STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

For forty-eight years—IRON TRADE REVIEW

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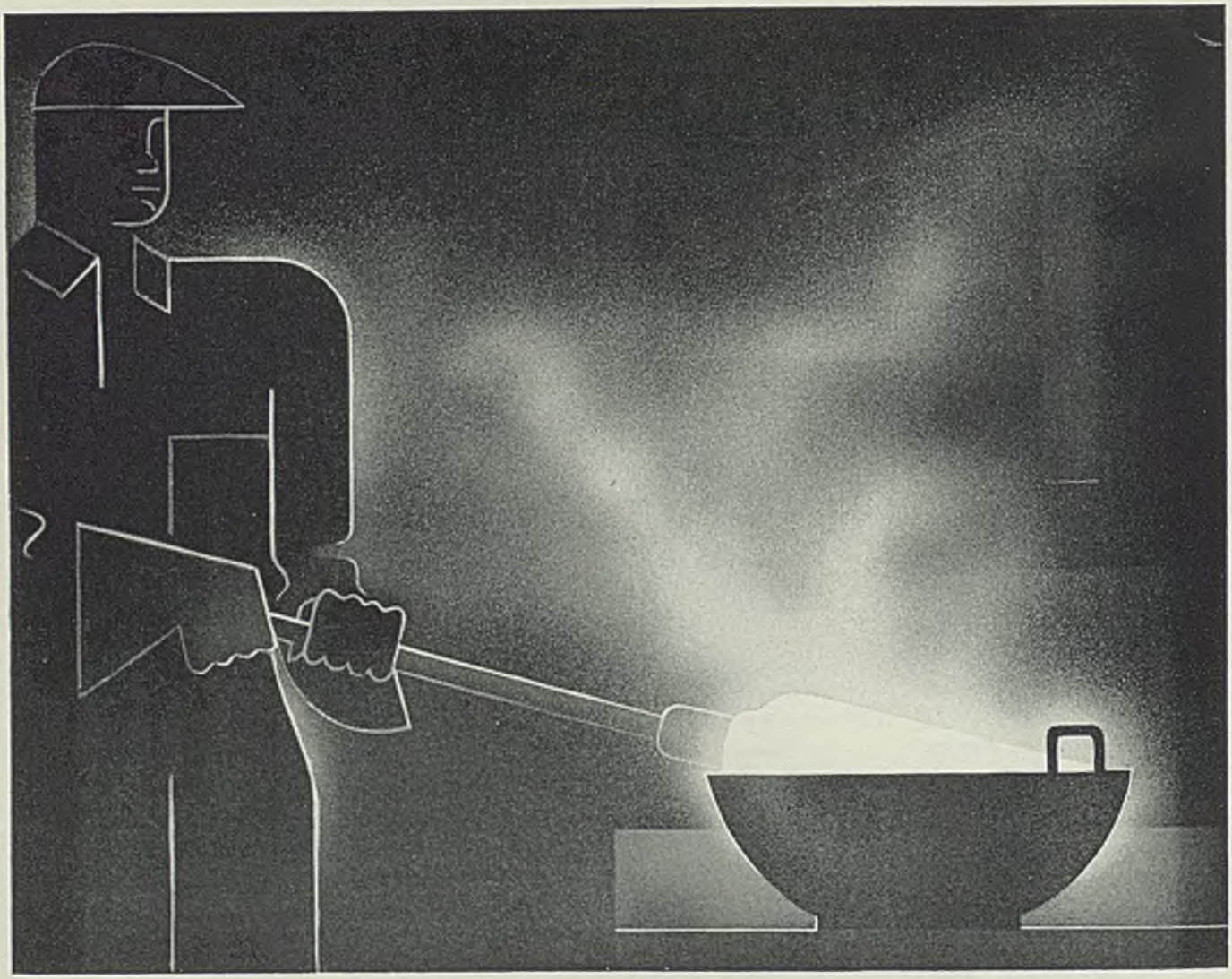

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As the Editor Views the News

NO ONE who attended the last two meetings of the Congress of American Industry could fail to notice the great change that has taken place in the attitude of industrial executives. During the 1935 meeting, the walls of the Waldorf-Astoria resounded with warnings of approaching chaos, of opposition to government policies and of antagonism against the federal administration. At last week's sessions the same walls (p. 14) echoed to pleas for constructive co-operation and to plans in which industry would participate actively in solving some of the nation's economic and social problems. In 1935 the motive was dissent and obstruction; in 1936 it is support and co-operation.

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The change is largely one of tactics and not of principles. We believe that the great majority of progressive industrialists still holds to the principle that a prosperous industry is a more effective guarantee of progressively higher standards of living and of a more equitable distribution of goods and income than hastily-drawn, impractical social legislation. In 1935 industrialists were fighting for their principle. They failed to sell it to the public effectively. The man in the street accepted the government's view in preference to industry's. Industrial executives, wisely, we believe, now have decided to help the administration in solving the nation's economic and social problems.

Change Tactics, Not Principles

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The advantages of this policy of co-operation will become more apparent after congress convenes. A taste of what is ahead is provided by the current opposition to retrenchment in the expenditure of relief funds through WPA. The manner in which local political forces are combating the administration's efforts to curtail government expense (p. 29) means that when the President returns from South America industry will be the most powerful ally to which he can turn for support for his policy of retrenchment. With government and industry co-operating, the progressive ideas of industry will be available to supplant some of the far-fetched new deal measures as they fail or prove to be impractical. Industry has taken an important foreward step in changing its tactics. It has much to gain and little or nothing to lose in assuming the co-operative attitude.

Much to Gain, Little to Lose

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Whenever experts on corrosion-resisting materials get together they usually discuss applications of specific metals and alloys. Zinc-coated metal will do so and so under certain conditions. Tellurium lead serves admirably for pipe subjected to certain acids. Stainless steels of certain specific analyses each are preferred for definite applications. And so on for all types of rolled, cast or forged ferrous and nonferrous metals. But invariably the discussion boils down to one conclusion, namely, that one cannot generalize. As F. N. Speller said at the A.S.M.E. meeting (p. 40) "It is not likely that we shall find one metal or one general remedy for corrosion." Selecting the alloy best suited for each specific corrosion condition will continue to challenge metallurgists and engineers.

Can't Generalize On Corrosion

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The American public is quite conscientious in changing the oil in automobiles when cold weather approaches. The average car owner may be a little more systematic in this respect than the maintenance men in some industrial plants. Changing to winter oil or providing for heating lubricants (p. 56) is necessary to protect much of the mechanical equipment in many establishments. . . . Automatic equipment for washing buses, street cars, etc. (p. 36) marks the advance of mechanization into a field heretofore dominated by manual labor. . . . Fabricating welded pressure vessels with walls up to 5 inches thick (p. 32) calls for extreme care in heat treatment, welding technique and inspection. In fact, the effectiveness of X-ray examination is a limiting factor in the economical thickness of this type of welded construction.

Get Ready for Cold Weather

E. L. Shaner

Industrial Congress Calls For United Action on Problems

STRONG indications that industry will not bury certain problems that became manifest with the depression, as it advances into a prosperous era, were evident last week in New York at the annual meeting of the Congress of Industry, held simultaneously with the forty-first meeting of the National Association of Manufacturers and subsequent to a meeting of the National Industrial council.

Each of the numerous addresses by steel executives and business leaders bore testimony to the deep thinking on social and political aspects of industrial and economic responsibilities.

Speakers identified with the steel industry included Ernest T. Weir, chairman, National Steel Corp., Pittsburgh, and Charles R. Hook, president, American Rolling Mill Co., Middletown, O. Mr. Weir, who spoke at the annual dinner, asserted that problems emphasized by the depression exist now as they did during the crisis, that improvement of living conditions must come from industry and that "we will never make progress toward improving the human conditions resulting from economic actions until we learn the facts about them."

National Welfare Uppermost

C. M. Chester, in his presidential address, advocated a 12-point program, placing first on the list industry's acceptance of its responsibility for the national welfare "as being an even higher duty than the successful operation of private business."

"Industry cannot just sit back and enjoy the fruits of prosperity," he said. "Now that the course of depression lies behind us . . . it is our job to join in creating a national depression study committee."

Mr. Chester pointed out that since NRA was invalidated business generally had kept its word that it would not cut wages, increase daily hours or pursue other unfavored practices. He said:

"The average weekly earnings, which mean more than the hourly rate to the worker, have increased 15 per cent. Under NRA the high point of employment in all occupations was 85.9 per cent of the 1929 figures. Today the gainfully employed in all occupations is 92.8 per cent of 1929.

"It is evident that if the average company today is employing more men than it did before the depression, the only possible explanation for a smaller total employment is that less companies are now in business. And this is actually the case. Full and increasing employment will be stimulated by the better flow of capital into development of necessary new industries."

A survey of the membership of the National Association of Manufacturers indicated that employment was actually 106 per cent of the 1929 level instead of the 95 per cent generally estimated, said Mr. Chester. He cautioned industrialists, however, not to rest upon their laurels in this respect but to "bend every effort of science and management skill to create still more jobs."

Must Find Depression Causes

He recommended that the proposed national depression study committee analyze causes of the receding depression, in an effort to eliminate business cycles or make them less severe.

Mr. Hook in speaking declared that while industry is in accord with many of the objectives of the federal administration, these objectives cannot be reached without confidence built on understanding between the government and industry and its employes.

Mr. Hook suggested that individual companies reduce their policies to writing so that there can be no doubt about them, explain the operations of their business to employes, and help to solve the problem of providing adequate housing for the lower income groups.

These things, he submitted, "are not paternalism, or philanthropy, but good business." Mr. Hook said that his company began stating its policies in writing 17 years ago.

The remarks of Mr. Weir, at the annual dinner were followed with close attention as he outlined his conception of what is expected of modern industrial leadership.

"This leadership," he said, "is expected not only to guide industry as the instrument for making all material things, but in addition to use industry as an instrument that will aid in solving the human problems of poverty, unemployment and others accentuated by the depression.

"This is a big order, yet basically, and within the capacity of industry to fill it, it is a rightful one. Any improvement in living standards must come from industry. Wealth can only be increased as more wealth is produced."

Industry fills a double function, he explained, not only as a maker of goods, but as an exchange through which the worker trades the products of his specialized skill for the other products that he needs. It is now demanded that industrial leaders improve this latter function—that they develop industry so that its efficiency as an exchange will equal its efficiency as a maker of goods, and thereby improve industry's social function as they also have improved its technological function.

"This seems to be the essence of the popular feeling today," Mr. Weir said. "It explains popular support of certain legislation which politicians have enacted and attempted to enact. It explains a frequently heard but an inaccurate statement that the American people now distrust industry. The American people are sold a thousand per cent on *industry*. They know that industry provides both goods and employment. But I believe that there is a disappointment with *management*."

He declared that "the sensible thing is to realize that a public state of mind has been created which will continue to have a tangible effect upon business. Mere resentment on the part of business will not change it. It represents a practical problem, which means action and words, not just words."

Outlines Duty of Industry

He made several suggestions: First, that industry should be the first to recognize and correct whatever is wrong in its present actions and policies; second, that it should retain and defend against all odds whatever is right; third, that industrial leadership, within industry's limits and in accordance with sound principles, should now attempt constructively to influence human conditions surrounding production; and, fourth, that industry should keep the public fully informed of its actions and policies.

"Industry should spare no effort in making clear that the aims of industry and the aims of the public in general are mutual—not opposed."

Mr. Chester, in his 12-point program, stressed the following needs in addition to the necessity for industry's acceptance of its responsibility: industry must continue to make better goods at lower cost, thus raising the standards of living and keeping the door of personal responsibility open; every possible employable in manufacturing industry must be put back to work; policies must be ready to stand public scrutiny at all times; industry must stand "four-square against monopoly"; it must engender confidence on the part of its workers; it must "invite increasing public understanding

by telling the facts"; it must see that workers, management and investor, according to their contribution, share fairly in the proceeds of manufacturing; it must "zealously live up to its responsibilities and insist that all other factors of our economic life, including labor organizations, be made equally responsible."

Monopoly Is Opposed

The declaration of principles adopted at the closing session incorporated most of these points. It stressed opposition to any monopoly in production, distribution and labor. It put the association on record as favoring economic security for each citizen, but stated that each person must create work for himself if that is within his power.

Other leading speakers included E. R. Weidlein, director, Mellon Institute of Industrial Research, Pittsburgh, who spoke on the partnership of industry and science; J. R. McCarl, former comptroller general of the United States, on government finances; and George H. Mead, president, Mead Corp. and chairman of the business advisory council to the United States department of commerce, on avenues of co-operation between industry and government.

"It is an obligation of first importance that industrial and business executives, as a part of their daily work, give time and consideration to the government of the community, state, and nation, and that the time spent in so doing is of just as great value to the stockholders and employes of their companies as any other phase of business life," said Mr. Mead.

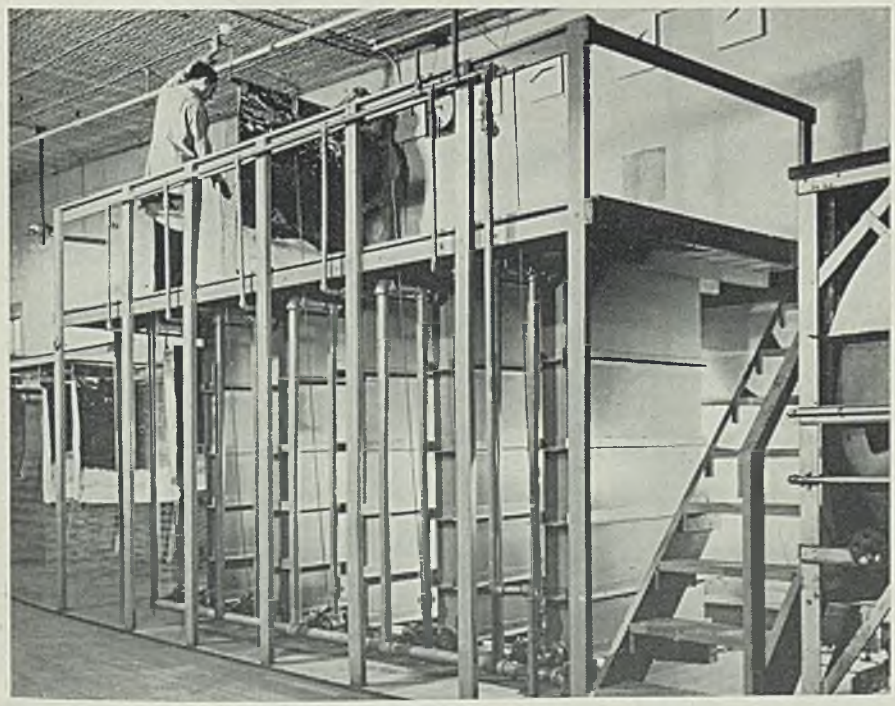
James A. Emery, general counsel, National Association of Manufacturers, in his address on "Competitions and Combines" declared:

"If the people of the United States desire to preserve the demonstrated benefits of a competitive private enterprise system relieved of its abuses let them insist upon an honorable code of business conduct. Let us aid in formulating it."

Survey Reasons for Vote

Raymond Moley, editor of *Today*, and formerly a member of President Roosevelt's "brain-trust," said in his address on "Business Leadership—1937 Model" that "the true quasi-public function of management must be made clear to the public by words, by deeds and by the interpretation of your deeds." He suggested to management that "in the long run it is more important for you to find out what was in the minds of the 27,000,000 people who voted for the President last month, than it is for you to try to read the mind of the President or his administrators from day to day."

Stainless Steel in Photographic Tanks



FOR washing large photographic prints, five stainless steel tanks have been installed by the Kaufmann-Fabry Co., Chicago. Each tank can accommodate a print 42 inches wide and up to 25 feet long by looping. In this comparatively new use of stainless steel, the metal is said to help insure chemical purity in the finished photomurals

Berry Conference Attracts 1000

WHILE the Congress of Industry, under auspices of the National Association of Manufacturers, was winding up its program in New York last week (see page 14) Major George L. Berry's council for industrial progress was getting under way in Washington. About 1000 attended the council's opening session Thursday, which was followed by an executive session Friday. Last year some 1500 attended the council's first conference.

Senator Wheeler, Montana, and Representative Rayburn, Texas, highly publicized in advance as speakers, failed to show up. Berry on Friday announced that "there are now 800 members of the council, 600 having joined since the conference opened." No large associations or business interests are included in this number.

Praising the growing spirit of co-operation on the part of employers, workers and farmers, Secretary Perkins in addressing the executive session said:

"Co-operative efforts by these groups to increase purchasing power, with the government standing by to aid in accomplishing this objective, will serve to continue the upward swing of recovery."

Requirements for Recovery

She pointed out that while fair and continued profits are of vital importance to industry, good and steady wages for workers and fair prices for farmers' products also are necessary to a sound prosperity.

She made a strong plea to those present that they survey their plants for all jobs suitable for the older or unskilled workers and wherever possible the places be filled with men from these groups.

Edward F. McGrady, assistant secretary of labor, who is now on the Pacific coast trying to settle the marine strike, sent Major Berry a telegram in which he said that "the activities in which I have been engaged particularly for the past three years have made me more certain that the only effective procedure to be followed in order to reconcile and cure the maladjustments of our industrial order is through co-operation and joint effort."

John G. Paine, chairman of the council's management group, said he realized that "in the membership of the council we do not have 100 per cent of the industries of this country, but we do have practically 100 per cent of those industries that represent the best in the American tradition."

Carnegie Outlines Training Program

IN LINE with efforts that are being made in many industries to overcome skilled labor shortages by starting training courses, Carnegie-Illinois Steel Corp. last week announced additional details concerning the program it inaugurated last summer (STEEL, Aug. 31, page 15).

At this time upward of 200 young men have been made apprentices in eight Carnegie-Illinois plants in the Pittsburgh-Youngstown district, and in the Chicago district a similar program is being pushed along parallel lines. Eventually the company hopes to be able to provide from its own ranks the skilled new forces required at all plants.

In order to accomplish this, the division has launched an elaborate four-phase plan of training. The first embraces the lengthy training of apprentices, over a four-year period and in more than a dozen mechanical classifications.

The second phase covers the supplementary training of technical graduates in sales and the various branches of operations, through their employment in an "observation corps" in all mill departments. Supervisory forces will be given specialized training in the third classification.

Provides Broad Training

In the fourth, a miscellaneous grouping, the company plans a "job training" program under which skilled workmen would be given additional study and instruction to enable them better to perform their work and to aid in standardization of operations looking to similar final results, at all company plants. Other avenues of instruction in this classification includes studies in citizenship matters for the benefit of aliens seeking naturalization, and the better preparation of men for their work through night trade extension classes.

At this time the company is conducting a survey from which it will be able to determine to within a close range, the number of apprentices it will be necessary to bring into the mills annually.

Under the new plan, the apprentices are started on a four-year course to learn one of the following trades: Blacksmith, boilermaker, bricklayer, electrician, machinist, molder, patternmaker pipefitter, roll turner, tinsmith, welder, mason, carpenter, structural worker, mill mechanic.

Selection of the apprentices is made carefully from men who already are employed in the mills—thus giving them an opportunity in the long run to better their economic status, from men who previously have been employed and who may be reinstated through a pickup in the rate of operations, or from recent graduates of high schools in either academic or trade courses.

During the long training period the apprentices are allotted certain hours each week for classroom study in mathematical subjects by competent instructors from the ranks of the company. Subjects such as arithmetic, algebra, geometry and trigonometry are taught in all classifications, and as the apprentices advance, they are given specialized instruction in the mechanics and strength of materials, economics and shop practice.

Interspersed between classroom and shop work will be shop talks, illustrated lectures and similar discussion meetings with experts in various lines taken from the offices and plants of the company.

The training course is divided into eight periods of approximately six months each for the purposes of grading as to rate of assimilation of instruction and as to pay.

At the beginning of the training course the apprentice is paid 90 per cent of the base pay for labor, and at the beginning of the eighth period his wages have increased to 140 per cent of the base pay for labor. The increase granted at the beginning of each successive period is a pro rata share of the total apprentice wage spread.

Organizers Demonstrate as Higher Wages Are Paid

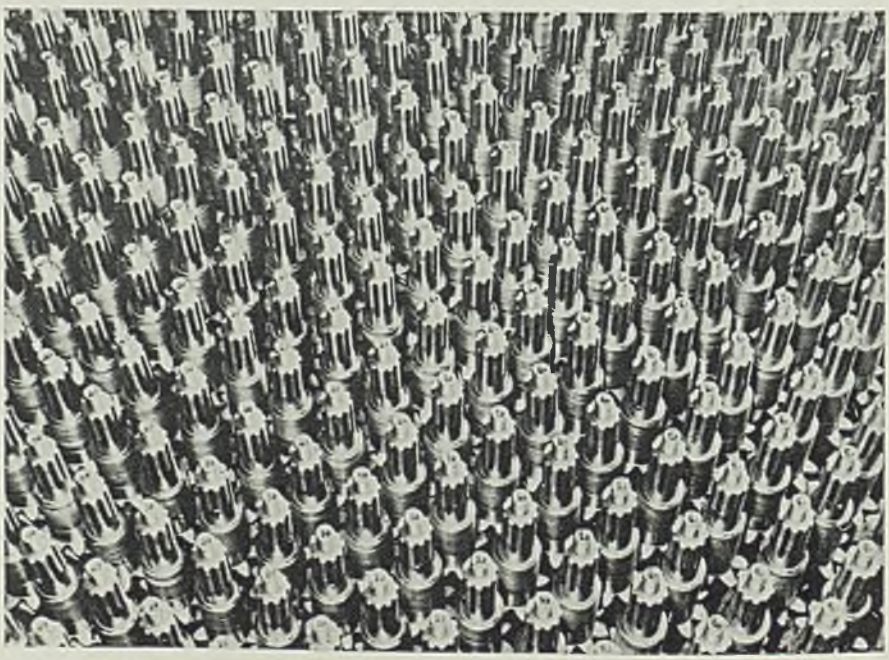
Seventy-five members of the steelworkers' organizing committee, carrying pamphlets, application blanks and loudspeakers solicited members at Carnegie-Illinois Steel Corp.'s Homestead, Pa., works Friday, the occasion being the first payday with the 10 per cent wage advance. Organizers followed men home but no violence was reported.

Chicago Group Honors Diesel Engine Inventor

About 250 industrial and civic leaders of the Middle West met in Chicago, Dec. 7, to honor the memory of Dr. Rudolph Diesel, inventor of the diesel engine. Speakers included B. C. Heacock, president, Caterpillar Tractor Co.; T. S. Hammond, president, Whiting Corp. and Illinois Manufacturers' association; C. B. Randall, vice president, Inland Steel Co.; J. D. Wyman, president, Deere & Co., and C. L. Cummins, president, Cummins Engine Co.

Among the steel men who attended were F. W. Walters, vice president, Steel Sales Corp., Chicago, manufacturers of tool steels, and Harry J. Cogswell, president, Latrobe Tool Mfg. Co., Latrobe, Pa.

Thousands of Pinions, Accurate to a Fraction of 1/1000-Inch



THESE bristles of steel are the spline ends of shiny new bevel drive pinions manufactured in Pontiac Motors' new $3,000,000 axle plant, Pontiac, Mich. They not only look alike, but are alike, down to the closest practical tolerance

Schedule Price Rise In Machine Tools

AS MANY buyers anticipated, numerous machine tools will be increased in price about Jan. 1 as a result of steadily rising labor and material costs, according to information obtained from dealers in the last two weeks.

Most machine tool prices have been advanced at least once this year, and on others there have been two or three increases of 5 to 10 per cent each.

Indicative of the upward trend, a surface grinder which sold in April, 1936, for $1280, and which is now priced at $1430, will be listed at $1573 after Jan. 1.

A medium-size milling machine which sold in November, 1935, for $1600, was advanced in July to $1660 and will be $1800 after the next advance. A larger size milling machine which sold in November, 1935, for $3650, and which is priced currently at $3850, will be increased 10 per cent about the first of the year.

Manufacturers who have not yet issued new price sheets asserted last week that their announcements were being withheld until after Jan. 1. These included makers of automatic screw machines, chucking machines and similar equipment. The last price increase in some of these lines was about one year ago.

Prompt deliveries apparently have been causing buyers more concern recently than the possibility of increased prices. Deliveries at present in many lines range from six weeks to six months. In general, the larger the machine tool the greater the length of time required for delivery. Lack of skilled help has helped result in some of the delays.

Demand has been stimulated recently by the requirements for expansion programs which are scheduled to get under way early next year.

Reports Sharp Gain in Rolling Mill Equipment

"Expanding activity in the steel industry has been reflected in sharp increases in orders for rolling mill equipment, in addition to entirely new rolling mill installations, and this is a forerunner of the great demand facing foundry and machine companies making this type of equipment," said Frank Cordes, president, Blaw-Knox Co.

The steel industry is operating at such a rate that probably all steelmaking units, such as blast furnaces and open hearths, are working virtually at their practical capacity so that when the demand for heavy steel for railroads and building construction develops more fully, it will probably be necessary to build additional open-hearth furnaces and to modernize existing facilities."

Forecasts Larger Market For Tin Containers in 1937

"Prospects for the largest volume of business in many years are now indicated for 1937 in the tin container industry," said O. C. Huffman, president, Continentl Can Co. Inc., last week.

"The statistical position of the canned foods industry, largest consumer is strong. Other principal markets for tin containers also offer encouragement, including motor oil, beer, and paint and varnish."

Crucible Exercises Option

Crucible Steel Co. of America has exercised its one-year option to purchase the former plant of the National Drawn Steel Co., East Liverpool, O. National, which ceased operations in 1932, formerly was a producer of cold-drawn carbon steel bars.

Steel Corp.'s November Shipments 882,643 Tons

Shipments of finished steel by the United States Steel Corp. in November were 882,643 tons, the largest total for November since 1929. November shipments were 124,774 tons less than in October, due to three fewer working days. They were 200,823 tons larger than in November, 1935. For nine months this year shipments are 9,757,767 tons, compared with 6,709,784 tons in the period last year.

U. S. STEEL CORP. SHIPMENTS
(Inter-company shipments not included)
(Tons)

	1936	1935	1934	1933
Jan.	721,414	534,055	331,777	285,138
Feb.	676,315	583,137	385,500	275,929
Mar.	783,552	668,056	588,209	256,793
April	979,907	591,728	643,009	335,321
May	984,097	598,915	745,063	455,302
June	886,065	578,108	985,337	603,937
July	590,851	547,794	369,938	701,322
Aug.	923,703	624,497	378,023	668.155
Sept.	961,803	614,933	370,306	575,161
Oct.	1,007,417	686,741	343,962	572.897
Nov.	882,643	681,820	366,119	430,358
11 mo.	9,757,767	6,709,784	5,507,693	5,160,313
Dec.	.....	661,515	418,630	600,630
Y'rly adj.	....	†23,750	†19,907	*44,283
Total	.....	7,347,549	5,905,966	5,805,235

*Addition. †Deduction.

Grace Sees Strong First Quarter

IN ANNOUNCING a special dividend of $1.50 on Bethlehem Steel Corp. common stock last week, Eugene G. Grace, president, expressed himself as optimistic over the outlook for the steel industry in the first quarter.

Recently announced price advances undoubtedly drove in considerable anticipatory tonnage, but even so, he said, there will be sufficient current demand to take care of the first quarter. He expected operations will be well sustained.

Mr. Grace stated he believed it was poor practice for the steel industry to give consumers an opportunity to cover in advance of a price increase. Whenever there is a reduction, he pointed out, it redounds to the buyers' advantage immediately. That his company has not put this policy into effect has been due to the competitive situation, he said.

He estimated that recent price advances would just about cover the wage increase. Advances in most products ranged from $2 to $4, making for an average of about $3.

Mr. Grace had just returned from an inspection trip to the corporation's west coast properties. He said no important expenditures for improvements to these there were under contemplation at present.

The special disbursement on common stock amounts to $4,787,000, to be paid Dec. 24 to 51,000 stock holders of record Dec. 17. This is the first on common since one of 50 cents paid in February, 1932.

Allegheny Steel Spends Million for Improvements

Plant improvements and extensions effected by Allegheny Steel Co. during 1936 will approximate $1,000,000, W. F. Detwiler, vice president of the company, has announced. At the Brackenridge plant two additional open-hearth furnaces have been put in operation and the bar mill enlarged to produce billets.

At the West Leechburg plant a modern office building has been built and the mill equipment augmented by two electric annealing furnaces, two normalizing furnaces, a continuous pickler on the 12-inch rolling mill and an extension to the cold-rolled strip plant. Auxiliary equipment, such as shears, levelers and slitters, has also been installed. Improvements at this plant are increasing its capacity on alloy steel strip by 50 per cent.

Activities of Steel Users and Makers

THE Berger Mfg. Co., Canton, O., Republic Steel Corp. subsidiary, will re-enter the building products fabrication field, in which it has not been active for several years, with a complete line of building products, according to L. S. Hamaker, executive vice president and general manager.

R. I. Schuppener, who has had more than 20 years experience as a sales executive with the Milcor Steel Co., Klauer Mfg. Co., and Wheeling Corrugating Co., will be general sales manager of the new division.

Among the items which the company will start producing shortly after Jan. 1, supplementing its present line of sheet metal products, are eaves troughs, conductor pipe, gutters, valleys, and ridgings. In addition it will have complete lines of trimmings and accessories, galvanized and black sheets, ternes and coke plates; roofing, siding, shingles, metal ceiling, metal lath, corner beads, channels and accessories. Metal windows, metal lumber, coal windows, wire products, furnace and ventilating pipe and accessories also will be produced.

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Cannon-Stein Steel Corp. has removed its plant from Marcellus and Wyoming streets, Syracuse, N. Y., to larger quarters at 817-819 South State street, Syracuse.

♦ ♦ ♦

Dravo Contracting Co. is building a 156 x 210-foot assembly shop at its marineways, Neville Island, near Pittsburgh, complete with a 20-ton erection and a 5-ton assemly crane, which will enable the construction of barges and other river equipment, uninterrupted by weather.

♦ ♦ ♦

Meriam Co., Cleveland, has completed an extension, 54 x 100 feet to its gas and oil engine rebuilding plant. The floor for assembling and testing consists of a solid block of concrete 60 feet long and permits six power units to be tested at one time.

♦ ♦ ♦

Nu-Scrap Briquetting Co., 219 South Sixteenth street, Milwaukee, has been placed in operation by E. J. Byerlein, who also is president, Milwaukee Foundry Equipment Co. The new company purchases borings and produces briquets for the market.

♦ ♦ ♦

Timken Roller Bearing Co., Canton, O., has taken a contract from the Chicago, Burlington & Quincy railroad for Timken boxes and bearings to equip all axles, including driving axles, of 10 locomotives to be built in its own shops. Timken also has been given orders for boxes and bearings for all axles on 10 locomotives being built by the American Locomotive Co., New York; from the Chicago, Rock Island & Pacific for bearings and boxes for two locomotives; from Edward G. Budd Mfg. Co., Philadelphia, for bearings and boxes for all journals on the six streamlined trains it is to build for the Chicago, Rock Island & Pacific. The latter is the eighth railroad using Timken bearings on high-speed trains, making a total of 22 such trains now operating or being built.

Financial

UNIVERSAL - CYCLOPS STEEL CORP., Pitsburgh, has filed a registration statement with the securities and exchange commission in connection with an offering of 100,000 shares of $1 par value, which is expected shortly through A. G. Becker & Co., Chicago, underwriter.

Under the exchange arrangement, each share of Universal Steel Co. preferred stock gets 7 shares of the new stock; each share of Universal common gets 8293 shares of new stock; for each share of Cyclops Steel Co. preferred, 7 1/3 shares of new stock, and for each share of Cyclops common, 24,244 shares.

Additional news of the steel and metalworking industries will be found on page 90.

DIVIDENDS DECLARED

National Steel Corp., Pittsburgh, declared a dividend of $1.62½ per share on the 2,161,677 common shares outstanding, there being no preferred. This brings the total dividends paid for the current year to $3.12½ a share. It is payable Dec. 21 to holders of record Dec. 12. The regular quarterly dividend rate has been raised $1 a year, thereby placing the common on a $2.50 annual basis.

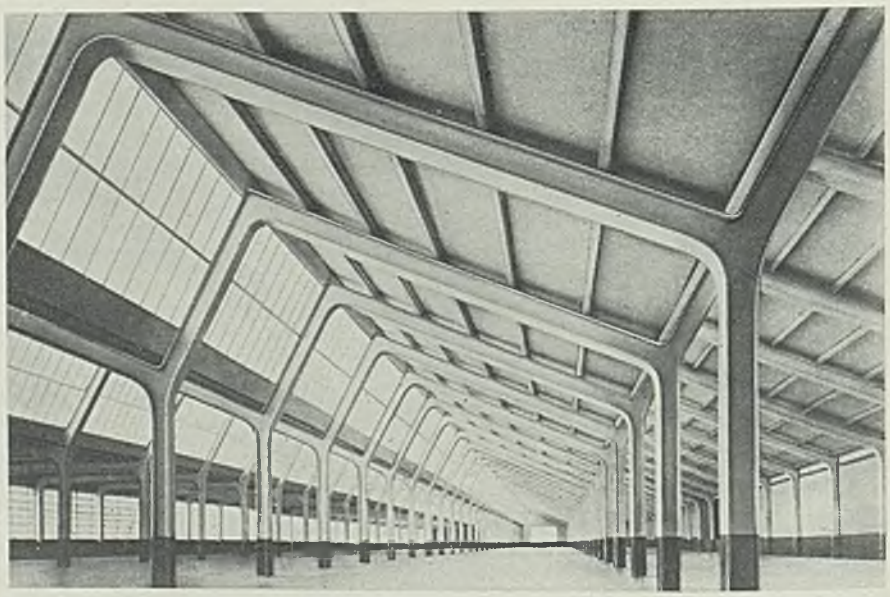
Midland Steel Products Co., Cleveland, declared a dividend of $2 on the common stock payable Dec. 23, and another for the same amount on the 8 per cent cumulative preferred payable Jan. 1; both to record of Dec. 15. Additional dividends of 50 cents each also were declared on the $2 noncumulative preferred and on the common, payable Jan. 1.

Valley Mould & Iron Corp., Hubbard, O., declared an initial dividend of $2 on the common stock, payable Dec. 19 to record Dec. 10. The regular quarterly dividend on the 5½ per cent preferred was paid Dec. 1.

Electric Controller & Mfg. Co., Cleveland, declared a common dividend of $1 a share and a special of $2.50, both payable Dec. 21 to record Dec. 14.

Jones & Laughlin Steel Corp., Pittsburgh, has declared a dividend of $2 on the preferred stock, payable Dec. 23 to Dec. 11 record, which will reduce the arrearage to $26.25.

Adopts Tree Form In Structural Steel Design



UNOBSTRUCTED space and the elimination of shadows are two advantages of this new type of single story factory building, which has a continuous rigid saw-tooth frame formed by the welding of rolled beam sections which permit construction of aisles up to 50 feet in width. The natural tree form of structural design is thus adapted to industrial purposes. The Austin Co., Cleveland, has developed the design

All-time November Record in Ingots

DAILY output of steel ingots during November was larger than in any month since September, 1929, and the highest of any November in the history of the industry, according to the American Iron and Steel institute.

The November average was 173,496 gross tons, an increase of 3 per cent over October's 168,333 tons, and 43 per cent above the average of 121,170 tons in November, 1935.

Highest daily average output in the record year, 1929, was reached in June at 196,118 tons. Average daily output in September, 1929, which has not since been exceeded, was 181,115 tons.

Total calculated production for November was 4,337,412 gross tons, and fell short of the 4,545,001 tons made in October because of two less working days. Total output in November, 1935, was 3,150,409 tons. Operations in November were equivalent to 79.05 per cent of capacity, against 76.70 per cent in October and 54.73 per cent a year ago.

That open hearths were charged more heavily than usual in November, in an effort to get out material in advance of price increases for first quarter, is indicated by the official operating rate of 79.05 per cent—in contrast with an average of 74.34 indicated by the institute's weekly reports.

Calculated production for 11 months of 1936 is 42,487,717 tons, compared with 30,344,580 tons in the corresponding period of 1935.

District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended Dec. 12	Change	Same week 1935	Same week 1934
Pittsburgh ..	75	+ 3	42	24
Chicago	77	None	59	35½
Eastern Pa...	49½	+ 1	37	19½
Youngstown..	79	+ 1	62	39
Wheeling	92	None	78	70
Cleveland ...	75½	— 4	84	59
Buffalo	84	None	47	24
Birmingham..	74	None	56	32½
New England	91	None	82	47
Detroit	95	None	94	59
Cincinnati ...	92	— 4	†	†
St. Louis	68	None	†	†
Average ...	77½	+ 1	54½	33½

†Not reported.

Production

THE national steelworks rate advanced 1 point to 77½ per cent last week, due to heavy pressure upon mills for shipments before the end of the year.

Youngstown—Up 1 point to 79 per cent, as Youngstown Sheet & Tube Co. added an eighth furnace at its Brier Hill plant. This company is preparing a ninth unit for operation, expected to be ready this week. Carnegie-Illinois Steel Corp. will take one furnace off at its Ohio works for repairs this week, to operate 13.

Cleveland-Lorain—Down 5 points to 74½ per cent, as National Tube Co., Lorain, blew out one furnace for relining, and Otis Steel Co. scheduled eight the first four days of the week and seven the last two days. Corrigan, McKinney continued with 12 units active.

Buffalo—Remained at 84 per cent. Little change is indicated over the remainder of the year.

Pittsburgh—Up 3 points to 75 per cent, based on a rate of 70-71 per cent by United States Steel Corp. subsidiaries and a 78-79 per cent average for the independents. Mills are being hard pressed to make deliveries and are scheduling virtually all available steelmaking capacity. In the case of nearly all mills, however, down-time for furnace repairs has been obligatory. The forty-fifth steelworks blast furnace was blown in the past week, this being the seventh stack at Carnegie-Illinois Edgar Thomson works.

Detroit—Unchanged at 95 per cent, based on ingot output in 20 out of 21 open-hearth furnaces.

Wheeling—Unchanged at 92 per cent, figured on operations in 34 out of 37 open hearths.

Chicago—Continued at 77 per cent for the third consecutive week. This rate likely will be extended or bettered during the remainder of December and through January. Blast furnace operations are at a new high level for the year with the lighting of an additional Gary stack, making a total of 28 units active.

Birmingham, Ala.—Sixteen open-hearth furnaces are being kept in operation, holding the ingot rate at 74 per cent.

Central eastern seaboard—Up 1½ points to 49½ per cent, with a still higher rate expected before Dec. 31.

Steel Ingot Statistics

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

1936	—Open Hearth— Gross tons	Per cent of capacity	——Bessemer—— Gross tons	Per cent of capacity	———Total——— Gross tons	Per cent of capacity	daily production, all companies (gross tons)	Number of working days
Jan.	2,849,557	53.73	196,389	31.54	3,045,946	51.40	112,813	27
Feb.	2,761,973	56.25	202,445	35.11	2,964,418	54.03	118,577	25
March	3,157,579	61.83	185,040	30.86	3,342,619	58.58	128,562	26
April	3,637,479	71.23	304,775	50.83	3,942,254	69.09	151,625	26
May	3,744,161	73.32	302,092	50.38	4,046,253	70.91	155,625	26
June	3,649,948	71.47	334,897	55.85	3,984,845	69.83	153,263	26
July	3,596,125	70.42	326,606	54.47	3,922,731	68.74	150,874	26
Aug.	3,844,570	75.28	350,560	58.47	4,195,130	73.52	161,351	26
Sept.	3,858,060	75.55	303,048	50.54	4,161,108	72.92	160,043	26
Oct.	4,227,291	79.71	317,710	51.03	4,545,001	76.70	168,333	27
Nov.	4,007,859	81.62	329,553	57.16	4,337,412	79.05	173,496	25
11 mos.....	39,334,602	70.02	3,153,115	47.80	42,487,717	67.68	148,558	286
1935								
Jan.	2,630,303	49.70	239,858	34.99	2,870,161	48.02	106,302	27
Feb.	2,549,935	54.21	224,336	36.82	2,774,271	52.22	115,595	24
March	2,634,482	51.70	230,810	34.97	2,865,292	49.78	110,204	26
April	2,408,686	47.27	231,916	35.14	2,640,602	45.88	101,562	26
May	2,378,865	44.95	254,796	37.17	2,633,661	44.06	97,543	27
June	2,048,177	41.80	210,487	33.17	2,258,664	40.81	90,347	25
July	2,043,371	40.10	224,456	34.01	2,267,827	39.40	87,224	26
Aug.	2,682,569	50.69	223,361	34.05	2,915,930	48.78	107,997	27
Sept.	2,591,267	52.88	233,737	36.83	2,825,004	51.04	113,000	25
Oct.	2,872,040	54.27	270,719	39.50	3,142,759	52.58	116,398	27
Nov.	2,898,246	56.87	252,163	38.20	3,150,409	54.73	121,170	26
11 mos.....	27,737,941	48.95	2,606,639	41.06	30,344,580	48.34	106,099	286
Dec.	2,845,013	58.06	228,392	35.99	3,073,405	55.53	122,936	25
Total	30,582,954	50.17	2,835,031	35.91	33,417,985	48.54	107,453	311

Capacity percentages for 1935 are based on open-hearth capacity of 60,954,717 gross tons and bessemer of 7,895,000 gross tons on Dec. 31, 1934; for 1936 on open-hearth capacity of 61,280,509 gross tons and bessemer of 7,195,000 gross tons, as of Dec. 31, 1935.

Ore Companies Must Pay $7,500,000 Back Taxes

Twenty northern Minnesota mining companies, including subsidiaries of the United States Steel Corp., must pay $7,500,000 in delinquent taxes, the Minnesota supreme court has decided in upholding an $88,000,000 real estate valuation on unmined iron ore. The companies had contended the valuation, which was a reduction of 15 per cent under the tax commission's figure, still was $10,000,000 too high. Cases of two companies were remanded for rehearing.

Men of Industry

WILLIAM E. UMSTATTD has been elected president, Timken Steel & Tube Co., Canton, O., subsidiary of Timken Roller Bearing Co., in addition to continuing his present capacity as president of the parent company. He succeeds Frederick J. Griffiths, who has resigned as a director of the parent company and as president and director of Timken Steel & Tube.

H. H. Timken Jr., previously a vice president, Timken Steel & Tube, has been made executive vice president, in addition to his present capacity as vice president and director of the Roller Bearing company.

W. Robert Timken has been elected a director of both companies to fill the vacancy of the unexpired term.

John E. Fick has been appointed general superintendent, steel and tube mills of Timken Roller Bearing, succeeding K. B. Bowman, who also has resigned.

♦ ♦ ♦

A. J. Youngbluth, Ishpeming, Mich., has resigned as purchasing agent for Cleveland-Cliffs Iron Co.

♦ ♦ ♦

Henry P. Davidson has been elected a director, American Brake Shoe & Foundry Co., New York, succeeding A. L. Humphrey.

♦ ♦ ♦

Herman Balsam, salesman of Union Drawn Steel Co., Massillon, O., in the tri-cities area of Illinois and Indiana, has resigned.

♦ ♦ ♦

Lawrence W. Hayden has been made manager of the newly established sales office at 90 West Broadway, New York, of the Lindberg Engineering Co., Chicago.

♦ ♦ ♦

A. J. Feltault has been appointed general sales and advertising manager, Cuno Engineering Corp., Meriden, Conn., specialist in filters used in various industrial applications, and coolant systems.

♦ ♦ ♦

Herman L. Weckler has been appointed vice president and general manager, DeSoto division of Chrysler Corp. He formerly was identified with Jones & Laughlin Steel Corp.

♦ ♦ ♦

A. T. Hunt is now identified with the sheet sales division, Bethlehem Steel Co., Bethlehem, Pa. He formerly had been general sales manager, Eastern Rolling Mill Co., Baltimore.

♦ ♦ ♦

Charles P. Powell has been appointed manager, Tonawanda, N. Y., plant, Crane Co., Chicago, succeeding William E. Peterson, who is on leave of absence because of ill health.

♦ ♦ ♦

J. A. Krugler has been appointed general sales manager, Taylor-Wharton Iron & Steel Co., High Bridge, N. J., succeeding J. C. Taylor Jr., who recently resigned. For the past 12 years, Mr. Krugler has served the Taylor-Wharton organization as sales engineer, for six years in the mining field, and subsequently at New York. Previous to this, his experience was in rail-

J. A. Krugler

road and mining engineering. He was born in Pottstown, Pa., and attended Rensselaer Polytechnic institute.

♦ ♦ ♦

A. D. Feeman has been appointed credit manager, Superior Steel Corp., Pittsburgh, in addition to continuing as purchasing agent. Mr. Feeman is also vice president, Purchasing Agents' Association of Pittsburgh.

♦ ♦ ♦

Andrew Johnson, manager of tin plate sales, National Steel Corp., has been appointed manager of the New York office, succeeding Harry Weber, who has resigned. Mr. Johnson formerly was district sales manager, Trumbull Steel Co., and when that company was absorbed by the former Republic Iron & Steel Co., he went with Republic for a short time in the New York office. Later he became manager of tin plate sales of Republic, resigning about five years ago to take a similar position with National Steel.

♦ ♦ ♦

Herbert H. Pease has resigned as treasurer, New Britain Machine Co., New Britain, Conn., but remains president and chairman of the board.

Ralph S. Howe has been elected treasurer, while E. L. Steinle and D. H. Montgomery have been elected vice presidents.

♦ ♦ ♦

Cecil G. Roush has been appointed manager, Kansas City office, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., effective Jan. 1. Mr. Roush will assume the duties formerly handled by C. W. Hamilton, who is being transferred to another activity of the Westinghouse company.

♦ ♦ ♦

W. F. Holtzman has been appointed manager, Rawlplug Washington Co., subsidiary of Rawlplug Co. Inc., New York, with headquarters at 50 Florida avenue, Northeast, Washington. The company manufactures a complete line of patented anchoring devices, and masonry drills, a complete stock of which will be carried in Washington for prompt delivery.

