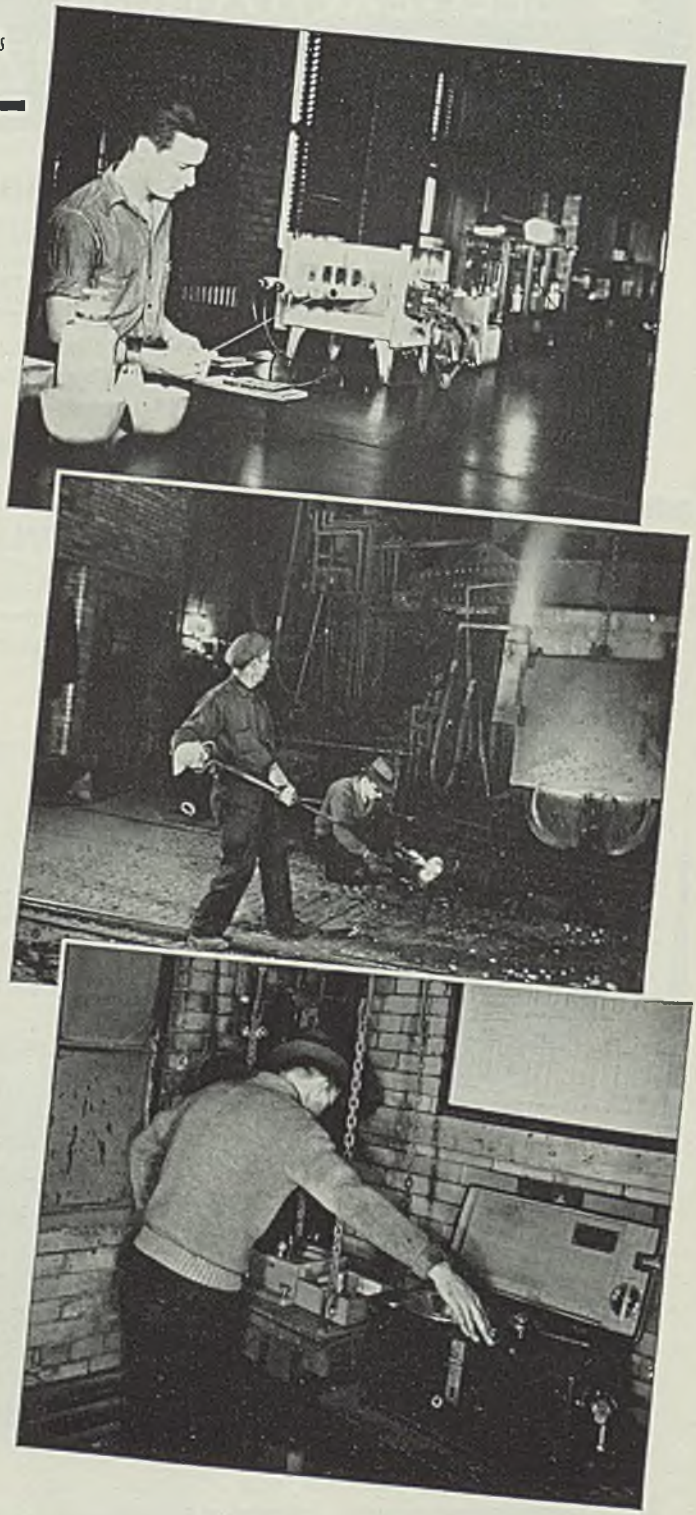
MODERN PROCEDURE IN ALLOY STEEL PRODUCTION

A Series of Advertisements based on Timken Methods

No. 6

Carbon Control



Close control of carbon is a vital factor in the manufacture of alloy steel, hence the extreme care that is bestowed upon this phase of production in the Timken steel plant.

The usual method of controlling carbon is to pour test samples at different stages of the melt. These are sent to the chemical laboratory and submitted to a chemical test, the results being reported to the furnaces as quickly as possible.

However, even with such modern aids as the pneumatic tube for rapid transference of the samples from furnace to laboratory, and the telautograph to flash test results back, there is necessarily an appreciable lapse of time.

To bridge this gap, Timken carbon control practice includes the use of the Carbometer, by means of which supplementary carbon checks can be made right on the furnace floor, thus enabling even closer control of carbon to be maintained. The Carbometer is a recently-developed scientific instrument that operates on a magnetic principle. Accurate carbon readings can be made in a few seconds.

TIMKEN STEEL AND TUBE DIVISION
THE TIMKEN ROLLER BEARING COMPANY
CANTON, OHIO

TIMKEN ALLOY STEELS

ELECTRIC FURNACE AND OPEN HEARTH • ALL STANDARD AND SPECIAL ANALYSES

Acid Proof Brick Joined with Sulphur Cement Protects Concrete and Steel

CONCRETE and steel can be protected against the action of dilute or concentrated acids and various corrosive salt solutions by sheathing of acid proof brick joined with sulphur base cement, according to Dr. C. R. Payne, Atlas Mineral Products Co., Mertztown, Pa. This company recently placed on the market a sulphur base cement, developed at the Mellon Institute of Industrial Research, Pittsburgh, which is now in use in several hundred tanks of all sizes and in various processing industries. In service these tanks successfully withstand various concentrations of hydrochloric, sulphuric, nitric, hydrofluoric and phosphoric acids and solutions containing ferric chloride, ferrous sulphate, copper sulphate, copper chloride, and zinc sulphate at temperatures up to 200 degrees Fahr. without deterioration or leakage.

Applications include tanks for the pickling of steel and other metals, electrolytic refining of metals, storage tanks for acids and other corrosive chemicals, industrial sewers, sump pits, neutralizing pits and acid proof floors.

Several Types in Use

There are several general types of construction. Welded steel tanks, lined inside with rubber and sheathed over the rubber with 8 inches of sulphur cement joined brickwork, have given excellent service. Successful, too, are steel tanks covered with alternate layers of asphalt cement and plasticized sulphur which are then lined with sulphur cement joined masonry. The exterior of the steel tanks is usually protected by periodical painting with a high grade acid proof paint.

Reinforced concrete tanks are made acid proof by coating them with asphalt cement or alternate layers of asphalt cement and plasticized sulphur and then lining them with sulphur cement joined masonry. If the outside of the concrete tank is to be subjected to acid fumes or acid splash, protection is afforded by capping the top of the concrete and veneering the sides with acid proof brick joined with sulphur cement.

Owing to the difference in thermal conductivity of sulphur cement joined masonry and concrete or steel and the difference in coefficient of expansion of these materials, a layer of rubber or other suitable plastic material must be placed between the brickwork and the outer structure if the tank is to be subjected to wide fluctuations in temperature.

Tanks built entirely of sulphur cement joined masonry have the advantage of being 100 per cent acid proof throughout. This type of construction is particularly satisfactory for the building of tanks for the pickling of metals or the electrolytic refining of metals in which processes the exterior of the tanks is subjected to the attacks of acid fumes or acid splash. Other applications are for the construction of pits, storage tanks, or sewers built in acid soaked ground.

For large tanks which are used to hold liquids at temperatures up to 200 degrees Fahr., acid proof and acid tight expansion joints are inserted in the brickwork at varying intervals. The expansion joint is built up by cementing a series of horizontal and vertical soft unvulcanized rubber plates to their brick surfaces in such a manner as to displace a given volume which would otherwise be filled with sulphur cement. Upon application of heat to the acid bath, the brickwork expands. The rubber is compressed into the pores of the brick and vulcanized in this position, thus setting up an expansion joint.

Basic Handbook Presents Engineering Fundamentals

Handbook of Engineering Fundamentals, by O. W. Eshbach, editor-in-chief, and 40 contributors; flexible binding, 1081 pages, 6 x 9, illustrated; published by John Wiley & Sons Inc., New York; supplied by STEEL, Cleveland, for $5 plus 15 cents postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

This is the first volume in the proposed new Wiley engineering handbook series which represents a revision of the basic conception of American handbooks. Since mathematics, physics and chemistry form the basis of all engineering, these are the fields dealt with in the new volume. It is designed to present in one compact volume a complete summary of the facts pertaining to the fundamental theory underlying engineering practice.

The first section presents a selection of mathematical and physical tables, including new and revised tables of the American handbook series. In addition to well-arranged tables on engineering constants, properties of numbers, logarithms, trigonometric and hyperbolic functions, there is included a series of tables of conversion factors for weights and measures, arranged in order of dimensional sequence, tables of integrals, standard structural shapes, and physical properties of metallic and nonmetallic materials.

Other sections offer such features as the presentation of dimension systems, systems of units, standards, and introduction to the theory of dimensional analysis; the systematically arranged and clearly illustrated fundamentals of theoretical mechanics and mechanics of materials with applications to beams, columns, shafts, and reinforced concrete; the modern theory of fluid mechanics as applied to the fields of hydraulics and aerodynamics; engineering thermodynamics, embodying the latest physical concepts of the fundamentals of heat engineering; the theory of the electric, magnetic and dielectric circuits and their application to generalized networks and transient theory; the fundamental principles of general chemistry, chemical tables and industrial chemistry; the principles of light, acoustics and meteorological phenomena; an extensive handbook treatment of the properties of metallic and nonmetallic materials with reference to features of manufacture and use; and a discussion of the elementary legal aspects of contractual relations with which all engineers should be familiar.

Section 11, devoted to metallic materials, gives the general properties of metals and alloys under authorship of Bradley Stoughton, Frank N. Speller, William Corse, J. D. Edwards, Zay Jeffries and other authorities. Those properties designated for various cast ferrous and nonferrous metals which have been given in low range in older handbooks have been brought up to date to include the properties of modern castings.

Announces Air Circulators

Three blades on the new air circulator for 1937 give greater breeze penetration and quieter operation without increase in current consumption, according to engineers and designers of the Emerson Electric Manufacturing Co., St. Louis. All types of the new fans can be provided with any of the four styles of mounting brackets supplied by the company, to give ceiling, wall, counter or adjustable floor column mounting. Two alternating and two direct current models are available.

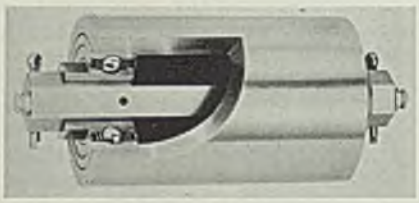
PROGRESS IN STEELMAKING

New Bearing Design Is Built with Self-Contained Double Seal

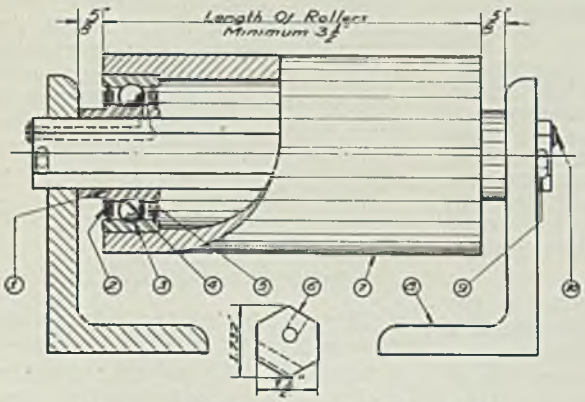
TWO new ball bearing roller designs, both suitable for heavy-duty service, have been incorporated in the conveying equipment of new broad strip mill. They are built with self-contained double seals which protect the ball bearings and ball raceways from dirt, dust and grit. One design is available with 4, 4¼ and 4½-inch diameter rollers in standard lengths ranging from 6 to 48 inches and spaced center to center from 6 inches up, to suit specific requirements.

Industrial grease fittings are used and afford a means of periodic lubrication. Load ratings vary with the three available diameters as follows: When used as gravity roller conveyor the continuous load rating per roller of 4-inch diameter is 3000 pounds; 4¼-inch diameter, 4000 pounds; 4½-inch diameter, 4500 pounds. When used in level lines the 4-inch diameter unit has a load rating of 3500 pounds, the 4¼-inch diameter, 4500 pounds, and the 4½-inch diameter, 5000 pounds.

In the accompanying illustrations is shown the 5-inch diameter roller available in lengths to suit within practical limits and having features similar to those previously mentioned. This type is applied for both power-driven and gravity applications. Each roller has a continuous load rating of 8000 pounds.



Cut-away view of ball bearing roller showing hexagon axle which prevents rotation of inner ball race



1. Broached Hardened Chrome Steel Inner Race.
2. Outside Labyrinth Seal.
3. Hardened Chrome Steel Solid Outer Race.
4. 8 Hardened Chrome Steel Balls ⅝" Dia.
5. Inside Labyrinth Seal.
6. Section Thru 1½" Hexagon Axle.
7. 5" Dia. Seamless Steel Tubing .71" Wall.
8. 7"x4"x¾" Angle Frame Rails.
9. ⅛" Dia. Cotter Pin.
10. Grease Fitting.

Continuous Load Rating 8,000 Lbs. Per Roller.

Details of 5-inch roller which is built for a continuous load rating of 8000 pounds

Both types incorporate hexagon axles thus preventing the inner ball raceway from rotating on the axle which is held stationary in the conveyor frame. Seamless steel tubing is employed in both designs, the wall thickness varying from 5/16 to 9/16-inch for those ranging from 4 to 4½-inch diameters and 0.71-inch for the 5-inch type.

Frame rails of various shapes are available as standard with rollers above or below the top of the frame as required. Both types of rollers are a product of the Mathews Conveyer Co., Ellwood City, Pa.

• • •

Filler Is Nonshrinkable

New pliable, waterproof, nonshrinking material has been developed for pattern shops at iron and steel plants that is suitable for mending wood, filling defects and and building up broken edges and broken corners of patterns. The material can be sanded with the wood after it has dried and can be scraped, sawed and cut; nails also can be driven through it. The filler will absorb shellac or stain.

• • •

Corner Radius Important

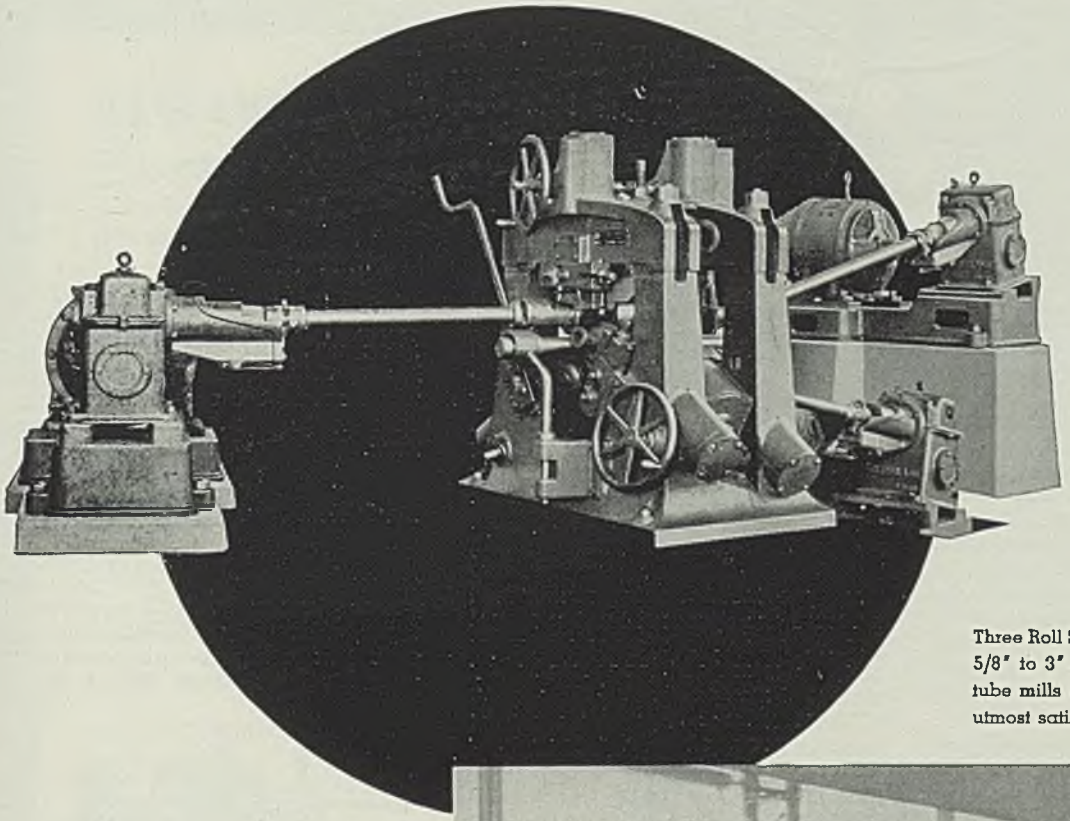
Investigation by a Pennsylvania steelmaker indicates that corner cracks on ingots are influenced largely by the corner radius of the mold. For molds 21 x 23 inches a corner radius of 1½ inches or smaller gives good results.

• • •

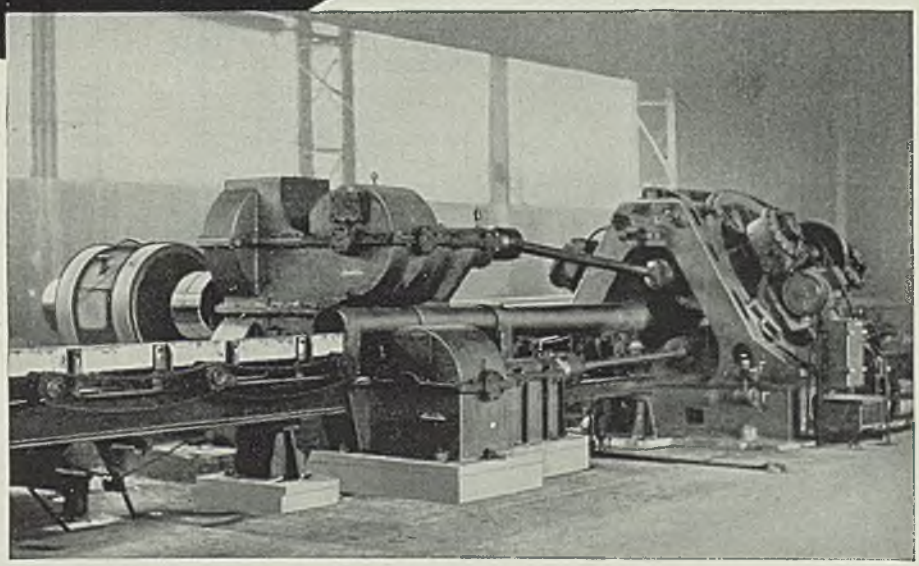
Aids in Removal of Scale

In the pickling of forgings the addition of rock salt to the sulphuric acid solution frequently assists in the removal of some of the complex alloy scales. The salt converts a portion of the sulphuric pickle into hydrochloric acid which aids in removing the chrome scale which is not attacked by sulphuric acid.

THREE ROLL TUBE STRAIGHTENERS



Three Roll Straightening Machine for tubes 5/8" to 3" outside diameter. A number of tube mills are using these machines with utmost satisfaction.



Three Roll Straightening Machine for tubes 3-1/4" to 8-5/8" outside diameter. Installed by one of Canada's large producers of tubing.

Aetna-Standard's ability as designers and builders of specialized mill machinery has again been proven by the development of the Three Roll Straightening Machine, for straightening tubes to extreme ends and maintaining accurate diameter and concentricity. This straightener can be built in various sizes and is especially adaptable for thin walled tubing. Consult Aetna-Standard Engineers on your requirements.

THE AETNA-STANDARD ENGINEERING COMPANY

CONSULTANTS · DESIGNERS · BUILDERS

STEEL AND NONFERROUS INDUSTRIES

YOUNGSTOWN « OHIO » U.S.A.

NEW EQUIPMENT

Welding Torch—

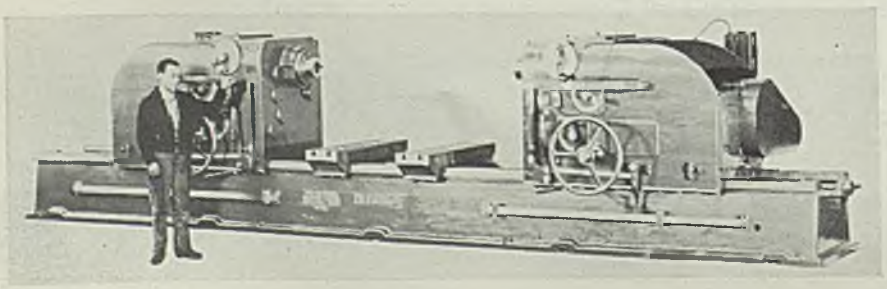
Weldit Acetylene Co., Detroit, is now offering a new automatic welding torch to manufacturers. The new tool weighs only 13 ounces and is designed with a special gas-tight swivel which enables the operator to weld in any direction without changing the angle of the torch handle. It automatically shuts off to a pilot light when not in use, and automatically comes back to fuli flame when the operator is again ready to weld. There is no mechanism inside the handle and the small fuel control valves are placed at the front end of the handle. Another feature is a special replaceable tip nut, at the end of the extension, which eliminates the necessity of replacing the entire extension shift threads when the tip nut becomes worn. This new unit is known as the model W.

♦ ♦ ♦

Boring Machine—

Defiance Machine Works, Defiance, O., has recently announced a new extra heavy horizontal two-way boring machine designed for facing, borlng and counterboring pump castings and other large castings from opposite ends. Spindle heads, mounted at the ends of the machine bed with work platens between them, have independently controlled drives, speeds and feeds. Machine bed is 25 feet long, has ways 6 inches wide with a maximum spread of 34 inches. One way is used as a guide for the head slides, which are 64 inches long. Each spindle head is driven by a V-belt from a motor mounted on the rear side, in 12 spindle speeds from 8 to 225 revolutions per minute are obtainable by sliding gears mounted on splined shafts. Four speed changes ranging from 0.0078 to 0.0625 inches per revolution of spindle are available also by shifting gears on splined shafts. Power rapid traverse and hand feed in either direction are also provided. Feeds and rapid traverse are operated by directional control levers. All spindles, gears and shafts are of heat treated alloy steel and the spindle drive gears are of herring bone type. Each spindle head is provided with a pump for automatic lubrication of bearings and gears. The head slides may each have up to six feet of movement on the bed, with maximum distance of 12 feet between noses of spindles. Work platens are 12 inches wide, 5 inches high and 48 inches long. Each may be positioned independently on the bed for mounting on suitable work-holding fixtures.

