

STEEL

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

Contents . . . September 14, 1936

Volume 99 - No. 11



EDITORIAL STAFF

E. L. SHANER, *Editor*

E. C. KREUTZBERG
Development Manager

A. J. HAIN, *Managing Editor*

A. H. ALLEN, *Engineering Editor*

Associate Editors

E. F. ROSS J. D. KNOX
G. H. MANLOVE DONALD R. JAMES
JOHN A. CRONIN W. L. HAMMERQUIST

New York B. K. PRICE-L. E. BROWNE
Pittsburgh E. A. FRANCE JR.
Chicago W. G. GUDE
Washington L. M. LAMM
London VINCENT DELPORT

BUSINESS STAFF

GEORGE O. HAYS, *Business Manager*
R. T. MASON, *Circulation Manager*

New York E. W. KREUTZBERG
 J. W. ZUBER
Pittsburgh S. H. JASPER
 D. C. KIEFER
Chicago L. C. PELOTT
 W. F. O'DELL
Cleveland R. C. JAENKE
 C. H. BAILEY

Member Audit Bureau of Circulations; Associated Business Papers Inc., and National Publishers Association.

Published every Monday. Subscription in the United States, Cuba, Mexico and Canada, one year \$4, two years \$6; European and foreign countries, one year £2.

Entered as second class matter at postoffice at Cleveland, under the Act of March 3, 1879. Copyright 1936 by Penton Publishing Co.



As the Editor Views the News	21
Proposes Joint Survey by Scrap and Steel Institutes	22
Gain in Heavy Products Double That of Light	23
Steel Earnings Gain; Taxes Also Higher in First Half	24
Labor	25
Activities of Steel Users and Makers	26
Meetings	26
Gearmakers on Cruise Told Employe Policies Are Vital	27
Men of Industry	28
Obituaries	29
Mirrors of Motordom	31
August Ingot Rate Best in 77 Months	34
Steelworks Operations for the Week	34
Windows of Washington	35
One Way to Restore Industry to Public Esteem— <i>Editorial</i>	37
The Business Trend—Charts and Statistics	38
Use of Instruments in Steelmaking	40
Modern Standards for Drafting Room Lighting	48
Materials Handling	57
Heating Coil Relieves Stresses in Welded Pipe	60
Surface Treatment and Finishing of Metals	62
Chemists Discuss Uses of Metals and Alloys	67
Iron and Steel Engineers Section	69-108
A Forward View of the Steel Industry	80
Convention Program	93
Official List of Exhibitors	99
Power Drives	110
Welding, etc.— <i>Robert E. Kinhead</i>	113
Progress in Steelmaking	114
Alloys and Design Solve Heat Problems	116
New Equipment Descriptions	122
Recent Publications of Manufacturers	126
Market Reports and Prices	127-150
New Construction and Incorporations	151
Index to Advertisers	166



Published by the PENTON PUBLISHING CO., Penton Building, Cleveland, O.
John A. Penton, *Chairman of Board*; C. J. Stark, *President and Treasurer*;
E. L. Shaner, J. R. Dawley and D. M. Avey, *Vice Presidents*; R. T. Mason, *Secretary*.

BRANCH OFFICES:

New York	220 Broadway	Washington	National Press Building
Chicago	Peoples Gas Building	Cincinnati	418-420 Sinton Hotel
Pittsburgh	1650 Koppers Building	London	Carlton House
San Francisco	2413 Milvia St.		Westminster, S. W. 1
Berkeley, Calif.	Tel. Berkeley 7354W	Berlin	Berlin, N. W. 40, Roonstrasse 10





“Ryerson Saved My Life That Time”---

“I had plenty of sheets ordered but they didn't arrive. Stock on hand would only last through the day—then Division Four would have to shut down, and the production line would be thrown out. We had to have 60 tons for the next day's production. I phoned Ryerson at 4 P.M. and they promised to deliver all 60 tons in the morning.

At 8:10 next morning, the sheets were coming in. Ryerson had taken them out of stock, loaded them on trucks, and traveled all night—but the sheets arrived and a full day's production was saved.”

We hope that you will not often need such fast service, but in an emergency you can definitely count on Ryerson to do everything possible to deliver the material you need at the time you require it.

And remember—this service can be secured not only on sheets, but structurals, plates, shafting, alloys, stainless—practically everything in the steel line.

JOSEPH T. RYERSON & SON, INC., Chicago, Milwaukee, Cincinnati, Cleveland, Detroit, St. Louis, Buffalo, Boston, Philadelphia, Jersey City.

RYERSON

As the Editor Views the News

SCRAP is one of the most interesting commodities in the metalworking industries. Its sources of supply are scattered more widely geographically than those of material such as ore, fuel or flux. Its prices are more sensitive and are dependent upon a more complex set of factors than those of other basic materials. Let the market quotations advance 50 cents per ton and immediately miles are added to the radius from a collecting center within which it is profitable to gather country scrap. Let a sizable export demand develop and overnight its effect on domestic prices begins to creep inward from seaboard to interior points.

• • •

From late in 1932 until recently the export demand for scrap was a godsend to the American scrap industry. More than any other factor

Scrap Essential To Steelmaking

(p. 22) it furnished the impetus which saved many dealers from failure. It helped to keep the scrap collecting and distributing machinery intact. Today domestic demand has revived. Prices are high. Sellers and consumers are debating whether or not the four years of foreign business were an unmixed blessing. Whatever the verdict, it is clear that a better understanding between scrap men and steelmakers is desirable. The individuals who are working diligently to this end deserve the thanks of all industry.

• • •

Gearmakers, conventioning aboard a passenger steamer on the Great Lakes (p. 27) heard the president of their association give sound advice on the timely subject of the obligations of employers.

Fair Deal Best Labor Policy

He stressed the importance of fair wages, good working conditions, suitable facilities for settling disagreements between employer and employe, and safeguards for security of employment. Stated in a nutshell, he was urging employers to give their workers a square deal.

This, of course, is the essence of ideal lab. relations and it is a pity that here and there one finds a company whose executives think that trickery and evasion can be substituted successfully for fair treatment. The occasional unfair employer not only unwittingly is playing into the hands of CIO and similar organizations but he also is making it more difficult to restore industry (p. 37) to public esteem.

• • •

Everyone is familiar with the campaign conducted by lighting experts to preserve eyesight by improving the illumination of homes, schools, etc. Unheralded by spectacular announcements, great progress also is being made in industrial lighting.

Save Eyesight in Shop, Office

Standards of illumination are being raised steadily (p. 48), and conditions which were considered adequate several years ago now are outmoded because illuminating engineers have developed better light sources and improved fixtures. This is particularly true in the case of drafting rooms, where the correlation of the distribution and visual characteristics of the light to the required seeing conditions presents special problems. It is just as important to guard against eyestrain in the shop or drafting room as in the home or school.

• • •

A part of this issue (pp. 69-108) is devoted to details of the forthcoming thirty-second annual convention and exposition of the Association of

Visit Us at Detroit Show

Iron and Steel Engineers. Meeting in Detroit, Sept. 22 to 25, the engineering fraternity of iron and steel will discuss a wide range of the industry's technical problems. A glance at the comprehensive program (p. 93) will show that engineering progress revolves around the trinity of men, machines and markets, which, appropriately, is the title of a forward looking article (p. 80) on the problems of the industry. STEEL will maintain a booth at the exposition, where visitors will be given a chance to cast secret ballots indicating their views on current political, social and economic questions. We cordially invite you to call on us! Space Nos. 48 and 49.

E. R. Phares

Proposes Joint Survey by Scrap and Steel Institutes

A JOINT commission to be named by the American Iron and Steel institute and the Institute of Scrap Iron and Steel Inc., to undertake co-operative study of the relation of scrap exports to the domestic market, was proposed by President Darwin S. Luntz at the mid-year conference of the Institute in the Statler hotel, Detroit, on Wednesday, Sept. 9.

The board of directors decided to hold the ninth annual convention at Cincinnati next Jan. 26-28, with David J. Joseph as chairman of the convention committee.

Frank discussion on export shipments of American scrap and the current rising domestic markets followed Mr. Luntz's suggestion at this largest mid-year conference.

Would Not Bar Exports

Serious consideration has been given recently by representative steelmakers to scrap problems, in view of the rising quotations and active demand for scrap, said Mr. Luntz. Unalterably opposed to any suggestion for an embargo or restriction on scrap exports. Mr. Luntz stated that the problem can be solved only co-operatively between the steel industry and the scrap industry because of the fundamental economic factors involved.

"The consumers of scrap should see to it," declared Mr. Luntz, "that a fair price is paid for our commodity at all times, to make it un-sound to export scrap. At no time should the price of scrap be permitted to go so low, as it has in recent years, that scrap dealers are compelled to sell for export, in order to cover their costs of operations and meet their payrolls. Among other economic factors, the development of direct dealing by certain steel companies has forced scrap dealers in certain districts to develop new markets for their scrap."

The exporting of scrap kept that industry from bankruptcy during the depression, said Michael V. Bonomo, Institute vice president, who is treasurer of Schiavone-Bonomo Corp., New York.

Speaking at the dinner meeting, he asserted that there are no shortages of scrap in this country.

He told how his company, in 1932, was forced to accept a foreign offer for a cargo of No. 2 steel at \$4.20 a gross ton because domestic mills were unwilling to buy.

"What effect has the export of scrap had on the steel mills, now

that they are busy and in need of scrap?" asked Mr. Bonomo. "Frankly, I believe it has brought some of them a temporary shortage of scrap that could have been avoided had they been far sighted enough in securing their requirements, instead of staying out of the market and trying to depress prices. But in the last two months they have come out into the open and told the scrap dealer that they needed scrap. They have met the market prices and bought large tonnages. They have met the natural rise in prices, caused by the inflexible law of supply and demand.

"I believe that while the position of some of the mills is not as comfortable as they would like to have

Steel Wool in Auto Horns

STEEL wool to cleanse surfaces of dirt is a commonplace. Steel wool in automobile horns to tune them to a pleasant pitch is something new. A test proved that an auto horn with a raucous, earsplitting note produced a dulcet harmony when plugged with steel wool, a note about middle C. A jury of delegates from New York civic organizations, headed by Ernest Peabody, president of the League for Less Noise, heard the melodious note and found it good. And one of the New York taxicab companies has agreed to change all of its horns.

it, it has eased much and I predict that soon a steady supply of scrap will flow into the mills the same as before and prices will find their level according to the same law of supply and demand.

"At one time we on the Atlantic coast shipped 75 per cent of our scrap for export and 25 per cent for domestic use; now the reverse holds true, with exports on the short end.

"Now let us see what the strong domestic market has done to the export of iron and steel. It has put it to sleep; with the possible exception of the south and the Gulf territory, from which localities scrap has always been exported, there is very little of this commodity being sold for export. There is still some movement in all the Atlantic, Gulf and Pacific ports, which is continually tapering off as old orders are being filled.

"In turning our attention from the export to the domestic business, we

scrap dealers have in many instances foregone higher prices and profits. Of this I can give concrete and positive proof. We are satisfied to deal right here in this country provided we are given a fair opportunity by the customers whom we serve.

"In conclusion let me tell you that in this country there is no such thing as a shortage of scrap. We have the greatest production and reservoir of scrap in the world, so much so that only lately certain outlying districts have been tapped for the first time since the World War. Much of this surplus material can be exported without any detriment to our domestic steel industry.

"The logical and natural export of scrap requires no defense. Exports have saved the business of untold numbers of scrap dealers. The export movement should be utilized to absorb the surplus which we have from time to time and to take up the slack when the domestic demand is dormant. One thing that has been overlooked entirely is the fact that exports have kept the machinery of the scrap industry intact, so that it is now functioning in full swing, to supply the steel industry with the material which is needed."

Deficient in Merchandising

The function of the scrap distributor was another active subject of discussion. Max M. Broad, Grant Iron & Metal Co., Detroit, in his address was critical of the position and the services rendered by scrap distributors in the present market. He charged that many had failed to merchandise their scrap. Joel Claster, of Luria Bros. & Co. Inc., Philadelphia, in outlining the specific operations of a scrap distributor in a vividly worded address, defended the law of supply and demand as the only cause of present marked conditions, and charged that certain steel mills were responsible for their own difficulties, instead of the scrap dealers. J. F. Froggett, senior editor, *Daily Metal Trade*, discussed, among other things, the factors that govern markets in scrap, iron ore, pig iron and steel.

Ben Cohen, of Cohen Machinery Co. Inc., Manchester, N. H., was the winner of the president's trophy in the third national golf tournament of the Institute, which was held at the Franklin Hills Country club on the same day, with a low gross score of 82. The runner-up, who was awarded a cup, was A. Cooper, of the Wilkof Co., Youngstown, O., with a gross score of 85. Other cups were awarded to the following two lowest net scorers, in a field of 28 players representing the various chapters: Ed Stein, of United Iron & Metal Co., Canton, O., and Harry Cohn, of Butler Iron & Steel Co., Butler, Pa. A special cup was awarded to Norman Franklin, of Jackson Iron & Metal Co., Jackson, Mich., as the

lowest gross scorer of the Michigan chapter.

Beside setting the date of the Cincinnati convention for next January, the board also adopted an advertising code, for the guidance of members who use the Institute emblem in any form of publication or advertisement.

A large group of the members made a special conducted inspection tour of the Ford Motor plant during the afternoon. The arrangements for the most successful mid-year conference of the Institute were in charge of a committee of the Michigan chapter, headed by Maurice Schlafer, president of the chapter, who presided at the dinner which closed the conference.

United To Build Rolling Mills for British Plant

United Engineering & Foundry Co., Pittsburgh, has been awarded the contract for a large rolling mill installation for Richard Thomas Ltd., South Wales, England, covering a complete slabbing mill, continuous hot strip mill, continuous cold strip mill for sheets and tandem tin plate mill.

The slabbing mill and strip mills are both of the same design as United built for Ford Motor Co. last year. Part of the equipment will be built in the company's plants here and part in England. The Thomas expansion program is said to represent an expenditure of approximately \$20,000,000.

Where Men Fashion Steel Into Automobiles



THIS aerial photograph shows part of the Ford Motor Co. buildings in Dearborn, Mich., including the new rotunda building in the right foreground and the administration building immediately across Schaefer road. In the background is the Ford Rouge plant, largest industrial establishment in the world. Part of the new steel mills may be seen in the top right of the photograph. In the rotunda beauty as well as utility is provided by 32 columns of stainless steel, each 45 feet high. By day or when floodlighted by night, this Allegheny metal with a Tampico brush finish presents a striking spectacle

Gain in Heavy Products Double That of Light

Expanding activity in the heavy industries is reflected in an analysis just completed by the American Iron and Steel institute showing that output of heavy products in the first half of 1936 was 44 per cent higher than for the same period last year, while the tonnage increase for lighter forms amounted to only 20 per cent.

This analysis is based on the institute's compilation of all types of finished steel produced for sale in the first half, figures which were reported in STEEL for Aug. 17, page 23, and Aug. 24, page 67.

Total of finished steel for the half was approximately 17,261,000 gross tons, or about 32 per cent over the corresponding period of 1935. Of this total, heavy products amounted to 9,928,000 tons, up 3,000,000; light products totaled 7,333,000 tons, up 1,200,000 tons.

Demand for rails, track accessories, car wheels and axles, amounted to over 1,000,000 tons, nearly 70 per cent

Additional news of the iron, steel and metalworking industries will be found on pages 149 and 150 of this issue.

above the first half of last year. Cutput of shapes, reinforcing bars, plates, and other products used in construction enterprises was up similarly,

amounting to 2,492,000 tons. Steel pipe production totaled 1,280,000, up 65 per cent.

Among lighter products the most striking gain was in sheet steel of which nearly one-half goes into automobiles and about one-sixth into furniture and household equipment. Over 3,300,000 tons of sheets were produced, up about 24 per cent over the corresponding period of last year.

Income Derived From Government Shows Rise

How the government since 1929 increasingly has supplanted private industry as a source of the incomes realized by the individuals of this nation is shown in an analysis by the National Industrial Conference board, New York.

The study presents estimates showing that income derived from government sources, which accounted for 8.5 per cent of the total in 1929, had increased in proportion to 17.5 per cent in 1934. Sums derived from government amounted to \$6,820,000,000 in 1929 and \$9,354,000,000 in 1934, an increase of 37 per cent, while the amount from private industry and occupations dropped from \$73,209,000,000 in 1929 to \$41,545,000,000 in 1934, or 43 per cent, the board said.

Plaque Is Bestowed Upon North Grand Island Bridge

American Institute of Steel Construction last week bestowed a stainless steel plaque upon the North Grand Island bridge, Niagara Falls, N. Y., which had been voted the most beautiful structure in its classification.

The plaque was presented by C. G. Conley of the Mt. Vernon Bridge Co., Institute president, and certificates were bestowed upon Col. Frederick S. Greene, superintendent of New York state public works, and others who had a part in the design of the bridge.

Pyrites Co. Not Affected

While shipments of Spanish pyrites have been suspended, due to the civil war in Spain, this, contrary to a previously noted report, has not affected operations at the plant of the Pyrites Co. Inc., Wilmington, Del., as this company has a substantial stock of raw material on hand. This company imports pyrites, selling the sulphur value to acid makers on the North Atlantic seaboard and retaining ownership of the iron ore residue. The sinter produced at the Wilmington plant is in excess of 66 per cent iron.

Steel Earnings Gain; Taxes Also Higher in First Half

NET earnings of 104 iron and steel companies aggregated \$55,249,000 in the first half of 1936, compared to \$23,873,000 in the corresponding period of 1935. Taxes paid by the companies exceeded \$42,000,000 in the first six months this year and were equal to more than 60 per cent of the total paid by them during the whole of last year.

The 104 companies, according to the American Iron and Steel institute, which completed this survey last week, produced more than 90 per cent of the total output of the industry.

Earnings of the companies in the first six months of this year afforded a return of 1.73 per cent on investment, compared with 0.91 per cent earned by the same companies in the first half of 1935. Over the 11-year period, 1925-1935 inclusive, earnings of the steel industry averaged only 3.35 per cent on investment.

The first half earnings were equivalent to \$3.92 per ton on the sale of 18,559,000 gross tons of iron and steel products produced for sale by the companies. In the corresponding period of 1935 they earned the equivalent of \$2.99 per ton. For the full year 1935 their earnings aggregated \$53,360,000, or \$3.01 per ton.

Reports of the companies indicated substantial increases in both employment and payrolls since last year, according to the Institute.

Total payrolls of the 104 companies, including payrolls of the affiliated companies, not all of which belong to the iron and steel industry, amounted to \$401,276,000 in the first six months of this year, indicating average monthly payrolls of \$67,000,000. This represents an increase of 21 per cent over the 1935 average monthly payrolls of \$55,500,000.

The \$42,000,000 taxes paid in the first half of this year were more than 60 per cent of the total tax payments of the same companies during the entire year 1935 largely because of social security payments.

Federal and state taxes on payrolls under social security laws amounted to \$4,000,000, in the first half year.

EARNINGS STATEMENTS

American Ship Building Co., Cleveland, reported a net profit of \$171,546 after all charges, for the fiscal year ended June 30. This compared with a net income of \$8832 in the preceding year. The net earning equaled \$1.31 a share on the common as compared with 3 cents a

year ago. Substantial improvement in operations of the bulk lake fleet resulted in an increase volume of business for the company.

Keystone Steel & Wire Co., Peoria, Ill., for the fiscal year ended June 30, reports net profit of \$1,501,493, equal after preferred dividends and all other charges, to \$1.90 a share, compared with \$1,202,790 or \$1.40 a share in the preceding year.

Vanadium-Alloys Steel Co., Latrobe, Pa., reports net profit \$592,216, for the year ended June 30. This equals \$2.93 a share, compared with \$357,377 or \$1.77 a share the preceding year.

DIVIDENDS DECLARED

Directors of Midland Steel Products Co., Cleveland, declared a regular quarterly dividend of \$2.00 a share on the 8 per cent cumulative first preferred stock and 50 cents on the \$2.00 non-cumulative dividend shares. A dividend of \$1.25 on the common stock was also declared. All

are payable Oct. 1, of record Sept. 21. Reed Roller Bit Co., Houston, Texas, declared an extra dividend of 55 cents a share and a regular dividend of 20 cents, both payable Sept. 30 to stock of record Sept. 19. On June 30 the company paid an extra dividend of 10 cents a share.

Reliance Mfg. Co., Alhambra, Calif., declared an extra dividend of 10 cents and a regular quarterly of 15 cents, both payable Nov. 2 to stock of record Oct. 22.

Detroit Steel Products Co., Detroit, has declared a dividend of 25 cents, payable Sept. 30 to record Sept. 19. A similar payment was made in the preceding quarter.

Pittsburgh Steel Co. Files Registration Statement

Pittsburgh Steel Co., Pittsburgh, has filed a registration statement with the securities and exchange commission covering 101,400 shares of no-par common stock.

The stock is to be offered to stockholders of record on or about Sept. 22 through transferable warrants which expire Oct. 19 on the basis of one share for each two and one-half shares held, at \$10 a share. Shares not subscribed for will be offered at \$10 a share to such persons as the

66 Consumers Show 70% Gain in Earnings

NET earnings of 66 identical companies among equipment manufacturers and other leading consumers of iron and steel for the first half of 1936 average 70 per cent higher than in the corresponding period last year. STEEL's tabulation, Aug. 3, page 16, included 32 companies; the tabulation Aug. 10, page 17, included 11, while the subjoined table lists 23.

It is apparent from the great majority of quarterly financial reports that consumers' earnings have increased substantially, although in many instances provisions have not been made for surtaxes, and other expenses. This measure of improvement, of course, is no indication of the profit on investment. All figures are net earnings, except where asterisk denotes loss.

	Second quarter, 1936	Second quarter, 1935	First half, 1936	First half, 1935
Worthington Pump & Machinery Corp., Harrison, N. J.			162,529	247,023*
General Steel Castings Corp., Eddy-stone, Pa.	558,233*	564,775*	1,181,216*	1,063,010*
Addressograph-Multigraph Corp., Cleveland	320,181	34,387	658,130	275,819
Pullman Inc., New York	1,493,717	413,299*	2,693,980	266,838
American Locomotive Co., New York.....			175,625*	772,225*
Lamson & Sessions Co., Cleveland			101,051	103,949*
Hayes Body Corp., Grand Rapids, Mich.	22,607*	2,936*	23,767*	52,420*
Continental Roll & Steel Fdry., E. Chgo.			383,248	95,129*
Blaw-Knox Co., Blawnox, Pa.			675,293	301,448
Allis Chalmers Mfg. Co., Milwaukee.....	1,334,473	577,197	2,088,600	554,995
Doehler Die Casting Co., Toledo, O.....	281,335	187,985	490,957	360,706
Eastern Mal. Iron Co., Naugatuck, Conn.	29,237		32,751	87,503*
Clark Equipment Co., Buchanan, Mich.	242,869	27,057		
General Refractories Co., Philadelphia	312,785	27,398	543,368	225,200
Midland Steel Products Co., Cleveland....	626,743		1,037,468	
Natl. Mal. & Steel Castings Co., Cleveland	471,388		657,393	
Parker Rust Proof Co., Detroit.....	283,812		534,205	
Pittsburgh Screw & Bolt Corp. Pitts.	336,466	714*	501,522	83,932*
Square D Co., Detroit	218,823	136,791	341,055	268,926
Cutler-Hammer Inc., Milwaukee	341,451		573,794	221,438
Electric Auto-Lite Co., Toledo.....	1,503,363	648,993	2,355,878	1,342,668
Truscon Steel Co., Cleveland.....	386,414	3,461*	320,216	161,538*
Union Tank Car Co., Chicago			821,706	607,454
United Engineering & Foundry			1,293,232	552,703
Timken-Detroit Axle Co., Detroit.....			904,095	397,425
S. R. Dresser Mfg. Co., Bradford, Pa.....	168,568		552,430	252,424
Reynolds Spring Co., Jackson, Mich.....	282,258	130,103	420,477	246,911

board of directors of the company designate, it is stated. The net proceeds are to be used for improvements, expansion and modernization of the company's manufacturing facilities, or to reimburse the treasury for expenditures made for such improvements.

Vanadium Alloys-Colonial Merger Is Approved

Merger of Vanadium Alloys Steel Co., Latrobe, Pa., and its formerly wholly owned subsidiary, Colonial Steel Co., Monaca, Pa., has been approved at a special meeting of stockholders. It was submitted on the advice of counsel and with the favor of the company's directors.

Colonial Steel Co. had been a wholly owned subsidiary of Vanadium Alloys, but in 1934 the federal trade commission ordered the latter firm to divest itself of Colonial stock, claiming such ownership to be in violation of section 7 of the Clayton act. The commission, however, failed to indicate how this should be accomplished.

Steel Industry Prominent In 25th Safety Congress

Delegates from the iron and steel industry will play a prominent part in the 25th congress of the National Safety Council in Atlantic City, N. J., Oct. 5-9.

An interesting series of programs has been prepared for the metals section. Officers of the section include H. W. Darr, Bethlehem Steel Co., Johnstown, Pa.; C. M. Allen, American Rolling Mill Co., Middletown, O.; Dr. R. C. Engel, Republic Steel Corp., Cleveland, and R. A. Chaffin, Continental Steel Corp., Kokomo, Ind.

J. A. Voss, director of industrial relations, Republic Steel Corp., and R. T. Penrod, engineer of tests, Bethlehem Steel Co., Cambria plant, are scheduled to speak at the meeting Monday afternoon, Oct. 5.