♦ ♦ ♦

Ernest T. Fisher, recently connected with the Illinois Foundry Co., Springfield, Ill., in the capacity of superintendent and assistant manager, has become associated with Claude B. Schneible Co., Chicago, manufacturer of dust suppressing equipment, as sales engineer, covering the territory contiguous to St. Louis.

♦ ♦ ♦

Wesley P. Sykes, metallurgical engineer, Cleveland wire works, General Electric Co., Cleveland, has been named by the American Society for Metals as the 1937 Edward De Mille Campbell memorial lecturer. The lecture will be presented at the society's nineteenth annual convention in Atlantic City, N. J., next October. Mr. Sykes has done extensive research work on the alloys of iron-tungsten and iron-molybdenum, and has written many technical papers dealing with these alloys. For three years he has been a special lecturer in the department of metallurgy, Case School of Applied Science, Cleveland.

Died:

HARRY ROSS JONES, 67, first president of the United Alloy Steel Corp., Canton, O., and identified with United Steel Co from 1904 through its various changes until his retirement in December, 1921, of a heart attack in Canton, Dec. 4. He gained his early business experience with the Youngstown Bridge Co., Youngstown, O.; Variety Iron Works, Cleveland; Columbus Bridge Co.; Osborn Engineering Co., Cleveland; and Southern States Portland Cement Co. He joined United Steel Co. in 1904 as secretary-treasurer,

1851—Willis Larimer King—1936

VENERABLE dean of the steel industry, Willis Larimer King, 85, a director of Jones & Laughlin Steel Corp., and formerly vice president and member of its executive committee until his retirement in 1934, died last Friday in Pittsburgh. His association with the company spanned 67 years.

He was one of the founders and a charter member of the American Iron and Steel institute, and an honorary vice president of the institute at the time of his death. In May, 1933, he was awarded the institute's Gary memorial gold medal "For outstanding achievement as a leader in inspiring high ideals and promoting confidence and good will in the welfare of the iron and steel industry."

Active almost up to the time of his death, he was affectionately referred to by his friends and associates as "the grand old man of the steel industry."

Born in Pittsburgh, Feb. 14, 1851, the son of Hugh Davidson King, one of that city's early bankers, and Eliza Ann (McMasters) King, he lived in that city all his life. While his early ambition trended toward the legal or medical professions, the iron and steel atmosphere furnished his life's breath and was the source of his never failing energy, ambition and enthusiasm.

Willis Larimer King

He was educated in Pittsburgh public schools and Newell's Academy, and also at Washington and Jefferson college, Canonsburg, Pa. When he was a boy, Andrew Carnegie was struggling to gain a foothold in the iron and steel industry at various locations on the Allegheny river. He was inspired by Carnegie and the early ironmasters.

It was July 12, 1869, when at the age of 18 he sought and gained employment as an order clerk in the original partnership of Jones & Laughlin Ltd. His capable efforts were rewarded with successive promotions in the sales department until he became vice president and general manager of sales. He was active in perfecting plans for the organization of the Jones & Laughlin Steel Co., now Jones & Laughlin Steel Corp., which superseded Jones & Laughlin Ltd. To him also was credited much of the success of efforts which resulted in the company becoming a fully integrated steel interest, through ownership of ore mines, coal properties, construction of coke ovens, transportation facilities, and finishing capacity.

During the period of the operation of the war industries board he served on its committee on iron and steel products. He was a strong advocate of the Golden Rule in business, and of him the late Joseph G. Butler Jr., in his book "Recollections of Men and Events" said: "Mr. King has been an important factor in the great success of the Jones & Laughlin Steel Co. . . . . The close friendship existing between Mr. King and myself is enduring and will continue to the end."

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and under his management the company became the country's first producer of alloy steels in commercial quantities and also was the first to develop vanadium and molybdenum steel on a large tonnage basis. In August, 1916, the company became United Alloy Steel Corp., with Mr. Jones as president. In 1933 he was asked to organize an alloy steel division for Youngstown Sheet & Tube Co., and completed his work late in 1935.

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Carl A. Weigel, 51, manager, Detroit Stewart Fence Co., in Detroit, Dec. 2.

♦ ♦ ♦

J. Norman Brookfield, 49, superintendent of melting departments, Ludlum Steel Co., Dunkirk, N. Y., in that city, Dec. 7.

♦ ♦ ♦

Dr. Charles LeGeyt Fortescue, 60, consulting transmission engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., in Pittsburgh, Dec. 4. Dr. Fortescue was internationally famous for his work in curbing the effects of lighting on transmission lines and distribution systems. He was a member of the American Institute of Electrical Engineers.

♦ ♦ ♦

Henry O. Van Eweyk, 68, founder and president, Milwaukee Brass Mfg. Co., Milwaukee, in that city, Dec. 6.

♦ ♦ ♦

William Werne, 64, in charge of iron mining developments, Inland Steel Co., until his retirement in 1935, in San Diego, Calif., Nov. 30.

♦ ♦ ♦

John Leonard Gates, 73, secretary and treasurer, Western Iron Works, San Francisco, at his home in Sausalito, Calif., Dec. 5. He was associated with the company for the past 45 years.

♦ ♦ ♦

James E. Van Houten, 81, secretary and treasurer, Dutchess Tool Co., Beacon, N. Y., baking machinery manufacturer, in that city, Dec. 6. He had been connected with this firm 50 years.

♦ ♦ ♦

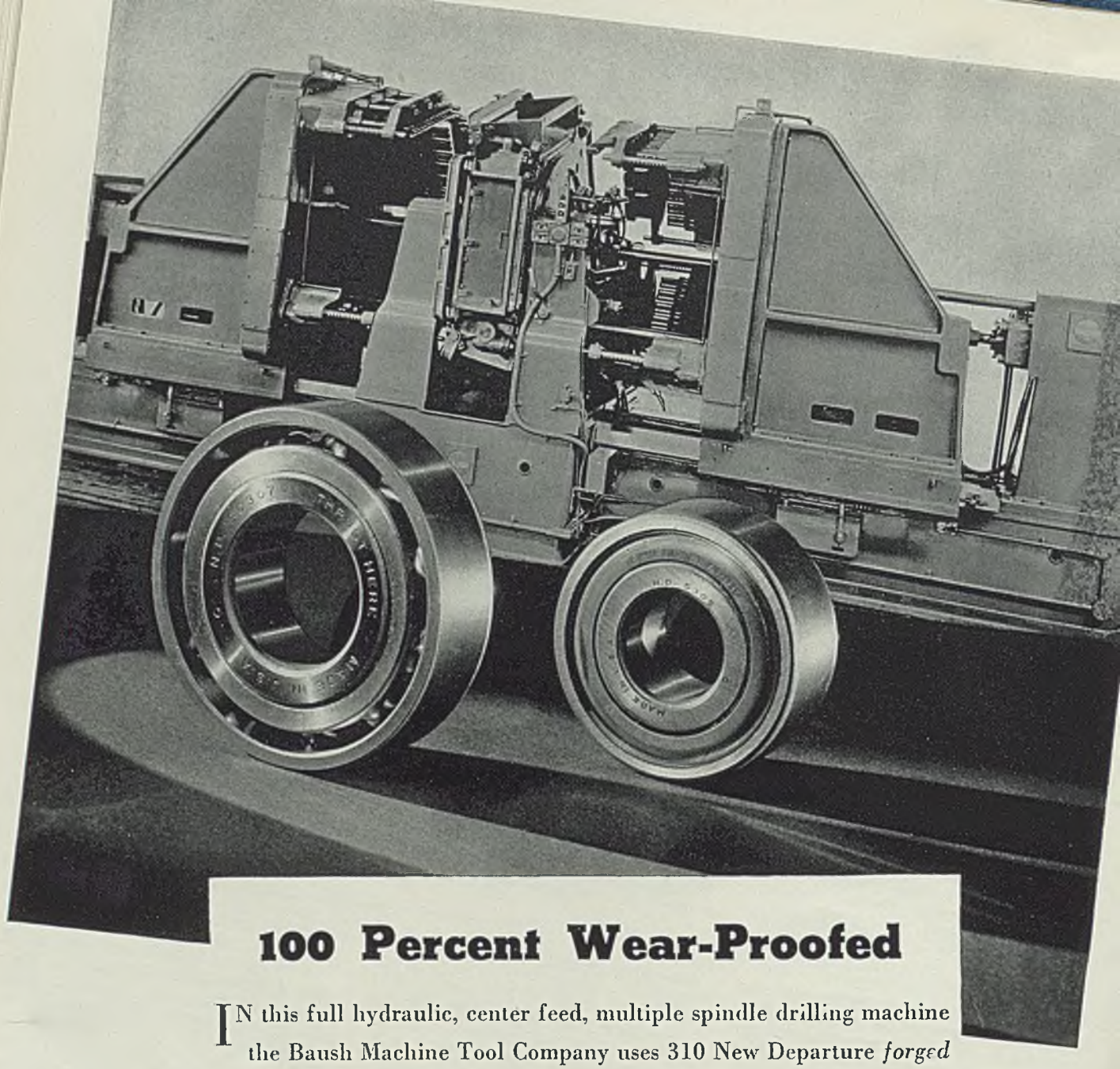
Frank W. Ruggles, 60, former president Republic Motor Truck Co., in Alma, Mich., Dec. 7. He went to Alma from Massachusetts in 1910 as manager of Alma Mfg. Co. Organizing the Republic company in 1912, he became its first president. He sold his interest in the company in 1920 and organized the Ruggles Motor Truck Co., Saginaw, Mich., and London, Ont. Later he became president, Northern Wheel Co., of Alma and St. Louis.

♦ ♦ ♦

Charles V. Witt, 59, well known in steel fabricating circles, a member of the Engineers' Society of Western Pennsylvania as well as the American Society of Mechanical Engineers, at Greensburg, Pa., Dec. 7.

♦ ♦ ♦

Leon Cammen, 61, noted engineer and inventor, in New York, recently. A native of Russia, he was graduated from the University of St. Petersburg in Russia, and also received a master degree from the University of Illinois, Champaign, Ill. Mr. Cammen was the originator of several innovations in rolling mill machinery, sheet mill machinery and also designed a machine for casting billets centrifugally. He was the author of books on government ownership of publicity utilities in the United States, and principles of metallurgy of ferrous metals.



100 Percent Wear-Proofed

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Either the right or left-hand heads, containing 48 and 40 spindles respectively, may be turned over by hand, indicating the 20-25 percent power saving effected by the bearings in this machine. Wherever fine machine tools are being built, the fact is constantly demonstrated that "Nothing Rolls Like a Ball." New Departure, *Division of General Motors Corporation*, Bristol, Conn., Detroit, Chicago, San Francisco.

Down through the years Forging has meant Toughness

NEW DEPARTURE

THE *FORGED STEEL* BEARING

2496

MIRRORS of MOTORDOM

DETROIT

JUST across the river from Detroit Ford has lined up some important expansions for its Canadian subsidiary, Ford Motor of Canada.

Ford at Walkerville, Ont., which is on the outskirts of Windsor directly opposite Detroit, is about to make enlargements which will result in a much more complete plant. Close to $1,700,000 will be spent, apparently indicating that Dearborn's leading citizen is as optimistic over the Canadian and export markets as he is on his own chances in this country in 1937.

Most of the contracts for Walkerville will be awarded about Jan. 1; $1,400,000 to go into new machinery and $300,000 for new plant construction.

Details still are guarded, though it appears that concentration on the assembly of the small 60-horsepower models will be the principal development at Walkerville.

As before, the Canadian plant still will be largely an assembly branch. Parts made in the United States and shipped across the line carry far less duty than completed cars.

Concerning the "60" motor, the popularity of this small Ford engine is already time-tested in England and the Continent; thus the fair assumption that Canadians and others of the British dominions, for whom assemblies are made at Walkerville, will find it to their liking.

Will Buy Some Equipment

The new plant will have some 73,000 square feet of floor space. New conveyor systems will be set up to handle body assemblies much better than in the present somewhat cramped quarters.

As far as can be learned, no die shop and no large presses will be installed. Most of the component stampings and other parts, as in the past, will come across the river from Dearborn.

Orders are now going through Ford's purchasing department for the equipment, including a long list of machine tools. One novelty which machinery builders will appreciate is the fact that for the new tool room alone orders for some 12 lathes have been placed. But, instead of purchasing them all from one maker —to provide for the interchangability of lathe tools—Ford has bought three machines from each of four makers. Apparently, with such a close comparison at hand, Ford will obtain some interesting test data, with production records.

Speaking of the 60-horsepower Ford, Dearborn has not made a vast number to date. This does not infer that hopes have not been realized for Ford admittedly ventured into the manufacture of the small companion car to see whether the American public wants cheaper transportation more than anything else. No one imagined that the small "60" would entirely replace the V-8.

Producing Few 60-Horsepower

Some of the critics of this policy, which is the most significant since Lincoln dropped the Zephyr into the market, hold that the innovation was "a backward move." They contend that a small car is a depression expedient and therefore transient, and that the "60" is three years too late. But Ford's worries on these charges are nil, for the same hue and cry attended the change from model T to model A, and it has been heard many other times in automotive history.

Thus, a year hence would be a fairer time to pass on the "60's" success, though it is true that only some 5 to 10 per cent of the Fords coming off the line are powered with the "60" motor.

Motor block production, even abetted by a sizable bank before the model was announced, has rarely run over 300 units daily at the Ford foundry, compared with the recent average daily output of some 6000 of the 85-horsepower V-8's.

Therefore, it is not surprising to hear that while development charges are being absorbed, costs on the small eight are running some $8 to $9 more per block than on the 85-horsepower engine. And this is in spite of the fact that the small power plant weighing 400 pounds is about 162 pounds less than the "85."

With this week, and more specifically Dec. 15, total Ford production will be up to 7000 units per day, or at the rate of approximately 35,000 a week. If this volume is reached it will be the first time since 1935 that Ford production has passed Chevrolet's.

The one "if" is brake assemblies at Dearborn, for temporarily this is the bottleneck. Assuming that enough brakes start coming through this week, Ford should live up to its plan of making 130,000 models in the month of December.

Seven thousand Fords a day seems like a lot of automobiles; actually it is not a new high, for Dearborn and the other Ford assembly plants turned out 8200 model A's back in 1930 for days on end.

Chevrolet is working on much the same schedule in December as is Ford. The aggregate for this General Motors unit is set up for 125,000 models, but since November after a slow start accounted for 112,229, December may result in better than 130,000. Last week, on a five-day basis, Chevrolet made some 30,000 cars.

Chrysler Corp. has breathed with relief since the Midland Steel Products Co. strike was settled ten days ago. Though about six days' time was lost, the various Chrysler Corp. units still hope to turn out 100,000 models for December.

History's Best in December

Add Ford's 130,000 to Chevrolet's 125,000, to Chrysler Corp.'s 100,000; to 90,000 as an overall for Buick, Pontiac, LaSalle and Olds, an include some 45,000 models from Hudson, Nash, Packard and Studebaker, and you have 490,000 assemblies or better for December. This appears to be the greatest December in history; a month that compares with the spring of 1929 when cars were being produced at the rate of 550,000 to 600,000 per month.

Too, the showing is all the more remarkable because of the fact that there are fewer makers today than seven years ago. Hupp, Reo and a

Mirrors of Motordom

few others are absent from the present procession.

Speaking of the Midland Steel Products strike, Chrysler's Dodge and Plymouth divisions started up work again last Monday morning. The DeSoto and Chrysler lines started on Tuesday. Some 7000 frames were put into Plymouth and Dodge early Monday, enough for a start, but it was several days before the effects of a week's layoff could be shaken off.

This strike, which was brought to a head by a small group of welders in the Midland plant and which went on to throw 67,000 people out of work, did have a few redeeming features. Seizing the opportunity to make up lost time some of the Chrysler parts makers who were down simply because the assembly lines were closed went about building parts banks.

One was the Chrysler foundry, which makes all the DeSoto and Dodge blocks and a part of the Plymouth castings. At this department they were melting all week, trying to get needed finished inventories ahead.

As this column began reporting two weeks ago, never in the history of the automobile industry has so much forward buying of steel gone on.

Steel Bought Well Ahead

To bring the figures up to date, the condition is accentuated even more so today. Itemized, Chrysler Corp. seems farthest along for it has steel obligations placed for fully 850,000 models; Chevrolet has bought ahead for 700,000 models; and Ford, enough to make 550,000 cars. The total, 2,100,000.

In comparison, two weeks ago these respective figures were: Chrysler, 650,000; Chevrolet, 500,000; and Ford, 400,000. In other words, in the last three weeks, or since the week before Dec. 1, these three alone have bought steel for 600,000 more cars.

If Chrysler, Ford and Chevrolet, representing about 80 per cent of the industry's production, have obligated themselves for 2,100,000 models in advance, steel buying by the entire industry apparently is in excess of 2,600,000 cars, or more than half of all 1937's motor car production.

Even Studebaker made news last week by publicly announcing it had bought 40,000 tons of steel, enough for five months' use, and had saved about $4 a car thereby.

The higher steel price—which in net will mean little more than $3 or $4 per car, will not be felt fully by the automobile builders until along about next July 4th.

By late last week the placing of these orders on the mill's books for future rolling and shipment had about drawn to a close. These obligations now more or less preclude important buying here until at least Feb. 1.

With Ford now in the ranks of steel turret tops, Packard is the lone conspicuous absentee among the leading motor makers.

Packard To Adopt Steel Top?

Packard's management is preparing to ask for estimates on new presses. Whether the adoption would be made in mid-season or remain for 1938 awaits to be seen.

Hudson's is the heaviest all-steel top, weighing 101 pounds; Fisher's is about 77 pounds and the average for the industry is something between 75 and 80. Counting in the converts to steel tops in 1936, plus the replacement of wood in door and floor parts, it is estimated that each 1937 automobile uses 65 more pounds of steel than its 1936 brother.

Standardization of parts in the automobile trailer industry was discussed at a meeting attended by representatives of the trailer coach and trailer parts industries and the Society of Automotive Engineers here last week. Problems include the mechanical difficulties of linking the trailer to the automobile. Data will be gathered from the various industries involved.

Further integration of the motor industry is indicated by the $50,000,000 merger of Briggs Mfg. Co. with Motor Products Co., Detroit. The oldest and largest independent maker of automobile bodies and stampings in the industry, Briggs was founded in 1909 and has six plants in Detroit and one in Evansville, Ind.; its chief customers are Chrysler and Ford, to whom it supplies bodies. Motor Products Co. was formed in 1926, has one plant in Detroit, one in Walkerville, Ont.; it supplies light auto accessories to nearly all of the major companies. This merger is the second major consolidation in the automotive industry this fall, following closely the Nash-Kelvinator tie-up.

Strike Shifts Business

One result of the Bendix Products Co. strike: Marvel Carburetor Co., Flint, Mich., has taken over the supply of carburetors to Buick from the former South Bend, Ind., supplier . . . . Hudson, up to an average of 85 assemblies an hour last week, nine hours daily, made almost 4000 cars in the week . . . Packard, with unfilled orders for about 27,000 models, will bring out a seven-passenger job on the "120" line . . . . A leading parts maker is surveying the old Alma Engine Co. plant at Hillsdale, Mich., for expansion . . . . Goodyear Tire & Rubber Co.'s purchase of the Kelsey-Hayes Wheel Co. plant, Jackson, Mich., was finally confirmed last week, but the deal was made Nov. 6. . . . "Who Silenced the Steel Body?" is a catch-word Fisher Body is using to advertise its uni-steel body. . . . . On bodies for 1937, Ford will continue to make its own two-door jobs, with automotive circles understanding that Briggs and Murray Body continue to have their same respective shares of the work let outside. . . . . Electric AutoLite Co. will pay an $800,000 bonus to employes on Dec. 18. . . . . Chevrolet reports more than 40 per cent of its 10,000 dealers have been with the company for more than five years. . . . . The old Velie Motor Co. plant at Moline, Ill., has been purchased by J. I. Case Co., Chicago.

Automobile Production

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

	1934	1935	1936
Jan.	155,666	289,728	364,004
Feb.	230,256	332,231	287,606
Mar.	338,434	425,913	420,971
Apr.	352,975	452,936	502,775
May	330,455	361,107	460,565
June	306,477	356,340	452,955
July	264,933	332,109	440,999
Aug.	234,811	237,400	271,291
Sept.	170,007	87,540	135,130
Oct.	131,991	272,043	224,628
Nov.	83,482	395,059	*419,700
11 mo.	2,599,487	3,542,406	3,980,624
Dec.	153,624	404,528	.....
Year	2,753,111	3,946,934	.....

*Estimated.

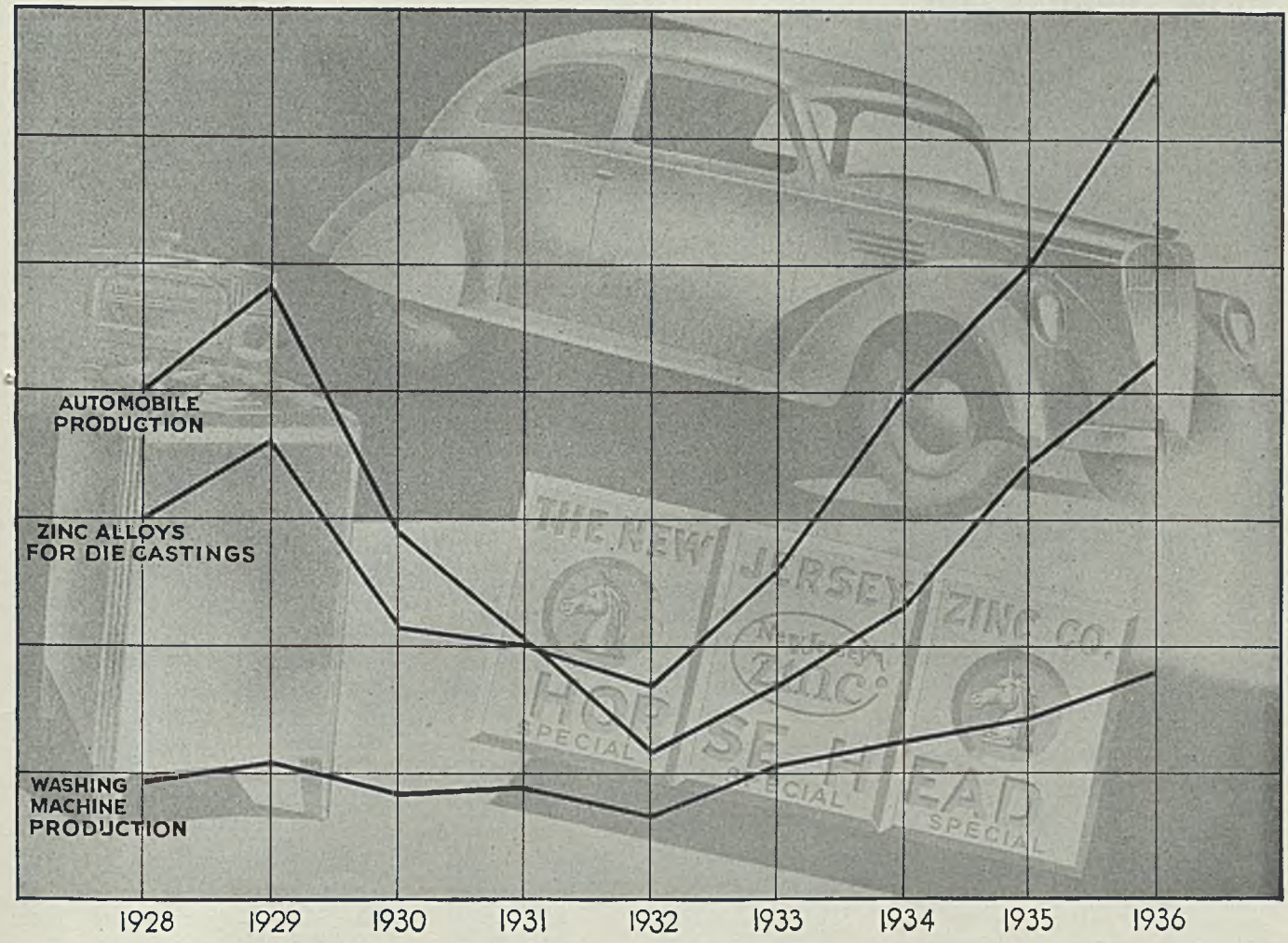
Estimated by *Cram's Reports*

Week ended:

Nov. 21	110,160
Nov. 28	104,283
Dec. 5	100,395
Dec. 12	119,455

The Research was done, the Alloys were developed, and most Die Castings are specified with

HORSE HEAD SPECIAL (99.99% UNIFORM QUALITY) ZINC



THERE MUST BE A REASON!

Using for comparison the production figures of two of the largest consumers of ZINC Alloy Die Castings—automobiles and washing machines—we follow the production of ZINC Alloy for Die Castings from 1928 through 1936.

As the chart indicates, the ZINC Alloy production has curved up and away from these two major industries since 1932, and therein lies the ZINC Alloy Die Casting development story. A story of acceptance for small tools, business appliances, household items, novelties, toys, hardware, and hundreds of other applications which are inevitably ahead.

There must be a reason for this acceptance.

THE NEW JERSEY ZINC COMPANY

160 Front Street — New York City

October Imports Show Slight Gain

IMPORTS of steel and iron products into the United States in October totaled 64,509 gross tons, a moderate increase over the 59,993 tons brought in during September, according to the metals and minerals division, department of commerce. The October tonnage compares with 59,473 tons in October, 1935.

Imports in the first tem months this year total 552,284 tons, compared with 359,700 tons in the corresponding period of 1935.

Final revised figures of the bureau on steel and iron exports in October place the total at 261,882 tons, against 235,571 tons in September and 238,350 tons in October, 1935. With scrap deducted, total exports of manufactured and semi-manufactured steel in October was 136,525 tons. In September the total was only 78,436 tons.

Exports of scrap in October showed considerable shrinkage, at 125,357 tons, from 157,135 shipped in September. Scrap exports for ten months of 1936 also show a decline, with 1,755,963 tons, compared with 1,845,437 tons in the corresponding period of 1935.

FOREIGN TRADE OF UNITED STATES IN IRON AND STEEL

Gross Tons

	1936		1935	
	Imports	Exports	Imports	Exports
Jan.	50,489	241,564	22,695	262,740
Feb.	43,358	213,802	28,905	228,657
March	56,720	264,337	21,470	323,017
April	49,621	301,987	28,866	205,341
May	59,391	314,950	47,719	286,599
June	59,910	294,951	33,208	286,333
July	47,940	296,738	31,894	296,782
Aug.	60,697	295,341	32,312	247,312
Sept.	59,993	236,784	53,158	244,367
Oct.	64,509	261,882	59,473	238,350
Nov.	.....	.....	56,637	204,838
10 mo.	552,284	2,720,205	359,700	2,619,498
Dec.	.....	.....	53,678	239,269
Total	.....	.....	470,015	3,063,605

ORIGIN OF OCTOBER IMPORTS

Gross Tons

	Iron ore	Pig iron	Manganese ore	Ferro-manganese
Norway	7,177	347	.....	3,202
Sweden	16,836	260	.....	4
Mexico	224	.....	.....	.....
Canada	33,981	63	.....	.....
Cuba	44,000	.....	2,880	.....
Chile	87,150	.....	.....	.....
Australia	3,802	.....	.....	.....
Germany	.....	420	10	.....
Netherlands	.....	2,408	.....	438
United Kingd.	.....	220	.....	.....
Soviet Russia in Europe	.....	305	12,360	.....
British India	.....	3,241	4,421	.....
Brazil	.....	.....	3,683	.....
Hong Kong	.....	.....	1	.....
Gold Coast	.....	.....	11.639	.....
Italy	.....	.....	.....	42
Poland	.....	.....	.....	196
Japan	.....	.....	.....	32
Total	193,170	7,264	34,994	3,914

	Sheets, skelp and sawplate	Structural steel	Steel bars	Hoops and bands
Austria	1	.....	6	.....
Belgium	1,543	5,808	3,238	1,548
Germany	937	68	174	210
Sweden	2	.....	340	2
United Kingd.	13	.....	49	.....
Canada	4	.....	.....	.....
France	.....	938	529	465
Czechoslovakia	.....	.....	6	.....
Total	2,500	6,814	4,342	2,225

More Standards Approved; Groups Join Association

During the past year the American Standards association has approved 33 new standards and revised 33 previously adopted standards, netting a new total of 357 approved American standards, according to Dana D. Barnum, president, at the annual dinner meeting of the association, New York, Dec. 9.

Five national organizations have been added to the association's membership: Industrial Safety Equipment association, Metal Lath Manufacturers association, National Association of Motor Bus Operators, Association of Gas Appliance Equipment Manufacturers, and American Gear Manufacturers association.

Mr. Barnum, president, Consolidated Gas Co., Boston, was re-elected president, and Edmund A. Prentis, Spencer, White & Prentice Inc., New York, was re-elected vice president.

UNITED STATES IMPORTS FOR CONSUMPTION OF IRON AND STEEL PRODUCTS

Gross Tons

Articles	Oct. 1936	Sept. 1936	Jan. thru Oct. '36
Pig iron	7,264	15,080	144,871
Sponge iron	181	29	1,590
Ferromanganese (1)	3,914	2,778	22,037
Spiegeleisen	4,532	4,173	35,339
Ferrochrome (2)	10	.....	31
Ferrosilicon (3)	6	1	453
Other ferroalloys (4)	.....	100	526
Steel ingots, blooms	4	10	83
Billets (5)	107	82	722
Concrete reinf. bars	151	178	3,414
Hollow bar, drill steel	169	253	1,767
Bars, solid, hollow	4,342	4,237	33,231
Iron slabs	.....	.....	.....
Iron bars	165	135	1,172
Wire rods	1,924	1,607	16,303
Boiler, other plate	45	174	421
Sheets, skelp, saw pl.	2,503	3,119	19,540
Die blocks, blanks (5)	16	3	174
Tin plate, taggers', terne plate	36	5	181
Structural shapes	6,817	5,211	47,952
Sheet piling	132	46	2,329
Rails, fastenings	595	1,290	6,832
Cast iron pipe, ftgs.	199	79	576
Mall. iron pipe ftgs.	36	37	166
Welded pipe	354	994	5,103
Other pipe	5,549	5,504	25,034
Hoops, bands	41	163	1,670
Cotton ties	2,225	2,156	19,980
Barbed wire	1,289	733	13,228
Round iron and steel wire	329	449	4,108
Tele. and tel. wire	1	1	37
Flat wire, strips	218	232	2,383
Wire rope, strand	268	182	2,070
Other wire	381	346	1,734
Nails, tacks, staples	1,997	1,440	19,717
Bolts, nuts, rivets	12	27	425
Horse, mule shoes	60	41	360
Castings, forgings	105	166	1,054
Total gross tons	45,977	51,061	436,613
Iron and steel scrap	18,532	8,932	115,671
GRAND TOTAL	64,509	59,993	552,284

(1) Manganese content; (2) chrome content; (3) silicon content; (4) alloy content; (5) new classes. No comparable figures for previous year.

UNITED STATES EXPORTS OF IRON AND STEEL PRODUCTS

Gross Tons

Articles	Oct. 1936	Sept. 1936	Jan. thru Oct. 1936
Pig iron	246	321	1,936
Ferromanganese, spiegeleisen	110	16	444
*Other ferroalloys	40	141	1,997
Ingots, blooms, etc.	2,770	1,097	16,268
Bars, iron	53	63	904
†Bars, concrete	133	229	2,736
‡Bars, other steel	5,485	4,011	42,030
Wire rods	2,775	1,541	29,912
Boiler plate	438	286	3,013
Other plate, not fabricated	13,141	4,951	59,514
Skelp	16,003	5,781	49,240
Iron sheets, galv.	138	151	1,350
Steel sheets, galv.	7,769	4,211	48,273
Steel sheets, black	13,132	10,199	112,321
Iron sheets, black	350	431	5,950
Strip, cold-rolled	2,062	2,108	18,988
Strip, hot-rolled	3,338	2,834	31,697
Tin plate and taggers' tin	19,396	8,893	190,646
Terne plate	208	50	2,736
Tanks, exc. lined	1,727	1,155	18,872
Shapes, not fab.	7,418	5,973	49,834
Shapes, fab.	8,307	2,050	21,154
Plates, fabricated	341	256	2,931
Metal lath	63	48	751
Frames, sashes	57	58	672
¶Sheet piling	734	204	2,683
§Rails, 60 lb.	7,238	2,184	36,067
§Rails, und. 60 lb.	237	190	5,172
Rail fastenings	740	514	6,473
Switches, frogs, etc.	252	194	1,593
Railroad spikes	260	119	2,073
R. R. bolts, nuts	130	60	690
Boiler tubes, smls.	1,061	422	5,635
Do. welded	33	77	410
Casing and oil-line pipe, seamless	2,684	2,163	16,851
Do. welded	475	135	2,350
Seamless blk. pipe, other than cas'g	324	225	3,051
Mall. iron screwed pipe fittings	473	364	2,989
Cast iron do.	183	174	1,713
Cast iron pres. do.	525	376	8,740
Cast iron soil do.	762	391	5,049
Welded steel pipe	725	784	8,648
Welded wrought iron pipe	527	225	2,234
Welded galv. steel pipe	758	458	7,236
Welded galv. wrt. iron pipe	52	53	1,134
Riveted iron, steel pipe and ftgs.	145	76	932
Iron or steel wire	2,488	2,078	20,499
Galvanized wire	2,317	1,857	17,835
Barbed wire	3,248	3,508	27,036
Woven wire fenc'g	143	231	1,982
do screen	85	117	907
Wire rope	240	352	2,718
Other wire & mfrs.	526	280	4,064
Wire nails	725	642	6,572
Horseshoe nails	74	64	588
Tacks	28	24	277
Other nails, staples	144	168	1,826
Bolts, etc.	713	639	5,432
Iron castings	545	480	5,928
Steel castings	358	391	2,813
Car wheels, axles	539	1,080	6,486
Horseshoes, calks	4	40	116
Iron and steel forgings, n. e. s.	310	243	3,271
Total gross tons	136,525	78,436	964,242
Iron & steel scrap	119,568	152,314	1,709,572
Tin plate scrap	1,274	1,589	13,047
Waste-waste tin pl.	4,515	3,232	33,344
Total, scrap	125,357	157,135	1,755,963
GRAND TOTAL	261,882	235,571	2,720,205

*New class. No comparable figures for previous year.

†New class. Previously included under former classification "steel bars."

‡New class. Includes alloy, nonalloy and stainless steel bars (excepting concrete reinforcement bars).

¶New class. Previously included with "frames and sashes."

§Previously shown at "50 pounds."

WINDOWS of WASHINGTON

WASHINGTON

A COMPLAINT has been issued by the national labor relations board against the United States Steel Corp. and the Carnegie-Illinois Steel Corp. charging that the companies have interfered with the self-organization of their employes in 21 steel plants. The complaint charges domination and financial support of a plan of employe representation established among employes of the Steel corporation and its various subsidiaries.

The two steel corporations were notified that a hearing will be held here Dec. 17 before the labor relations board.

Issuance of the complaint follows an investigation by the board's Pittsburgh regional office of charges filed by the steel workers' organizing committee and by the Amalgamated Association of Iron, Steel and Tin Workers.

The board's complaint alleges that the Carnegie-Illinois Steel Corp. had insisted that representatives of the plan approve a wage agreement, prepared by the company, without submission of its terms to the employes affected.

District Council Criticized

It states that early in November a Pittsburgh district general council was created, its delegates consisting of two employe representatives and two management representatives from each of the company's plants in the Pittsburgh district. The company has paid the expenses of the general council's meetings.

No provision was made for collective meetings in the various plants to instruct delegates, according to the complaint. After the general council was created, to handle matters affecting more than a single plant, a wage proposal was submitted to the employe representatives at the separate plants in identical form. The board's complaint recites that the company refused to negotiate concerning this agreement with the employe group of the general council; also that it tried to remove the employe chairman, on the ground that his representation of the employes was not within prescribed limits of the plant. The latter move involved a secret meeting of delegates called without notifying the employe chairman.

The Steel corporation established the plan of employe representation in 1933. The complaint states that in the course of putting the plan in operation the company dominated the employes and interfered with their rights to organize unhampered by management.

Many Defects Are Claimed

The complaint refers to many "defects" in the plan as an instrument to provide expression of employe opinion. No provision appears in it for collective meetings, and no opportunity for employes to cast votes on important problems such as wage agreements or the submission of disputes to arbitration.

All expenses of the plan are borne by the company. Newly hired employes automatically become members of the plan, and the company does not advise them of the existence in the plants of the Amalgamated Association of Iron, Steel and Tin Workers. Employe representative elections under the plan are held on company property. The company permits incumbent employe representatives to campaign for re-election during working hours at the company expense. Employe representatives act as tellers and compile votes in these elections, and are paid for their full time while so doing.

The complaint states that foremen and superintendents, having "hiring and firing" powers, openly ascertain the names of employes who have failed to vote in a plant election. It is also stated that the bulletin boards are used to influence employes regarding wage proposals; likewise that the minutes of employe representative meetings are edited so that the full proceedings are not known to the general run of employes.

It is also claimed that the Carnegie-Illinois company treats its employer-employe relationship as interstate in character by the administration of the Pittsburgh district general council, which has employe delegates from the states of Pennsylvania and Ohio. The company makes all classes of employes in four states subject to the plan of employe representation, including those engaged in river transportation of raw materials through several states, and also the shipping and receiving employes.

Announcement was made here last week by the so-called La-Follette civil liberties committee that the Tennessee Coal, Iron & Railroad Co. had been subpenaed on complaints that it has interfered with the rights of workers to organize and bargain collectively.

The subpena, it was stated at the committee, was served on the company at Birmingham, Ala., and investigators of the committee said that it has not yet been decided just what officials will be called for questioning by the committee.

It is expected now that hearings of the committee, which is headed by Senator LaFollette of Wisconsin, will not be resumed until congress convenes early next month. It is expected at that time that executives of several steel corporations will be called upon to testify.

NO MINIMUM WAGE IN EFFECT FOR PUBLIC WORK

In connection with the administration of the Walsh-Healey government contract act, H. E. Collins, assistant director of procurement of the treasury department has sent a communication to the heads of all government departments and establishments calling attention to the fact that no minimum wages are included at present in government contracts under this law, and they will not be until Secretary of Labor Perkins designates a minimum wage in any industry.

In his letter to the department

heads Mr. Collins says: "Following is extract of a letter signed by the acting administrator, public contracts act, department of labor, as to the effect of a wage determination by the secretary of labor upon an existing contract under the Walsh-Healey act:

'Section 11 of the act provides in part that, the provisions requiring the inclusion of representations with respect to minimum wages shall apply only to purchases or contracts relating to such industries as have been the subject matter of a determination by the secretary of labor. This provision has been the subject of an administrative interpretation in regulations No. 504, prescribed by the secretary of labor under the public contracts act;

'Art. 1101 (minimum wages). Until a determination of the prevailing minimum wage for a particular industry or group of industries has been made by the secretary of labor prior to the invitation for bids, the stipulation with respect to wages in section 1(b) of the act will be inoperative, as provided in article 1(b) of these regulations.'

"Consequently unless the secretary of labor has made a determination of the prevailing minimum wage for the particular industry or industries involved in the performance of the contract prior to the award and unless the stipulation requiring the payment of such wage as prescribed by section 1(b) of the act is included in the contract, the minimum wage provisions of the act will not be applicable during the life of the contract.

"I shall appreciate your making this explanation known to prospective bidders whenever the opportunity is presented."

LABOR BOARD REPORTS ON STEEL EMPLOYMENT BY PWA

A report has been made to Harold Ickes, public works administrator, by the bureau of labor statistics on direct and indirect industrial relationship as the result of PWA work.

Typical of the research which resulted in the determination of the ratio is the bureau's study of the steel industry. The report states that "field agents made an intensive study of fifteen representative mills operating at capacity of from 55 to 60 per cent. All processes required in the production of the finished product were included; iron and coal mines, transportation by rail and water; blast furnaces, open hearth furnaces and Bessemer converters; blooming mills, bar mills, sheet mills, and fabricating mills.

"Field agents of the bureau found that approximately six tons of basic materials are required for each ton of finished steel. Included in the raw materials are more than two tons of iron ore, more than one half ton of scrap metal and approximately three quarters of a ton of limestone and other fluxing agents. A ton and a half of coal is required to manufacture coke for melting, and three quarters of a ton more for power and heat in the plant.

"Twenty-three hours of employment are created in the extraction and transportation of basic commodities required for the making of one ton of steel. Fabrication of finished articles from these materials requires from six to 58 hours of labor, the amount varying with the type of production. For example, the simple operation of converting ingots and slabs requires only six hours per ton. On the other hand, structural shapes, used in huge quantities in PWA construction, furnish 58 hours of employment per ton." PWA construction accounted for a total of 2,950,000 man-months employment in the steel industry, according to the survey.

FEDERAL SPENDING HOLDS CLOSE TO PREVIOUS YEAR

Comparison of official reports for the first five months of the present fiscal year with those for the corresponding period of a year ago, says the United States chamber of commerce, indicates that federal expenditures have continued at substantially the same level, that revenues are greater and that the deficit is less.

Nominally, says the chamber, expenditures for the current period are somewhat less than they were last year at the same date, but when adjustments are made for the excess of repayment of loans over new loans made by the lending agencies of the government, such excess being used to defray current operating costs, real expenditures for the five months' period are about the same as a year ago.

It is pointed out by the national chamber that notwithstanding that many activities which were formerly designated as emergency expenditures have now been transferred to the regular budget, emergency expenditures, if allowance is made for the credits from loaning agencies, are somewhat in excess of those of last year at the corresponding date.

Outstanding among emergency expenditures, says the chamber, are those for direct relief of unemployment. In the face of improved business conditions with the increased employment and opportunities for employment, expenditures of this character are approximately 65 per cent in excess of those of last year for the same period.

Despite the elimination of processing taxes, which during this period last year were yielding very appreciable amounts, the chamber states that revenues for the first five months of the year exceeded those of last year by approximately $175,000,000. This increase in revenues plus the credits arising from the liquidation of loans has resulted in a deficit of about $450,000,000 less than last year. At the present rate of accumulation, however, the deficit at the end of the year will approach $3,000,000,000, but this may be reduced by the expected increase of revenues when income taxes are paid under the 1936 revenue act during the last half of the current fiscal year.

SUPREME COURT UPHOLDS STATE FAIR-TRADE LAWS

The President will be back from his South American trip this week. No matter how much there is to do in government it is a well known fact to close observers that when the President is away departmental and other matters seem to lag. This is probably inevitable.

During the past week the United States Supreme Court upheld the validity of two state fair-trade statutes, ruling that trade-mark good will is "property in the very real sense." Both the California and Illinois laws which prohibit sale of standard products below prices fixed by the producer by contract, were sustained.

The court denied in its decision that either the Illinois or California statutes either attempted to "fix prices" or delegate that power to private persons.

Senator O'Mahoney of Wyoming last week discussed at some length his federal licensing bill.

"I cannot make it too emphatic," said the senator, "that this is not a fight to regiment business, business men or even corporations. It is the culmination of a struggle which has been going on in the United States since before most of us now living were born, to prevent a comparatively few persons of great ability and skill but little conscience to manipulate the corporation laws of a few states to the disadvantage of the entire nation."

The senator stated that he was not the originator of this federal incorporation as a means of regulating national commerce and therefore "it is permissible for me to say that it is one of the most important proposals ever considered by congress."

EXTEND SOCIAL SECURITY

Announcement was made last week by the social security board that an extension of time from midnight Dec. 5 to midnight Dec. 15 has been granted for filing of employes' application forms for social security accounts under the federal old age benefits program.

Editorial

It Is Time To Look at Unemployment Realistically

RECENT developments in the government's attempt to scale down expenditures for the relief of unemployed illustrate clearly how difficult it is to curb the flow of public funds once it has started. The opposition to retrenchment from WPA workers, local politicians, mayors of important cities and even governors has been so vehement that Administrator Hopkins has been obliged to postpone some of the contemplated reductions.

Employers in industry have a big stake in this situation for several reasons. First, they already have been asked by the President to increase employment in private enterprises so as to assist in taking the burden gradually from the government relief agencies. Secondly, many leaders in industry originally opposed some of the relief measures of the federal administration on the grounds that they would tend to perpetuate unnecessary dependency, would cost more than was necessary and would create a drain on the federal treasury that would be difficult to stop. In other words, many executives in industry warned the administration against the very thing that now is happening.

President Now Aligned With Industrial Employers Against Those Who Oppose Curbing of Relief

However strong the impulse may be to cry "We told you so," the intelligent procedure for industry is to join forces with the President to help him cut down the cost of relief. By a curious turn of the wheel of fate, the President now finds himself in the position of restraining the desires of those who urged extravagant relief policies upon him when the emergency was acute, and at the same time, of needing the assistance of those who then opposed these policies. Today, he needs the support of industry not only to help him to bring the flow of "easy money" under reasonable control, but also to place the entire employment problem on a sounder basis.

In order to appreciate fully the difficulties involved in this task, it is necessary first to consider how thoroughly the lack of discrimination in distributing federal aid has demoralized the public conscience in some localities. For example, look at conditions in the anthracite coal region of Pennsylvania. Unemployed miners have sunk shafts on the property of others, are taking out coal and selling the stolen fuel at prices under the regular market. Public opinion supports this practice. Local authorities wink at the lawlessness. Juries will not indict. The governor of Pennsylvania does nothing about it.

In the same way, a large number of citizens all over the country have gained the impression that the individual has a constitutional right to permanent employment by the government. In some sections this alleged right is considered to be more important than the citizen's obligation to take work in private business when it is available.