Defiance extra heavy horizontal two-way boring and facing machine designed for boring large castings from opposite ends



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Electric Flow Meters—

Bristol Co., Waterbury, Conn., announces the addition of a complete line of electric flow meters for steam, liquids and gases. These meters can be furnished for recording, integrating and indicating flow. Readings are transmitted over a simple two-wire circuit, telephone circuits included, which does not enter into the calibration of the instrument. All electrical contacts are enclosed in glass. A standard Bristol meter body is employed to measure the differential across an orifice. Both the transmitter and the receiver are equipped with moisture, fume and dust-proof aluminum alloy cases. Conduit openings are provided so that the instrument may be used with modern wiring systems.

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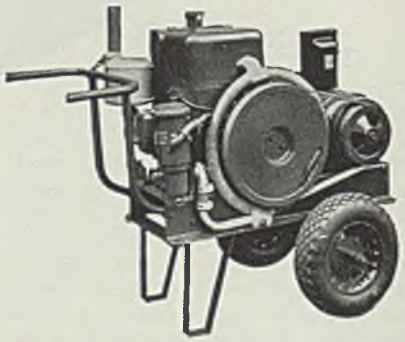
Portable Power Plant—

Ready-Power Co., Detroit, has recently introduced a new portable power plant made in three different types, all readily transportable and each furnishing enough continuous power to light twenty 50-watt lamps



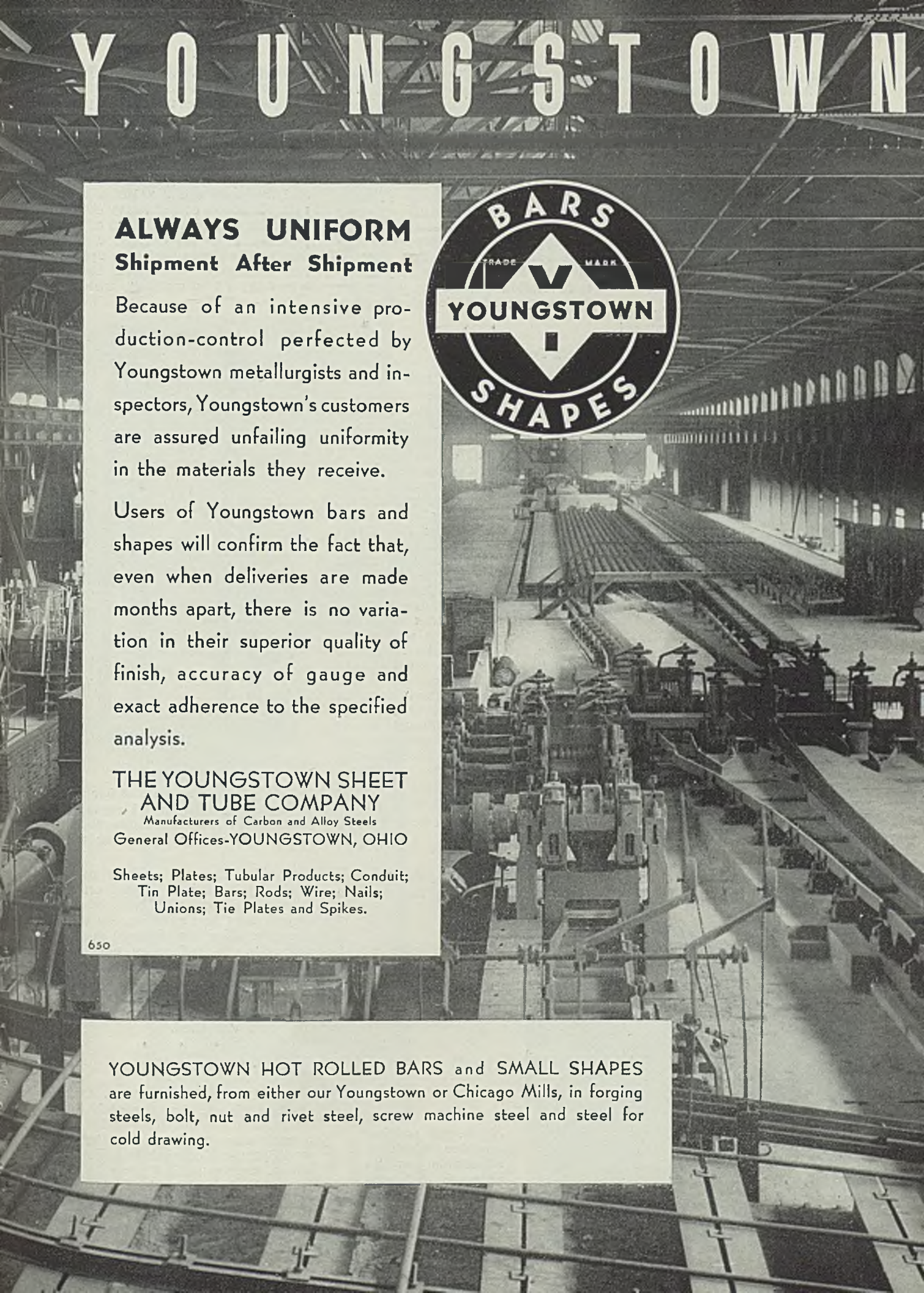
Portable power plant which furnishes sufficient power for a bank of twenty 50-watt bulbs

or their equivalent. These units are powered with a slow speed, heavy duty, water cooled International engine and are designed for use by road builders, wrecking crews, contractors and others requiring a dependable supply of electric current for use in remote places where central station power is not available. Units are furnished mounted on a two-wheel truck with pneumatic tires.

♦ ♦ ♦

Plastic Packing—

Crane Packing Co., 1800 Cuyler avenue, Chicago, announces a new general all-service plastic packing with a new anti-frictional, dry-graphite lubrication. This packing is engineered for service in power plants, refineries, chemical plants, process industries, marine service



ALWAYS UNIFORM
Shipment After Shipment

Because of an intensive production-control perfected by Youngstown metallurgists and inspectors, Youngstown's customers are assured unfailing uniformity in the materials they receive.

Users of Youngstown bars and shapes will confirm the fact that, even when deliveries are made months apart, there is no variation in their superior quality of finish, accuracy of gauge and exact adherence to the specified analysis.

BARS
TRADE MARK
YOUNGSTOWN
SHAPES

THE YOUNGSTOWN SHEET AND TUBE COMPANY
Manufacturers of Carbon and Alloy Steels
General Offices-YOUNGSTOWN, OHIO

Sheets; Plates; Tubular Products; Conduit; Tin Plate; Bars; Rods; Wire; Nails; Unions; Tie Plates and Spikes.

650

YOUNGSTOWN HOT ROLLED BARS and SMALL SHAPES are furnished, from either our Youngstown or Chicago Mills, in forging steels, bolt, nut and rivet steel, screw machine steel and steel for cold drawing.

and industrial works of all kinds. Packing is supplied in six different styles; round, rectangular, square, bulk and split as well as endless strips. It is also supplied in six different forms to operate under varying conditions of corrosion. Each different style is available in varying sizes. The packing is composed of fine particles of a new alloy suspended in a binder with flake graphite and long fiber asbestos.

♦ ♦ ♦

Switchgear—

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has announced a standard line of factory built metal enclosed switchgear for shipment as a complete assembly. Built for small industrial installations or auxiliary circuits in steam-power stations, the units are factory assembled and tested so that cross connections do not have to be made in the field. Metal enclosed switchgear consists of cubicles in which are modern circuit breakers, buses, disconnecting switches, instrument transformers and similar auxiliaries. On the front panels, which are hinged, are relays and meter equipment. The connecting switches are located in the upper compartment and wire glass permits inspection of their position without opening the doors.

♦ ♦ ♦

Spot Welding Machine—

Thomson-Gibb Welding Machine Co., Lynn, Mass., has recently announced a new spot welding machine which has four transformers and a series of hydraulic plungers which actuate in rotation to make a number of welds. It also has a special work-carrying table and an indexing arrangement so that rows of spot welds can be made at fixed positions across the work. An interesting feature is the rotary control valve located at the lower center on the front of the machine. This device controls the pressure and duration of current flow for each individual weld and permits variation in the thickness of the metal being welded. The valve controls a small motor which operates hydraulic valves, each of which operates a single electrode. The camshaft also operates a limit switch controlling the primary current of the transformer. These switch cams are adjustable to permit a long or short period of current dwell. The camshaft may revolve at any speed from four to sixty revolutions per minute, depending on the type of work being welded.

♦ ♦ ♦

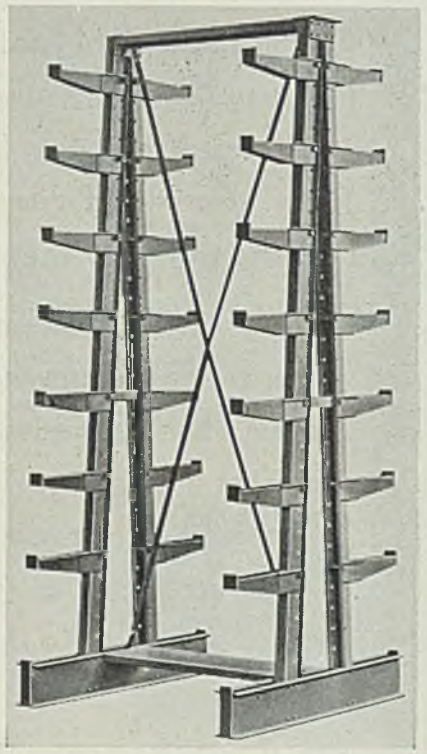
Multi-Pointer Gage—

Bailey Meter Co., 1050 Ivanhoe road, Cleveland, has recently developed a new diaphragm operated multi-pointer gage for boiler room service. The unit consists essentially of a flat calibrated spring, a sealed link, and a power diaphragm, the weight of which is carried on a second link pivoted at one end on the calibrated spring and at the other end on the sealed link. Draft is applied on the left side of the diaphragm, which causes movement of the system to the left. This movement is opposed by the flat calibrated spring. The motion is transmitted by the sealed link to the outside of the diaphragm unit where a drive link carries the motion to the indicating pointer. Stops at both ends of the diaphragm drive and support link prevent damage of the indicating pointer by over deflection of the unit. Parts of the unit are of stainless steel, aluminum or cadmium plated metal, with Swedish spring steel for the calibrated springs. Shaft-type pivots are made of ultra-finish stainless steel.

♦ ♦ ♦

Pipe and Bar Rack—

General Fireproofing Co., Youngstown, O., has recently introduced a new pipe and bar rack of heavy special construction consisting of two upright assemblies made up of posts, brackets and base channels. The upright assemblies are connected at top and bottom by formed channel plates and by diagonal stay braces. The base is of heavy 6-inch channels, and the posts are 2 x 3-inch channels. Brackets are of heavy section and each will support a load of 2000 pounds. Each bracket has a clear depth of 12 inches, and each upright has 14 brackets. Where the character of the stored materials makes it desirable, standard shelves of 12-inch depth may be placed on the bracket. Pipes and bars of any length may be stored on the racks by assembling the required number of racks. In such cases, one starting unit complete as above described and the required number of additional units consisting of one upright assembly only, and the connecting numbers are used.

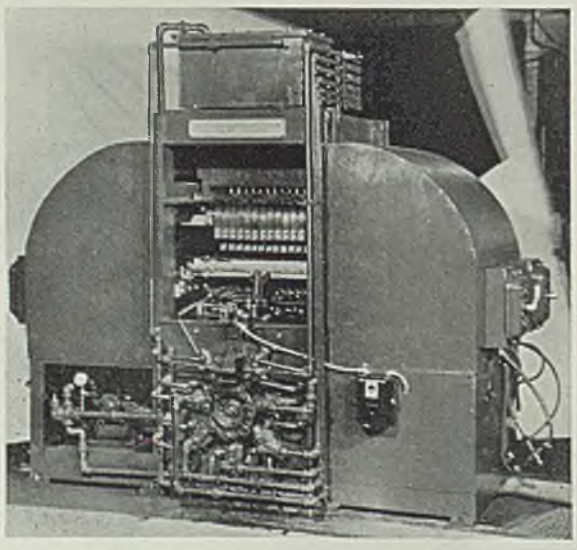


Starting unit of a pipe and bar rack, designed by General Fireproofing Co., which may be made to any length by adding connecting units

♦ ♦ ♦

Tractor Shovel—

Speeder Machinery Corp., Cedar Rapids, Iowa, has recently announced a new machine which is a combination of Caterpillar tractor and Speeder ⅜-yard shovel. The machine, known as TS-40, can be converted back to a standard tractor at any time. Either gasoline or diesel tractors can be supplied. Crane, buckets, dragline or clamshell may be built into the machine.



Multi-spot welding machine which is adjustable as to pressure and current timing built by Thomson - Gibb Welding Machine Co.

History and Development Of Cold Drawn Steel Bars

(*Continued from Page 44*)

plant under discussion, aside from the various tests mentioned previously. Each machine operator is skilled in the operation of his particular piece of equipment and from experience has developed a technique for the "feel" of the machine. For example, the drawbench operator is drawing bessemer, a relatively soft steel. If a bar of another grade is accidentally mixed in the lot of raw material, the drawbench man will almost invariably detect the "off" grade—by finish, accuracy, general response, etc. He then marks this bar which is held up and rechecked for analysis and if the analysis is other than intended for that particular order the machine operator who detects the error receives a $5 bonus. This applies likewise to all other machine operators—shear or saw men, straighteners, turners, grinders and others, and has resulted in an alert organization and an absolute minimum of mixed steel for the consumer.

Final Inspection by Laboratory

Final inspection is controlled by the laboratory and is rigid and complete in every respect. As the bars are received from production they are placed on inspection tables where an inspection is made for size by micrometer, snap or ring gage. The entire length of the bar is checked for size and trueness to shape. Then the surface is given visual inspection by carefully trained inspectors.

In the case of material sold to meet certain physical requirements, identified samples from a predetermined number of bars are submitted to the laboratory for test and approval before shipping. In the case of critical use where exceptional soundness of surface is required the inspection department uses another nondestructive and recently perfected test—magnetic analysis—where the bars are passed through a machine which detects minute surface defects by their effect on a magnetic field.

Having passed the inspection department, the bars are covered with a protective coat of slushing oil to provide a uniform film to resist changes in temperature and consequent rusting, after which they are ready for loading for shipment or for stock.

The heart of the modern cold finished bar mill is the laboratory which must be equipped completely for chemical and physical tests essential for determining strength, machinability and hardness. The modern laboratory is provided with all types of hardness testing machines, tensile testing equipment, impact equipment, machinability testing equipment and also complete equipment for photomicrography.

For the cold finished bar mill processing alloy and high carbon bars, high strength and critical duty material, necessary complements to the cold finishing equipment are furnaces for annealing, normalizing and heat treating. Fig. 10 shows a battery of such furnaces designed for the heat treatment or annealing of bars in long lengths.

The four furnaces shown in the illustration are low-pressure units fired with manufactured gas made by combining a 1500 B.t.u. refinery gas and a 560 B.t.u. coke oven gas, resulting in approximately 990 to 1010 B.t.u. in the manufactured gas. The two furnaces on the right in the illustration are overfired, the two on the left are top and bottom fired

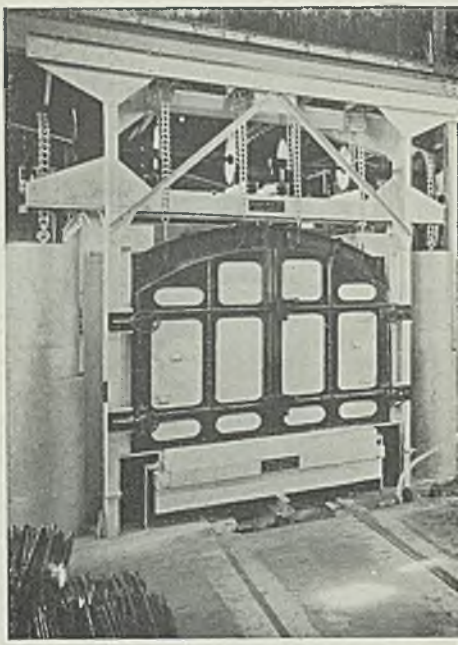


FIG. 10—Annealing, normalizing and heat treating bars in this battery of furnaces is one of the most important steps in the whole operation

and all the units are automatic and zone controlled, so constructed that thermocouples can be extended directly into the mass of steel receiving treatment.

No. 1 furnace is of the car type, the alloy racks on top of the cars being 12 inches above the car bottom to give ample circulation around the material resulting in a more uniform heating.

No. 2 furnace is of the batch type with solid hearth and hand loaded, used principally as a quenching furnace, capacity 5000 pounds per hour.

No. 3 furnace is a car type with a specially designed alloy car, used for

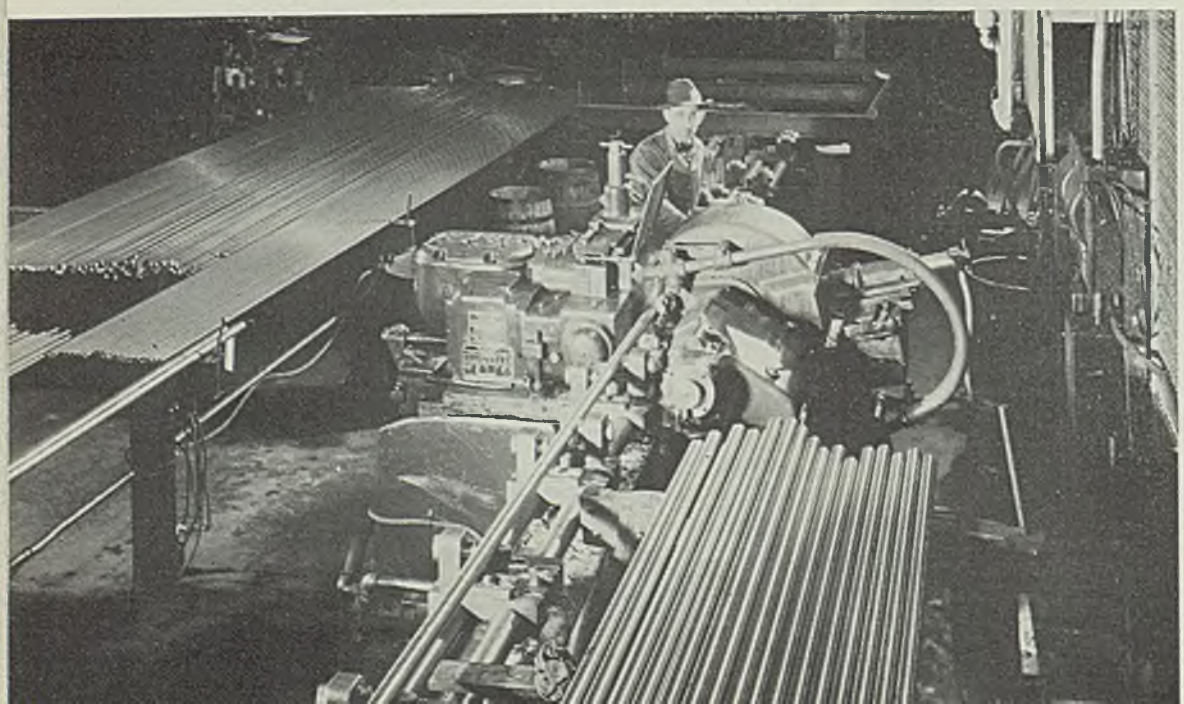
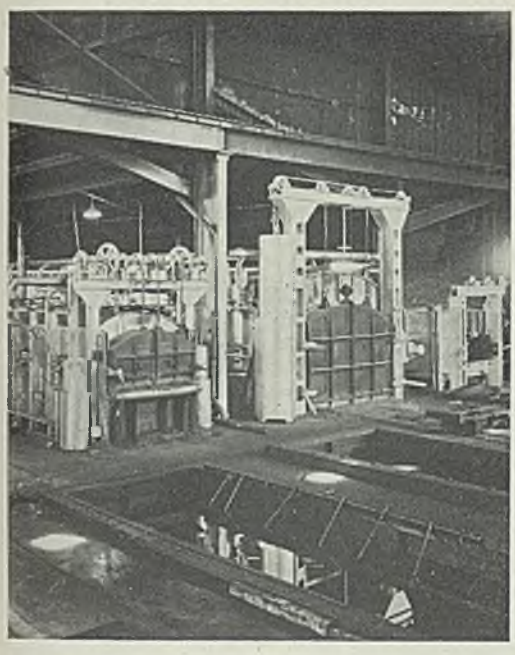


FIG. 9—Tolerances of 0.00025-inch in small diameter bars are ground on high speed wheels in this grinding machine



annealing, capacity 60,000 pounds per charge. This furnace is equipped with loading carriages made in short sections from a high-chrome high-nickel heat resistant alloy.

No. 4 furnace is the same general type as No. 2 with a capacity of 10,000 pounds per hour, maximum temperature 2900 degrees Fahr. This furnace is designed primarily for heating steel for hot rolling necessary for producing special hot rolled profile shapes for cold drawing. In front of the battery of furnaces may be seen the quenching tanks, one for oil and one for water.

Prior Heat Treatment Important

Furnace treatment of bars prior to cold finishing enables the ultimate user to produce parts from a heat treated and cold finished bar of definite physical properties, eliminating the necessity for rough forming the part, heat treating and subsequent machining and grinding to finished dimensions. In order that the heat treated and cold finished product give uniform response in the ultimate consumer's production, complete control of the furnace treatment and control of the product is essential. Therefore, a plant with a furnace department must have especially designed heavy-duty straightening equipment as well as descaling machines, and special automatic hardness testing machines such as the direct reading brinell machine.

The final requisites for the complete cold finished bar plant are adequate shipping facilities and ample storage space for finished stock available for immediate shipment. Fig. 11 shows a large finished stock warehouse. In one end of the building are automatic recording scales for weighing outgoing shipments and racks for the assembling of carload orders of miscellaneous items as well as for the accommodation of customers' material made up and awaiting release. In the other half of the building are racks for the storage of unsold finished stock. A large inventory of a wide range of sizes, lengths and grades is required to give prompt service on urgent requirements.

Loading Methods Employed

Shipping facilities in connection with this finished stock building naturally accommodate both rail and truck carriers. At one end is a loading platform for loading truck shipments coming directly out of production while at the other end of the building near the unsold finished stock is the loading platform for trucks for material taken from finished stock. There are track connections for loading box cars or open top cars at the end of the building opposite the unsold material and also track facilities through the middle of the building.