Election of officers will be held Wednesday morning, Oct. 7, followed by addresses by C. V. Davison, American Rolling Mill Co.; C. E. Ralston, Pittsburgh Plate Glass Co., and H. B. Meller, Air Hygiene foundation, Pittsburgh.

Presentation of awards for the 1935-36 safety contest will be made Oct. 8. Then John A. Oartel, safety engineer, Carnegie-Illinois Steel Corp., Pittsburgh, will speak on "Safety Kinks in the Metal Industry," an illustrated talk. This will be followed by an address by T. H. McKenney, Chicago, past general chairman of the council's metals section.

Employee Group In Session Today

INTEREST in the steel labor situation centers at Pittsburgh today, Sept. 14, with accredited employe representatives planning to meet with officials of the Carnegie-Illinois Steel Corp. to discuss wages, liberalization of the pension plan and other problems.

It has been pointed out that this is one of the customary annual meetings, formerly conducted by the American Sheet & Tin Plate Co. Benjamin F. Fairless, president of Carnegie-Illinois, hoped to be present at the session today.

Following announcement of fourth quarter price increases in some lines, CIO leaders, as expected, lost no time last week in renewing their demands for wage increases in the steel industry, but the clamor diminished noticeably upon failure to elicit encouragement of any kind from the companies.

Nevertheless, CIO organizers continued to assert that "the increase in wages which the workers will receive in the next few weeks will be attributable to nothing except the campaign to organize them into an industrial union."

Included in the many wage demands was one by employe representatives of 1800 workers in the McKeesport, Pa., division of National Tube Co., recommending that "all salaried employes be given due consideration when required to work overtime by paying them time and a half for such work." The National works' representatives have also gone on record demanding \$5 a day for common labor as a minimum, against \$3.88 now paid inside steel mill labor for eight hours.

Insurgents Get Nowhere

An unauthorized, insurgent group of employes failed to make good on boasts that they would obtain a 25 per cent wage increase, national agreement, 40-hour week and other concessions from Carnegie-Illinois last week.

The small group met at Pittsburgh with expenses reputedly financed by the Steel Workers' Organizing committee. Carnegie-Illinois Steel Corp. issued a statement asserting that the revolted had no legal status and said, "Out of a total of 399 employe representatives in our plants, we understand 18 are in town today (Sept. 9). They had no credentials and no action has been given by their constituents to authorize them to proceed in this manner. Under our employe representation agreement with our employes there is a regular procedure by vote that must be followed

before any authoritative action can be taken."

A period of comparative quiet followed the severing of connections between the A. F. of L. and CIO, after numerous statements from both sides. The status of the ten CIO unions, having a membership of about one-third of the A. F. of L., was a matter of controversy, and will provide fireworks at the annual convention of the A. F. of L.

Campaign Urges Loyalty to American Industrial Plan

Five full-page advertisements outlining the advantages of the American industrial system have been prepared by the National Association of Manufacturers in a nonpartisan effort to assist in interpreting that system to the public.

The series covers a wide range of facts, starting off with the general topic, "What Is Your America All About?" The American plan, it is pointed out, has come nearer to removing poverty than any system yet devised and has distributed wealth so widely that "even in the midst of the depression there were more than 44,000,000 savings accounts."

Next in the series of messages is one titled, "The Myth About Men and Machines." It is followed by "A Word to a Wise Woman," telling how federal, state and local indebtedness last year amounted to \$1600 for each family. The fourth advertisement, "Two Billion People Envy You," is devoted to the high standard of living in this country, and the fifth, "Industry Speaks of the Future," tells of the future of industrial progress.

All of the advertisements are illustrated and each offers free copies of booklets to persons interested in learning more about the subjects. The plan of the campaign provides that the advertisements are to be placed in newspapers and paid for by local industrial advertisers.

Gathering of Evidence on Steel Bids Nears an End

Gathering of evidence in the Pittsburgh district by the department of justice for the senate campaign investigating committee virtually has been completed, with hearings expected to take place probably at Pittsburgh within the next few weeks.

The investigation has been directed primarily at alleged collusive bidding by steel producers on steel sheet piling, but from the thoroughness of the department of justice's investigation, there are other subjects relative to the steel industry's commercial policies which have been investigated.

Activities of Steel Users and Makers

AMERICAN Fork & Hoe Co., Cleveland, has completed negotiations for the purchase of the Evansville Tool Works Inc., Evansville, Ind., manufacturer of axes, hatchets, hammers and other tools. The American company maintains a large plant at Charleston, W. Va., where it manufactures similar tools, and has acquired the Evansville plant to supplement the lines, possibly expanding the area of its output by the addition of some other lines. Robert Raymond, formerly vice president of the Evansville company, will be local manager, and Edwin W. Gebhardt will continue as factory superintendent.

Timken Steel & Tube Co., Canton, O., is moving its New York office from 16 West Sixtieth street to 165 Broadway, effective Sept. 15. The office is in charge of Arthur R. Adelberg.

Ferro Enamel Corp. will dismantle its building at the Great Lakes exposition, Cleveland, in October and erect it next to the general offices at 4150 East Fifty-sixth street, Cleveland. This building will be used for offices and display purposes.

United Iron & Metal Co., 687 Wilkins street, Detroit, has changed its name to the United Metals Refining Co., and has removed its offices and warehouse to new and larger quar-

ters at 1641 Caniff avenue. No changes in personnel have been made.

Pittsburgh Steel Co., Pittsburgh, has opened a new district sales office at 1314 Johnston building, Charlotte, N. C., covering southeastern territory, which includes the Carolinas, Georgia, and Florida. Henry A. Roemer Jr., formerly representative of Republic Steel Corp. in the same territory, has been appointed district sales manager for Pittsburgh Steel Co.

Eisler Electric Corp. has acquired the interests of the Bissett Steel Co. and George Bissett in the Tungsten Electric Corp., Bissett Steel division, Union City, N. J. F. M. Woodford will continue as western manager, with offices at 3030 Euclid avenue, Cleveland. This office will operate in sales and manufacture as a direct branch and will cover middle western territory.

Firth-Sterling Steel Co., McKeesport, Pa., has opened a branch office and warehouse at 415 West Fifth street, Dayton, O., to better serve its customers in southern Ohio. This branch will be in charge of George W. Frick Jr., who will have associated with him W. A. Nungester and Malcolm Forward on high speed tool steels and stainless steels; David M. Smith and Earl V. Johnson on Firthrite sintered carbides, and Paul E. Dimling, on Firthalloy dies.

Standard Brake Shoe & Foundry Co. is moving its general offices and plant from Pine Bluff, Ark., to Memphis, Tenn. The first unit, with

capacity of 750 tons a month, will be in operation Oct. 1. This is said to be the city's first steel foundry. About 200 workers will be employed.

Meetings

AMERICAN Institute of Steel Construction, New York, will hold its fourteenth annual convention at White Sulphur Springs, W. Va., Oct. 21, 22 and 23. This organization has 200 members, from every state, and accounts for 85 per cent of the industry fabricating structural shapes into buildings, bridges and other steel structures. Clyde G. Conley of the Mount Vernon Bridge Co., Mount Vernon, O., is president. V. G. Iden is secretary.

BLAST FURNACE AND COKE GROUPS TO MEET IN CHICAGO

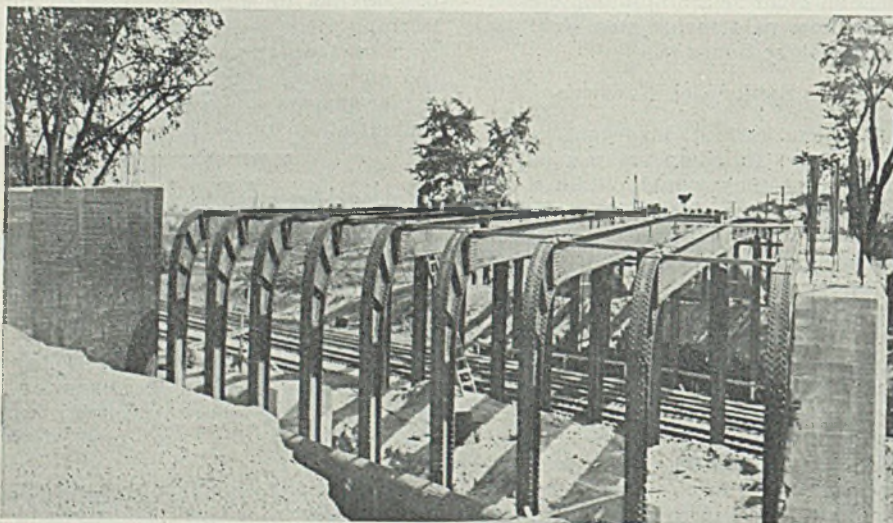
Eastern States Blast Furnace and Coke association and the Chicago District Blast Furnace and Coke association will conduct a joint meeting at the Palmer House, Chicago, Oct. 16. The preliminary program includes lunch at noon, a technical program in the afternoon and dinner in the evening.

F. D. Schreiber, Pittsburgh Coke & Iron Co., Neville Island, Pa., is secretary of the Eastern States association and B. A. Standerline, Wisconsin Steel Co., Chicago, secretary of the Chicago District association.

FREIGHT HANDLING TOPIC AT CLEVELAND MEETING

Great Lakes Regional Advisory board will hold its forty-second regular meeting at the Carter hotel, Cleveland, Sept. 16. The program will deal with rail handling of freight. Producers, receivers and shippers of freight, and other representatives of industry and railroads and the public are invited to attend.

Rigid Frame Steel Bridge Has Thin Superstructure



THIS three-span, rigid frame steel bridge over the New York Central tracks at Triskett road, Cleveland, was designed to obtain a maximum amount of clearance with a minimum depth of superstructure. The concrete curtain walls are designed to move with the steel framework, eliminating part of the expense of abutments. Columns are set on rockers. The job involves about 360 tons of steel

Studies Steel Industry As Market for Other Goods

A study of the iron and steel industry as a market for other commodities has just been completed by Owen C. Holleran of the marketing research division of the bureau of foreign and domestic commerce, department of commerce. The American Iron and Steel institute co-operated with the department in the survey. It is anticipated that it will be ready for distribution in about a month. This survey follows others made in various of the basic industries.

It was found that the steel industry is a market for office supplies, machinery, transportation and lighting equipment, building materials etc. The survey will show the location of steel mills, and the production capacity of each section of the industry.

Gearmakers on Cruise Told Employe Policies Are Vital

UNDERTAKING something new for a metalworking trade and technical organization, the American Gear Manufacturers association conducted its nineteenth semiannual meeting aboard the S. S. SEEANDBEE cruising the Great Lakes, embarking from Chicago, Tuesday morning, Sept. 8, and arriving in Cleveland, Thursday evening, Sept. 10. More than 125 persons made the trip which met all expectations from both the business and pleasure points of view.

From all reports, the gearmaking industry is working well up to capacity and is anticipating several active months just ahead. Because of this activity and pressing demands for deliveries, attendance at the meeting was somewhat smaller than usual.

The first of three business and technical sessions was conducted on Tuesday afternoon.

Committees Report Progress

Numerous standing committees submitted reports dealing for the most part with progress since the last meeting. Several have completed recommended practices to be incorporated in the association's loose-leaf handbook.

In presenting his address as president, E. S. Sawtelle, vice president, Tool Steel Gear & Pinion Co., Cincinnati, emphasized the fact that the product of the gear industry ranges from small radio gears with thousands in a box up to 12 to 15-foot diameter gears appraised in tons. Each shop seems to be faced with entirely different problems and for this reason it is difficult for the association to serve all its members adequately.

Regardless of the variety of product or the degree of specialization, the gear industry must face its problems as a unified whole, Mr. Sawtelle said. It should not forget that the policies, often the prices and the whole set-up may be controlled by the attitude of a jobbing shop that supplies repeat parts or does some small specialized job that can be set up as a standard for customer comparison.

"Today, many seek the easy way; want someone else to solve their problems; they cry out for association rules or government laws to solve their difficulties," continued President Sawtelle, "but when the rules and laws are clamped on them, they are usually the first to complain because of the restrictions and hardships imposed. Were all government

officials supermen, not swayed by personal greed, not desirous of perpetuating their jobs or holding on to their vested interests, maybe we might delegate some of our problems and let the supermen handle them.

"Today it seems the style for politicians to promise everything, defame all opposition, refuse all advice, and blacken the characters of all critics. With government regulation, controlled by politicians, reaching into every avenue that influences our business and personal lives, it is my belief that unless our business management interests itself and its employes in the principles of sound economic thinking, we and our children will pay a tremendous penalty for our negligence.

"History shows that progress comes by evolution . . . Undoubtedly, many of the panaceas offered today in ridiculous extremes will tomorrow be developed in moderation and be thoroughly acceptable. Let us not close our minds toward evolutionary progress but try to be forward thinkers with our feet on the ground.

"Radical agitation is a menace to all business and to all employed by business. Too often the organizer or the agitator has developed a lovely racket for himself at the expense of those he is supposed to benefit.

Laws Hamper Business

"In an economic structure as complicated as modern business we have found the fallacy of attempting to correct our mistakes or iron out our troubles with a few simple laws. They can't be applied. Most industry went into the code regime wholeheartedly and with 100 per cent cooperation — until it tried to apply the regulations.

"But the communist or other theorists have had no such experience and can see only our present ills. The statement has been made that more communists can be produced by one unscrupulous employer than by a dozen red orators.

"If this is true, this is worth our serious thoughts. Are our policies right? Can our employes see in their management a strict attention to business, a fair attitude toward others, and those attributes which command employes' respect rather than offer fertile ground for the radicals' claim that the employer is riding on the back of the workman? If our house is not in order, we will some day pay the penalty. Today,

with class hatred preached in high places, we need to see that we do nothing to widen the breach between employer and employe.

"If ever it has been incumbent upon an employer to give consideration to labor relationships, that time is here. When a quarrel develops it is too late; right is not usually exclusively on one side or the other. The heat generated by the quarrel makes a fair solution extremely difficult. The wise man irons out his troubles before they magnify.

"Employe representation in your own shop, group insurance, adequate training of employes, reasonable promotion policies, fair wages, clean and workable environment, a just participation in your prosperity or your profits; all of these are subjects that cannot be safely ignored or neglected."

More Difficulties Ahead

Vice President H. H. Kerr, president, Boston Gear Works Inc., North Quincy, Mass., presided at the Wednesday afternoon session. In reporting as chairman of the commercial committee, Mr. Kerr warned members of the association that in the months ahead they would be obliged to face many bothersome problems in connection with the social security act, the Walsh-Healy government contracts act and the Patman-Robinson antiprice discrimination act.

He urged that manufacturers take pains to explain to employes the operation and effect on business of the social security act which will require contributions from both employer and employe after the first of the year. Situations will arise which will require a mutual understanding.

In making the report of the membership committee, at the Thursday afternoon meeting, Chairman L. R. Botsai, Nuttall works, Westinghouse Electric & Mfg. Co., Pittsburgh, stated that the association has 81 company memberships and 12 academic memberships. Individuals represented in the company memberships total 160 and in academic membership 13.

Chicago Gear Mfg. Co., Chicago, and Mechanical Specialties Mfg. Co., Chicago, were elected to company membership. Reliance Electric & Engineering Co., Cleveland; United States Electrical Mfg. Corp., Los Angeles; and Otis Elevator Co., New York, were voted into associate membership. Prof. H. C. Hesse, University of West Virginia, Morgantown, W. Va., was elected an academic member.

The spring meeting of the association will be held in the first two weeks of May at some point in the Pittsburgh, Buffalo and Philadelphia area.

The meeting program included the presentation of many committee reports and five technical papers on gear making practice with numerous discussions. These activities will be reported in detail in the Sept. 21 issue of STEEL.

Men of Industry

J H. McELHINNEY, since August, 1929, general superintendent of Lukens Steel Co., Coatesville, Pa., has tendered his resignation, effective Sept. 24, to become associated with another steel company. Detailed announcement of Mr. McElhinney's plans will be made shortly.

G. Donald Spackman, president of Lukenweld Inc., a division of Lukens, will succeed Mr. McElhinney as general superintendent.

Mr. McElhinney joined the Lukens company over ten years ago as assistant manager of production. Prior to



J. H. McElhinney

joining Lukens, Mr. McElhinney, who was graduated from the University of Pittsburgh in 1909, was engaged in power house construction for two years; in 1911 entered the employ of the United Engineering & Foundry Co., two years later joined the Youngstown Sheet & Tube Co.; after service in the World war was identified with the Columbia Steel Co., acted as consulting engineer in the practice of Lief Lee, rejoined United Engineering & Foundry Co., and in 1926 went with Lukens.

Mr. Spackman, a graduate of Swarthmore, joined Lukens in 1919, and served successively in the mechanical department, as fuel engineer, superintendent of flanging department and assistant general superintendent. When the Lukenweld division was formed in May, 1930, he was elected president.

Lester M. Curtiss, appointed superintendent of production a few months ago, will continue in charge of all production.

E. J. Anglin, heretofore general superintendent, has been elected vice president in charge of operations for Weirton Steel Co., Weirton, W. Va.

Mr. Anglin has been connected with the company since 1916, when he became superintendent of the strip steel department. In 1923 he was appointed manager of the steelworks division and in January, 1934, was named general superintendent.

J. S. Williamson, formerly assistant general superintendent, has been appointed general superintendent of the works, succeeding Mr. Anglin.

W. R. Siedenburg has been named assistant general superintendent, and George Harmuth has been appointed manager of the strip steel department. B. F. Garrison has been named to the superintendency of the 48-inch strip mill.

George I. Wright has been appointed transportation sales and division manager by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

A. C. Streamer, formerly transportation manager, has been appointed manager of the switchgear division of the company.

Mr. Wright was formerly chief electrical engineer of the Reading railroad and made his headquarters in Philadelphia.

Frederick S. Cook, since 1919 vice president and secretary of the McCracken-Ripley Co., Portland, Oreg., has been named Pacific coast manager for Robert W. Hunt Co., engineer, with headquarters at San Francisco. He was graduated from Columbia university, New York, with the degree of engineer of mines, in 1905, and in that capacity engaged in the operations and examination of lead and zinc properties until the opening of the World



G. Donald Spackman

war. Mr. Cook is a member of the American Institute of Mining and Metallurgical Engineers.

Robert W. Wilson has become associated with the McCord Radiator & Mfg. Co., Detroit. He will be in charge of the sales and engineering of the industrial radiator division at Plymouth, Ind. He recently resigned as vice president of the Perfex Radiator Co., with whom he had been connected for the past nine years.

James S. Hearons has been appointed assistant manager of sales, railroad division, Inland Steel Co., Chicago. Mr. Hearons began work as a special apprentice for the Erie railroad in 1906, and later became associated with the Illinois Central railroad. During the war he served in the



James S. Hearons

A.E.F. as captain in the engineering division. Prior to his Inland appointment, Mr. Hearons was assistant to the president of the Clark Equipment Co., specializing on railroad sales.

Henry A. Roemer Jr., formerly representative of Republic Steel Corp. at Charlotte, N. C., has been appointed district sales manager of a newly opened office at that point for Pittsburgh Steel Co., Pittsburgh.

Harry E. Sheldon, founder and president of Allegheny Steel Co., will be honored by business and civic leaders of the Brackenridge, Pa., district on Sept. 17 as a testimonial of the part he has played in the industrial progress of the community.

Wilbur C. Schade has been appointed manager of the alloy castings department of Ross-Meehan Foundries, Chattanooga, Tenn. Mr. Schade has had wide experience in the foundry industry, both as a practical foundryman and as an executive. At the age of 25 he was superintendent of the S. Jarvis Adams plant at Midland, Pa., and five years later became vice president and general manager of the

Phoenix Iron Works Co. During the 11 years he was in charge of this plant, many special-purpose castings were successfully made of alloy irons developed by him.

A. Gordon Patterson, district manager at Bradford, Pa., for the Oil Well Supply Co., will become assistant treasurer of the National Tube Co., Pittsburgh, Oct. 1.

G. H. Duggan has resigned as president and managing director of Dominion Bridge Co. Ltd., Lachine, Que. His successor is W. F. Angus, formerly vice president.

Frederick O. Schramm has been named district sales agent for New York and vicinity by the Pittsburgh Steel Foundry Corp., Glassport, Pa. He will have offices at 11 West Forty-second street, New York.

James A. Jackson, vice president and director of the banking firm of Lazard Freres & Co. Inc., New York, and formerly a vice president of the National City Bank of New York, has been elected a director of Reynolds Spring Co., Jackson, Mich.

Frank Page, vice president, International Telephone & Telegraph Co., New York, returned from Europe Sept. 4, after completing a seven-week tour of the firm's manufacturing and operating properties in England, Germany, Belgium and France.

Paul B. Schnelker, machine shop foreman and key man of the National Grave Vault Co. for the past 15 years, has been appointed plant superintendent of the Wyandot Vault Co., Upper Sandusky, O. He assumed his new duties Sept. 1.

L. A. Peto, formerly vice president, comptroller and treasurer of the Canadian Car & Foundry Co. Ltd., Montreal, Que., has been elected vice president and general manager. He is succeeded in his former position by P. C. McLachlan.

A. W. Taber has joined Charles Englehard Inc., Newark, N. J., industrial instrument manufacturer, as sales manager. Mr. Taber is planning an extension of the company's sales activities in the Middle West and Southeast.

Frank W. Ladky, who formerly represented the Acme Steel Co. in the state of Wisconsin, has been named sales agent by the Allegheny Steel Co., Pittsburgh, covering the same territory. He will have headquarters in the Bankers building, Milwaukee. Associated with Mr. Ladky is David A. Garlick, formerly with Bliss & Laughlin Inc., Harvey, Ill.

James R. Buchanan has been added

to the field metallurgical staff of the Detroit district sales office of the Union Drawn Steel Co., Massillon, O. Mr. Buchanan was formerly associated with the metallurgical department of the Chevrolet Motor division of General Motors Corp., Flint, Mich. He joined Union Drawn Steel in April, 1936, and had been located in the home office of the company until taking up his work in Detroit.

George S. Case Jr., until recently assistant general manager of the Chicago plant of Lamson & Sessions Co., Cleveland, has been elected vice president and general manager of the Chicago subsidiary. He replaces the late George E. Osborn. He has been affiliated with the company since his graduation from Dartmouth in 1930, in operating and sales capacities, and has been at the Chicago plant since January, 1935.

J. E. Buckingham has been elected vice president in charge of sales for the western district, with headquarters in the Straus building, 310 South Michigan boulevard, Chicago, by the Lincoln Electric Railway Sales Co., Cleveland. For the past 14 years he has been connected with the Worthington Pump & Machinery Corp., in railroad sales, the last five of which he has been western regional manager, railroad division.

Harold K. Work has been appointed director of research to head the research and development department of Jones & Laughlin Steel Corp., Pittsburgh. He will also have charge of the new miniature steel plant designed to correlate the work of the research and development engineers with the manufacturing operations.

Before going with Jones & Laughlin, Mr. Work was with the Aluminum Co. of America, having started in the research department in 1929 at Buffalo. In 1931 he was made head of the electro-chemical division of the Aluminum Research Laboratories, New Kensington, Pa., and in 1934 chemical engineer of the jobbing division. He is a member of the American Chemical society, the Electro-Chemical society, and the American Electro-Platers society.

tory manager of the Foster Nut & Bolt Co., and also was organizer, vice president and general manager of the former Superior Nut & Bolt Co.

F. L. Dole, 71, vice president of the Aermotor Co., Chicago, in that city, Sept. 4.

Leopold Adelsdorf, 76, treasurer of Goldsmith Bros. Smelting & Refining Co., Chicago, in that city, Sept. 8.

David H. Johnston, 58, office manager of the Detroit district sales office and warehouse of Union Drawn Steel Co., Massillon, O. at Whitehall, Mich., Aug. 26.

W. O. McKinney, 69, president and treasurer of the McKinney-Harrington Conveyor Co., North Chicago, Ill., in Chicago, Sept. 2. He had been head of the company for the past 20 years.

Ira C. Bower, 53, secretary and general manager, Midwest Steel & Iron Co., Denver, in that city, Aug. 31. Previous connections include Denver Iron & Wire Works and the White Orman Iron Works, Oakland, Calif.

Andrew T. Merriman, 64, Cleveland district sales manager for the American Steel & Wire Co. for the past 27 years, in Cleveland, Sept. 5. He joined the company in Chicago 30 years ago and went to Cleveland in 1909.

J. McC Moffett, 64, vice president in charge of sales, Midwest Piping & Supply Co. Inc., St. Louis, Sept. 5. He had been identified with the company since its formation in 1920, and before that was associated with Urbauer-Atwood Co., piping contractor, Chapman Valve Co., Kansas City street railways and Standard Oil Co. of Indiana.