Therefore one of the first measures to be taken in solving the unemployment problem is to change the attitude of a large portion of the American public. It will be up to the President himself to "unsell" some of the ideas which he "sold" too well in the recent past. Whereas once it was good politics to boast of the millions being "carried" by the government, henceforth it should be good statesmanship to boast of hundreds of thousands transferred from public to private payrolls.

Census of Unemployed and Suitable Training of Jobless Are Essential In Solving Problem

This brings us to the kernel of the unemployment problem. Nobody knows how many persons are really unemployed. Unquestionably a primary step in the situation should be a census that will show the mathematical dimensions of the problem. This should be taken immediately. The poor excuse of political expediency should no longer stand in the way.

Next comes the task of revising the system of government aid so that a federal charge is given an incentive to seek private employment. The system should be flexible enough to permit the individual to get part-time private employment without jeopardizing his status in WPA or other government agency.

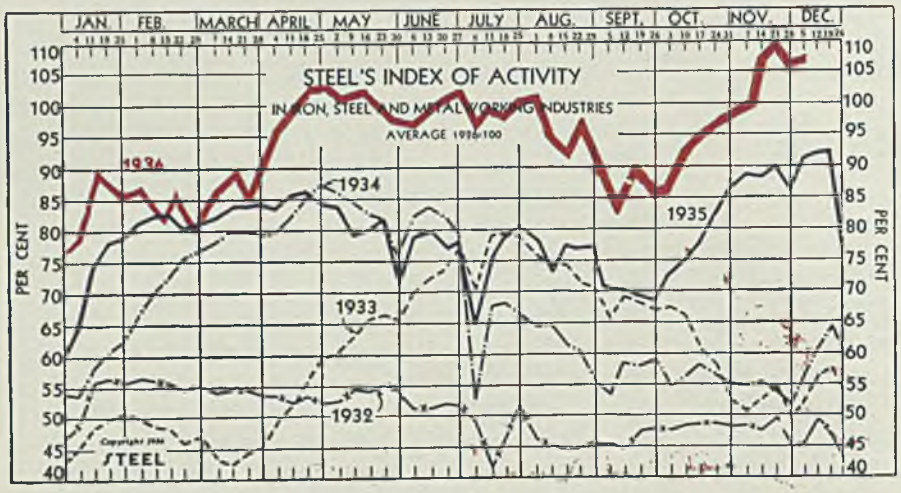
Also, something should be done to prepare unemployed for useful work in industry and commerce. Industry is beginning to see the need of this, but the government has done practically nothing to train its wards for private work.

Industry need not be urged by the President to take on more employes. Industry already has jobs waiting, for which no qualified applicants are available. Employers will be willing to bear more than their share of the responsibility of re-employment, but they cannot solve the problem alone.

The chief obstacle today is the short-sighted attitude of local authorities who still believe it is popular to get as much federal money for their constituents as is possible. Make it popular for local politicians to brag about how few persons in their localities are on the federal payroll and the unemployment problem will be well on its way to solution.

Here is a job in which industry can support the President whole-heartedly and without surrendering any of the principles it has sponsored from the very beginning of the depression.

THE BUSINESS TREND



STEEL'S *index of activity in the iron, steel and metalworking industries gained 2.4 points to* 108.2 *in the week ending December* 5:

Week ending	1936	1935	1934	1933
Sept. 5	87.5	70.9	53.5	65.5
Sept. 12	83.1	70.1	58.7	69.1
Sept. 19	90.1	69.4	58.1	68.2
Sept. 26	86.2	68.5	59.3	66.9
Oct. 3	89.0	73.3	54.7	67.4
Oct. 10	93.4	74.9	56.4	66.0
Oct. 17	95.5	77.4	58.2	60.9
Oct. 24	97.1	82.4	56.3	58.0
Oct. 31	99.1	86.4	55.0	52.3
Nov. 7	102.1	88.4	54.9	50.7
Nov. 14	107.9	88.8	55.2	52.6
Nov. 21	109.9	90.9	54.4	55.4
Nov. 28	105.8†	86.0	51.9	49.7
Dec. 5	108.2*	91.7	56.8	52.6

†Revised. *Preliminary.

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

Industrial Activity Resumes March to Higher Levels

A REASSURING rebound of activity, following the mild interruption caused by the observance of Thanksgiving day, carried STEEL'S index from 105.8 to 108.2 for the week ending Dec. 5. All barometers except automobile assemblies responded with moderate gains during the week.

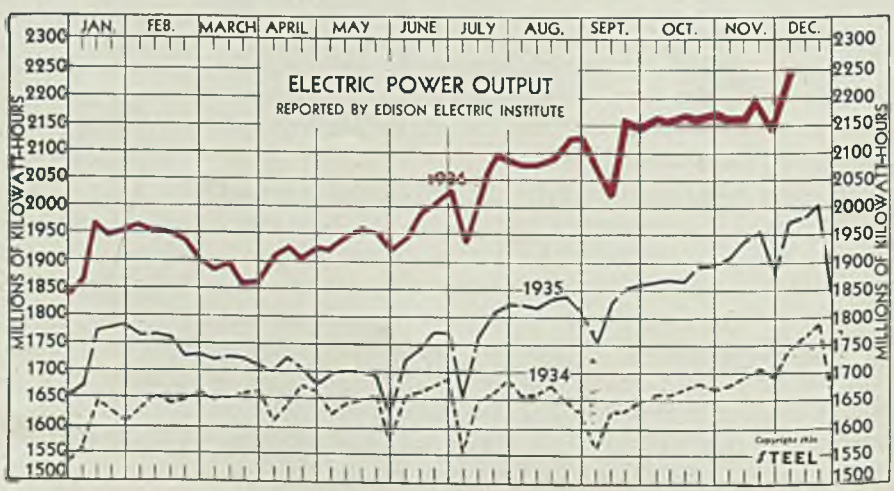
Leading in the upward trend toward new high levels was electric power output, which established a new all-time record of 2,243,916,000 kilowatt-hours. This is the tenth time in 1936 that power output has risen above previous high points. Production is running about 14 per cent ahead of that of a year ago, and 24 per cent ahead of output in the corresponding week of 1929.

Steelworks operations again advanced, this time to an estimated rate of 76.5 per cent of capacity. Thus the steel industry starts out in December at a rate slightly higher than that which prevailed during the early part of October. Steel production now has been maintained at 70 per cent or more of capacity continuously since the middle of September, and, if the week embracing Labor day is excluded, since the last week of July.

Compared with last years showing, revenue freight car loadings are making an impressive record in the closing months of 1936. In November and December, 1935, loadings were averaging about 625,000 cars weekly. In the same months of 1936 the average will be from 725,000 to 750,000.

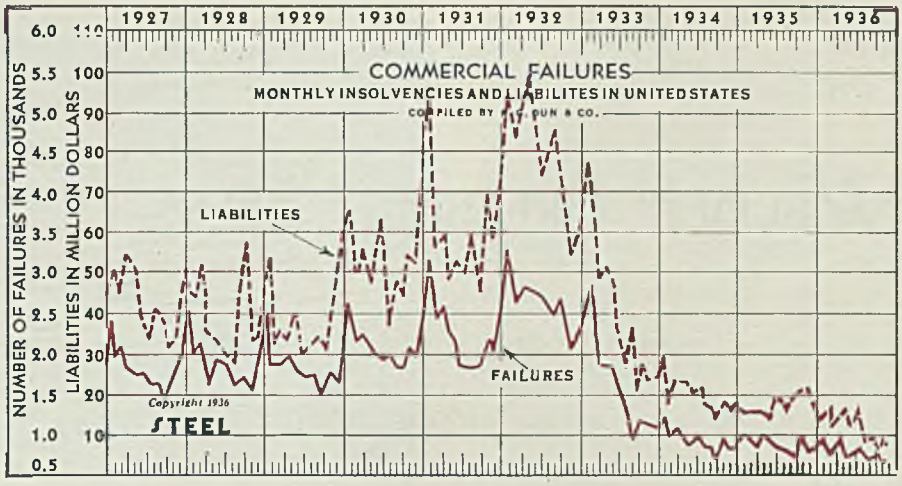
Automobile output dipped slightly, due to labor difficulties in the parts industry. Assemblies in the week ending Dec. 5 totaled 100,395, compared with 104,283 in the preceding week. Production on 1937 models had been increased gradually to a high of 110,160 units in the week ending Nov. 21. Failure to match that output since was due first to Thanksgiving day interruptions and then to labor trouble.

	Millions Kw.-Hrs.			
	1936	1935	1934	1933
Dec. 5	2243	1969	1743	1619
Nov. 28	2133	1876	1683	1554
Nov. 21	2196	1953	1705	1608
Nov. 14	2169	1938	1691	1617
Nov. 7	2169	1913	1675	1617
Oct. 31	2175	1897	1669	1583
Oct. 24	2166	1895	1677	1621
Oct. 17	2170	1863	1667	1618
Oct. 10	2168	1867	1658	1656
Oct. 3	2169	1863	1659	1646
Sept. 26	2157	1857	1648	1652
Sept. 19	2170	1851	1630	1638
Sept. 12	2028	1827	1633	1663
Sept. 5	2098	1752	1564	1582
Aug. 29	2135	1809	1626	1637



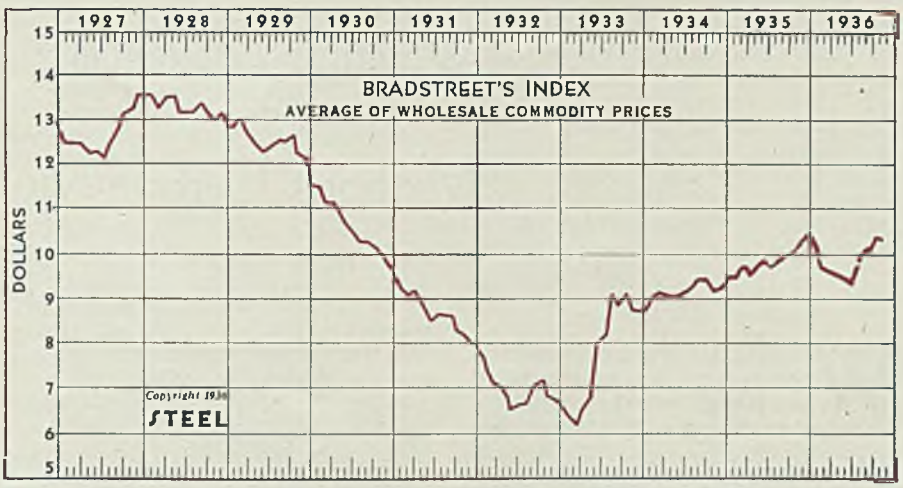
Commercial Failures Show Moderate Gain in October

	Failures, Number		Liabilities, Dollars (000 omitted)	
	1936	1935	1936	1935
Jan.	1,077	1,146	$18,104	$14,603
Feb.	856	956	14,089	15,217
March	946	940	16,271	15,361
April	830	1,083	14,157	16,529
May	832	1,004	15,375	14,339
June	773	944	9,177	12,918
July	639	902	9,904	16,523
Aug.	655	884	8,271	13,266
Sept.	586	787	9,819	17,002
Oct.	611	1,056	8,266	17,185
Nov.	...	898	.....	14,384
Dec.	...	910	.....	15,686



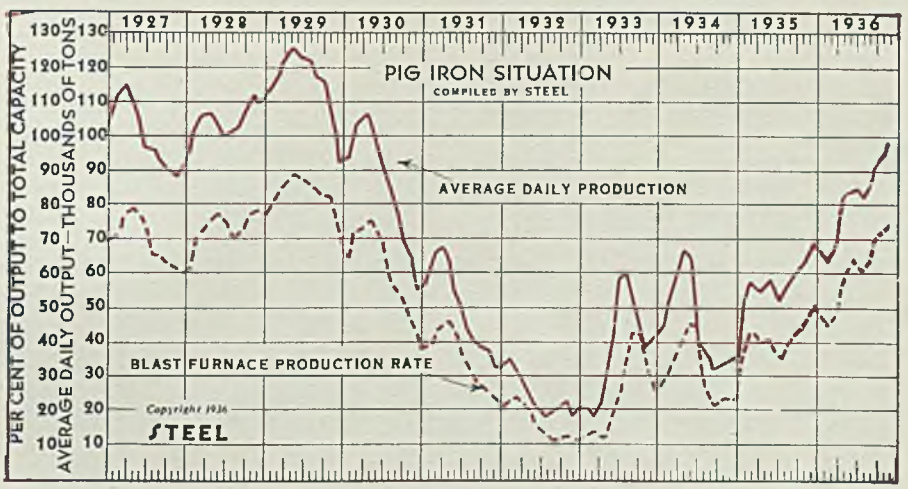
Bradstreet's Price Index Off Slightly in October

	1936	1935	1934	1933
Jan. 1	$10.36	$9.49	$9.01	$6.53
Feb. 1	10.02	9.78	9.26	6.53
Mar. 1	9.92	9.79	9.17	6.54
Apr. 1	9.85	9.66	9.16	6.98
May 1	9.81	9.79	9.14	8.02
June 1	9.73	9.90	9.24	8.34
July 1	9.85	9.84	9.32	9.01
Aug. 1	10.14	9.91	9.48	8.99
Sept. 1	10.19	10.00	9.45	9.05
Oct. 1	10.27	10.17	9.27	8.84
Nov. 1	10.22	10.28	9.29	8.81
Dec. 1	.....	10.40	9.49	8.83



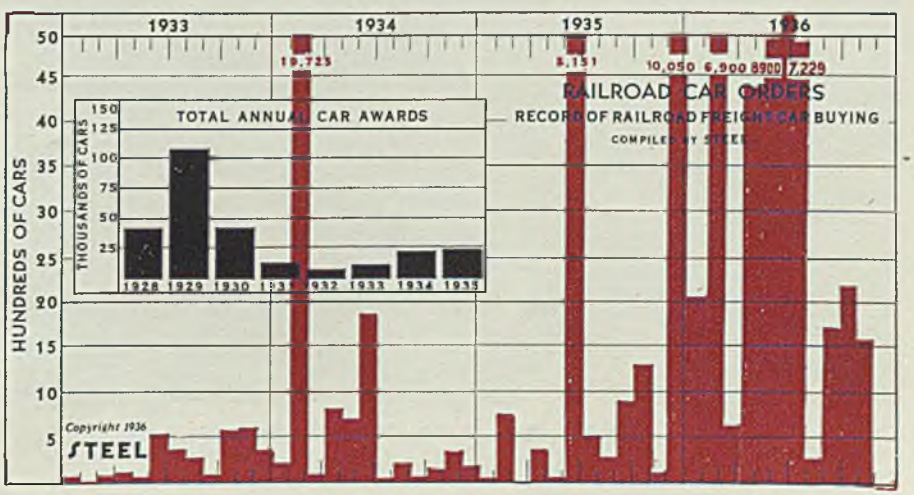
Daily Iron Production Highest Since May, 1930

	Daily Average, Tons		Blast Furnace Rate, Per Cent	
	1936	1935	1936	1935
Jan.	65,461	47,692	48.2	34.2
Feb.	63,411	57,675	46.6	41.4
Mar.	66,004	57,120	48.5	41.0
Apr.	80,316	55,719	59.1	40.0
May	85,795	55,986	63.1	40.2
June	86,551	51,949	63.6	37.2
July	83,735	49,043	61.5	35.2
Aug.	87,475	56,767	64.3	40.7
Sept.	90,942	59,009	66.9	42.5
Oct.	96,509	63,818	71.0	45.8
Nov.	98,331	68,876	72.3	49.5
Dec.	.....	68,242	....	49.0



Freight Car Awards Decline in November

	1936	1935	1934	1933
Jan.	2,050	24	152	3
Feb.	6,900	806	19,725	0
March ...	632	0	30	5
April	4,427	350	800	50
May	8,900	2	717	8
June	5,220	5,151	1,835	500
July	7,229	500	19	306
Aug.	225	200	105	202
Sept.	1,750	875	7	23
Oct.	2,210	1,250	75	514
Nov.	1,550	100	254	533
Dec.	....	10,050	110	316



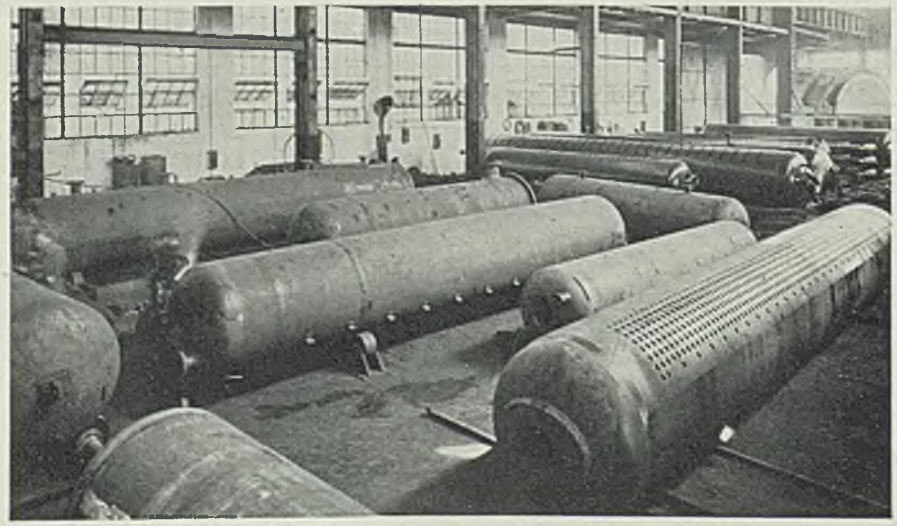
Welded Pressure Vessels

Produced in Wall Thicknesses up to 5-Inch Which Is Maximum with Existing Inspection Methods. Carbon-Molybdenum Steel Is Used

BY A. J. MOSES
Hedges-Walsh-Weidner Co.,
Chattanooga, Tenn.

WELDED pressure vessels now are being produced with wall thicknesses up to 5 inches by Hedges-Walsh-Weidner division, Chattanooga, Tenn., of Combustion Engineering Co. Inc., New York. This advance has been made possible by the installation of a 400,000-volt X-ray machine which permits satisfactory inspection of welds in 5-inch steel plate. Unless some other method of inspection becomes available, the company believes from its experience that 5-inch plate is about the thickest than can be used for producing welded pressure vessels. Beyond that thickness sensitivity is lost and the time of exposure becomes prohibitive. In other words, where heavier wall thicknesses are required, as up to 6-inch and slightly above, it is still necessary to use seamless shell forgings with welded-on heads instead of the welded vessels.

For welded pressure vessels of high wall thickness, it is the practice of the company to use three types of steel. Two of them are modified carbon steels which sometime ago were approved by the American Society of Mechanical Engineers boiler code committee. They have 65,000 and 70,000 pounds per square inch tensile strength, respectively. They differ from the ordinary 55,000-pound firebox steel in that the carbon and manganese contents are higher, the carbon being limited to 0.35 and the manganese to 0.90 per cent.

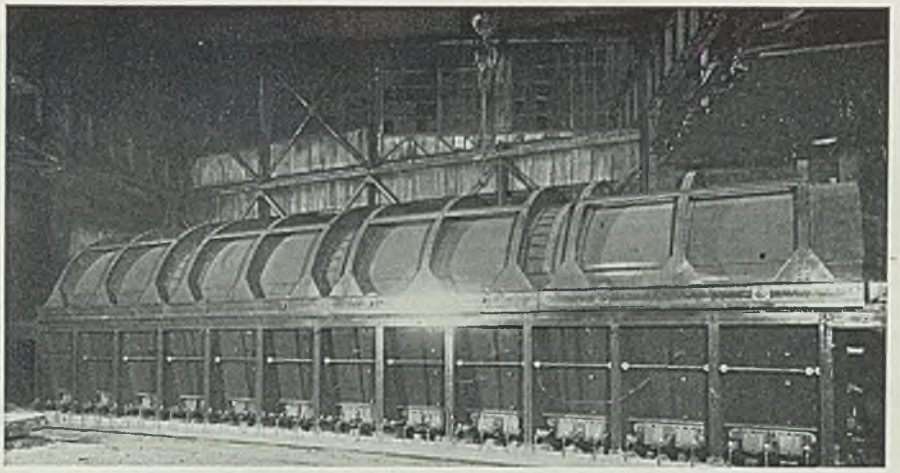


A group of boiler drums of thick and thin plate construction; the heavier plate is used for the tube hole area

The third steel is an alloy steel now being used, with the sanction of the boiler code committee, for the first time in the manufacture of welded boiler drums. It is a carbon-molybdenum steel containing 0.20 carbon, 0.60 manganese, 0.50 molybdenum and has minimum tensile strength at room temperature of 70,000 pounds per square inch. While this alloy steel is new for boiler drums, its introduction in this application is not regarded as an experiment since it has been used extensively for pressure vessel parts such as tubes, valves and fittings, particularly for pressure vessels for certain processing operations at high temperatures.

Use of Alloy To Increase

As a result of the company's investigation of this particular alloy steel for several years, it believes the steel will be used increasingly for the manufacture of welded pressure vessels with high wall thickness. It has high creep value, welds well, is a tough steel and withstands fabrication in an unusually satisfactory manner. Although this steel does not offer any improvement in corrosion resistance, the company goes so far as to believe that its use, because of creep



Annealing furnace for stress-relieving welded pressure vessels is 14 x 64 feet and 14 feet high at center, the top being removable so that work is placed in and removed from furnace by overhead cranes. It is fired by 72 gas burners at furnace bottom and combustion takes place in enclosed tunnels so designed as to prevent flame impingement on cylindrical vessels being stress-relieved. Temperature record of the stress-relieving cycle is obtained from a 12-point potentiometer

strength and weldability, should be permitted for oil stills.

In rolling heavy plates, steel mills cannot produce grain structures comparable to those in the thinner gages. Because of the ratio of reduction in rolling, the thick plates do not receive the same amount of mechanical working. Therefore, in working with plates where thickness exceeds 2 inches, the first operation is a normalizing heat treatment for grain refinement. This is applied to the plates while they are flat and before any forming is attempted. The treatment involves subjecting the steel to a temperature slightly above the upper critical range, holding for one hour per inch of thickness and quickly air cooling. Plates which must be normalized always are specified with a slight extra thickness to compensate for scale loss.

Shaped on Hydraulic Presses

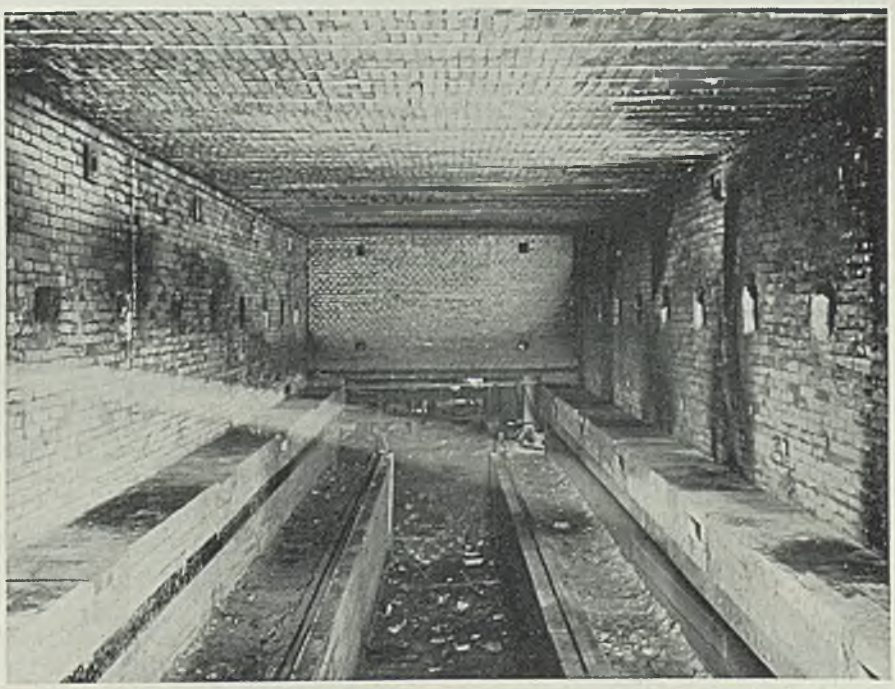
Shaping of the heavy plates is done cold under hydraulic presses, one of which will take plate lengths up to 43 feet 6 inches. In this press the company has formed 5-inch plate in lengths up to 26 feet. In working on the heavier plates the practice approaches a V-block operation, with a narrow upper die and a wider bottom die, care being required to avoid having the upper die so narrow as to indent the plate. This method requires more strokes of the press. Care also must be taken to limit the amount of elongation of the outer fibers during the forming operation, this being a function of the ratio of the thickness of the plate to the diameter of the drum.

Forming of these thick plates is interrupted once or twice in order to relieve the stresses set up by cold working. The plates are heated to 1200 degrees Fahr., held at that temperature for one hour per inch of thickness and furnace cooled. These interstage heat treating operations, as well as the preliminary normalizing operation, are performed in an oil burning furnace which, though air-tight, is not operated with any attempt at a neutral atmosphere because the scale problem at 1200 degrees is not serious.

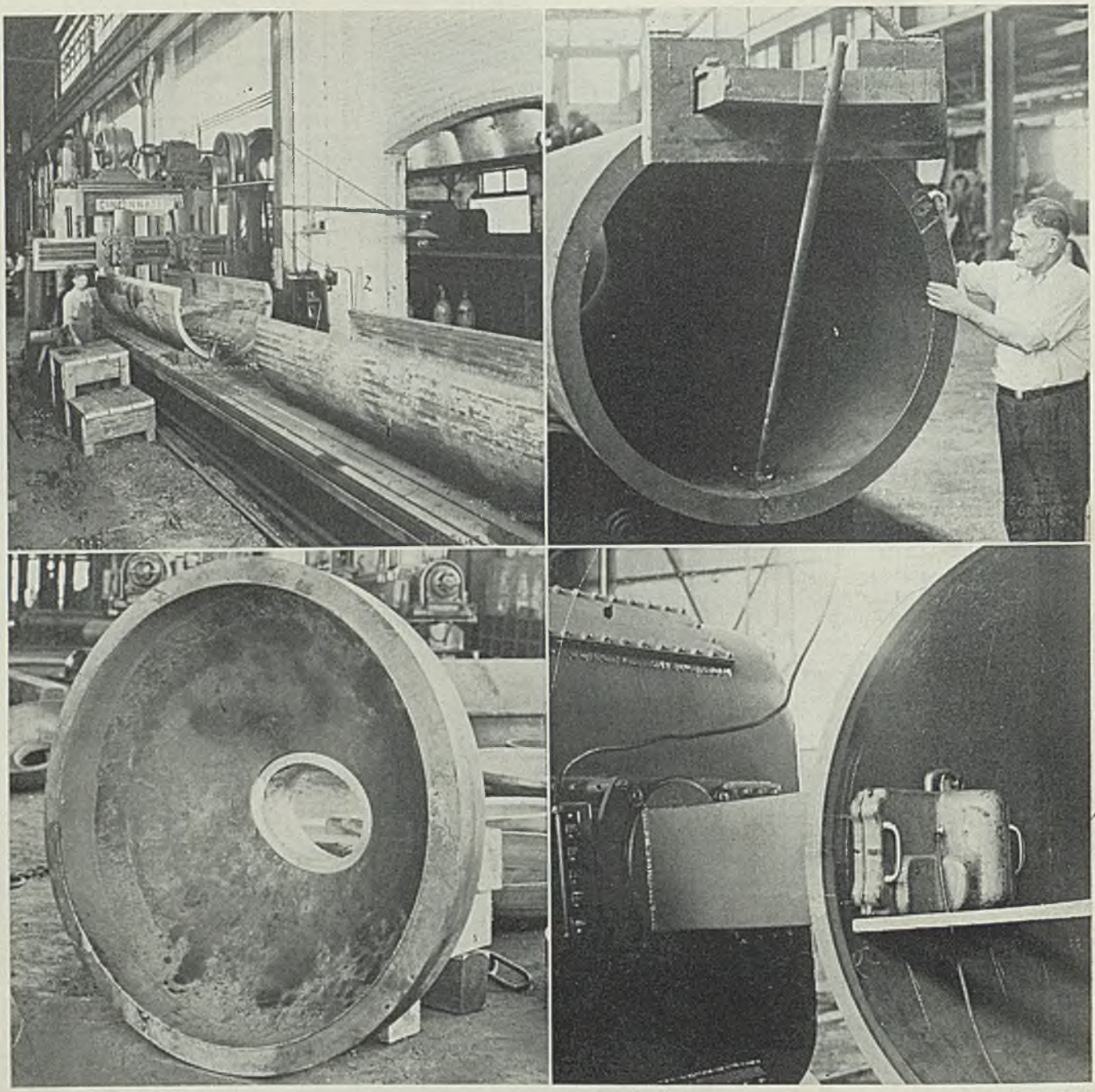
Since intermediate girth seams are not desirable in heavy-walled boiler drums, the shells comprise two plates, each formed to approximate half circles, necessitating the use of two longitudinal seams. Shells exceeding 40 feet in length have been fabricated by this method. For reasons of economy, plates of unequal thickness frequently are employed in such drums, the heavier section designed for areas to be perforated with tube holes and the lighter for unperforated sections or sections having a greater tube hole ligament capacity. In the construction, the heavier plate is tapered by machining to the thickness of the lighter, the machining being done so as to make neutral radii equal and the neutral circumferences coincident. This planing operation, together with the machining of the weld grooves, usually is performed after the plates have been formed into half cylinders. Similar machining of shell thickness down to head thickness and preparation of the girth weld grooves usually is done after the completion of the longitudinal seam welding.

Arc Welding Is Used

All welding is done by the electric arc method, using heavily coated electrodes. The electrodes are coated and otherwise prepared as a regular part of the company's operations. Design of weld joints for all main seams is the double-butt type.



Interior of plate normalizing and stress-relieving furnace, 14 x 45-feet and 11 feet high, which means a height of 7½ feet over top of car. Car-type furnace was chosen as being more suitable for normalizing treatments, permitting quicker removal and cooling of plates; it also is suitable for stress-relieving boiler drums. Rectangular baffled combustion troughs for oil firing are located in floor; combustion chamber outlets are shown on lower sidewalls at slightly below car level. Furnace temperature is controlled automatically by thermocouples spaced at four critical points; temperature records are kept for all jobs



After boiler plate has been formed into half circles, longitudinal weld grooves are machined along the edges, as shown at top left; where thick and thin sections are used, the edges of the thicker section are machined to correspond with those of the thinner section. In welding longitudinal seams, attached samples are used for checking physical properties of welded joints. Welding of these samples is a continuation of and an exact duplication of the welding procedure used in the actual seams. The view at top right shows such samples in connection with the welding of a seam in drum with 54 inches inside diameter and 4 inches in wall thickness, to resist water pressure of 1400 pounds per square inch. Semi-elliptical high pressure boiler drum head is shown at bottom left, an interior view of welded manway reinforcement construction; this head is of 3⅜-inch plate and is to be attached to shell shown at top right. To obtain clean-cut images of welded defects by X-ray method, a Bucky diaphragm is used to screen out rays which are not parallel to the primary rays; view at bottom right shows an X-ray test in progress which is examining a boiler drum with 3-inch wall thickness

Fillet welding is permitted only in the welding of nozzles, reinforcements and other external and internal attachments. All welding is done in the down-hand position, the drum being rotated slowly to permit this when welding the heads to the shell. Weld metal is deposited in the grooves in relatively thin layers. The process leaves a heavy slag coating over these layers. This slag is cleaned thoroughly from each layer before depositing the succeeding one. Also, each bead is inspected for the removal of defects which cannot be eliminated in the succeeding operation. No actual peening of the layers is necessary ordinarily. However, peening sometimes is desirable under extreme conditions for the purpose of counteracting warpage and curtailing dangerous stresses pending thermal stress relieving.

In finishing double butt welds, a small reinforcement of deposited metal is added to both sides of the plates. This reinforcement subsequently is chipped off and the surfaces ground practically flush with that of the plate. The purpose of this reinforcement is to obtain a full thickness of refined weld metal.

After serving this purpose the reinforcing layers are removed from butt-weld joints as this added metal would interfere with X-ray examination.

In welding longitudinal seams, attached samples are used for the purpose of checking the physical properties of the weld joint against standard requirements. The welding of these samples is a continuation of and an exact duplication of the welding procedure used in the actual seams. After stress relieving, such samples are tested for tensile strength and ductility. Minimum results have been established for transverse bend and tension specimens, and also for all weld metal ductility and tension coupons.

Many Precautions Taken

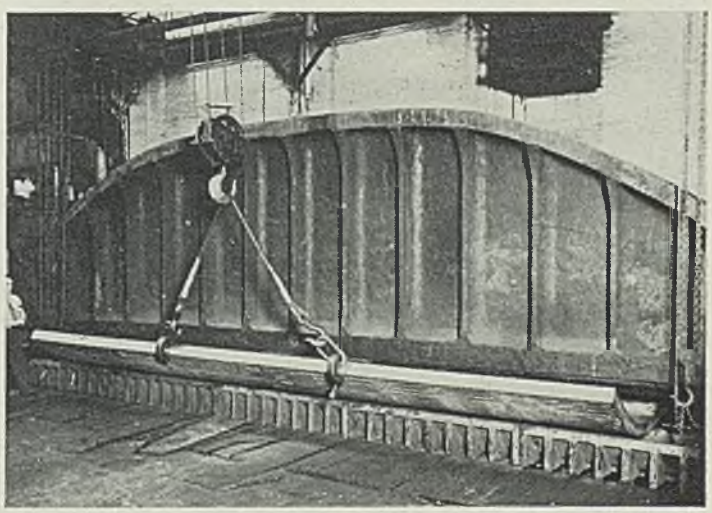
No physical test samples are required from the head girth seam welds, provided such samples have been obtained from the longitudinal seams. Semi-elliptical shaped heads are used in the construction of high-pressure boiler drums. Also in this field a welded manhole reinforcement type of construction often is used; this differs radically from the flanged-in type of construction. In the former a dished reinforcement plate is welded to the head around the manhole opening, using a single "V" and a fillet weld on the inner and outer seams, respectively.

Many precautions are taken to insure the quality of weld joints in boiler drums. The materials used and the electrodes are controlled and checked carefully. Operators are trained thoroughly and qualified properly. Preparation of the work for welding and the welding operations are under the constant supervision of competent inspectors.

All boiler drum main seams, that is, butt welded joints, are subjected to X-ray examination. A radiograph of 8 to 15 lineal inches of weld joint is obtained per exposure. An image of a permanent marker placed on the work is obtained on the film, so that these can be matched readily. To obtain clean-cut images of weld defects, the company makes use of a device known as a Bucky, composed of alternate thin layers of wood and lead. The Bucky is oscillated between the work being X-rayed and the film during time of exposure, this oscillation preventing objectionable images of the lead vanes on the film. All rays except those which are substantially parallel with the primary rays are absorbed by the lead vanes, resulting in images which are not marred and blurred by indiscriminate scattered radiation. As a result of two years' experience, the company regards the Bucky as mandatory.

Time for each exposure increases rapidly with the thickness of plate. Where an exposure on 2¾-inch plate requires approximately 45 seconds, an exposure on 4½-inch plate requires one hour, while an exposure on 5-inch plate requires 3¼ hours. These exposure times are based on using the Bucky grid. Above 5 inches a fraction of an inch additional thickness increases the exposure time to such an extent as to make this thickness a practical limit with the 400,000-volt X-ray tube. Because of the great amount of time required in examining heavy work, the X-ray equipment at this plant is operated continuously in 8-hour shifts.

All defects revealed by the X-ray photographs are chipped out, repaired and again X-rayed. The films, constituting a permanent record, are kept on file over a period of years. Following the X-ray examination, the completely welded drums are thermally stress relieved in large annealing furnaces, being placed in cast iron saddles to prevent warpage while the drum is at the stress relieving temperature. The vessels gradually are brought up to 1100 to 1250 degrees Fahr., held at temperature for one hour per inch of thickness and furnace cooled to about 500 degrees Fahr. before removal. Furnace and work temperatures must be held under fairly close control to avoid distortion of the vessels.



Shaping of heavy plates is done cold under a hydraulic press. This view shows forming of a half-circle for a drum with 60-inch inside diameter, 5⅛-inch wall thickness, 26½-foot length between girth welds and designed to resist water pressure of 1400 pounds per square inch

Vessels Tested Extensively

Stress relieved vessels are tested hydrostatically to twice the design working pressure. While under pressure, the weld seams are given a thorough hammer test, the weight of the hammer and the force of the blows being so regulated as not to damage the surface severely. Following these tests, all machine work such as drilling, counterboring and grooving of tube holes, and the finishing of gasket surfaces, is completed. The drums finally are cleaned for inspection and the application of a surface protecting

High-Tensile Steel Tested

By the practice described above, the company has supplied fusion welded boiler drums for steam pressures up to 1400 pounds per square inch, in diameters of 24 to 60 inches and in lengths from a few feet to more than 40 feet. The present limit of 5-inch wall thickness compares with the 2½-inch limit that was possible with riveted construction, prior to the authorization of welded construction in boiler drums some six years ago.

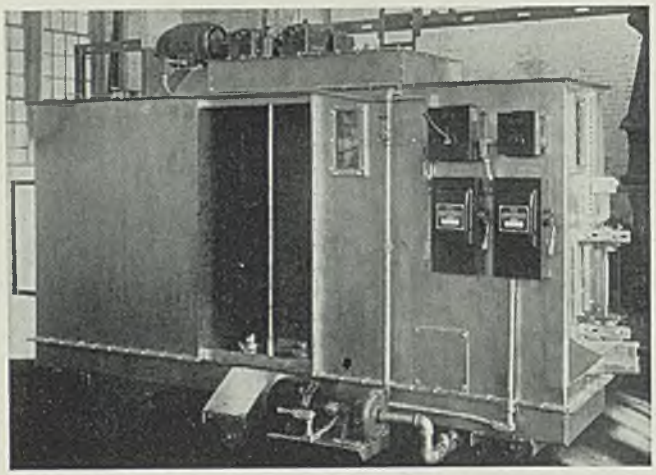
Realizing that there is a need for a reliable and economical extension of nondestructive testing to greater thickness and also for the approval of higher tensile steels, the company has engaged in some experiments. Some promising preliminary fatigue tests already have been made on welded vessels fabricated of special steels with minimum tensile strength of 85,000 pounds per square inch. Present data indicate limitations in this respect will have to do with ductility requirements of base materials for this service.

The company believes that welded boiler drums of such higher tensile steels will be common practice within the next few years.

Some interesting trends are revealed in the use of material at this plant for the construction of welded boiler drums and various types of fired and unfired pressure vessels for the oil, paper, chemical and other processing industries.

In heat exchangers and in superheater headers with welded outlets the company is using some alloy steel containing 4 to 6 per cent

(*Please turn to Page* 60)



AUTOMATIC sash washer utilizes acid spray, water spray and rotary brushes

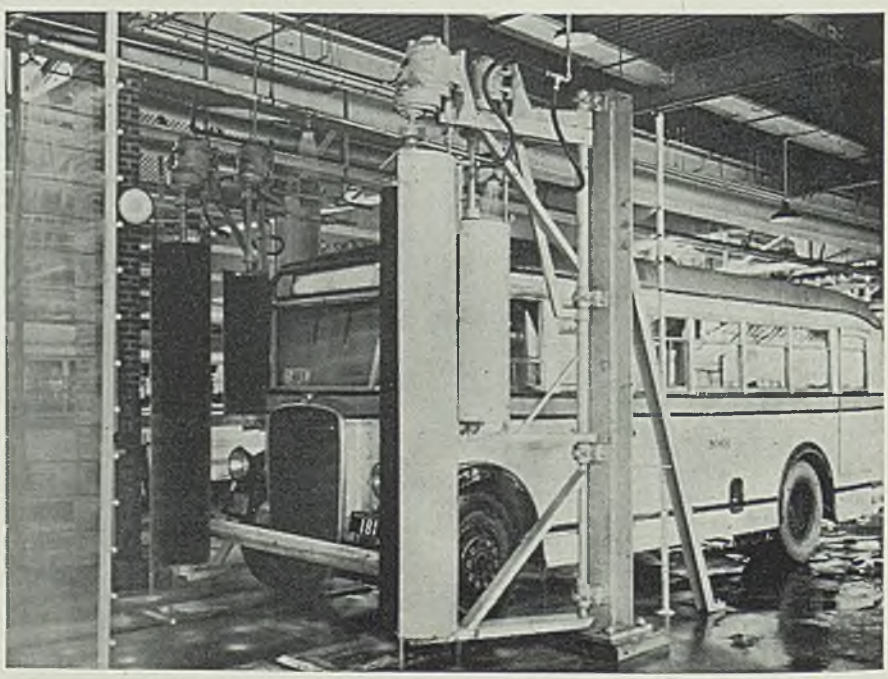
Automatic Washing Machines Reduce Costs in Transportation Industry

DEFINITE savings in both manpower and time have been reported by public transportation companies which have installed a new type bus and car washing system recently perfected by Ross & White Co., Chicago. Units are built so that the cars to be cleaned are driven on a runway, where they intercept a light beam. Relays are set in motion by a photoelectric cell control equipment operating simultaneously on both sides of the vehicle. Two vertical revolving brushes are set on each side of the apparatus so that the first scrubs the cars from top to bottom and the second, revolving in the opposite direction, gives the windows a second cleaning. Perforated spray pipes are attached to the brush structure and constantly wash the dirt from the brush structure.

Body brushes are driven by 3-horsepower motors through a vertical gear reduction unit operating in a bath of oil. Reducers are thoroughly waterproof. Window cleaning brushes are driven by 2-horsepower motors. Brush supports are mounted on a vertical shaft with phosphor bronze sleeves, bolted through four pillow blocks to the main structure. The method of shaft and sleeve construction used permits the brushes to align themselves against the side of the bus or car in case it is on an incline or listing to one side.

When the brushes are locked in their proper washing position, the movement of the horizontal beam supporting the brushes works against Gibson compression springs that are easily adjustable to the pressure desired. The brushes are thus kept in the proper position relative to the side of the vehicle to be washed. This feature makes it possible to wash machines of varying widths efficiently and to allow for wear on the bristles if desired.

Storm sash washing presents a problem to street railways and to railroads every year. Recently placed on the market by the Ross & White company is a new sash washer to handle this problem with a minimum of lost time. The washer consists of a steel plate portable box having two compartments 11 feet long, 30 inches wide and 5 feet 7 inches high. Dirty sash are placed between roller and channel iron guides at the receiving end, where they are conveyed forward by pawl or moving chain. Sash are first covered with an acid spray, if desired, and then conveyed between four brushes which rotate in opposite directions. Acid solution is reclaimed and recirculated by centrifugal pump. After the sash leave the brushes, six sprays of clean water rinse them as they are being pushed out of the delivery end.



Rotating brushes are set in motion when a vehicle intercepts a beam of light directed on a photoelectric cell. Brushes and water sprays clean the vehicle as it passes through the apparatus

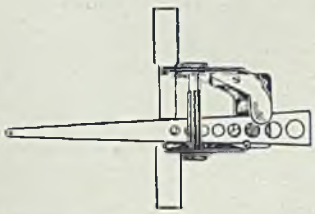
Results Published in Worn Wire Rope Inspection

In co-operation with the special research committee on wire rope of the American Society of Mechanical Engineers, the national bureau of standards tested 229 specimens taken from 79 worn wire ropes. Condition and strength of each sample were determined, and strength was estimated using charts prepared by John A. Roebling's Sons Co., Trenton, N. J. It was found the estimated strength and the actual strength were nearly the same. These data indicate the strength of worn ropes may be determined with sufficient accuracy for deciding when the rope should be replaced.

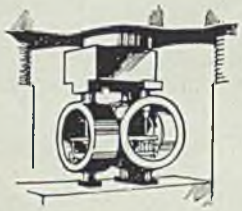
Results have been published by the bureau of standards as research paper RP920. Walter H. Fulweiler, Ambrose H. Stang and Leroy R. Sweetman conducted the research.

In RESEARCH
PRODUCTION
FABRICATION

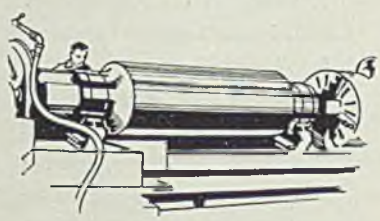
Southwark Serves the Metal Industry



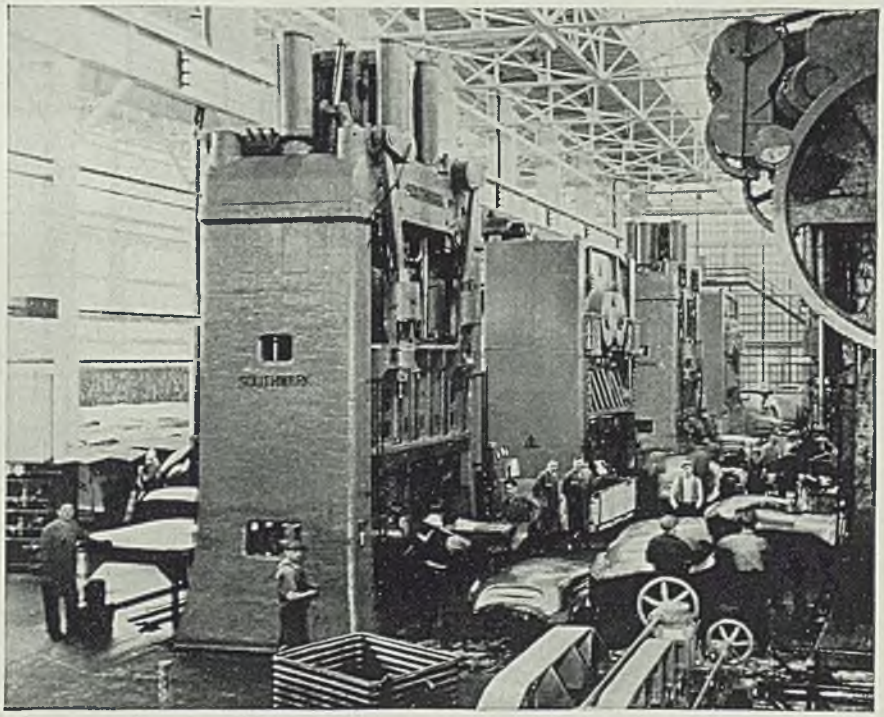
Accurate determination of the deep-drawing characteristics of sheet metal. Southwark offers the means in the Kenyon Extensometer which has been used to define many properties of materials such as yield point, uniform elongation and other values of the plastic range —as well as to determine the relation of yield point elongation to the severity of stretcher strain.