Generally speaking, cold finished bars are loaded in box cars as the surface of the bars is easily damaged by exposure to the weather. Even so, particular care must be taken to have the bars properly oiled and slushed and also tightly blocked in the cars to prevent slippage and damage in transit. For overhead crane unloading gondola cars are used but this type of equipment requires wrapping the lifts of bars in waterproof paper and covering the cars with more waterproof paper, special tarpaulins or removable tops.

Applications Are Varied

Applications for cold finished bars are so varied and numerous that it is not practical to attempt to cover them completely; however, a partial listing will serve to illustrate the important part played by this product: Automobile parts such as piston pins, steering posts, brake rods, water pump shafts, transmission gears and spline shafts, spark plugs, shells, bolts, screws, nuts, miscellaneous gears, pinions, axles and shafts, for agricultural implements and tractors, many of the same parts for domestic appliances such as refrigerators, washing machines, vacuum cleaners, sewing machines and radios; parts for cash registers, typewriters, adding machines, dictaphones and telephones; parts for railroad equipment, motorcycles, bicycles, road building machinery, shoe and textile machinery, electrical equipment and similar applications.

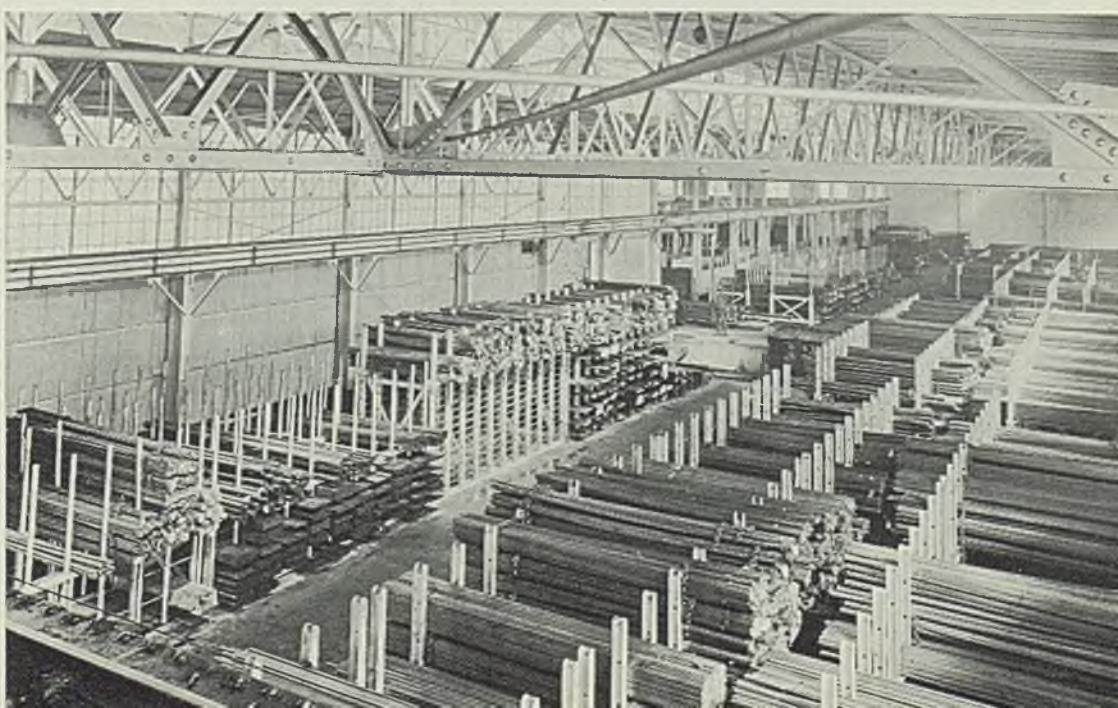


FIG. 11—Important adjunct to the complete cold finished bar plant is an ample stock warehouse to aid in immediate shipments

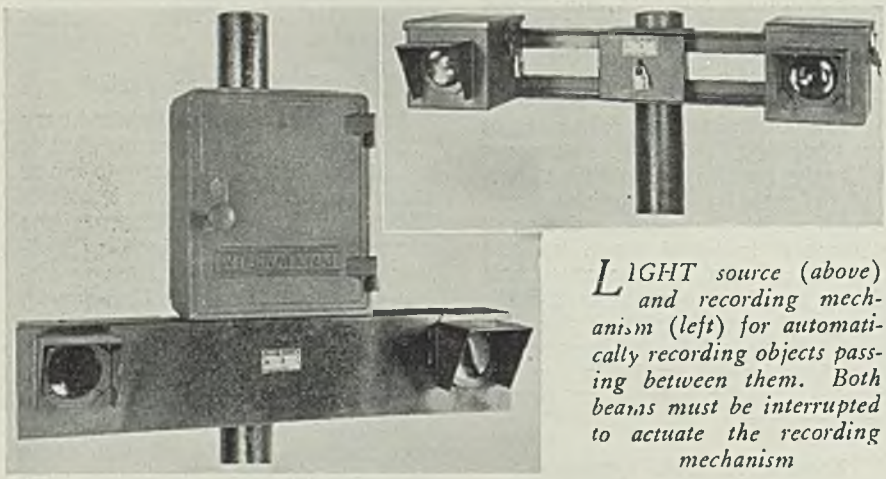
Electric Eyes Count Traffic

AN AUTOMATIC recorder, utilizing invisible infra-red rays and an electric eye to count and record the number of vehicles passing over a road every hour, has been added to the products of International Business Machines Corp., New York. It is intended for the use of the motor vehicle departments and similar organizations in analyzing traffic flow and, in a slightly modified form, can be used industrially for counting and timing of production.

The installation comprises two light sources, shown in an accompanying illustration, several feet apart, which project parallel beams of light across the road after being passed through filters which stop all but the invisible infra-red rays, to avoid annoyance to pedestrians. The beams fall upon two mirrors in the ends of a horizontal periscope and are reflected onto a single photoelectric cell; unless both beams are interrupted the cell will not function, thus preventing the registration of pedestrians. Both light source and recording mechanism are contained in pressed steel housings.

The photoelectric cell actuates a mechanism which counts the passage of each vehicle. At the end of each hour it automatically prints the cumulative total on a tape, together with the hour and the day of the week. The device can register up to 400 impulses a minute, and can record a total up to 99,999 impulses. It contains a 30-day supply of tape and can operate for 8 days at a time without attention. It operates on standard 110-volt current and in case of power failure, records on the tape the time of such failure.

Eleven states are already compiling statistics from the information obtained through the use of these traffic recorders.



LIGHT source (above) and recording mechanism (left) for automatically recording objects passing between them. Both beams must be interrupted to actuate the recording mechanism

Practical Training Course In Arc Welding Lessons

Lessons in Arc Welding, paper, mimeograph; 130 pages, 8 x 10½ inches; published by Lincoln Electric Co., Cleveland; supplied by STEEL, Cleveland, for 50 cents, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

The purpose of this practical publication, containing 44 lessons in arc welding, is to provide operators and other interested persons a thorough working knowledge of the practical application and use of arc welding. It is well illustrated by sketches.

The former edition, which was issued to the extent of 10,000 copies three years ago, has been expanded from the 28 original lessons to the present size. The lessons are based on the course in arc welding conducted at the plant of the Lincoln Electric Co. for nearly 20 years. They are the result of experience in teaching a large number of men to become practical welding operators.

From general fundamental suggestions the course takes the student by easy stages through the various phases of practical arc welding.

Survey of Nation's Steel Markets Is Now Available

Showing in concise form the present major markets for semifinished and raw materials, a study prepared by the bureau of foreign and domestic commerce is now available. Purpose of this study is to enable industrial marketing executives to form a quick and accurate conception of the size and location of those sections of their market represented by the iron and steel industry of the United States.

In this study the bureau has for the first time attempted to isolate and picture individual markets for the benefit of the manufacturers of industrial goods who are engaged in supplying the needs of these markets.

Need for more adequate information concerning industrial markets has long been known, and the uses for such data are many and important. Economic losses accrue to individual producers from acting on mistaken estimates of the size of the industrial markets which they supply. Inability to plan sales activities in accordance with industrial capacity and demand results in both financial loss and waste of human and natural resources.

Accurate information on industrial capacities as a basis for making production schedules and for apportioning sales and advertising budgets would reduce this waste. Data on industrial consumption requirements can constitute a direct aid to business in laying out sales territories as well as planning production facilities.

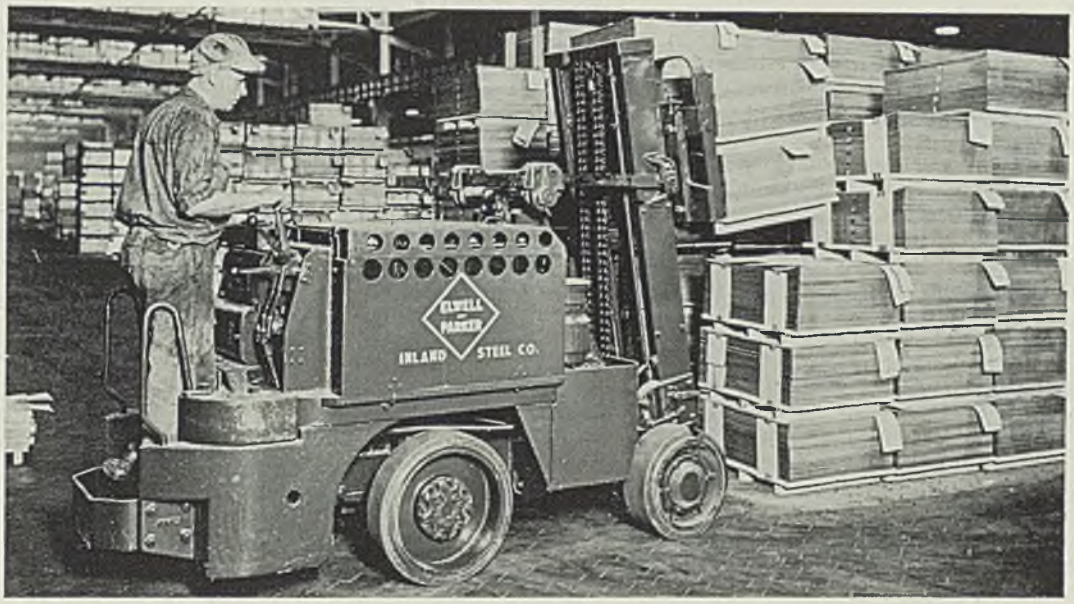
These facts have formed the basis of the study now released by the bureau of foreign and domestic commerce. Copies of this study are available from the bureau in Washington or at any of the divisional offices.

A.I.M.E. Transactions of 1936 Are Now in Print

Transactions of the American Institute of Mining and Metallurgical Engineers, Iron and Steel Division, 1936; cloth, 411 pages, 6 x 9 inches; published by the American Institute of Mining and Metallurgical Engineers, New York; supplied by STEEL, Cleveland, for $5, plus 15 cents postage; in Europe by Penton Publishing Co. Ltd., 416-17 Caxton House, Westminster, London.

This volume contains some 20 papers presented at the annual meeting of the iron and steel division of the American Institute of Mining and Metallurgical Engineers in February, 1936. The papers relate both to fundamental science and to the application of fundamentals to the solution of practical problems. One group of papers discusses ore preparation and blast furnace problems; another relates to corrosion of steel and high-tensile low-alloy steels, several are concerned with physical metallurgy and two describe devices for measurement of temperature. Included also is Prof. H. F. Moore's Howe memorial lecture on "Correlation Between Metallography and Mechanical Testing.".

MATERIALS HANDLING



HERE is shown an electric storage battery elevating truck at the Inland Steel Co., Indiana Harbor, Ind., tiering up piles of cold rolled strip steel wired to wooden skids. Photo courtesy Elwell-Parker Electric Co.

Open Top Car Experiment

(*Concluded from Page* 50)

Warren, chief engineer, Sharon Steel Corp., Sharon, Pa. stated: "The greatest improvement in loading strip and sheets into box cars could be made by the use of a box car with removable roof, as all steel mills would have cranes available and a good many of the customers have cranes for unloading."

At the recent meeting of the Atlantic States Shippers Advisory board one traffic manager reported on a new type of box car with a removable top, which was in service on the Pennsylvania railroad. Inquiry at the general offices of the carrier reveals that this car is at present only in the experimental stage.

♦ ♦ ♦

Takes Presses to Job

SOME small presses in the plant of the Niles Steel Products Co., Niles, O., have been mounted either on conventional skid platforms, or on I-beams, so that a lift truck can pick up a press and transfer it readily to any point in the shop where it may be needed to complete operations on parts. This eliminates considerable rehandling of materials during fabricating.

The company recently installed a new electric industrial truck, which, in addition to press transfer work, is used in conventional manner for handling skid platforms and tote boxes, and also for placing dies in the presses. The new truck is a 3-ton, high-lift, battery-operated machine.

♦ ♦ ♦

Truck Handles Paper Rolls

A NEW high mast lift truck especially designed for handling paper in rolls, and backing to a greater height has recently been announced by Towmotor Inc., Cleveland. A scoop is used instead of a fork to avoid injuring the paper, and in operation the forward edge is lowered to the floor with the mast tilted slightly forward. The operation of loading the paper and depositing the rolls where desired may be accomplished by the driver without aid. The lifting is done by a hydraulic mechanism. The truck is the standard Towmotor gas powered equipment.

Undertakes Broad Research Program

RESEARCH in metallurgy, electroplating, spectroscopy, photomicrography and physical testing is to be conducted in a new laboratory just completed by the Bausch & Lomb Optical Co., Rochester, N. Y. At the same time the company has made a 50 per cent increase in its staff of graduate chemical engineers and metallurgists. The new laboratory will be under the general direction of Theodore B. Drescher, vice president, and its activities will be supervised by Frank P. Kolb, chief chemist, and Theodore J. Zak, assistant chemist.

One of the units, in charge of Dr. James E. Wilson, with Vernon Patterson as assistant, will engage in applying metallurgical equipment to studying the structure of steels and alloys. This unit is equipped with the new Bausch & Lomb metallographic instrument for the study of the crystal structure and surface characteristics of metals. It also has an electric heat treating furnace with controlled atmosphere and a smaller one for treating high speed steel up to 2500 degrees Fahr. Equipment includes hardness testers and equipment for cutting and polishing metal specimens for microscopic examination.

Spectrographic analyses will be studied in a separate unit. The testing and control unit, directed by Ray A. Kirchmaier and Joseph T. Anderson, is equipped for general analytical work. The manufacturing unit, under George G. King, has facilities for making pitches, waxes, resins, polishing felts and some 600 other materials. Dr. D. M. Webb is one of the newcomers to the staff for research in chemistry and one of his immediate problems will concern electrodeposition of various metallic substances as a backing for reflectors.

Changes Fog Light Design

S & M Lamp Co., Los Angeles, Calif., has made an interesting change in the construction of its automotive lamps known as Fog-Lites. For many years the company used amber reflectors and crystal lenses in these lights. It now is using amber lenses and silver reflectors. The change has not brought any material improvement in light projection or fog penetration but is regarded as yielding a lamp of smarter appearance in that amber lenses are more noticeable than amber reflectors.

Error Was Made in Caption

An error was made in a caption which appeared on Page 46, STEEL of Feb. 1, in connection with an article describing Ludlum Steel Co.'s hollow electrode furnace for producing stainless steel castings. The caption read: "Macrostructure of an 18-8 stainless steel casting made from metal annealed in the hollow electrode furnace, etched 50 per cent hydrochloric acid 35 minutes, 160 to 180 degrees Fahr." Instead of the word "annealed", the words "melted and refined" should

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.

Multi-Breaker—Square D Co., 6060 Rivard street, Detroit. Bulletin No. CA-543A, superseding previous bulletins and price lists on the multi-breaker, a low cost circuit breaker for domestic and commercial use.

Leather for Industrial Purposes—Alexander Bros. Inc., Philadelphia. Catalog No. A-116, illustrates and describes some of the many applications of leather in industrial plants, including tables and list prices.

Pumping Reducers—Foote Bros. Gear & Machine Corp., 5301 South Western boulevard, Chicago. Folder showing applications of its IXL helical pumping reducers for pumping shallow oil wells.

Electric Fans—Emerson Electric Mfg. Co., St. Louis. Bulletin No. X-1949, on its complete new line of electric desk, ceiling, air circulators, ventilating and exhaust fans, including performance data and list prices.

Handling Equipment — Barrett-Cravens Co., Chicago. Catalog No. 500, covering its line of lift-trucks and skids, portable elevators, storage racks, barrel trucks and miscellaneous handling equipment. Tables of specifications and check-charts.

Screen Cloth—Robins Conveying Belt Co., 15 Park Row, New York. Bulletin No. 98, describing screen cloth for vibrating screens, for stone, sand, gravel, slag, ore, coke, coal, chemicals, oyster shells, sinter and other abrasives.

Hoisting Equipment—Wright Mfg. division American Chain & Cable Co. Inc., York, Pa. Handbook on hoisting equipment. In addition to complete specifications, it includes suggestions on choosing a hoist as well as engineering tables on trolleys, cranes and I-beams.

Lubrication — Alemite division, Stewart-Warner Corp., 1826 Diversey parkway, Chicago. Catalog illustrating the entire range of Alemite's industrial equipment, including a section of hand gun repair parts and many photographs of Alemite equipment in actual use, in many different types of industries.

Cemented Carbide Tools—Carboloy Co. Inc., 2985 East Jefferson avenue, Detroit. Bulletin No. TA-371, on proper carbide grade selections for cemented carbide tools, explaining the necessity of considering type of material being machined, name of parts to be machined, machining specifications and type of machine used.

Porcelain Enameling — Ferro Enamel Corp., Cleveland. Dictionary of porcelain enameling terms.

Air Conditioning—Carbondale division, Worthington Pump & Machinery Corp., Harrison, N. J. Folder No. 1122, announcing a new line of unit air conditioners with a wide range of air and refrigeration capacities, giving a complete air conditioning job, including cooling and dehumidifying, heating and humidifying.

Survey of Nickel Industry in 1936—International Nickel Co., 67 Wall street, New York. Booklet giving a general survey of the nickel industry during 1936, including brief descriptions of the practical applications it was put to in the principal fields of industry; bulletin No. T-11 giving technical information on forging monel metal, nickel and inconel.

Steel Rate Touches New High at 81 Per Cent

Buyers Seek Second Quarter Coverage; Sheet Needs Lead

MARKET IN TABLOID

DEMAND . . . . *Strong in all lines, buying extends to second quarter.*

PRICES . . . . . *Scrap index moves 29 cents higher.*

PRODUCTION . . *Operations at 81 per cent.*

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

SETTLEMENT of General Motors strike and consequent releases of steel have given the steel market a fillip and tended to increase confidence. Some tonnage already has been ordered forward for use when it is possible to start the assembly lines, and larger releases will follow.

However, the opinion is gaining that the effect of this added demand will be less than generally expected. Suspension because of the strike made little impression on mill schedules and replacement may not cause as much difficulty as anticipated, although it will have some effect in further deferring deliveries in some lines. This undoubtedly will be most apparent in sheets, particularly wide sizes.

Steelworks activity advanced 1½ points over the preceeding week to 81 per cent. Pittsburgh rose two points to 84 per cent and Chicago two points to 80; Wheeling was up three points to 80, Cincinnati up eight points to 30, New England up 14 points to 88, Cleveland up one point to 76½, and eastern Pennsylvania up one point to 54½. Youngstown lost one point to 80, Birmingham lost three points to 76, and Detroit four points to 86. Buffalo at 85 and St. Louis at 82 per cent were unchanged.

General users of steel, especially sheets, are seeking further contracts, even though delivery extends into second quarter, for which no price announcement has been made. Considerable tonnage is being booked at the price prevailing at time of delivery.

Opinion is gaining that prices will not be advanced for second quarter, although galvanized sheets may be raised because of the sharp increase in the price of zinc.

Settlement of the maritime strike on the Pacific coast is bringing releases on considerable steel tonnage held back because of interrupted communication.

Automobile production last week totaled 72,850 units, compared with 72,295 the previous week.

Structural lettings last week showed an increase from 17,095 tons to 30,470 tons, which compares with 9350 tons a year ago. This includes 3900 tons for an electrical generating plant at Detroit, 3300 tons for a bridge in North Carolina, and 3000 tons of steel sheet piling in two lots for work on Long Island. Further large tonnages in the New York district are promised by the World's fair and the west side elevated highway, both of which will be out for bids soon.

Export demand for steelmaking scrap at eastern ports is being felt definitely by consumers in the Pittsburgh district, as even present high prices are not sufficient to obtain tonnage from the East. With scrap prices now at $19 to $20 per ton the spread between scrap and pig iron is almost wiped out. Not for a dozen years has the range been so high. Average price of steelmaking scrap is now $1.50 above that prevailing at the beginning of 1937 and almost $7 per ton above the price at the beginning of 1936.

Steel ingot production in January was the largest for that month in history, 4,736,697 gross tons being turned out. This was seven per cent above the 4,431,645 tons made in December and 55 per cent over January, 1936. In January, 1929, production was 4,500,131 tons. January production was at 81.42 per cent of capacity, the highest rate since February, 1930, when the rate was 84.47 per cent. American Iron and Steel institute has changed its compilation from daily to weekly basis to conform to other indexes figured on a weekly basis.

Finished steel shipments by the United States Steel Corp. in January were 1,149,918 tons, the highest for that month since 1929, when they reached 1,267,823 tons, and the highest for any month since May, 1930. This compares with 721,414 tons in January, 1936.

Advances in scrap prices have carried STEEL'S composite of steelmaking grades to $19.08, an advance of 29 cents for the past week. The iron and steel composite has advanced 3 cents because of scrap increases and stands at $36.67. The finished steel composite is unchanged at $55.80.