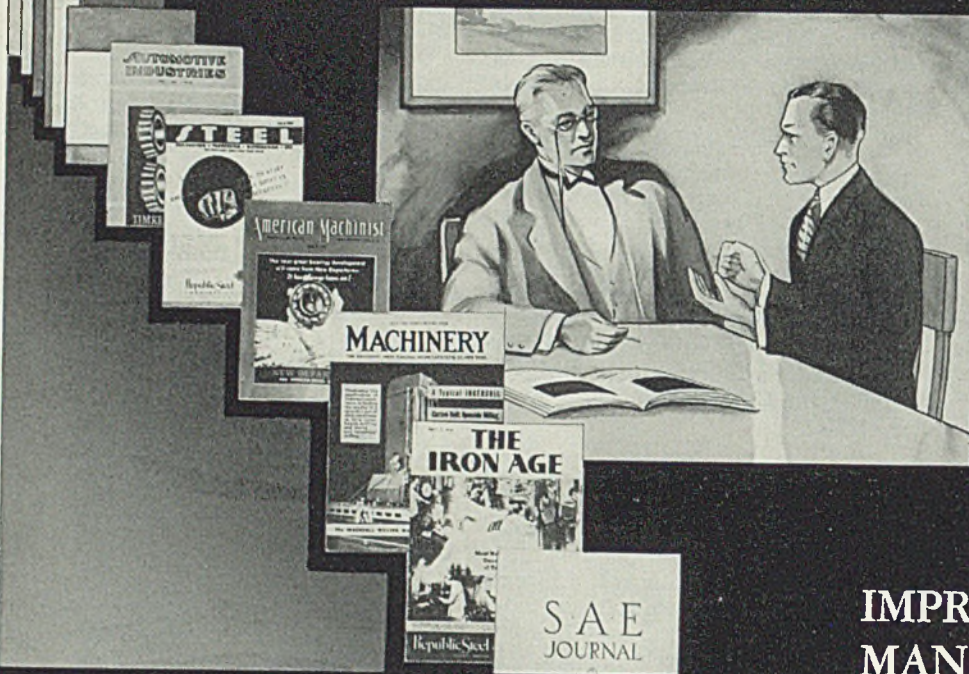
Harry Bates Thayer, 78, former president, American Telephone & Telegraph Co., New York, and of the Western Electric Co., New York, at New Canaan, Conn., Sept. 3. He played an important part in the growth of the telephone industry and in the development of wireless telephony and radio broadcasting. He retired in 1928.

Marshall Robinson, 74, for many years identified with the farm implement industry, in Milwaukee, Sept. 7. After serving for 22 years as sales manager at Milwaukee for the International Harvester Co., Mr. Robinson became associated with the Advance-Rumely Co., LaPorte, Ind. Later he was identified with the Acme Harvesting Machinery Co., Peoria, Ill., and the Kentucky Wagon Mfg. Co., Louisville, Ky. He had been retired for five years.

Died:

MICHAEL J. RILEY, 60, for the past 25 years prominent in the machinery and nut and bolt industry of Cleveland, in that city, Sept. 9. At the time of his death he was western representative of the E. J. Manville Machine Co., Waterbury, Conn. Before that he was superintendent of the Lake Erie Nut & Bolt Co., fac-

THE ATTENTIVE EAR



*Receives
Suggestions
FOR*

**IMPROVED
MANUFACTURING
METHODS**

THE OBSERVING EYE



*Studies
FOR*

**FUTURE
REFERENCE**

ATTENTIVE listening is the means of being apprised of valuable facts.

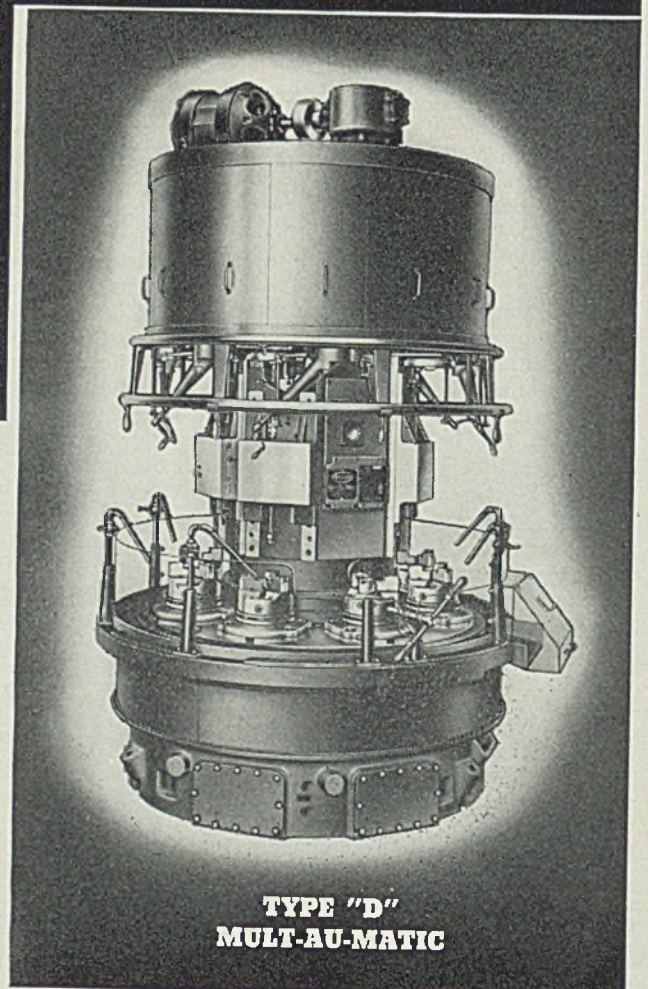
In complete harmony with the Observing Eye, the Attentive Ear receives suggestions for Improved Manufacturing Methods.

It has been heard—"In many plants Bullard Mult-Au-Matics are key units of Production"—and—"What Mult-Au-Matics can do for others, they can do for you".

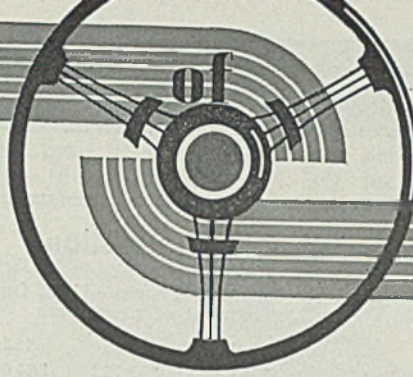
We suggest—"Let Bullard Engineers work up Time and Cost Saving Data on your jobs". Send prints or samples for Bullard Estimates.

Mult-Au-Matics in sizes to meet your requirements for multiple operations of Turning, Boring, Facing, Drilling, Reaming, Threading, and other miscellaneous special operations.

THE BULLARD COMPANY
Bridgeport Connecticut



**TYPE "D"
MULT-AU-MATIC**



DETROIT

WHEN the big die shops like Coleman and Koestlin here begin to get a breathing spell, as they have the past week or so, the natural sequence becomes obvious—that the motor plants are now taking in their new dies and getting re-equipped for fall as rapidly as possible.

Assembly of scarcely 30,000-odd new cars in the industry the past week thus fails to reflect the true state of activity here. For the time is nearly at hand when more makers will join with Packard and Studebaker in getting out their 1937 models.

Barring a last-minute reversal, though, September may go down strangely enough without another major car maker announcing its new lines. However, the period between Oct. 1 and 15 will see announcements on new models coming frequently.

Then, since most makers will time their introduction on models with the start of fourth quarter, an assembly race will follow during the last three months. From the information available now, that quarter may readily exceed in total production the 1,071,630 cars made for the same period in 1935.

Advance buying of parts and materials more or less confirms this appraisal. Chrysler Corp. has been the least timid and already has obligated itself in steel and other materials for 300,000 assemblies over October, November and December. Ford has bought ahead for 215,000 assemblies that will fall mainly in October and November. Chevrolet's advance buying in steel covers enough roughly for 250,000 models, also like Ford to the extent that December's figure has not yet been written in.

Figures Must Be Qualified

In a sense these figures must be qualified. Take Chrysler's purchases, for example, which show that one-third of these orders are in material for "float," the remainder for immediate and nearby shipment.

Parts and materials for 100,000 of the 215,000 Ford schedule are also for float and the same percentage is reflected in Chevrolet's case. In every instance the permissible time limits on parts floats seems more liberal this season.

Therefore, since so large a share of the Chrysler and Ford buying has been

designated for parts storage, the expectation of further buying for late November and December assemblies is indeed good.

Not a few in Detroit today, well qualified to venture a wager, would say the final quarter will account for at least 1,100,000 cars. If it does 1936 can be set down right now as aggregating production of 4,400,000 automobiles.

Chrysler's contribution alone is significant. Making 300,000 cars in the fourth quarter means 100,000 per month, a strong comparison with the 1936 record of 113,000 jobs turned out by the company in July.

Through last week as all the big names, save Ford, remained closed at assembly line divisions, new car production was still a meagre total. Ford gives every indication of virtually being finished with work on 1936 jobs. Chevrolet now has stopped 1936 assemblies, Plymouth and other volume makers remain down.

In fact, totals for the industry are conspicuously leaning on Studebaker and Packard. Both anxious to stock dealers, these two have been reeling off 4500 to 5000 cars per week between them.

Mixed Opinion on Packard

Packard's 1937 announcement has left mixed opinions in its wake. Especially on the subject of the small Packard six, the reaction of automotive circles has been about equally divided.

First, there are the usual red-hot protagonists who foresee a banner year for Packard, but there are also those who think the six has been priced too high. It is true that the minimum of \$795 on the six (and up to \$910 f.o.b. factory) falls close to prices on competitor sixes and eights, but by the same token, because it was not lower, it also falls in a warmly-contested volume field.

From General Motors, Olds, Pontiac and the Buick 40 will have to be reckoned with, and from the independents are Graham, Hudson and Nash, not to forget the Chrysler Airstream lines. All vie for the \$800-\$900 purses.

Small wonder then that Packard may be set down as either profoundly determined, or overly optimistic when it tentatively lines up a production of

65,000 jobs on the 100-horsepower six line alone for 1937.

In fact, the entire Packard program is built around the six for next year, for this line is counted on for more than half the entire output. The 120, now \$50 cheaper, has been scheduled for 50,000 cars, and the super eights and twelves, combined, 8000 models. This makes a total for the company of 133,000 cars.

If they go over the top—and next year at this time alone will tell—not only will previous Packard production be doubled, but fourth place in the industry will be assured.

Last week, Packard got up to 2000 assemblies and early plans call for going to a two-shift day as soon as possible with the plan that production of 800 models per day then will be reached. That swift a pace would mean 4000 models each week, roughly 22,000 per month, or on a full twelve-month calendar year basis, 135,000 to 140,000 jobs.

All of which sounds bullish for Packard common. But Detroit is not talking up Packard alone. Those three aforementioned General Motors models, of which Buick will soon be formally out, have a trick up their sleeves, not to overlook some of the others like Chrysler Corp. and Hudson.

In a field slightly higher, but which may come to be locked in struggle with the maximum range on Packard's 120 line is LaSalle. Relatively hidden in the flurry over its brother-sister cars, LaSalle's preparations have been astute at the Cadillac plant out in West End here.

LaSalle Wants Roominess

The new LaSalle is going to hit interior roominess hard and by so doing will—inadvertently or not—pattern closely after Lincoln's Zephyr. Bodies for LaSalle, as usual made by Fisher, will be 5½ inches wider across the front seat and 4¾ inches wider in the rear than in the present car. Furthermore, the frame will be dropped to a point permitting the floor to be two inches lower than the present.

So radical a body dimension change, without sacrificing standard tread, more or less precludes running boards and fenders as we know them in 1936. From start to finish the big play will be on making the passenger more comfortable in LaSalle, for the motor, still

to be a straight eight, will carry over as will most other mechanical features. From well-founded report, dropping the LaSalle price near to \$1200 should gather in the sales.

Hudson and Terraplane are still closed, last week being the second successive one. Since dealers are to be invited in Sept. 29, and according to the way deliveries of new dies, tools and machinery to Hudson are lined up, September may just as well be counted out as far as Hudson assemblies are concerned.

Hudson will have a few hand-built models of both Hudson and Terraplane to show its dealers on the 29th, models that will feature changes centering on new radiator shells and hoods. The shell, incidentally, will be interchangeable with all models on both lines.

Wheelbases, fenders, and many body panels will be the same, however, as in the 1936 models. Thus, to the eye, the net change for this maker goes down as a new interpretation of radiator grille and shell, the unusual details having been alluded to in this department recently.

Graham, which has given up the Wayne, Mich., body plant it used to share with Reo, is rapidly attaining a better degree of integration at the Warren avenue, Detroit, division. Its calculations have arrived at the conclusion that \$400,000 will be saved annually by this move. In addition to some re-equipment of precision machinery, Graham recently put in 1590 feet of new body paint drying ovens that will use natural gas.

Austin Completing New Plans

Since a month ago when Austin broke out with a new management and the announcement that small passenger units and commercials would again be made, Thomas L. Hibbard, vice president, has been completing plans for the four passenger models. A new motor, still a four-cylinder, is being worked out. Last week the company announced that production at Butler, Pa., would start in November. The car will be in the \$300 class.

But where one dares to tread in the business so thoroughly canvassed by General Motors, Ford and Chrysler, another last week made news through retirement. Reo, maker of automobiles for 32 consecutive years, announced its retirement within the next 90 days entirely from the manufacture of passenger cars.

Reo's crisis was plain when in 1927 and 1928 it faced the momentous decision of choosing one of two plans then before the management. The first was to keep on making a relatively higher priced car and continue to cater to the \$1500-\$2000 price class. The second, and the one that came to be ruled out,

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
7 mo.	1,979,196	2,550,364	2,929,875
Aug.	234,811	237,400	.....
Sept.	170,007	87,540	.....
Oct.	131,991	272,043	.....
Nov.	83,422	395,059	.....
Dec.	153,624	404,528	.....
Year.....	2,753,111	3,946,934	.....

Estimated by *Cram's Reports*

Week ended:	
Aug. 15	56,679
Aug. 22	73,709
Aug. 29	53,037
Sept. 5	31,628
Sept. 12	26,750

was to depart from tradition and put out a cheaper model.

Intervening years have told the story plainly in the gravitation to cheap transportation. Today, the Reo management finds the outlook more profitable to concentrate on commercial cars. Reo, as a name, will soon be gone, though another progeny and namesake of H. E. Olds, Oldsmobile, in a sense perpetuates a fine old name in motordom.

Under General Motors' wing, Olds seems set for new records in 1937. Production of sixes and eights for the coming season will aim at 240,000 units, a 20 per cent increase over the 200,000 made this year. And remember 1932. Only 17,000 Olds cars were produced then!

Production Problems at Olds

Olds, in passing, seems to have spread its wings so widely that some manufacturing problems have arisen. On certain sheet metal parts, for example, capacity at Fisher's Cleveland plant has been utilized in past years. But the story Detroit has now is to the effect that the new Grand Rapids, Mich., division of Fisher will take over a lot of the Cleveland work, and in addition, that next year Olds will have its own press shop.

Buick is just about ready to show its 1937 lines, but last week had more cause for elation in final figures on the 1936 model. They made 173,435 jobs, almost three for one with 1935's 63,985 assemblies. Buick's 1937 tentative schedule calls for 170,000 units.

Buick is spending \$14,500,000 for

new machinery, tools and for increased plant facilities, it is reported. Potential production will be increased from 800 to 1000 cars a day.

Chevrolet's figures for August show production of 87,673 units, the third highest August figure since the record in 1928. Most of the Chevrolet parts plants, like Gear & Axle, the various transmission units and others started wheels turning last Tuesday morning after shutdowns running up to three or four weeks.

Perhaps Packard dug up the sleeping dog when it brought out the six last week. Anyway the "companion car" idea has been revived to embrace Ford again. The same speculation on whether a small V-8 motor will supplement the present V-8 seems to have been given a fresh boost recently.

Actually, though a bank of representative parts for the small Ford have been built up and are on hand at Dearborn there is no assurance one way or the other yet that a final decision has been made. In fact, the size of certain parts' supplies indicates that not all details have been settled on.

Take motors for instance. The original order early this spring coming through to the Ford foundry was to make up a lot of the 20,000 small blocks, which was done at the rate of around 200 daily. Since, about 6000 have been scrapped and thrown back in the cupola, 500 have been exported and the balance of 9000 is still on hand. But starting up production right away with only 9000 motors to begin with is not likely.

Dealers To Look at New Models

Chevrolet dealers will soon be called into Detroit to take a look at the 1937 lines . . . Graham's super-charger sales at 28 per cent of its total this year, are five times what they were in 1935 . . . Auto dealers in 1304 towns in 48 states, 42 dealers in 23 foreign countries, 37 export companies and 1146 prospective buyers direct, are the sum total of interest that has written into Austin at Butler, Pa., asking about the new line to be out in two months . . . Goodyear Tire & Rubber and National Acme Co. finally got together and the former has bought the three-year idle Windsor, Vt., plant of Acme's that used to make automatic screw machinery . . . Bendix is thinking seriously of investing over \$1,000,000 in a new plant at Los Angeles for auto and airplane equipment . . . The service division headquarters of Chevrolet figures that nearly 1000 of their dealers so far in 1936 have modernized their service facilities, along lines suggested by the factory, at a cost of over \$4,000,000 . . . Pontiac begins assemblies on 1937 lines Sept. 21.

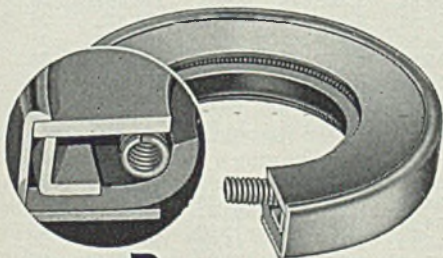
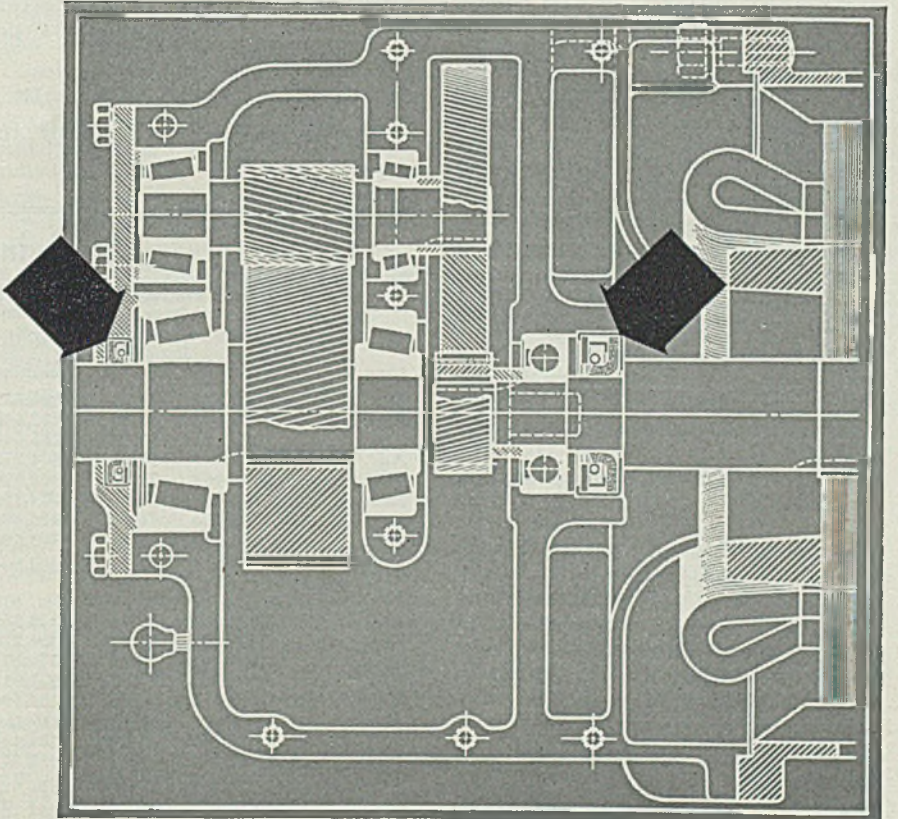
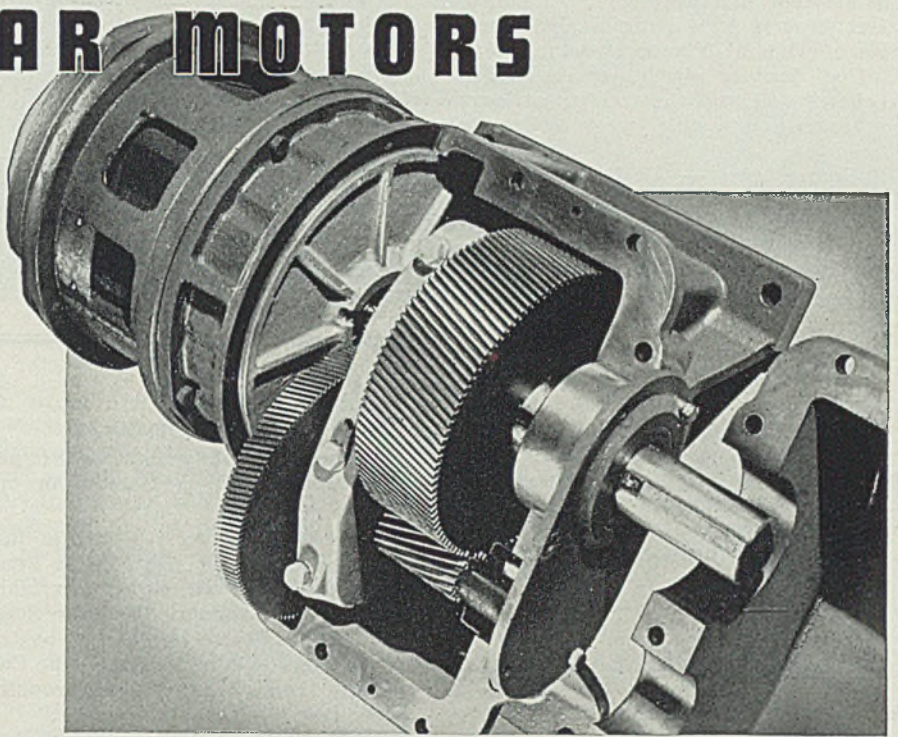
"PERFECT" OIL RETAINERS PROTECT INDUSTRIAL GEAR MOTORS

THE wide acceptance of the modern gear motor for materials handling and production equipment drives is due in no small degree to its reputation for dependability and long service life.

The use of Chicago Rawhide "Perfect" Oil Retainers on both high and low speed shafts, effectively holds the lubricant in the gear case. They protect both bearings and gears by preventing loss of lubricant and by exclusion of moisture, dirt or other foreign matter.

The centerless ground outside diameter of the "Perfect" Oil Retainer assures a precision fit in the bearing housing. The pre-softened and oiled shaft contact surface of the leather packing member reduces frictional resistance to a minimum.

Write for suggestions on the application of these bearing seals to your equipment.



PERFECT
Oil Retainer
PATENTED

CHICAGO RAWHIDE MANUFACTURING COMPANY

1308 ELSTON AVENUE • CHICAGO, ILLINOIS

57 Years Manufacturing Quality Mechanical Leather Goods Exclusively

PHILADELPHIA CLEVELAND NEW YORK DETROIT BOSTON PITTSBURGH CINCINNATI

Production

DUE principally to Labor Day influences and shutdown by an important producer in the Youngstown district for repairs, the national steelmaking rate declined 2 points last week to 69½ per cent. However, resumption at Youngstown and tentative heavier schedules in other centers will pull the rate up at least several points this week. Details follow:

Youngstown—Declined sharply to 67 per cent last week, a loss of 12 points. This was due largely to holiday influences and shutdown by Youngstown Sheet & Tube Co. for repairs. The rate is expected to rebound to 79 per cent this week.

Chicago—Production was reduced by observance of the Labor Day holiday, but the rate during the remaining five days continued at 72½ per cent. Steady schedules are in prospect for the balance of September.

Detroit—Without change at 100 per cent last week as all 19 basic open-hearth furnaces were in production.

Wheeling—Steady at 98 per cent

District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended Sept. 12	Change	Same week 1935	1934
Pittsburgh	72	+ 2	48	13
Chicago	72½	None	59	24
Eastern Pa....	47½	- 1	35½	16
Youngstown...	67	-12	57	24
Wheeling	98	None	84	23
Cleveland	79½	- 2½	67	18
Buffalo	81	+ 5	35	19
Birmingham...	64	None	48½	23
New England 70	-10	73	25	
Detroit	100	None	94	77
Cincinnati	76	- 4	†	†
Average.....	69½	- 2	54	20½

†Not reported.

pected that the rate will move up this week to 85 per cent.

Buffalo—Up 6 points to 81 per cent, with 30 open hearths in operation.

Cleveland—Down 2½ points last week to 79½ per cent. Otis Steel Co. melting in all eight. Corrigan, McKinney division of Republic Steel Corp. continues to operate 12 out of 14 furnaces, while National Tube Co., Lorain, took one off for repairs early last week, to operate 11.

Birmingham, Ala.—Steady demand from mills and fabricating shops held steelmaking at 64 per cent last week.

STEEL CORP. SHIPMENTS GAIN

Finished steel shipments by the

United States Steel Corp. in August were 923,703 tons, a loss of 27,148 tons from the 950,851 tons shipped in July. However, the daily average of shipments in August was 35,527 tons, in July 35,216 tons, the decline being due to one less working day in August.

August Ingot Rate Best in 77 Months

PRODUCTION of steel ingots in August totaled 4,195,130 gross tons, compared with 3,922,731 tons in July, a gain of 272,399 tons, or close to 7 per cent, according to statistics of the American Iron and Steel institute.

The daily rate increased from 150,874 tons to 161,351 tons in August. In August, 1935, total production was 2,915,930 tons, at an average daily rate of 107,997 tons. Production facilities were 73.52 per cent engaged in August, 68.74 per cent in July and 48.78 per cent in August, 1935. August production is the highest since March, 1930, when 4,254,331 tons were made, a daily average of 163,628 tons.

For eight months of 1936 production is 29,444,196 tons at a daily rate of 142,242 tons, with capacity 64.81 per cent engaged. For the same period in 1935 production was 21,226,408 tons, the daily rate 102,050 tons and capacity was engaged 46.10 per cent.