A nation-wide Testing Machine Calibration Service—a unique service for users of testing machines in all parts of the United States—provided by Southwark scientists—supported by Southwark's leadership in this field.



Hydraulic Press Rams, and Rolls for Steel Mills—Southwark grinds from rough forgings or castings to accurately finished products, up to thirty-six inches in diameter and twenty-four feet long.



Southwark Hy-Speed Presses for forming and drawing, etc., are used by the largest manufacturers of automobile bodies, chassis and parts in the world. Reasons: Production capacity equal to or better than competing presses; less expense in design and construction of dies; quicker, more convenient die setting; longer die life; no waste of product in adjustment after die change; uniform pressure on every piece; fewer rejects; fewer returns for repressing; less tearing of metal in sharp changes in contour; no possibility of machine breakdown due to incorrect die setting. Ask for bulletin No. 127.

BALDWIN-SOUTHWARK CORP.

SOUTHWARK DIVISION • PHILADELPHIA

Pacific Coast Representatives — Pelton Water Wheel Co., San Francisco

SOUTHWARK

IN our 81 research laboratories, skilled metallurgists are constantly striving to develop new steels—to improve those already in use. It's men like this, never satisfied with things as they are, who enable us to say, "Tell us what the steel must do . . . and we'll provide the steel that will do it at lowest cost."

NAME THE USE . . .

We'll provide the Steel!

AS varied as the needs are the Steels we make for industry. Whether you want steels which are strong at high temperatures, or strong at low ones . . . steels which are soft or almost as hard as a diamond . . . steels which expand when heated or don't expand . . . which stretch or resist stretching . . . which harden in use or do not harden . . . steels which resist this sort of corrosive fumes or that type of metal-eating acid . . . they're here. In infinite variety, tailor-made to fit your special needs. Steels that enable you to wring the greatest value from your steel dollar.

Some of the most noteworthy of these steels are described below. But the best way to find out what modern steels can do for your product—to make it tougher and more enduring—better able to withstand vibration, shock and wear—more resistant to corrosion — easier to fabricate — cheaper to build—is to consult our metallurgists. Tell them what the steel must do. Let them work out, in your own shops if need be, the most economical solution for you.

U·S·S CARILLOY STEELS: This new name, identifying controlled alloy steels produced by Carnegie-Illinois Steel Corporation, means quality alloy steels made to your specification. Back of the name are special mill facilities — steel craftsmen trained specifically for alloy steel production — exact metallurgical control. Keep this name in mind. It is your assurance of quality, your guarantee that your product will perform in service as it should.

U·S·S CONTROLLED STEELS are carbon steels for forging, forming, heat treating and machining in which all quality factors can be definitely predetermined . . . steels in which the physical properties are consistently uniform. Scientific metallurgical control eliminates those "mysterious differences" which make it so difficult to obtain uniform results with ordinary steels.

U·S·S STAINLESS STEEL:

Metallurgy's closest approach to the "perfect metal." Stainless Steel to a greater degree than any other commercial metal is impervious to all destructive forces — stress, corrosion, heat and time itself. Having a tensile strength of from 85,000 to 185,000 lbs. per sq. in., thin sections of USS Stainless can be built up into light-weight beams with a strength-weight ratio as high as 10 to 1 compared to ordinary steel construction. Lesser weight means fewer pounds to buy — an important factor in cost reduction often overlooked.

U·S·S HIGH TENSILE STEELS:

Both USS COR-TEN and USS MAN-TEN are open-hearth tonnage grades of steel whose superior properties are obtained by the addition of alloying elements in low percentages. That is why their cost is low in comparison to other types of alloy structural steels.

MAN-TEN has the superior yield point and tensile strength of COR-TEN, equals copper-steel in its resistance to corrosion and is high in abrasion resistance. Its lower price per pound recommends its use where corrosion resistance and other special properties of COR-TEN are not required.

COR-TEN is the pioneer low alloy, high tensile steel. It has twice the yield point of mild steel, one-half more tensile strength, nearly double the impact resistance, and greater resistance to abrasion. Its resistance to atmospheric corrosion is from 4 to 6 times that of ordinary steel — which permits the use of COR-TEN's superior strength in lighter sections with assurance.

U·S·S AR STEEL: There is no better low-cost solution to abrasion problems than USS Abrasion Resisting Steel. Even though initial cost is comparatively low, it has stood up better in some installations than 11/14% manganese steel and other high priced materials. More than 68% of the present sales volume is repeat business—proof that A R Steel is doing a real job where abrasive conditions are severe.

UNITED STATES STEEL

Progress in Overcoming Corrosion of Metals Is Reviewed in Symposium

USE of corrosion-resistant metals in the design of machinery and equipment was discussed in a three-session symposium conducted during the fifty-seventh annual meeting of the American Society of Mechanical Engineers held in New York, Nov. 30-Dec. 4. Applications of aluminum, lead, zinc, cast iron, stainless steel, copper, and nickel, were treated in eight technical papers. These papers reviewed recent developments in the fight to restrain fabricated minerals from disintegrating.

Problems faced in the battle against corrosioin were reviewed by F. N. Speller, director, department of metallurgy and research, National Tube Co., Pittsburgh, who also discussed factors which have been instrumental in intensive research to overcome corrosion."

No One Metal Satisfactory

"It does not seem likely, says Mr. Speller in his summary, "that we shall find one metal or one general remedy for all kinds of corrosion. The metal and environment must be mated so as to live together peaceably, at least until the owner gets a reasonable return on his investment. It is too much to expect at the present that one metal can be developed to serve all purposes. The problem of the engineer, therefore, is to select the metal that will best serve any specific purpose at the lowest ultimate cost. Too much attention may be given to the first cost."

E. H. Dix Jr. and R. B. Mears, aluminum research laboratories, Aluminum Co. of Amercia, New Kensington, Pa., in their paper on "Aluminum and Its Alloys" describe the commercially useful corrosion-resistant aluminum alloys and their particular characteristics which fit them for machinery and equipment subjected to corrosive conditions.

"The resistance to corrosion of aluminum and aluminum alloys is largely the result of their film-forming characteristics. The ever present aluminum-oxide film is protective under a great variety of conditions. Full recognition of this important characteristic will aid greatly in the intelligent use and maintenance of aluminum equipment employed in corrosive environments. Under most conditions, this film is self-repairing provided sufficient oxygen is present. "Periodic cleaning, if necessary, especially with a mildly abrasive cleaner, will greatly aid in maintaining a uniformly resistant film. Thicker films may be produced artificially by electrolytic treatments in which the aluminum is made the anode in an aqueous solution, hence the term 'anodic coating'."

Effect on the aluminum base of alloying elements, heat-treatments, resistance to fresh water, sea water, mineral acids, organic acids, alkaline solutions, organic solvents, and gases; the commercially available forms of aluminum and how it may be formed through casting, riveting; and its use in transportation, the electrical and chemical industries, in refrigeration and air conditioning and architecture were treated by the authors.

Lead for Acid Resistance

The importance of lead, especially a soft lead containing about 0.05 per cent tellurium, was dealt with by George O. Hiers, National Lead Co., Brooklyn, N. Y., in his paper on "Corrosion-Resistant Lead Equipment."

"While lead is principally used for equipment for handling sulphuric acid," says Mr. Hiers, "either alone or in the wide industrial use in combination with other acids or salts of the acid, it also finds considerable use with other agents and in contact with the soil or atmosphere. Its durability is related to a protective film or coating of corrosion product."

Due to inherent qualities "soft-or chemical-lead and hard-lead pipes have some limitations in strength. Chemical-lead and tellurium-lead pipes for heating coils may be safely used with a maximum steam pressure of 50 pounds per square inch. Instances where higher steam pressures up to 150 pounds per square inch are desired, copper tubing covered with an adherent layer of lead of substantial thickness may be used and can readily be procured."

Antimonial-lead sheet and pipe, according to the author, are used in pumps and valves sometimes in preference to chemical lead because of the "adequate corrosion resistance to sulphuric acid at ordinary and slightly elevated temperatures" and because of greater strength.

Tellurium lead has recently "been taking its place as a new material in equipment" and has proven satisfactory. "A Midwest company is successfully using tellurium-lead coils as a heat exchanger handling hot sulphurous acid at 160-180 Fahr. under a steam pressure of 20 pounds, and is using tanks with tellurium lead in continuous operation for strong sulphuric acid solutions which, during the operation, reach the boiling point of the acid solution, with agitation."

Zinc Thickness Important

"Zinc in the Chemical Industries" was the subject of the paper presented by E. A. Anderson, metal section, research division, New Jersey Zinc Co., Palmerton, Pa. The paper is primarily concerned with the resistance of zinc to corrosion by industrial atmospheres.

The thickness of the coatings is highly important, said Anderson, since a zinc coating does not disappear by corrosion. "Early failures resulting from the use of thin coatings of zinc have caused many engineers to form a poor opinion of the life of galvanized coatings in general."

The "ways in which older types of cast iron have been used in chemical-process equipment, and how, following failure in service, some of the compositions have been improved to provide materials of construction for equipment in which chemical products meeting all requirements as to quality have been produced at relatively low cost" was the basis for the paper by H. L. Maxwell, E. I. Du Pont de Nemours & Co., Wilmington, Del., on "Cast Iron in Chemical Equipment."

A wide range in the composition

of castings may result in castings suitable for chemical use or just as easily result in material of no commercial value, stated Mr. Maxwell. "Specify to the foundry reasonable limits of composition that you know by experience are suited to your operation, and, having done that, insist that you get what you specify."

J. H. Critchett, Union Carbide & Carbon Research Laboratories Inc., New York, was author of a paper on "Corrosion-Resistant Stainless Steels and Iron." The author dealt with "the selection of a proper quality of stainless steel, based on a combination of laboratory tests and practical results achieved in application."

No All-Resisting Stainless

The author pointed out that "there is no stainless steel resistant to all corrosion media, and that the corrosion resistance of a given steel to a given application can only be predicated if all of the factors involved in the fabrication, assembly, and maintenance of the equipment are known, in addition to the details of the corroding media and the way they change in the processes involved." The varying properties of steel alloyed with chromium, nickel, manganese, and combinations of these metals are considered in relation to specific applications.

Pure nickel, including nickel-clad steel, Monel, Inconel, Hastelloy, and Illium were metals discussed by F. L. LaQue, development and research division, International Nickel Co. Inc., New York, in his paper on "Nickel and Nickel-Base Alloys" and their use in the design of corrosion-resistant machinery and equipment.

"Copper and Copper-Base Alloys" was the subject of the paper by R. A. Wilkins, Revere Copper & Brass Inc., New York. This paper was concerned with the presentation of the "characteristic corrosion-resisting properties and the fundamental physical of the metals in question, and to direct the attention of the engineer to those easily overlooked factors which so often determine the effectiveness of a given cuprous material when used in a structure or apparatus designed to resist corrosion."

Quieting Noise Of Machinery

DISCUSSING practical means for quieting machinery, Ernest J. Abbott, physicist, Research Co., Ann Arbor Mich., illustrated a number of examples of machinery noise problems and emphasized the wide variety of factors encountered in this particular field. Characteristics of any sound, he said, can be measured in great detail. Theoretically, one might proceed in a routine manner to measure all the characteristics of each sound in which he is interested. Practically, such an attack would be far beyond the realms of economic possibility in both time and cost, he said. The only feasible medium is to modify the attack and the technique of measurement to solve the problem at hand with a minimum of experimentation.

Most practical problems involve so many important factors, he said, that at best the number of measurements required is large. Complications exist whether one uses meters or not and meters do provide means of unscrambling the most complicated problems. Hence, he said, large savings often result from the use of experimental methods through the elimination of costly experimental construction.

Sound-level measurements were sufficient in some of the problems which he presented. In others, such measurements formed an important part of the data but were not sufficient. In still others they were of no use at all. Frenquency analysis is an extremely powerful tool by which many problems can be solved, Mr. Abbott said. Acoustical measurements are most valuable when they are correlated with other knowledge of the machine such as changes in its parts, measurements of the internal action or peculiarities in the method of manufacturing. The speaker said such correlations almost invariably yield unexpected information.

Rubber Bonded to All Metals

Rubber can be bonded to practically all metals in various spring applications, said Walter Keys, United States Rubber Products Inc., Detroit, in his illustrated paper on "Rubber Springs," but under present operating conditions in numerous instances, the use of rubber springs is not practicable. The average life of a rubber spring is from four to eight years, according to Mr. Keys. Rubber springs should not be subjected to temperatures higher than 125 to 150 degrees Fahr. and use of rubber more than 2 inches thick in a spring is not recommended.

A paper by F. B. Zimmerli, chief engineer, Barnes-Gibson-Raymond Inc., Detroit, on "Tests of Applications of the Wahl Formula to Spring Endurance" was read. Figures based on the results of these tests were presented with the paper. C. T. Edgerton, secretary of the sub-committee, read "Progress Report No. 3 on Heavy Helical Springs," containing results of research work at Wright field, Dayton, O.

Training To Make Skilled Workers

THE place and importance of adult education, the results to be desired and some of the better methods of obtaining them were under consideration at the session on training people to be skilled workers.

"It must be assumed," said C. G. Simpson, Philadelphia Gas Works, Philadelphia, "that all efforts of business and industry to develop and improve workers have as their ultimate aim the improvement of the total results of the enterprise. However, one of the first essentials for activity directed toward worker development is a clear-cut understanding of the specific results to be striven for.

Aims of Training Course

"Some typical examples of these specific aims are: Establish a higher standard of safety and accident prevention; develop personnel for a new process or machine; reduce losses caused by material spoilage, disposition of scrap; develop co-operation and teamwork between production and technical, or staff, units; improve the attitude of employes toward their work, their supervisors, or the company; raise the quality standard of the product or service; discover and develop supervisory ability to handle men, to plan and schedule work, to budget labor and cost requirements, to minimize detail work, etc.; and to improve relations with distributors, dealers, or users of the product or service."

Drawbacks also must be considered. "While there is a lot to be said for company aid in formal education," asserted Mr. Simpson, "there are likely to be two characteristic weaknesses. First, employes who have completed a course with company aid may feel a rate increase or promotion should follow in due time and, if it does not, dissatisfaction sets in. Second, employes eager to take advantage of company aid may take course not pertaining to their immediate works with the result that the period between the learning time and the time for application may be so long as to waste the effort of employes and the expense of the company."

Measuring Power In Metal Cutting

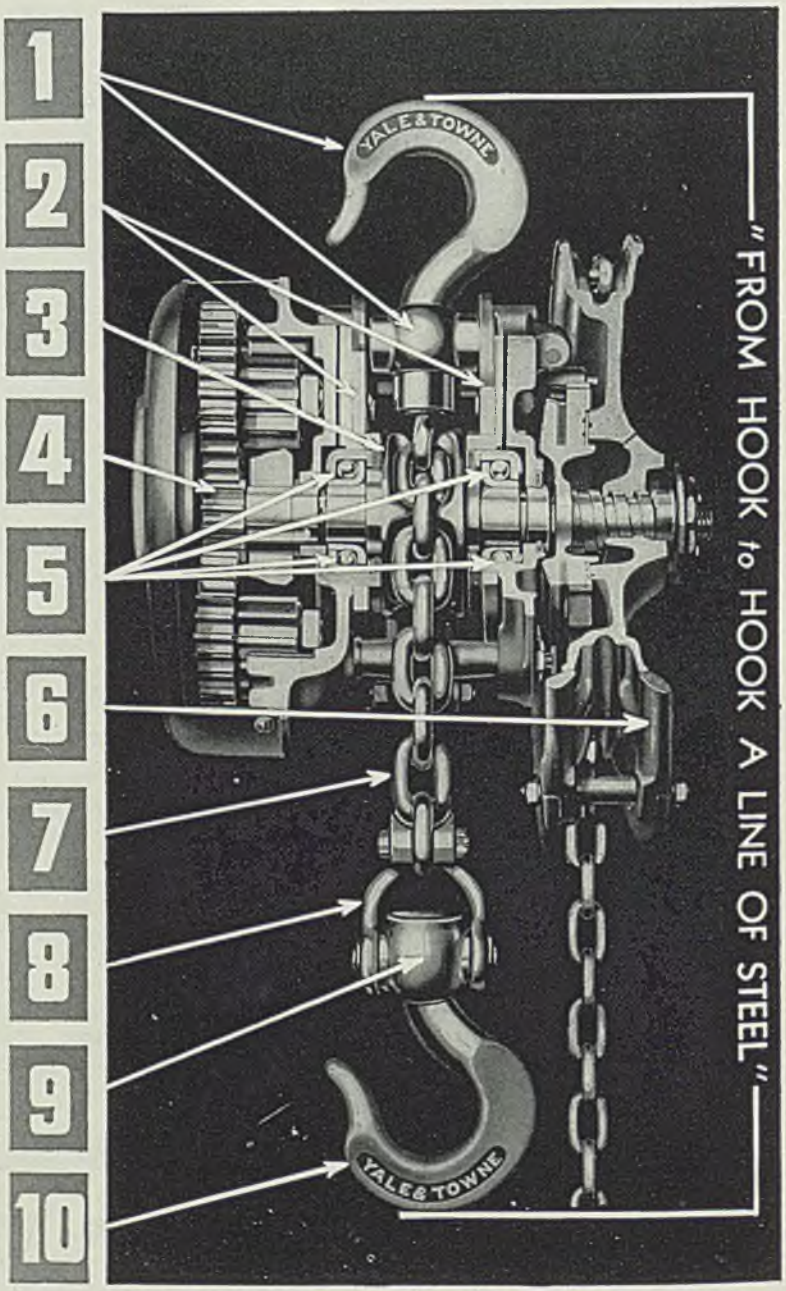
RESULTS of an experimental study of the application of cutting tools to the turning

(*Please turn to Page* 60)

10 Reasons Why Buyers Select YALE CHAIN HOISTS

Because . . . Yale Chain Hoists have an international reputation for QUALITY and that quality is based on the outstanding features of construction, as follows:

1. Heavy forged steel safety hook and cross head designed to withstand shock.
2. Heavy wrought steel suspension plates support the load between the top hook cross head and load sheave.
3. The load sheave on which the load is lifted is a massive special analysis steel casting.
4. The driving pinion is a one-piece forging of special steel.
5. Ball bearings upon which the load sheave is mounted are of high carbon chrome alloy steel running in chrome vanadium steel races.
6. A continuous and adjustable hand chain guide prevents snagging—with a tensile strength of 50,000 lbs.
7. The load chain is of steel, welded and heat treated.
8. Drop forged two-piece shackles with heat-treated suspension pin permit changing or replacing load chain without welding.
9. Lower hook is equipped with heavy duty ball bearing, completely enclosed, packed in grease, requires no further lubrication.
10. Steel safety hook opens slowly without fracture before any other part of the hoist is overstrained—protects operator and load.



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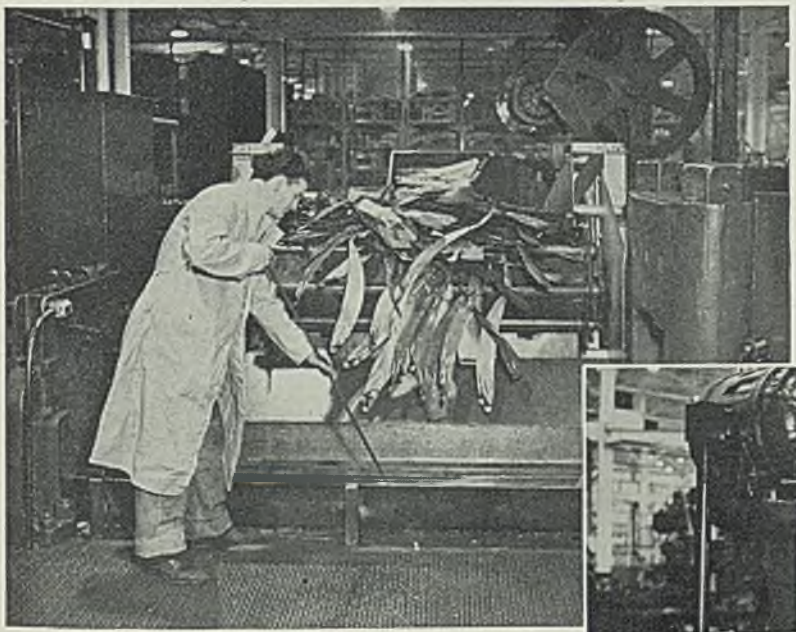
PHILADELPHIA DIVISION, Philadelphia, Pa., U. S. A.

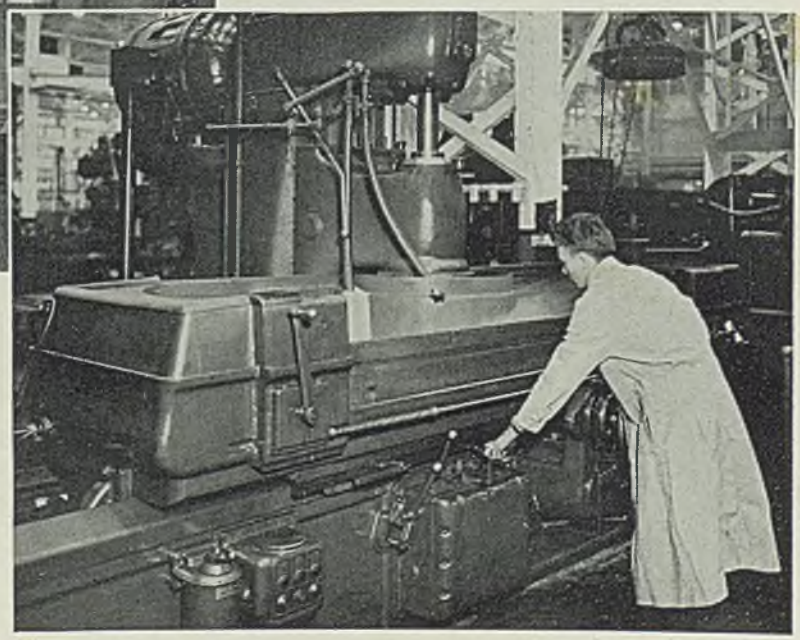
Materials Handling

Straightline Flow Featured in Stamping Plant

PRODUCTION is under way in the Grand Rapids, Mich., Stamping division of General Motors Corp. Formal inspection of this heavy stampings plant, as reported in STEEL of Dec. 7, was made recently by General Motors and Fisher Body executives, accompanied by a group of civic and industrial leaders. Representing General Motors' conception of the last word in layout, fabricating technique and production equipment, the plant now employs more than 2100 workers in two shifts and is producing 1500 complete sets of stampings per day for Fisher unisteel turret top bodies. It also is producing special parts required by assembly plants elsewhere in the country.

On a 78-acre site, and having floor space of 400,000 square feet, the plant is fully self contained, being served by its own boiler house, gas house and a substation for distributing electric power from an independent high tension power line. The main manufacturing building comprises two chief divisions, the press shop and the metal shop or assembly department. In addition there is a well equipped die shop





SCRAP left from stamping operations in the Grand Rapids plant is baled on the hydraulic press shown above into 300-pound blocks and sold to the mills. Work in the vertical surface grinder shown at right is held in position by a magnetic chuck and the surface is ground by an abrasive wheel revolving inside the circular shield

capable of building all the dies and tools required for the fabrication of body stampings; it also has a maintenance department.

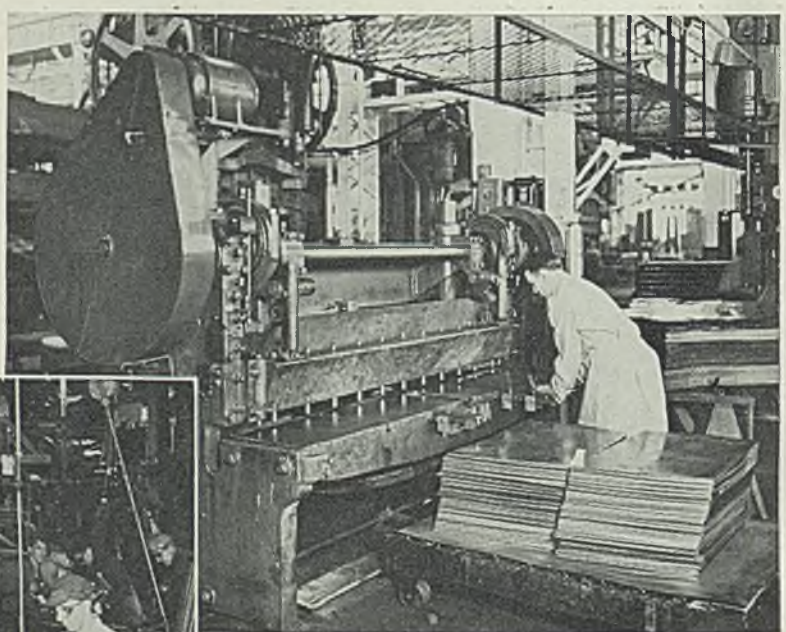
Layout of departments and production equipment is based on the principle of straightline flow of materials. Thus all incoming materials whether entering by truck or rail are routed to the receiving dock. This occupies a 100-foot wide single craneway extending 525 feet from front to rear of the building. Sheet steel as it is received in bundles is stacked on the floor in this section. Adjacent to the receiving dock and at right angles to it is the press shop with its long lines of presses arranged in parallel rows, each line devoted to a different type of stamping. The front line of the press shop consists of a battery of square shears and roller leveling machines which prepare the sheets for press operations.

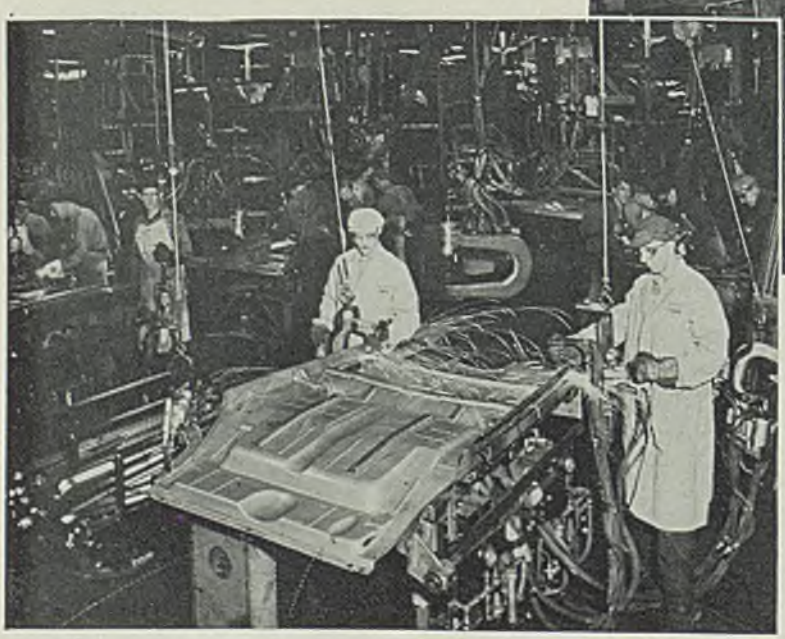
Press Shop Setup

The first operation in the press shop is to deliver the sheet steel bundles to the square shears by means of overhead cranes and then from the shears to the roller leveling machine to produce a perfectly ductile blank free of tears, worms and wrinkles. The press shop lines comprise five parallel double rows of presses or 10 press lines in all. This equipment includes some of the largest presses used in the automobile industry. Three are 750-ton presses, weighing more than 500 tons each, used for making the larger stampings such as the turret tops. Due to the proportions of the press shop equipment, it was found desirable to build a large gallery under the press room floor to provide the foundation. This is a large clear basement area of solid, waterproof concrete. Unlike conventional practice, the presses are not bedded in a foundation but are mounted individually on huge reinforced concrete columns which are tied into the floor foundation. A series of columns for each press is tied together by steel girders which make the floor for the press. This construction results in a vibrationless floor both in the press shop and in the pit.

Numerous interesting and impressive features of the press shop result from the size and quantity of work handled. These include a 54-ton die for flanging the roof panel, and a number of press setups with three or four different dies handling as many separate operations in one setting. An unusual feature is the use of gravity feed for transferring stampings from one press to another. This is accomplished by the installation of inclined racks or guide rails connecting one or more groups of presses. Scrap from the press shop averages 200 tons daily and is compressed in two large baling presses to bricks weighing approximately 300 pounds.

An outstanding characteristic of the plant is a system of overhead monorail conveyors which thread every press line, carrying parts in various stages of completion down the line of presses and then continuing through to form the vital link between the press shop and the assembly department. While the conveyor lines appear as a maze, making it difficult even for the trained eye to rationalize the system, actually there are just four separate systems of closed conveyor chains serving the entire operation. The complexity, to the ob-





SHOWN above is a shear which cuts sheet steel plates to the approximate size required for the various parts of the steel bodies. Many welding operations are served by the handling systems in the Grand Rapids plant, the one at left showing rocker panels being welded to the sides of the underbody. The steel floor is braced lengthwise by the rockers

Put your tough handling jobs up to Exide

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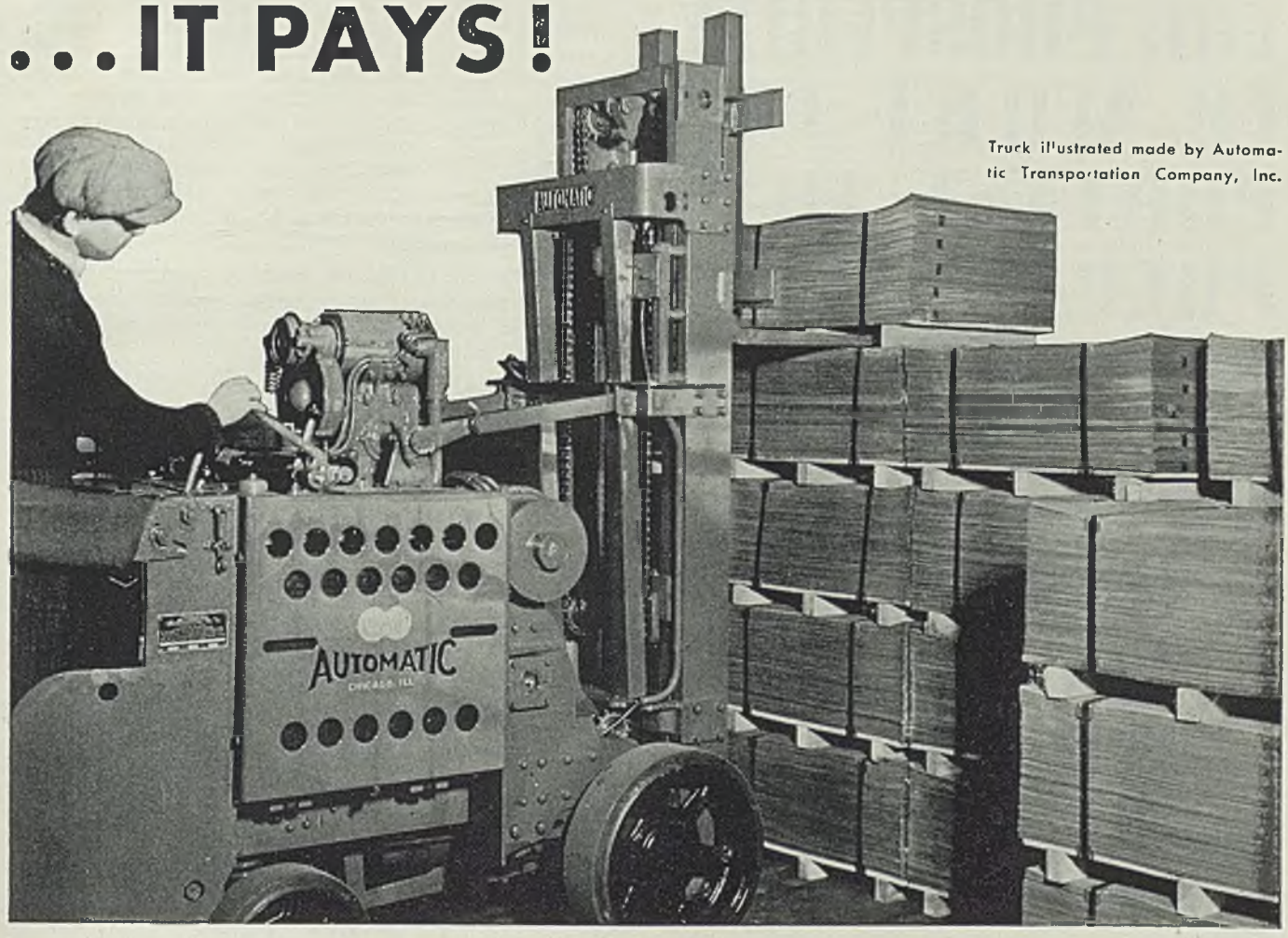

Truck illustrated made by Automatic Transportation Company, Inc.

WHEN you bear in mind all the advantages of the electric industrial truck, it is wise to get the facts before concluding that batteries aren't equal to the toughest jobs in a mill. Nearly half a century of experience has shown that such handling problems are simply a matter of engineering analysis and of the right size Exide-Ironclad Battery for the work to be done.

Put your tough jobs up to Exide . . . we stand ready to prove that Exide-Ironclads can handle them if given the opportunity. The right installation for your conditions assures continuous operation throughout each shift . . . good speeds . . . tremendous power . . . and highly economical, trouble-free service.

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PREPAREDNESS FOR PROSPERITY IS MORE IMPORTANT THAN PREPAREDNESS FOR WAR . . .

Yet how many plants are really prepared for genuine prosperity?

Are the facilities of finance, organization, plant, equipment and personnel in the iron, steel and metalworking industries ready for sustained activity at high levels?

Has rehabilitation and modernization been carried forward sufficiently to make up for the neglect of the depression period?

Are proper precautions being taken to guard against serious shortages of skilled workmen?

Is capacity for production, finishing, processing, and manufacture being brought into balance, or is the industry still topheavy in productive capacity?

These and scores of other problems are vital in this recovery period. Preparedness for recovery is more important than preparedness for war.

STEEL's annual issue—the "Yearbook of Industry" number dated Jan. 4, 1937—will deal with these problems of preparedness. Every one of the more than 30 major articles will be pointed toward the single question "Is Industry Prepared?" By text, illustrations, statistics, tables and charts, STEEL will attempt to show wherein the industries it serves are weak or strong in their state of readiness for big business ahead.

To advertisers, the "Yearbook Issue" of STEEL for 1937 presents unusual opportunities. In it you can direct your appeal to important buyers whose minds are keyed to the urgency of preparedness.

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'YEARBOOK OF INDUSTRY' issue

Jan. 4, 1937

server, arises from the fact that each line threads a tortuous path with many bends and turns. Some of the conveyor lines carry a multiplicity of parts on a single hook, at least during a part of the long journey through the plant. An outstanding example of this is the No. 4 conveyor line which handles an amazing assortment of body parts on one hook. These include two trunk lids, shroud top, front end frame, inner door panel and outer door panel. The four conveyor lines have total length of more than 7800 feet.

Heavy Cranes Provided

Supplementing the monorail conveyor system, the plant is provided with heavy duty cranes and craneways for the heavy lifting. In all there are four 50-ton, four 30-ton and one 15-ton cranes. Each 30 and 50-ton unit has a 15-ton auxiliary crane in addition. The cranes are used for unloading incoming freight and transporting sheet steel bundles in the receiving department, for transporting castings and dies in the die shop and for handling dies in and out of the presses in the press shop.

As noted above, the monorail conveyor system which threads the press shop also forms the link between that department and the assembly department, permitting the final development of the idea of straightline flow of materials. Basically the assembly department carries through the idea of straightline flow by paralleling as closely as is practical, line for line, the unit lines in the press shop. Thus the door line or the turret top line may be conceived as traveling in a single line from the receiving department to the shipping dock.

Welding Done in Metal Shop

Units handled in the metal shop include turret tops, underbodies or floor panels, door assemblies, quarter panels, shroud assemblies and center pillar assemblies. Of great importance in this department is the welding procedure and equipment which includes such units as flash, gun, projection and electric arc welders and welding torches. For example, there are 160 gun and 20 large projection welders and among the latter is one 500-kilovolt ampere transformer unit which produces 18 spots in one setting in welding the hinge reinforcement on the inner door panel.

A unique feature of the welding equipment used for the underbody is the use of a pair of automatic spot welding guns from a single timing control. By this means it is possible to set up two guns for a single long weld and, depending on the nature of the weld, have one gun at the end and one at the center, or both guns at the outer ends, and then moving both guns simultaneously to finish the weld line without overlapping and with maximum efficiency.

All welding guns automatically are timed by special air operated controls to assure production of perfect welds. All welding tools are watercooled to preserve their life and maintain correct form of welding tips. Cooling water for all welding tools is circulated from one source, a pumping station in the boiler house, recirculation being from a cooling pond. Current for the entire department is controlled from one transformer station which is fed from the switchhouse. Welders are fed from a ceiling mounted bus bar installation having capacity of 2000 amperes.

Two Lines Build Industry

Of the various operations in the metal shop, the assembly of the new steel underbody is particularly interesting. It is built up on two parallel lines to get the required production. Each line has five main stations and two finishing stations common to both lines, a total of seven stations. Of special interest is the production of steel doors of the type used in the unisteel body. The inner and outer door panels are made of separate stampings and each unit is handled separately in assembly, the various brackets and fittings being added on separate lines. After both panels have been completely fitted they are welded together into a single unit. This assembly then goes to a "hemming" press which closes the joints all around, leaving nicely finished edges. Following hemming, the panels again are welded, making a total of two complete welding operations to assure strength and rigidity. As the individual units of the body are completed along their respective production lines they are hooked to one of the overhead feeder conveyor lines that carry them to the shipping dock where they are prepared for the journey to the various assembly plants.

The die shop mentioned above occupies two full bays 150 x 260 feet and eventually will employ at least 350 skilled workers including die makers and others. It is fully equipped to manufacture all the dies used at this plant, including 36 to 70-ton dies required for fabricating one-piece solid steel roofs. Outstanding equipment includes a 60-ton planer type milling machine with work table 120 inches wide and 16 feet long; it has two heads, a heavy vertical head spindle capacity for handling cutters up to 18 inches in diameter and a horizontal swiveling head of sufficient capacity. A planer has a bed of similar size.

A large automatic die cutting machine is designed for carrying out any complex movement in all three planes, the cutting tool being guided by a tracer arm. An unusual feature is an installation of six fitting presses, hydraulically operated, used in fitting the parts of press dies when giving them the final finishing touches before the tryout operation on the production press. Much other special and unusual equipment is included. The entire die shop is traversed by an overhead craneway which facilitates the handling of raw materials and finished dies. A related feature is the installation of jib-mounted hoists at each of the work places for the rows of benches on which the dies are laid out and built.

To assure adequate lighting and cheerful working conditions more than 82 per cent of the total wall area of the plant is glass. This in combination with a high roof and freshly painted, light reflecting interior assures the maximum benefit of natural illumination. After daylight hours the same level of illumination is provided by a modern lighting system.

New Data on Chromium-Molybdenum Steel Tubes

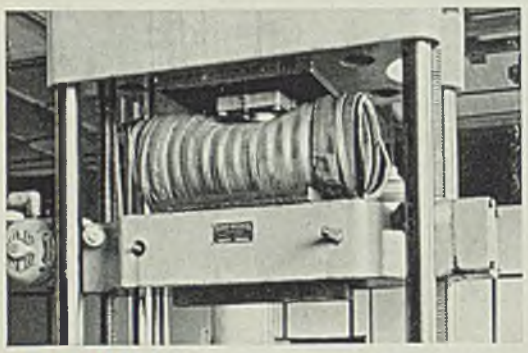
Column strength curves are plotted for chromium-molybdenum steel tubes of 75,000 and 85,000 pounds per square inch yield strength, in a new publication by the Summerill Tubing Co., Bridgeport, Pa., entitled "Aircraft Tubing Data." Hitherto the plotting of curves for such tubing had been confined to 60,000 pounds per square inch yield strength.

Data on properties of steel tubing has been assembled in this book in a rearranged style for quick reference. This data covers round tubing as before and, in addition, streamline for special round cornered squares used by the aircraft industry.

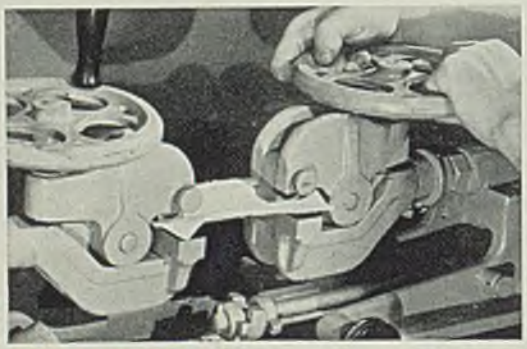
Alloys Eliminate Hazards In Casting Cylinders

An automobile manufacturer has found the greatest problem in using superheated iron for cylinders without the addition of alloy is to melt iron hot enough to break down the graphite, and pour hot enough to obtain fluidity; at the same time keeping the large bosses from shrinking due to liquid shrinkage. With the use of alloys, that manufacturer has found it possible to produce more satisfactory castings by eliminating most of these hazards.

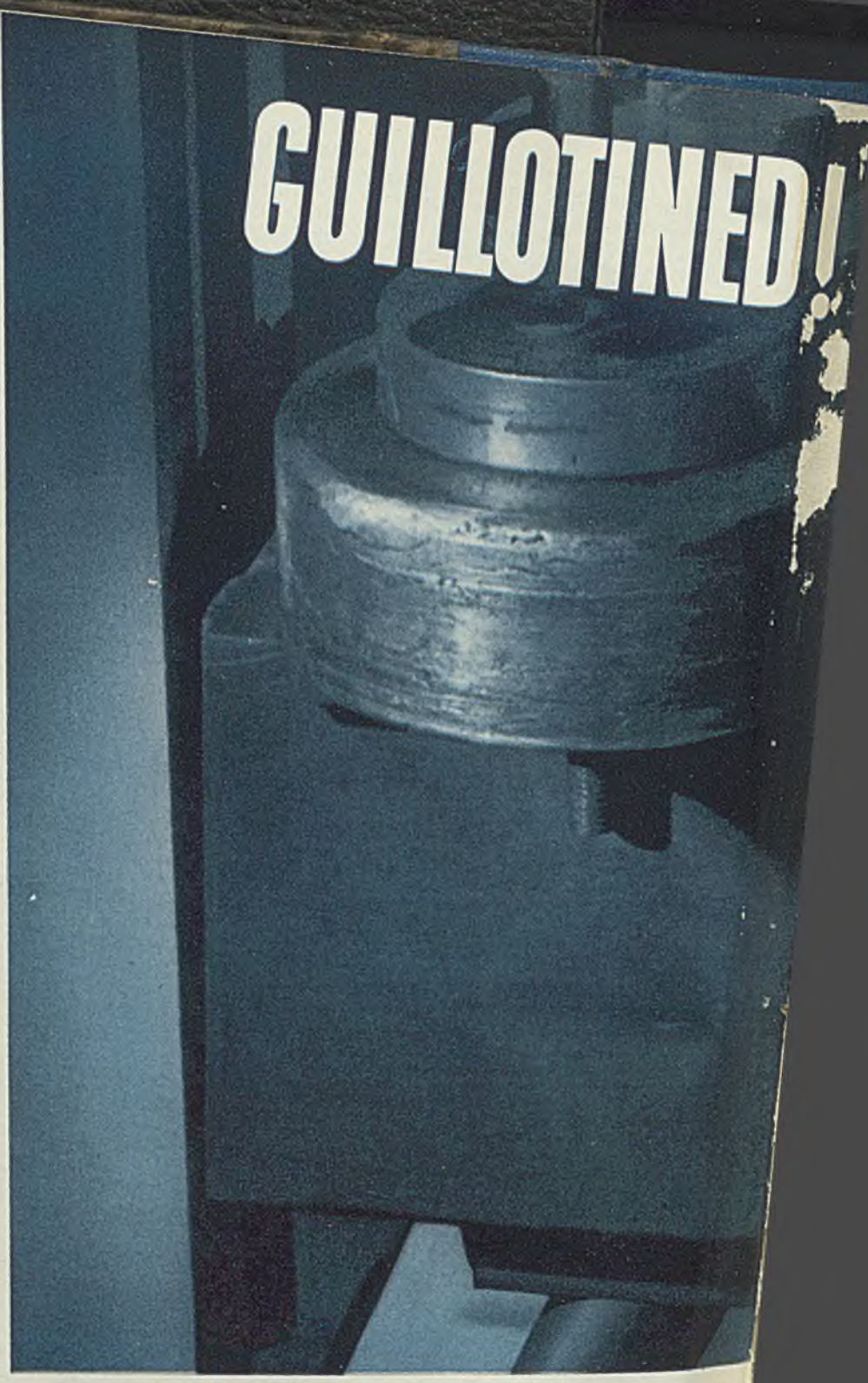
BOMBED! These rivet-studded steel "bombs" reproduce the deteriorating effects of blistering heat and months of exposure. Packings or other mechanical goods are subjected to oxygen under tremendous heat and pressure. The durability of U. S. Packings and all U. S. Rubber Mechanical Goods is attributable to this merciless testing.