COMPOSITE MARKET AVERAGES

	Feb. 13	Feb. 6	Jan. 30	One Month Ago Jan., 1937	Three Months Ago Nov., 1936	One Year Ago Feb., 1936	Five Years Ago Feb., 1932
Iron and Steel	$36.67	$36.64	$36.62	$36.55	$34.65	$33.48	$29.24
Finished Steel	55.80	55.80	55.80	55.80	53.90	53.70	46.72
Steelworks Scrap ..	19.08	18.79	18.70	18.12	16.05	13.83	7.89

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

A COMPARISON OF PRICES

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

Finished Material

	Feb. 13, 1937	Jan. 1937	Nov. 1936	Feb. 1936
Steel bars, Pittsburgh	2.20c	2.20	2.05	1.85
Steel bars, Chicago	2.25	2.25	2.10	1.90
Steel bars, Philadelphia	2.49c	2.49	2.36	2.16
Iron bars, Terre Haute, Ind.	1.95	2.10	1.95	1.75
Shapes, Pittsburgh	2.05	2.05	1.90	1.80
Shapes, Philadelphia	2.25½	2.25½	2.11½	2.01½
Shapes, Chicago	2.10	2.10	1.95	1.85
Tank plates, Pittsburgh	2.05	2.05	1.90	1.80
Tank plates, Philadelphia	2.23½	2.23½	2.09	1.99
Tank plates, Chicago	2.10	2.10	1.95	1.85
Sheets, No. 10, hot rolled, Pitts.	2.15	2.15	1.95	1.85
Sheets, No. 24, hot ann., Pitts.	2.80	2.80	2.60	2.40
Sheets, No. 24, galv., Pitts	3.40	3.40	3.20	3.10
Sheets, No. 10, hot rolled, Gary	2.25	2.25	2.05	1.95
Sheets, No. 24, hot anneal., Gary	2.90	2.90	2.70	2.50
Sheets, No. 24, galvan., Gary	3.50	3.50	3.30	3.20
Plain wire, Pittsburgh	2.60	2.60	2.50	2.30
Tin plate, per base box, Pitts.	$4.85	4.85	5.25	5.25
Wire nails, Pittsburgh	2.25	2.25	2.05	2.40

Semifinished Material

Sheet bars, open-hearth, Youngs.	$34.00	34.00	32.00	30.00
Sheet bars, open-hearth, Pitts	34.00	34.00	32.00	30.00
Billets, open-hearth, Pittsburgh	34.00	34.00	32.00	29.00
Wire rods, No. 5 to $\frac{15}{32}$-inch, Pitts.	43.00	43.00	40.00	40.00

Pig Iron

	Feb. 13, 1937	Jan. 1937	Nov. 1936	Feb. 1936
Bessemer, del. Pittsburgh	$22.26	22.26	20.81	20.81
Basic, Valley	20.50	20.50	19.00	19.00
Basic, eastern del. East Pa.	22.26	22.26	21.06	20.81
No. 2 fdy., del. Pittsburgh	22.21	22.21	20.31	20.31
No. 2 fdy., Chicago	21.00	21.00	19.75	19.50
Southern No. 2, Birmingham	17.38	17.38	15.75	15.50
Southern No. 2, del. Cincinnati	20.69	20.69	19.69	20.20
No. 2X eastern, del. Phila.	23.135	23.135	21.93	21.68
Malleable, Valley	21.00	21.00	19.50	19.50
Malleable, Chicago	21.00	21.00	19.75	19.50
Lake Sup., charcoal, del. Chicago	26.54	26.54	25.87	25.25
Gray forge, del. Pittsburgh	21.17	21.17	19.67	19.67
Ferromanganese, del. Pittsburgh	84.79	84.79	80.13	80.13

Scrap

Heavy melting steel, Pittsburgh	$19.75	18.95	17.40	14.80
Heavy melt. steel, No. 2, east Pa.	17.75	16.40	13.75	12.00
Heavy melting steel, Chicago	19.00	18.25	16.50	14.30
Rail for rolling, Chicago	20.75	19.40	17.25	15.50
Railroad steel specialties, Chicago	20.75	19.65	18.25	15.75

Coke

Connellsville furnace, ovens	$4.00	4.00	4.00	3.50
Connellsville, foundry, ovens	4.25	4.25	4.25	4.20
Chicago, by-product foundry, del.	10.25	10.25	9.75	9.75

Steel, Iron, Raw Material, Fuel and Metals Prices

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

Sheet Steel

Prices Subject to Quantity Extras and Deductions (Except Galvanized)

Hot Rolled No. 10, 24-48 in.

Pittsburgh	2.15c
Gary	2.25c
Chicago, delivered	2.28c
Detroit, del.	2.35c
New York, del.	2.48c
Philadelphia, del.	2.44c
Birmingham	2.90c
St. Louis, del.	2.485c
Pacific ports, f.o.b. cars, dock	2.70c

Hot Rolled Annealed No. 24

Pittsburgh	2.80c
Gary	2.90c
Chicago, delivered	2.93c
Detroit, delivered	3.00c
New York, del.	3.13c
Philadelphia, del.	3.09c
Birmingham	2.95c
St. Louis, del.	3.135c
Pacific ports, f.o.b. cars, dock	3.45c

Galvanized No. 24

Pittsburgh	3.40c
Gary	3.50c
Chicago, delivered	3.53c
Philadelphia, del.	3.69c
New York, delivered	3.73c
Birmingham	3.55c
St. Louis, del.	3.735c
Pacific ports, f.o.b. cars, dock	4.00c

Tin Mill Black No. 28

Pittsburgh	2.95c
Gary	3.05c
St. Louis, delivered	3.285c

Cold Rolled No. 10

Pittsburgh	2.80c
Gary	2.90c
Detroit, delivered	3.00c
Philadelphia, del.	3.09c
New York, del.	3.13c
Pacific ports, f.o.b. cars, dock	3.40c
St. Louis	3.135c

Cold Rolled No. 20

Pittsburgh	3.25c
Gary	3.35c
Detroit, delivered	3.45c
Philadelphia, del.	3.54c
New York, del.	3.58c
St. Louis	3.585c

Enameling Sheets

Pittsburgh, No. 10	2.60c
Pittsburgh, No. 20	3.20c
Gary, No. 10	2.70c
Gary, No. 20	3.30c
St. Louis, No. 10	2.935c
St. Louis, No. 20	3.535c

Tin and Terne Plate

Gary base, 10 cents higher.

Tin plate, coke base (box) Pittsburgh	$4.85
Do., waste-waste	2.75c
Do., strips	2.50c
Long ternes, No. 24 unassorted, Pitts.	3.70c
Do., Gary	3.80c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	23.00	24.00
Plates	26.00	28.00
Sheets	33.00	35.00
Hot strip	20.75	22.75
Cold strip	27.00	29.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	17.00	18.50	21.00	26.00
Plates	20.00	21.50	24.00	29.00
Sheets	25.00	28.00	31.00	35.00
Hot strip	15.75	16.75	21.75	26.75
Cold stp.	20.50	22.00	27.00	35.00

Steel Plate

Pittsburgh	2.05c
New York, del.	2.33c
Philadelphia, del.	2.23½c
Boston, delivered	2.45c
Buffalo, delivered	2.30c
Chicago or Gary	2.10c
Cleveland, del.	2.24½c
Birmingham	2.20c
Coatesville, base	2.15c
Sparrows Pt., base	2.15c
Pacific ports, f.o.b. cars, dock	2.60c
St. Louis, delivered	2.33c

Structural Shapes

Pittsburgh	2.05c
Philadelphia, del.	2.25½c
New York, del.	2.30¼c
Boston, delivered	2.43½c
Bethlehem	2.15c
Chicago	2.10c
Cleveland, del.	2.25c
Buffalo	2.15c
Gulf Ports	2.45c
Birmingham	2.20c
Pacific ports, f.o.b. cars, dock	2.60c

Bars

Soft Steel
(Base, 3 to 25 tons)

Pittsburgh	2.20c
Chicago or Gary	2.25c
Duluth	2.35c
Birmingham	2.35c
Cleveland	2.25c
Buffalo	2.30c
Detroit, delivered	2.35c
Pacific ports, f.o.b. cars, dock	2.75c
Philadelphia, del.	2.49c
Boston, delivered	2.60c
New York, del.	2.53c
Pitts., forg. qual.	2.55c

Rail Steel
To Manufacturing Trade

Pittsburgh	2.05c
Chicago or Gary	2.10c
Moline, Ill.	2.10c
Cleveland	2.10c
Buffalo	2.15c

Iron

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

Reinforcing

New billet, straight lengths, quoted by distributors

Pittsburgh	2.25c
Chicago, Gary, Buffalo Cleve., Birm., Young.	2.30c
Gulf ports	2.65c
Pacific coast ports f.o.b. car docks	2.70c
Philadelphia, del.	2.54c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	2.10c
Chicago, Buffalo, Cleveland, Birm., Young.	2.15c
Gulf ports	2.50c

Wire Products

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

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	$2.25
Cement coated nails	$2.25
Galv. nails, 15 gage and coarser	$4.25
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. l.)	$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.	2.55c
20,000 to 59,999 lbs.	2.50c
60,000 to 99,999 lbs.	2.45c
100,000 to 299,999 lbs.	2.42½c
300,000 lbs. and over	2.40c

Gary, Ind., Cleve., Chi., up 5c; Buffalo, up 10c; Detroit, up 15c; eastern Michigan, up 20c.

Alloy Steel Bars (Hot)

(*Base, 3 to 25 tons*)

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

Alloy S.A.E.	Alloy Diff.	Alloy S.A.E.	Alloy Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo	0.55
4600 0.20 to 0.30 Mo. 150-2.00 Ni.	1.10
5100 0.80-1.10 Cr.	0.45
5100 Cr. spring	0.15
6100 bars	1.20
6100 spring	0.85
Cr. Ni., Van.	1.50
Carbon Van.	0.85
9200 spring flats	0.15
9200 spring rounds, squares	0.40

Piling

Pittsburgh	2.40c
Chicago, Buffalo	2.50c

Strip and Hoops

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

Hot strip to 23⅞-in. Pittsburgh	2.15c
Chicago or Gary	2.25c
Birmingham base	2.30c
Detroit, del.	2.35c
Philadelphia, del.	2.44c
New York, del.	2.48c
Cooperage hoop, Pittsburgh	2.15c
Chicago	2.25c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland	2.85c
Detroit, del.	3.05c
Worcester, Mass.	3.05c

Carbon	Cleve. Pitts.	Worcester, Mass.
0.26—0.50	2.85c	3.05c
0.51—0.75	3.95c	4.15c
0.76—1.00	5.70c	5.90c
Over 1.00	7.75c	7.95c

Rails, Track Material

(Gross Tons)

Standard rails, mill	39.00
Relay rails, Pittsburgh, 20—100 lbs.	25.50-28.00
Light rails, billet qual., Pittsburgh, Chicago	$38.00
Do., rerolling quality	37.00
Angle bars, billet, Gary, Pittsburgh, So. Chicago	2.70c
Do., axle steel	2.25c
Spikes, R. R. base	2.90c
Track bolts, base	4.00c
Tie plates, base	2.10c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs., inclusive up $2; 16 and 20 lbs. up $1; 12 lbs. up $2; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts

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

Carriage and Machine

½ x 6 and smaller	70 off
Do. larger	65-10 off
Tire bolts	50-5 off

Plow Bolts

All sizes	65-10-10 off

Stove Bolts

In packages with nuts attached 72½ off; in packages with nuts separate 72½-5 off; in bulk 81½ off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts	60 off
Elevator bolts	60 off

Nuts

S. A. E. semifinished hex.: ½ to ⅞-inch	60-20-5 off
Do., ⅛ to 1-inch	60-20-5 off
Do., over 1-inch	60-20-5 off

Hexagon Cap Screws

Milled	50-10 off
Upset, 1-in., smaller	60 off

Square Head Set Screws

Upset, 1-in., smaller	75 off
Headless set screws	75 off

Rivets, Wrought Washers

Structural, Pittsburgh, Cleveland	3.25c
Structural, Chicago	3.35c
⅞-inch and smaller, Pitts., Chi., Cleve.	70-5 off
Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs.	$6 off

Cut Nails

Cut nails, Pitts. (10% discount of size extras)	$3.10
Do., less carloads, 5 kegs or more, no discount on size extras	$3.40
Do., under 5 kegs, no disc on size extras	$3.55

Pipe and Tubing

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

Welded Iron, Steel Pipe

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

Butt Weld

Steel

In.	Blk.	Galv.
⅛ and ¼	60	44½
⅜	64½	55
½	67½	59
¾	69½	61½

Iron

⅛	27	10½
¼	32	16
⅜—1¼	35	21
2	38½	23

Lap Weld

Steel

2	62	53½
2½—3	65	56½
3½—6	67	58½
7 and 8	66	56½
9 and 10	65½	56

Iron

2	32½	18
2½—3½	33½	20½
4—8	35½	24

Line Pipe

Steel

⅛, butt weld	56
¼ and ⅜, butt weld	59
½, 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

⅛—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

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		Charcoal Iron	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¼—3½	18
4½—5	42	4	20
		4½	21

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

Lapwelded steel: 200 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 lbs., 2 pts. under base.

Seamless Boiler Tubes

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound. Less-carloads revised as of July, 1, 1935, card.

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

Seamless Tubing

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$41.00-42.00
4-in., Birmingham	44.00-45.00
4-in., Chicago	52.00-53.00
6 to 24-in., Chicago	49.00-50.00
6-in & over, east. fdy.	45.00
Do., 4-in.	46.00

Class A pipe $3 over Class B Stnd. fitgs., Birm. base. $100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., Buffalo and Young.	$34.00
Philadelphia	39.30
Duluth	36.00

Forging Billets

6 x 6 to 9 x 9-in., base

Pitts., Chicago, Buffalo	40.00
Forging, Duluth	42.00

Sheet Bars

Pitts., Cleve., Young., Sparrows Point	34.00

Slabs

Pitts., Chicago, Cleveland, Youngstown	$34.00

Wire Rods

Pitts., Cleve., No. 5 to 13/32-inch incl	43.00
Do., over 13/32 to 41/64-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.	10.17-10.60
Chi., ov., outside del.	9.50
Chicago, del.	10.25
New England, del.	12.00
St. Louis, del.	10.50-11.00
Birmingham, ovens	6.50
Indianapolis, del.	9.65
Cincinnati, del.	9.75
Cleveland, del.	10.30
Buffalo, del.	10.50
Detroit, del.	10.70
Philadelphia, del.	9.85

Coke By-Products

Spot. gal. Producers' Plants

Pure and 90% benzol	16.00c
Toluol	30.00c
Solvent naphtha	30.00c
Industrial xylol	30.00c

Per lb. f.o.b. Frankford

Phenol (200 lb. drums)	15.00c
Do., (450 lbs.)	14.00c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls., to jobbers	7.25c

Per 100-lbs. Atlantic seaboard

Sulphate of ammonia	$1.35

†Western prices, 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 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$22.00	$22.50	$21.50	$23.00
Birdsboro, Pa.	22.00	22.50	21.50	23.00
Birmingham, Ala.‡	17.38	....	16.38	21.50
Buffalo	21.00	21.50	20.00	22.00
Chicago	21.00	21.00	20.50	21.50
Cleveland	21.00	21.00	20.50	21.50
Detroit	21.00	21.00	20.50	21.50
Duluth	21.50	21.50	....	22.00
Erie, Pa.	21.00	21.50	20.50	22.00
Everett, Mass.	22.75	23.25	22.25	23.75
Hamilton, O.	21.00	21.00	20.50	....
Jackson, O.	20.25	20.25	19.75	....
Neville Island, Pa.	21.00	21.00	20.50	21.50
Provo, Utah	18.50	....	18.00	....
Sharpsville, Pa.	21.00	21.00	20.50	21.50
Sparrows Point, Md.	22.00	....	21.50	....
Swedeland, Pa.	22.00	22.50	21.50	23.00
Toledo, O.	21.00	21.00	20.50	21.50
Youngstown, O.	21.00	21.00	20.50	21.50

‡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	22.58	....	21.46	....
Boston from Birmingham	23.37	....	22.87	....
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	24.27	24.77	....	....
Brooklyn, N. Y., from Bmghm.	24.05	....	....	....
Canton, O., from Cleveland	21.76	21.76	21.26	22.26
Chicago from Birmingham	21.22	....	21.10	....
Cincinnati from Hamilton, O.	20.82	21.58	21.08	....
Cincinnati from Birmingham	20.69	....	19.69	....
Cleveland from Birmingham	21.12	....	20.62	....
Cincinnati from Hamilton, O.	21.07	21.79	20.07	....
Mansfield, O., from Toledo, O.	22.76	22.76	22.26	22.26
Milwaukee from Chicago	22.00	22.00	21.50	22.00
Muskegon, Mich., from Chicago, Toledo or Detroit	23.90	23.90	23.40	24.40
Newark, N. J., from Birmingham	23.01	....	....	....
Newark, N. J., from Bethlehem	23.39	23.89	....	....
Philadelphia from Birmingham	22.38	....	22.26	....
Philadelphia from Swedeland, Pa.	22.76	23.26	22.26	....
Pittsburgh district from Neville Island	⎧ Neville, base plus 63c, 76c, ⎩ and $1.13 switch'g charges			
Saginaw, Mich., from Detroit	23.25	23.25	22.75	22.75
St. Louis, northern	21.50	21.50	21.00	....

Delivered from Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis from Birmingham	†21.12	....	20.82	....
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., $25.50, Phila. base, standard and copper bearing, $26.63.

Gray Forge		Charcoal	
Valley furnace	$20.50	Lake Superior fur.	$23.50
Pitts. dist. fur.	20.50	do., del. Chicago	26.54
		Lyles, Tenn.	24.00

Silvery†

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

Bessemer Ferrosilicon†

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

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

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

Refractories

Per 1000 f.o.b. Works

Fire Clay Brick	
Super Quality	
Pa., Mo., Ky.	$58.90
First Quality	
Pa., Ill., Md., Mo., Ky.	$45.60
Alabama, Georgia	$38.00-45.00
Second Quality	
Pa., Ill., Ky., Md., Mo.	40.85
Georgia, Alabama	36.10
Ohio	
First quality	$40.85
Intermediary	38.00
Second quality	29.45
Malleable Bung Brick	
All bases	54.15
Silica Brick	
Pennsylvania	$45.60
Joliet, E. Chicago	54.15
Birmingham, Ala.	45.60
Ladle Brick	
(Pa., O., W. Va., Mo.)	
Dry press	$25.00
Wire cut	23.00
Magnesite	
Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	42.00
Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk)	24.00
Base Brick	
Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.	
Chrome brick	$47.00
Chem. bonded chrome	47.00
Magnesite brick	67.00
Chem. bonded magnesite	57.00

Fluorspar, 85-5

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

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	80.00
Do., Baltimore, base	80.00
Do., del. Pittsburgh	84.79
Spiegeleisen, 19-20% dom. Palmerston, Pa., spot	†26.00
Do., New Orleans	26.00
Ferrosilicon, 50% freight allowed, c. l.	69.50
Do., less carload	77.00
Do., 75 per cent	126-130.00
Spot, $5 a ton higher.	
Silicoman., 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, lb.	7.75-8.25
Ferrophosphorus, per ton, c. l., 17-19% Rockdale, Tenn., basis, 18%, $3 unitage	58.50
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $3 unitage	75.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80
†Carloads. Quan. diff. apply.	

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin: New York Spot	Straits Tin: New York Futures	Lead: New York	Lead: East St. L.	Zinc: St. L.	Aluminum 99%	Antimony: Chinese Spot, N. Y.	Nickel: Cathodes
Feb. 6	13.00	13.12½	12.70	50.15	50.10	6.00	5.85	6.25	*19.00	14.25	35.00
Feb. 8	13.00	13.12½	12.70	50.37½	50.20	6.00	5.85	6.25	*19.00	14.25	35.00
Feb. 9	13.00	13.12½	12.70	50.20	50.05	6.00	5.85	6.40	*19.00	14.25	35.00
Feb. 10	13.00	13.12½	12.70	50.70	50.50	6.00	5.85	6.40	*19.00	14.25	35.00
Feb. 11	13.00	13.12½	12.70	51.25	51.15	6.00	5.85	6.40	*19.00	14.25	35.00
Feb. 12—Holiday											

*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 13.00. Conn. copper

Sheets

Yellow brass (high)	18.12½
Copper, hot rolled	20.37½
Lead, cut to jobbers	9.50
Zinc, 100-lb. base	10.50

Tubes

High yellow brass	20.87½
Seamless copper	21.37½

Rods

*High yellow brass	15.00
Copper, hot rolled	17.12½

Anodes

Copper, untrimmed	17.87½

Wire

Yellow brass (high)	18.37½

OLD METALS

Deal. buying prices, cents lb.