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
March	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	950,851	547,794	369,938	701,322
Aug.	923,703	624,497	378,023	668,155
8 mo.	6,905,904	4,726,290	4,427,306	3,581,897
Sept.	614,933	370,306	575,161	
Oct.	686,741	343,962	572,897	
Nov.	681,820	366,119	430,358	
Dec.	661,515	418,630	600,630	
Yearly adj.....	†23,750	†19,907	*44,233	
Total	7,347,549	5,905,966	5,805,235	

*Addition. †Deduction.

last week. Thirty-six out of 37 open hearths are melting.

Pittsburgh—Up 2 points to 72 per cent, based on operations of United States Steel Corp. subsidiaries at an average of 68 per cent for the week, and an unchanged rate by the independents at 75 per cent.

Central eastern seaboard—Off about a point last week to 47 to 48 per cent, with little early variation expected.

Cincinnati—One open hearth was taken off last week, decreasing steelmaking to 76 per cent. Nineteen furnaces are in production.

New England—Down 10 points last week to 70 per cent. It is ex-

Steel Ingot Statistics

	Monthly Production—Complete for Bessemer; Open Hearth, Calculated from Reports of Companies Making 98.03 per cent						Calculated daily production, all companies (gross tons)	Number of companies working days
	Open Hearth		Bessemer		Total			
	Gross tons	Per cent of capacity	Gross tons	Per cent of capacity	Gross tons	Per cent of capacity		
1936								
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	3,964,418	54.03	118,577	25
Mar.	3,157,579	61.83	185,040	30.86	3,342,619	58.58	128,562	26
Apr.	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
8 mo.	27,241,392	67.00	2,202,804	46.14	29,444,196	64.81	142,242	207
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
Mar.	2,634,482	51.70	230,810	34.97	2,865,292	49.78	110,204	26
Apr.	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
8 mo.	19,376,388	47.52	1,850,020	35.03	21,226,408	46.10	102,050	208
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
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.



WINDOWS OF WASHINGTON

PRESIDENT ROOSEVELT made another effort last week to woo industry. He did not offer assurance of another breathing spell but he made conciliatory remarks about the re-employment situation and practically promised to see that laborers are taken off the government payrolls and put to work in the industries.

There has been considerable conjecture here as to just how far Mr. Roosevelt will be able to go. He promised a breathing spell once to industry. It did not eventuate and since that time industry has been wondering whether it will be slapped on the other cheek, too.

In his fireside radio chat last week the President asserted that "re-employment in industry is proceeding rapidly." And to that end he apparently has allocated another \$2,500,000 to the employment service of the department of labor. He announced a week or so ago that he had allocated \$1,500,000 to that service to bring all employment cards strictly up to date so that the manufacturer desirous of hiring a certain man would have the complete and latest information available through government channels.

Saving Industry Was Aim?

President Roosevelt, in this same chat, contended "that the government spending was in large part responsible for keeping industry going and putting it in a position to make this re-employment possible." He said further that "business men, with their businesses small and large, had to be saved."

It must be remembered that the President in this latest speech took rather a different slant on industry. Previously he had criticized industry in general for not employing more people. Now he calls attention to the fact that "government having spent wisely to save it, private industry begins to take workers off the rolls of the government relief program."

Mr. Roosevelt contended that "government orders were the backlog of

heavy industry" and he said that "government wages have turned over and over again to make consumer purchasing power and to sustain every merchant in the community."

In connection with the re-employment work, Mr. Roosevelt said that "until this administration we had no free employment service, except in a few states and cities. Because there was no unified employment service, the worker, forced to move as industry moved, often traveled over the country, wandering after jobs, which seemed always to travel just a little faster than he did."

Dealing with the additional appropriation which he has made to the department of labor, the President said that it is being done for the benefit of industry and he asked "employers, large and small, throughout the nation to use the help of the state and federal employment service whenever in general pickup of business they require more workers."

LABOR ANTICIPATES SHORT PERIOD OF OUTWARD CALM

With the severance of the CIO and the A. F. of L. last week, there is every indication that the fight between William Green and John Lewis will be rather quiet—at least for the time being. Reports indicate that there will be a flareup at the annual convention of the A. F. of L. when the whole question probably will be aired. However, until that time, unless the unexpected happens, there will be no fireworks.

During the past week, both sides made statements about the severance of the tie between the two organizations, but no more than was to be expected under the circumstances.

"In view of the choice made by the organizations holding membership in the CIO," said President Green on the subject of the final break, "the charge which has been repeatedly made that the executive council lacked authority to take ac-

tion against these organizations falls flat. Instead of suspending these organizations through formal action the executive council accorded them an opportunity to make their own decision. This is in accordance with the voluntary principles and policies which have been applied and followed by the A. F. of L."

Mr. Green said that "notwithstanding the failure of all the efforts which have been put forth to compose the differences which have arisen and to heal the breach which was created by action of the CIO organization, the officers and members of the executive council earnestly hope that an understanding will be ultimately reached, differences adjusted and unity restored."

The CIO crowd is very militant, however, and it is going to take some diplomacy if Green and Lewis are ever brought together again.

At the same time the CIO is claiming that an incomplete check based on scattered reports shows that more than 70 city central labor unions are included in the hundreds of labor bodies that have passed resolutions protesting against the suspension of the CIO unions, or supporting their program of industrial organization.

The same source declares that state federations whose conventions have lined up for the CIO number 15, the overwhelming majority of those that have met so far this year. Craft unions of every kind, it is indicated, are represented in the innumerable actions by local unions.

PRESIDENT READS BOOK TO AVOID QUESTIONS

From the White House down, the President has tightened the lid on government news until after the election. From the reporter's standpoint, it is always quiet in Washington just prior to any election but this year has been more quiet than usual.

As a typical example of this, the President held a press conference at the White House last week, the first

one in some time, and spent almost the entire time reading extracts from a book on waste. He gave the newsmen practically no chance to ask questions and those that were asked he simply parried. He seems to have made up his mind that neither he nor any of his subordinates are going to take chances of a slip between now and election time.

One of the correspondents asked the President, quite in fun, when he would begin his campaign speeches. The President replied that the start would be made probably sometime early in January. This is quite typical of just what happened at perhaps the least newsy conference that has been held in Washington between Mr. Roosevelt and the press.

STUDIES EXPENDITURES MADE FOR MACHINERY

A survey is being made by the machinery division of the department of commerce in connection with expenditures for machinery by certain agencies.

The division is contacting the army, navy, railways and merchant marine to find out the amount spent by them on machinery for the years 1914, 1919 and 1936. The purpose of the information for the years 1914 and 1919 is to ascertain the confusion in obtaining deliveries of machinery while for both 1919 and 1936 the figures are wanted to show the difference in costs.

EMPLOYMENT GAINS CITED BY MISS PERKINS

More than a million persons have been put back to work during the past year and pay envelopes have increased by \$42,000,000, Secretary of Labor Perkins, stated last week in an address. Furthermore, she said, "nearly 5,500,000 more workers are engaged in regular industrial employment than at the low point of the depression in 1933 and more than 3,000,000 others are working on useful emergency jobs provided by the government."

Miss Perkins rang in the changes on the Walsh-Healy government contract bill in which she stated that this law "takes a long needed step toward putting the government in its proper place as a model employer. It is designed to prevent government contracts going to sweatshops. The act requires that every government contract of over \$10,000 for which bids are invited contain stipulations that the contractor is a manufacturer or regular dealer in the articles of the contract, that in their production no one will be employed at less than the minimum wages determined by the secretary of labor or for longer than 8 hours a day or 40 hours a week.

"In addition," continued the secretary, "the contract must state that no children and no convict labor will be employed under the contract, no part of which will be performed

under working conditions which are insanitary or dangerous to the safety of the workers. This statute is expected to make an end of the unfair advantage heretofore enjoyed by bidders who, through cutting wages and other unfair ways, have been able consistently to underbid many reputable competitors."

LATEST BERRY STATEMENT UNDER ANOTHER TITLE

Major George L. Berry continues as an enigma to Washington newsmen. He now comes through with a complimentary statement about John L. Lewis and makes it as president of the International Printing Pressmen and Assistants' union. Of course it has always been known here that he was president of that organization, but he has never used that in his public statements, especially when he was trying to get industry to co-operate with him on his business council.

Major Berry first appeared on the horizon here during the NRA as an administrator. He stayed along with that organization as long as he could and then had the President appoint him as industrial co-ordinator—a position that no one has ever quite been able to understand. Of course, in this connection he organized that conference here which proved to be such a farce and which he has tried to continue ever since. In the meantime, he went out and organized the so-called nonpartisan league to re-elect Mr. Roosevelt, and now he comes through in the official organ of his union and says that "a set of embossed resolutions," rather than condemnation, should be presented to John L. Lewis and his associates for their efforts to push industrial organization.

TAX REVISION HEARINGS MAY START NEXT MONTH

It is believed here that the joint congressional committee on internal revenue taxation, headed by Senator Harrison of Mississippi, will hold hearings on tax revision beginning in October. There is every indication that these hearings will be held behind closed doors.

An effort will be made, it is reported, to have the hearings completed and tentative drafts of a new revenue bill ready by the time congress convenes in January.

The committee already has on file letters from any number of industrialists complaining about the new surplus corporation taxes, in some instances pointing out the inequalities. It is believed that the writers of some of these complaints will be asked to appear before the committee.

In addition to these complaints, it is a forgone conclusion that the administrative provisions of the present tax laws will be revised because they are causing no end of trouble for the government.

Many of the excise taxes expire in

June of next year and something will have to be done about them. Of course Mr. Roosevelt has said that if he is re-elected no additional taxes will be put on the statute books nor will any of the present taxes be increased, but when congress gets the bit in its teeth there is really no telling just how far it will go.

In addition to Senator Harrison the other members of this joint committee include: Representative Doughton of North Carolina, chairman; Senator King of Utah; Senator George of Georgia; Senator Couzens of Michigan; Senators Keyes, of New Hampshire; Representative Hill of Washington; Representative Cullen of New York; Representative Treadway of Massachusetts; and Representative Bacharach of New Jersey.

WORLD TIN CONSUMPTION SHOWS INCREASE

That world apparent consumption of tin appreciably increased in the twelve months ended June of this year is revealed in a report to the commerce department's minerals and metals division.

According to data compiled by the International Tin Research and Development council, apparent consumption of tin throughout the world in that period amounted to 147,720 tons, compared with 125,881 tons in the preceding 12 months, an increase of 16.4 per cent.

United States consumption in the 1935-36 period totaled 69,644 tons, an increase of 35 per cent, while British consumption, amounting to 21,789 tons, registered an advance of 2.1 per cent. Consumption in France and Russia showed increases of 10.6 per cent and 25.1 per cent, respectively, while German consumption was down 10.6 per cent. Germany and Spain were the only two important consuming countries whose tin consumption in 1935-36 was lower than in 1934-35, statistics show.

GERMANS OFFER TO BUY GRAIN IF MEXICO BUYS PIPE

Apropos of the German trade situation and how it is affecting and may continue to affect our manufacturers, comes an unconfirmed report from Mexico which illustrates just what is happening.

The Mexican government is about to be in the market for a large quantity of iron pipe. The Germans have made representations to the Mexican government to the effect that they will buy a large quantity of a certain kind of grain from Mexico if the government will buy its pipe from Germany. In addition, the Mexican government can buy the pipe with the aski mark, at a reduction below par, and will be able to save money at both ends of the line. If this is true—and there is every reason to believe that it is — what chance does the American pipe manufacturer have to get this business?

Here Is One Way To Restore Industry to Public Esteem

ONE of the inevitable features of a long period of economic depression is an outburst of demagoguery, in which politicians attempt to discredit many established institutions and customs indiscriminately. Unfortunately, the aftermath of depression in our own country is running true to the historical formula.

Among the institutions ticketed by demagogues for the role of depression scapegoats are banking institutions, rich individuals, all large corporations, many important industries, and some trade associations. Certain politicians bearing the labels of both major parties and of the numerous secondary parties daily are preaching doctrines which tend to make the average citizen believe that finance and industry are public enemies.

In fairness to certain honest, conscientious politicians, it should be stated that there always are conditions in financial and industrial activity which require correction. Prior to the depression excesses and abuses in every walk of life were overdue for drastic punitive action.

It Is Not Necessary To Smear Entire Groups To Correct Misdeeds of Small Minority

Nevertheless it was not necessary to indict all bankers to punish the guilty ones. Nor was it fair to publicly throw the light of suspicion on all industry to correct the excesses of the less than 10 per cent of companies which were causing most of the trouble. Furthermore, it was not necessary to condemn efficient machinery in order to emphasize the importance of the employment problem.

Now we face the task of repairing the damage wrought by demagoguery. We must re-establish in the public mind a correct view of the role of finance and industry in the general welfare of the nation. Somehow we must convince the man in the street that he is unjust when he characterizes the town's principal industrial employer as an "economic royalist" or a "prince of privilege" just because a clever politician has popularized these words over the radio. We must prove to the layman that he is unfair when he looks upon the employer as a demon and the union labor leader as a saint simply because of

distorted publicity put out by an alliance of political-labor union propagandists. We must assure the public that much of the political talk about the menace of the machine to employment is sheer nonsense. Most important of all, we must help to restore confidence in the system of free individual enterprise.

The task is not easy. A single drop of ink will cloud a half-pint of clear water, but it will take gallons of water to offset the contaminating effect of that one drop. In the same way, a few political wisecracks can undermine confidence in worthy institutions to the extent that months and years of painstaking effort are required to restore them to the position of respect and esteem which they merit.

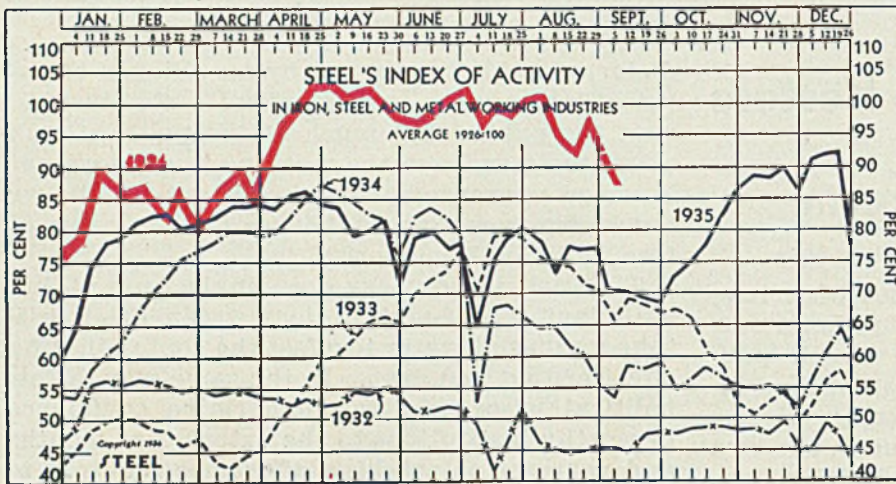
Presenting Unbiased Economic Facts to Public Is Effective Way To Win Respect for Industry

That effort should be made effective immediately. No time should be lost in placing wholesome facts before the public. One method by which this can be accomplished is for each industrial company to help finance the publication in newspapers of the five advertisements prepared by the National Association of Manufacturers.

The first advertisement sets forth the importance of free, competitive business to the welfare of the nation. It shows clearly what this system has done for American citizens since its inception in 1776. The second advertisement explodes the common politically-planted fallacy that machines destroy jobs. The third is an appeal to housewives, embracing a discussion of the menace of hidden taxes and an argument that the money spent in unnecessary taxes would do more constructive work if spent for food, clothes and other necessities or luxuries of life. The fourth, entitled "Two Billion People Envy You," is addressed to American citizens and proves to them that their standard of living—erected upon the system of free private enterprise—is so far above that of other nations that our advantages are the envy of the world. The fifth and final advertisement presents industry's conception of the vistas of opportunity ahead—provided that the existing system is not destroyed or impaired.

The message conveyed in this series is vital, convincing, constructive. It will go a long way toward correcting current misconceptions about industry. Every industrial executive should carefully weigh the advantages of this campaign, and if thoroughly convinced of its effectiveness, should support it.

THE BUSINESS TREND



STEEL'S index of activity in the iron, steel and metalworking industries declined 6.3 points to 87.7 in the week ending September 5:

Week ending	1936	1935	1934	1933
June 20	101.0	77.3	81.8	73.9
June 27	101.9	78.4	79.4	77.0
July 4	97.5	64.1	52.3	71.4
July 11	100.9	76.5	67.8	79.1
July 18	99.9	79.8	68.1	79.4
July 25	102.1	80.8	66.4	78.8
Aug. 1	102.5	78.4	64.8	75.9
Aug. 8	98.7	73.4	64.6	74.7
Aug. 15	92.6	77.5	61.4	74.2
Aug. 22	97.7	77.0	60.3	71.6
Aug. 29	94.0†	77.3	55.1	70.3
Sept. 5	87.7*	70.9	53.5	65.5

†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 Pace Steadies After Labor Day Letdown

CONTRADICTION extremes are reflected in the business picture for the first week of September. In the seven-day period ending Sept. 5 revenue freight car loadings established a new high for 1936. At the same time, automobile output dropped to the lowest point since the week ending Oct. 5, 1935. Steelworks operations eased slightly and electric power output was down only negligibly from the record high of the previous week.

The net effect of these movements was a decline in STEEL'S index of activity to 87.7—the lowest point recorded since the week ending March 21. The sharp drop is due largely to the automobile situation and only in small part to the interruption to activity caused by the Labor

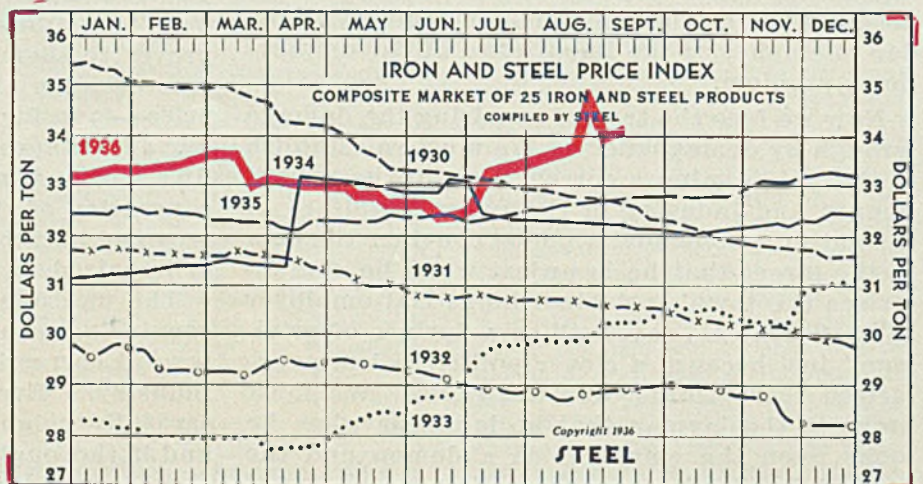
day week-end. The rebound in the weeks ending Sept. 12 and 19 will be reinforced sometime during the month by expanding activity in the automobile industry. The outlook, therefore, is for an early rise in STEEL'S index to the high figures which prevailed in the late spring and early summer months.

Announcement of price advances in certain items of semifinished and finished steel has interjected a new factor into the prospect for demand over the remainder of the year. One effect may be a stimulus to ordering in the remaining weeks before Oct. 1.

The marked improvement in freight traffic is encouraging in that it provides encouraging support for the already noticeable expansion in purchases by railroads of materials and equipment. This is matched by greater activity in many of the so-called heavy industries.

Another favorable factor is that recent estimates of farm income are more optimistic, showing that the effect of drought while severe, was overrated in the earlier statements.

	1936	1935	1934
Sept. 5	\$34.10	\$32.79	\$32.17
Aug. 29	34.03	32.78	32.17
Aug. 22	34.94	32.72	32.22
Aug. 15	33.88	32.68	32.23
Aug. 8	33.82	32.64	32.23
Aug. 1	33.72	32.59	32.28
July 25	33.51	32.55	32.28
July 18	33.49	32.42	32.28
July 11	33.48	32.40	32.33
July 3	33.48	32.39	32.38
June 27	32.79	32.39	33.15
June 20	32.77	32.40	33.16
June 13	32.77	32.41	32.84
June 6	32.81	32.45	32.83



August Pig Iron Production Up 4.5 Per Cent

	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	85,796	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.	87,484	56,767	64.3	40.7
Sept. ....	.....	59,009	.....	42.5
Oct. ....	.....	63,818	.....	45.8
Nov. ....	.....	68,876	.....	49.5
Dec. ....	.....	68,242	.....	49.0

Domestic Freight Car Awards Decline in August

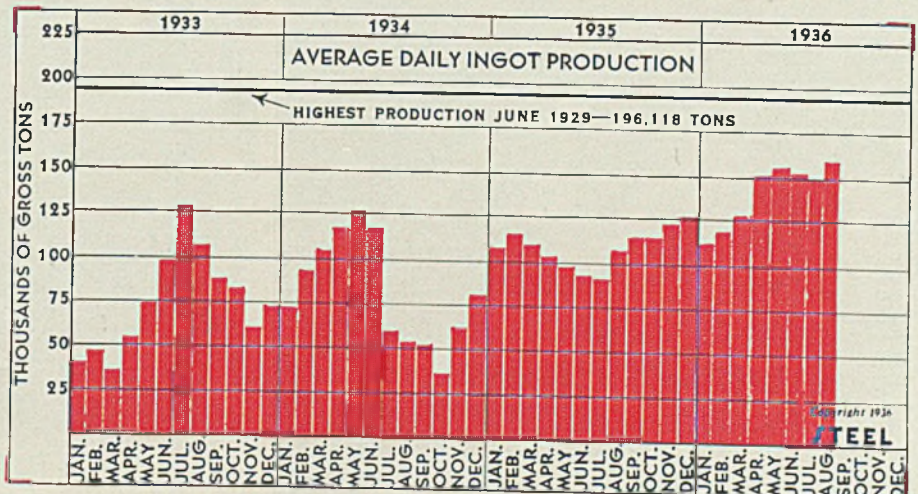
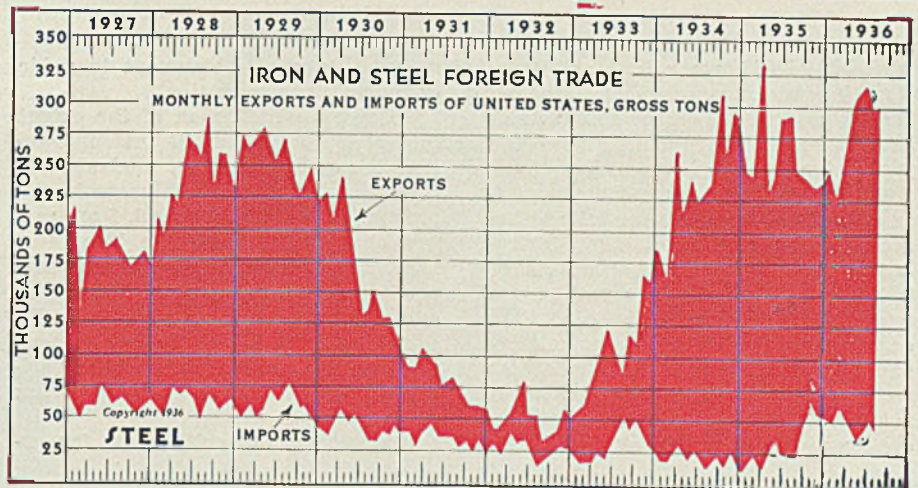
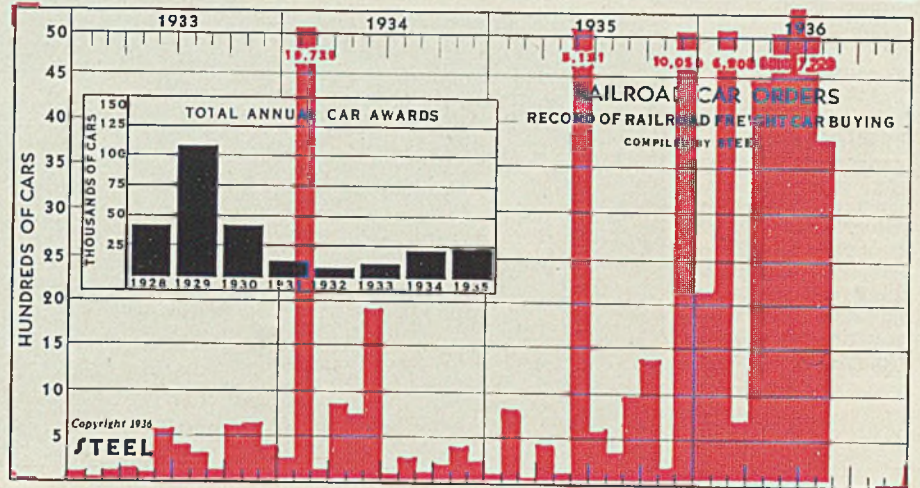
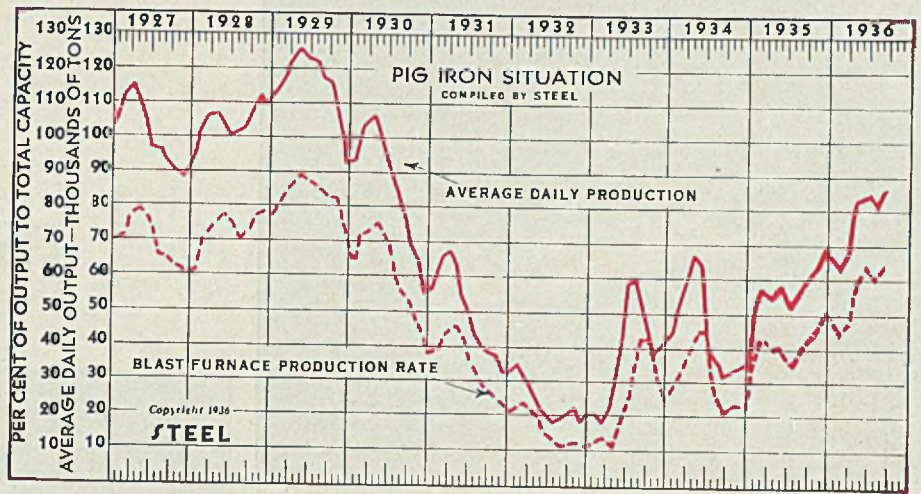
	1936	1935	1934	1933
Jan.	2,050	24	152	3
Feb.	6,900	806	19,725	0
March	632	0	30	5
April	4,427	350	800	50
May	8,900	2	717	8
June	5,220	5,151	1,835	500
July	7,229	500	19	306
Aug.	3,725	200	105	202
Sept. ....	.....	875	7	23
Oct. ....	.....	1,250	75	514
Nov. ....	.....	100	254	533
Dec. ....	.....	10,050	110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