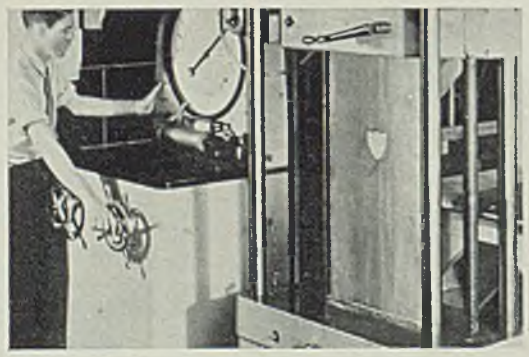


CRUSHED! Exerting thousands of pounds of slow pressure, this U. S. crush-test device pre-determines the resistance and resiliency of metal reinforced U. S. Oil Suction and Discharge Hose. That's how we know U. S. barge and dock loading hose for the oil industry will stand up under terrific abuse.

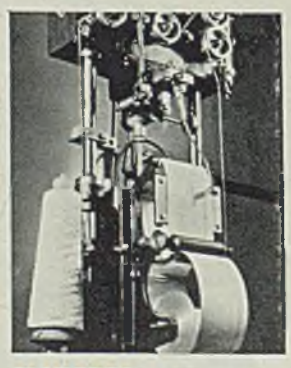


TORTURED! This duck tensile testing machine determines the stretch and strength of the fabric used in U. S. Rubber Mechanical Goods by pulling it to pieces in jaws of steel, while a sensitive indicator records its performance. The long life and wearing quality of U. S. Air Hose, Steam Hose and other mechanical goods is the result of tests like these.

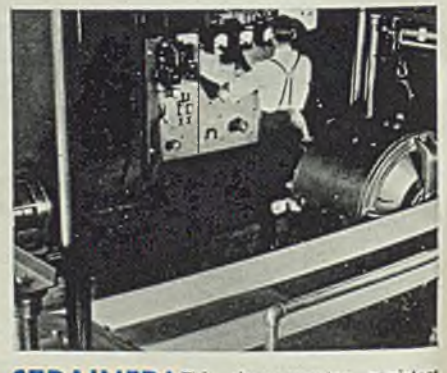




PULLED! This tensile testing machine is especially designed for U. S. Rubber laboratories. Capable of a pull of 25 tons, it is so delicately balanced that it registers a few ounces. Here the virtually stretchless and unbreakable quality of U. S. Conveyor and Transmission Belting is proved in advance of production and sale.



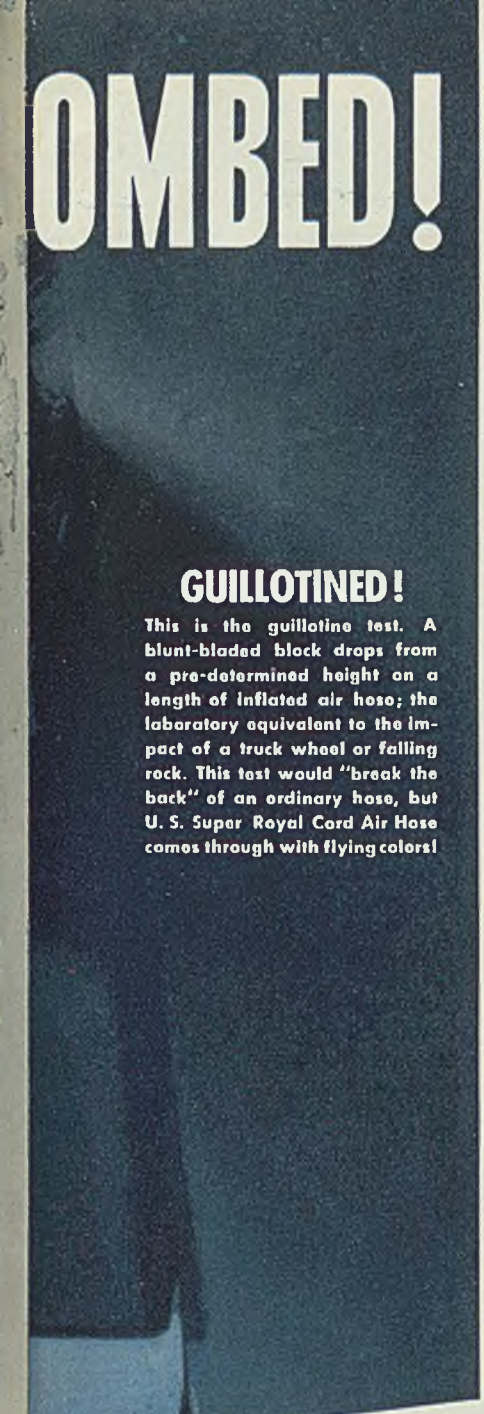
TWISTED! This machine tests the tensile strength and stretch of strands of cord used in the construction of U.S. Super Royal Cord Air Hose, U.S. Royal Cord Belts.



STRAINED! This dynamometer registers the efficiency of U. S. Royal Cord and other transmission belts under varying tensions. It measures the horsepower delivered by the belt at different speeds under conditions simulating actual field operation.

OMBED! CRUSHED! TORTURED

Performance Value of U. S. Rubber Mechani Goods Proved in Advance by Scientific Tort Tests in U. S. Research Laboratories!



GUILLOTINED!
This is the guillotine test. A blunt-bladed block drops from a pre-determined height on a length of inflated air hose; the laboratory equivalent to the impact of a truck wheel or falling rock. This test would "break the back" of an ordinary hose, but U. S. Super Royal Cord Air Hose comes through with flying colors!

In steaming jungles . . . on vast U. S. Rubber plantations . . . in million dollar research laboratories, U. S. Rubber engineers are wresting from rubber and metal and textiles the new processes and new technologies that produce new U. S. Rubber Goods for industrial use.

Tremendous Achievements

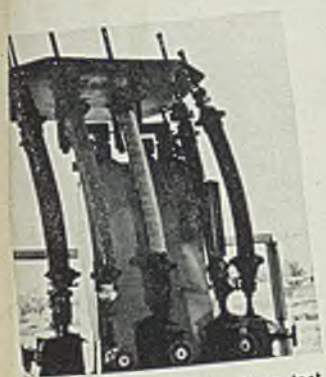
The notable achievements of these anonymous men of the test-tube and slide-rule form a long roll of "firsts" in tires, hose, belting, packing, insulation, and the bonding of steel and rubber. For *every* year sees the birth in U. S. Rubber laboratories of hosts of new rubber alloys, compounds, and products that cut industry's costs, eliminate waste, speed production, and create progress!

Performance—Proved in Advan

U. S. Rubber's service to indust too broad to be defined by speci tions, too vital to be written in t of price. It lies in a matchless kn edge of the chemistry of rul coupled with a quality of craftsm ship that demands proof of pro performance — in advance. On t pages are shown a few of the U Rubber laboratory "torture tests" safeguard the investment of the chaser by mercilessly seeking every product flaw and every formance weakness in advanc production and sale.

This is what we mean when we that U. S. Rubber Mechanical Go have built into them—

SERVICE BEYOND PRICE AND SPECIFICATIO



FLEXED! The steam hose test rack! Blasts of superheated steam attack, flex, and vibrate lengths of U. S. Matchless Steam Hose while they are exposed to sun, rain, heat, and cold.

STRETCHED! This U. S. Rubber laboratory machine tests the tensile strength and other physical properties of rubber compounds under varying loads. From tests of this sort, the superior materials used in U. S. Permobond Rubber Tank Linings are developed for industrial uses.

UNITED STATES RUBBER COMPANY
US
TRADE MARK

United States Rubber Company

SURFACE TREATMENT AND FINISHING OF METALS

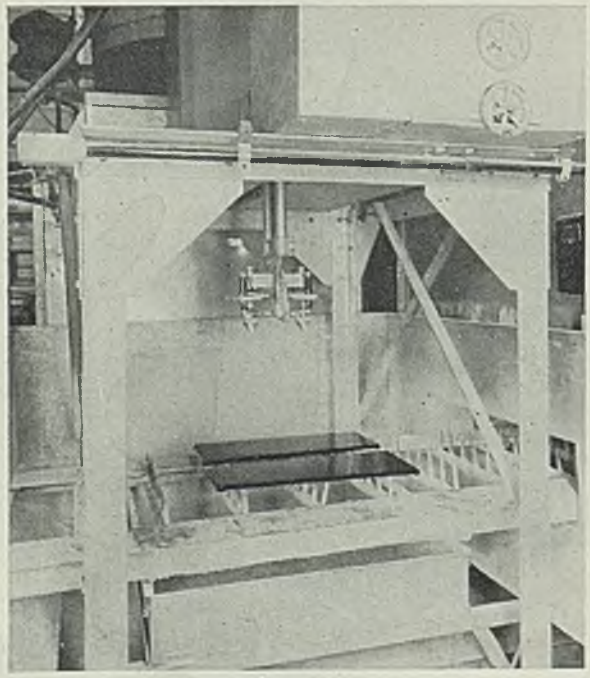
Automatic Spraying of Porcelain Enamel Speeds Production, Cuts Costs

BETTER products at increased production speed was the father of the thought when the Edison General Electric Appliance Co. Inc., Chicago, decided to install an automatic spraying machine in their porcelain enameling plant, where their ranges, water heaters and other articles are manufactured.

The ideas combined in this new machine are entirely different from those of other machines of similar type. They constitute a very definite improvement over the old swinging arm type, the new machine giving an absolutely even and perfect coat, it is claimed.

The automatic spraying assembly consists of a moving sprayer head, which has four spray nozzles of the type used on ordinary hand spray guns, adjusted to give a flat, fan shaped spray. In operation the entire spraying assembly moves back and forth at a regulated rate of speed across the conveyor carrying the ware to be sprayed.

A very interesting improvement is that the spray is automatically shut off each time it crosses the ware as soon as it reaches the edge of it, and is automatically turned on again as soon as it reaches the edge again on the return trip. The points at which the spray is turned off and on may be adjusted for various widths of ware. This operation, imitating hand spraying, saves hundreds of dollars on material and prevents piling up of enamel on the nose of the gun, which may cause spitting.



AUTOMATIC spraying of porcelain enamel, as illustrated here, affords definite savings in manufacturing costs

The exhaust on the automatic spraying system is downdraft. This has a definite advantage over the conventional updraft or sidedraft reclaiming systems, as the dust and extraneous matter is pulled down away from the wet surface and so cannot stick on it and cause defects. Dry enamel cannot drop onto the wet surface from the pipes above.

The machine is 36 feet long, equipped with a conveyor which carries the ware from the loading end until it is unloaded after spraying. There are two manual spray booths on the line, where hand operators spray the ends and sides of flanges, and the backs of pieces where it is necessary.

Spray Adjustment Is Simple

In preparing the machine for operation it is necessary to adjust the speed of the conveyor and the speed of the spraying assembly until the desired weight of coat is applied, and for the width of ware to be sprayed. The weight of application is measured in grams per square foot. Once this is adjusted the machine is claimed to give an absolutely uniform coating for hours at a time. The machine is usually readjusted when using a new supply of enamel. These adjustments require only a few seconds.

Studies show that this machine, made by the Binks Manufacturing Company, Chicago, gives an appreciable saving in labor, and because of the more uniform coat obtained, rejects are reduced. With the conveyor moving at a speed of 20 feet per minute the machine applies a 35 grams per square foot coat on miscellaneous flat pieces. The entire process is claimed to be more accurate, faster and more economical than is possible on a machine without the automatic spraying.

For the past year the company has been covering a large quantity of its ware with a "one cover" coat. As this one cover coat is sprayed at 35

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A BETTER STRIP

Superior Hot or Cold Rolled Strip fits production schedules like a glove. It stamps, draws, bends, welds. It is accurate and uniform. Call for a Superior engineer, he'll give you convincing details. No obligation.

SUPERIOR STEEL CORPORATION

GENERAL OFFICE: 3122 GRANT BLDG., PITTSBURGH, PA. WORKS: CARNEGIE, PA.

grams per square foot, an advantage readily can be seen, compared to the 20 grams per square foot for the final coat on "two cover" ware. This makes a weight of 38-40 grams per square foot on two cover coat ware as compared to only 35 grams per square foot on the coat sprayed by the automatic machine. The thinner enamel aids to reduce chipping and other defects, and reduces enameling costs about one-third below those of two coat ware.

Hand operators are required to spray edges of flanges and the backs of pieces which require spraying in order to prevent warping. On such work two operators are required in order to keep up with the speed of the machine — one spraying the backs of pieces and flanges on two sides, and the other spraying flanges on the other two sides. It is also necessary to have two operators to load and unload the conveyor.

The same principle can be adapted to other spray problems and it is especially recommended where large flat objects are sprayed on a conveyor. Wall boards, linoleum, leather, imitation leather, range and refrigerator parts, paper, fabrics, blackboards, tile, glass, shingles and many other objects lend themselves readily to the automatic type of spray coating.

Radiant Tube Furnace Reduces Fuel Costs in Porcelain Enamel Firing

BY J. B. NEALEY
American Gas Association

GAS heated radiant or hot tube furnaces which recently have come into general use for annealing in the sheet steel industry and for other metallurgical heating operations, have now invaded the field of porcelain enameling. Heretofore, furnaces employed for this purpose were, of necessity, of the muffle type, but with the new gas hot tube method of heating no muffle is required as the heating-up period is short. A gas burner of novel design, and of the diffusion combustion type, has been added, and this also helps to increase the speed and efficiency with which enameling can now be accomplished. The gas radiant tube enameling furnace is an outcome of one of the projects of the committee on industrial gas research of the American Gas association, of which F. J. Rutledge, of Philadelphia is chairman.

The feature of this system of heating is a series of metal tubes located on the inside walls and bottom of the furnace but with the ends protruding through the back wall to the outside. A gas burner fires into one end of each tube and an eductor at the other end draws the hot products of combustion through. When in operation these tubes become very hot and radiate the heat to the work in the furnace. These hot tubes can be used long after their theoretical life, for the negative pressure inside prevents the escape of the combustion products to the inside of the furnace, should any holes appear in the tube walls.

Quick Comeback With Gas

One of the advantages of this furnace is that it can be shut down with every assurance of a quick heat up when lighted again. When the plant is not working nights and week-ends, this results in a material decrease in fuel consumption. This furnace is built with lightweight firebrick and the construction gives a very fast comeback after a shutdown. In fact, the gas burners are turned on full when first lighted so that the full thermal capacity of the furnace can be taken advantage of from the start.

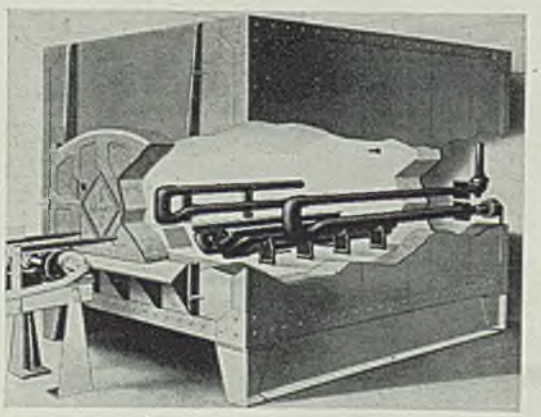
One of these new gas radiant tube furnaces has recently been built at the plant of the Ferro Enamel Corp., Cleveland. This furnace is of the batch type and is 3 x 6 feet in size. It is equipped with four U-shaped gas radiant tubes laid horizontally, 2 on the sides and 2 in the bottom. These are 4-inch tubes with a ⅜-inch wall thickness and are of chrome-nickel (35-12) alloy, centrifugally cast. The U bend is sand cast separately and the bell and spigot joints are welded in the field. Each tube also has an enlarged, sand cast, flat section for heat concentration which is particularly useful near the front of the furnace to offset door losses. These are also welded to the tubes.

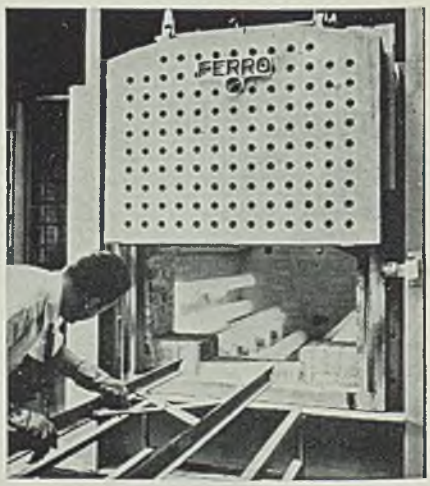
Diffusion Type Burners Used

The tube ends project through the back wall of the furnace and the burners and eductors are coupled to them. The eductor is a venturi shaped device, provided with pressure air to pull the hot products of combustion through the tubes. The two top passes of the bottom tubes are used as "pigs" or supports for holding the ware. To these are welded strips of alloy, broken here and there for expansion joints, and the burning bars are laid directly on these. While refractory "pigs" require constant attention, the tubes remain true and undisturbed with all kinds of service.

A newly designed gas burner of the diffusion type is used with these tubes. It consists of two burners, set in tandem, the first acting as a pilot and the second as the main burner. The pilot has two venturi throats and space for the inspira-

(*Please turn to Page* 60)

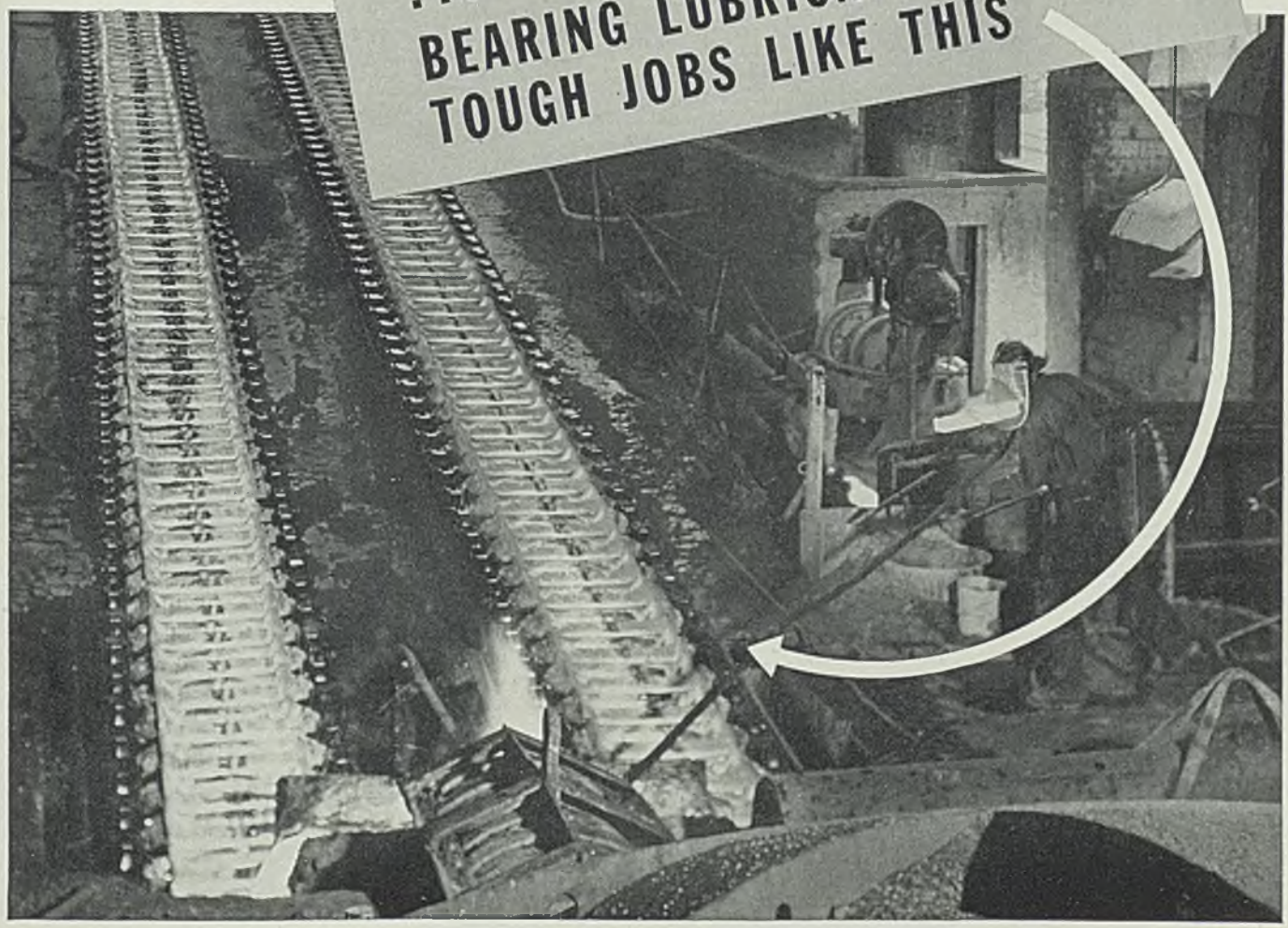




PHANTOM view (left) illustrating position of radiating tubes and method of supporting them in furnace. Right, is shown furnace as it appears in operation. Note white hot tubes on bottom and sides. Negative pressure in tubes prevents escape of combustion products into furnace should holes appear in tube walls

GULF H·M·GREASE

...THE *Right* BEARING LUBRICANT FOR TOUGH JOBS LIKE THIS



GULF LUBRICATION ENGINEERS *Cooperate with Plant Men to Save Maintenance Expense*

WHEN hot iron is poured into the molds and starts up this long pig conveyor, it gives off tremendous heat. The bearings which support the conveyor are exposed to the heat—and must be protected against excessive wear and failure by a lubricant which can "take it."

That's where the Gulf engineer comes in. He recommends a lubricant—from Gulf's complete line of more than 400 oils and greases—which has been specially manufactured to provide for such operating conditions as these. In the case pictured above Gulf H.M. Grease is used—a high melting-point grease specially manufactured to withstand such severe conditions. As a result, the plant manager reports lowest costs for bearing maintenance.

For each piece of equipment in your mill, no matter what the conditions of operation, the Gulf engineer is prepared to recommend the oil or grease which provides maximum protection against wear and maintenance expense. A Gulf engineer is always at your service.

GULF OIL CORPORATION
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GULF INDUSTRIAL LUBRICATION

WELDING, etc.

by Robert E. Kinkead

How Long Will It Last?

IT IS no secret the welding industry as a whole was never so prosperous as at the present moment. One of the principal topics of conversation coming up among men engaged in the industry arises from attempts to answer the question of how long it will last.

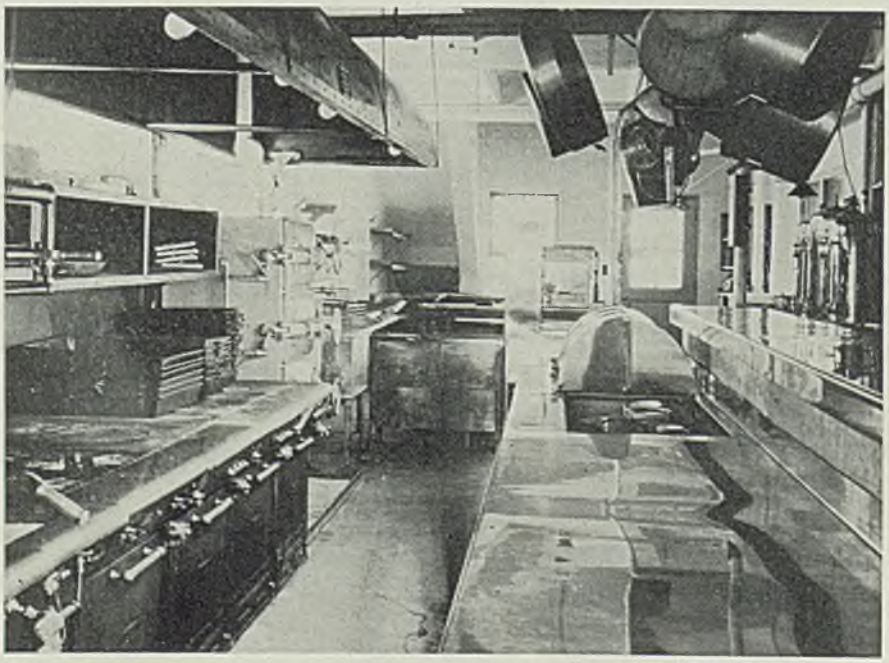
Our own idea is the welding industry will prosper or languish along with industry at large. In the main, American industry is prospering because able men are trying to make money by producing things for which there is an economic want. So long as this condition continues, there will be what we call prosperity for the country as a whole. As soon as the able and energetic turn from that policy and try to make money out of money, the decline will set in.

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.

It is inevitable in the light of history, as soon as many men acquire substantial means, they turn from production to making money out of money. And it is a further fact, well established by the record, that once they start in this direction, nothing will stop them short of an economic smash. The people we refer to are not the mythical "they" who are supposed to rule Wall street and Washington. "They" are the mass of people who have incomes of $2000 to $100,000 per year. What the people of higher income do is of no great consequence to the country as a whole.

The hope for continuance of this move in the direction of general prosperity must necessarily rest on the fact the country went through such a bad economic smash it will require from three to six years for people to become well enough off to lose their heads and think they can make money out of money again.

Clean Steel Serves Clean Food



PRACTICALLY everything in sight in this hotel kitchen is made of stainless steel. Serving equipment and containers at Atlantis hotel, Miami, Fla., are made of Armco 18-8 stainless steel, No. 4 polish, manufactured by American Rolling Mill Company, Middletown, O. All equipment shown here was formed according to specification. It was designed especially to speed service and minimize the work of cleaning and polishing

• • •

Alice in Alloyland

W. D. Wilkerson Jr. in November *Metal Progress* produced a delightful bit of nonsense under the above title. Illustrations by Earl J. Neff furnish the Walt Disney angle. Among the characters are Ferry Chrome, Chromi Yum, Phospho Russ, Silly Con, Kobold, the Corrosive Agents.

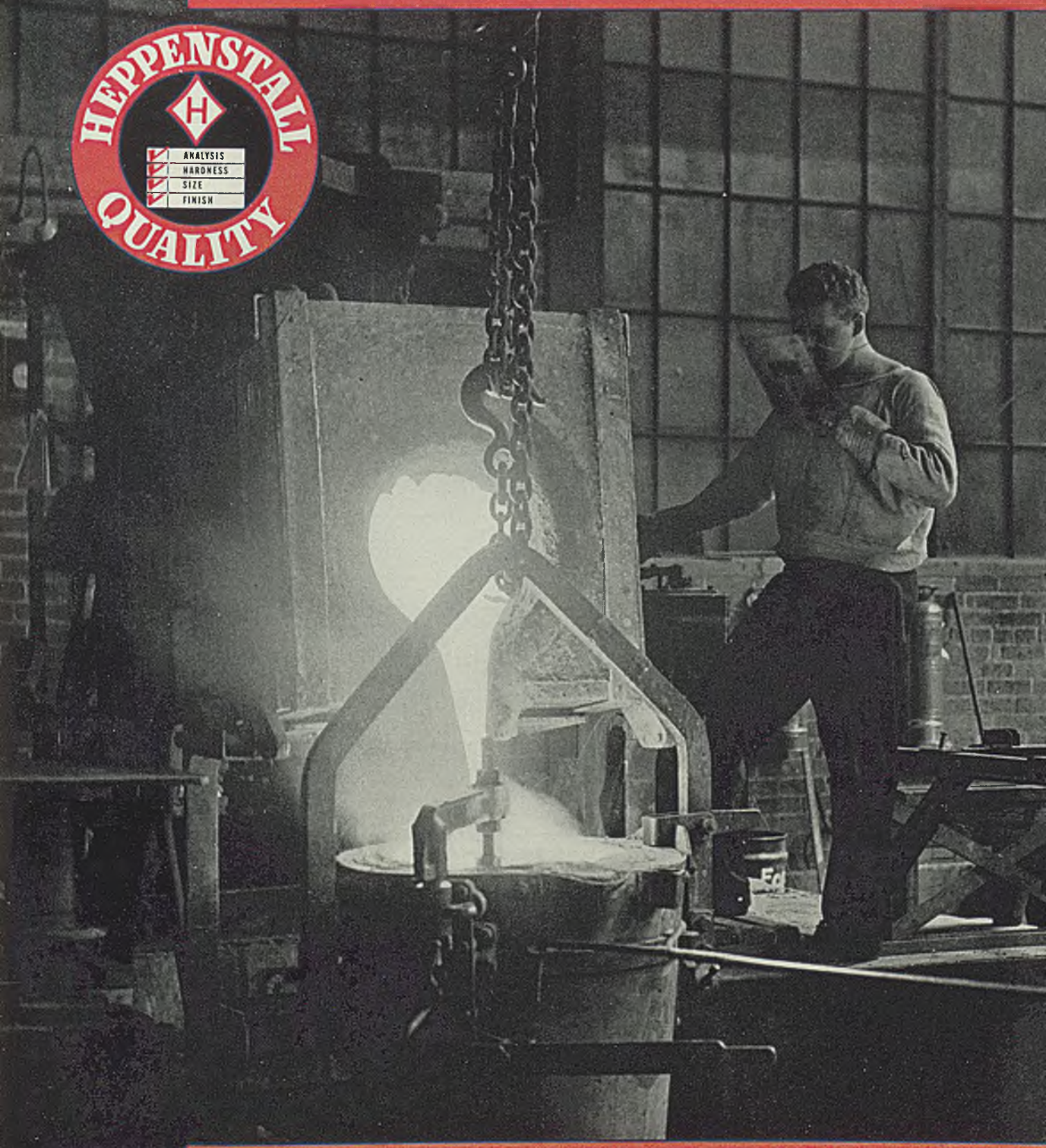
The burden of academic degrees is heavy among the upper crust of metallurgists. Doctors of Science are common, Masters of Science are the Yeomen of the business and Bachelors of Science are used to change the charts on the pyrometers. But the metallurgists almost always have the saving grace of being able to kid themselves enough to maintain a reasonable degree of mental health. Where this is not the case, the boys down in the mill who make the metal supply the need for mental perspective in ways that are effective if not conducive to the dignity of the man who is taking his Doctor's degree too seriously.

We cannot fail to remember that two of the boys who were inmates of our own Agricultural and Mechanical College at the same time we were are now chief metallurgists of the first and third ranking steel producers. Both are able and practical.

Alice in Alloyland is clever and humorous.

Pioneer Melter of Steel in Electric Induction Furnaces, Heppensta

Offers a Valuable Background of Experience in Tool Steel Product



HEPPENSTALL COMPANY

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LOCOMOTIVE AXLES, PINS AND RODS...E. I. S. AND O. H. ALLOY STEELS...CARBON AND ALLOY FORGINGS

Now Is the Time for Protection of All Lubricants Against Winter Cold

BY THIS time lubricant in speed reducers and equipment with oil reservoirs should have been changed to winter oil where exposed to the atmosphere. In some cases where the plant is unheated at nights or over the week end such changes of oil are also advisable.

Where the equipment is exposed to high temperatures during the day and cold at night winter oil may not afford the desirable protection because of thinning too greatly with the heat. Where this occurs the use of some method of warming the oil is advised.

Steam or hot water flushing sometimes cause water to enter the casing and contaminate the lubricant. Often they cannot be used because of the surroundings.

Blow torches, if properly applied, evenly over the casing, but not above the oil level, are a common method of warming the oil. Care must be exercised not to spot heat and crack the case by unequal expansion.

Prevent Conveyor Freezing

For conveyor systems installed in the open, where the roll bearings as well as the speed reducers are liable to "freeze," some plants adopt the practice of operating frequently, empty if necessary, during cold weather and continuously during extreme cold spells. Temperature in outside pits or trenches is often lower than at the surface, particularly when exposed to damp lake breezes. The moist atmosphere aids in "freezing" the bearings.

Immersed electric heaters are usually the most satisfactory method of heating the oil. These may be turned on at a predetermined time by the watchman and so have the lubricant warmed up at starting time.

Danger exists in connection with "home-designed" electric oil heaters in that the heating unit is generally designed with too great capacity so that the surrounding lubricant gets too hot and sometimes burns (carbonizes) before the mass of lubricant is warmed enough to flow or circulate. Such heating units should be designed to heat slowly. Also if more than a single heating element is installed it is well to separate the units so that all of the heat is not located in a single spot.

What! No Maintenance?

THE most profitable moments to the management are when the maintenance men have nothing to do in the line of repairs, especially from emergency breakdowns. This viewpoint is well summed up in the following quotation from a recent crane advertisement in STEEL.

"You can be glad when there's no work for the maintenance man; when production's running smoothly. The less fixin' he has to do the better off you are. Breakdowns means costly delays—time losses for men and machines—extra expense."

This is true not only of cranes and machines but also of the drives, because when the drive fails the machine stops; if the drive gives trouble, production falls down.

Maintenance can be decreased by providing the most suitable and substantial equipment for the service and by continuous inspection and servicing to see that the equipment remains in proper running condition. Because the maintenance men are not rushing from one breakdown to the next does not mean that they need sit idly by waiting for an accident to happen. However, time spent in reading a newspaper is more profitable to the management than time given to emergency breakdowns.

Maintenance men may be profitably kept busy on continuous and repeated inspections to find and tighten loose parts, to locate wearing parts which may be replaced at the first convenient opportunity instead of waiting until they wear out in service, to detect undue heating which is usually a good indicator of possible future trouble and to clean, oil and service regularly and efficiently. Such service, although not spectacular, is the most economical and profitable to the management.

♦ ♦ ♦

Recognize Signs of Trouble

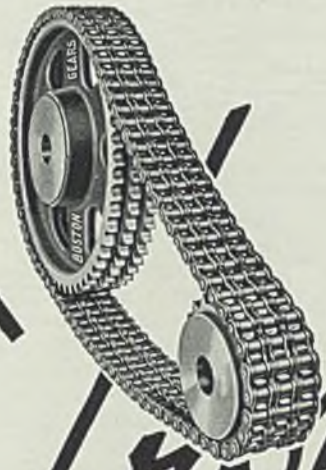
Seldom does a breakdown occur without some indication of impending trouble just as clouds appear before a storm. Industrial maintenance, however, has not progressed to the point where a "barometer" will indicate an early failure.

Breakdowns usually give some sign or signal. Hot bearings or motors, sparking commutators, excessive arcing in contacts, burnt points, loose connections, and the peculiar sound of single phasing are only a few of the omens of trouble ahead.

The experienced maintenance man keeps his eyes and ears open for these signals. False notes in the rhythm of factory noises in some cases warn more than the eye can see. In a way these uncommon noises are distress signals or signs of torture or abuse. Whenever such occur the cause should be traced down immediately and the necessary emergency treatment applied.

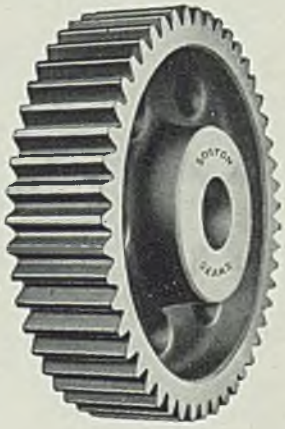
♦ ♦ ♦

Prevention of waste of spare parts, materials and supplies for repair or maintenance will usually pay greater returns than buying low-priced items. Labor in replacement and cost of interruption are usually so far in excess of the cost of parts and material that only the best are worth using.



"from stock"

TO YOU



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MEMBER OF A.G.M.A.

BOSTON GEAR WORKS, INC.
NORTH QUINCY, MASS., U. S. A.

BOSTON GEARS

PROGRESS IN STEELMAKING

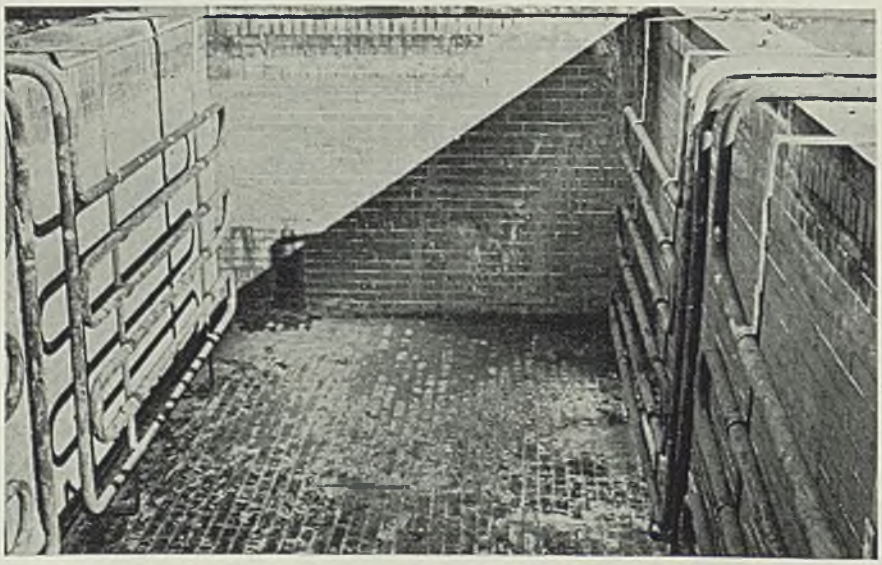
Waste Pickle Liquor Is Evaporated In Rubber-Lined Steel Tank

FACED with the problem of disposing of waste sulphuric pickle liquor, a large manufacturer in Ohio devised a system whereby the liquor was piped to a large outdoor tank. Here, by means of steam coils, it was held at a temperature of 210 to 220 degrees Fahr. until completely evaporated.

The original installation consisted of a large concrete tank. This did not prove satisfactory, however, due to the fact that the concrete was constantly cracking from the contraction or expansion, permitting waste liquor to leak out onto the ground which caused an undesirable working condition.

This tank was replaced in July, 1936 with a 6500-gallon steel tank of all-welded construction which was lined with a ¼-inch thickness of Triflex rubber. This lining, which is a product of the B. F. Goodrich Co., Akron, O., consists of a layer of hard rubber vulcanized between two layers of soft rubber. It is provided with built-in expansion joints which permit the lining to contract or expand without danger of cracking. As a protection against excessive heat or physical damage, the lining is covered with a special brick sheathing.

During the six months the tank has been in service no difficulty whatsoever has been experienced with leaks. Due to the fact that the tank has no overhead protection, it is planned to maintain a low steam pressure in the coils throughout the winter months while tank is empty to prevent any water which might collect from freezing and causing damage.



Welded steel tank lined with rubber and sheathed with acid-resisting brick is equipped with steam coils for effecting quick evaporation of spent pickling liquor

◆ ◆ ◆

Safety Features Provided

All buildings of a recently completed stripsheet mill in the Great Lakes district using overhead cranes are equipped with safety walks and stairs which permit crane operators to reach their posts without the aid of ladders. The building housing the hot strip mill is equipped with motor-operated windows in its glass monitors. Catwalks are provided at the sides of the windows for the windows washers and all buildings have both exterior and interior monorails from which sidewall windows may be washed without the use of trolleys. These monorails also proved extremely useful in glazing the building, and will be employed in the future when glazing and repairs are necessary.

◆ ◆ ◆

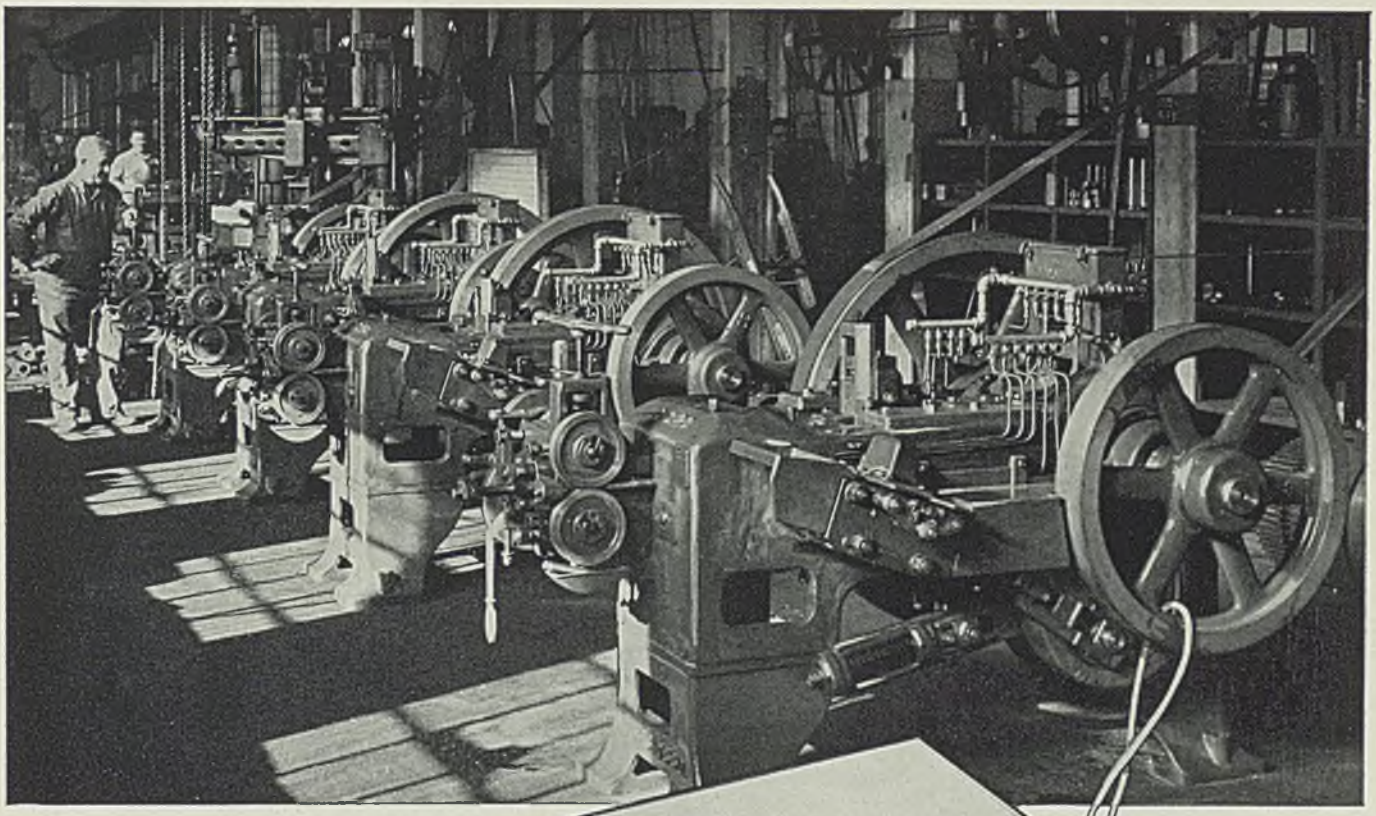
Glaze Reduces Eye Strain

Production and health efficiency in various departments of steel mills, and fabricating and processing departments can be increased by the application of a newly devised glaze for shop windows. The liquid is tough, durable and impervious to weather. Furnished either in blue or white, the new material can be brushed or sprayed on the outside or inside of windows. It diffuses the sun glare that strikes through the glass and fills the factory interiors with a soft, restful light. Over 90 per cent of the daylight is maintained. Room temperatures are reduced from 10 to 15 degrees Fahr. by the application of this tinting solution. It will not rub or flake away.

◆ ◆ ◆

Power Requirement Is Large

Over 7000 horsepower is required to operate a new 72-inch reversing cold strip mill recently installed in the Chicago district. This is the largest amount of power ever applied to a single stand reversing cold mill. The rolls are driven by a 4000-horsepower motor and the reels by two 1500-horsepower motors. A 3-stand tandem cold mill in the same district requires 6850 horsepower for its operation, the largest amount of power yet concentrated on a single tandem cold mill. A 1500-horsepower and two 2500-horsepower motors drive the main rolls while the tension reel is powered with a 350-horsepower motor.



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Welded Pressure Vessels Produced with Thick Walls

(*Concluded from Page* 35)

chromium, 0.50 molybdenum, under 0.20 carbon, and 0.30 to 0.60 manganese. It finds that good welding results with this plate in thicknesses up to about 1-inch. Due to the extreme air hardening qualities of this steel, difficulty is encountered with thicker sections and it has been found that welds in the thicker sections require more careful inspection than warranted from a cost standpoint. In many cases steel of the same analysis, excepting that the chromium content is 2 to 3 per cent instead of 4 to 6 per cent, is used because of its superior weldability.

For welded pressure vessels for the oil industry, for operation at temperatures up to around 900 degrees Fahr., creep value rather than tensile strength is the controlling consideration so there is practically no advantage in using high tensile modified carbon steels over firebox quality steel with 55,000 pounds per square inch tensile strength. In fact, ordinary carbon steels quite usually are used unless corrosion becomes a factor. For use with nitric, acetic and some other acids, the company uses considerable stainless steel, including straight chromium stainless containing 15 to 18 per cent chromium, and the 18-8, chromium-nickel type. For certain processing purposes nickel-clad and stainless-clad steels are used. For low-temperature operations, such as in the dry ice industry and in the dewaxing process in the oil industry, there is an increasing use of steel containing 2 to 3 per cent nickel.

Measuring Power Required In Cutting of Metals

(*Concluded from Page* 41)

of monel metal were discussed in a paper by O. W. Boston, professor, college of engineering, University of Michigan, Ann Arbor, Mich., and W. W. Gilbert, instructor in that college. The manner in which high speed steel tools wear and fail was brought out and the tool life of the large radius tool was compared with that of a straightedged small radius tool. The practical advantages of each were discussed. Cutting speed tool life curves were presented and equations developed for the latter tool when turning monel metal with thin cuts and shallow thick cuts for each of several types of cutting fluids were shown. The influence of feed and depth of cut on tool life at various cutting speeds was determined when turning monel metal with a sulphurized mineral oil. Three components of the cutting force also were determined for various combinations of feed and depth of cut when turning monel metal with an emulsion.

Comparative torque and horsepower requirements of standards 4-flute and spiral flute taps were discussed by Harry L. Daasch, associate professor of mechanical engineering, Iowa State college, Ames, Iowa, Data were presented on requirements for the use of ½-inch, 13-tread, standard flute and spiral tip flute taps during the tapping of S.A.E. 1020 steel. The torque values were shown to vary with speed when a constant percentage of thread was produced. The torque increased the speed when lard oil was used as a cutting fluid; also the tendency was toward decreased torque with increased speed when sulphurized oil was used. Spiral tin taps required less torque than straight flute taps under similar cutting conditions, the speaker pointed out. Horsepower requirements were found to be less with sulphurized oil than with lard oil at high percentages of thread depths for both kinds of taps. Spiral tip taps could be operated at lower horsepower inputs than could the straight flute style when similar cutting conditions exist.