No. 1 Composition Red Brass	
New York	8.75- 9.00
Cleveland	9.75-10.00
Chicago	9.12½-9.37½
St. Louis	9.00- 9.50
Heavy Copper and Wire	
*New York, No. 1	10.75-11.00
Chicago, No. 1	10.75-11.00
Cleveland, No. 1	10.75-11.00
St. Louis, No. 1	10.62½-11.00
Composition Brass Borings	
*New York	8.00- 8.25
Light Copper	
*New York	9.00- 9.25
*Chicago	9.12½-9.37½
Cleveland	8.75- 9.00
St. Louis	9.00- 9.50
Light Brass	
Chicago	5.87½-6.12½
Cleveland	5.25- 5.50
St. Louis	6.00- 6.25
Lead	
*New York	5.00
Cleveland	4.87½- 5.00
Chicago	5.00- 5.25
*St. Louis	4.75- 5.00
Zinc	
*New York	3.25
St. Louis	3.50- 3.75
Cleveland	3.25- 3.50
Aluminum	
Borings, Cleveland	9.75-10.00
Mixed, cast, Cleve.	13.25-13.50
*Mixed, cast, St. L.	13.00-13.50
Clips, soft, Cleve.	15.00-15.25
SECONDARY METALS	
Brass, ingot 85-5-5-5, lcl.	14.00
Stand. No. 12 alum.	17.50-17.75

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS

Baltimore	3.50c
Boston††	3.55c
Buffalo	3.10c
Chattanooga	3.71c
Chicago (j)	3.35c
Cincinnati	3.55c
Cleveland	3.25c
Detroit	3.43½c
Houston	3.10c
Los Angeles	4.00c
Milwaukee	3.46c-3.61c
New Orleans	3.70c
New York‡ (d)	3.62c
Pitts. (h)	3.30c-3.45c
Philadelphia*	3.45c
Portland	3.85c
San Francisco	3.85c
Seattle	4.10c
St. Louis	3.59c
St. Paul	3.60c-3.75c
Tulsa	3.35c

IRON BARS

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

REINFORCING BARS

Buffalo	2.60c
Chattanooga	3.71c
Cleveland (c)	2.25c
Cincinnati	3.40c
Houston	3.25c
Los Angeles, c.l.	2.45c
New Orleans*	2.84c
Pitts., plain (h)	3.25c
Pitts., twisted squares (h)	3.40c
San Francisco	2.72½c
Seattle	3.75c
St. Louis	3.49c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES

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

PLATES

Baltimore	3.60c
Boston††	3.58c
Buffalo	3.47c
Chattanooga	3.81c
Chicago	3.45c
Cincinnati	3.65c
Cleveland, ¼-in. and over	3.56c
Detroit	3.65c
Detroit, ⅜-in.	3.85c
Houston	3.10c
Los Angeles	4.00c
Milwaukee	3.41c
New Orleans	3.80c
New York‡ (d)	3.65c
Philadelphia*	3.30c
Phila. floor	4.95c
Pittsburgh (h)	3.40c
Portland	3.85c
San Francisco	3.75c
Seattle	4.05c
St. Louis	3.69c
St. Paul	3.70c
Tulsa	3.60c

NO. 10 BLUE

Baltimore	3.45c
Boston (g)	3.70c
Buffalo	3.72c
Chattanooga	3.66c
Chicago	3.35c
Cincinnati	3.50c
Cleveland	3.41c
Det. 8-10 ga.	3.43½c
Houston	3.45c
Los Angeles	4.15c
Milwaukee	3.46c
New Orleans	3.85c
New York‡ (d)	3.57c
Portland	3.95c
Philadelphia*	3.45c
Pittsburgh (h)	3.25c
San Francisco	3.95c
Seattle	4.10c
St. Louis	3.59c
St. Paul	3.60c
Tulsa	3.80c

NO. 24 BLACK

Baltimore*†	4.10c
Boston (g)	4.30c
Buffalo	3.35c
Chattanooga*	3.56c
Chicago	3.90c-4.55c
Cincinnati	4.05c
Cleveland	4.31c
Detroit	4.33½c
Los Angeles	4.35c
Milwaukee	4.16c
New York‡ (d)	4.22c
Philadelphia*†	4.15c
Pitts.** (h)	3.65c-4.95c
Portland	4.65c
Seattle	4.85c
San Francisco	4.65c
St. Louis	4.29c
St. Paul	4.30c
Tulsa	4.85c

NO. 24 GALV. SHEETS

Baltimore*†	4.20c
Buffalo	4.10c
Boston (g)	4.35c
Chattanooga*	4.16c
Chicago (h)	4.35c-5.35c
Cincinnati	4.65c
Cleveland	4.91c
Detroit	5.00c
Houston	4.50c
Los Angeles	4.60c
Milwaukee	4.76c
New Orleans*	4.09c
New York‡ (d)	4.50c
Philadelphia*†	4.80c
Pitts.** (h)	4.50c-4.75c
Portland	5.35c
San Francisco	5.25c
Seattle	5.35c
St. Louis	4.89c
St. Paul	5.10c
Tulsa	5.20c

BANDS

Baltimore	3.50c
Boston††	3.70c
Buffalo	3.52c
Chattanooga	3.91c
Cincinnati	3.75c
Cleveland	3.66c
Chicago	3.60c
Detroit, ⅜-in. and lighter	3.68½c
Houston	3.35c
Los Angeles	4.30c
Milwaukee	3.71c
New Orleans	4.25c
New York‡ (d)	3.82c
Philadelphia*	3.55c
Pittsburgh (h)	3.50c
Portland	4.60c
San Francisco	4.45c
Seattle	4.60c
St. Louis	3.84c
St. Paul	3.85c
Tulsa	3.55c

HOOPS

Baltimore	3.75c
Boston††	4.70c
Buffalo	3.52c
Chicago	3.60c
Cincinnati	3.75c
Detroit, No. 14 and lighter	3.68½c
Los Angeles	6.25c
Milwaukee	3.71c
New York‡ (d)	3.66c
Philadelphia*	3.80c
Pittsburgh (h)	4.00c
Portland	5.95c
San Francisco	6.50c
Seattle	5.95c
St. Louis	3.84c
St. Paul	3.85c

COLD FIN. STEEL

Baltimore (c)	4.15c
Boston*	4.30c
Buffalo (h)	3.70c
Chattanooga*	4.51c
Chicago (h)	3.95c
Cincinnati	4.15c
Cleveland (h)	3.95c
Detroit	4.03½c
Los Ang. (f) (d)	6.35c
Milwaukee	4.06c
New Orleans	4.75c
New York‡ (d)	4.22c
Philadelphia*	4.18c
Pittsburgh	3.80c
Portland (f) (d)	5.35c
San Fran. (f) (d)	6.30c
Seattle (f) (d)	5.35c
St. Louis	4.19c
St. Paul	4.20c
Tulsa	4.80c

COLD ROLLED STRIP

Boston	3.495c
Buffalo	3.39c
Chicago	3.52c
Cleveland (b)	3.00c
Cleveland (b)	3.20c
Detroit	3.43c
New York‡ (d)	3.57c
St. Louis	3.61c

TOOL STEELS

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

	Base
High speed	59½c
High carbon, high chrome	39c
Oil hardening	23c
Special tool	21c
Extra tool	17¾c
Regular tool	14½c

Uniform extras apply.

BOLTS AND NUTS

(100 pounds or over)

	Discount
Chicago (a)	65
Cleveland	70
Detroit	70-10
Milwaukee	65
New Orleans	70-10
Pittsburgh	65-5

(a) Under 100 lbs., 60 off.

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

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

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

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Feb. 11

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

	British gross tons U. K. ports		Continental Channel or North Sea ports, metric tons	
			Quoted in dollars at current value	**Quoted in gold pounds sterling
PIG IRON	£ s d			£ s d
Foundry, 2.50-3.00 Silicon	$19.23 to	3 18 6*	$18.30	2 5 0
Basic bessemer	19.23	3 18 6*	14.23	1 15 0
Hematite, Phos. .03-.05	21.48	4 7 6	.....	.....
SEMIFINISHED STEEL				
Billets	$30.69	6 5 0	$24.40	3 0 0
Wire rods, No. 5 gage	47.16	9 12 6	41.68	5 2 6
FINISHED STEEL				
Standard rails	$40.51	8 5 0	$44.74	5 10 0
Merchant bars	2.03c	9 5 0	1.39c to 1.57c	3 15 0 to 4 5 0
Structural shapes	2.00c	9 2 6	1.29c to 1.48c	3 10 0 to 4 0 0
Plates, †¼ in. or 5 mm.	2.23c	10 3 9	2.00c to 2.05c	5 9 6 to 5 12 0
Sheets, black, 24 gage or 0.5 mm.	2.64c	12 0 0	2.67c	7 5 0††
Sheets, gal., 24 gage, corr.	3.23c	14 15 0	3.41c	9 5 0
Bands and strips	2.20c	10 0 0	1.75c to 1.89c	4 15 0 to 5 2 6
Plain wire, base	2.31c	10 10 0	2.49c	6 15 0
Galvanized wire, base	2.75c	12 10 0	2.94c	7 17 6
Wire nails, base	2.64c	12 0 0	2.39c	6 10 0
Tin plate, box 108 lbs.	$ 4.85	0 19 9	.....	.....

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

Domestic Prices at Works or Furnace—Last Reported

		£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$19.89	4 1 0(a)	$17.61	378	$22.24	660	$25.36	63
Basic bessemer pig iron	20.25	4 2 6(a)	12.84	275	14.66	435	29.97 (b)	69.50
Furnace coke	5.28	1 1 6	5.93	127	4.62	137	7.65	19
Billets	30.69	6 5 0	27.55	590	21.57	640	38.84	96.50
Standard rails	1.82c	8 5 0	1.64c	780	1.73c	1,150	2.38c	132
Merchant bars	2.19c	9 10 0	1.68c	800	1.16c	775	1.98c	110
Structural shapes	2.01c	9 3 0	1.64c	780	1.16c	775	1.93c	107
Plates, †¼-in. or 5 mm.	2.16c	9 16 9	2.12c	1,010	1.43c	950	2.29c	127
Sheets, black	2.64c	12 0 0§	2.84c	1,350‡	1.54c	1,025‡	2.59c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	3.08c	14 0 0	4.41c	2,100	2.85c	1,900	6.66c	370
Plain wire	2.42c	11 0 0	2.77c	1,320	2.02c	1,350	3.11c	173
Bands and strips	2.26c	10 5 0	1.92c	915	1.43c	950	2.29c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. a del. Middlesbrough. b hematite. ††Close annealed.

**Gold pound sterling carries a premium of 66.85 per cent over paper sterling.

Iron and Steel Scrap Prices

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

HEAVY MELTING STEEL

Birmingham†	12.50-13.50
Bos. dock, No. 1, exp.	16.00-16.25
N. Eng. del. No. 1	15.50
Buffalo, No. 1	18.50-19.00
Buffalo, No. 2	17.00-17.50
Chicago, No. 1	18.75-19.25
Cleveland, No. 1	17.50-18.00
Cleveland, No. 2	16.50-17.00
Detroit, No. 1	15.50-16.00
Eastern Pa., No. 1	18.50-19.00
Eastern Pa., No. 2	17.50-18.00
Federal, Ill.	15.00-15.50
Granite City, R. R.	16.50-17.00
Granite City, No. 2	15.00-15.50
New York, No. 1	14.00-14.50
N.Y. dock, No. 1 exp.	13.50-14.50
Pitts., No. 1 (R. R.)	20.00-20.50
Pitts., No. 1 (dlr.)	19.50-20.00
Pittsburgh, No. 2	17.50-18.00
St. Louis, R. R.	16.50-17.00
St. Louis, No. 2	15.00-15.50
Toronto, dlrs. No. 1	9.75-10.50
Toronto, No. 2	8.75- 9.50
Valleys, No. 1	18.50-19.00

COMPRESSED SHEETS

Buffalo, dealers	17.00-17.50
Chicago, factory	18.00-18.50
Chicago, dealer	16.50-17.00
Cleveland	17.50-18.00
Detroit	16.00-16.50
E. Pa., new mat.	18.50-19.00
E. Pa., old mat.	16.00-16.50
Pittsburgh	19.75-20.25
St. Louis	15.00-15.50
Valleys	18.50-18.75

BUNDLED SHEETS

Buffalo	14.50-15.00
Cincinnati, del.	12.50-13.00
Cleveland	14.00-14.50
Pittsburgh	17.50-18.00
St. Louis	12.00-12.50
Toronto, dealers	6.00

SHEET CLIPPINGS, LOOSE

Chicago	13.50-14.00
Cincinnati	11.50-12.00
Detroit	12.25-12.75
St. Louis	11.00-10.50

STEEL RAILS, SHORT

Birmingham	16.00-16.50
Buffalo	21.00-22.00
Chicago (3 ft.)	21.50-22.00
Chicago (2 ft.)	22.50-23.00
Cincinnati, del.	20.00-20.50
Detroit	19.00-19.50
Pitts., open-hearth, 3 ft. and less	23.50-24.00
St. Louis, 2 ft. & less	19.50-20.00

STEEL RAILS, SCRAP

Boston district	†13.50-14.00
Buffalo	18.50-19.00
Chicago	19.00-19.50
Pittsburgh	20.50-21.00
St. Louis	17.00-17.50
Toronto, dealers	9.00

STOVE PLATE

Birmingham	9.00- 9.50
Boston district	†9.75-10.00
Buffalo	13.75-14.00
Chicago	10.50-11.00
Cincinnati, dealers	11.25-11.75
Detroit, net	10.50-11.00
Eastern Pa.	15.00
New York, fdry.	10.50-11.00
St. Louis	11.75-12.25
Toronto, deal'rs, net	7.50- 8.00

SPRINGS

Buffalo	19.50-20.00
Chicago, leaf	20.25-20.75
Chicago, coil	22.50-23.00
Eastern Pa.	23.50-24.00
Pittsburgh	25.00-25.50
St. Louis	18.75-19.25

ANGLE BARS—STEEL

Chicago	21.00-21.50
St. Louis	17.50-18.00
Buffalo	14.50-15.00

RAILROAD SPECIALTIES

Chicago	20.50-21.00

LOW PHOSPHORUS

Buffalo, billet and bloom crops	20.50-21.50
Cleveland, billet, bloom crops	22.00-22.50
Eastern Pa., crops	23.50-24.00
Pittsburgh, billet, bloom crops	25.00-25.50
Pittsburgh, sheet bar crops	23.50-24.00

FROGS, SWITCHES

Chicago	18.50-19.00
St. Louis, cut	17.00-17.50

SHOVELING STEEL

Chicago	18.75-19.25
Federal, Ill.	15.00-15.50
Granite City, Ill.	15.00-15.50
Toronto, dealers	7.50

RAILROAD WROUGHT

Birmingham	9.00-10.00
Boston, district	†8.00- 8.25
Buffalo, No. 1	17.00-17.50
Buffalo, No. 2	18.50-19.00
Chicago, No. 1, net	16.75-17.25
Chicago, No. 2	18.75-19.25
Cincinnati, No. 2	16.50-17.00
Eastern Pa.	19.00
St. Louis, No. 1	14.00-14.50
St. Louis, No. 2	16.50-17.00
Toronto, No. 1 dlr.	8.00

SPECIFICATION PIPE

Eastern Pa.	16.00-16.50
New York	12.00-12.50

BUSHELING

Buffalo, No. 1	17.00-17.50
Chicago, No. 1	17.75-18.25
Cincin., No. 1, deal.	12.25-12.75
Cincinnati, No. 2	9.00- 9.50
Cleveland, No. 2	13.00-13.50
Detroit, No. 1, new	15.00-15.50
Valleys, new, No. 1	18.00-18.50
Toronto, dealers	7.00

MACHINE TURNINGS

Birmingham	6.00- 6.50
Buffalo	12.00-12.50
Chicago	10.00-10.50
Cincinnati, dealers	10.00-10.50
Cleveland	11.50-12.00
Detroit	10.50-11.00
Eastern Pa.	12.50-13.00
New York	†8.50- 9.00
Pittsburgh	14.25-14.75
St. Louis	8.00- 8.50
Toronto, dealers	6.25- 7.00
Valleys	13.75-14.25

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	7.25- 8.25
Buffalo	12.25-12.75
Cincinnati, dealers	10.00-10.50
Cleveland	13.00-13.50
Detroit	10.50-11.00
Eastern Pa.	11.00-11.50
New York	†7.00- 7.50
Pittsburgh	14.00-14.50
Toronto, dealers	6.25

CAST IRON BORINGS

Birmingham	6.00- 6.50
Boston dist. chem.	†9.50- 9.75
Boston dist. for mills	†8.00- 8.25
Buffalo	12.00-12.50
Chicago, dealers	10.50-11.00
Cincinnati, dealers	10.00-10.50
Cleveland	13.00-13.50
Detroit	10.50-11.00
E. Pa., chemical	13.00-13.50
New York	†8.00- 8.50
St. Louis	8.00- 8.50
Toronto, dealers	6.75

PIPE AND FLUES

Cincinnati, dealers	10.50-11.00
Chicago, net	13.00-13.50

RAILROAD GRATE BARS

Buffalo	14.50-15.00
Chicago, net	12.00-12.50
Cincinnati	11.00-11.50
Eastern Pa.	15.00
New York	†10.50-11.00
St. Louis	12.25-12.75

FORGE FLASHINGS

Boston district	†11.75-12.00
Buffalo	17.00-17.50
Cleveland	17.00-17.50
Detroit	14.50-15.00
Pittsburgh	17.50-18.00

FORGE SCRAP

Boston district	†6.50- 7.00
Chicago, heavy	21.50-22.00
Eastern Pa.	16.50-17.00

ARCH BARS, TRANSOMS

St. Louis	16.50-17.00

AXLE TURNINGS

Boston district	†9.00- 9.50
Buffalo	14.50-15.00
Chicago, elec. fur.	18.00-18.50
Eastern Pa.	16.50-17.00
St. Louis	11.50-12.00
Toronto	6.25

STEEL CAR AXLES

Birmingham	17.00-18.00
Buffalo	19.50-20.00
Boston district	†18.50-19.00
Chicago, net	22.50-23.00
Eastern Pa.	22.00-22.50
St. Louis	21.00-21.50

SHAFTING

Boston district	†18.00-18.50
Eastern Pa.	22.50
New York	†18.00-19.00
St. Louis	15.00-15.50

CAR WHEELS

Birmingham	16.00-17.00
Boston dist. iron	†13.00-13.50
Buffalo, iron	17.50-18.00
Buffalo, steel	20.50-21.50
Chicago, iron	19.00-19.50
Chicago, rolled steel	20.50-21.00
Cincinnati, iron	17.50-18.00
Eastern Pa., iron	19.00
Eastern Pa., steel	23.00-23.50
Pittsburgh, iron	19.00-19.50
Pittsburgh, steel	25.00-25.50
St. Louis, iron	16.50-17.00
St. Louis, steel	18.75-19.25

NO. 1 CAST SCRAP

Birmingham	13.00-14.00
Bos. dis. No. 1 mach.	13.75-14.00
N. Eng., del. No. 2	†13.00
N. Eng., del. textile	16.00
Buffalo, cupola	16.50-17.00
Buffalo, mach.	17.25-17.75
Chicago, agri. net	12.50-13.00
Chicago, auto	14.75-15.25
Chicago, mach. net	16.50-17.00
Chicago, railr'd net	15.00-15.50
Cinci., mach. cup	16.25-16.75
Cleveland, mach.	19.00-19.50
Eastern Pa., cupola	18.50-19.50
E. Pa., mixed yard	16.00-16.50
Pittsburgh, cupola	18.00-18.50
San Francisco, del.	13.50-14.00
Seattle	11.00-12.00
St. Louis, No. 1	14.00-14.50
St. L., No. 1, mach.	15.50-16.00
Toronto, No. 1, mach., net	10.50-11.00

HEAVY CAST

Boston dist. break.	12.75-13.00
New England, del.	15.00
Buffalo, break.	14.50-15.00
Cleveland, break.	14.50-15.00
Detroit, No. 1 mach. net	13.50-14.00
Detroit, break.	12.50-13.00
Detroit, auto net	14.25-14.75
Eastern Pa.	18.00
New York, break.	†13.50-14.00
Pittsburgh	16.00-16.50

MALLEABLE

Birmingham, R. R.	15.00-15.50
New England, del.	†16.25-17.50
Buffalo	18.50-19.00
Chicago, R. R.	21.00-21.50
Cinci., agri. del.	15.25-15.75
Cleveland, rail.	20.00-20.50
Detroit, auto, net	15.00-15.50
Eastern Pa., R. R.	18.00-18.50
Pittsburgh, rail	19.50-20.00
St. Louis, R. R.	17.50-18.00

RAILS FOR ROLLING

5 feet and over

Birmingham	16.00-16.50
Boston	13.50-14.00
Buffalo	20.00-20.50
Chicago	20.50-21.00
Eastern Pa.	18.50-19.00
New York	16.50-17.00
St. Louis	17.75-18.25

LOCOMOTIVE TIRES

Chicago (cut)	20.50-21.00
St. Louis, No. 1	18.00-18.50

LOW PHOS. PUNCHINGS

Buffalo	20.00-21.00
Chicago	22.50-23.00
Eastern Pa.	23.00-23.50
Pittsburgh (heavy)	23.75-24.25
Pittsburgh (light)	21.25-21.75

Iron Ore

Lake Superior Ore

Gross ton, 51½%

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 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 manganiferous ore, 45.55% iron, 6-10% man.	16.00
No. Afr. low phos.	16.00
Swedish low phos.	nominal
Spanish No. Africa basic, 50 to 60%	15.50
Tungsten, spot sh. ton unit, duty pd.	$15.85-16.00
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	20.00-21.00

Manganese Ore

(Nominal)

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52%	34.00
So. African, 50-52%	34.00
Indian, 50-52%	34.00

Bars

Bar Prices, Page 88

Pittsburgh—Shipments of bars continue at a high rate and mill schedules are satisfactory, although demand is not as heavy as in other products, such as sheets. Machine tool builders, railroad car shops, and mid-western bolt and nut manufacturers have been specifying steadily and deliveries have been well maintained to automobile manufacturers other than General Motors. Return of the latter to the market undoubtedly will be stimulating. The price of carbon bars is steady at 2.20c, base, Pittsburgh.

Cleveland—Nut and bolt concerns, farm and roadmaking equipment manufacturers continue to specify freely for immediate consumption. Requirements for commercial and cold-drawn alloy bars from sources other than auto partsmakers has given much encouragement.

Chicago—With new business continuing active, bar mills are unable to improve deliveries and shipments generally extend four weeks or more. Specifications from leading consumers are heavy and shipments will be stimulated further by resumption of operations at General Motors plants.

Philadelphia—Although some shipments of commercial steel bars are still available at about three weeks, the general minimum appears to be four weeks, with some mills sold further ahead. In alloy steel bars, the situation continues exceedingly tight, with some producers sold ahead until June. Extended delivery is forcing considerable buying as consumers endeavor to get on rolling schedules. Prices are strong.

New York—Bar shipments are expanding rapidly, with consumers more concerned with deliveries than price. However, in this they are being more or less reassured, for leading trade opinion is that there will be no advance for second quarter.

Tin Plate

Tin Plate Prices, Page 88

Pittsburgh — Tin plate operations continue at 96 per cent of capacity, with no immediate decline in sight. A highlight recently has been demand for export with foreign interests reported offering advantageous premiums. Domestic demand shows no sign of slackening. Packers are preparing for a heavy season. Tin plate remains $4.85 per base box, Pittsburgh.

Plates

Plate Prices, Page 88

Pittsburgh—Plate mills have been operating at a high rate, with heavy shipments to railroad equipment manufacturers and other sources taking large tonnage. It is anticipated that aggregate demand for plates may show an upturn before long. Plates continue at 2.05c, base, Pittsburgh.

Cleveland—Plate mills are active, due to extending backlogs resulting from heavy buying during the protection period. By far the greatest tonnage is for tank and freight car construction. However, requirements from miscellaneous consumers have aggregated considerable tonnage. Boat repair work for the American Shipbuilding Co., Cleveland, and others, is expected to result in considerable tonnage of plates over the next few months.

Chicago—Plate deliveries are being extended as mill books have been swelled by heavy buying lately for freight cars. Deliveries to railroad shops and equipment builders will continue at a brisk rate through the remainder of this half and demand from tank and structural fabricators and miscellaneous users is growing. Lighter gages are receiving the best call from smaller consumers.

New York—Plate deliveries are becoming more extended, although two weeks can still be done in some cases. Contributing principally are releases against identified work placed in January; nevertheless, new business is exceeding most trade expectations. Socony-Vacuum Oil Co. will build a 4,000,000-gallon tank in Staten Island, requiring more than 700 tons of plates.

Philadelphia—While some eastern plate mills are still able to offer two weeks, deliveries in general are becoming more extended. One eastern seller within the past week has been forced to extend deliveries to four and five weeks. Significant of the volume of business now going through the mills is an expansion of ingot production at two eastern plate mills. Prices are firm.