Iron and Steel Exports Show Slight Change; Imports Off

	1936		1935	
	Imports	Exports	Imports	Exports
Jan.	50,489	241,564	22,784	262,740
Feb.	43,358	213,802	28,905	228,537
March ..	56,720	264,337	21,409	323,035
April	49,621	301,987	28,866	205,336
May	59,391	314,950	47,719	286,598
June	59,910	294,951	33,208	286,333
July	47,940	296,738	31,894	296,782
Aug. ....	.....	.....	31,312	247,312
Sept. ....	.....	.....	53,158	244,419
Oct. ....	.....	.....	59,569	238,358
Nov. ....	.....	.....	56,637	205,242
Dec. ....	.....	.....	53,678	239,268


Steel Ingot Production Up Sharply in August

	Gross Tons		
	1936	1935	1934
Jan.	112,813	106,302	73,968
Feb.	118,577	115,595	92,164
March	128,576	110,204	103,646
April	151,625	101,562	117,443
May	155,625	97,543	125,907
June	153,263	90,347	117,672
July	150,874	87,224	59,578
Aug.	161,351	107,997	51,161
Sept. ....	.....	113,000	50,759
Oct. ....	.....	116,398	54,885
Nov. ....	.....	121,170	61,947
Dec. ....	.....	122,936	78,570

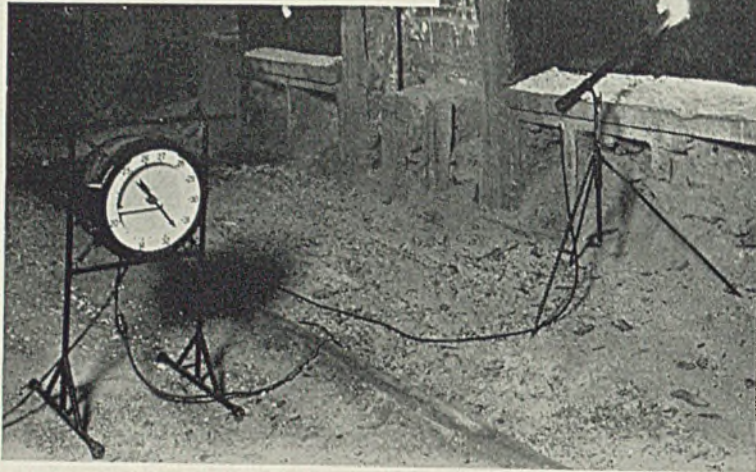


Instruments Are

BY A. F. MORANTY
Cleveland District Manager,
Industrial Division, Leeds
& Northrup Co.



PORTABLE radiation pyrometer in use to check soaking pit temperatures is shown above. At the right is another radiation pyrometer, with portable recording and indicating mechanism, measuring temperature in open-hearth furnace



INDICATING, recording and controlling instruments in the iron and steel and metalworking industries have come to be invaluable aids to the production of a high quality, uniform and dependable product; their importance and widespread use are often little appreciated. Actually, instruments are the mechanical senses of industry, supplying information on temperature, pressure, speeds, flow, density, purity, acidity, conductivity and numerous other factors which must be measured and controlled. It is difficult to conceive of a single industry which does not regularly rely

on some type of instrument to guide or guard some operation.

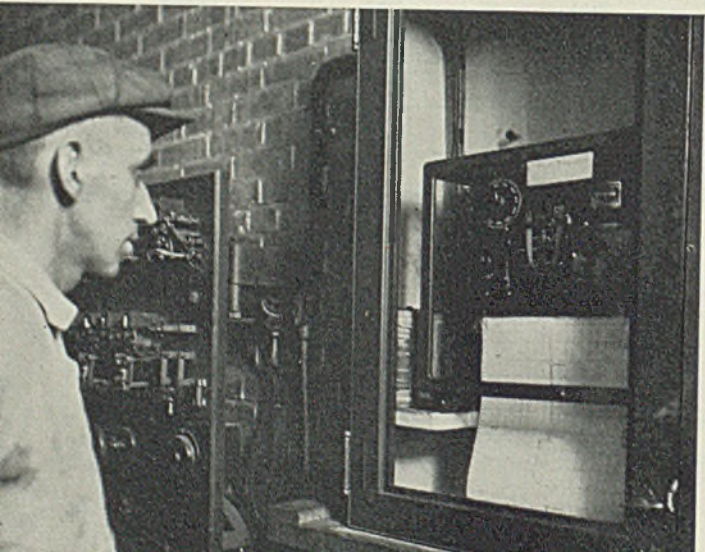
To give an indication of the extent to which application of instrumentation has progressed, an analysis has been made of instrument usage in the production of iron and steel, from raw materials on through the blast furnace, steelmaking processes, and various types of rolling mills. The chart or flow sheet shown on page 45, while it is not guaranteed to be complete, reveals in a general way where various types of instruments are being used today.

Starting at the coke plant for ex-

ample, optical pyrometers are in use for measuring oven temperatures. B.t.u. recorders check coke oven gas; flow meters are installed in gas and liquid by-products lines where also need is found for pressure indicating and recording equipment. Indicating, recording and controlling pyrometers are applied widely to various by-product recovery processes, where close check is required on temperatures.

Efficient blast furnace operation requires close control of the temperature of the hot blast, careful governing of the ratio of coke, ore and limestone, and a means of knowing accurately the time to keep stoves on gas and air. Constant temperature of the hot blast results in better furnace operation and steadier blast pressure. The volume of heated air passing through the tuyeres being always at the exact temperature desired produces a more uniform smelting of the ore. By smelting consistently at the same temperature, and at a constant rate, a more uniform iron is obtained. Operation of the furnace is much smoother, with an increase in tonnage and a decrease in coke consumption and in dust losses. Ability to control hot blast temperature within narrow limits also assists in the control of sulphur and silicon contents of the iron.

Accurate control of stove temperatures is important. Stoves are ordinarily kept on gas longer than efficient



INDICATOR providing continuous record of hot blast temperature on blast furnace, assisting efficient operation

Eyes, Ears and Hands of Steelmaking

operation requires. After the stove is heated to a safe maximum temperature, any further increase means a waste of gas. Soaking at excessive temperatures eventually burns out the checker bricks with consequent delays and repair bills. Rugged, accurate, and dependable instruments for this application are essential tools for furnace men.

A blast furnace superintendent reports that installation of automatic hot blast regulators resulted in a saving of about 10 cents per ton from the standpoint of fuel economy and a payroll saving of well over \$700 monthly.

In addition to temperature recorders on stoves, downcomers, dust catcher and gas washer, recorders are used extensively for indicating blast pres-

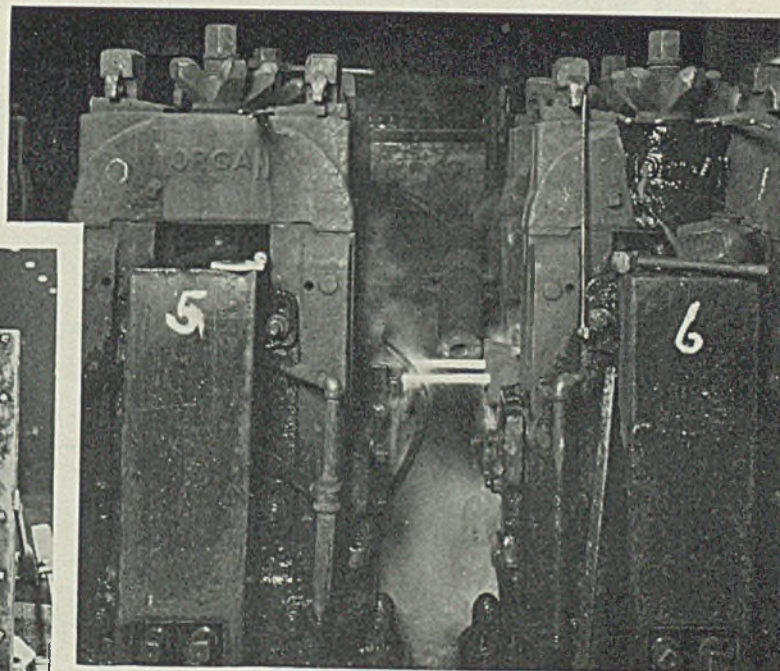
sure. Optical pyrometers assist in checking temperatures of slag and molten metal.

Considering the place of instruments on steelmaking furnaces, it is noted that optical pyrometers are used for measuring pouring temperatures of electric furnaces, bessemer converters and open-hearth furnaces. Roof temperature control systems, on electric furnaces and open hearths have come to be common practice, involving suitable thermocouples or radiation pyrometers and recording mechanisms.

Centralized control of furnace pressure, fuel-to-air ratio and reversal has been installed on many open-hearth furnaces. A typical control panel on an installation of this type includes

recorder for showing temperatures at several points in the regenerative system and at one point before and one after a waste-heat boiler, if the latter is used; controller for operating reversal automatically; indicators showing rate of flow of combustion air and rate of fuel flow; indicator showing atomizing steam pressure and recorder for furnace pressure; indicator showing instantaneous rate of fuel flow and recorder for steam pressure and fuel flow; switch for cutting out automatic reversal mechanism; switch for changing from combined fuel and air control to individual control; regulator knobs for fuel and air; pushbuttons and signal lights for regulating fuel, combustion air, speed of induced draft fan and fan damper; integrator show-

CONTROL panel below is the nerve center from which automatic hot rolling operations are directed at the new Lackawanna strip-sheet mill of Bethlehem Steel Co. At the right is shown a high-speed radiation pyrometer installed between stands of a rod and wire mill



ing total fuel flow over a period of time; and a clock.

Some of this equipment likewise is adapted to use on soaking pits for automatic control of combustion, pressures, regenerator reversal and the like. Optical and radiation pyrometers are used to check temperatures of ingots in the pits.

For measurement of temperatures

of gases, refractories and even molten metal the thermocouple or immersion pyrometer is used. This device includes the thermocouple which is "immersed" in the substance to be measured, compensating lead wires and indicating mechanism. The thermocouple comprises a tube containing two dissimilar metals in contact at the end or so-called hot junction. Increase in temperature sets up an electromotive force in the closed circuit which is recorded by a potentiometer or millivoltmeter and indicated in terms of temperature. The "cold junction" of the couple is located at the indicating instrument and some means must be taken to keep this junction at constant temperature or to compensate for temperature changes.

Thermocouple Elements

Typical "hot junction" thermoelements include platinum-platinum rhodium; iron-constantan; chromel-alumel; and copper-constantan. Of these the iron-constantan is used most widely.

Following the steel ingot into the blooming mill and on to various other mills for rolling semifinished products, it will be noted from the flow sheet that on nearly all the mills shown high-speed temperature recorders are used. This type of equipment, known variously as radiation pyrometer, ardometer, etc., measures the heat energy given off per second per unit area from the hot surface at which it is pointed. The device essentially comprises a tube with either a lens

or mirror or both which focuses the beam of radiation on a sensitive element, the latter being usually one or more thermocouples. The indicating system, separate from the collecting tube and connected by wires, shows quickly the temperature of the material upon which the tube is focused.

High-Speed Types Available

Speed of this type of recorder varies with the design. One type, designed for use on open-hearth furnaces and the like, is portable and requires about 16 seconds for a reading. Other types are installed permanently on roll tables or at some other point where the hot product is passing, and provide a temperature reading in 2 or 3 seconds. Here, of course, a continuous record of product temperature is possible.

Optical pyrometers often are preferred for temperature measurement, but require manual operation. Principle of operation is familiar, involving only sighting on the object to be measured, adjustment of a glowing filament to identical brilliance with the object, and reading the galvanometer scale. There are a number of different types of optical pyrometers,

built in this country and abroad, most popular being the so-called "disappearing filament" type.

Principle of the photoelectric cell has been adapted to pyrometer use. One type involves a photoelectric cell mounted in a housing which receives the radiation and transmits a proportional current to amplifying tubes and then to an indicating mechanism. An electric recorder for radiation pyrometers also has been perfected, using photoelectric and phototube tubes.

Control instruments also play an important part in regulation of reheating furnaces, annealing and normalizing furnaces, galvanizing or tinning baths, and pickling tanks. An accompanying illustration shows part of the 8 by 10-foot panel for recuperative-type slab heating furnaces at the new Lackawanna, N. Y., strip-sheet mill of Bethlehem Steel Co. Each furnace has one of these control panels which provide continuous records of conditions in the furnace, air-to-fuel ratio and the like, and also automatically regulate the furnaces.

Automaticity and instrumentation have been brought to a high degree of perfection in this mill. Another illustration shows the control panel which includes high-speed temperature recorder chart and control switches for starting, stopping and regulating all rolling operations in the mill.

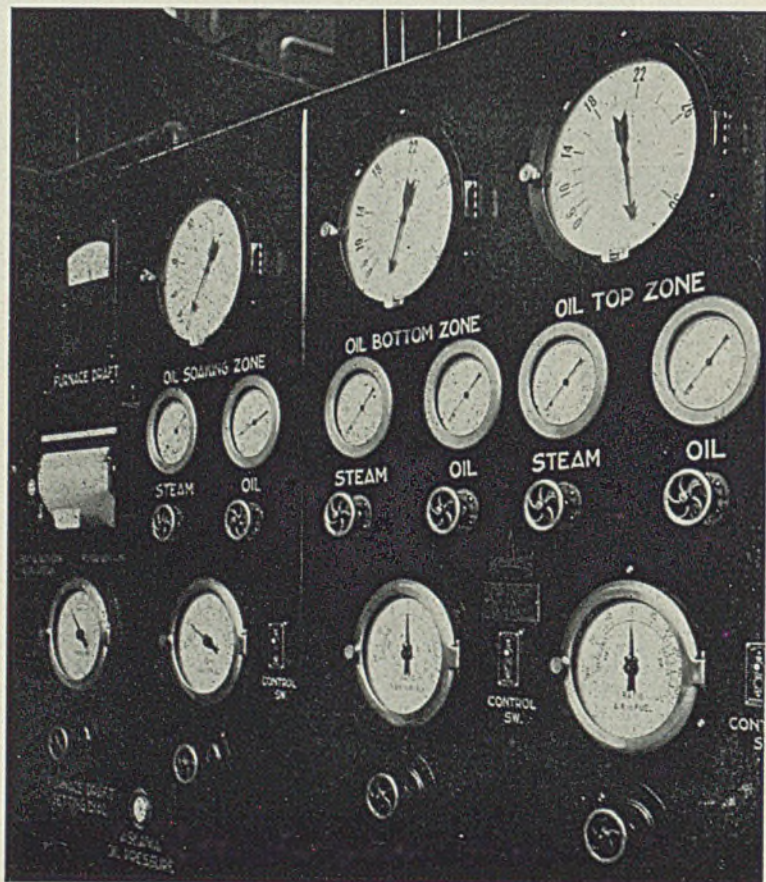
Auxiliary Applications

While the foregoing applications cover in general instrument applications in the actual production processes, there are numerous auxiliary applications in the industry. Thus, in the power house, temperature recorders and indicators are used for generator stators, rotors, cooling air or gas, air-cooler water and bearings. Other applications include recorders for generator and station loads, frequency and load control systems, and remote metering systems for power and load.

Similarly in the boiler house are many uses for instruments. Temperature recorders are installed widely for furnaces, boiler pass gas, flue gas, preheater air, economizer water, feed water, boiler steam, superheater steam, condenser steam, cooling water, condensate, turbine steam and water, and turbine bearings or oil. Other types of instruments are used for measuring acidity, alkalinity and conductivity of make-up, and concentration of boiler water, while recording and signaling equipment has been adapted to flue gas analysis, smoke density and turbine speed.

In laboratories and repair shops there is literally no limit to the field for instruments, for such purposes as measuring heat value of fuels, capacitance, chemical concentration, dielectric losses, inductance, insulation resistance, light, magnetic characteristics, phase angle, power factor, radiation, voltage, current, etc. Equipment also must be available for calibration

COMBUSTION control panel with instruments which indicate and record temperatures, pressures and fuel combustion of recuperative slab heating furnace at Bethlehem's Lackawanna strip-sheet mill. Panel is 10 feet long by 8 feet high, and controls and records the handling of either gas or oil fuel.





\$AVE
with
\$UPERIOR \$TAINLESS
\$TEELS

Stainless steel puts new life in old products. It shines and gleams for the sake of sales appeal. Permanently non-corrosive, it keeps products sold and helps to sell more.

Superior Stainless offers wide opportunity

for application and it fabricates with ease. It is easy to save with Superior Stainless Steels. Our engineers are always at your service—whether it's stainless or whether it's hot or cold rolled strip.

SUPERIOR STEEL CORPORATION

General Office: 3122 Grant Bldg., Pittsburgh, Pa.

Works: Carnegie, Pa.

Sales Offices:

4305 Chrysler Bldg., New York; 1017 Fisher Bldg., Detroit; 2002 Girard Trust Bldg., Philadelphia; 2013 Peoples Gas Bldg., Chicago; Brace, Mueller and Huntley, Inc., Buffalo-Rochester-Syracuse; Steel Sales Corp., 129 South Jefferson St., Chicago; H. L. Brown, 2001 Carew Tower, Cincinnati; Avenue Bldg., 4500 Euclid Ave., Cleveland, O.

and testing of the various instruments and meters in regular use.

In the development of instruments for industry, manufacturers have set up a number of desirable qualities and have attempted to design instruments which would meet these specifications. Among them are ease and convenience of use, good lighting, readability, ruggedness and accuracy. A glance at some of the accompanying illustrations will show how well present-day instruments are meeting many of these qualities.

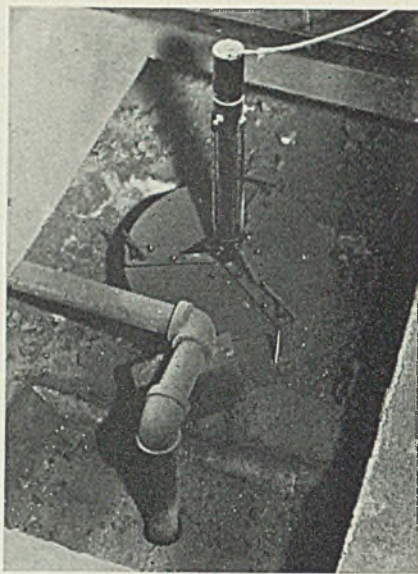
Naturally, daily operation of a large number of instruments requires a supervisory force for maintenance and repair. In many plants a staff of instrument men is specially detailed to inspect all equipment regularly, install new charts, file old charts, clean and fill recording pens, test and replace thermocouples, check calibration, supervise new installations, and study all applications to determine whether proper service is being furnished.

For further observations on instrumentation in iron and steel, see "Care and Maintenance of Instruments Used in the Steel Industry," by M. J. Conway and R. C. Kennan, *Iron and Steel Engineer*, June, 1932.

Another good reference is the *Manual of Instrumentation*, by M. F. Behar, in eight parts, published by Instruments Publishing Co., Pittsburgh.

Allowable Stress Raised in Structural Specification

A new standard specification for the design, fabrication and erection of structural steel for buildings has just been issued by the American Institute of Steel Construction, New York. In this new specification revisions have been incorporated in accordance with the recommendations of a committee on specifications including Chairman F. T. Llewellyn, research engineer, United States Steel Corp.; and G. H. Danforth, contracting engineer, Jones &



○ PEN-HEARTH roof temperatures are accurately and dependably recorded by radiation pyrometer located permanently in the roof

Laughlin Steel Corp.; H. W. Fitts, vice president, New England Structural Co.; Jonathan Jones, chief engineer, fabricated steel construction, Bethlehem Steel Co.; Aubrey Weymouth, chief engineer, Post & McCord Inc.; F. H. Frankland (ex officio), chief engineer, A.I.S.C., and C. F. Goodrich, chief engineer, American Bridge Co.

Among the important changes in the specification are allowable unit stresses which accord in general with a basic stress of 20,000 instead of 18,000 pounds per square inch in tension.

With a view to conservatism, the first specification of the Institute issued in 1925 prescribed a basic unit

PORTABLE radiation pyrometer for checking open-hearth temperatures avoids necessity for dependence on observer's eye in sighting on white-hot interior of furnace

stress of 18,000 pounds. At that time the minimum yield point of standard structural steel was 30,000 pounds per square inch. Since that time several changes have occurred that affect the situation.

1. The minimum yield point of present-day standard structural steel has been raised to 33,000 pounds per square inch, with an increase in the ultimate strength from 55,000/65,000 pounds to 60,000/72,000 pounds.

2. The principal foreign countries of the world have increased the allowable basic unit stress permitted for comparable steel to approximately 20,000 pounds.

3. Knowledge has been highly developed and current practice has been standardized in the structural steel industry, with a consequent increase in the dependability of structural steel to meet given conditions of use.

To the industry the Institute is making a free distribution of the new specification but duplicate copies may be had only upon payment of the cost of production. Those desiring copies of the new specification in quantity may obtain same in lots of 10 to 50 at 15 cents each, in lots 50 to 100 at 10 cents each, and in lots of over 100 at 8 cents each.

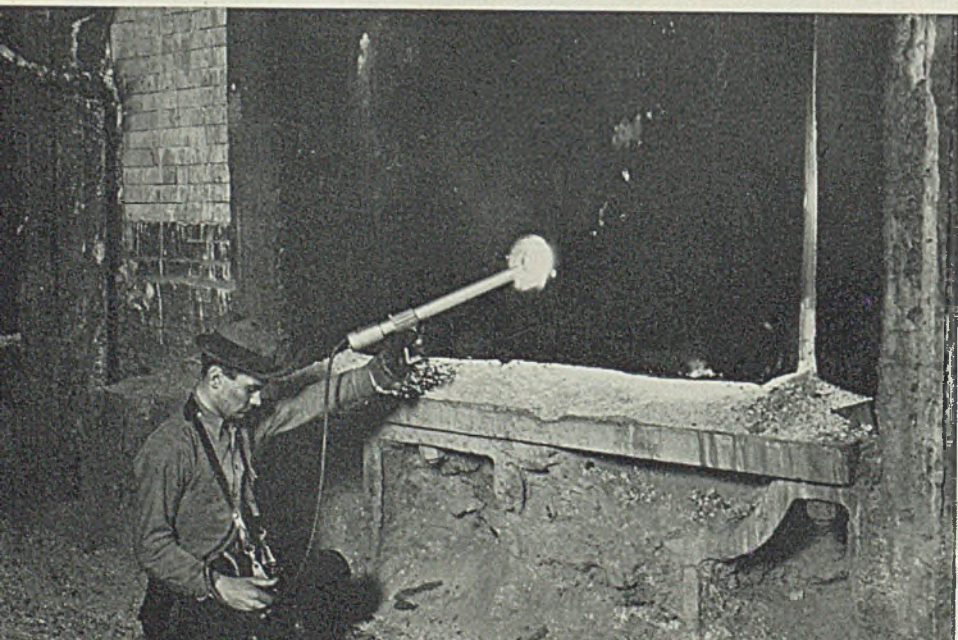
New Methods in Drilling And Surfacing Explained

Drilling and Surfacing Practice, by Fred H. Colvin and Frank A. Stanley, 431 pages, 6 x 9 inches; published by McGraw-Hill Book Co., New York; supplied by STEEL, Cleveland, for \$4, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

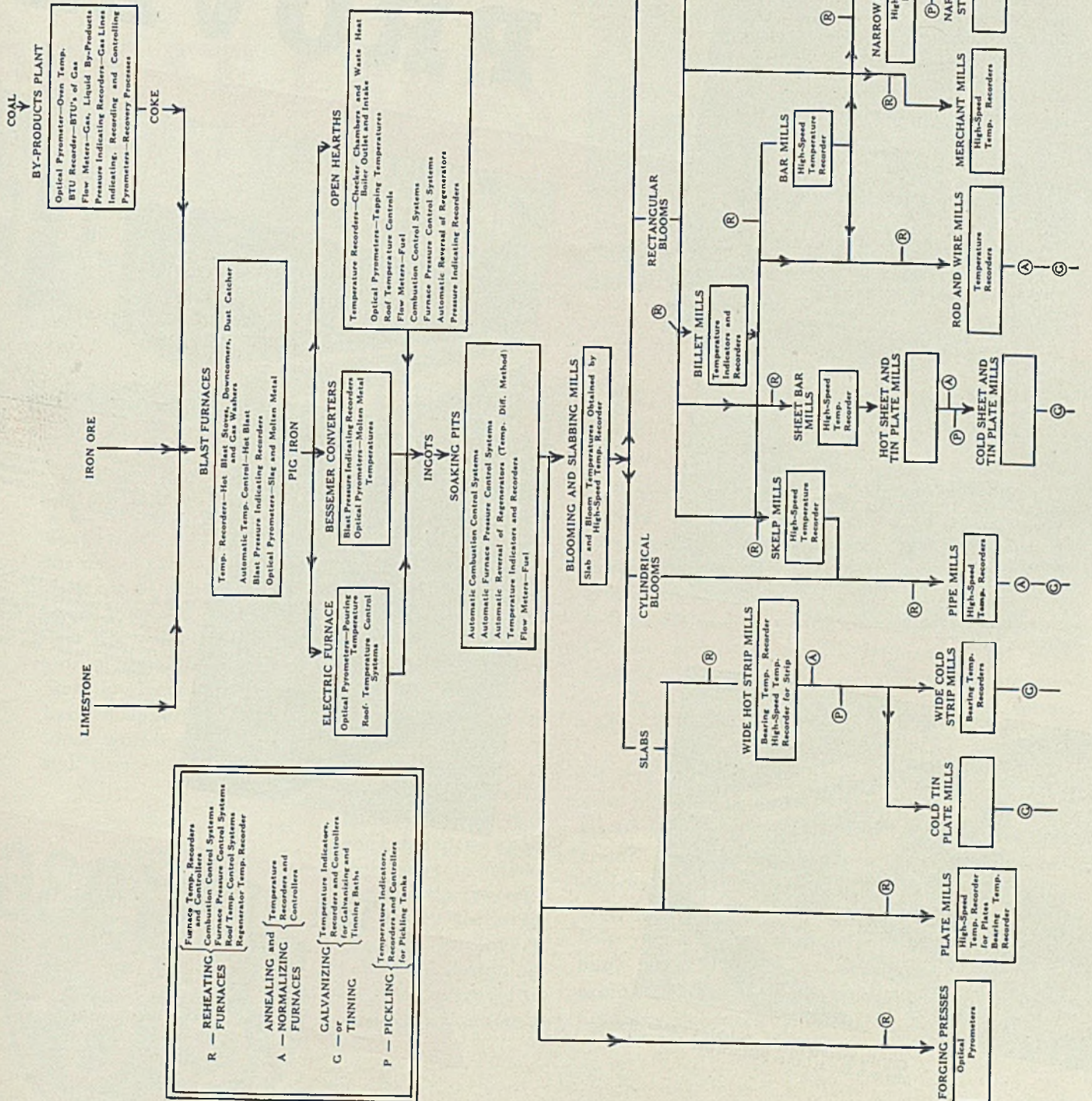
The authors in this work seek to show developments in drilling and surfacing practice and present much information not hitherto available in compact form.