Another series of tests pertained to the dry tapping of cast iron with ⅜-inch, 16-thread taps. There was little difference in the torque requirements when the two types of taps were used. Slightly lower horsepower input was shown for the spiral tip tap.

Tire Chains Subject of Research at Institute

An industrial fellowship investigating broadly the durability of automotive tire chains has been founded at Mellon Institute of Industrial Research, Pittsburgh, by the McKay Co., Pittsburgh, which manufactures commercial chains of all types. This fellowship, which began operation on Sept. 15, 1936, has for its objective the production of better chains, particularly for the motorist. A comprehensive program of basic research is being carried on, including studies of the design, materials, processes of manufacture, and testing of chains.

The McKay fellowship is headed by Dr. David F. Helm. Prior to joining the research staff of Mellon Institute, Dr. Helm was employed as research engineer on cast iron metallurgy in the engineering experiment station of Ohio State university, Columbus, O.; previously he was a chemist with the Midgley Foundation, Columbus.

Radiant Tube Furnace for Porcelain Enamel Firing

(*Concluded from Page* 52)

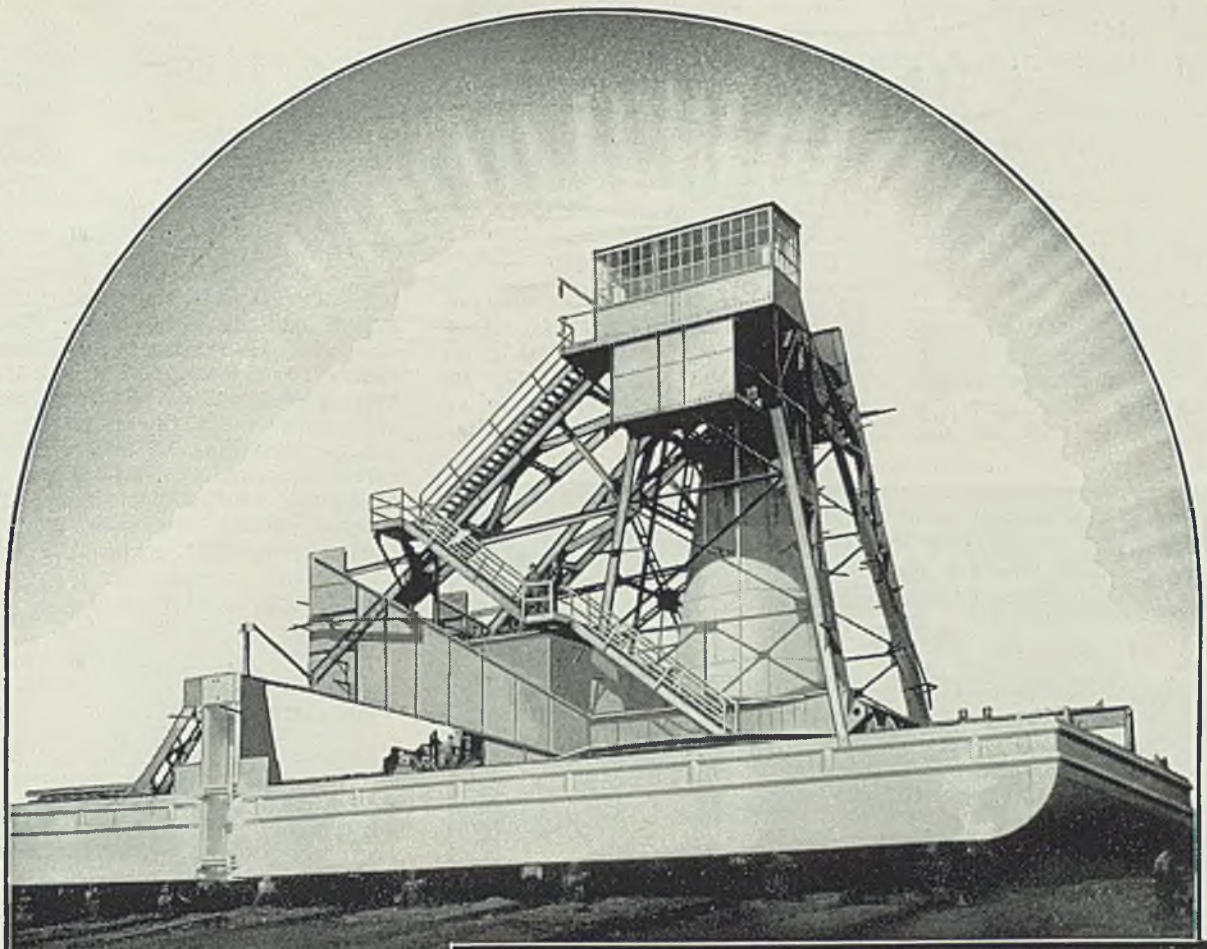
tion of primary air. A gas nozzle is located just back of the pilot burner which fires into and through the main burner. Surrounding the second venturi is a chamber through which the gas flows and is preheated on its way to the four burner nozzles. The pilot burner and the four gas nozzles which start from this chamber protrude into the end of the alloy radiant tube and the remainder of the air for combustion is drawn in at this point through the action of the eductor.

The gas pressure ranges from 3 to 4 ounces while the air pressure in the eductor is 16 ounces. Automatic temperature control is provided in the form of a single potentiometer, thermocouple and motor for all four gas burners. The motor operates on and off valves in the air and gas supply lines which are brought close together, at this point, for this purpose. The pilot lights operate constantly except during periods of suspension of production. Another important feature is that almost any existing enameling furnace can be quickly converted to this method of heating by installing these tubes and gas burners. If of the muffle type, the muffle can be removed.

Illumination Design Data Published in New Booklet

Lighting standards and systems, general interior lighting design, supplementary lighting methods, floodlighting and sportlighting, luminous architectural elements are the main topics covered in a new booklet recently released by Nela Park engineering department, General Electric Co., Cleveland. It is intended as an outline of procedure in lighting design with a compilation of essential design data and tables of value to engineers, architects and others responsible for lighting design and installation.

Use of the visibility meter and standards of the footcandle system are outlined. General interior design treats coefficients of utilization, color correction, types and styles of arrangements for most effective services under varying requirements and surroundings. Styles of lights and their arrangement for best results are described in supplementary lighting methods. Industrial applications to jobs of all types are also illustrated in this section. Floodlighting design for general and specific applications and the light to be expected from any given arrangement of floods is shown.



Giant clamshell dredge built of Granite City Steel Plates by the St. Louis Shipbuilding and Steel Company.

STEEL PLATES
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Granite City Steel Company can supply steel plates in all qualities for almost any purpose. Plates to be sheared, punched, fabricated or welded are certain to respond with complete satisfaction. Careful supervision and the most modern production methods assure excellent surface, accurate sizes, good workability, and uniform flatness.

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8 South Michigan Blvd., Chicago
1805 Boatmen's Bank Bldg., St. Louis
1613 Pioneer Bldg., St. Paul
1602 Mariner Tower, Milwaukee
1750 Army Street, San Francisco

NEW EQUIPMENT

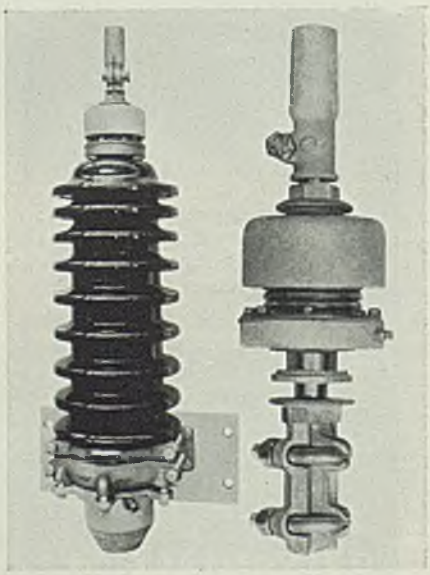
Reflectors—

Curtis Lighting, 1123 West Jackson boulevard, Chicago, has recently designed two new reflectors for industrial lighting. The new No. 1585 reflector is designed for use with 500 or 300-watt incandescent lamps or 400-watt mercury vapor lamps. The unit is protected by an aluminum housing so it may be mounted above craneways, under or near open skylights and in similar unprotected positions without danger of lamp breakage. Overall diameter of the housing is 13⅜ inches and height the same. The No. 1590 unit is designed for 400 watt mercury vapor or 750 to 1500-watt incandescent lamps. The silver mirrored reflector is encased in an aluminum ventilated housing. Diameter of this reflector is 21½ inches, height 21 inches. Socket adjustment on threaded pipe provides proper light control for each interior.

• • •

Cable Terminator—

Delta-Star Electric Co., 2400 Fulton street, Chicago, announces a single conductor cable terminator for use on an oil pressure cable. The device is equipped at the lower end with a standard wiping sleeve and at the top with an expansion type stud. The expansion member is an oil tight bronze bellows securely gasketed to the external parts. It permits free expansion and contraction of the cable under all weather conditions. A gas relief plug is also provided. The clamp type internal connector is of the double-U bolt form, insuring a permanent connection. Terminators can be furnished complete with in-



Delta-Star expansion joint cable terminator for use on an oil pressure cable

ternal barriers and stress cones to suit any type of cable. A voltage of 46 kilovolts and a current of 750 amperes can be carried.

♦ ♦ ♦

Welding Machine—

Giant Grip Mfg. Co., Oshkosh, Wis., announces a new welder in four models ranging from 90 to 300 amperes. The new welders are lighter in weight than the standard machines made by this company, as a result of the wood construction in the cabinets and the arrangement of the amperage control. Only ten controls are provided in the smaller models and fourteen in the larger. With the same safety factor as the standard machines, these new welders are specially designed

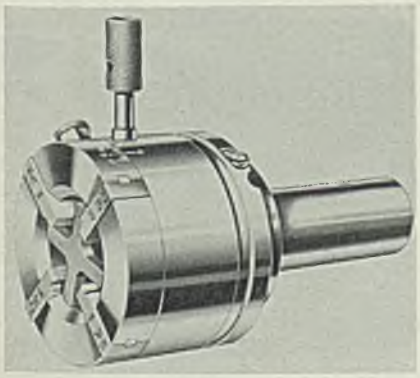
New lightweight portable welding machine built by Giant Grip Mfg. Co.

transformer type but without reactance control, static high frequency arc or sheet metal attachment. Each is equipped with rotating knife switch control with amperage distinctly marked indicating each step in welding.

♦ ♦ ♦

Die Heads—

Geometric Tool Co., New Haven, Conn., has redesigned the style C line of self-opening die heads, making it possible to convert one whole series of tools from an inside trip die head to an outside trip type tool, or vice versa. Conversion may be easily made through the use of a few small parts. Inside trip head is recommended for use where work is irregular in shape so it cannot be uniformly chucked, yet uniform thread length must be maintained. Outside trip heads are employed in cutting fine pitch threads or short lengths where it is desirable to relieve the chasers and the thread of all stress in tripping. Tools are all of alloy steels, hardened and ground. Twenty-three sizes and types of the style C heads are carried in stock with a cutting range from ⅜ to 6 inches. Special order types range up to 10 inches in diameter.



Geometric type C die head with internal tripping device, also available in external tripping model

♦ ♦ ♦

Ventilator—

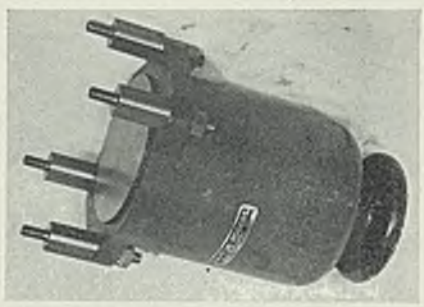
F. Meyer & Bro. Co., 1311 South Adams street, Peoria, Ill., has recently placed on the market a new type ventilator known as the Syphon Air model. A vane keeps the rear of the ventilator to the wind, and twin vents cause a stream of air to rush past the opening in front,

sucking the air from below out with it. Ventilators range in size from 8 to 48 inches, in capacity from 150 to 4600 cubic feet per minute with a wind velocity of 5 miles per hour. Rotation of the ventilator is on bronze bearings to avoid rust, Armco ingot iron of ample gage is used throughout.

♦ ♦ ♦

Die Cushions—

Dayton Rogers Mfg. Co., 1845 East Franklin, Minneapolis, is now marketing a new improved design of a combination drawing and stripping die cushion. The basic design of this device is a heavy cast iron alloy cylinder that may be clamped directly to the press bolster plate for shallow drawing purposes. It may also be placed with the use of spacing studs clear of the bolster plate for compound blanking purposes. The long piston, having a hardened and ground top face to receive the draw ring pins, is guided by a generous size piston stem protruding through the bottom of the piston cylinder. The end of the threaded piston stem is provided with a precision adjusting hand wheel that predetermines the height of the piston face when the piston is at rest. This eliminates the necessity of correcting the length of the draw ring pins or stripper rods on compound dies. This hand wheel adjustment is not only used to an advantage on the drawing dies, but it is very readily brought into use in adjusting the stripper to the correct height after the compound punch is ground, thus, assuring the stripper at its correct height in its free or idle position. Each pneumatic cushion unit is self-contained, consisting of its own air chamber and takes the air directly from the air line; consequently, the necessity of auxiliary air tanks is eliminated. It is also provided with a pneumatic hose connection from the regulating valve with a pressure gauge recording the amount of air pressure used on each job. This universal cushion is now offered in five sizes having piston diameters from 4 inches to 12 inches, working pressure from one-quarter ton to five tons on an air line of 20 pounds to 150 pounds, with a maximum drawing capacity of 1½ inches on all sizes.



Dayton Rogers universal pneumatic die cushion

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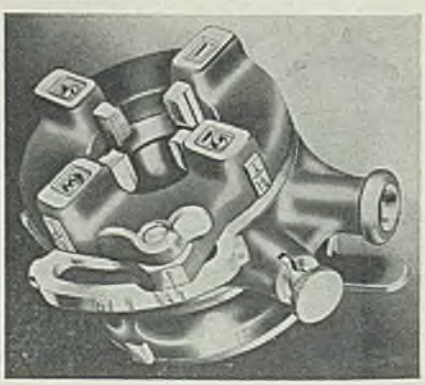
Threading Tool—

Beaver Pipe Tools, Warren, O., announce a new ratchet threading tool, known as No. 60-R. Capacity of this tool is ¼ to 1½ inches.



Beaver No. 60-R ratchet pipe threading device

Three sets of dies, each threading two sizes cover the range and are quickly changed. The dies are fully adjustable for cutting standard, oversize or undersize threads. A three-jaw self centering chuck centers the pipe, no bushings or grip screws being necessary. Threading dies are well above the face of the stack, are easy to oil and the chips fall away. Extra heavy ratchet and ratchet pawl are provided. The unit is of unbreakable air furnace malleable iron with a rust proof finish.

♦ ♦ ♦

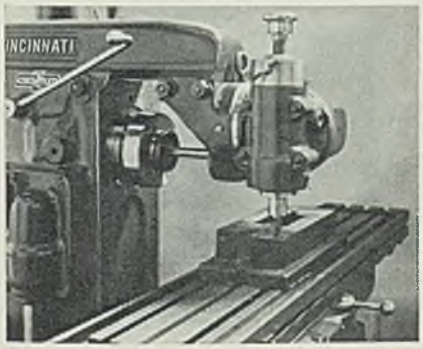
Spiral Screw Driver—

Forsberg Mfg. Co., Bridgeport, Conn., has recently placed on the market an improved model spiral screwdriver. The new tool drives screws 2½ to 5 turns in one stroke. Reversible feature has been eliminated in this model. Strong clutch is built in with a positive lock for heavy service. Handle is finished in mahogany and metal parts are chromium plated except the bits which are blued. Three models are available—W71, length closed 9⅝ inches, each stroke turning the screw 2½ times; W81, length closed 13⅞ inches, each stroke turning the screw 5 times; W91, length closed 15⅞ inches, each stroke turning the screw 4½ times.

♦ ♦ ♦

Milling Attachment—

Cincinnati Milling Machine and Cincinnati Grinders, Cincinnati, announces a new high speed universal milling attachment, made in sizes



Cincinnati high speed universal milling attachment for L-type, MH and Dial type machines

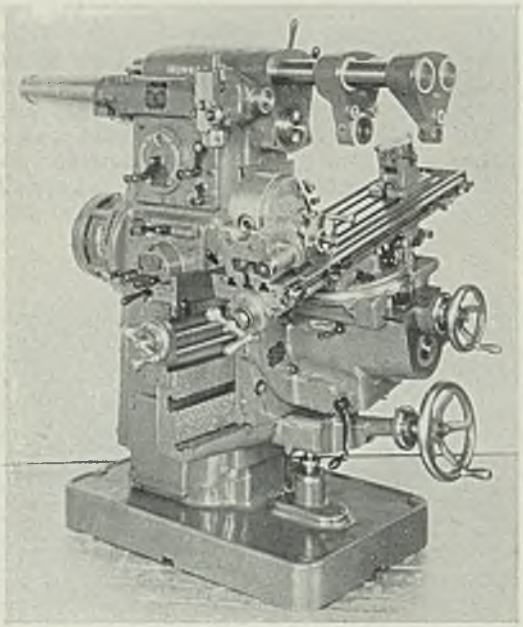
to fit Cincinnati L-type, MH, and dial type milling machines. This attachment is especially useful in tool rooms and light production work requiring the use of small milling cutters, drills or boring tools. Spindle may be swiveled 360 degrees in the plane parallel to the face of the machine column and 90 degrees in a plane at right angles to the face of the column. Graduations around the circumference of the housings allow accurate setting of the cutter to any desired angle. Four clamping bolts in each swiveling element hold the spindle in the desired position. The attachment is driven directly from the machine spindle by means of a splined shaft fitting into an adapter. The overarm supports the attachment, permitting the entire cross range of the machine to be usable. Gears and shafts are made of heat treated alloy steel, and the drive is supported on antifriction bearings throughout.

♦ ♦ ♦

Milling Machine

Brown & Sharpe Mfg. Co., Providence, R. I., is now equipping the Omniversal milling machine with an Omniversal head designed to increase the range of the machine. In addition to the movements and adjustments of the universal model, the new machines have angular adjustment of the knee in a vertical plane at right angles to the

spindle and a horizontal feed of the entire knee assembly in the same plane. The new head, which is adjustable parallel to the main spindle, has a spindle that can be set accurately in any angle in a horizontal or vertical plane. This feature eliminates use of many special jigs and fixtures, according to the company. The Omniversal head is mounted on the left side of the column of the machine where it is readily available for use. The head may be used in either the normal position at the left of the column or in either of the overarm holes; it may be adjusted transversely 14 inches in the former position and 5⅞ inches in the latter; the head has universal angular adjustment through verniers reading to two minutes of arc; and the spindle itself has a 2-inch axial hand feed and may be clamped in position anywhere along the path of travel. The head spindle is gear driven from the rear of the machine spindle in all positions and has a speed range of 88 to 2860 revolutions per minute in approximately a 2 to 1 ratio with the machine spindle speeds.



Brown & Sharpe Omniversal milling machine equipped with Omniversal head, which permits adjustments in all directions

♦ ♦ ♦

Welding Electrodes—

Metal & Thermit Corp., 120 Broadway, New York, announces an addition to its line of Murex heavy coated electrodes for arc welding. The new electrode, known as Murex Type N, is designed for bridging gaps where fit-up between plates is poor and, in the smaller sizes, may be used on vertical and overhead work, or to make rapid, single pass welds on light gauge materials. In addition, it will produce clean, sound, single or multiple pass fillets. The physical properties of the metal deposited by the Murex Type N electrode are said to range from 74,000 to 84,000 pounds per square inch in tensile strength with 26 to 24 per cent ductility. The new electrode is also said to work equally well with either direct or alternating current and may be used either with straight or reversed polarity.

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.

Cleaning Unit—Pangborn Corp., Hagerstown, Md. Bulletin No. 201a, describing and illustrating type "RA-2" rotoblast cleaning unit.

Plastic—Richardson Co., Lockland, O. Handbook describing Insurok, giving information regarding specifications and for procedure in working it, etc.

Abrasives—Norton Co., Worcester, Mass. Booklet No. 168-1P, offering a condensed study of abrasive wheels, polishing and buffing powders used in lapidary work.

Acetylene Gas—Air Reduction Sales Co., Lincoln building, Forty-second street, New York. Booklet giving history and specific qualities of acetylene gas. Includes a diagram illustrating comparative consumption of oxygen by the various fuel gases.

Power Transmission Equipment—Boston Gear Works Inc., North Quincy, Mass. Catalog No. 51, illustrating the company's numerous products, includes tables of various sizes and prices.

Burnishing Rollers—Haynes Stellite Co., Kokomo, Ind. Folder No. F-3107, describing advantages of burnishing railroad car axle journals, locomotive driving axle journals, piston rods, and crank pins, with the company's rollers.

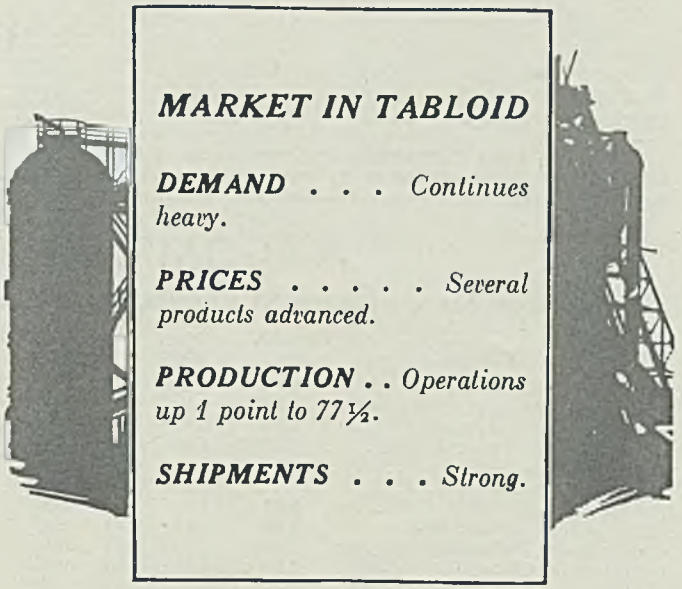
Turret Lathe—Jones & Lamson Machine Co., Springfield, Vt. Folder No. 122, illustrating a number of the company's turret lathes, with bar capacity from 1½ to 4 inches and chucking capacity of 10 to 18 inches.

Welding and Cutting Equipment—Bastian-Blessing Co., 240 East Ontario street, Chicago. Booklet No. R-120, announces reduction in prices of welding and cutting equipment in spite of rising costs and tells how this was achieved in its own factory.

Speed Test Set—Niagara Electrical Instrument Co., 1 West Genesee street, Buffalo. Folder illustrating how a practical test of load conditions on electrical equipment, individual motors and feeder circuits, can be quickly made with Niagara speed test set.

Steelworks Operating Rate Advances to 77½

Backlogs Near Peak; Heavy Production Into January Likely



MARKET IN TABLOID

DEMAND . . . *Continues heavy.*

PRICES . . . . . *Several products advanced.*

PRODUCTION . . *Operations up 1 point to 77½.*

SHIPMENTS . . . *Strong.*

BACKLOGS began to show signs of leveling off at their high peaks last week, but the national steelworks operating rate increased 1 point to 77½ per cent of capacity and appeared likely to continue undiminished through the greater part of this month and into January.

Automobile production, freed from the adverse effects of labor trouble in suppliers' plants, increased 19,060 units to 119,455 from the previous week's 100,395. Advance buying of steel by Ford, Chrysler and Chevrolet is now estimated sufficient for 2,100,000 models. On this basis it is calculated that the entire industry has bought steel for more than 2,500,000 cars. Studebaker, which has reserved 40,000 tons, estimates it has saved about $4 a car.

Railroad purchases, while not as heavy as in the week before last, still were active. Denver & Rio Grande Western ordered 12,640 tons of rails; Kansas City Southern, 8000; Grand Trunk 3500, and Wheeling & Lake Erie 2000. Car awards included 2275 for the Southern Pacific and 2000 for the Chesapeake & Ohio. Southern Pacific ordered 28 locomotives and Denver & Rio Grande Western 15. Pennsylvania is reported considering an extensive repair program, which may involve possibly 24,000 freight cars and 1800 locomotives. One leading carbuilder has requested protection on 250,000 tons of plates alone.

Shape Awards Higher

THE price advance has brought in a large volume of inquiries from structural steel fabricators. Shape awards last week totaled 26,985 tons, an increase of 9,853, and were featured by the placing of 12,000 tons for Republic Steel Corp.'s new strip-sheet mill.

Additional sheet producers last week found themselves unable to accept further tonnage at fourth quarter prices. The mills have turned down considerable business because of the delivery situation. However, by late last week most large consumers had contracted for a large portion of their first quarter requirements.

Several producers of semifinished material have declared themselves out of the market on tonnage to be shipped at fourth quarter prices. Nearly all grades of bars and small shapes have been in heavy demand, and in certain districts it is reported little additional tonnage can be accepted for shipment by Jan. 31. Demand for manufacturers' wire is better at present than in any recent December.

Tin plate operations are up slightly, averaging better than 95 to 100 per cent, with a leading producer operating at 97.

A general advance in warehouse steel prices is expected to be announced in the near future. Light rails have been advanced $3 a ton, ferromanganese is up $5 a ton and pipe discounts have been extended unchanged. A first-quarter price announcement is anticipated soon in skelp.

Scrap Composite Up 38 Cents

THE strong upward price movement continues in scrap and is reflected by a 38-cent rise in STEEL'S composite. This third consecutive weekly advance puts the index at $16.63, highest since September. No. 1 steel advanced 75 cents a ton to $18-18.50 at Pittsburgh; a number of grades were up 25 to 50 cents at Chicago; prices were boosted 25 cents to $1 in the Boston district, and at Philadelphia No. 2 heavy melting steel was up to $14.

The iron and steel price composite is up 9 cents to $35.08. The finished steel index remains at $53.90.

Daily average steel ingot production in November, 173,496 gross tons, was larger than in any month since September, 1929. It was 3 per cent ahead of October's daily average, 168,333 tons, and 43 per cent ahead of November, 1935, with 121,170. Total November output, 4,337,412 gross tons, fell 4 per cent below the October production of 4,545,001 tons. Eleven months' total production, 42,487,717 tons, was 40 per cent ahead of the 30,344,580 tons produced in the same period last year.

Operations in the Pittsburgh district were up 3 points to 75 per cent; Eastern Pennsylvania 1 to 49½, and Youngstown 1 to 79. Cincinnati was down 4 to 92 and Cleveland 4 to 75½.

COMPOSITE MARKET AVERAGES

	Dec. 12	Dec. 5	Nov. 28	One Month Ago Nov., 1936	Three Months Ago Sept., 1936	One Year Ago Dec., 1935	Five Years Ago Dec., 1931
Iron and Steel	$35.08	$34.99	$34.79	$34.65	$34.15	$33.31	$29.90
Finished Steel	53.90	53.90	53.90	53.90	53.10	53.70	47.74
Steelworks Scrap..	16.63	16.25	16.12	16.05	16.18	13.17	8.16

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

	Dec. 12, 1936	Nov. 1936	Sept. 1936	Dec. 1935
Steel bars, Pittsburgh	2.05c	2.05c	1.95c	1.85c
Steel bars, Chicago	2.10	2.10	2.00	1.90
Steel bars, Philadelphia	2.36	2.36	2.26	2.16
Iron bars, Terre Haute, Ind.	1.95	1.95	1.85	1.75
Shapes, Pittsburgh	1.90	1.90	1.90	1.80
Shapes, Philadelphia	2.11½	2.11½	2.11½	2.01½
Shapes, Chicago	1.95	1.95	1.95	1.85
Tank plates, Pittsburgh	1.90	1.90	1.90	1.80
Tank plates, Philadelphia	2.09	2.09	2.09	1.99
Tank plates, Chicago	1.95	1.95	1.95	1.85
Sheets, No. 10, hot rolled, Pitts.	1.95	1.95	1.95	1.85
Sheets, No. 24, hot ann., Pitts.	2.60	2.50	2.50	2.40
Sheets, No. 24, galv., Pitts.	3.20	3.20	3.20	3.10
Sheets, No. 10, hot rolled, Gary	2.05	2.05	2.05	1.95
Sheets, No. 24, hot anneal., Gary	2.70	2.70	2.60	2.50
Sheets, No. 24, galvan., Gary	3.30	3.30	3.30	3.20
Plain wire, Pittsburgh	2.50	2.50	2.40	2.30
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.25
Wire nails, Pittsburgh	2.05	2.05	1.95	2.40

Semifinished Material

Sheet bars, open-hearth, Youngs.	$32.00	$32.00	$30.00	$30.00
Sheet bars, open-hearth, Pitts.	32.00	32.00	30.00	30.00
Billets, open-hearth, Pittsburgh	32.00	32.00	30.00	29.00
Wire rods, No. 5 to 9/32-inch, Pitts.	40.00	40.00	38.00	38.00

Pig Iron

	Dec. 12, 1936	Nov. 1936	Sept. 1936	Dec. 1935
Bessemer, del. Pittsburgh	$21.8132	21.0632	20.8132	20.81
Basic, Valley	20.00	19.25	19.00	19.00
Basic, eastern del. East. Pa.	21.8132	21.0632	20.8132	20.81
No. 2 fdy., del. Pittsburgh	21.3132	20.5632	20.3132	20.31
No. 2 fdy., Chicago	20.50	19.75	19.50	19.50
Southern No. 2, Birmingham	16.88	15.75	15.50	15.50
Southern No. 2, del. Cincinnati	20.44	19.69	19.44	20.2007
No. 2X eastern, del. Phila.	22.6882	21.9382	21.6882	21.68
Malleable, Valley	20.50	19.75	19.50	19.50
Malleable, Chicago	20.50	19.75	19.50	19.50
Lake Sup., charcoal, del. Chicago	26.2528	26.8750	25.2528	25.2528
Gray forge, del. Pittsburgh	20.6741	19.9241	19.6741	19.67
Ferromanganese, del. Pittsburgh	80.13	80.13	80.13	90.13

Scrap

Heavy melting steel, Pittsburgh	$18.25	$17.40	$17.75	$14.05
Heavy melt. steel, No. 2, east. Pa.	14.00	13.75	14.00	11.25
Heavy melting steel, Chicago	16.50	16.50	16.15	13.35
Rail for rolling, Chicago	17.25	17.25	16.75	14.50
Railroad steel specialties, Chicago	18.75	18.25	17.65	14.25

Coke

Connellsville furnace, ovens	$4.00	$4.00	$3.90	$3.55
Connellsville, foundry, ovens	4.25	4.25	4.25	4.10
Chicago, by-product foundry, del.	9.75	9.75	9.75	9.75

Steel, Iron, Raw Material, Fuel and Metals Prices

Except when otherwise designated, prices are base, f.o.b. cars. Asterisk denotes price change this week.

Quotations include first quarter price advances on sheets, strip and wire, most mills now declining tonnage at former prices; $3 per ton advance on plates, shapes, bars and $2 on semifinished are not yet general.

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.	2.50c
Philadelphia, del.	2.46c
Birmingham	2.30c
St. Louis, del.	2.48c
Pacific ports, f.o.b. cars, dock	2.90c

Hot Rolled Annealed No. 24

Pittsburgh	2.80c
Gary	2.90c
Chicago, delivered	2.93c
Detroit, delivered	3.00c
New York, del.	3.15c
Philadelphia, del.	3.11c
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.	3.71c
New York, delivered	3.75c
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	3.28c

Cold Rolled No. 10

Pittsburgh	2.80c
Gary	2.90c
Detroit, delivered	3.00c
Philadelphia, del.	3.11c
New York, del.	3.15c
Pacific ports, f.o.b. cars, dock	3.40c

Cold Rolled No. 20

Pittsburgh	3.25c
Gary	3.35c
Detroit, delivered	3.45c
Philadelphia, del.	3.56c
New York, del.	3.60c

Enameling Sheets

Pittsburgh, No. 10	2.60c
Pittsburgh, No. 20	3.20c
Gary, No. 10	2.70c
Gary, No. 20	3.30c

Tin and Terne Plate

Gary base, 10 cents higher.

Tin plate, coke base (box) Pittsburgh	$5.25
Do., waste-waste	2.75c
Do., strips	2.50c
Long ternes, No. 24 unassorted, Pitts.	3.50c
Do., Gary	3.60c

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	1.90c
New York, del.	2.19c
Philadelphia, del.	2.09c
Boston, delivered	2.32c
Buffalo, delivered	2.15c
Chicago or Gary	1.95c
Cleveland, del.	2.09½c
Birmingham	2.05c
Coatesville, base	2.00c
Sparrows Pt., base	2.00c
Pacific ports, f.o.b. cars, dock	2.45c
St. Louis, delivered	2.18c

Structural Shapes

Pittsburgh	1.90c
Philadelphia, del.	2.11½c
New York, del.	2.16¾c
Boston, delivered	2.30¾c
Bethlehem	2.00c
Chicago	1.95c
Cleveland, del.	2.10c
Buffalo	2.00c
Gulf Ports	2.30c
Birmingham	2.05c
Pacific ports, f.o.b. cars, dock	2.45c

Bars

Soft Steel
(Base, 3 to 25 tons)

Pittsburgh	2.05c
Chicago or Gary	2.10c
Duluth	2.20c
Birmingham	2.20c
Cleveland	2.10c
Buffalo	2.15c
Detroit, delivered	2.20c
Pacific ports, f.o.b. cars, dock	2.60c
Philadelphia, del.	2.36c
Boston, delivered	2.47c
New York, del.	2.40c
Pitts., forg. qual.	2.40c

Rail Steel
To Manufacturing Trade

Pittsburgh	1.90c
Chicago or Gary	1.95c
Moline, Ill.	1.95c
Cleveland	1.95c
Buffalo	2.00c

Iron

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

Reinforcing

New billet, straight lengths, quoted by distributors

Pittsburgh	2.05c
Chicago, Gary, Buffalo, Cleve., Birm., Young...	2.10c
Gulf ports	2.45c
Pacific coast ports f.o.b. car docks	2.45c
Philadelphia, del. ..	2.26c-2.36c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	1.90c
Chicago, Buffalo, Cleveland, Birm., Young. ..	1.95c
Gulf ports	2.30c

Wire Products

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

Base Pitts.-Cleve. 100 lb. keg

Standard wire nails	$2.25
Cement coated nails	$2.25
Galv. nails, 15 gage and finer	$3.25
do. finer than 15 ga.....	$4.75

(Per pound)

Polished staples	2.95c
Galv. fence staples	3.20c
Barbed wire, galv.	2.75c
Annealed fence wire	2.90c
Galv. fence wire	3.30c
Woven wire fencing (base column, c. 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 19,999 lbs.	2.55c
20,000 to 59,999 lbs.	2.50c
*60,000 to 99,999 lbs.	2.35c
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 2.55c

Alloy	Diff.	Alloy	Diff.
S.A.E.		S.A.E.	
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo.	0.50
4600 0.20 to 0.30 Mo. 1.25-1.75 Ni	1.05
5100 0.80-1.10 Cr.	0.45
5100 Cr. spring	base
6100 bars	1.10
6100 spring	0.70
Cr., Ni., Van.	1.40
Carbon Van.	0.85
9200 spring flats	base
9200 spring rounds, squares	0.25

Piling

Pittsburgh	2.25c
Chicago, Buffalo	2.35c

Strip and Hoops

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

Hot strip to 23/16-in.	
Pittsburgh	2.15c
Chicago or Gary	2.25c
Birmingham base	2.30c
Detroit, del.	2.35c
Philadelphia, del.	2.46c
New York, del....	2.50c
Cooperage hoop, Pittsburgh	2.05c
Chicago	2.15c
Cold strip, 0.25 carbon and under, Pitts., Cleveland.	2.85c
Detroit, del.	3.06c
Worcester, Mass..	3.05c

Carbon	Cleve-land Pitts.	Worcester, Mass.
0.26—0.50...	2.85c	3.05c
0.51—0.75...	3.70c	3.90c
0.76—1.00...	5.45c	5.65c
Over 1.00...	7.50c	7.70c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$39.00
Relay rails, Pitts. 20—100 lbs.	25.50-28.00
Light rails, billet qual. Pitts., Chi..	$35.00
Do., reroll. qual..	34.00
Angle bars, billet, Gary, Pitts., So. Chi.	2.70c
Do., axle steel..	2.10c
Spikes, R. R. base.	2.90c
Track bolts, base..	4.00c
Tie plates, base....	2.10c

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

Bolts and Nuts

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

Carriage and Machine

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

Plow Bolts

All sizes	65-10 off

Stove Bolts

In packages with nuts attached 72½ off; in packages with nuts separate 75-5 off; in bulk 81½ off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts	60 off
Elevator bolts	60 off

Nuts

S. A. E. semifinished hex.:	
½ to 1⅛-inch.....	60-20-5 off
Do., ½ to 1-inch...	60-20-5 off
Do., over 1-inch...	60-20-5 off

Hexagon Cap Screws

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

Square Head Set Screws

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

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland	3.25c
Struc., c. l., Chicago.....	3.35c
⅛-in. and smaller, Pitts., Chi., Cleve.	70-5 off
Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs.	$6.00 off

Cut Nails

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

Pipe and Tubing

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

Welded Iron, Steel Pipe

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

Butt Weld

Steel

In.	Blk.	Galv.
¼ and ⅜	60	44½
½	64½	55
¾	67½	59
1—3	69½	61½

Iron

½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

Lap Weld

Steel

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

Iron

2	37	22½
2½—3½	38	25
4—8	40	28½

Line Pipe

Steel

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	52.40-53.40
6 to 24-in., Chicago.	49.40-50.40
6-in. & over, east. fdy.	45.00
Do., 4-in.	46.00
Class A pipe \$3 over Class B	
Stnd. fitgs., Birm. base..	$100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., Buffalo and Young.....	$32.00
Philadelphia	37.67
Duluth	34.00

Forging Billets

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

Pitts., Chicago, Buffalo..	39.00
Forging, Duluth	41.00

Sheet Bars

Pitts., Cleve., Young., Chi., Buffalo, Canton, Sparrows Point	32.00

Slabs

Pitts., Chicago, Cleveland, Youngstown....	32.00

Wire Rods

Pitts., Cleve., No. 5 to 11/32-inch incl.	43.00
Do., over 11/32 to 7/16-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. ..	$3.75- 4.00
Connellsville, fdry..	4.25- 4.50
Connell. prem. fdry.	5.50
New River fdry. ..	6.00
Wise county fdry...	4.45- 5.00
Wise county fur...	4.00- 4.50

By-Product Foundry

Newark, N. J., del..	10.20-10.65
Chi., ov., outside del.	9.00
Chicago, del.	9.75
New England, del...	12.00
St. Louis, del.	10.00-10.50
Birmingham, ovens	6.50
Indianapolis, del...	9.40
Cincinnati, del. ...	9.50
Cleveland, del.	10.30
Buffalo, del.	10.50
Detroit, del.	10.70
Philadelphia, del. ..	9.88

Coke By-Products

Spot gal. Producers' Plants

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

Per lb. f.o.b. Frankford

Phenol (200 lb. drums).	15.50c
Do., (450 lbs.)	14.50c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls., to jobbers	8.25c

Per 100 lbs. Atlantic seaboard

Sulphate of ammonia....	$1.30†

†Western prices, ½-cent up.

Pig Iron

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

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

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

Delivered from Basing Points:				
Akron, O., from Cleveland	21.76	21.76	21.26	22.26
Baltimore from Birmingham	22.08	.....	20.96	.....
Boston from Birmingham	21.62	.....	21.50	.....
Boston from Everett, Mass.	22.00	22.50	21.50	23.00
Boston from Buffalo	22.00	22.50	21.50	23.00
Brooklyn, N. Y., from Bethlehem	23.93	24.43	.....	.....
Brooklyn, N. Y., from Bmghm.	23.55	.....	.....	.....
Canton, O., from Cleveland	21.76	21.76	21.26	22.26
Chicago from Birmingham	†20.72	.....	20.60	.....
Cincinnati from Hamilton, O.	20.82	21.58	21.08	.....
Cincinnati from Birmingham	20.44	.....	19.82	.....
Cleveland from Birmingham	20.62	.....	20.12	.....
Cincinnati from Hamilton, O.	22.17	22.77	22.27	.....
Mansfield, O., from Toledo, O.	22.26	22.26	21.76	22.76
Milwaukee from Chicago	21.57	21.57	21.27	22.07
Muskegon, Mich., from Chicago, Toledo or Detroit	23.60	23.60	23.10	24.10
Newark, N. J., from Birmingham	22.61	.....	.....	.....
Newark, N. J., from Bethlehem	22.99	23.49	.....	.....
Philadelphia from Birmingham	21.93	.....	21.81	.....
Philadelphia from Swedeland, Pa.	22.31	22.81	21.81	.....
Pittsburgh district from Neville Island	Neville base plus 67c, 81c and $1.21 switching charges			
Saginaw, Mich., from Detroit	22.75	22.75	22.25	22.25
St. Louis, northern	21.00	21.00	20.50	.....

Delivered from Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis from Birmingham	†20.68	.....	20.50	.....
St. Paul from Duluth	22.94	22.94	.....	23.44

†Over 0.70 phos.

Low Phos.

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

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

Silvery†

Jackson county, O., base: 6-6.50 per cent $24.00; 6.51-7—$24.50; 7-7.50—$25.00; 7.51-8—$25.50; 8-8.50—$26.00; 8.51-9—$26.50; 9-9.50—$27.00; Buffalo $1.25 higher.

Bessemer Ferrosilicon†

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

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

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

Refractories

Per 1000 f.o.b. Works

Fire Clay Brick

Super Quality

Pa., Mo., Ky. $55.00

First Quality

Pa., Ill., Md., Mo., Ky... $45.00
Alabama, Georgia..$38.00-45.00

Second Quality

Pa., Ill., Ky., Md., Mo... 40.00
Georgia, Alabama 35.00

Ohio

First quality $40.00
Intermediary 37.00
Second quality 28.00

Malleable Bung Brick

All bases 50.00

Silica Brick

Pennsylvania $45.00
Joliet, E. Chicago 54.00
Birmingham, Ala. 48.00

Ladle Brick (Dry Press)

Pa., O., W. Va., Mo..... $24.00
do., wire cut 22.00

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).. 40.00
Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk).. 22.00

Base Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick $45.00
Chem. bonded chrome.. 45.00
Magnesite brick 65.00
Chem. bonded magnesite 55.00

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 $19.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid.. 80.00
Do., Baltimore, base.. 80.00
Do., del. Pittsburgh.. 85.13
Spiegeleisen, 19-20% dom. Palmerston, Pa., spot† 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 7.50
Ferrophosphorus, per ton, c. l., 17-19% Rockdale, Tenn., basis, 18%, $3 unitage 58.50
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $3 unitage.. 75.00
Ferromolybdenum, stand. 55-65%, lb. 0.95
Molybdate, lb. cont..... 0.80
†Carloads. Quan. diff. apply.

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 N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Chinese Spot, N. Y.	Nickel Cathodes
Dec. 5	10.50	10.62½	10.12½	50.75	50.25	5.20	5.05	5.05	*19.00	12.75	35.00
Dec. 7	10.50	10.62½	10.12½	50.75	50.25	5.20	5.05	5.05	*19.00	12.75	35.00
Dec. 8	10.50	10.62½	10.12½	51.75	51.00	5.20	5.05	5.05	*19.00	12.75	35.00
Dec. 9	10.50	10.62½	10.12½	52.25	51.75	5.20	5.05	5.05	*19.00	12.87½	35.00
Dec. 10	10.50	10.62½	10.12½	52.50	51.95	5.20	5.05	5.15	*19.00	12.75	35.00
Dec. 11	10.50	10.62½	10.12½	52.12½	51.50	5.30	5.15	5.15	*19.00	12.75	35.00

*Nominal range 19.00 to 21.00c.

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 10.50c Conn. copper

Sheets

Yellow brass (high) 16.25
Copper, hot rolled 18.25
Lead, cut to jobbers.... 8.75
Zinc, 100-lb. base 9.50

Tubes

High yellow brass 18.50
Seamless copper 18.75

Rods

High yellow brass 14.25
Copper, hot rolled 15.00

Anodes

Copper, untrimmed 15.75

Wire

Yellow brass (high) 16.50

OLD METALS

Deal. buying prices, cents lb.