The Pennsylvania railroad is issuing substantial releases for repairs to 24,000 freight cars and 1800 locomotives. This is apart from arch bar replacements in trucks of 185,000 freight cars by the end of this year.

Birmingham, Ala.—Plate mill operation continues active with shipments almost equal to production.

San Francisco—Demand is exceptionally quiet at the moment and little new work is in sight. To date this year 6306 tons have been booked as compared with 38,916 tons for the corresponding period in 1936.

Seattle—Several contemplated projects, deferred because of lack of water transportation, are expected to develop shortly and a number of awarded contracts, delayed for the same reason, will be pushed to completion. Spokane will call bids shortly for an unstated footage of 30-inch steel pipe. Commercial Boiler Works, Seattle, has taken a contract to construct a digester, involving 50 tons, for the Fibreboard Products Co., Port Angeles.

Contracts Placed

3192 tons, 60-inch weld steel pipe, Crystal Springs pipe line No. 2, San Francisco, to Consolidated Steel Corp., Los Angeles.

2700 tons, 25 coal barges, Wheeling Steel Corp., Wheeling, W. Va., to Dravo Contracting Co., Pittsburgh.

1800 tons, eight tanks, Pan-American Petroleum & Transport Co., Texas City, Tex., to Chicago Bridge & Iron Works, Chicago.

1410 tons, six oil tanks, Shell Petroleum Corp., St. Paul, Minn., to Chicago Bridge & Iron Works, Chicago.

1050 tons, barges, Standard Oil Co. of

New York, to Kaw Steel Construction Co., Kansas City, Kan.
600 tons, tanks, Globe Oil & Refining Co., Lemont, Ill., to Graver Tank & Mfg. Co., East Chicago, Ind.
365 tons, large size water main, Convent avenue, New York, to Alco Products Inc., Dunkirk, N. Y.
244 tons, for school building in Covington, Ky., to Pollak Steel Co., Cincinnati, through Whittenberg Const. Co., Louisville, Ky., general contractors.
180 tons, 500,000-gallon tank and tower, Fresno, Calif., to Chicago Bridge & Iron Works, Chicago.
130 tons, for Heekin Can Co. warehouse, Cincinnati, to Pollak Steel Co., Cincinnati, through Ferro-Concrete Const. Co., Cincinnati.

Contracts Pending

700 tons, for 4,000,000-gallon tank, Socony-Vacuum Oil Co., New York, pending.
350 tons, four fuel oil tanks, White Fuel Corp., South Boston, Mass.
150 tons, 300,000-gallon elevated steel tank, water system, Salisbury, Md., bids Feb. 19.
Unstated tonnage, 100,000-gallon tank, Spotswood, N. J., bids Feb. 16.

Sheets

Sheet Prices, Page 88

Pittsburgh—Return of General Motors to the market may result in complications in a situation already unusually complex. Most large sheet producers are now booked solidly long in advance, and in one or two instances it is reported that specifications have been placed for second-quarter delivery with the stipulation that the price prevailing then shall be paid. Pressure being exerted for shipment indicates that most of the specifications are for immediate use. Aggregate bookings from all types of consumers were exceptionally good in recent weeks. Where disruptions were caused by floods return to normal has been speedy. Pittsburgh base prices on sheets are steady.

Cleveland—Miscellaneous consumers continue to specify freely for immediate consumption. Some are anxious to have all their material rolled, fearing that when General Motors resume active operation deliveries will be delayed. Requirements for enameling and galvanized sheets are particularly heavy. The possibility of a price advance on some grades of galvanized and other coated sheets for second quarter is thought likely.

Chicago—Delivery problems are becoming more troublesome and the resumption of automotive operations at General Motors plants is expected to aggravate this situation. Producers are completely sold for this quarter and new bookings are extending farther into second quarter. Miscellaneous users show no slackening of needs and few buyers find they overestimated needs.

Philadelphia—While looking for no general increase in sheet prices here, some trade leaders expect an advance in galvanized sheets, due to sharp increase in zinc in recent weeks. Possibility of such a revision, combined with heavy demands from jobbers for supplies to meet spring trade, has forced deliveries on galvanized sheets further ahead, with a result that some leading producers are now virtually out of the market for this quarter. Deliveries on other sheet grades also are being extended, and with settlement of the maritime strike on the Pacific coast, one eastern mill which until recently has been able to offer No. 10 hot rolled within two weeks, is now able to do no better than four weeks. Settlement of the General Motors strike last week will further complicate deliveries in general. New demand is being well sustained, and the fact that several of the larger mills are already practically

out of the market for tonnage for delivery this quarter, gives rise to the belief that an announcement of second quarter prices may come earlier than is usual.

New York—With the automobile strike settled and deliveries daily becoming more complicated, consumers of sheets are rushing into the market in greater number in an effort to get on rolling schedules. Much of this tonnage is for second quarter and consumers in the main are showing little hesitancy on the fact prices have not been announced for that period. Their main consideration is to get delivery. However, indications are that there will be no important advances in sheets, except in galvanized. In this product, the sharp advances in zinc in recent weeks may lead to higher prices. Breese Corps. Inc., Newark, N. J., is low on a $118,000 contract to supply metal stack columns for the Archives building, Washington.

Cincinnati — Curtailment of sheet production because of the Ohio river flood has resulted in almost all production for the remainder of this quarter being engaged. Orders in some grades are being accepted. Some second quarter business is being taken, subject to prices then prevailing, so as to assure delivery position.

Buffalo—Local sheet works continue at practically full capacity. Inquiry is coming from practically all classes of consumers and forward buying is believed to be general.

St. Louis—Demand for sheets is more active with urgent requests for deliveries. The leading local producer has increased output by completion of its new equipment. Galvanized sheets are in active demand, with the general manufacturing trade accounting for major tonnages.

Pipe

Pipe Prices, Page 89

Pittsburgh—Settlement of the Pacific coast maritime strike has cleared the way for the movement of orders placed in Pittsburgh and nearby production centers. Railroad equipment makers have been specifying freely for boiler tubes and freight car work, and most tube mills are operating close to capacity. Demand for oil country goods continues well maintained. Pure Oil Co. has let a contract for 14 miles of 4-inch oil line to the B. &. M. Construction Corp., Tulsa, Okla. The line will run from Edmond, Okla., to Oklahoma City.

Cleveland—Jobbers of standard steel pipe report a slight decline in stock turnover for the first two weeks in February. However, favorable weather has permitted plant and general construction work to go on at a relatively high rate. Some believe that prices will be advanced for second quarter, to conform more closely with increases on other steel products. Cast iron pipe demand is dull and little improvement is expected during the month.

Chicago—Cast pipe orders still are light and while inquiries show occasional gains, no marked upturn in buying is in immediate prospect. Most pending projects are for small lots. Prices are steady.

Boston—Small tonnage buying of cast pipe is slightly more active in 100 to 150-ton lots. Alco Products Inc., Dunkirk, N. Y., is expected to fabricate 500 tons of large diameter electrically welded steel pipe for Hartford, Conn., bids, Feb. 2.

New York—Small miscellaneous orders make up most cast pipe buying. Prices are firm. Eastern foundries are less active with smaller

backlogs, a part of current output going into stocks.

Philadelphia — Heavy demand from the southwestern oil fields continues to force some tube mills to the limit of capacity. This business is being bolstered by better than seasonal demand for merchant pipe.

Seattle—Dealers are awaiting delivery of much material held aboard ship during the strike. Inquiry is more active, as municipalities find means for financing their requirements. Queen City Construction Co., Seattle, has the contract to install a water system at Des Moines, Wash., involving 20,500 feet of 1½ to 6-inch steel pipe.

Steel Pipe Pending

460 tons, 12-inch pipe and also small tonnage of 16-inch pipe for west side elevated highway extension, New York; general contractors' bids to be opened Feb. 17 by the president of the Borough of Manhattan. This is in addition to the 3760 tons of 18-inch steel pipe noted as pending in last week's issue.

Unstated tonnage, 5525 feet, 20-inch riveted shore pipe, United States engineer, Galveston, Tex.; bids Feb. 17.

Cast Pipe Placed

169 tons, special castings, city of Milwaukee, to Rudisill Foundry Co., Anniston, Ala.

150 tons, small sizes, Southbridge, Mass., to United States Pipe & Foundry Co., Burlington, N. J.

136 tons, 6 and 8-inch, treasury department, invitation 20220, Los Angeles, to unnamed interest.

125 tons, 6 and 8-inch, Onset, Mass., to R. D. Wood & Co., Florence, N. J.

100 tons, 6 and 8-inch, procurement division, treasury department, Northport, N. Y., to United States Pipe & Foundry Co., Burlington, N. J.

100 tons, 4 and 6-inch, Lowell, Mass., to Warren Foundry & Pipe Corp., Everett, Mass.

60 tons offset pipes, to Filer & Stowell Co., Milwaukee; 250 fire hydrants, to Florence Pipe Foundry & Machine Co., Florence, N. J.

Cast Pipe Pending

2355 tons, 6, 8 and 12-inch, for Chicago; bids Feb. 24.

200 tons, Maplewood, Oreg., extension; United States Pipe & Foundry Co., Burlington, N. J., low.

150 tons, McNeil Island, Wash., extension; American Cast Iron Pipe Co., Birmingham, Ala., low.

100 tons, 4-inch, for Taholah Indian reservation, Washington; bids at Hoquiam, Wash., Feb. 15.

Unstated tonnage, new water works system, Costburg, Wis.; bids on general contracts close Feb. 18.

Cold Finished

Cold Finished Prices, Page 89

Pittsburgh — Cold-finished producers will be benefitted materially by the return of General Motors. Although some material already has been taken in anticipation of a reopening, suspension orders affected this line considerably. Requirements of jobbers have been a feature of the cold-finished market recently, but demand from other sources has been steady and shipments are heavy. Deliveries are three to four weeks in some lines and four to six weeks in others. Cold-finished bars continue at 2.55c, base, Pittsburgh.

Medart Co., St. Louis, has opened a district sales office in Kansas City, Mo., W. A. Crooks, an experienced power transmission engineer, is in charge of the office.

Transportation

Track Material Prices, Page 89

Rail mills are attempting to increase production in anticipation of heavier requirements of railroads during the next several months. Some producers are limited in ability to step up rail output, however, due to lack of sufficient ingot steel or of mill capacity.

Specifications for freight car materials are heavy and producers are

pushed to keep up with demand. Most cars and locomotives pending recently have been allocated though some additional equipment remains to be placed.

The Santa Fe plans to build 1000 refrigerator cars and 350 automobile cars in its own shops and will convert 200 box cars from wood to all steel construction. These are in addition to equipment already purchased. Little demand for track material has appeared from the flooded districts in the south although some rehabilitation work is expected to be necessary.

Car Orders Placed

Atchison, Topeka & Santa Fe, 1000 refrigerator cars and 350 automobile cars to own shops; also will convert 200 wood box cars to all-steel construction and equip 650 automobile cars with loading devices.

Canadian National, noted last week as having awarded a substantial number of cars, distributed its requirements as follows: Eastern Car Co. Ltd., 1000 box cars, 300 gondolas, 175 refrigerator cars and 15 snow plows; National Steel Car Corp. Ltd., 1000 box cars; Canadian Car & Foundry Co., Ltd., 1000 box cars and 58 flat cars; and company's own shops, 125 refrigerator cars.

Canadian Pacific, noted last week as having made a distribution, has placed orders as follows: Canadian Car & Foundry Co. Ltd., 1900 40-ton box cars; National Steel Car Corp. Ltd., 300 50-ton hopper cars, 200 50-ton gondolas and 100 75-ton gondolas; and Eastern Steel Car Co. Ltd., 1100 40-ton box cars.

Chicago & Illinois Midland, 100 hopper cars and 100 gondola cars, to Pullman-Standard Car Mfg. Co., Chicago.

Louisiana & Arkansas, 100 box cars, to Pullman-Standard Car Mfg. Co., Chicago.

Louisville & Nashville, 27 ballast cars to American Car & Foundry Co., New York.

Mexican National Railways, 50 box cars, Pressed Steel Car Co., Pittsburgh.

Missouri Pacific, in addition to award of 2225 freight cars as noted in last week's issue, has also placed 300 flat cars with its own shops.

Southern Pacific, 41 passenger cars, to Pullman-Standard Car Mfg. Co., Chicago.

Car Orders Pending

Board of Transportation, New York, 150 subway passenger cars, bids March 5; this is a readvertisement, with the first request involving three alternates and a maximum of 250 cars.

Chief of army engineers, Washington, 16 mine cars, Brown-Fayes, Johnstown, Pa. low.

Locomotives Placed

Chief of army engineers, Washington, two yard locomotives, to Fate-Root-Heath Co., Plymouth, O.

Michigan Limestone Co., Buffalo, two 600-horsepower diesel switchers, to American Locomotive Co., New York.

Buses Booked

American Car & Foundry Motors Co., New York, 25 coaches for Capital Transit Co., Washington.

Twin Coach Co., Kent, O., 28 gas coaches; Pacific Car & Foundry Co., Seattle, 15 gas coaches; Kenworth Motor Truck Corp., Seattle, 15 gas coaches; all for Seattle municipal transportation system.

Strip

Strip Prices, Page 89

Pittsburgh — Diversified consumption has been strong factor in maintaining strip mill operations at high rate. Some producers report amount of material affected by suspension orders from General Motors has been considerably less than the amount generally believed would be suspended, although many suppliers of General Motors have been unable to specify as freely as usual. Deliveries are still extended. Strip continues at 2.15c, base, Pittsburgh, for hot rolled and 2.85c, base, either Pittsburgh or Cleveland, for cold rolled.

Cleveland—Strip mills continue at peak production as small farm tool and electrical equipment manufac-

turers continue to specify heavily. Most of this tonnage is for immediate consumption, although some consumers, anticipating termination of General Motors labor difficulties, specified further ahead than customary. Deliveries on hot-rolled narrow widths are in heaviest demand. Shipments so far this month compare favorably with the corresponding period in January.

Chicago—Strip demand continues active and heavier shipments are in prospect as consequence of recent automotive labor developments. Producers generally are able to give delivery within 30 days on hot-rolled strip, with shipments of cold-rolled material more extended.

Boston—Some shipments of cold strip, held up indirectly by the automotive strike, have been released by partsmakers, who are again taking in material. Mills are operating at a high rate, and although deliveries are better consumers are still pressing for tonnage. Some cold strip mills are gradually reducing current heavy backlogs.

New York—Eastern sellers of narrow cold strip are still able to offer shipments in about five weeks, but with suspensions being lifted by automobile accessory manufacturers, extension of these schedules appears imminent.

Philadelphia — With the settlement of the General Motors strike, deliveries on strip steel are expected to jump sharply. Until recently three weeks deliveries could be obtained on both hot and cold strip. Current demand is more active than a fortnight ago.

Wire

Wire Prices, Page 89

Pittsburgh — With specifications for manufacturers' and merchant products well maintained, wire producers are in a comfortable position. Lifting of General Motors suspensions will improve movement in certain lines. Shipments are at a high rate, prices are firm. Discussion continues on probabilities of making adjustments such as bringing prices of nails and plain wire into alignment, but no action has been taken.

Cleveland—Wire producers report heavy backlogs, particularly in manufacturing wire. In some cases they are not accepting more business for first quarter delivery. However, a few sales have been made for shipment next quarter at prices effective at time of shipment.

Chicago—Shipments of plain wire and merchant wire products necessitate near-capacity operations. Deliveries of merchant products are moderately heavier, with further gains anticipated. Some talk is heard of higher prices next quarter but producers have yet to indicate probable levels for that period.

Boston—Steel cable strand inquiry for suspension bridges totals 740 tons, 180 being required for the Deer Isle-Sedgwick span, Maine, and 560 tons for two suspension bridges near Wells, N. Y., closing with the Thousand Island Bridge authority, Watertown, N. Y., March 2. Finishing mill operations are at a high rate, with continued pressure for delivery. New business is substantial, notably for specialties. Prices are firm and unchanged, with manufacturers' wire 2.80c, Worcester.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 89

New York—J. Rich Steers Inc., 17 Battery Place, is low on the general contract for Bayonne, N. J., terminal piers, noted previously as requiring 500 tons of wrought iron bolts, spikes and washers and 100 tons of straps.

Bolt, nut and rivet specifications

are moderately heavier. Some gains are shown in demand from jobbers though they have fairly heavy stocks. Requirements of tractor and farm implement manufacturers at Chicago are increasing gradually and railroad shops and equipment builders also are specifying more freely. Bolt, nut and rivet prices are fairly steady.

End of the maritime strike on the Pacific coast has released considerable business that had accumulated. New business is dull because of extensive forward buying a month ago.

Shapes

Structural Shape Prices, Page 88

New York—Led by 6000 tons for bridges, over St. Lawrence river, near Wells Island, N. Y., closing March 2, with the Thousand Island Bridge authority, Watertown, N. Y., structural steel inquiry is mounting more rapidly in the East. Public works and engineering projects are coming out more freely, supplemented by an encouraging volume for industrial plant expansion and more private construction. Sheet piling has been more active, generally at firm prices. Structural awards are also somewhat heavier, led by a 1725-ton garage, New York.

Architectural contracts for nine buildings, taking several thousand tons, for the 1939 New York world's fair, have been awarded. The first will be out for construction bids this spring. The west side elevated highway from Canal street to the Battery, New York, taking approximately 25,000 tons will also be out for figures by late spring, foundation contract to be let on bids of Feb. 17.

Boston—Phoenix Bridge Co., Philadelphia, is low on 1600 tons for bridge at Deer Isle-Sedgwick, Maine. Awards are slightly heavier with more volume being placed at new prices, although all old specified tonnage figured before the advance is not yet cleaned up.

Buffalo—Sellers report many medium sized jobs being figured, especially for bridge construction. Private construction also is on a rising tendency. Operating rates of local fabricators are substantially higher than they were a year ago.

Philadelphia—While down from last month, when there was a rush to cover on protections at old prices, structural activity is holding up better than most anticipated. Fabricating shops are figuring on considerable work, although most is from outside the immediate district. Prices are firm at 2.15c, Bethlehem, Pa., or 2.255c, Philadelphia.

Pittsburgh—Shape awards last week included 3900 tons for an addition to a turbine and boiler house for the Detroit Edison Co., Detroit, placed with Bethlehem Steel Corp., Bethlehem, Pa. Inquiries include 8000 tons for another section of the New York City express highway superstructure and 4000 tons for a government air corps engineering shop and repair dock, Sacramento, Calif.

Cleveland—Awards last week were limited to relatively small tonnages, as most of the important projects were placed last month, to take advantage of price protection.

Shape Awards Compared

	Tons
Week ended Feb. 13	30,470
Week ended Feb. 6	17,095
Week ended Jan. 30	64,988
This week, 1936	9,350
Weekly average, 1936	21,764
Weekly average, 1937	15,128
Weekly average, January	31,148
Total to date, 1936	150,240
Total to date, 1937	105,894

Fabricators are making deliveries on those jobs, some reporting backlogs extending well into March.

Chicago — Fabricated structural steel inquiries and awards are fewer, but fabricators have moderately heavy backlogs and specifications for plain material are increasing. Most new inquiries are for small lots.

Birmingham, Ala. — Structural shape fabricating shops have well filled books and new contracts are coming in mostly for small tonnages. Structural mills are sold through first quarter and inquiries indicate steady production well into second quarter.

San Francisco—Consolidated Steel Corp., Los Angeles, was low bidder for highway bridges over the All-American Canal, specification 718. Awards totaled 1538 tons and brought the aggregate for the year to 17,350 tons, compared with 13,641 tons for the same period last year.

Seattle — End of the maritime strike will enable plants to obtain deliveries and stimulate contemplated construction. Washington state and Idaho have reached an agreement for joint construction of the Snake river bridge, Clarkston, Wash., to Lewiston, Ida., estimated at $650,000. Plans are being completed.

Shape Contracts Placed

3900 tons, addition to turbine and boiler house, for Detroit Edison Co., Detroit, to Bethlehem Steel Corp., Bethlehem, Pa.

3300 tons, bridge, Albemarle Sound, near Edenton, Washington, Chowan and Perquimans counties, North Carolina, South approach, Part A, and swing span and North aprpoach, parts B and C, 3000 tons to Bethlehem Steel Corp., Bethlehem, Pa. and 300 tons to Virginia Bridge Co., Roanoke, Va., T. A. Loving & Co., Goldsboro, N. C., and Tidewater Construction Co., Norfolk, Va., general contractors, bids January 26.

1950 tons, manufacturing building and extension to building, for Union Metal Products Co., Hammond, Ind., to Austin Co., Cleveland.

1725 tons, garage, Eighteenth street and avenue A, New York, to Post & Mc Cord, New York.

1650 tons, Red river bridge, Bryan county, Oklahoma, to Illinois Steel Bridge Co., Jacksonville, Ill.

1525 tons, building, Container Corp., San Fernandino, Fla., to Jones & Laughlin Steel Corp., Pittsburgh, Merritt-Chapman-Scott Co., New York, general contractor.

1500 tons, steel sheet piling, boat basin, Contract 36-6, Queens, N. Y., to Jones & Laughlin Steel Service Corp., Long Island City, N. Y.; Tully & Son, Di Napoli, Inc., New York, general contractor.

1500 tons, steel sheet piling, tide gate and dam, contract No. 4, Flushing, N. Y., divided, half to Bethlehem Steel Corp., Bethlehem, Pa., and remainder to Carnegie-Illinois Steel Corp., Pittsburgh, Rodgers & Hagerty Inc., general contractor.

1440 tons, state highway bridge, Queens county, New York, to Bethlehem Steel Corp., Bethlehem, Pa., Vachris Co., general contractor.

1000 tons, building, for Commonwealth Ice & Cold Storage Co., Boston, to New England Structural Co., Everett, Mass.

1000 tons, mail, baggage, express and main depot, Los Angeles passenger terminal, Los Angeles, to Consolidated Steel Corp., Los Angeles.

900 tons, addition to main building, for North American Aviation Co., Los Angeles, to Bethlehem Steel Corp., Bethlehem, Pa.

900 tons, building, Keebler-Weyl Baking Co., Philadelphia, awarded through the Turner Construction Co., that city, to the Bethlehem Steel Corp., Bethlehem, Pa.

650 tons, extension to Meadow station, for Hartford Electric Light Co., Hartford, Conn., to Lehigh Structural Steel Co., Allentown, Pa.

650 tons, two bridges, Woodford and Lang, Calif., for Southern Pacific Co., to American Bridge Co., Pittsburgh.

600 tons, Knik river bridge, Alaska, to Wisconsin Bridge & Iron Works, Milwaukee.