Even simple machine operations have undergone significant changes during the past decade and drilling, reaming, tapping and all surface operations show marked improvement, both in machines and tools. Because of these improvements new methods have become possible in many instances. Straight holes of small diameter and moderate depth can now be made without the use of the gun drill. New grinding methods have made better reaming possible and ground taps produce more accurate holes at higher speed than possible previously.

While some of the older operations, such as planing, retain many of their old characteristics, new developments demand study to keep abreast of the times. Milling machines, cutters and methods have undergone numerous changes and modern broaching practice has opened new possibilities in the field of machining.



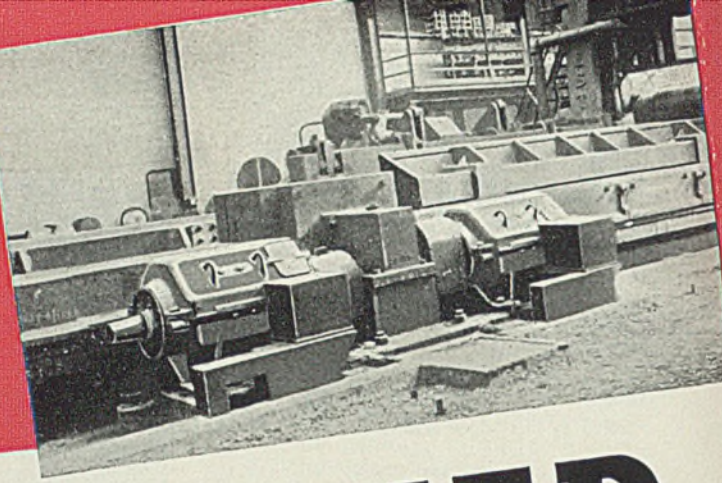
Summary of Instrument Applications in Iron and Steel Production



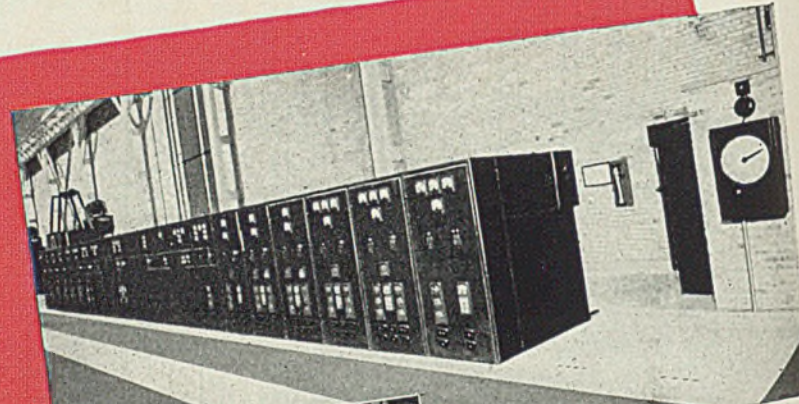
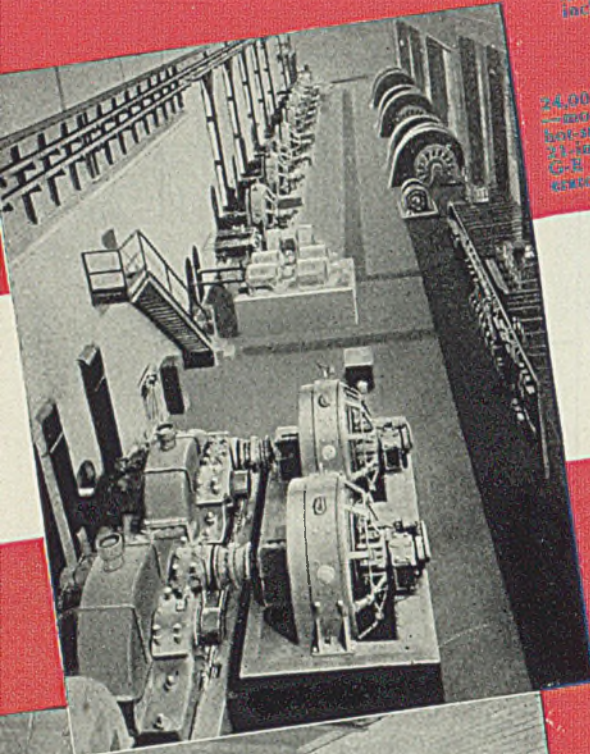
The INITIAL 1930 Installation

Two G-E 150-hp Type MD motors driving the front live table at the 40-inch reversing mill.

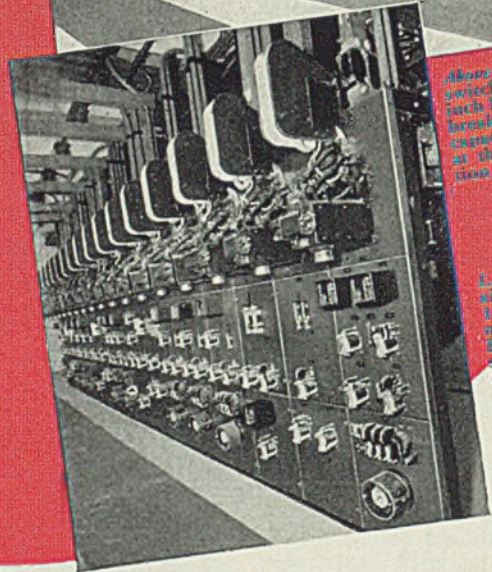
24,000 hp of G-E motors—motor room of 30-inch hot-strip mill No. 1 and 21-inch bar mill. Three G-E 5000-hw motor-generator sets at right rear.



PROVED

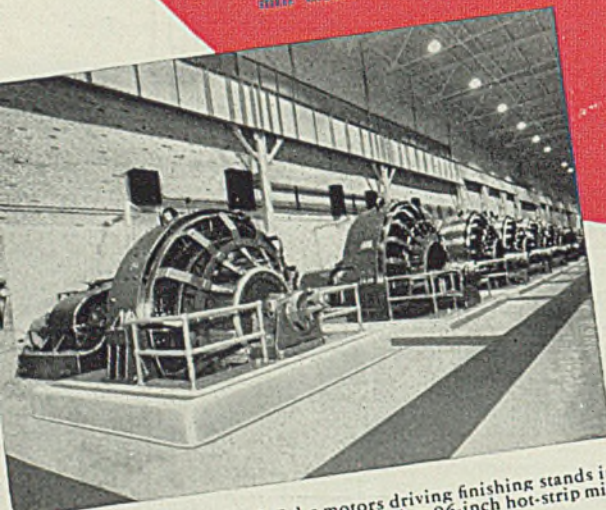


G-E main drives in the No. 1 merchant mill motor room.



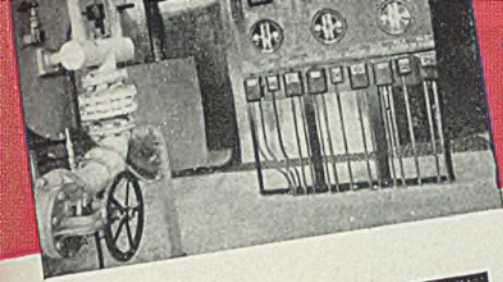
Along G-E Type M1-6 metal-clad switchgear in Great Lakes new 96-inch hot-strip mill (No. 2 coil circuit breaker, 100,000 kw interrupting capacity). G-E Selwyn equipment at the right, used for communication with the mill output.

Left G-E Type MC-5 250-volt six-pole circuit breakers for four 1000-kw generators, and automatic reclosing feeders, in the Gorse plant. G-E automatic switchgear "stands the gaff" of steel-mill service.



G-E d-c motors driving finishing stands in the new Great Lakes 96-inch hot-strip mill.

The NEW 1936 Mill

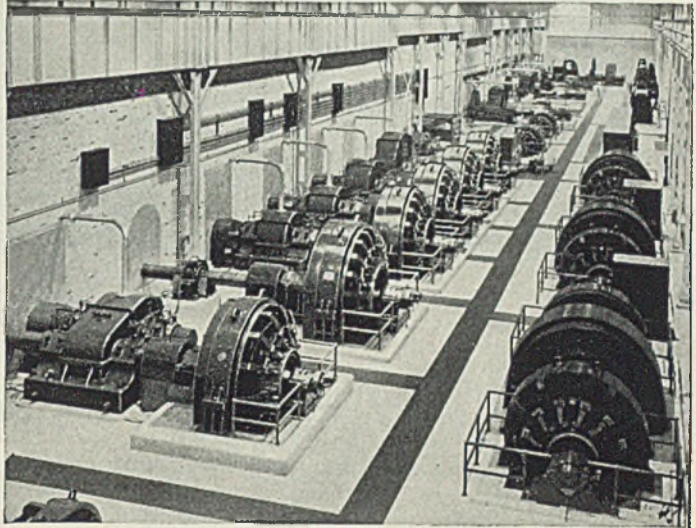


Three G-E atmosphere controllers supply atmosphere for bright annealing steel sheets in Great Lakes No. 2 continuous hot-strip mill. Continuous control of atmosphere assures annealing a mirror-bright surface on steel sheets.

DEPENDABILITY

GREAT LAKES

again chooses



Motor room, Great Lakes 96-inch hot-strip mill No. 2, from finishing end. G-E motors, 39,000 hp strong, drive finishing stands and roughing stands

GENERAL ELECTRIC EQUIPMENT

AFTER more than five years of dependable operation of General Electric equipment, Great Lakes Steel Corporation, of Detroit, again selects G-E apparatus for its mammoth new 96-inch hot-strip mill. The experience of this progressive manufacturer with the entire line of G-E products called for a repeat order. The new mill is now installed and operating, and you who attend the annual convention of Iron and Steel Engineers in Detroit, September 22-25, will have an opportunity to inspect in all particulars the inner workings of this splendidly co-ordinated installation.

progress has been made as the art advanced, and today General Electric, the largest manufacturer of electric equipment in the world, is proud to offer you the best that money can buy in complete electric equipment. From turbine (if you generate your own power) to auxiliary motors and control on the final processes, General Electric is prepared to install for you a properly balanced and co-ordinated equipment—flexible, easy to operate, and saving time, money, and labor for your company.

General Electric builds apparatus that you can depend upon from start to finish. For more than twenty-five years General Electric engineers have been designing electric drives for steel mills. Continued

Let our steel-mill engineers assist you in planning your mill installation. G-E steel-mill equipment includes a-c and d-c motors and control, motor-generator equipment, switchgear, cable, protective devices, electric furnaces, and welding—in short, everything electric. Our specialists will be glad to help you. Call the nearest G-E office or write our home office. We cordially invite you to visit the G-E exhibit at the Steel Convention. General Electric Company, Schenectady, N. Y.



ELECTRIC



COLOR-CORRECTED light is provided in the drafting room of the International Harvester Co. by lighting fixtures combining mercury vapor and incandescent lamps supplementing skylights in the sawtooth roof. There are no windows

Modern Standards for Drafting Room Lighting

RECOGNITION of the importance of lighting as a factor in productive efficiency has recently progressed from a generalized approval of "good light" to specific standards for illumination level, distribution, and visual characteristics of the lighting, determined by the particular seeing tasks involved. Throughout industry, the relationship of these objective lighting standards to working efficiency and morale has now been firmly established on an economic as well as a visual basis.

In the drafting room, however, the relationship between lighting and productive performance is particularly close. The work itself demands continuous visual effort of an acute nature. In addition, accuracy and speed of accomplishment rest almost entirely on the "human element" — the draftsman's subjective reactions, conscious or unconscious, to the conditions in which he works.

With the popularization of the photoelectric illumination meter for lighting surveys, desirable levels of illumination as measured in foot-candles have received a predominant place in determining lighting standards. Foot-candle readings have acquired a significance comparable to

temperature readings, so far as personal well-being is concerned. Drafting room requirements, however, offer a desirable re-emphasis of the fact that adequate illumination levels alone cannot assure comfort or efficiency unless the distribution and visual characteristics of the light also be correlated to the required seeing conditions. Indeed, the objectionable effects of bright "point"

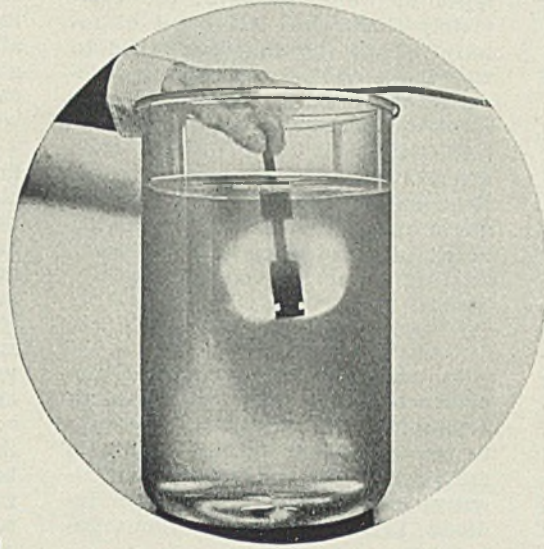
WITH the co-operation of lighting engineers, standards of industrial illumination are steadily increasing, and the benefits accruing from good lighting are being better appreciated. The accompanying article examines in some detail the relation between lighting and productive performance in drafting rooms, and suggests recommended illumination levels. For a comprehensive review of the subject of industrial illumination, both from humanitarian and efficiency standpoints, refer to the Aug. 13, Aug. 20 and Sept. 17, 1934, issues of
STEEL

light sources, reflected glare, harsh or misplaced shadows and nonuniform light distribution generally increase with higher lighting levels.

The illumination level, like the room temperature, occupies its logical place when used as a starting point in the effort to achieve desirable working conditions. A drafting room in which the working plane is illuminated at less than 20 foot-candles during all or part of the day can logically be classed with a room heated at less than 60 degrees Fahr. While the eye may give no immediate sensory warning of strain due to illumination inadequate for the task at hand, fatigue and other indirect reactions to strain have tangible overall effects. The justification for this level (20 foot-candles) as the lower limit for adequate drafting room lighting is found in actual increases in productive efficiency of those who have previously worked under lower illumination levels.

The standards of light distribution in drafting rooms, and over drawing boards in particular, must also be derived from practical "test cases" which have resulted in improved productive efficiency. Apparently, on such a basis, the distribution of natural daylight as it enters the

It isn't a trick . . .



It's a

TRIUMPH

WE CALL it the "Goldfish Bowl". For many years it has been a standard display at various engineering conventions. That little flame merrily burning under water is *sure fire*. It always draws a crowd.

But it's doing more than that . . . It is heating pickling tanks today for one adventurous national manufacturer who has found new economies and closer quality control in this fascinating flame that burns submerged. Specifically, the experience is this: low initial cost, low operating cost, freedom from acid dilution caused by steam.

Kemp meets half way all manufacturers with the courage to investigate direct solution heating advantages.

Kemp engineers will work with your own and develop your application to the point where there can be entire confidence that it will work. Competent engineers in developments of this sort make few, if any, serious mistakes, even on new ideas. They are able to analyze the conditions and check probable results to a logical conclusion. Are you game? For detailed information write **The C. M. Kemp Manufacturing Co., 405 E. Oliver St., Baltimore, Md.**

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

room from skylights or windows above and to the left of the drawing boards is a desirable ideal.

In contrast to the uniform light distribution from a large light source of low intrinsic brightness, such as furnished by a window or skylight, are the drop lamps or desk lamps still commonly used when daylight is not available. In the first place, the brightness of these light sources is necessarily highly concentrated. Even if they are so shaded to eliminate direct glare, they produce a serious reflective glare on tracing cloth, metal drawing instruments and other more-or-less "shiny" surfaces. On many surfaces, too, light from such a concentrated source produces a non-uniformity in the reflected brightness that interferes with accurate observation of intentional tone variations of the work. A drop lamp in an ordinary small reflector, two feet above a 4 x 5-foot drawing table, will result in a variation of more than 200 per cent in illumination values across the working plane from the center to the corners. There is convincing evidence to show that this nonuniformity of illumination, even when not annoyingly noticeable, is an important factor in lowering visual efficiency. If the surrounding room area is at a still lower illumination level, the strain of continual eye-adjustment from one level to another is still further increased.

In the quest for uniform light dis-

tribution, the opposite alternative to localized lighting, that of totally indirect artificial illumination, naturally arises as a desirable possibility. Despite its superiority for certain types of work, however, the completely shadowless flat effect of totally indirect lighting has failed to win the approval of draftsmen accustomed to work under ideally located windows or skylights. *Controlled shadows* of a diffused character, such as those present when light enters from a large window above and to the left of the drawing board, apparently result in a more "natural" working condition on the boards.

Skylights Required

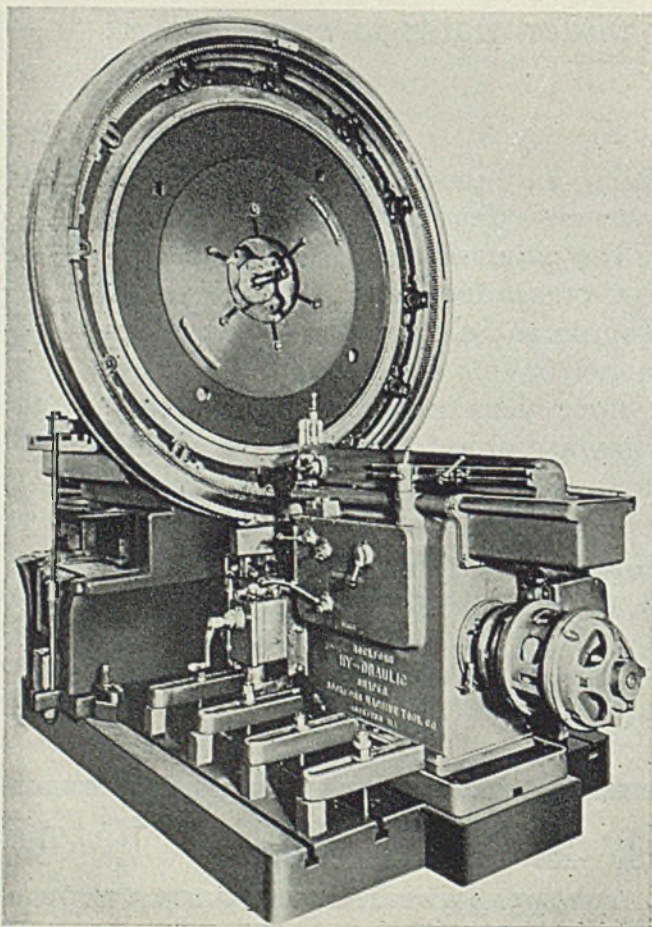
In larger drafting rooms, too, the presence of skylights or saw-tooth construction is generally necessary to meet adequate lighting standards during the day, and ceilings sufficiently uniform to permit full indirect lighting are seldom encountered.

Perhaps the closest approach to the ideal type of light distribution previously outlined is obtained by the use of longitudinal light sources of large area and low intrinsic brightness, so mounted that a diffused light is directed downward over the left edge of each drafting table. In one such unit, an output of 11,200 lumens is distributed through 650 square inches of diffusing glass. Mounted 8 to 10 feet

from the floor, its light distribution closely simulates the effect of a large window just to the left and above the drafting table. The lamp similarly mounted over the adjacent table, 15 feet to the right, softens the shadows still further. The overall effect is to produce a uniform and glareless illumination of 20-foot candles or more at every point on the working plane.

A further characteristic of artificial lighting for drafting rooms, also highly important in its effect upon visual efficiency, is the spectral balance of the light emitted. When artificial light is used to supplement daylight at certain hours or in certain parts of the room, the minimum of blue in the spectral characteristics of light from incandescent lamps results in an objectionable contrast, particularly trying for those who must move back and forth between the two types of light. Even when only artificial light is in use, moreover, the color characteristics of daylight are regarded as ideal for such work when all factors are considered. Indeed, blue glass bulbs or filters have been frequently employed, to correct the light emitted by incandescent lamps, although this "subtractive method of color correction absorbs 35 per cent or more of the total light output of the ordinary lamp, and reduces its efficiency correspondingly.

In contrast to the incandescent lamp, the familiar Cooper-Hewitt



Hydraulic Shaper Cuts Large Gears

UNUSUAL use of a hydraulic shaper for machining internal gears provides diameter capacity not ordinarily available in the average machine shop. The large circular work piece shown in this illustration contains an internal gear having a 90-inch pitch circle, 2-inch face and 4-pitch teeth. The gear teeth are cut from the solid in three stages—gashing, forming, finishing. Specifications require that the tooth form shall not be lapped or otherwise finished after machining and that no marks of any kind shall appear on the finished surfaces. The relatively small quantity of these work pieces machined at one time does not justify the purchase of a special gear cutting machine, and consequently the application of the hydraulic shaper was devised. The work piece is mounted on the arbor of an accurate indexing device, and the indexing head and shaper are mounted in accurate relationship on a heavy base. Equipment is built by Rockford Machine Tool Co., Rockford, Ill.

mercury vapor tube, which has also been utilized in drafting room practice, lacks the red component entirely. Highly efficient visually when color recognition is not involved, this blue-white light has disadvantages arising from the distortion of color values in architectural drafting and other types of work which require the use of colored inks, paper, etc.

Recently, there has been a notable expansion in the use of lighting units in which mercury vapor and incandescent light are combined in a proportion approximating the color characteristics of daylight in its visual effect. In other words, an "additive" type of color balance is secured, preserving the full light output of both types of lamps. Office lighting at the new windowless building of the Hershey Chocolate Company is of this type, and it is being widely applied in textile applications and similar critical industrial seeing tasks, retail showrooms, and the like.

This same principle of "additive" color correction, along with low intrinsic brightness and diffused distribution desired in drafting room lighting, has been applied in new units recently installed in several outstanding drafting rooms.

Design for Drafting

For the gas power engineering department of the International Harvester Co., Chicago, a new drafting room building has recently been erected in which fundamental emphasis has been placed on the comfort and efficiency of working conditions. The central drafting room in this building, 145 x 75 feet in area, is fully air conditioned. Tables and desks for over 100 draftsmen, engineers and inspectors are conveniently spaced within this area. Walls of the building are windowless, daylight illumination being supplied by skylights in the saw-tooth roof.

Artificial lighting for the room was chosen on the basis of the standards previously discussed, with particular effort to obtain a glareless light which would blend well with the daylight on dark days and during other periods of reduced daylight.

The lighting units themselves combine a straight mercury vapor tube and a number of incandescent lamps beneath a single reflector. With diffusion glass mounted in an angular relation beneath the lamps, the intrinsic brightness is low enough to permit one to look directly at the light sources without a sense of discomfort. Eighty units of this type, operating at 850 watts, have been installed, mounted 11 feet high directly over and parallel to the left hand edges of each of the drafting tables. The spacing of tables and cabinets has been correlated to the

lighting layout to provide a uniform illumination in excess of 20-foot candles.