No. 1 Composition Red Brass

New York 6.75-6.87½
Cleveland 7.50- 7.75
Chicago 7.00- 7.25
St. Louis 6.75- 7.25

Heavy Copper and Wire

New York, No. 1... 8.25-8.37½
Chicago, No. 1 ..... 8.50- 8.75
*Cleveland, No. 1... 8.75- 9.00
St. Louis, No. 1..... 8.25- 8.75

Composition Brass Borings

New York 6.25-6.37½

Light Copper

New York 7.25-7.37½
Chicago 6.75- 7.00
Cleveland 6.75- 7.00
St. Louis 6.75- 7.25

Light Brass

Chicago 4.25- 4.50
Cleveland 4.25- 4.50
St. Louis 3.75- 4.25

Lead

New York 4.37½- 4.50
Cleveland 4.00- 4.25
Chicago 4.00- 4.25
St. Louis 4.00- 4.25

Zinc

New York 2.50-2.62½
St. Louis 2.50- 3.00
Cleveland 2.50- 2.75

Aluminum

Borings, Cleve. 9.75-10.00
Mixed, cast Cleve... 13.25-13.50
Mixed, cast, St. L... 13.00-13.25
Clips, soft, Cleve.... 14.75-15.00

SECONDARY METALS

Brass ingot, 85-5-5-5, l.c.l..10.75
Stand. No. 12 alum.. 16.75-17.25

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.	†12.00
N. Eng. del. No. 1	13.25
Buffalo, No. 1	16.00-16.50
Buffalo, No. 2	14.50-15.00
Chicago, No. 1	16.25-16.75
Cleveland, No. 1	15.50-16.00
Cleveland, No. 2	15.00-15.50
Detroit, No. 1	13.25-13.75
Eastern Pa., No. 1	15.00-15.50
Eastern Pa., No. 2	14.00
Federal, Ill.	13.75-14.25
Granite City, R. R.	15.25-15.75
Granite City, No. 2	13.75-14.25
New York, No. 1	†11.50-12.25
N. Y. dock, No. 1 exp.	†11.25-11.75
Pitts., No. 1 (R. R.)	18.50-19.00
Pitts., No. 1 (dlr.)	18.00-18.50
Pittsburgh, No. 2	16.50-17.00
St. Louis, R. R.	15.50-16.00
St. Louis, No. 2	13.50-14.00
Toronto, dlrs. No. 1	10.50-11.00
Toronto, No. 2	9.50-10.00
Valleys, No. 1	16.75-17.25

COMPRESSED SHEETS

Buffalo, dealers	14.50-15.00
Chicago, factory	15.75-16.25
Chicago, dealer	14.00-14.50
Cleveland	15.00-15.50
Detroit	13.75-14.25
E. Pa., new mat.	15.50
E. Pa., old mat.	12.50-13.00
Pittsburgh	18.00-18.50
St. Louis	11.00-11.50
Valleys	16.50-16.75

BUNDLED SHEETS

Buffalo	12.75-13.25
Cincinnati, del.	10.25-10.75
Cleveland	12.50-13.00
Pittsburgh	16.50-17.00
St. Louis	9.75-10.25
Toronto, dealers	4.50

SHEET CLIPPINGS, LOOSE

Chicago	10.50-11.00
Cincinnati	9.25- 9.75
Detroit	10.00-10.50
St. Louis	9.50-10.00

STEEL RAILS, SHORT

Birmingham	15.00-16.00
Buffalo	18.50-19.50
Chicago (3 ft.)	18.00-18.50
Chicago (2 ft.)	19.00-19.50
Cincinnati, del.	17.75-18.25
Detroit	16.50-17.00
Pitts., open-hearth, 3 ft. and less	21.50-22.00
St. Louis, 2 ft. & less	16.00-16.50

STEEL RAILS, SCRAP

Boston district	†11.25-11.75
Buffalo	16.50-17.00
Chicago	16.25-16.75
Pittsburgh	19.00-19.50
St. Louis	16.75-17.25
Toronto, dealers	8.50

STOVE PLATE

Birmingham	8.50- 9.00
Boston district	†7.75- 8.25
Buffalo	13.00-13.50
Chicago	9.00- 9.50
Cincinnati, dealers	9.75-10.25
Detroit, net	9.00- 9.50
Eastern Pa.	12.00-12.50
New York, fdry.	†10.00
St. Louis	8.50- 9.00
Toronto, deal'rs, net	5.50- 6.00

SPRINGS

Buffalo	17.50-18.00
Chicago springs	19.00-19.50
Eastern Pa.	19.50-20.00
Pittsburgh	21.50-22.00
St. Louis	17.25-17.75

ANGLE BARS—STEEL

Chicago	18.00-18.50
St. Louis	16.00-16.50
Buffalo	14.50-15.00

RAILROAD SPECIALTIES

Chicago	18.50-19.00

LOW PHOSPHORUS

Buffalo, billet and bloom crops	18.50-19.00
Cleveland, billet, bloom crops	19.00-19.50
Eastern Pa., crops	20.50-21.00
Pittsburgh, billet, bloom crops	22.00-22.50
Pittsburgh, sheet bar crops	21.00-21.50

FROGS, SWITCHES

Chicago	16.25-16.75
St. Louis, cut	15.50-16.00

SHOVELING STEEL

Chicago	16.25-16.75
Federal, Ill.	13.75-14.25
Granite City, Ill.	13.75-14.25
Toronto, dealers	6.50

RAILROAD WROUGHT

Birmingham	9.00-10.00
Boston, district	†8.00- 8.25
Buffalo, No. 1	14.50-15.00
Buffalo, No. 2	16.00-16.50
Chicago, No. 1, net	14.50-15.00
Chicago, No. 2	16.25-16.75
Cincinnati, No. 2	14.75-15.25
Eastern Pa.	16.00
St. Louis, No. 1	13.50-14.00
St. Louis, No. 2	15.25-15.75
Toronto, No. 1 dlr.	7.00

SPECIFICATION PIPE

Eastern Pa.	14.50-15.00
New York	†10.00-10.50

BUSHELING

Buffalo, No. 1	14.50-15.00
Chicago, No. 1	15.00-15.50
Cincin., No. 1, deal.	11.50-12.00
Cincinnati, No. 2	7.25- 7.75
Cleveland, No. 2	11.00-11.50
Detroit, No. 1, new	12.50-13.00
Valleys, new, No. 1	16.00-16.50
Toronto, dealers	6.00

MACHINE TURNINGS

Birmingham	6.00- 6.50
Buffalo	9.75-10.25
Chicago	8.50- 9.00
Cincinnati, dealers	8.25- 8.75
Cleveland	10.50-11.00
Detroit	8.25- 8.75
Eastern Pa.	10.00-10.50
New York	†5.00- 5.50
Pittsburgh	12.25-12.75
St. Louis	7.25- 7.75
Toronto, dealers	4.00- 4.50
Valleys	10.75-11.25

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	†5.50- 5.75
Buffalo	10.00-10.50
Cincinnati, dealers	7.25- 7.75
Cleveland	11.00-11.50
Detroit	9.00- 9.50
Eastern Pa.	9.00
New York	†6.00
Pittsburgh	12.00-12.50
Toronto, dealers	4.00

CAST IRON BORINGS

Birmingham	6.00- 6.50
Boston dist. chem.	†7.00- 7.25
Boston dist. for mills	†6.75- 6.90
Buffalo	10.00-10.50
Chicago, dealers	8.75- 9.25
Cincinnati, dealers	7.25- 7.75
Cleveland	11.00-11.50
Detroit	9.00- 9.50
E. Pa., chemical	10.50-13.00
New York	5.75- 6.25
St. Louis	8.00- 8.50
Toronto, dealers	4.50- 5.00

PIPE AND FLUES

Cincinnati, dealers	9.00- 9.50
Chicago, net	8.00- 8.50

RAILROAD GRATE BARS

Buffalo	11.00-11.50
Chicago, net	10.50-11.00
Cincinnati	9.75-10.25
Eastern Pa.	12.50-13.00
New York	†8.00- 8.50
St. Louis	10.50-11.00

FORGE FLASHINGS

Boston district	†9.75-10.25
Buffalo	14.50-15.00
Cleveland	14.50-15.00
Detroit	12.00-12.50
Pittsburgh	16.50-17.00

FORGE SCRAP

Boston district	†6.50- 7.00
Chicago, heavy	19.00-19.50
Eastern Pa.	14.00-14.50

ARCH BARS, TRANSOMS

St. Louis	16.50-17.00

AXLE TURNINGS

Boston district	†7.50- 8.00
Buffalo	13.00-13.50
Chicago, elec. fur.	16.00-16.50
Eastern Pa.	14.00
St. Louis	10.50-11.00
Toronto	4.50

STEEL CAR AXLES

Birmingham	15.50-16.00
Boston district	†14.50-15.00
Buffalo	19.00-19.50
Chicago, net	19.00-19.50
Eastern Pa.	21.50
St. Louis	18.00-18.50
Toronto	8.50

SHAFTING

Boston district	†15.75-16.00
Eastern Pa.	20.50-21.00
New York	†15.50-16.00
St. Louis	15.00-15.50

CAR WHEELS

Birmingham	15.00-15.50
Boston dist. iron	†11.00-11.50
Buffalo, iron	16.00-17.00
Buffalo, steel	18.50-19.00
Chicago, iron	17.00-17.50
Chicago, rolled steel	18.50-19.00
Cincinnati, iron	14.25-14.75
Eastern Pa., iron	17.00-17.50
Eastern Pa., steel	20.00-20.50
Pittsburgh, iron	18.25-18.75
Pittsburgh, steel	21.50-22.00
St. Louis, iron	14.00-14.50
St. Louis, steel	17.00-17.50
Toronto, net	8.50

NO. 1 CAST SCRAP

Birmingham	13.75-14.50
Bos. dis. No. 1 mach.	†11.25-12.00
N. Eng., del. No. 2	†9.00- 9.50
N. Eng., del. textile	13.00
Buffalo, cupola	15.00-15.50
Buffalo, mach.	16.00-16.50
Chicago, agri. net	12.00-12.50
Chicago, auto	12.50-13.00
Chicago, mach. net	14.00-14.50
Chicago, railr'd net	13.00-13.50
Cinci., mach. cup.	14.75-15.25
Cleveland, mach.	16.25-16.75
Eastern Pa., cupola	17.00-17.50
E. Pa., mixed yard	14.00-14.50
Pittsburgh, cupola	17.00-17.50
San Francisco, del.	13.50-14.00
Seattle	10.00-11.00
St. Louis, No. 1	12.50-13.00
St. L. No. 1, mach.	13.00-13.50
Toronto, No. 1, mach., net	9.50-10.00

HEAVY CAST

Boston, dist. break.	†10.50-11.00
New England del.	11.00-11.50
Buffalo, break.	13.50-14.00
Cleveland, break.	13.00-13.50
Detroit, No. 1 mach. net	13.50-14.00
Detroit, break.	11.50-12.00
Detroit, auto net	13.50-14.00
Eastern Pa.	15.50-16.00
New York, break.	†11.50-12.00
Pittsburgh	14.50-15.00

MALLEABLE

Birmingham, R. R.	14.00-14.50
New England, del.	†16.25-17.50
Buffalo	17.00-17.50
Chicago, R. R.	18.50-19.00
Cinci., agri. del.	14.25-14.75
Cleveland, rail.	17.50-18.00
Detroit, auto, net	14.50-15.00
Eastern Pa., R. R.	16.50-17.50
Pittsburgh, rail	18.00-18.50
St. Louis, R. R.	15.50-16.00
Toronto, net	7.00

RAILS FOR ROLLING

5 feet and over

Birmingham	15.00-15.50
Boston	†11.00-11.50
Buffalo	17.50-18.50
Chicago	17.00-17.50
Eastern Pa.	17.50-18.00
New York	†12.00-12.50
St. Louis	16.50-17.00

LOCOMOTIVE TIRES

Chicago (cut)	18.50-19.00
St. Louis, No. 1	13.50-14.00

LOW PHOS. PUNCHINGS

Buffalo	18.25-18.75
Chicago	19.00-19.50
Eastern Pa.	19.50-20.00
Pittsburgh (heavy)	20.50-21.00
Pittsburgh (light)	20.00-20.50

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.	13.50
No. Afr. low phos.	13.50
Swedish low phos.	11.50
Spanish No. Africa basic, 50 to 60%.	12.50
Tungsten, spot sh. ton unit, duty pd.	$15.85-16.00
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	19.50-19.75

Manganese Ore

(Nominal)

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52%	30.00
So. African, 50-52%	30.00
Indian, 50-52%	30.00

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS

Baltimore*	3.20c
Boston††	3.30c
Buffalo	3.10c
Chattanooga	3.56c
Chicago (j)	3.20c
Cincinnati	3.42c
Cleveland	3.10c
Detroit	3. 29c
Houston	3.10c
Los Angeles	3.80c
Milwaukee	3.31c-3.46c
New Orleans	3.55c
New York‡ (d)	3.51c
Pitts. (h)	3.15c-3.30c
Philadelphia*	3.25c
Portland	3.70c
San Francisco	3.60c
Seattle	4.05c
St. Louis	3.45c
St. Paul	3.45c-3.60c
Tulsa	3.35c

IRON BARS

Portland	3.50c
Chattanooga	3.56c
Baltimore*	3.10c
Cincinnati	3.42c
New York‡ (d)	3.15c
Philadelphia*	3.25c
St. Louis	3.45c
Tulsa	3.35c

REINFORCING BARS

Buffalo	2.60c
Chattanooga	3.56c
Chicago	2.10c-2.60c
Cleveland (c)	2.10c
Cincinnati	3.25c
Houston	3.25c
Los Angl., cl.	2.45c
New Orleans	3.50c
Pitts., plain (h)	3.05c
Pitts., twisted squares (h)	3.175c
San Francisco	2.45c
Seattle	3.65c
St. Louis	3.35c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES

Baltimore*	3.10c
Boston††	3.29c
Buffalo	3.35c
Chattanooga	3.66c
Chicago	3.30c
Cincinnati	3.52c
Cleveland	3.41c
Detroit	3.52c
Houston	3.10c
Los Angeles	3.80c
Milwaukee	3.41c
New Orleans	3.65c
New York‡ (d)	3.47c
Philadelphia*	3.10c
Pittsburgh (h)	3.25c
Portland (i)	3.75c
San Francisco	3.60c
Seattle (i)	3.90c
St. Louis	3.55c
St. Paul	3.55c
Tulsa	3.60c

PLATES

Baltimore*	3.10c
Boston††	3.31c
Buffalo	3.47c
Chattanooga	3.66c
Chicago	3.30c
Cincinnati	3.52c
Cleveland, ¼-in. and over	3.41c
Detroit	3.52c
Detroit, ⅜-in.	3.85c
Houston	3.10c
Los Angeles	3.60c
Milwaukee	3.41c
New Orleans	3.65c
New York‡ (d)	3.50c
Philadelphia*	3.10c
Phila. floor	4.95c
Pittsburgh (h)	3.25c
Portland	3.75c
San Francisco	3.80c
Seattle	3.90c
St. Louis	3.55c
St. Paul	3.55c
Tulsa	3.60c

NO. 10 BLUE

Baltimore*	3.20c
Boston (g)	3.40c
Buffalo	3.72c
Chattanooga	3.46c
Chicago	3.15c
Cincinnati	3.32c
Cleveland	3.21c
Det. 8-10 ga.	3.24c
Houston	3.45c
Los Angeles	3.90c
Milwaukee	3.26c
New Orleans	3.65c
New York‡ (d)	3.41c
Portland	3.85c
Philadelphia*	3.20c
Pittsburgh (h)	3.05c
San Francisco	3.60c
Seattle	4.05c
St. Louis	3.40c
St. Paul	3.40c
Tulsa	3.80c

NO. 24 BLACK

Baltimore*†	3.80c
Boston (g)	4.05c
Buffalo	3.35c
Chattanooga*	3.36c
Chicago	3.55c-4.55c
Cincinnati	3.97c
Cleveland	4.01c
Detroit	4.14c
Los Angeles	4.35c
Milwaukee	4.16c
New Orleans*	3.32c
New York‡ (d)	4.10c
Philadelphia*†	3.85c
Pitts.** (h)	3.65c-4.95c
Portland	4.30c
Seattle	4.80c
San Francisco	4.20c
St. Louis	3.30c
St. Paul	4.10c
Tulsa	4.85c

NO. 24 GALV. SHEETS

Baltimore *†	3.90c
Buffalo	4.10c
Boston (g)	4.00c
Chattanooga*	3.96c
Chicago (h)	4.15c-5.15c
Cincinnati	4.82c
Cleveland	4.61c
Detroit	4.82c
Houston	4.50c
Los Angeles	4.60c
Milwaukee	4.76c
New Orleans*	3.92c
New York‡ (d)	4.50c
Philadelphia*†	4.50c
Pitts.** (h)	4.30c-5.55c
Portland	4.60c
San Francisco	5.00c
Seattle	5.25c
St. Louis	4.90c
St. Paul	4.60c
Tulsa	5.20c

BANDS

Baltimore*	3.30c
Boston††	3.40c
Buffalo	3.52c
Chattanooga	3.71c
Chicago	3.40c
Cincinnati	3.57c
Cleveland	3.46c
Detroit, ⅛-in. and lighter	3.49c
Houston	3.35c
Los Angeles	4.30c
Milwaukee	3.51c
New Orleans	4.05c
New York‡ (d)	3.66c
Philadelphia*	3.30c
Pittsburgh (h)	3.30c
Portland	4.35c
San Francisco	4.20c
Seattle	4.55c
St. Louis	3.65c
St. Paul	3.65c
Tulsa	3.55c

HOOPS

Baltimore	3.55c
Boston ††	4.40c
Buffalo	3.52c
Chicago	3.40c
Cincinnati	3.57c
Det., No. 14 and lighter	3.49c
Los Angeles	6.05c
Milwaukee	3.51c
New York‡ (d)	3.66c
Philadelphia*	3.55c
Pittsburgh (h)	3.80c
Portland	5.85c
San Francisco	6.25c
Seattle	5.90c
St. Louis	3.65c
St. Paul	3.65c

COLD FIN. STEEL

Baltimore (c)	3.98c
Boston*	4.15c
Buffalo (h)	3.70c
Chattanooga	4.38c
Chicago (h)	3.75c
Cincinnati	3.97c
Cleveland (h)	3.75c
Detroit	3.84c
Los Ang. (f) (d)	6.10c
Milwaukee	3.86c
New Orleans	4.55c
New York‡ (d)	3.96c
Philadelphia*	4.01c
Pittsburgh	3.60c
Portland (f) (d)	6.25c
San Fran. (f) (d)	6.05c
Seattle (f) (d)	6.35c
St. Louis	4.00c
St. Paul	4.27c
Tulsa	4.80c

COLD ROLLED STRIP

Boston	3.245c
Buffalo	3.39c
Chicago	3.27c
Cincinnati (b)	3.22c
Cleveland (b)	3.00c
Detroit	3.18c
New York‡ (d)	3.36c
St. Louis	3.41c

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
Milwaukee	70
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, 3.35c.

Prices on heavier lines are subject to new quantity differentials: 399 lbs. and less up 50 cts.; 400 to 3999 lbs., base; 4000 to 7999 lbs., 15 cts., under, 8000 to 14,999 lbs., 25 cts. under; 15,000 to 39,999 lbs., 35 cts. under; 40,000 lbs. and over, 50 cts. under; (except Boston).

‡Domestic steel; *Plus quan. extras; **Under 25 bundles; *†50 or more bundles; †New extras apply ††Base 40,000 lbs., extras on less.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Dec. 10

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

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
PIG IRON			
Foundry, 2.50-3.00 Silicon	$15.28 3 2 6*	$14.23	1 15 0
Basic bessemer	15.28 3 2 6*	11.79	1 9 0
Hematite, Phos. .03-.05	18.34 3 5 0	.....	.....
SEMIFINISHED STEEL			
Billets	$28.73 5 17 6	$19.10	2 7 0
Wire rods, No. 5 gage	43.77 8 19 0	36.61	4 10 0
FINISHED STEEL			
Standard rails	$40.34 8 5 0	$44.74	5 10 0
Merchant bars	1.85c 8 10 0	1.20c	3 5 0
Structural shapes	1.80c 8 5 0	1.42c	3 17 6
Plates, †¼-in. or 5 mm.	1.88c 8 12 6	1.75c to 1.94c	4 15 0 to 5 5 0
Sheets, black, 24 gage or 0.5 mm	2.23c 10 5 0	2.30c	6 5 0††
Sheets, gal., 24 gage, corr.	2.80c 12 15 0	2.76c	7 10 0
Bands and strips	2.02c 9 5 0	1.48c	4 0 0
Plain wire, base	2.13c 9 15 0	1.94c	5 5 0
Galvanized wire, base	2.51c 11 10 0	2.15c	5 17 6
Wire nails, base	2.62c 12 0 0	1.75c	4 15 0
Tin plate, box 108 lbs.	$ 4.58 0 18 9	.....	.....

British ferromanganese $75 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	$18.34	3 15 0(a)	$15.69	336	$16.61	490	$25.37	63
Basic bessemer pig iron	18.34	3 15 0(a)	12.14	260	14.53	430	27.99	(b)69.50
Furnace coke	5.26	1 1 6	5.91	127	4.63	137	7.65	19
Billets	29.95	6 2 6	23.68	507	19.60	580	38.86	96.50
Standard rails	1.80c	8 5 0	1.49c	711	1.73c	1,150	2.38c	132
Merchant bars	2.04c	9 7 0	1.50c	695	1.05c	700	1.98c	110
Structural shapes	2.05c	9 7 6	1.43c	680	1.05c	700	1.93c	107
Plates, †¼-in. or 5 mm.	2.11c	9 13 9	1.84c	875	1.28c	850	2.29c	127
Sheets, black	2.62c	12 0 0§	2.42c	1,150‡	1.39c	925‡	2.59c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	3.05c	14 0 0	3.26c	1,550	2.85c	1,900	6.66c	370
Plain wire	2.18c	10 0 0	2.42c	1,150	1.95c	1,300	3.11c	173
Bands and strips	2.20c	10 2 0	1.62c	770	1.28c	850	2.29c	127

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

**Gold pound sterling carries a premium of 67.00 per cent over paper sterling.

Bars

Bar Prices, Page 70

Pittsburgh—The heavy buying wave in merchant bars and small shapes continued last week, definitely forecasting that December will be the most active month of the year. With the possible exception of small bar sizes under 2 inches, all grades of carbon bars, alloy bars, bands and bar shapes are in active call. Mills have been trying to segregate speculative tonnage from bar business for legitimate needs, but have found that some buyers have been placing blanket orders with a number of mills and doubtless do not intend to specify all the tonnage under tentative order.

Cleveland—Producers are still taking orders at the old prices on some grades of hot-rolled bars. There have been a few exceptional cases of consumers placing orders at the increased prices with the intention of getting preferred delivery, to satisfy their pressing needs. The most encouraging aspect of the active market over the last month is the fact that while speculative buying has been noted most customers are in actual need of material.

Chicago—Mill order books in steel bars are loaded to the point where little additional tonnage can be accepted for shipment by Jan. 31. As a consequence deliveries are extended on the average to about 30 days, and it is likely that most new business henceforth will be at the higher quotations named recently for first quarter. Consumption is heavy, but shipments are somewhat in excess of current requirements.

New York—Buying of steel bars is heavy and many consumers are submitting firm specifications for delivery as early as possible. Most sellers are endeavoring to confine deliveries at old prices to January.

Philadelphia—With mills still accepting tonnage at fourth quarter prices bar buying continues heavy. Most sellers apparently are endeavoring to limit such tonnage to their capacity to produce in January.

Plates

Plate Prices, Page 70

Philadelphia—Plate bookings continue heavy as consumers seek protection against first quarter prices. Floor plates, as well as tank plates, are subject to the $3 advance. The Pennsylvania railroad opened bids Dec. 8 on five steel deck barges requiring 400 tons of plates. Locomotive orders booked last week call for 1150 tons of plates. Clarification with respect to protections for

identified work are appearing. Some leading sellers are adopting a policy of limiting the deadline for specifications on railroad equipment work to March 31 and on ship and building construction to April 30. It is explained, however, that where the latter jobs are of extraordinary size exceptions probably will be made to the general rule. Shipments on specifications are at mills' convenience, some sellers stipulating at their convenience within a month or two after the specification deadline. Buyers' acceptance of protective quotations must in all cases be made by the end of January.

Pittsburgh—American Barge Line Co. has revised its recent order for twelve 175-foot standard coal barges, which was placed about six weeks ago with Dravo Contracting Co., to scale down the total order to 10 and to change the design of seven of the 10 to include bulkheads for carrying gasoline. This leaves three, also 175-foot barges, which will be used for coal. From sources aside from marine work plate inquiry over the past week has reached a heavy proportion, most interest being in customers asking price protection on identified jobs into January and February. Where projects are legitimately identified, producers are giving protection at 1.90c, Pittsburgh, but advise that plates for shipment after Feb. 1 will take the higher price of 2.05c.

Cleveland—Fabricators report considerable tonnage pending as a result of recent price adjustments for first quarter. A large tonnage of plates is expected to be used in repair work on lake freighters over the next few months. One producer reports 500 tons already under contract.

Chicago—Plate business is being stimulated by heavy orders placed recently for railroad equipment. Best plate shipments for the next several months are expected to be railroads and freight car builders. Requirements of structural fabricators are seasonally quiet, but there is a fair amount of prospective business for construction in the oil industry.

New York—Plate sellers are deluged with orders as buyers seek protection before the new prices go into effect. Requests for railroad equipment protection is the heaviest in years, one car builder asking protection on 250,000 tons of plates, in addition to various other forms of steel.

Birmingham, Ala.—Plate mills have been maintaining steady production about equal to demand. Local fabricators are finding delivery somewhat better.

Seattle—New projects are developing and fabricating plants anticipate much additional business early in the year. Pulp and paper plants are planning increased facilities calling for digesters and other equipment.

Contracts Pending

3192 tons, Crystal Springs pipe line No. 2, San Francisco, 60-inch welded steel pipe; bids opened.

560 tons, water system, St. Maries, Idaho; bids Dec. 21.

450 tons, approximately, five 100-foot sand barges, for Paff & Smith, Charleston, W. Va.

235 to 940 tons, one to four oil tank barges, for Socony Vacuum Oil Co. for use on the Ohio and Mississippi rivers; bids taken Dec. 10.

110 tons, 25,000-barrel tank, Vernon, Calif.; Southwest Welding & Mfg. Co., Alhambra, Calif., low.

Unstated, siphons for Roza reclamation project; bids at Yakima, Wash., Dec. 14.

Unstated, siphons for state project, Jerome county, Idaho; bids in.

Unstated, 37,000 feet of 10 and 12-inch steel water mains for White Salmon, Wash.; bids in January.

Sheets

Sheet Prices, Page 70

Pittsburgh—The heavy buying wave in sheets appeared to come to a close late last week when sheet mills booked up to an exceedingly heavy degree began withdrawing from the market. By this was meant that they would no longer accept business at fourth-quarter prices, and in fact had begun to book some orders which customers understood would take the $4 a ton higher market ostensibly taking hold after Feb. 1. According to close calculations, somewhere between 25,000 and 30,000 tons of sheets were placed by all buyers throughout the country on each day from Dec. 1 to Dec. 10. A significant test of the higher sheet market, however, will not develop for another month to six weeks, due to the fact that all important buyers have covered for their requirements well into the future.

Cleveland—New business at the increased prices is encouraging, in view of the rather heavy buying before the first of the month. One of the main reasons that consumers are placing additional tonnage, is to get preferred delivery position on the mill books. The question of price seems of little importance in the present market. Auto manufacturers and household utility concerns continue to absorb the largest tonnages. The former is regaining its stride after a minor delay due to a brief strike, while the latter is now entering its holiday peak.

Chicago—Sheet mill operations are being pushed as order books are filled to capacity for seven weeks. On new business higher first quarter prices are being named, but most larger users have contracted for their requirements through a fair portion of first quarter.

Philadelphia—With most buyers covered well ahead there is a lull in sheet buying. One pending inquiry, however, involves 700 tons of sheets and strip for car repair work for the Baltimore & Ohio. Edward G. Budd Mfg. Co. recently placed 250 tons of stainless steel for streamlined trains with a Pittsburgh producer.

Within the past week an eastern producer of hot-rolled sheets withdrew from the market at old prices. This apparently places the market on hot sheets as well as cold-finished in this district formly at the new level.

New York—Sheet buying is principally by smaller consumers as large users had covered their needs before the price advance. Concern as to deliveries is forcing in some new tonnage now, apart from immediate requirements. Despite heavy protective buying the opinion prevails there will be substantial new buying as the new year gets under way, due to active fabrication of materials.

Cincinnati—New prices for sheets are holding firmly on first quarter orders so far booked. Although this tonnage is not heavy, demand is such as to indicate an active market after Jan. 1 despite whatever speculative buying was done at the lower prices.

St. Louis—Due to the fact that supplemental tonnages cannot be shipped before Feb. 1, certain mills have discontinued taking orders at current prices. Demand generally holds well, with pressure for deliveries even more urgent. Buying by warehouses in recent weeks has been in considerable volume and these interests are well covered at the lower price.

Sesamee Co., Hartford, Conn., has doubled its floor space and increased the number of its employes for manufacture of keyless, combinationless locks.

Transportation

Track Material Prices, Page 71

While the heavy buying movement of the past fortnight has subsided considerable tonnage of steel is required for cars, locomotives and rails now being booked. The Pennsylvania is considering a repair program for which steel protection is being sought. This is said to be one of the heaviest programs in the history of the road and is understood to involve 24,000 cars and 1800 locomotives. A large number of new locomotives are also likely to be purchased, particularly in view of the fact this road may start soon on electrification of its road from Paoli to Harrisburg, Pa., about 80 miles. Contractors are asking steelmakers for estimates on some items involved.

Southern Pacific has closed for 28 locomotives and the Denver & Rio Grande Western 15. Southern Pacific has distributed orders for 2275 cars and Chesapeake & Ohio for 2000. Rail purchases the past week total 26,140 tons.

New York, New Haven & Hartford will build 150 low-side coal cars in its own shops at Readville, Mass. Southern railroad has awarded a contract for equipment to air condition 132 cars. Three subsidiary roads of the United States Steel Corp. are considering the purchase of 4700 cars. The Reading road will build 25 all-steel eight-wheel cabooses in its own shops. Baltimore & Ohio has given an order to White Motor Co., Cleveland, for 28 motor coaches. Bids have been opened on 250 subway cars for New York, but no award has been made.

Elgin, Joliet & Eastern is expected to close soon on six diesel switch engines and Bessemer & Lake Erie on ten steam freight and two passenger locomotives. Locomotive requirements of the Pennsylvania may include 125 units.

The market on light rails, new billet quality, will be advanced $3 a ton to $38, Pittsburgh or Chicago, for effect with the first quarter. Freight car wheels have been advanced $1 per ton and passenger car wheels $2 per ton.

Car Orders Placed

Chesapeake & Ohio, 2000 cars, as follows: 500 hoppers to Pullman-Standard Car Mfg. Co.; 500 boxcars to General American Tank Car Corp.; 500 hoppers and 500 gondolas to American Car & Foundry Co.

Great Northern, 500 ore cars to Bethlehem Steel Co., Bethlehem, Pa.

Southern Pacific, 2275 cars, as follows: 250 box cars each to Bethlehem Steel Co., Pressed Steel Car Co., Pullman Standard Car Mfg. Co., American Car & Foundry Co.; 825 automobile cars to General American Tank Car Corp.; 350 automobile cars to Mt. Vernon Car Mfg. Co.; 100 ballast cars to American Car & Mfg. Co.

Car Orders Pending

Baltimore & Ohio, 1500 gondolas.

Chicago & North Western, 500 automobile cars, 23 coaches.

Central of Georgia, five coaches, three baggage-mail cars.

Richmond, Fredericksburg & Potomac, six baggage-express cars.

200 box cars, Western Pacific Co., San Francisco; bids in.

Locomotives Placed

Denver & Rio Grande Western, 15 locomotives to Baldwin Locomotive Works.

Southern Pacific, 28 locomotives, 14 each to Baldwin Locomotive Works and Lima Locomotive Works.

Rail Orders Placed

Denver & Rio Grande Western, 12,640 tons to Colorado Fuel & Iron Co., Denver.

Grand Trunk, 3500 tons to Carnegie-Illinois Steel Corp., 1500 tons to Inland Steel Co.

Kansas City Southern, 6000 tons to Carnegie-Illinois Steel Corp., 2000 tons to Inland Steel Co.

Wheeling & Lake Erie, 2000 tons, to Carnegie-Illinois Steel Corp.

Pipe

Pipe Prices, Page 71

Pittsburgh—Prices and discounts on all forms of tubular products have been extended unchanged into at least first quarter. Pipe producers failed to make formal announcement to this effect, but through their bookings of business for shipment through first quarter they have confirmed their intention not to raise prices. The market continues to feature fair diversity of orders. It is expected that several line pipe jobs will reach the closing stage early in 1937.

Cleveland—One leading producer will book this year nearly twice the tonnage of tubular goods it sold in 1935. This tonnage is composed mainly of numerous small lot orders from jobbers, to be used in homes and industrial expansions and repair work.

The Public Works Administration awarded 450 tons of 24-inch coated line pipe, for a water main here, to Universal Valve & Fitting Co., Cleveland. Youngstown Sheet & Tube Co., Youngstown, O., will roll the plates. The project was split into two units, P. W. A. taking bids on one in Columbus, O., and the city of Cleveland the other. The second unit involving approximately 300 tons, went to American Rolling Mill Co., Middletown, O.

Chicago—Cast pipe shipments are declining and few new inquiries involve large lots. Several projects on which bids were taken several weeks ago remain to be placed, but expectations are for a downward trend in new business and shipments. Producers now are quoting the $2 a ton advance.

New York—The cast pipe market was quiet last week, with shipments for carload lots the general rule. A. Stanley Mundy Co., Woodbridge, N. J., is low on 29,000 feet of various sizes for a water project at Trenton, N. J.

Vicksburg, Miss.—City has let contract for new natural gas line to B. & M. Construction Co., Oklahoma City, Okla., 44 miles of 6⅝-inch pipe to be Lindewelded. Terminal points of the new line are Jackson and Vicksburg, Miss.

San Francisco—Prospects for cast pipe business during the remainder of the year are not especially bright. United States Pipe & Foundry Co. took 535 tons of 4 to 12-inch for Fresno, Calif. Pacific States Cast Iron Pipe Co. is low with the general contractor for a water system at Atwater, Calif., involving 450 tons of 4 to 10-inch. Bids open Dec. 19 for a water system at Nashua, Mont., the entire job involving approximately 18 miles of 4, 6 and 8-inch pipe.

Seattle—The cast pipe market continues lifeless, small lots moving out of stock and no important projects pending. Washington state will call new bids for the Burien tank and water main system, previous tenders rejected. Spokane will open bids for about 50 tons of 6-inch cast pipe, Dec. 17. Nashua, Mont., will receive bids Dec. 19 for an unstated tonnage of cast pipe, also equipment for pumping plant.

Cast Pipe Placed

535 tons, 4 to 12-inch, Fresno, Calif., to United States Pipe & Foundry Co., Burlington, N. J.

150 tons, 4 and 10-inch, treasury department, invitation 2844, San Francisco, to Pacific States Cast Iron Pipe Co., Provo, Utah.

125 tons, 8-inch, water line, Ruggles O., through Erie county commissioner, to James B. Clow & Son Co., Cleveland.

100 tons, 16 to 6-inch, grade elimination, Bucyrus, O., to James B. Clow & Son Co., Cleveland.

Unstated tonnage, 12,225 feet of 6-inch, resettlement project, Ironwood, Mich., to Lynchburg Foundry Co., Lynchburg, Va.

Cast Pipe Pending

250 tons, for New York city; Donaldson Iron Co., Emaus, Pa., and United States Pipe & Foundry Corp., Burlington, N. J., low bidders.

143 tons, 4 to 8-inch, treasury department, Reno, Nev., for delivery at Yerington, Nev.; bids opened.

103 tons, 3 to 8-inch, specification 179, metropolitan water district, Los Angeles; bids opened.

Unstated tonnage, 29,000 feet of various sizes for Trenton, N. J.; A. Stanley Mundy & Co., Woodbridge, N. J., low.

Unstated tonnage, 48,000 feet, Port Byron, N. Y.; bids Dec. 28.

Steel Pipe Placed

800 tons, water main, Cleveland, split into two units, one purchased through PWA at Columbus, O., and the other by the city of Cleveland. The PWA unit of 500 tons went to Youngstown Sheet & Tube Co., Youngstown, O., through Universal Valve & Fitting Co., Cleveland; the other unit of 300 tons was awarded to American Rolling Mill Co., Middletown, O.

MacKenzie Machinery Co., 25 Huntington avenue, Boston, has been made exclusive sales representative in the Boston territory for the South Bend Lathe Works, South Bend, Ind.

Strip

Strip Prices, Page 71

Pittsburgh—Prices on all grades of stainless steel strip are being carried into first quarter unchanged but as previously reported, cold-rolled strip steel advances $5 a ton and hot-rolled strip steel $4 a ton for effect on shipments after Feb. 1. This fact has not precluded some producers from still accepting hot-rolled strip orders at the fourth-quarter price of 1.95c on base lots of 1 to 25 tons, but time for processing is beginning to preclude any more cold-rolled strip orders at 2.60c, Pittsburgh or Cleveland, base for 3 to 25 tons. Therefore, some test of the new 2.90c level on cold-rolled strip probably will develop within the next week to ten days.

Cleveland—Some mills have definitely discontinued taking orders at the old prices, especially on cold rolled material, while others expect to drop out soon. At present most producers feel that they will be able to complete deliveries at the old prices during January. However, there are some who do not know exactly where they stand. Electrical equipment manufacturers, small farm tool concerns and auto partsmakers have already placed some orders at the increased prices, in order to get preferred positions. on the rolling schedules.

Chicago—Strip producers are well booked through January and except in occasional instances are unable to accept additional business for delivery before Feb. 1. Shipments are ahead of consumption, with consumers less interested than usual in holding down inventories over the year-end. On new business for future delivery, price advances of $4 on hot strip and $5 on cold rolled strip are being named.

Philadelphia—Narrow strip buyers here are well covered on nearby requirements with shipments rather than new buying, the principal feature of current activity.

Wire

Wire Prices, Page 71

Pittsburgh—Shipments of manufacturing and merchant wire products are at a steadily increasing rate as buyers are taking material against specifications entered late in November to avoid higher prices on wire products of $3 and $4 a ton, effec-

tive for first quarter. Sellers are firm in quoting nails at $2.25 per keg, f.o.b. Pittsburgh or Cleveland, on all new business that develops, but large consumers are still under cover and test is not likely to take place for another month.

Electric welded mesh has been advanced $4 to $62, Pittsburgh, effective Dec. 10.

Cleveland—Producers report some new tonnage placed at the increased prices, but this is comparatively small in contrast to that placed before and shortly after the recent price adjustments were announced. New prices are holding firm, especially in nails, on which weakness was reported some time ago. Relatively little forward buying of merchant products, to cover next spring requirements, has yet been placed. Automobile spring makers and wire specialty manufacturers are active consumers.

Chicago—Producers have heavy backlogs of manufacturers' wire, and while activity in merchant products makes a slightly unfavorable comparison, demand is holding better than during the corresponding period of the preceding several years. Active consumption is aiding shipments of manufacturers' wire, while the season has a restricting effect on business in barbed wire and other commodities used by agriculture. Automotive requirements of manufacturers' wire are expanding, while needs of miscellaneous users generally are steady. Price advances of $2 to $4 a ton are being applied on new business.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 71

First quarter contracting is getting under way, with recent price advances of about 10 per cent on bolts and nuts and $4 a ton on large rivets applying. Business received some stimulation from the higher prices, though consumption continues active and compares favorably with that of a month ago. Good demand for railroad equipment is having a stimulating effect on bolts, nuts and rivets, while relatively good schedules of farm implement and tractor manufacturers also is an aid to demand.

Tin Plate

Tin Plate Prices, Page 70

Pittsburgh—With rolling schedules made up almost completely of tin plate for early 1937 billing, mills have been increasing operations the past week, and the average is now better than 95 to 100 per cent, strongly supported by the leading producers' rate of 97 per cent. One contributing reason for this improvement is the usual year-end practice to build up rolling schedules in December so as to distribute large Christmas payrolls to employes. Another factor this year is the heavy speculative buying going on in tin mill black sheets where a $4 a ton increase takes effect with shipments after Feb. 1. Standard tin plate, however, remains unchanged at a net base price of $4.85 per box.

Shapes

Structural Shape Prices, Page 70

Chicago—A large portion of new inquiries for fabricated structural steel consists of individual lots of less than 100 tons, more than 10,000 tons being involved in such projects. Chicago will spend about $5,000,000 on new schools, while a similar sum is involved in bridge and grade separation work in Cook county. Most of recent awards consists of bridges.

Cleveland—Fabricators are busy

figuring jobs that are to be awarded before the first of next month, to take advantage of the present low prices. Plans for the Cleveland Twist Drill Co., Cleveland, extension to office and plant building, involving 500 tons, are expected to be out this week. Bids are due Dec. 15 on a state bridge at Lorain, O., involving 750 tons. Bethlehem Steel Corp., Bethlehem, Pa., was awarded 12,000 tons for the strip-sheet mill of Republic Steel Corp. at Cleveland.

Pittsburgh — So unusually heavy has been the request of prospective users of structural steel for identified building jobs that a leading mill here last week found it had over 1300 inquiries aggregating more than 300,000 tons before it for request of price protection. Plain structural shapes remain quoted at 1.90c, Pittsburgh.

NEW YORK ASKS 55,000 TONS TUNNEL SEGMENTS

New York — New York City tunnel authority will take bids Dec. 23 for 55,000 tons cast iron linings for the vehicular tunnel under East river from Manhattan to Queens. On 47,700 tons of cast iron and steel tunnel linings for the second Hudson-Midtown vehicular tunnel Bethlehem Steel Co., Bethlehem, Pa., is low at $3,080,252.

Shape Contracts Placed

12,000 tons, strip-sheet mill, Cleveland, for Republic Steel Corp., Cleveland, to Bethlehem Steel Corp., Bethlehem, Pa.

2300 tons, building, for Youngstown Sheet & Tube Co., Youngstown, O., to Fort Pitt Bridge Works, Pittsburgh.

1675 tons, Red river bridge, NRS-955, Bonham, Texas, to Virginia Bridge & Iron Co., Roanoke, Va.

1225 tons, viaduct, Wilkes-Barre, Pa., to Bethlehem Steel Corp., Bethlehem, Pa.

660 tons, bridge, Vernon, Tex., to Austin Bros., Dallas, Texas.

610 tons, extension, Blue Ridge Co., Glasgow, Va., to Belmont Iron Works, Philadelphia.

600 tons, 40 steel radio towers of new self-supporting type, for United States department of commerce, to Blaw-Knox Co., Blawnox, Pa.

570 tons, Franklin street bridge, Johnstown, Pa., to Bethlehem Steel Corp., Bethlehem, Pa.; George Vang Inc., Pittsburgh, general contractor at $138,007.

570 tons, plant extension, for Owens Illinois Glass Co., Bridgeton, N. J., to Bethlehem Steel Corp., Bethlehem, Pa.

550 tons, office building, for W. H. Walker, Washington, to Barber & Ross Inc., Washington.

500 tons, state bridge, Ottawa county, Ohio, to General Constructors & Contractors Inc., Chicago.

420 tons, crane runway, navy yards, Philadelphia, to Lehigh Structural Steel Co., Allentown, Pa.

375 tons, bridge, Winchell, Tex., to Virginia Bridge Co., Roanoke, Va.

335 tons, building No. 83, Calco Chemical Co., Bound Brook, N. J., to Bethlehem Steel Co., Bethlehem, Pa.

335 tons, extension to Isherwood Hall, Annapolis, Md., to Bethlehem Fabricators Inc., Bethlehem, Pa.

325 tons, bridge, Cedar Rapids, Iowa, to Iowa Steel & Iron Works, Cedar Rapids.

300 tons, turbine stands, Ashtabula, O., for Cleveland Electric Illuminating Co., Cleveland, to American Bridge Co., Pittsburgh.

300 tons, store building, for Home Furniture Co., Braddock, Pa., to Levinson Steel Co., Pittsburgh.

300 tons, building, Hastings, Iowa, to Paxton & Vierling Iron Works, Omaha, Nebr.

280 tons, manufacturing building, for Caspers Tin Plate Co., Chicago, to Vierling Steel Works, Chicago.

Shape Awards Compared

	Tons
Week ended Dec. 11	26,985
Week ended Dec. 4	17,132
Week ended Nov. 27	16,860
This week, 1935	26,936
Weekly average, 1935	17,081
Weekly average, 1936	21,808
Weekly average, November	19,043
Total to date, 1935	854,440
Total to date, 1936	1,090,444

250 tons, building, Port Ivory, N. Y., for Proctor & Gamble Mfg. Co., to Joseph T. Ryerson & Son Inc., Chicago, through Caye Construction Co., Brooklyn.

250 tons, building, Flintkote Co., Rutherford, N. J., to Oltmer Iron Works, Jersey City, N. J., through Ferber Co., Hackensack, N. J.

210 tons, rag storage shed, for Armstrong Cork Co., Fulton, N. Y., to Smith & Caffrey, Syracuse, N. Y.

200 tons, Mt. Washington sanitarium, Eau Claire, Wis., to W. E. Hobbs Supply Co., Eau Claire.

200 tons, building, Mineral Point, to Wisconsin Bridge & Iron Co., Milwaukee.

200 tons, building, for Corning Glass Co., Corning, N. Y., to Rogers Structural Steel Co., Corry, Pa.

175 tons, state highway bridge, WF-36-2 Queens county, New York, to American Bridge Co., Pittsburgh.

170 tons, grade crossing elimination, over New York Central railroad tracks, Montrose, N. Y., to American Bridge Co., Pittsburgh.

160 tons, New Jersey state highway bridge elimination, Absecon boulevard, to Phoenix Bridge Co., Phoenixville, Pa.

160 tons, furnace steel, Streator, Ill., to Belmont Iron Works, Philadelphia.

150 tons, waterworks, Eau Claire, Wis., to W. E. Hobbs Supply Co., Eau Claire.

140 tons, state highway bridge, on route 184, Luzerne county, Pennsylvania, to Bethlehem Fabricators Inc., Bethlehem, Pa.

130 tons, state highway bridge on route 865 Elk county, Pennsylvania, to Fort Pitt Bridge Works, Pittsburgh.

120 tons, building, U. S. Gypsum Co., Warren, O., to Rogers Structural Steel Co., Corry, Pa., through Austin Co., Cleveland.

120 tons, piling, bureau of reclamation, invitation A-42,118-A, Knob, Calif., to Inland Steel Co., Chicago.

120 tons, freight house, for Erie railroad, Buffalo, to McMannus Steel Construction Co., Buffalo.

100 tons, state highway bridge, 8498, Herkimer county, New York, to Fort Pitt Bridge Works, Pittsburgh.