510 tons, Neches power station extension, Gulf States Utilities Co., Beaumont, Tex., to Virginia Bridge & Iron Co., Birmingham.

470 tons, public school No. 108, for board of education, Bronx, N. Y., to Weatherly Steel Co., Weatherly, Pa.

470 tons, public school No. 104, for board of education, Queens, New York, to Drier Structural Steel Co., New York.
435 tons, Wolfe road bridge, Cook county, Illinois, to American Bridge Co., Pittsburgh.
400 tons, South California avenue grade separation, Chicago, for Cook county, Illinois, to Bethlehem Steel Corp., Bethlehem, Pa.
350 tons, Forty-seventh street subway and bridge, Chicago, for Chicago Park district, to Duffin Iron Co., Chicago.
310 tons, machine shop, for Chain Belt Co., Milwaukee, to Milwaukee Bridge Co., Milwaukee.
300 tons, factory building Rohn & Hass, Bristol, Pa., to Frank M. Weaver & Co., Lansdale, Pa.
300 tons, service bay structures, Pickwick Landing power house, for Tennessee Valley Authority, Knoxville, Tenn., to Wisconsin Bridge & Iron Co., Milwaukee.
260 tons, boiler framing, for American Gas & Electric Co., Windsor, W. Va., to Indiana Bridge Co., Muncie, Ind
250 tons, state highway bridge, route 18013, Clinton county, Pennsylvania, to Pittsburgh-Des Moines Steel Co., Pittsburgh.
235 tons, state highway bridge, route 31013, Huntington, Pa., to Ft. Pitt Bridge Works, Pittsburgh.
230 tons, school Lemington avenue, Pittsburgh, to Keystone Engineering Co., Pittsburgh.
225 tons, state bridge Kennewick, Wash., to Poole & McGonigle, Portland.
210 tons, garage and office, for New York State Electric & Gas Co., Brewster, N. Y., to Belmont Iron Works, Eddystone, Pa.
195 tons, Woolworth store, Eighty-sixth street and third avenue, New York, to Brooklyn Iron Works, Brooklyn.
185 tons, warehouse, for M. R. Spear Co., New York, to Harris Structural Steel Co., New York, through G. C. O'Day Construction Co. New York.
180 tons, building, Charles Lenning Co., Philadelphia, to Frank M. Weaver & Co., Lansdale, Pa.
180 tons, assembly hall, Utica, N. Y., to Utica Structural Steel Co., Utica, N. Y.
150 tons, brewery malt house, Worcester, Mass., to Bethlehem Steel Corp., Bethlehem, Pa.
115 tons, Budda mission, San Francisco, to Judson-Pacific Co., San Francisco.
110 tons, transit road bridge, for Lehigh Valley railroad, Depew, N. Y., to Bethlehem Steel Corp., Bethlehem, Pa.
110 tons, bridge, Concord, N. H., to Bethlehem Steel Corp., Bethlehem, Pa.
100 tons, naphtha distillation plant, Atlantic Refining Co., Point Breeze, Pa., to Belmont Iron Works, Eddystone, Pa.

Behind the Scenes with STEEL

Magna Cum Laude

HEAD of the school of chemical engineering at Purdue university writes that he has prepared a display of pages from the Business Trend section of STEEL'S Yearbook issue, said display now being erected in the main hall of his department for the edification of all embryo engineers who frequent the spot.

The novel system of preparing charts with the trend lines superposed over a photograph of the subject material was evolved by our Mr. Don Cadot, specialist in statistics, graphs, charts, trends and general art production. He claims the idea came to him one clear, cold night as he idled over a glass of Chablis 1884, contemplating certain vagaries and whimsies.

Any other colleges or universities wishing to make use of material published in STEEL for display purposes contact our Readers' Service Department, division of education and advancement. Cooperation will be lightning-like.

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Mournful Draftsmen

YOU may recall our recent paragraph here about the gentleman in a Birmingham, Ala., plant who subscribed for STEEL and said he was just one of six who planned reading the magazine for the next two years. Well, he took up our offer to supply routing slips with each issue, and reports the number of readers in his crowd has now increased to seven.

To his note, he adds the somewhat plaintive explanation: "We are only a number of draftsmen in the employ of a large corporation." That line has a swing which Rodgers and Hart could turn into a No. 1 lilt.

Don't take it so hard, E.V.W. Remember that in the minds of draftsmen are born the wonders of tomorrow. And what is any large corporation but a composite of hard-working groups like yours?

• • •

Proud Prognosticator

LAST fall Bob Kinkead, welding expert who among other things writes a weekly page in STEEL, estimated for our clients that total welding rod consumption for 1936 would amount to 110,000,000 pounds. Official figures have just been released and show total consumption of 111,000,000 pounds.

With an accuracy of within 1 per cent, Bob now feels qualified to enter himself into the ranks of official forecasters, and with perfect sangfroid will now furnish estimates on any statistics you can name.

Boy, an arc welded medal for Mr. K., please.

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INQUISITIVE CAMERA DEPT.—XXII

FRANK M. SABATKA, expert on advertising and engraving production and cost analysis, boasts nearly 24 years of continuous service to STEEL and the Penton Publishing Co. A native son of Cleveland, he came with the company in March, 1913, and there is little he can't tell you about engraving work.

New Sublurb

SOME of our mail (incoming) is addressed most peculiarly and reflects strange twists which executives' and typists' minds take. For instance, the other day comes a letter from Chicago addressed: "Penton Publishing Co., Pentonville, Cleveland." The nine-story Penton building at the corner of West Third and Lakeside streets has not yet managed to secede from the city of Cleveland. And if we had so managed, we wouldn't pick "Pentonville" as a name. Rather something more sprightly like Penton's Sunny Acres.

—SHRDLU

Shape Contracts Pending

6000 tons, highway bridge, St. Lawrence river, near Wells island, New York; bids March 2, Thousand Islands Bridge authority, Watertown, N. Y. Requirements are for American and Canadian crossings, also International Rift crossing. Two of the bridges to be of the suspension type; Robinson & Steinman, New York, consulting engineers.
2500 tons, addition to federal building, New York.
1600 tons, bridge, Deer Isle—Sedgwick, Hancock county, across Eggemoggin beach, Maine; bids in, Robinson & Steinman, New York, consulting engineer, Phoenix Bridge Co., Philadelphia, low.
1600 tons, interstate bridge, Atchison, Kans.; Wisconsin Bridge & Iron Co., Milwaukee, low bidder.
1000 tons, U. S. navy hangar, Sand Point, Seattle; bids soon.
850 tons, Pickwick-Memphis transmission line, for Tennessee Valley authority, Berclair, Tenn.
800 tons, national guard armory, West Orange, N. J.
750 tons, cranes, Bethlehem Steel Corp., Sparrows Point, Md.
680 tons, manufacturing and distribution building, Kearny, N. J., for Coca Cola Co.
495 tons, Alameda street bridge, Los Angeles for United States engineer office, proposal 262; bids Feb. 15.
400 tons, highway bridges for All-American canal, Knopp, Calif.; Consolidated Steel Corp., Los Angeles, low.
350 tons, high school, Norristown, Pa., Ralph S. Herzog, Philadelphia, awarded general contract; 375 tons of reinforcing bars also will be required.
350 tons, Pine Creek bridge, Idaho; bids opened.
320 tons, through truss bridge, Sullivan county, Pennsylvania; bids to state highway department, Harrisburg, Pa., Feb. 19.
300 tons, mill building, for Rustless Iron & Steel Corp., Baltimore, Md.
280 tons, male and female mental buildings, Mayview, Pa., for city of Pittsburgh.
260 tons, state highway bridge, Route 61038, Russell, Pa.
250 tons, through truss bridge, Pine Grove township, Warren county, Pennsylvania; Frank Kukurin, Wilmerding, Pa., low bidder on general contract.
250 tons, grade crossing elimination, Lodi, N. Y., for Lehigh Valley railroad.

250 tons, alterations to store building, for Russek's Inc., Brooklyn, N. Y.
248 tons, foundations, West and Marginal streets from Spring to Cedar streets, west side elevated highway with ramp approaches, New York; bids Feb. 17, president, Borough of Manhattan.
225 tons, factory building, for Fuller Label & Box Co., Pittsburgh.
200 tons, store, Montgomery Ward & Co., Rochester, Minn.
180 tons, bridge, Greenville, N. H.
105 tons, sheet piling, for U. S. engineer, Pittsburgh; bids Feb. 16.
100 tons, two I-beam bridges, Blair county, Pennsylvania; bids to state highway department, Harrisburg, Pa., Feb. 19.
100 tons, postoffice, Wausau, Wis.

Reinforcing

Reinforcing Bar Prices, Page 89

Pittsburgh—Concrete reinforcing bar specifications have not been featured by large awards in the past few days, but the volume of small business is steady. It is anticipated that activity will show a gain in the near future, with the announcement of several projects which will get under way early next summer.

Cleveland—Reinforcing bar market continues dull with but a few small awards and few pending jobs. However, mills are fairly active making deliveries on the many small jobs placed before the termination of price protection Feb. 1. Total estimated tonnage of reinforcing bars during January was 410 tons, compared with 435 tons in December and 107 tons in November.

Chicago—Inquiries are more active. New projects are evenly divided between private and public jobs. Current deliveries are heavy for this period, showing less than the usual mid-winter slackening. Awards are headed by 1475 tons for Chicago sanitary district work. Prices still show instability on occasion.

New York—With a light volume being bought, reinforcing bar prices have softened with 2.68c, job delivery, frequently shaded. Inquiry is slightly heavier, general figures being in on a building for the Coca Cola Co., Kearny, N. J., taking 1100 tons. Close to 1000 tons of highway mesh for New York state will be placed by several contractors shortly, general awards having been made.

Philadelphia—Early distribution of 375 tons of billet steel bars for a high school in Norristown, Pa., is expected to be made through a Philadelphia contractor. McCloskey & Co., local general contractors, are expected to announce momentarily the award of about 350 tons of rail steel for a local public school, which is in addition to steel recently let for two other public schools on which these contractors are in charge.

San Francisco—The largest inquiry of the year has just come out for figures and involves 1000 tons for two crossings in Oakland, Calif., in connection with the east bay yard facilities of the San Francisco-Oakland bridge. Bids open Feb. 24.

Seattle—Local mills have backlogs to insure capacity runs to the end of the first quarter. Unfavorable weather has held back new construc-

Concrete Awards Compared

	Tons
Week ended Feb. 13	4,858
Week ended Feb. 6	683
Week ended Jan. 30	3,191
This week, 1936	1,979
Weekly average, 1936	6,005
Weekly average, 1937	3,022
Weekly average, January	3,787
Total to date, 1936	65,560
Total to date 1937	21,152

tion and little new business is up. Small tonnages have been placed. Orders for merchant bars, placed late in the year, are still being rolled. Pulp mill improvements are furnishing considerable tonnages. Awards this week approximated 1500 tons.

Reinforcing Steel Awards

1375 tons, southwest sewage disposal plant, Chicago sanitary district, to Material Service Corp., Chicago.

1300 tons, bridge, Albemarle Sound, near Edenton, Washington, Chowan and Perquimans counties, North Carolina; south approach, Part A, and swing span and north approach, parts, B and C, to Bethlehem Steel Co., Bethlehem, Pa., through T. A. Loving & Co., Goldsboro, N. C., and Tidewater Construction Co., Norfolk, Va., respectively.

1000 tons, additional awards for pulp mill work at Grays Harbor, Shelton and Everett, Wash., to Bethlehem Steel Corp., Seattle.

278 tons, tide gate and dam, Queens, N. Y., to Bethlehem Steel Corp., Bethlehem, Pa., Rodgers & Hagerty Inc., New York, general contractors.

190 tons, 24-in. reinforced concrete pipe, Ventura, Calif., to unnamed interest.

145 tons, tank foundations for Shell Oil Co., Seattle, to Bethlehem Steel Corp., Seattle.

130 tons, bus terminal, Fourth street, San Francisco for Atchison, Topeka & Santa Fe railroad, to Bethlehem Steel Corp., San Francisco.

130 tons, bridge, Aberdeen, Wash., to Bethlehem Steel Corp., Seattle.

110 tons, dam, Southbridge, Mass., to Bethlehem Steel Corp., Bethlehem, Pa.

100 tons, state bridge Kennewick, Wash., to unnamed interests at Portland, Oreg.

100 tons, bridge, Mesa county, Colorado, to unnamed interest.

Reinforcing Steel Pending

1000 tons, two crossings, in connection with San Francisco-Oakland bridge; bids Feb. 24.

700 tons, Westside elevated highway, 135th to 146th street, New York; bids Feb. 16.

600 tons, north tube, Hudson Midtown tunnel, New York; Mason & Hanger Co. general contractor.

400 tons, building Sheffield Farms, New York.

375 tons, high school, Norristown, Pa., Ralph S. Herzog, Philadelphia, awarded the general contract; 350 tons of structurals also will be required.

342 tons, bridge, Deer Isle—Sedgwick, across Eggenmoggin Beach, Hancock county, Maine; bids in; Robinson & Steinman, New York, consulting engineers.

200 tons, seven buildings for State Farm hospital, Stockton, Calif.; bids Feb. 24.

177 tons, highway bridge, St. Lawrence river, near Wells island, New York; bids March 2; substructures take 126 tons and superstructures 51 tons, Robinson & Steinman, New York, consulting engineers.

135 tons, north metropolitan relief sewer, Medford, Mass.

100 tons, foundations, West and Marginal Streets from Spring to Cedar Streets, westside elevated highway with ramp approaches, New York; bids Feb. 17, president, borough of Manhattan.

100 tons, addition to Sutter hospital, Sacramento, Calif.; bids opened.

Pig Iron

Pig Iron Prices, Page 90

Pittsburgh—Although buying has not been heavy recently, pig iron producers find themselves in a situation which could very easily change for the better rapidly. Foreign interests are reported making frequent inquiries, and evidence of the desire of other nations to obtain pig iron is clearly shown by the Japanese government's recent decision to suspend the import duty for two years. Prices are steady.

Cleveland—Pig iron consumers continue to order actively on contracts, but little new business is in prospect until second quarter prices are known. Foundries supplying the railroad and farm implement trades are particularly active. Melt continues at capacity, but this is not sufficient to keep producer stocks from declining. Prices are firm and there is some belief that they will be advanced for second quarter.

Chicago—Pig iron shipments hold at a rate slightly ahead of January, while new business is fair. A number of foundries have found it necessary to re-enter the market. Prices are firm.

Boston—Total volume of new business in numerous small lots is heavy, in view of substantial first-quarter covering and steady shipments against previously placed business. Prices are firm. Foreign iron is selling $1 a ton under domestic in some instances but sales are probably curtailed by low stocks.

New York—Movement of pig iron continues active, as most foundries are now operating at a higher rate than in several years. Most of this business is moving against contracts, with new orders spotty. Export inquiries continue to be received, and according to one estimate, inquiries are on hand from more than ten foreign countries.

Buffalo—A slow but apparently steady gain in shipments of pig iron has set in following the lull of the early portion of the year. Sellers think the latter part of the quarter may develop some fairly good sales and that shipments are on the up grade. Prices are firm.

Philadelphia—Iron specifications continue brisk, although relatively little of this represents new buying. Both foundry and steelmaking operations show steady expansion.

Cincinnati—Foundries hit by high

water are rapidly resuming melt, as shown by pig iron shipments. Delayed demand for castings may be reflected in tonnage moved throughout February. Outlook now is that contracts will be cleared up by April 1.

St. Louis—Buying of pig iron has expanded further, due to a number of melters underestimating requirements. Shipments so far this month exceed those of January, and despite the handicap of floods to the southern movement, producers have been able to keep all customers well supplied. Melters are consuming current deliveries of pig iron, with the result that little stock building is in evidence.

Birmingham, Ala.—Shipments of pig iron continue steady and much iron was moved from this district last week. It is reported that 4000 tons of Birmingham iron may be shipped to Japan this month. Prices are firm.

Toronto, Ont.—Demand for merchant pig iron is moving ahead steadily, with sales running approximately 1500 tons weekly. Melters are showing considerable interest in the market. Foundry iron is the most active. Prices are firm.

Scrap

Scrap Prices, Page 92

Pittsburgh—The market is strong, but mill buying of scrap has been confined to comparatively small lots, the latest going to an upriver consumer at around $19.75 per ton for No. 1 heavy melting steel. Hydraulic bundles are reported to have brought $20 during the past week. The pressure for railroad specialties continues strong.

According to dealers, it is increasingly evident that this district is affected by the high prices commanded by export material. Dealers point out that approximately 25,000 tons were recently accumulated at one eastern city for shipment abroad and assert that prices offered by foreign interests have shut off the possibility of this district obtaining scrap from the east.

Cleveland—Iron and steel scrap continues tightly held by dealers, making it even more difficult to do business on the limited amount of free scrap. Mills are well covered but there is a little buying in the Youngstown district, although consumers there also appear fairly well covered. Heavy melting steel is firmer but quotations have not changed, due to lack of sales.

Chicago—Heavy melting steel is bringing higher prices in the dealers' market, with bids of $19.50 common. Mill buying is light, however, and the market nominally continues at $18.75 to $19.25 on the basis of last sales. A number of other grades have advanced under the stimulus of active demand and a supply little more than adequate to accommodate shipping requirements. Most quota-

tions are at a 12-year peak. Railroad offerings recently have been restricted.

Boston—Scrap prices are firm but few grades have registered advances, shafting at $18.50, f.o.b. cars, and machine turnings being exceptions. Demand and shipments are active. For export, shippers are paying $16.25 to $16.50, dock, Boston, for heavy melting steel.

New York—Steel shafting and machine shop turnings have been advanced $1 and 50 cents per ton, respectively, for domestic shipment. Other grades of iron and steel scrap are for the most part unchanged, although stove plate and No. 2 cast for export are 50 cents higher, dock delivery. Heavy melting steel prices for rail and boat shipment are firm, but unchanged. Demand is active with buying and shipments against contracts steady.

Buffalo—It is reported about 5000 tons of No. 2 heavy melting steel has been sold during the past week at a price in line with the recent $18.75 contracts for No. 2 material of this grade. Buying is continuing according to dealers. Low phosphorus grades, short steel rails, rerolling rails and some other materials have moved at the highest prices of the present upward surge in scrap, dealers report.

Philadelphia—Supplies of steel scrap are coming out more freely although this has not resulted in lower prices and in some other grades quotations are higher. A boat is now being loaded at Port Richmond with steel scrap for export, the best here since last fall. A growing volume of scrap is being accumulated for shipments to be made over the next several weeks.

Detroit—Scrap is strong with demand for foundry grades bringing an advance of 25 to 50 cents. Lack of the usual supply from automotive plants is being felt keenly. Country scrap is scarce. Opinion is that the market has not reached its top.

Cincinnati — Resumption of activity in the scrap market found dealers' quotations higher, heavy melting steel being 50 cents higher at $16.50 to $17. Flood embargoes on shipments are still in effect in some spots, but foundries are eager for material, especially short rails.

St. Louis—Soaring prices and considerable activity in buying on the part of mills has featured the iron and steel scrap situation. Mills bought 16,000 to 18,000 tons of No. 2 heavy melting steel for delivery over the next 60 days.

The price is understood to be at the high point of the quoted range, and 50 cents higher than the last purchase of this grade.

Birmingham, Ala. — Continued strength is shown in iron and steel scrap. Consumers, with one or two exceptions, have little stock on hand and depend on spot buying.

Seattle—Domestic scrap demand continues active and prices are firm at about $11.50 for No. 1 melting. Mills are buying in considerable tonnages and good material finds ready sale. Tidewater stocks are low. Exporting houses welcome resumption of water transportation but freight rates have advanced about $2.50 a ton and Oriental buyers are loath to pay the increased c.i.f. price.

Toronto—Trading in iron and steel scrap shows improvement, according to dealers, who state that deliveries now are at the highest level in years and yard holdings are being reduced. Steel mills are taking all offerings of heavy melting steel and there also is a brisk demand for turnings.

Warehouse

Warehouse Prices, Page 91

Pittsburgh—Steady movement of material from warehouses has resulted in a slightly better tone than a month ago. Cold-finished and sheets are in particularly good demand. Sheet sales have been assisted by the open winter, which has enabled construction work to go forward, and by the fact that some small consumers have turned to jobbers for more prompt delivery than they could obtain from the mills. Prices are steady.

Cleveland—Extended deliveries on sheets, strip, alloy bars, and tubular goods from mills have stimulated warehouse stock turnover. While daily average sales so far this month are slightly behind January, many feel that this condition will be reversed over the remainder of the month. The new differential plan has created little opposition, and prices have remained firm at the advanced figures.

Chicago—Warehouse sales are steady at about the average January rate but continue to show substantial gains compared with February, 1936. Some business is coming from flood areas. Prices are steady.

New York — Numerous small-lot orders sustain steel warehouse buying. Specialty, alloy and cold-finished items are active. Mill deliveries show little improvement with alloy steels promised for 10 to 12 weeks delivery and heat treated materials delayed considerably more.

Philadelphia—Jobbing business is heavier than in January. Extended deliveries at the mills are forcing

more tonnage to the jobbers, who in turn are having some difficulty in keeping their stocks up.

Detroit—General Motors idleness has reduced movement of steel from stock and some dealers have reduced hours. January sales exceed those of a year ago but February will be low. Miscellaneous orders total well.

Cincinnati—With the Ohio river flood ended jobbers find industrial demand about normal. So far ordering attributed to rehabilitation work has not appeared in volume but may develop later.

St. Louis — Warehouse business here has been stimulated by a heavy volume of emergency orders from the flood area. Buying by railroads has been heavy, and sales of tool steel are greater than average seasonal volume. Oil country items are active, and the only exception to the prevailing activity is building material.

Seattle—Weather conditions last week continued to reduce volume of warehouse business and orders have been in small lots, with sheets probably the most active. With resumption of water traffic, jobbers anticipate important orders from Alaska and Hawaiian islands.