Another installation of similar lighting units has been made by the Link-Belt Co., Chicago, replacing former artificial lighting providing but 5 foot-candles at the working level. Opal glass globes containing a single 300-watt incandescent lamp have been supplanted by 850-watt combination units on the same spacing (10 x 15-foot centers), and the intensity at the working plane has been raised to a uniform level of 20-foot candles. In this drafting room, approximately 160 x 60 feet, 66 of the units are in use. In both of these installations comments of the draftsmen who work under the new lighting reveal a decided satisfaction in the absence of glare, the uniform distribution and the "whiter" spectral characteristics.

The newest combination unit of the type such as used in these drafting rooms introduces several refinements in design. In this unit, the incandescent component of the light is supplied by four 150-watt lamps mounted in a horizontal plane in an angular relation to the axis of the lamp. A 33-inch mercury vapor tube, 1 inch in diameter, is mounted below these sockets along the axis of the lamp. This tube and its operating auxiliary are of an improved type, supplying the same lumen output at 275 watts as was formerly supplied by 350-watt mercury vapor tubes. This unit is equipped with a reflector of Alzac aluminum and diffusing panels designed to combine efficient light distribution with a clean-cut external appearance.

As the fundamentals of desirable drafting room lighting are more thoroughly appreciated, either on the basis of illumination theory or the practical effects of improved lighting on productive efficiency, there is reason to believe that standards such as those outlined will have a predominant place.

Chromium and Molybdenum Combined in Casting Steel

Suitable steel casting compositions for high temperature service contain chromium and molybdenum, according to a recent patent. That for centrifugal casting molds contains 0.16 per cent carbon; 2.40 per cent chromium and 0.38 per cent molybdenum, with or without 0.5 per cent nickel. Molybdenum may be replaced with twice the quantity tungsten, and 0.4 per cent vanadium increases the yield point.

Composition for hot press dies contains 0.21 per cent carbon; 2.53 per cent chromium; 0.42 per cent molybdenum and 0.28 per cent vanadium. Hot roller composition contains 0.28 per cent carbon; 2.01 per cent chro-

mium; 1.08 per cent nickel, and 0.48 per cent molybdenum. Heating molds to 700 degrees Cent. and cooling in furnace removes internal strain.

Stainless Steel Withstands Low-Temperature Service

So much has been said about the excellent properties and many uses of stainless steel at elevated temperatures that freezing or below-freezing applications might be considered almost novel. As a matter of fact, it is stated in the May issue of the *Electromet Review* published by the Electro-Metallurgical Co., New York, stainless steel retains its strength and toughness at low temperatures that would quickly cause brittleness in ordinary steel and other common metals. Recent experiments show that these qualities are unimpaired even at liquid air temperatures of approximately 300 degrees Fahr. below zero.

A new and interesting application of stainless steel in sub-freezing service is its use as ice picks in an ice-breaking machine. These picks are shaped somewhat like the tip of a soldering iron and do the actual work of breaking up the ice. Steels formerly used corroded and wore away so rapidly that they had to be replaced at frequent intervals. Stainless steel, not the architectural type, but the file-hard cutlery variety, is now used for these picks and remains bright and sharp for long periods.

Steel Structures Analyzed And Design Discussed

Analysis and Design of Steel Structures, by Almon H. Fuller and Frank Kerekes; cloth 627 pages, 6 x 9 inches; published by D. Van Nostrand Co. Inc., New York; supplied by STEEL, Cleveland, for \$5, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

This book is designed for use as an elementary course as a basis for advanced work or for one or more advanced undergraduate courses with emphasis on bridges or on buildings. An additional chapter gives an approach to some of the problems of the structural engineer which are beyond the limits of undergraduate requirements.

The effort has been to present the material from the standpoint of the student going through his first experience in structural work and forming a connecting link between class work in mechanics and engineering work in the office and field. Problems are used to illustrate the principles developed in the text and also to present extensions and applications for exploration beyond previous experience.

"THE BEARING



The Hindenburg, world's largest and only Diesel powered Zeppelin uses

VEEDOL

A Product of the
Tide Water Oil Company

TIDE WATER

THERE IS A COMPLETE LINE OF TYCOL LUBRICANTS

Soap is a thickening agent which controls the rate of flow of the lubricant to the bearings, just as a sponge controls the water it has absorbed.



Maximum economical lubrication per pound of grease is assured by the use of cylinder oil, making a minimum of soap necessary.

FELT AS COOL AS THE OLD SWIMMING HOLE"

"In comparison to the heat we used to have on a bearing on one of our drives, it felt as cool as the old swimming hole after we switched to Tide Water's Tycol Green Cast Grease. No other lubricant — and we tried many over a period of eight years — ever approached the satisfaction that the Tide Water lubricant gives us."

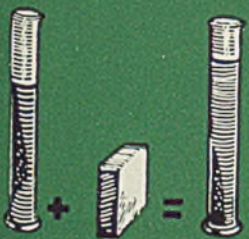
This operator had to contend with a condition of unusually high pressure. Whatever the service requirement, Tide Water's complete line of greases makes possible the selection of the exact consistency for every purpose. Compounded of the highest grade of paraffine-base cylinder oil and a minimum of calcium soap, Tide Water's Tycol Greases frequently save up to 50% over ordinary cup greases.

Look for the natural green cast. It identifies Tide Water's Tycol Grease — whether the service is that of lubricating enclosed gears, the mill table, or practically any other operation in the mill. Try Tide Water's Tycol Grease on your hardest job and get the most convincing proof — better performance, with resulting economies of operation! Full details may be obtained by writing:

TIDE WATER OIL COMPANY
17 Battery Place, New York, N.Y.

GREEN CAST GREASES

SCIENTIFICALLY ENGINEERED FOR EVERY INDUSTRIAL USE



Tycol Green Cast Greases are made of paraffine stock cylinder oil — having high flash and fire points, with maximum film strength.

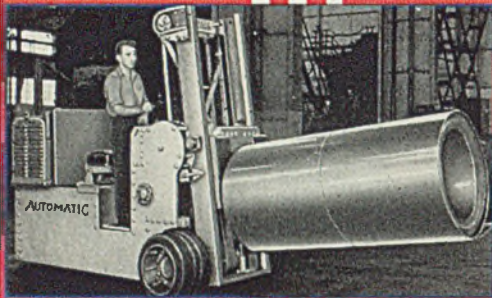


Tycol Green Cast Greases are compounded to suit every operating condition — for indoor and outdoor service, for anti-friction or plain bearings.

TRADE

AUTOMATIC

MARK

COIL TRACTORS**SHEET HANDLERS****SAFE
RUGGED
EFFICIENT****A
CAPABLE
MODERN
HANDLING
SYSTEM****SPEEDY
COMPACT
ECONOMICAL****FOR HEAVY DUTY STEEL MILL SERVICE
CAPACITIES UP TO 30 TONS**

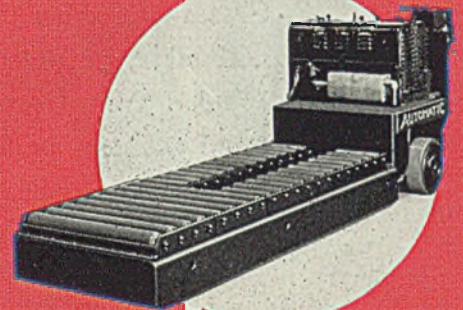
— A powerful heavy-duty Coil Tractor for transporting strip steel coils up to 93" long— 8,000 to 18,000 lbs. From Picklers to Cold Rolls—to Storage or Rotary Shears.

Heavy Duty Fork Trucks for sheet steel— capable of transporting and stacking 8,000 to 16,000 lb. bundles of sheet steel from Rotary Shears to Storage or Shipping.



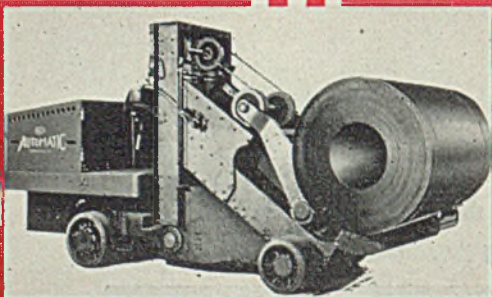
— Speedy, Compact Coil Tractors unusually short wheel-base and over-all length for box-car loading of strip steel coils weighing up to 10,000 lbs.

Special Low-Lift Platform Trucks with — powerful motor-driven roller platform for quick sheet-steel pick-up at Rotary Shears and transportation to Storage or Shipping. Capacity up to 40,000 lbs.



— Special powerful heavy-duty Coil Tractors with retracting coil cradles for side pick-up and transportation of strip steel coils from Picklers to Rotary Shears. Capacities 18,000 to 30,000 lbs.

Heavy-duty center control Lift Trucks — for quick pick-up and transportation of bush trucks—from Picklers to Plating process or Storage. Capacities up to 30,000 lbs.



WRITE TODAY for Illustrated Bulletin of "AUTOMATIC'S" New Modern Handling System for HEAVY DUTY STEEL MILL SERVICE.

See "AUTOMATIC'S" New Heavy Duty Coil Tractors at the IRON & STEEL EXPOSITION, Detroit, Sept. 22nd to 25th Incl. Booths 148-149-150.

AUTOMATIC TRANSPORTATION COMPANY

DIVISION OF YALE & TOWNE MANUFACTURING CO.

MATERIALS HANDLING

Force-Feed System of Materials Distribution in Industry

ALFRID P. SLOAN JR., president of General Motors Corp., in submitting to his stockholders last month the financial statement for the twelve months ended June 30, 1936, mentioned among important influences contributing to the high degree of recovery of the automotive industry the following: "Technological progress was maintained and accelerated during the period of the depression, resulting in more attractive, more efficient, better all around merchandise—and the automotive industry still adheres to the old-fashioned philosophy that the best yardstick to gage its progress, and hence its contribution to the national welfare, is its ability to offer continually better merchandise at the same price, or equal merchandise at a lower price—always the principle of lowest possible costs and selling prices of goods and services."

In the report from which this statement is quoted, "attention is called to the fact that both the Corporation's cash and net working capital position, at the close of the period under review, are the strongest in its history."

These significant statements are worthy of study by all manufactur-

ers who are seeking broad principles for applying to their own businesses. There is no single industry which has done more during the past five years in continuing to apply sound principles of materials handling as part of its technological progress than has the automotive industry. When the majority of American industries were out of the market for the products of the materials handling manufacturers, the automobile industry continued to be the first-line customer. Consequently it was largely the influence of the automotive industry that brought development of such important materials handling equipment items as the heavy special fork trucks for loading and unloading sheet steel, the large die-handling trucks now common in many plants, and many special conveyor devices such as lift tables, roll-over units and turntables which are proving indispensable in machining operations.

One of the developments in materials handling in the automobile industry which was most marked during the depression has been called by some the force-feed system. In actual practice, this is simply an application of the fundamental principle

that equipment handles best which handles least. It may be described also as a decentralization of storage. In its simplest form, it is the feeding of materials and parts to the areas nearest to where they are to be used first in production or in assembly.

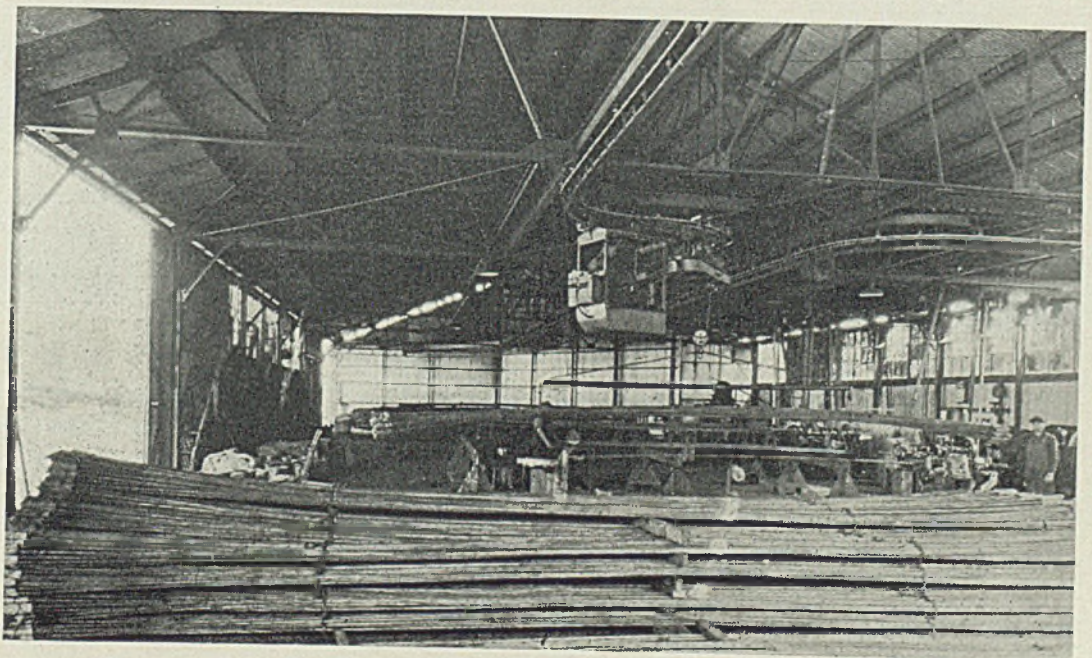
It has been mentioned by many authorities that "the most important single principle of modern materials handling is to eliminate lost motion, to avoid every handling operation which modern equipment makes unnecessary." This principle is carried out in the force-feed system. Instead of handling into a central warehouse and then out of that warehouse to some other plant point, the effort is made to take materials directly to points of use.

A two-fold advantage from this method of handling is a better control over inventory and a more adequate assurance that there will be a continuous flow of materials on all subassembly lines, thus providing insurance against a slowing down of operations throughout the plant. In this system, adequate banks of small parts are stored, in convenient areas, on skid platforms, or in tote pans, skid bins, or other receptacles.

♦ ♦ ♦

Safe Handling Essential

BRIEF mention was made in a previous article of the importance of materials handling equipment as a factor of safety for employees. In one month of the current year in the



OVERHEAD handling of long sucker rods into storage area and thence out to freight car loading platforms offers a suggestion of value to manufacturers with similar handling problems. Photo courtesy Cleveland Tramrail Division

MATERIALS HANDLING

state of New York industrial accidents caused the deaths of 120 workmen, and the report of the New York state department of labor shows that materials handling accidents caused 22 of these fatalities. Of these 22, no less than 13 were attributed to severe strains incurred in overlifting, while six other deaths were from injuries received by workmen when the materials they were handling slipped and struck them.

The writer discussed this subject of industrial accidents with a state inspector whose duties led him to investigate causes of such injuries. The official stated that the vast majority of the deaths and serious injuries occur in plants where there is a lack of mechanical handling equipment, and where employes utilize obsolete materials handling methods. In many such instances, the installation of a hoist or lift truck or other simple piece of equipment would save workmen from serious injuries. Since New York leads all other states in employment of labor, it will be conservative to reach the conclusion that a major percentage of all deaths from industrial accidents may be chargeable to poor handling methods or lack of suitable materials handling equipment.

Lift-Jack Handling

APPARENTLY some manufacturers sense a broad market for semi-live skids and a lifting device to make them entirely mobile units. Within the past few months, two additional units have been announced.

One of these is a lift jack for use with welded platform skids. It consists of a lifting mechanism carried between two wheels, quickly attachable to or detachable from the platform. Contact is made by bringing the handle of the jack unit forward to a horizontal position, an engaging pin locking in the socket and simultaneously raising the platform off the floor. This jack unit is said to have a lifting power of 6000 pounds, but weighs only 42 pounds.

The other line announced in recent weeks is a lifting and pulling lever mounted on roller bearing rubber tired wheels, and used in similar manner to convert a semilive skid platform into a factory truck. This unit is designed to lift 3000-pound loads.

Last year a middle western manufacturer announced a combination jack-lift and trailing wheel tote box, a similar application of the principle of utilizing a lifting handle to make a semilive unit mobile. In 1934 one of the prominent floor truck and caster manufacturers developed a lift-jack system.

Small Assembly Units

IN SOME modern plants, there is a noticeable tendency to lay out assemblies into two or more complete units instead of having one large assembly line. In two medium sized factories in the East this plan is in operation. The advantage is that when production requirements slow down, it is necessary to run only one assembly conveyor and its accom-

VERTICAL roller conveyor used as guard-rails on a storage line in a representative steel plant. Photo courtesy Standard Conveyor Co.

panying quota of overhead monorails and electric hoists. Under the old procedure, even when production dropped 50 per cent, the parts had to make the entire circuit of the department, and the entire conveyor and other parts of the materials handling system had to be kept in motion.

Pallet Handling Wins Favor

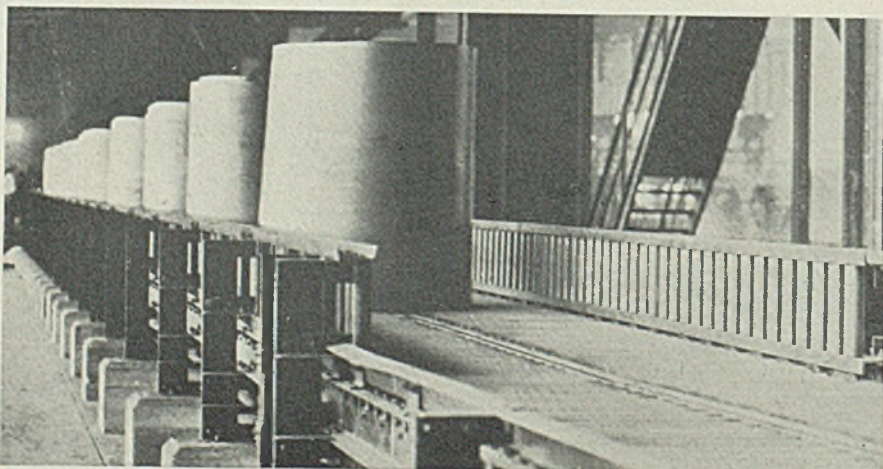
ONE comparatively recent method of handling, which is apparently making rapid strides in popularity, is the combination of industrial fork trucks and pallets. The latter, which in reality are low-clearance skids, offer numerous advantages, including inexpensive construction, higher stacking of loads in storage areas, or in warehouses, and convenient use of rail and truck shipment without necessity of returning of skids. This trend toward greater use of pallets has led to the development of fork-type hand-lift trucks and to the addition of other hand-lift truck models with exceedingly low clearances.

Equipment To Fit the Job

MATERIALS handling manufacturers have been noted for their ability to devise special machines for special jobs. In a large electrical manufacturing plant in New England, an interesting illustration of this fact was observed recently. The equipment is a special reel handling truck with a capacity of 12,000 pounds. The design is such that by means of adequate arrangement of supporting arbors, the single truck may be used for transporting a reel weighing 12,000 pounds and of 78 inches in diameter; or it may be used to handle two 48-inch reels at one time, four 36-inch reels, six 30-inch reels or twelve 24-inch reels.

Builds New Storage Trestle

FOR many years the Farrel-Birmingham Co., Ansonia, Conn., has utilized a trestle for unloading raw materials for its foundry, spotting the cars over the particular bins or areas assigned to the different products. When the trestle and sand shed were found to be in bad shape recently, the company replaced them with a new steel trestle and a steel and concrete sand shed. From the bins the material is placed in cars by a small shovel truck.





QUALITY

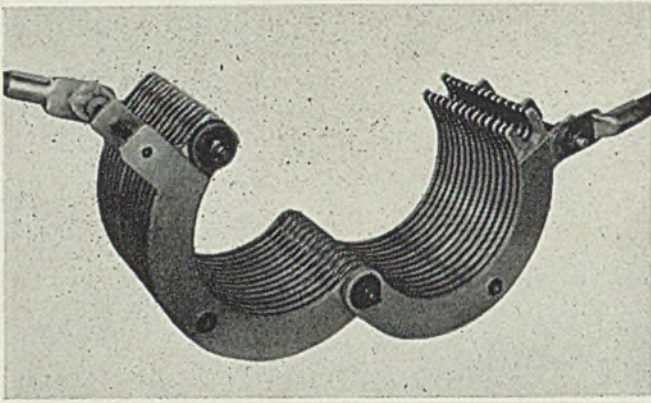
LEWIS rolling mill equipment progresses with the requirements of the steel industry.



LEWIS WELDED BASE FOR MILL GEAR DRIVE.



LEWIS FOUNDRY & MACHINE CO.
PITTSBURGH, PA.



Electric heating coil which is clamped around the welded joint in the pipe

Stresses in Welded Pipe Relieved By Low-Frequency Heating Coil

BY C. M. WEINHEIMER

Chief Engineer, Detroit Electric Furnace Co., Detroit

WHEN a welded joint is subjected to fatigue or normal service strains, residual welding stresses may become serious, especially when they coincide with stresses resulting from the internal forces. Consequently, residual welding stresses should be relieved to as great a degree as possible before the joint is put into service.

The principal object in stress relieving a welded pressure line for operation at temperatures of 850 degrees Fahr. and higher is to reduce and equalize stresses locked in at the time the weld metal freezes, as a precaution and preventive against trouble under initial application of load. Stress relief has a double purpose. First it heats the joint to a temperature at which plastic flow or creep occurs readily. On cooling, both pipe and weld shrink uniformly. Secondly, stress relief effects a drawing and tempering action. This drawing increases the ductility of the weld metal, raises its impact strength and improves fatigue resistance. This is accomplished by equalizing the characteristics of the entire weld wedge and converting the weld metal structure from martensite or troostite to sorbite—changing the weld metal from "as cast" to an annealed condition.

Conditions for Stress Relief

Stress relief and drawing requires that the weld and adjacent pipe metal be raised to a temperature of 1100 to 1200 degrees Fahr., held at that temperature for a specific period of time and then cooled uniformly at a definite rate. The time under maximum heat specified by codes is one hour per inch of wall thickness. The length of pipe to be heated on each

side of the weld is approximately six times the thickness of the pipe.

A necessary and practical restriction in heating equipment is the requirement of portability and ease of handling. Whatever device is used must be taken to the weld and it must be capable of easy application in close quarters. Under these restrictions, an effective heating device is the electric heating coil. A device of this type has been developed by engineers of the writer's company.

Essentially the Detroit electric weld stress reliever consists of a portable low-frequency heating coil and protective insulating shield, both hinged so that they are readily

Transformer and control equipment are conveniently mounted on a truck for transporting to the weld to be stress relieved

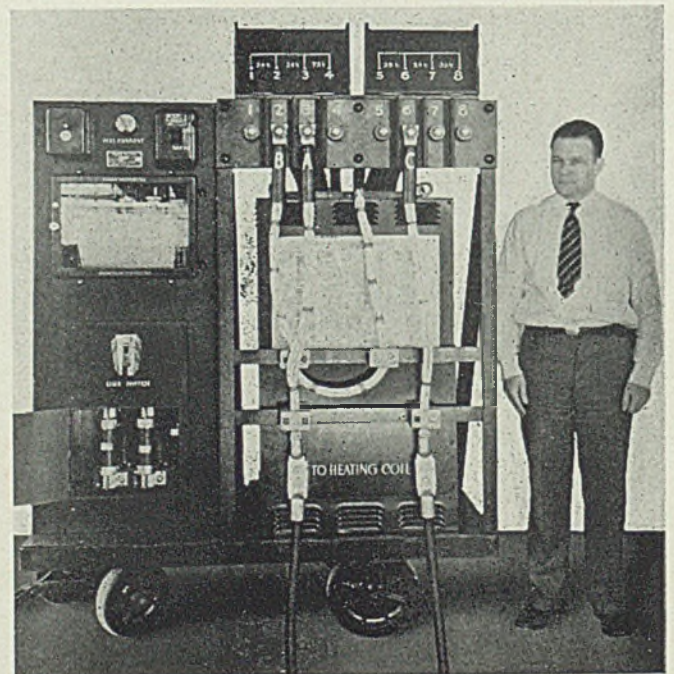
clamped around the pipe weld. By this means, heat is developed in the weld metal and in the necessary length of pipe. A tap change transformer with auxiliary equipment for controlling electric energy to the heating coil and controlling pyrometer are mounted on a hand truck.

The equipment is rugged and operation simple so that a pipe fabricating crew should have no difficulty in handling it. The primary cable is connected to any 60-cycle power supply of approximately 100 kilovolt-ampere capacity. The thermocouple is attached to the weld and to the controller. The coil is mounted around the weld to be relieved and the secondary cables are connected to the coil. The correct voltages are secured by making the proper connections on the tap changer. The controller is then set at the desired temperature and the line and control switches closed.

In order to limit the rate of temperature rise in the weld metal the starting voltage is ordinarily less than that required to bring the weld to maximum temperature. Each advance is made by changing the tap connections at the transformer with the current turned off temporarily while the change is being made.

When the temperature has been raised to its final value it is automatically maintained within close limits by the operation of the magnetic contactor controlled by the pyrometer and thermocouple at the weld.

If desired, the rate of cooling can also be controlled by keeping the coil energized at a lower voltage to meet any special conditions of cooling which might be required. At the end of the operating cycle the current is turned off and the coil moved to the next weld.