100 tons, building, Tarkio, Mo., to Gate City Iron Works, Omaha, Nebr.

Shape Contracts Pending

4600 tons, bridge, Phillipsburg, N. J., Easton, Pa.; bids Dec. 21.

2600 tons, section 7 of six avenue subway, New York; Arthur A. Johnson Corp., New York, low at $4,722,000, includes 370 tons of reinforcing bars.

2000 tons, buildings, Indianapolis Railways Inc., Indianapolis; Lundoff-Bicknell Co., Chicago, and John E. Erickson Co., Chicago, low for general contract on alternate designs.

2000 tons, viaduct on Eleventh avenue between Thirty-fourth and Thirty-seventh streets, New York; bids Dec. 22.

1700 tons, bridge over Potomac river, Point of Rocks, Maryland.

1500 tons, 19-story apartment at West End avenue, Eighty-seventh street, New York.

1200 tons, pier No. 26 in North river, for New York City dock department.

1000 tons, transmission line towers, for West Penn Power Co., Pittsburgh; line between Charleroi and Luxor substations.

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

1000 tons, reservoir, Twin Falls, Idaho.

1000 tons, warehouse, Owensboro, Ky.

900 tons, municipal light plant, Kansas City, Kans.

800 tons, factory building, for Holly Sugar Corp., Hardin, Mont.

625 tons, bridges No. 1746-A and 1741-A, Balcony Falls, Va., for Chesapeake & Ohio railway.

600 tons, bridge, Warsaw, Mo.

500 tons, repairs to Glenwood bridge, Allegheny county, Pittsburgh; Greenberg Construction Co., Uniontown, Pa., general contractor.

500 tons, Israel-Zion hospital, Brooklyn, N. Y.; out for figuring.

453 tons, deck plate girder underpass, Willistown township, Chester county, Pennsylvania; bids to state highway department, Harrisburg, Pa., Dec. 18.

400 tons, high school addition, for board of education, Ambridge, Pa.

400 tons, civic auditorium, Hammond, Ind.; bids Dec. 14.

390 tons, state bridge, Tillamook county, Oregon; bids at Portland, Dec. 17.

350 tons, building alterations, for F. H. T. Holding Co., New York.

346 tons, Fresno dam, Milk river project, Mont.; general contract to Wachter & O'Neill Construction Co. and McGarry Bros., Bismarck, N. D., includes 60 tons of plates.

340 tons. Washington state bridge, Pacific county; bids at Olympia, Dec. 22.

300 tons, bridge No. 593, Boston, Ind.,

for Chesapeake & Ohio railway.

300 tons, Lakewhite and collodion buildings, for Hilton Davis Chemical Co., Cincinnati, O.

290 tons, state highway bridges, Atlantic and Hunterdon counties, New Jersey.

286 tons, 8-story building, for 78 East Fifty-Sixth Street Corp., New York.

285 tons, bridges Atlantic and Hunterdon counties, New Jersey; bids Dec. 14.

250 tons, bridge, Tonawanda, N. Y., for New York Central railroad.

250 tons, Vandeventer avenue viaduct, St. Louis; Webb-Boone Paving Co. and Chase Contracting Co., St. Louis, low.

215 tons, I-beam underpass, East Whiteland and Willistown townships, Chester county, Pennsylvania; bids to state highway department, Harrisburg, Pa., Dec. 18.

210 tons, highway work in Denver,; bids opened.

200 tons, lithographing plant, for J. L. Clark Mfg. Co., Rockford, Ill.

200 tons, plant, for Campbell Soup Co., Camden, N. J.

169 tons, two-span through truss bridge, Somerset and Cambria counties, Pennsylvania; bids to state highway department, Harrisburg, Pa., Dec. 18. Included, 25 tons of plain steel bars.

153 tons, one-span truss bridge, Jefferson county, Pennsylvania; bids to state highway department, Harrisburg, Pa., Dec. 18. Included, 38 tons of plain steel bars.

150 tons, bridge, Wilmot, Kenosha county, Wisconsin; bids closed Dec. 10.

136 tons, two-span truss bridge, Clinton county, Pennsylvania; Paul E. Rarick, Zions Grove, Pa., low on Dec. 4 letting. Included, 14 tons of plain steel bars.

121 tons, four bridges in Crook and Sheridan county, Wyoming; bids Dec. 17.

100 tons, building, for unnamed interest at Ringwood, N. J.

Unstated, 20 sets gates for outlet works, Coulee dam, Wash.; Hardie-Tyne Co., Birmingham, Ala., general contractors.

Unstated, radial gate and hoist for Kachess dam, Wash.; bids to Bureau of Reclamation, Denver, Dec. 21.

Behind the Scenes with STEEL

Juvenile

MAYBE you noticed that recent two-page spread in STEEL, (Nov. 23 and Dec. 7) headlined "The First Step," and showing a chunky 15-month old lad teetering on his first pair of brogans. Well, if you think it was an easy job to snap that pose, you've never tried to balance a nonwalking youngster without visible means of support.

The little fellow's name is Peter Charles Pope and he proved a most tractable cameractor. Only difficulty encountered was in getting him to break out into a grin. His father retreated out of the camera range and tried waving various forms of kitchen utensils to attract his son's attention, but nothing seemed to work. Bottle openers, corkscrews, spatulas and cookie cutters were all hurtled about with abandon, but the lad just scowled and intimated, "What the hell is going on here?"

Finally, someone produced an eggbeater and started it whirring. Just the thing, it was, for the boy smiled contentedly as the camera snapped. First time he'd ever seen his dad operate an egg beater, probably.

The picture must have struck a responsive chord among some readers, for shortly after its appearance word came announcing the birth of 8-pound 15-ounce Thomas Gerald Loew of Milwaukee. Congratulations, Mr. and Mrs. Loew. And don't forget about eggbeaters.

* * *

Puppet Partner

WHITEY MAURATH, indefatigable welding rod producer and merchandiser, has had built for himself a noval "maurionette" (see cut) which he will use in his advertising in STEEL throughout next year, as well as on the cover of next week's issue (boy, are we letting out secrets!) with the little fellow in Santa Claus attire.

Whitey Maurionette, we are told, is fully jointed to assume lifelike poses, and has a body of papier-mache and plastic wood. Two Cleveland sculptresses studied Whitey the man during several sittings, to transfer the proper facial expressions to Whitey the Maurionette.

The little fellow will appear in a series of 13 advertisements during 1937, with a change of costume each time. For instance, in the *Yearbook of Industry* issue, Jan. 4, 1937, young Whitey will don overalls and workshirt and

will be taking inventory in a miniature stockroom. Some fun, hay?

Whitey is a dominant personality in the welding rod business, and he hopes all his friends will extend the same courtesies to his new little pal that they have shown him.

* * *

Errotten

OUR old friend, J. C. S. from Buffalo, wants us to interpret a printer's bull which appeared in the Dec. 7 issue, wherein a correction line was dropped in the wrong place, thus completely balling up an entire paragraph.

Well, J. C., we have long since given up trying to explain these things. It only brings up the old question: Are printers people? If you will send us 25 cents in coin or stamps to cover postage and a couple of beers, we will write the paragraph out for you in longhand, so there can be no mistaking its portent.

* * *

Essential

M E. MC IVER, secretary of the American Association of Engineers, which since 1915 has been laboring to promote the social and economic status of the engineer, writes that "We find STEEL very interesting and in almost every issue we discover something so significant in professional problems that we consider it essential to pass it on to our members."

For example, see p. 31 of the November issue of *Professional Engineer.*

—SHRDLU

Reinforcing

Reinforcing Bar Prices, Page 71

Pittsburgh—All indications point to a first-quarter price advance on reinforcing steel bars, new billet quality, sometime late this month for immediate effect, thus precluding extensive price protection at old levels. Meanwhile, the official market on new billet quality bars holds at 2.05c, f.o.b. Pittsburgh, for carload lots as quoted by distributors.

Cleveland—Mills are active here mainly due to numerous small awards of less than 100 tons. Most of these have come from private sources. The only large pending project, holding the interest of jobbers here, is the Huntington park bridge, this city, involving 170 tons. The general feeling is that prices will not be advanced until Jan. 1.

Chicago—Activity in reinforcing bars is slow to decline. Business is being maintained somewhat better than usual for this period, with inquiries fairly numerous for small lots. Larger bookings total 1600 tons, including 800 tons each for sewer work and a housing project here. Considerable tonnage is pending for other public construction, including bridges and dams. Prices continue at previous levels.

New York—After a month of relative quiet reinforcing bar awards on identified projects total 465 tons with 1400 tons pending. With price shading from $4 to $6 reported in some instances both in New York

Concrete Awards Compared

	Tons
Week ended Dec. 11	2,141
Week ended Dec. 4	2,495
Week ended Nov. 27	3,945
This week, 1935	3,265
Weekly average, 1935	6,862
Weekly average, 1936	6,053
Weekly average, November	3,757
Total to date, 1935	343,205
Total to date, 1936	302,632

and New Jersey, sellers are awaiting official announcement on first quarter prices. Apparently little effort is being made to cover.

Seattle—New projects involve no large tonnages but local mills still have considerable backlogs and there is a fair run of small tonnages. No awards of importance were placed this week. Fresno dam, Milk river project, Mont.; awarded to Bismarck, N. D., contractors, involves 865 tons of reinforcing.

San Francisco—Demand for reinforcing bars continues unabated and more than 11,500 tons are pending. Awards aggregated only 843 tons, bringing the total for the year to 226,522 tons, compared with 200,534 tons for the corresponding period in 1935.

Reinforcing Steel Awards

800 tons, Calumet intercepting sewer, Chicago sanitary district, divided between Concrete Engineering Co., Chicago, and Inland Steel Co., Chicago.

800 tons, second section, Jane Addams housing project, Chicago, to Inland Steel Co., Chicago.

117 tons, gymnasium, high school, Daley City, Calif., to Concrete Engineering Co., San Francisco.

115 tons, bridge, Dutchess county, New York, to Concrete Steel Co., New York, through A. E. Ottiavaneo, Croton-On-Hudson, New York.

109 tons, bureau of reclamation, invitation A-42,144-A, Knob, Calif., to Bethlehem Steel Co., Bethlehem, Pa.

100 tons, brew house, F. & M. Schaeffer Brewing Co., Brooklyn, N. Y., to Igoe Bros. Inc., Newark, N. J.

100 tons, building at Port Ivory, N. Y., for Procter & Gamble Co., to Jos. T. Ryerson & Son Co. Inc., Chicago.

Reinforcing Steel Pending

1000 tons, plant, for Campbell Soup Co., Camden, N. J., includes 200 tons of spirals.

1000 tons, extension of Westside elevated highway, to downtown, Manhattan, New York; maturity indefinite.

865 tons, Fresno dam, Milk river reclamation project, Mont.; Wachter & O'Neill Construction Co. and McGarry Bros., Bismarck, N. D., general contractors.

370 tons, section 7, route 101, Sixth avenue subway, New York.

232 tons, bureau of reclamation, invitation A-42,156-A, Knob, Calif.; bids opened.

230 tons, schedule C, Broadway low level tunnel, Oakland, Calif.; bids opened.

224 tons, schedule G, Broadway low level tunnel, Oakland, Calif.; bids Dec. 24.

220 tons, Washington state road projects; bids at Olympia, Dec. 22.

176 tons, bureau of reclamation, invitation A-42,158-A, Potholes, Calif.; bids opened.

125 tons, branch post office, Shorewood, Milwaukee county, Wisconsin; Thorp-Rogoff Co., Chicago, general contractor.

118 tons, bureau of reclamation, invitation 25,542-A, Hatch, New Mexico; bids opened.

113 tons, paving work, East Whiteland and Willistown townships, Chester county, Pennsylvania; bids to state highway department, Harrisburg, Pa., Dec. 18.

103 tons, airdrome, Sacramento, Calif.; bids Dec. 14.

Unstated, University of Montana journalism school; bids at Missoula, Dec. 14.

Unstated, state bridge, Sandpoint, Ida.; H. C. Malott, Seattle, general contractor.

Semifinished

Semifinished Prices, Page 71

Last week several semifinished steel producers openly declared themselves out of the market on tonnage to be shipped at fourth-quarter prices. Producers' bookings have been so heavy that it appears doubtful that they can ship and deliver them within the next 45 days. Their

unfilled business has reached a point which has not been matched at any time since possibly early in 1929. Consequently, orders of semifinished steel users are being accepted only on first quarter. A long-delayed first-quarter price announcement on skelp now seems to be near at hand, with the present 1.80c, Pittsburgh or Chicago, base on both narrow and wide skelp probably to be reaffirmed.

Pig Iron

Pig Iron Prices, Page 72

Pittsburgh—Colonial Iron Co.'s merchant blast furnace at Riddlesburg, Pa., idle since 1929, is expected to commence operations about Feb. 1, 1937, following approval last week of a $125,000 loan from the RFC.

Continuing heavy demand for pig iron is noticeable, with mention of a shortage soon heard in some quarters. Buying at present seems to be taking the advance level. Springdale Foundry Co., Springdale, Pa., has been awarded a contract at $262.46 to furnish alloy cast iron grate bars for the federal engineers at Pittsburgh.

Cleveland—Considerable pig iron contracting at the higher prices has been noticed among consumers here. Some additional tonnage was placed last week for shipment this month. This new business has exceeded most expectations, for it was thought that consumers were carrying sufficient stocks, in view of the heavy buying before the first of the month. Some believe that shipments during December will total more than any other month this year.

Chicago—Pig iron shipments continue at the best rate so far this year, as producers are endeavoring to complete deliveries before Jan. 1. No announcement has been made regarding the disposition of unshipped tonnages after that date. Consumption continues heavy, but foundry stocks are being increased. Some small lots are being received at the higher market.

New York—Pig iron shipments are heavy, although new buying reflects protective coverage last month.

Philadelphia—Pig iron shipments are heavy, but new business is quiet, as most consumers covered their needs before the last price advance.

Cincinnati—A few spot shipments, at new prices, constitute new business in pig iron. The movement against contracts entered prior to the Dec. 1 price advance is steadily at the high level of October and November. Higher prices are firm on first quarter inquiries and on a few purchases.

St. Louis—Purchasing of pig iron for first quarter at the advanced price has broadened slightly, but is not impressive, most melters having covered requirements for the next 60 days. Shipments continue in heavy volume, with indications that the December movement will be the highest for any month this year. Some steel casting plants have stepped up activities, mainly to accommodate railroad work.

Birmingham, Ala.—Some few sales are reported for delivery during first quarter, and the pig iron market is considered firm, with shipments still active. Alabama production of iron in first 11 months totaled 1,782,488 tons, which is 648,440 tons more than produced all of last year. Production this year will exceed any year since 1930.

Toronto, Ont.—Canadian pig iron markets showed little or no change the past week. Sales, however, continue in good volume with melters taking iron at frequent intervals for spot delivery and a few inquiring for first quarter. Prices are firm.

Scrap

Scrap Prices, Page 73

Pittsburgh—For the second successive week a strong upward price movement in remelting scrap was in evidence here and quotably No. 1 steel advanced 75 cents a ton to $18 to $18.50. Similar advances took place in all low phos specialty grades as brokers hurried to cover whatever shortages they had, clearly anticipating higher consumer buying levels before the end of the year. Recent railroad lists have found No. 1 steel on the Baltimore & Ohio sold for about $18.60 and on the Pennsylvania, $18.45, both f.o.b. tracks for delivery within this district.

Cleveland—No sales of size are being made in steel and iron scrap here and rising prices at Pittsburgh and other centers have had no effect on quotations yet. New York Central is understood to have sold scrap rails at $19.50, Alliance, O., and also rails for rerolling at $20.50, Central Ohio points.

Chicago—Scrap is stronger, with a number of grades up 25 to 50 cents. No. 1 heavy melting steel has brought close to $17.50 on railroal lists and brokers and dealers find little material available at less

than $17. Mills have been buying only small lots, generally avoiding large purchases because of refusal of the trade to sell substantial tonnages at recent levels. Other grades are in good demand as a consequence of heavy consumption.

New York—Prices on certain classifications, especially cast grades, moved up sharply last week on a wave of heavier mill buying and more activity in the export market. Heavy breakable cast is up $1 from last week and No. 1 heavy melting steel is 50 to 75 cents a ton stronger. Both Japan and Italy are again in the market.

Philadelphia—Further strength in steel and iron scrap is becoming evident. No. 2 heavy melting steel has risen to $14 and advances have been made in a number of other grades. No. 1 steel remains unchanged at $15 to $15.50, delivered, with the latter figure supported by a recent consuming purchase. It is doubted, however, if nearby consumers could now do much under $16 on a tonnage of size. Cast grades show particular strength.

Boston—Indicative of returning heavier demands for iron and steel scrap prices have been boosted 25 cents to $1 a ton on 19 classifications.

Detroit—Stronger consumer demand here has forced prices on hydraulic compressed sheets, No. 1 and No. 2 heavy melting steel 25 cents a ton higher, a reversal of the weak trend the preceding month or more. Some automotive scrap supplies this month will be diminished resulting from the Midland Steel Products and Bendix Products strikes.

Cincinnati—District mills closed on an important tonnage of iron and steel scrap, including a wide variety of open-hearth and blast furnace grades. Covering operations have created an active market and brought another 25-cent increase in buying prices.

St. Louis—There is still strong competition among dealers and consumers for available iron and steel scrap and the market continues to advance sharply. The past several days have witnessed increases of 25 cents to $1.50 per ton, with steel works material most acutely affected.

Birmingham, Ala. — Scrap is strong, demand active and stock on hand with dealers rather limited. Quotations are firm, heavy melting steel holding at $12.50 to $13.50. Large producers of scrap have offered much tonnage lately.

Seattle—In view of lack of export demand, the market is holding its own, although prices are not firm. The situation is being sustained by continued interest of local mills and foundries, while low stocks at tidewater offset absence of foreign demand. Japan is buying some material in British Columbia, where shipping facilities are unimpaired. The price for No. 1 melting steel is quoted generally at $10.50.

Toronto, Ont. — Trading in iron

and steel scrap is active. Both Toronto and Montreal dealers report good demand for steel scrap. Iron grades are in demand with machinery cast the most active. Stove plate and other lines are somewhat spotty. Prices are firm with higher levels expected soon.

Warehouse

Warehouse Prices, Page 74

New York—Most jobbers have advanced cold-rolled strip to 3.56c. delivered in metropolitan area, but at least one seller holds at the old price of 3.36c. Price increases on other items are not expected for the next two weeks. Consumption of strip by manufacturers of metal stampings and toys and safety razors is especially heavy. Alloy steels and steel for machinery also are in good demand. Sheet sales are in a mixed condition, with some sellers noting a decline, while others report a good demand. Structural shapes are moving slowly.

Pittsburgh—Nails have been advanced 20 cents per keg to $2.45, black wire 10 cents to 3.05c, and galvanized wire 10 cents to 3.40c, all for in-town Pittsburgh shipment, effective immediately. Other warehouse steel price advances will probably be made about Jan. 1.

Philadelphia—Warehouse business is unusually active for this season. Sharp advances in prices are expected to be announced shortly, to become effective in district Jan. 1.

Cleveland—Distributors report an active market in expectation that prices will be raised Jan. 1 to conform to mill changes. Requirements for small structural shapes have improved, but lighter gage stock is still most active. Sales so far this month are reported to be considerably better than in the corresponding period last month.

Detroit—Announcement of higher warehouse steel prices likely will be delayed until after Dec. 20 at least, according to report of leading jobbers here last week. Meanwhile, demand shows no contraction and trading is brisk.

Chicago—Orders are equal to or above the November volume, in contrast to any preceding year and partly is accounted for by the higher prices which are in prospect. Changes likely will be deferred until Jan. 1.

Cincinnati—Active demand from warehouses continues unabated, with no apparent speculative buying induced by certainty of price increases soon.

St. Louis—The usual seasonal recession in sales of steel from warehouses has failed to appear. On the contrary, business so far this month is on a slightly higher daily average than in November. Purchasing reflects actual requirements, also a desire on the part of consumers to stock up prior to the effective date of the price advance.

Seattle—Volume of sales is less than a month ago, due to seasonal restrictions and also to the closing of many plants because of the marine strike. Advanced prices are being well maintained, although Portland dealers have declared open prices and the situation in Oregon is said to be uncertain. This is attributed to keener competition in that area where steel imports are unsettling the price structure.

Steel in Europe

London—(*By Cable*)—Pig iron inquiries in Great Britain are being taken only for delivery to the end of June and new bookings are being accepted only at a premium. Exports of pig iron are negligible. Steel demand holds at a high rate and new furnaces are being started. Most producers are booked for months ahead. Several important foreign contracts have been taken, including a steelworks in Turkey, awarded to H. A. Brassert & Co., London.

The Continent reports active export conditions in all markets. The European steel cartel has increased basic gold export prices.

Ferroalloys

Pittsburgh—Effective on first-quarter business, ferromanganese sellers have advanced the market $5 per ton to $80, duty paid seaboard, or $85.13, delivered, Pittsburgh.

Spiegeleisen has been advanced $2 and all grades of silicomaganese $4.

Import Ore and Pig Iron

Philadelphia—Ore arrivals here in the week ended Dec. 5 totaled 11,912 tons, including 6250 tons of iron ore from Algeria, 5612 tons of chrome ore from Cuba and 50 tons of manganese ore from England.

Other arrivals included 399 tons of pig iron from British India, 167 tons from the Netherlands and 129 tons from Norway. Fifty tons of ferromanganese came in from the Netherlands.

Metallurgical Coke

Coke Prices, Page 71

The Youngstown mine of the H. C. Frick Coke Co. near Connellsville, Pa., will be reopened by the Bortz Coal Co. with plans for employing 200 men. The plant, idle since 1929, includes 200 acres of coal and 200 beehive coke ovens. Plans are to start with 50 ovens and gradually increase to capacity. Closed six years, the Cokeburg mine near

Washington, Pa., of the Industrial Mines Corp., resumed operations Dec. 7, leading ultimately to the employment of 600 men. Completely electrified, the mine is considered one of the largest in the district. Initial work will be devoted to putting the mine in condition after the long shutdown.

Standard furnace grade of beehive coke remains quotable at $3.75 to $4 a ton and from all indications sellers are not inclined to ask higher prices. Common foundry coke at $4.25 to $4.50 is also quotably unchanged.

Shipments for industrial and domestic consumption continue heavy and in excess of the November rate. Prices are steady.

Nonferrous Metals

Nonferrous Metal Prices, Page 72

New York — Paced by advancing prices abroad major nonferrous metals tended higher here last week. Lead and zinc both rose $2 per ton to the highest levels since 1930 while tin recovered from its recent lows. Domestic copper held unchanged but export copper advanced to around 10.80c, c.i.f.

Copper — Independent fabricators entered the market on a larger scale, boosting sales to a high of 2582 tons on Thursday. Some interests here believe that if this buying movement continues to gain momentum and if prices rise much higher abroad an advance here before the year-end would be likely. Domestic producers, however, maintained a conservative attitude and still look for steady prices at 10.50c, Connecticut.

Lead — The advance of $2 per ton on Friday was directly attributable to the rise in prices abroad to levels above New York parity. Consumer buying was heavy even at the higher price and the undertone continued strong. The market closed at 5.30c, East St. Louis, and 5.15c, New York, with St. Joseph Lead Co. still asking $1 premium on the latter market.

Zinc — Prices advanced to the basis of 5.15c, East St. Louis, due to the well-sold position of sellers who turned away business even at the higher level. It was reported that there is not a great deal of metal to be had at any price but consumers are well covered through the first quarter.

Tin — Prices reacted Friday on the news that the control agreement would be renewed for another five years and that quotas for the first quarter would be 100 per cent of standard tonnages. A larger cut in quotas had been anticipated in some quarters. Straits spot closed around 52.12½c against a high for the week of 52.50c.

Antimony — Chinese and American spot both closed at 12.75c, New York. Only light sales to regular customers were reported.

Weirton Employes' Group Waives December Dues

At the regular November meeting of the board of directors of the Weirton Plant Employes' Relief and Beneficial association, it was unanimously voted to omit the payment of December dues as affecting all active members of the Weirton plant association. This action of the directors is similar to that taken in June of this year when it was voted to waive July dues.

In both cases, the necessary premium payments to the insurance companies were paid out of the reserve fund which contained sufficient funds to meet these expenditures and also maintain the reserve required as provided under the by-laws of the association.

Census Shows Gains For Tin Cans and Other Tinware

Total value of tin cans and other tinware in 1935, $292,388,012, showed a 40.6 per cent increase over the 1933 total of $207,946,457; the industry's 27,484 wage earners in 1935 represented a gain of 17.7 per cent over 1933 with 23,343 workers; and wage payments aggregating $27,825,974 exceeded the 1933 figure, $22,692,907 by 22.6 per cent, according to preliminary returns from the biennial census of manufactures by the department of commerce.

Cost of materials, fuel and purchased electric energy was computed at $206,033,852 in 1935, compared to $207,946,457 in 1933, an increase of 50.3 per cent.

Production estimates included: Venthole-top cans, chiefly for evaporated milk 1,774,961,311 with a value of $17,200,813 produced in 1935, compared with 1,736,937,202 with a value of $14,721,113 produced in 1933; sanitary cans, including sweetened-condensed-milk cans, 7,590,318,855 with a value of $151,195,053 produced in 1935, compared to 5,436,278,955 with a value of $94,842,452 in 1933; ice cream cans, 759,838 with a value of $411,649 in 1935, compared with 540,481 with a value of $399,403 in 1933; dairy milk cans, 1,000,142 with a value of $3,101,924 in 1935, compared to 866,233 with a value of $2,277,601 in 1933; other miscellaneous cans and packages, 3,188,977,991 with a value of $99,646,154 in 1935, compared with 2,846,121,935 with a value of $82,495,640 in 1933.

Plants with annual production valued under $5000 have been excluded from the census since 1919.

Per Capita Comparisons Show '29 Still Unsurpassed

Before 1929 standards of production are reached, the growth in population must be taken into account, the National Industrial Conference board pointed out last week in a survey which showed that while actual output in various manufacturing industries has reached or even surpassed the 1929 level, per capita production in general is still approximately 19 per cent below the per capita output of 1929.

To provide the same amount of goods per capita today as were made available by industry in 1929, total output must exceed that of 1929, the board said.

Of 18 industries studied, only four had a greater output per capita of population in the first nine months of 1936 than in 1929. On a per capita basis, production in the plate glass industry in this period stood at 130.8 per cent of the 1929 level; in the tobacco products industry at 106.2 per cent; in the boot and shoe industry at 106.1 per cent; and in the petroleum refining industry at 100.4 per cent.

Industries in which per capita production this year has been between 80 per cent and 90 per cent of the 1929 level included textiles, slaughtering and meat packing, sugar melting, and flour milling. Per capita output in the automobile industry this year was 78 per cent of the 1929 volume. Other industries in which the per capita output ranged between 75 per cent and 80 per cent of the 1929 level are rubber tires and tubes, iron and steel, zinc, coke, and tin.

Granite City Employment Up to 1929; Wages Higher

Employment at the Granite City Steel Co., Granite City, Ill., is virtually at the same level as the peak year of 1929, according to Hayward Niedringhaus, president.

In 1934 the payroll showed approximately 2000 men, but these employes were working less than half time. Today there are over 2900 full time employes. The company's wage rates have increased 21 per cent over the 1929 rates.

Republic's New Mill to Roll Strip 98 Inches Wide

The new strip-sheet mill of Republic Steel Corp., Cleveland will be capable of rolling material 98 inches wide, instead of 90 inches as originally planned, it was disclosed last week, as work progressed. This, it is said, will make the new mill the widest of its kind. Present record-holder is National Steel Corp.'s 96-inch mill, Ecorse, Mich.

A continuous plate mill, now under construction at Braddock, Pa., for Carnegie-Illinois Steel Corp., is rated as a 100-inch mill, but presumably will not be able to handle strip-sheet to a width of 98 inches.

Hours in Manufacturing Show 4.3 Per Cent Gain

Man-hours in 25 manufacturing industries in October showed an increase of 4.3 per cent over September, caused by an increase of 3.1 per cent in the number of workers employed and an advance of 1.2 per cent in the average hours worked per wage earner, according to the National Industrial Conference board.

Total payroll disbursements in October were 4.7 per cent higher than in the preceding month. Average hourly earnings were the same as in September, but weekly earnings increased from $25.11 to $25.50, a gain of 1.6 per cent, as a consequence of the lengthening of the work-week. Inasmuch as the cost of living declined slightly from September to October, the purchasing power of weekly earnings increased 1.7 per cent.

The board's report shows that distinct gains have been made since October, 1935. During the year employment rose 9.5 per cent; total man-hours, 16.7 per cent; total payrolls, 20.7 per cent. Average hourly earnings in October, 1936, were 2.8 per cent higher than in October, 1935; the average work-week was 6.8 per cent longer; and weekly earnings were 10.2 per cent higher. Although living costs increased during this year-interval, real weekly earnings in October, 1936, were 6.8 per cent above those of October, 1935.

A comparison of conditions in October, 1936, with those prevailing in October, 1929, shows that the number of workers employed in the 25 industries is now only 9 per cent less than in October, 1929.

Equipment

Pittsburgh—Rust Engineering Co., here, has been awarded contract for annealing furnaces for the strip mill development at Campbell, O., for Youngstown Sheet & Tube Co. in connection with its recent announcement of a $10,000,000 plant expansion. Fort Pitt Bridge Works has been awarded 2500 tons of structural steel for three mill buildings, and Surface Combustion Co., Toledo, O., a heating furnace for the Brier Hill tube round mill. Westinghouse and General Electric have been awarded electrical equipment in connection with the expansion.

Chicago—Inquiries for most types of plant machinery and equipment continue active. In the case of machine tools, there is little delay in placing orders because of the inability of manufacturers to make early delivery. In some other instances, however, closing on inquiries is being deferred until early next year. Machine tool sales continue to compare favorably with the best preceding months this year, with indications pointing to an extension of recent activity into first quarter. Good schedules of most metalworking plants are providing a brisk demand for small tools.

Seattle—Demand is slow due to seasonal conditions, and is aggrevated by the maritime strike which has closed many inland industries. Prospects for a heavy turnover early next year are promising.

Construction and Enterprise

Ohio

BARBERTON, O. — City is completing plans for construction of $420,000 sewage disposal system. Will probably be ready for bids early in January. Fred Marvin is mayor; Barstow & LeFeber Inc., 31 North Summit street, Akron, are consulting engineers.

BEDFORD, O. — Weldrods Inc., Libby road, Maple Heights, manufacturer of welding wire, plans to move into former Latex factory site on Willis street, here. R. R. Applegate is general manager.

CLEVELAND — Kokomo Sanitary Pottery Corp. has acquired plant of Globe Brass Mfg. Co. here, as part of its expansion program. Max Gerber is president.

CLEVELAND — Reilly Tar & Chemical Co., 11 South Meridian street, Indianapolis, has plans nearing completion for construction of branch plant here, estimated to cost over $100,000 with machinery and equipment.

DAYTON, O. — Materiel division, office of contracting officer, Wright field, will receive bids until Dec. 21 for furnishing various lengths and sizes of chrome molybdenum seamless steel tubing, circular 37-395, for delivery various army air stations.

DEFIANCE, O. — Former skilled employes of Defiance Pressed Steel Co. are organizing new company to manufacture stampings and other metal products. Negotiations are under way with local business men to secure backing for the project; incorporators are Fred J. Weisgerber, Pierce Whetstone, Charles A. Hahn and associates.

DEGRAFF, O. — Village is taking separate or combined bids, due Dec. 21, for construction of waterworks system, including well casing screen, pump and pump house, elevated steel tank of 100,000 gallons capacity. Cost is estimated at $60,000. Carl J. Simon, Van Wert, is engineer.

MANSFIELD, O. — City has completed preliminary plans for erection of elevated water tank and construction of additional mains at an estimated cost of $181,000. Project should be ready for bids early in February.

NEW WASHINGTON, O.—Village has PWA loan and grant for construction of waterworks consisting of six miles of mains and 100,000-gallon storage tank. Cost is estimated at $75,000. Jennings & Lawrence Co., 538 Rowlands building, Columbus, is consulting engineer. August Rettig is mayor.

NILES, O. — City plans construction of improvements to distribution system and erection of electric substation. Cost of project is estimated at $200,000; will be ready for bids upon final approval by PWA. R. G. McLean is city engineer; A. H. Heidenrich, Hudson, is consulting engineer.

NORTH BALTIMORE, O. — Julius Paul Foundry Co. building has been purchased by James C. and Louis Lund, Detroit, and will be repaired and modernized for production of light and heavy medium grey castings.

SANDUSKY, O. — Temporary order restraining construction of municipal light plant here has been dissolved. Plans call for construction of generating station, distribution and street lighting systems. Preliminary survey completed some time ago by Burns & McDonnell Engineering Co., Dixie Terminal building, Cincinnati. Fund of $1,515,000 has been allocated by PWA.

SPRINGFIELD, O. — Ohio Masonic Home, board of trustees, will construct water supply system, including two wells, 100,000-gallon reservoir tank, pump house and two pumps. E. J. Price is superintendent.

SYLVANIA, O. — Village has completed revised plans for construction of power plant and distribution system to cost $158,000. Edward G. Jacobs is city clerk; Carl Simon, Van Wert, is engineer.

TOLEDO, O. — Gulf Refining Co. has begun modernization of second still at its refinery, here, at an estimated cost of $40,000.

TOLEDO, O.—Champion Spark Plug Co. is building $500,000 plant for manufacture of spark plugs in Middlesex, near London, England.

TOLEDO, O. — Lake Erie Ship Building Co., Buffalo, plans construction of winter ship repair plant here. Adam Cornelius, Buffalo, is president.

Connecticut

STAMFORD, CONN. — Edwards & Co. has awarded contract for structural steel for mill building to Bethlehem Steel Corp., Bethlehem, Pa.

New York

NEW YORK — Elk Sheet Metal Works Inc. has been incorporated by Adolphe Rothblatt, 20 West Forty-third street, to deal in sheet metals.

NEW YORK — Flodel Metal Corp., Manhattan, has been organized to deal in metals, metallic alloys and minerals for use in construction, by Hardin, Hess & Eder, 4 Trinity place, New York.

NEW YORK — Multi-Metal Co., 801 East 193rd street, the Bronx, has acquired additional space at Garrison avenue and Whittier street, Bronx, and will alter building, install machinery and establish offices at new location. Company makes metal filtration equipment for chemical plants.

POTSDAM, N. Y. — Clarkson Memorial college has adopted five year building plan. Plans for $350,000 building will be drawn immediately as part of the program. Dwight J. Baum, Riverdale, N. Y., is architect; Bertrand R. Snell is president of board of trustees.

Pennsylvania

GROVE CITY, PA. — Borough will receive bids until Dec. 18 for one diesel oil engine generator and auxiliaries.

PITTSBURGH — City will receive bids until Dec. 15 for furnishing and installing steam generating unit and appurtenances at Ross pumping station.

PITTSBURGH — Pittsburgh Junction Railroad, Smithfield and Water streets, has permit for construction of warehouse at corner of Twenty-first street and Pennsylvania Railroad Co. Cost is estimated at $20,000. James Baldwin, 1000 Macon avenue, is contractor.

Michigan

BATTLE CREEK, MICH. — Kellogg Co. has permit for construction of $100,000 addition to factory, five stories, 85 x 340 feet.

DETROIT — H. & H. Iron & Metal Co., 8101 Marrow street, has been incorporated by Henry Levett, 4758 Sturtevant avenue, to deal in metals.

DETROIT — Falcon Tool Co., 12502 Greiner, has been incorporated by Ralph Edens, 22144 Elmwood avenue, to deal in tools.

DETROIT — Midwest Electric Products Co. has been formed by Harold W. Tuttle, 3916 Verment avenue, to manufacture electric products.

DETROIT — Sterling French Machine Co., 423 New Center building, has awarded contract for erection of $30,000 factory building on Schaefer road, to Austin Co., Detroit.

FERNDALE, MICH. — Forging & Casting Co. is erecting $11,000 factory addition. Austin Co., Detroit, is contractor.

IMLAY CITY, MICH. — Almont Mfg. Co. is building an addition to its foundry department.

LANSING, MICH. — City is completing plans for construction of sewage disposal system and will be ready for bids soon. Shoecraft, Drury & McNamee, Ann Arbor, are consulting engineers.

MUSKEGON, MICH. — Huron Portland Cement Co., 1325 Ford building, Detroit, has purchased site on Muskegon harbor and plans erection of permanent warehouse.

ST. JOSEPH, MICH. — St. Joseph Machines Inc. is planning an addition to its plant.

Illinois

CHICAGO — Wedge Mfg. Co., 2334 South Michigan avenue, has been incorporated to deal in equipment, tools and devices, by V. L. Jacobs and associates.

EAST ST. LOUIS, ILL. — American Steel Foundries, 2039 East Broadway, has permit for construction of $20,000 addition to core room, 75 x 120 x 40 feet.

JOLIET, ILL. — James Heggie frame pattern shop and foundry was badly damaged by fire Nov. 10. Damage was given as approximately $11,000.

MOLINE, ILL. — Plant of Velie Motors Corp. has been purchased by J. I. Case Co., manufacturer of tractors and agricultural equipment, Racine, Wis.

Louisiana

SUNSET, LA.—City, Joseph H. Castille, clerk, receives bids Dec. 15 for construction of waterworks system, including installation of pumps, tank and tower. Fund of $24,500 is available.

Mississippi

ABERDEEN, MISS. — Plant of Federal Compress & Warehouse Co. was seriously damaged by fire recently. Ben Hester, 81 Monroe street, Memphis, Tenn., is president.

CORINTH, MISS. — Board of aldermen receives bids Dec. 21 for construction of sewage disposal plant. R. M. Striger, Tupelo, is engineer.

GEORGETOWN, MISS. — Town has PWA allotment of $7454 for erection of 30,000-gallon elevated steel water tank on 75-foot tower, construction of pump house and installation of electrically-driven pump.

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MABEN, MISS. — Town will construct waterworks system consisting of two 400-foot wells, electric motor-driven pumps, pump house, tank and tower, cast iron pipe, fittings and fire hydrants. Project will cost approximately $38,180; funds will be supplied by PWA.

NEW HOULKA, MISS. — Town has $17,273 allotment from PWA for construction of complete new water system, including elevated tank and tower.

North Carolina

CHARLOTTE, N. C. — Pet Dairy Products Co., 1607 East Fourth street, will erect new plant in Charlotte.

CHARLOTTE, N. C. — Swift & Co., Union Stockyards, Chicago, has awarded contract for construction of plant, here, to J. J. McDevitt Co., Builders building.

HIGH POINT, N. C. — City authorized construction of hydroelectric plant in the Yadkin river near here and issuance of $3,171,750 bonds to finance the project. E. M. Knox is city manager.

LEAKSVILLE, N. C. — Town has PWA allotment of $2,727 for construction of additions and improvements to waterworks. Project includes enlarging capacity of present filtration plant, erecting 150,000-gallon elevated storage tank and extending distribution system.

LENOIR, N. C. — Caldwell County Membership Corp., J. H. Hart, president, receives bids Dec. 22 for construction of 298-mile electric distribution system in Caldwell county. Spoon & Lewis, Jefferson building, Greensboro, are engineers.

NEW BERN, N. C. — National Oil Co. is erecting bulk plant on route 17 near here, to replace present plant. W. H. Fowlkes, Greenville, is district manager.

PLYMOUTH, N. C.—Kelkhefer Container Co., Milwaukee, will build pulp mill here, at an estimated cost of $5,000,000.

WILMINGTON, N. C.—City will spend $25,156 for extension and replacement of mains for fire protection purposes. Grant of $11,320 has been approved by PWA for this project.

WILMINGTON, N. C. — Atlantic Refining Co., 260 South Broadway, Philadelphia, plans to start construction about Jan. 15 on gasoline and oil distributing plant to be erected at Cliffs on Cape Fear river. Construction will include erection of five storage tanks. Cost is estimated at $1,000,000.

South Carolina

EBENEZER, S. C. — Town has PWA allotment of $18,182 for construction of waterworks system.

GREENWOOD, S. C. — City receives bids Dec. 21 for constructing water tank.

NORWAY, S. C. — Town will construct waterworks system consisting of well, pump and pumphouse, 75,000-gallon elevated tank and distribution system. Allotment of $27,273 for this purpose has been approved by PWA.

ORANGEBURG, S. C. — City plans construction of $80,000 water softening plant with all necessary machinery and structures, in addition to installing high-duty service pumps and drilling well. Grant of $36,000 approved by PWA.

SUMTER, S. C. — City will construct $96,363 additions to sewer and water systems including installation of disposal plant machinery and laying of water mains. Grant of $43,363 supplied by PWA.

Tennessee

CHATTANOOGA, TENN. — Tennessee Stove Works, East Fourteenth street, Hardwick Caldwell, president, plans construction of $25,000 plant addition on Greenwood street. Gordon Smith, Volunteer Life building, is architect.

ENGLEWOOD, TENN. — Town will construct pumping station, 100,000-gallon elevated tank and improvements to distribution system in a $63,636 project financed by PWA.

MEMPHIS, TENN. — Southern Bell Telephone & Telegraph Co., Hurt building, Atlanta, Ga., plans $100,000 expansion program here. Frank Flournoy is district manager.

NEWBERN, TENN. — City has PWA approval for construction of $50,000 municipal electric distribution system; bids will be received Dec. 18. L. O. Brayton Engineering Co., Dyersburg, Tenn., are consulting engineers.

Virginia

BERKLEY, VA. — Shenandoah Milling Co., Church street, Martin R. Herring, manager, is negotiating for properties of former Chesapeake Knitting Mill Co. Plans are being made to remodel building and install machinery at an expense of about $100,000.

RICHMOND, VA. — Palisades Piece Dye Works Inc., North Bergen, N. J., acquired Ashley Cotton mills and will remodel for dyeing and finishing. Cost is estimated at $30,000.

Texas

HOUSTON, TEX. — Blenville Furniture & Mfg. Co., 743 Front street, New Orleans, La., leased building 801 Williams street, here, for assembly and manufacturing plant.

HOUSTON, TEX. — Region Fords & Engineering Co., San Pedro, Calif., plans to construct $100,000 plant here, for manufacture of oil well supplies. W. S. Proctor, 2209 Bartlett street, is local manager.

ITASCA, TEX. — Hill County Electric Co. has REA grant of $400,000 for construction of rural transmission lines in Hill, Ellis and Johnson counties.

Wisconsin

APPLETON, WIS. — Armcaster Mfg. Co. has been incorporated by Harlow W. Wickert and associates, to manufacture tools, machinery and appliances, principally electrical.

ASHLAND, WIS. — Lake Superior District Power Co. plans power plant additions and alterations to cost $865,000, including installation of 5000-kilowatt turbine at Ashland plant, boiler equipment, transmission lines, substations, etc.

BELOIT, WIS. — Ray Mfg. Co., formerly Electrical Equipment Mfg. Co., has acquired site on Gardner street and will start work soon on new factory building. Firm will make batteries, battery chargers, farm light plants, etc. Walter R. Cones is general manager.

CHIPPEWA FALLS, WIS. — PWA grant of $58,500 toward new vocational school costing $130,000 has been approved. Plans are being drawn by Howard M. Nelson, architect, 204 East Grand avenue, Eau Claire, Wis.

EAU CLAIRE, WIS. — Fehr Concrete Pipe Works Co. will soon start construction of 40 x 80-foot factory building, equipped with machinery for manufacture of concrete pipe.

GREEN BAY, WIS. — Northwest Engineering Co. has awarded general contract for construction of $40,000 plant addition, to Selmer Construction Co., Green Bay.

LA CROSSE, WIS. — Trane Co., maker of heating specialties, will soon award contracts for construction of one-story, 121 x 290-foot addition to Bennett street plant. Reuben N. Trane is president.

Minnesota

DULUTH — Interlake Iron Corp., producer of pig iron and coke, has been granted permit for construction of factory addition.

HALSTAD, MINN. — Village has selected Ealy G. Briggs, consulting engineer, 1955 University avenue, St. Paul, to prepare plans and estimates for proposed municipal light and power plant.

MINNEAPOLIS — Superior Separator Co., manufacturer of grain cleaning machinery, formerly located in St. Paul, has moved to new quarters at 1179 Fifteenth avenue S. E., Minneapolis.

Iowa

ALBERT CITY, IOWA — Thieman Harvester Co., manufacturer of tractor attachments, etc., has started construction on one-story factory addition, 20 x 90 feet.

DES MOINES, IOWA — Minneapolis-Moline Power Implement Co., Minneapolis, has awarded contract for construction of 90 x 130-foot, one-story factory branch and warehouse building here.

KEOKUK, IOWA — Kumo Foundry Co. is moving plant and equipment from Quincy, Iowa, to recently purchased site and building on South Third street, here. J. C. Kushera is president of the company and Ellis L. Moelling is prominent in negotiations.

Montana

LAUREL, MONT.—O. M. Wold Farm Machine Co. has started construction of one-story factory addition, 56 x 92 feet.

Pacific Coast

BURBANK, CALIF. — Lockheed Aircraft Corp. has obtained permits for construction of $21,000 addition to its factory at Empire street and San Fernando boulevard here.

LOS ANGELES — Henger-Seltzer Co., distributor for Bridgeport Brass Co. products, is building $25,000 warehouse at 130 South Hewitt street.

COLFAX, WASH. — Voters have approved $50,000 bond issue to finance construction of proposed disposal plant. L. R. Stockman, Baker, Oreg., is supervising engineer.

OLYMPIA, WASH. — REA allotments for Washington include $45,000 for 43 miles of line in Benton county and $13,000 for construction of 13 miles at Tanner, Wash.

PUYALLUP, WASH. — Brew Mfg. Co. planing mill was destroyed by fire Nov. 29, causing loss of $40,000 in addition to loss on stock and machinery.

Canada

HAMILTON, ONT. — Canadian Cotton Mills Ltd. plans erection of $75,000 manufacturing and warehouse plant at its factory here.