Iron Ore

Iron Ore Prices, Page 92

Cleveland—Receipts of iron ore at lower lake ports for this season to Feb. 1, shipments to interior furnaces and dock balances follow:

	Receipts	Shipments Season	Dock Bal., Feb. 1, '37
Buffalo	3,792,876	29,277	2,040
Erie	1,536,884	1,556,160	45,402
Conneaut	6,773,428	6,959,087	1,425,754
Ashtabula	4,479,943	4,949,998	1,221,744
Fairport	898,389	887,979	403,818
Cleveland	9,061,815	7,346,902	392,221
Lorain	2,677,341	1,286,301	9,909
Huron	704,976	822,176	219,463
Toledo	1,512,232	820,870	40,875
TOTAL	31,437,884	24,658,750	3,761,226
Year ago	19,907,228	14,374,604	4,969,841

Metallurgical Coke

Coke Prices, Page 89

While demand for coke continues at its high rate, attention of operators has been focused recently upon the opening of negotiations in connection with the expiration of union mine contracts April 1. Coke production up to Feb. 1 in the season 1936-1937 was estimated at 1,673,900 net tons, compared to 796,900 net tons in the corresponding period of the season 1935-1936.

Foundry coke shipments reflect the active rate of consumption and compare favorably with deliveries of the past several months. While coal consumers are attempting to build up stocks in anticipation of mine shutdowns April 1, many foundries are unable to stock coke because of lack of storage facilities. By-product oven capacity is being taxed to accommodate demand and producers are unable to acquire sizable reserves.

Steel in Europe

Foreign Steel Prices, Page 91

London—(*By Radio*)—Steel and iron production in Great Britain in January fell slightly under that of December, partly due to holiday interruptions. Steel production in January totaled 998,900 tons, a daily rate of 38,419 tons, compared with 1,019,200 gross tons in December, a daily rate of 39,200 tons. Pig iron output in January, from 114 stacks, totaled 650,700 gross tons, a daily rate of 20,990 tons, compared with the December production of 671,400 tons, from 110 stacks, a daily rate of 21,657 tons.

Demand for steel and iron continues unchecked and surpasses production, though the latter is being increased. Shortage of scrap interferes with enlargement of output. Blast furnaces and steelworks are booked for months ahead and deliveries are being further extended. Some export business is being maintained in spite of the shortage. Contracts for a large steelworks to be built in Turkey have been formally placed. (STEEL, Jan. 4, page 402.)

The Continent reports new selling for export has almost stopped as most works are booked to capacity.

Coke By-Products

Coke By-Product Prices, Page 89

New York — Naphthalene shipments are heavier with substantial improvement in buying at firm and unchanged prices. Sulphate of ammonia shipments against contracts, notably to the fertilizer industry, tend upward, and demand from chemical consumers is steady. Prices are firm at $27 a ton, eastern seaboard. Production of distillates, which fell off in the Ohio valley section due to floods, is gradually recovering. Distillate prices are firm and unchanged. Steady demand for phenol prevails at 15 cents a pound in 200 pound tins, delivered, Frankford, Pa.

Ferroalloys

Ferroalloy Prices, Page 90

New York — While consumers stocked up at the time of the price advance last December, the movement of ferromanganese is again expanding. Prices are steady at $80, duty paid, Atlantic and Gulf ports. Domestic spiegeleisen, 19 to 21 per cent, is unchanged at $26, Palmerton, Pa.

Semifinished

Semifinished Prices, Page 89

Inquiries for semifinished steel from a number of outside sources have been frequent recently, but prospective buyers have encountered considerable difficulty in obtaining material because of the great demand from finishing departments. However, it is anticipated that at least part of these recent inquiries may be satisfied through trades. Foreign demand has been heavy, with premiums up to $5 a ton in some cases for shipments abroad. The shortage of semifinished material appears to be worldwide. Billets, blooms, sheet bars and slabs are quoted $34, base, Pittsburgh, and common wire rods, $43 and $45.

Nonferrous Metals

Nonferrous Metal Prices, Page 90

New York—Copper, lead and zinc prices were extremely strong last week with the markets tense. At the close of the markets prior to the legal holiday on Friday copper and zinc were practically nominal as there was no available metal in any tonnage to sell. Tin was generally quiet and uncertain.

Copper—Producers here strongly resisted forces tending to lift the domestic market above the 13-cent level. Export copper advanced to a high of 13.60c, c.i.f. European ports.

Lead—Lead continued to display unusual strength. Prices held unchanged at 5.85c, East St. Louis, despite heavier demand.

Zinc—Prime western zinc advanced to 6.40c, East St. Louis, on the acute shortage of supplies. The market closed strong with higher prices in prospect.

Tin—Prices fluctuated widely early in the week, following the trend in London. A stronger undertone developed on settlement of the auto strike.

Antimony — Demand continued light with prices unchanged at 14.25c, New York.

Rebuilding Trucks on 185,000 Freight Cars

The Pennsylvania railroad has started equipping trucks of 185,000 freight cars with one-piece solid cast steel side frames, to replace arch bars, formerly generally used in truck construction. The program will be completed by Jan. 1, 1938.

The improved trucks for the Pennsylvania cars will be largely constructed from parts reclaimed from those previously in use, officials say. It is already a routine performance to assemble a new truck from reclaimed parts and a new cast steel side frame in four and a half minutes.

After the new truck has been built the work of removing an old-type truck and replacing it with a new one, by the assistance of a crane, requires only 12 minutes.

V. E. Sprouse Co., Columbus, Ind., has leased the former Cole Motor Car building in Indianapolis, for the manufacture of metal products. The building has been fully equipped.

Best January Shipments For U. S. Steel Since 1929

Shipments of finished steel in January by the United States Steel Corp. totaled 1,149,918 tons, compared with 1,067,365 tons in December and 721,414 tons in January, 1936. This is the highest total for January since 1929, when 1,267,823 tons were shipped, and the highest for any month since May, 1930.

U. S. STEEL CORP. SHIPMENTS
(Inter-company shipments not included)
(Tons)

	1937	1936	1935	1934
Jan.	1,149,918	721,414	534,055	331,777
Feb.	.....	676,315	583,137	385,500
Mar.	.....	783,552	668,056	588,209
April	.....	979,907	591,728	643,009
May	.....	984,097	598,915	745,063
June	.....	886,065	578,108	985,337
July	.....	590,851	547,794	369,938
Aug.	.....	923,703	624,497	378,023
Sept.	.....	961,803	614,933	370,306
Oct.	.....	1,007,417	686,741	343,962
Nov.	.....	882,643	681,820	366,119
Dec.	.....	1,067,365	661,515	418,630
Y'rly adj.	.....	.....	†23,750	†19,907
Total§	.....	10,825,132	7,347,549	5,905,966

*Addition. †Deduction. §Subject to adjustment.

Equipment

Chicago — Machinery and plant equipment sales have tended to level off, but gains of past two months generally are retained. Machine tool buying holds at the active January rate. The Milwaukee road is expected to spread buying over a large portion of the year. The Santa Fe still has a number of tools pending. Price advances on most machine tools now have become effective, but several additional increases are in prospect. Small tool demand continues active. Pending mill equipment includes a 44-inch hot strip mill for Inland Steel Co.

Cleveland — Machine tool and equipment inquiries were fairly active past week with normal sales reported. Deliveries in most cases remain deferred. Gradual resumption of production and delivery is reported from Cincinnati district where machine tool makers are reconditioning plants as rapidly as possible. Effects of flood probably will extend deliveries from Cincinnati district as much as 30 days.

Seattle — Inquiries for diesel engines for tugs and fishing vessels are active. Washington Iron Works, Seattle, has ten large units in shops. Improving weather conditions spur inquiries for road machinery. Pumping equipment is in good demand. New mine developments create demand for miscellaneous mine machinery.

Construction and Enterprise

Ohio

CINCINNATI — Standard Oil Co. of Ohio, Midland building, plans to make repairs following flood damage to storage and plant facilities. Estimated cost is $1,000,000.

CLARKSBURG, O.—Village plans construction of waterworks and sewage disposal plant, and has received WPA approval. Estimated total cost is about $78,000, of which village will supply $21,000. Frank Carroll is mayor, and Burgess & Niple, 568 East Broad street, Columbus, are engineers.

COLUMBUS, O. — City plans construction of new building at municipal light plant to house new boiler, stoker and conveying apparatus. Cost will be around $260,000. Application has been filed for PWA funds, but approval is dependent on settlement of litigation now in courts.

GERMANTOWN, O.—City plans to construct an electrically-operated pumping plant in its sewage disposal works. Fund of $135,000 is being arranged. M. W. Tatlock, 911 Ferndale avenue, Dayton, O., is engineer.

HUDSON, O. — Village plans to make waterworks improvements during 1937 costing almost $6000. Guy F. Garman is mayor.

LIBERTY CENTER, O.—Village has been granted $55,851 by PWA for construction of waterworks plant and system, and will take bids until Feb. 27. Champe, Finkbeiner & Associates, 1025 Nicholas building, Toledo, are engineers.

MARION, O. — Marion Rural Electric Co-operative Inc., Roland Leeper, manager, care of Ohio Farm Bureau Rural Electrical Co-operative Inc., 620 East Broad street, Columbus, is taking bids due noon Feb. 22 for erection of rural lines around Marion. Carl Frye is engineer.

PAINESVILLE, O. — Industrial Rayon Corp., West Ninety-eighth Walford streets, Cleveland, plans construction of a 12,000,000-pound capacity rayon plant. Including construction of a power plant, total cost will be around $10,000,000.

PIQUA, O. — City has cancelled bids asked Feb. 4 for auxiliary equipment for municipal light, and will ask bids again after specifications have been revised. Equipment needed includes a 236-kilowatt generator and excitor unit, either steam or internal combustion engine driven, a voltage regulator, an auxiliary stoker drive unit, and two motor-driven condensate pumps. Estimated cost is $16,000. City engineer is Albert Schroeder, City Hall. (Noted STEEL, Feb. 1).

SPRINGFIELD, O. — Ohio Edison Co., H. E. Miller, local manager, plans construction of an addition to the Mad River plant, to include installation of a new turbine condenser, booster, stoker, and auxiliaries. Cost is estimated at around $2,000,000. Commonwealth & Southern Corp., Jackson, Mich., is engineer.

YOUNGSTOWN, O.—Cold Metal Process Co., Venice J. Lamb, president, is considering installation of an electric annealing furnace at its Wilson avenue plant, and rehabilitation of mills and machinery at its Salt Springs road plant, which was damaged by fire last year. Total estimated cost is approximately $300,000. Project will be discussed at next meeting of board of directors.

Connecticut

NEW HAVEN, CONN. — New Haven Pulp & Board Co., East street, plans construction of a power plant, to include installation of turbines, stokers and handling equipment. Estimated cost is between $200,000 and $250,000. F. L. Smith, 21 East Fortieth street, New York, is architect.

New York

BUFFALO, N. Y. — Gerstman Mfg. Co., 706 William street, will take bids soon for construction of a new plant. L. Greenstein, Prudential building, is engineer and architect.

LOCKPORT, N. Y. — Loudon Packing Co., Evansville, Ind., plans to build a factory on South Niagara street at a cost of $150,000, with equipment.

NEW YORK — Washburn Wire Co. will build a 5-story plant at 537 East 118th street. Estimated cost is $175,000.

WELLSVILLE, N. Y. — L. C. Whitford has the contract for a 100 x 350-foot industrial plant to be built in Wellsville. The industry to occupy the works is being financed by public subscription and details of its products have not been disclosed as yet.

New Jersey

DOVER, N. J. — General Insulation & Mfg. Corp., Alexandria, Ind., plans to construct a manufacturing plant to serve eastern and export customers. Cost will be over $50,000, with equipment.

IRVINGTON, N. J. — Art Tube Co. plans to build a $100,000 plant. Architect is J. T. Simpson, 744 Broad street, Newark.

Pennsylvania

BRADFORD, PA. — Bradford Oil Refining Co. plans to make improvements to its refinery, at a cost of over $100,000.

PHILADELPHIA—Board of education, Parkway and Twenty-first street, plans to install a boiler plant in new 3-story high school on York road. Cost will be about $2,400,000. Irwin T. Catharine is board architect.

Michigan

ADRIAN, MICH. — City plans construction of sewage disposal plant to cost between $120,000 and $150,000. Project may be financed through PWA grant and issuance of revenue bonds. Engineers are Shoecraft, Drury & McNamee, Ann Arbor, Mich.

BAY CITY, MICH. — Wolverine Knitting Mills plans construction of a 100 x 150-foot plant addition. Henry C. Weber Construction Co., Bay City, has general contract.

BAY CITY, MICH.—Aetna Portland Cement Co. will expand powerhouse at local mill, and purchase steel coal bunkers, conveyors and coal-handling equipment. Sigmund Firestone, 59 South avenue, Rochester, N. Y., is engineer.

CADILLAC, MICH. — B. F. Goodrich Co., Akron, O., has purchased a 100,000-square foot factory at Cadillac and will renovate it for general rubber manufacturing.

DETROIT — Detroit Trailer Co. has been incorporated to manufacture trailers, and George A. Kendall, 481 Beaufait avenue, is correspondent.

DETROIT — Westlof Tool & Die Co. has been incorporated to manufacture tools. Robert J. Westrick, 428 Bellevue avenue, is correspondent.

DETROIT — Sainte Claire Tool Co. has been organized to manufacture tools and dies, and G. F. Lask, 6450 East Lafayette boulevard, is correspondent.

DETROIT — Firestone Tire & Rubber Co., Akron, O., has purchased 300 acres of land adjoining the plant of the Pennsylvania Salt Co., south of Wyandotte, Mich., and will construct a large tire manufacturing plant there. Building operations are expected to start around August 1.

LAWTON, MICH. — Village has awarded general contract for the building housing its proposed new sewage disposal plant to Haines & Haines, Dowagiac, Mich. Cole, Moore & Geupel Inc., South Bend, Ind., are engineers.

PLYMOUTH, MICH.—Dunn Steel Products Co. will build an addition to its plant for manufacturing cold upset parts, and general contract has been awarded.

Illinois

CARLINVILLE, ILL. — City plans construction of a filtration plant costing $600,000, and Warren & Van Praag, Decatur, are engineers.

CHICAGO — Cudahy Packing Co., 221 North LaSalle street, plans to build a packing plant on Baltimore avenue at a cost of $40,000.

CHICAGO — Agar Food Products Co., 310 North Green street, plans construction of a 1- and 2-story plant addition costing $42,000. Architect is Smith, Brubaker & Egan, 30 North LaSalle street.

CHICAGO — A. Brandwein & Co., 2349 South State street, will take bids soon for construction of a 4-story plant addition to cost around $60,000. Architect is A. Epstein, 2001 West Pershing street.

CHICAGO — Molded Products Corp., 2145 West Walnut street, plans to build a factory at North Sacramento avenue near Kinzie street at a cost of about $155,000. Austin Co., 510 North Dearborn street, is engineer and architect.

Indiana

HAMMOND, IND. — Berry Bearing Co. Inc. has been organized to manufacture bearings, hangers, power transmission devices, etc. Correspondent is Ralph Carlson, Hammond.

INDIANAPOLIS—Reliable Metal Spinning Corp., 335 Northern avenue, has been formed to manufacture sheet metal products. Incorporators are Fred P. Irvine, George A. Danneker and Fred

Drexler, and George A. Danneker, same address, is correspondent.

Delaware

WILMINGTON, DEL.—Board of health plans to install furnaces, mechanical handling and other equipment in garbage disposal plant near Shellpot creek. Cost is estimated at $220,000, and Harry C. Maier is city engineer, City Hall.

Maryland

MT. WASHINGTON, MD. — Maryland Bolt & Nut Co., Charles S. Duvall, manager, Baltimore, plans to rebuild its burned forge shop at Mt. Washington.

Louisiana

BUNKIE, LA. — Coca Cola Bottling Co. plans to build a 2-story plant. Architects are Stone & Pitts, Goodhue building, Beaumont, Tex. Estimated cost is $70,000.

Mississippi

MONTICELLO, MISS. — City will vote Feb. 27 on $30,000 bonds as part of cost of construction of waterworks plant and system. Total cost is estimated at $53,000.

North Carolina

CHARLOTTE, N. C. — City will probably vote in April on $1,365,470 bonds for waterworks improvements. R. H. Hicklin, of Robert & Co., engineers, Bona Allen building, Atlanta, is in charge of plans.

GREENSBORO, N. C. — Armco Finishing Co., Burlington, will take bids soon for construction of a silk mill to cost $100,000.

South Carolina

HARTSVILLE, S. C. — Hartsville Print & Die Works will spend around $35,000 for construction and purchase and installation of new machinery and equipment.

Virginia

NORFOLK, VA. — Eastern Tar Products Corp., Lexington building, Baltimore, plans construction of a plant costing $60,000.

Missouri

KANSAS CITY, MO. — Brown Strauss Corp., 1446 Guinotte street, plans to make plant improvements costing $50,000.

Oklahoma

BLACKWELL, OKLA. — City will vote Feb. 10 on $50,000 bonds for purchase and installation of new boiler at municipal light plant. Black & Veatch, 4706 Broadway, Kansas City, Mo., are engineers.

Wisconsin

MADISON, WIS.—E. B. Wayts, Tenney building, engineer for rural electrification co-operative association, will take bids soon for erection of 424 miles of rural transmission lines in Trempealeau county, for which REA has allotted $445,000.

MILWAUKEE—Veterans' administration, 764 Arlington building, Washington, will take bids until March 2 for installation of an additional boiler and pulverized coal burning equipment at the Milwaukee soldiers home. Estimated cost is $25,000.

MILWAUKEE—O. H. Kindt Mfg. Co., 4670 North Teutonia avenue, millwork manufacturer, will build a factory addition, 61 x 141 feet, and has awarded general contract to Hunzinger Construction Co., 1827 North Thirtieth street.

RACINE, Wis.—J. I. Case Co., maker of farm and industrial tractors and general farm machinery, has purchased the plant of the Rock Island Plow Co., Rock Island, Ill., and will use it for manufacturing. It was announced previously that the Case Co. intended to acquire the Velie Motor Co. plant at Moline, Ill., but this transaction did not work out.

WAUSAU, WIS.—Marathon Rubber Products Co., Sherman street, will ask bids soon for construction of a 1-story plant addition, 60 x 90 feet. Architects are Oppenhamer & Obel, Wausau and Green Bay, Wis. Estimated cost is $30,000.

Kansas

ATCHISON, KANS. — Missouri Pacific railroad, S. L. Wonson, assistant chief engineer, Missouri Pacific building, St. Louis, Mo., plans to build new shop at Atchison, costing $100,000.

CUNNINGHAM, KANS. — Skelly Oil Co. plans repairs and alterations to its oil refinery at an estimated cost of $45,000.

South Dakota

MITCHELL, S. DAK. — City plans to construct a dam and pumping station on the James river at a cost of about $205,000. J. C. Scallin is city engineer.

Iowa

CRESCO, IOWA — Howard County Rural Electric association, S. C. Shea, president, plans erection of 150 miles of transmission lines costing $152,000, and REA approval and aid is being sought.

DES MOINES, IOWA — Seven Up Bottling Co., care of J. B. Maher, Hotel Commodore, plans to repair and alter its bottling plant at 1505 East Grand avenue, at a cost of $40,000, including new equipment.

HAMBURG, IOWA — City will take bids March 2 for construction of a water purification plant and installation of pumping equipment. E. G. Grundy is mayor and Northern Engineering Co., Brainerd, Minn., is engineer.

LARCHWOOD, IOWA — Lyon County Electric Cooperative association plans to erect transmission lines costing $67,500, and has applied to REA for approval and aid.

MANCHESTER, IOWA — City plans to build a sewage disposal plant. R. Milroy is city clerk.

FORT DODGE, IOWA — International Harvester Co., 606 South Michigan avenue, Chicago, plans construction of a plant costing $60,000.

PELLA, IOWA — Pella Electric Cooperative association has been allotted $70,000 by REA for erection of rural transmission lines in Marion, Jasper and Mahaska counties.

WATERLOO, IOWA — Iowa Public Service Co., George A. Neal, general manager, Sioux City, plans construction of a $1,000,000 electric light plant at Waterloo. A 15,000-horsepower generator will be installed.

WEBSTER CITY, IOWA — City is considering construction of sewage disposal plant. Fred Hahne is mayor.

Nebraska

EXETER, NEBR. — Exeter Foundry & Machine Co. plans to erect a 1-story foundry and machine shop, 55 x 75 feet, at Hastings, Nebr. Estimated total cost of building and equipment is $47,500.

KEARNEY, NEBR. — State board of control, Walter Hager, chairman, State House, Lincoln, has recommended construction of a power plant at the state tubercular hospital, Kearney, and a bill appropriating $45,000 for the purpose is before the legislature.

LINCOLN, NEBR. — Lincoln Steel Works, E. T. Luff in charge, plans to build a factory and warehouse, costing $100,000.

LINCOLN, NEBR. — Eastern Nebraska Rural Public Power district plans to extend rural power lines on project No. 3 at an estimated cost of $375,000. Engineer is Henningsen Engineering Co., 326 Union State Bank building, Omaha.

Nevada

COBRE, NEV. — Cobre Minerals Corp., Reno, plans to build a mill for developing large pumice deposits. Estimated cost is $500,000.

Pacific Coast

LOS ANGELES — California Nut & Bolt Corp. Ltd. has been organized by George and Nelle Shinski and E. A. Kramer, of Los Angeles. Correspondent is Paul Taylor, 516 Bartlett building.

PORT ANGELES, WASH. — Fiberboard Products Co., R. E. Bundy, manager, will expand its facilities and build several new buildings.

PORT ANGELES, WASH. — Port Angeles Plywood Inc. has been organized by J. J. Lucas, H. H. Balch and G. O. Johnson, with headquarters at 703 Lincoln street. The company proposes to build a $400,000 plant.

PUYALLUP, WASH. — Brew Mfg. Co., wood products manufacturers, will rebuild its plant which was recently damaged by fire.

NYSSA, OREG. — Amalgamated Sugar Co., Ogden, Utah, has purchased 185 acres and plans to build a $2,000,000 sugar factory. H. A. Benning is manager.

Canada

CORNWALL, ONT. — Howard Smith Paper Mills Ltd., 407 McGill street, Montreal, Que., will take bids around April 1 for construction of an extension to its pulp mill, at an estimated cost of $60,000. J. C. Day, 620 Cathcart street, Montreal, is engineer.

PORT ARTHUR, ONT.—Abitibi Power & Paper Co. Ltd., 408 University avenue, Toronto, will take bids soon for altering the plant of the Thunder Bay Paper Co. Ltd. Machinery is to be overhauled, new equipment purchased and the plant remodeled. Cost is estimated at $700,000.

FORT WILLIAM, ONT. — Great Lakes Paper Co., Neebing street, S. T. McCavour, manager, plans to spend $300,000 for alterations and additions to its plant, including installation of new machinery and equipment.

THUNDER BAY, ONT. — Marathon Paper Mills Co., Rothschild, Wis., plans construction of a processing plant costing $100,000.