METAL SHOW ISSUE

OCTOBER 12, 1936

I N F O R M A T I O N

GENERAL

The National Metal Congress and Exposition, sponsored by the American Society for Metals, will be held at the Public Auditorium, Cleveland, Ohio, October 19-23. The following technical societies, will participate:

American Society for Metals
American Welding Society
Iron & Steel Division, A.I.M.E.
Iron & Steel Division, A.S.M.E.
Institute of Metals Division, A.I.M.E.
Machine Shop Practice Division, A.S.M.E.
Wire Association

Naturally, **STEEL** will play a prominent part in co-operating to make this Eighteenth Annual National Metal Congress a success. The issue of October 12 will carry the complete advance details of the exposition and convention, and will be in the hands of readers a week before the convention opens—ample time to make plans.

In addition, this issue will portray the increasing uses of metal alloys with a special section (largely pictorial) devoted to "Alloys in Action". This will serve to crystallize the interest aroused by the Metal Alloy articles which are a part of **STEEL'S** basic editorial structure.

This issue will serve to bring the exposition to those who cannot attend.

PUBLICATION

A feature of the October 12 issue of **STEEL** will be a combined editorial and advertising section devoted to the same interests as the National Metal Congress.

Those advertisers desirous of appealing to these same interests will find unusual value in being properly represented in the special section of this issue.

Added advertising value will be gained by "Alloys in Action", a pictorial feature which will be incorporated in this section. This will add emphasis and interest to the entire section to the decided advantage of all advertisers.

This interest value is not confined to the readers of **STEEL** who attend the Exposition, but extends in even larger measure to those similarly interested who do not attend, thereby depending more largely upon **STEEL** to bring the Exposition to them.

COLOR

Two colors will be used—red and black—printed on India tint coated stock.

RATE

Including color and insert position—\$175 a page for regular advertisers—\$200 per page one time.

BLEED-OFF

\$25.00 additional for one page.
\$40.00 additional for a two page spread.
(Bleed-off plates, 8 $\frac{3}{4}$ x 11 $\frac{7}{8}$ inches.)

CLOSING DATES

Final forms will close Wednesday, September 30.



PRODUCTION • PROCESSING • DISTRIBUTION • USE

For Forty-eight years—IRON TRADE REVIEW

CLEVELAND

NEW YORK • PITTSBURGH • CHICAGO • WASHINGTON • LONDON

Wood Veneer Opens New Architectural Uses for Steel

INCREASED use of steel for architectural purposes and for manufacture of products formerly made of wood has led to a search for new methods of finishing that metal to present a natural wood appearance. Early "imitation wood" finishes are familiar to many. Development has been rapid and metal surfaces now can be finished so they can be distinguished from wood only by rapping the finished surface sharply with the knuckles.

One of the latest developments is a product known as "Flexwood," manufactured by United States Plywood Co. Inc., New York. This material is a genuine wood veneer cut to approximately 0.012-inch and mounted on cotton sheeting by means of a water resistant adhesive. Lamination of the veneer and cloth is accomplished between hot plates in a hydraulic press. The name Flexwood indicates that the sheet material has been made flexible. This is accomplished by passing the veneer, after it has been mounted on cloth, through a machine which upsets the cellular unity of the wood to produce a limp, pliable sheet of veneer.

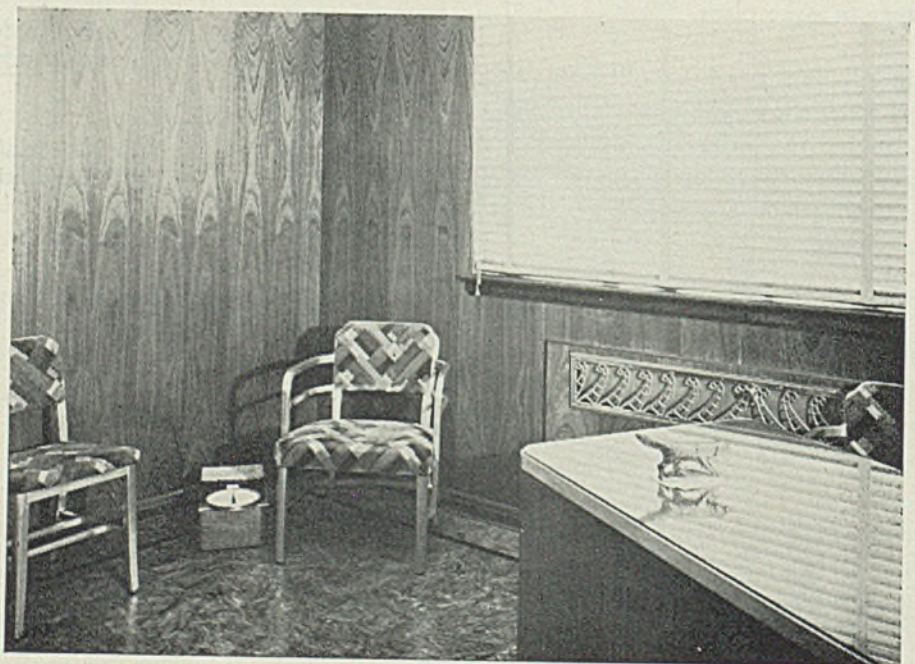
The veneer is applied by hand to any smooth, hard surface, whether flat or curved. Architecturally, it is used for wall decoration, being applied to plaster, masonite, sheetrock, plywood boards or steel. The bulk of the installations are on plaster. Bonding of the veneer to the backing is accomplished through a special, elastic, water resistant adhesive which has high strength. The cement must have these properties because there is a tendency for the material to expand as moisture is

absorbed into the veneer. Due to this factor of expansion and contraction, which cannot be entirely controlled, the adhesive itself must be strong enough to counteract any pull which develops. In the application of this veneer to metal surfaces, no failures result from the fact that wood and metal have different coefficients of expansion. While the wood may be shrinking at the same time the metal is expanding, the adhesive used will compensate for the difference and is sufficiently elastic to withstand

this action without any rupture in the glue line.

Recently there has been a growing interest in the application of wood veneer to steel and other metals. Notable examples of such treatment are found in some of the new high-speed trains being developed. Union Pacific railroad trains recently completed by Pullman Car & Mfg. Corp., Chicago, are decorated with such rare woods as avodire, redwood burl, birdseye maple, and gray English hawthorn. New York Central's Mercury train, designed by Henry Dreyfuss, has interiors of American walnut. The four latest Burlington Zephyrs, produced by Edward G. Budd Mfg. Co., Philadelphia, have sleeping car and lounge interiors featuring such woods as English oak, satinwood, primavera, Orientalwood and American walnut.

In railroad cars, veneer has been applied to steel or aluminum plates or masonite. From a practical standpoint, it has been found advisable to design the interior so that wherever joints occur in the plates, a molding is used over the veneer. This is particularly important in the case of the frieze panels where due to deflection and torsional strain, welded plates have been known to open at the seam thus causing a rupture in the veneer surface. Designers, therefore, are laying out



This entire office is beautifully finished in walnut using wood veneer on walls, steel radiator enclosure and steel desk. Note perfect matching of grain in the walls



The Steel we put in determines the Service you get out

OF COURSE, the performance of tin plate has always been affected by the character of the steel used. But with the advent of Weirite, a radically improved tin plate, the importance of the steel is paramount.

Steel purity is the foundation of Weirite's density, exceptional ductility, accurate gauge and uniform protective coating. These are the characteristics, so vital to the appearance, utility and economical production of articles made of tin plate. These qualities are developed by ingenious forming and finishing equipment, the use of which would be impossible without the elimination of impurities in the steel.

Weirite's performance will add value to the tin plate parts or products which you make. If you have a packaging problem you will profit by consulting manufacturers of tin plate containers and closures. They are now able to supply packages which give full protection, have strong selling appeal, and cost little.



WEIRTON STEEL COMPANY,
Weirton, W. Va. . . . Division of
National Steel Corporation

WEIRTON STEEL

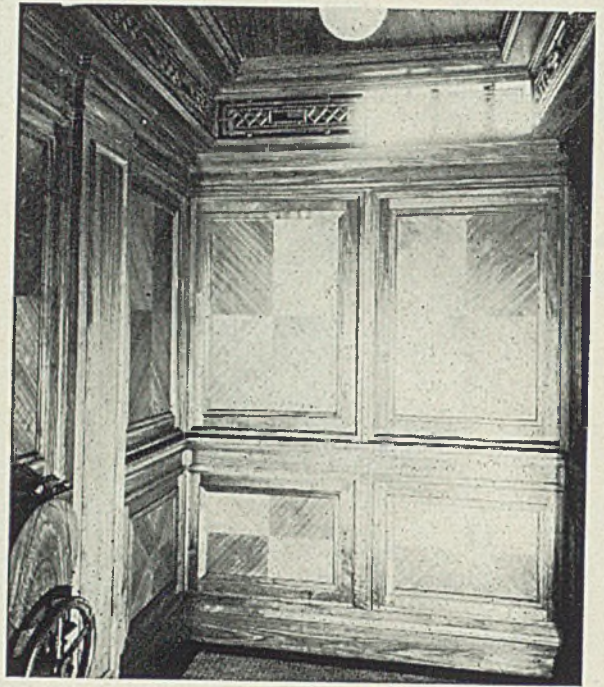
compartments and other spaces with consideration given to maximum sizes of metal plates available, so that one of the weaknesses in this type of treatment is overcome. The original installation of Flexwood in railroad cars was made by the Illinois Central railroad and cars were placed in service in October, 1934. During this period of continuous operation, the material has withstood all normal wear and tear which is found in railroad operation, without any failure.

For several years veneer has been successfully applied to steel elevator cab enclosures on both old and new installations. Application has been made successfully to lacquered surfaces, although contractors specializing in this type of work consider it advisable to sandpaper the metal surfaces first. Where application is made to bare metal the surface first must be washed free from any trace of oil or grease. In elevator work it has been found impractical to attempt to apply veneer over metal moldings. While such work can be done, it is not considered practical from a production standpoint and the actual bearing surface to which the veneer is attached frequently is not sufficient to hold the material if any tendency toward expansion or contraction develops.

Architecturally, veneer is commonly used to cover steel radiator enclosures and no record of failure has been found where application was made in strict accordance with instructions. Heat from radiators is said to have no effect on the adhesive or the veneer itself. It is not practical, however, to use veneer without giving it the protection of a finish. Veneer must be finished the same as wood in any other form.

Many manufacturers of metal

ILLUSTRATING
the quartered walnut effect which can be obtained when veneer is used to refinish the walls of elevators



items such as women's compacts, cigarette cases and modernistic lamps have been using veneer successfully for several years. The fact that wood can be applied to curved surfaces makes it particularly suitable for such decoration. Since wood is available in many colors and can be finished in many ways it makes an ideal decoration for compacts due to the fact that there is a seasonal appeal in woods of light and dark colors. Many new uses will suggest themselves to manufacturers of small articles designed for popular appeal and sale as well as to architects and designers of heavier equipment as the popularity of veneer increases.

Galvanized Sheets Given Chemical Surface Treatment

Research department of the American Rolling Mill Co., Middletown, O., recently announced the result of extended development work in the production of Armco galvanized "Paintgrip" sheets. This new type of galvanized sheet steel is intended to be painted without special treatment of the surface by the user.

The sheets are said to have all the value of full coated galvanized sheets, with the added protection of a special insulating coating which keeps the paint from direct contact with the zinc surface. The result is claimed to be galvanized metal with good physical surface for mechanical adhesion, plus chemical neutrality which retards aging of the paint.

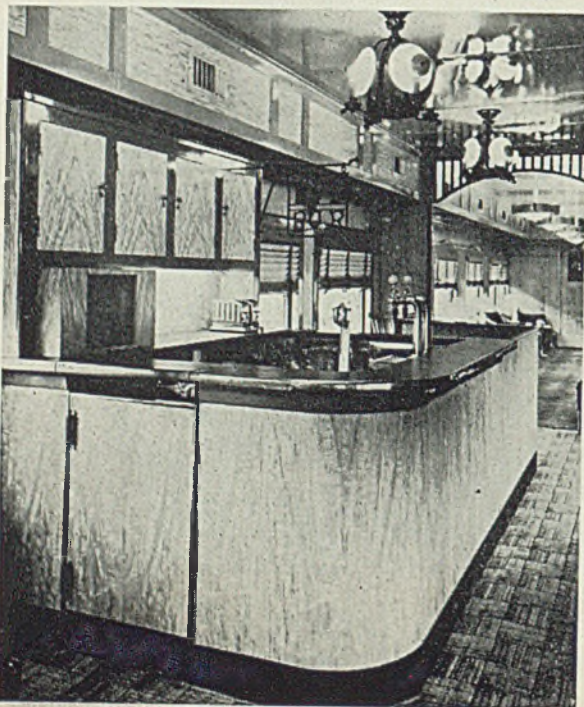
This treatment is now available in any of the grades of galvanized sheets manufactured by Armco, and is supplied in two surface finishes.

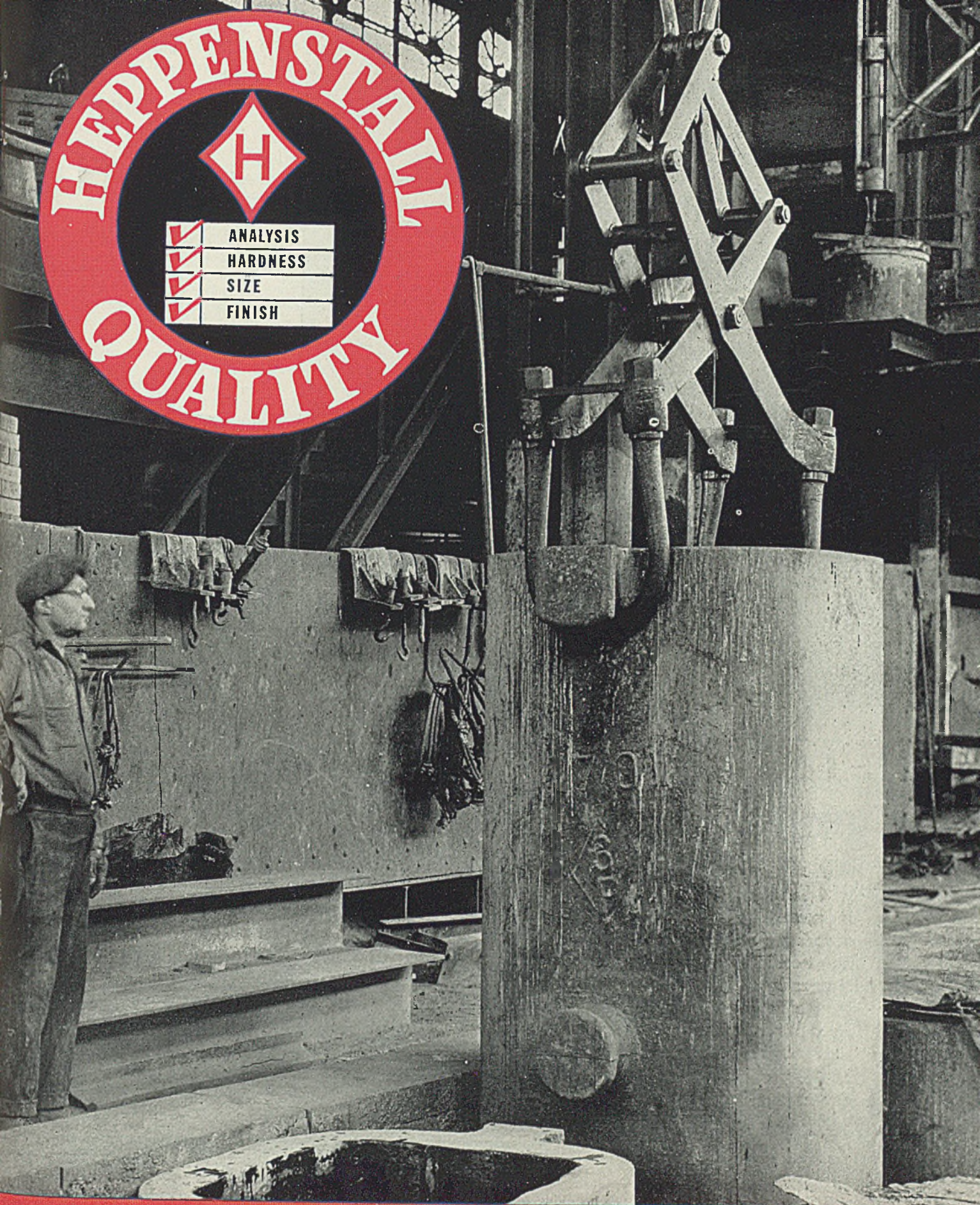
The forming qualities are claimed to be the same as untreated galvanized sheets with corresponding weights of coating.

Furfural and Benzene Used In Paint, Varnish Remover

A paint and varnish remover said to be superior to many preparations now on the market may be made from furfural and benzene. The material was developed by the chemical engineering department, Iowa State college, Ames, Iowa, in a search for uses of furfural, an oily liquid made from oat hulls. The formula is: Two parts furfural and one part a saturated solution of paraffin wax in benzene.

ORIGINAL installation of wood veneer in railroad cars was made in cars of the Illinois Central railroad. They have withstood all normal wear and tear in continuous service since October, 1934





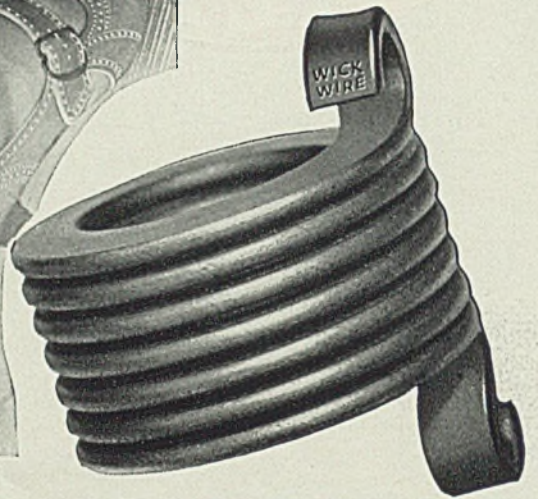
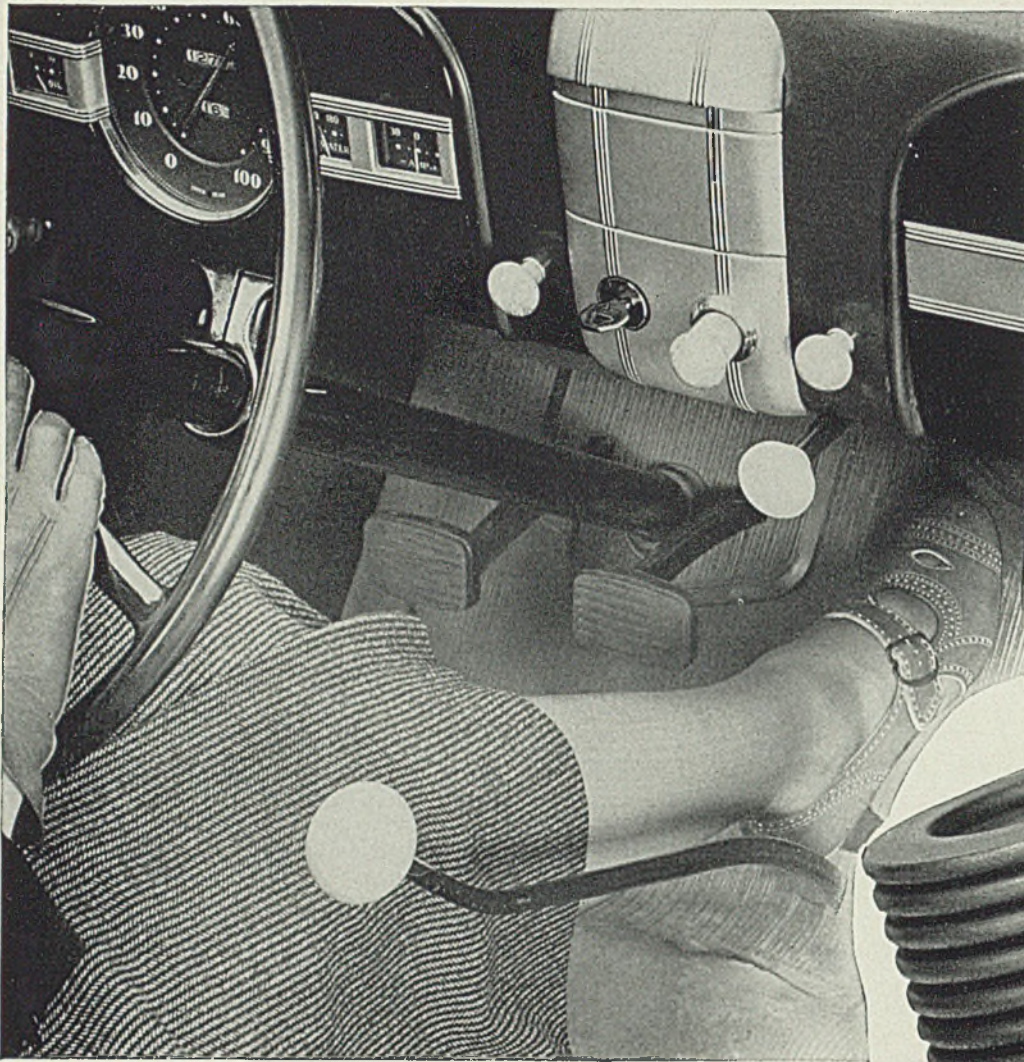
HEPPENSTALL COMPANY

GELLERT TONGS... DIE BLOCKS... SHEAR KNIVES... HAMMER BARS... PISTON RINGS... TAPPING AND GALVANIZING ROLLS
 LOCOMOTIVE AXLES, PINS AND RODS... E. L. S. AND A. S. ALLOY STEELS... CARBON AND ALLOY FORGINGS

AN INTERESTING NEW FOLDER
 HEPPENSTALL GELLERT TONGS, SEE
 ON REQUEST. USE THIS COUPON

Name _____

Company _____



OIL-TEMPERED WIRE IS NEEDED every time she presses the starter

The starter spring . . . the all-important link between the starting motor and the engine, is constantly subjected to the toughest kind of spring abuse . . . therefore the need for the finest oil tempered spring wire procurable. Naturally, Wickwire Spencer has been selected as an important source of supply by the industry. You couldn't ask for more sincere tribute to the quality and uniformity of Wissco oil-tempered spring wire. Makers and users of valve springs, overhead garage

door springs, agricultural equipment springs, clock springs and many others have learned to appreciate the high strength, ductility and toughness of this remarkable wire. It is regularly furnished in round, square and rectangular shapes in a wide range of gauges. Write for particulars.

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

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

WISSCO WIRE
by Wickwire Spencer

Metals and Alloys Used in Chemical Industry Reviewed in Symposium

FEATURE of the ninety-second meeting of the American Chemical Society in Pittsburgh, Sept. 7-11, was a symposium on "New Metals and Alloys Applicable to the Chemical Industry." B. D. Saklatwalla, Rustless Iron Corp. of America, Baltimore, presented a paper entitled "Some Fundamentals Governing the Practical Evolution of New Metals," outlining methods and considerations in the developments along these lines. Consideration must be given to the availability of the minerals involved before exploiting them, according to the speaker. In spite of advances in scientific endeavor, empirical trial is still the only method for determining the usefulness of a particular new metal or alloy.

New alloys, especially those ferrous in nature, generally have qualities differing from all components. Pure metals are improved in two opposing ways—obtaining the metal in a superpure state or adding impurities to the pure metal. There is also a distinct trend toward combination of metals in spite of the advancement of alloy development, such processes as sintering, plating and welding showing great development. Important considerations in the development of alloys are corrosion resistance and temperature resistance. Mr. Saklatwalla claimed, however, that from the standpoint of the chemical engineer, alloys for handling waste effluents and for shipping containers are equally as important as for use in process equipment.

Steel Corrosion Discussed

Written by Florence Fenwick and John Johnston, research laboratory, United States Steel Corp., Kearny, N. J. was a paper entitled "Steels Resistant to Corrosion and Scaling." According to these writers, steels of higher strength can in many applications be used to advantage only if they have a greater resistance to corrosion than ordinary ferrous materials; and enhanced corrosion resistance is usually a primary requirement in materials for use in structures where lightness is desirable. The corrosion resistance of a metal depends on the degree to which the product of its reaction to the environment isolates the metal from the environment; it thus depends on the environment as well as the metal. The isolating agent is a film which in many environments may be protective against further attack, as in the stainless steels, or moderately impervious, as in some of the

more modern rust-resistant steels, or relatively impervious and unstable, as in ordinary ferrous materials. The difference is thus in degree rather than in kind, and appears to be associated with differences in the ability of the film to resist breakdown or to heal itself if broken. This view, which is supported by experimental evidence, is used as a basis for the discussion of the range of usefulness of some of the corrosion-resistant steels.

Chemical Uses of Chromium

In a discussion on "Chromium and Its Alloys in the Chemical Industry," W. J. Priestley, Electro Metallurgical Sales Corp., New York, points out that the element chromium has played an important part in the development of chemical equipment, particularly because of the wide adaptation of the chrome steels. There is a wide selection of corrosion-resistant steels now available, all of which contain chromium as the basic alloying element.

His discussion covered five groups of straight chromium steels, grouped according to chromium content, and two groups of chromium-nickel austenitic steels. The latest developed analyses and modifications were listed together with suggestions as to their correct use by the chemical engineer.

Nickel and nickel alloys were discussed by R. J. McKay, International Nickel Co., New York. A general picture of the properties and corrosion resistance of chemically pure nickel was given. These properties serve as a basis of discussion of the newer alloys of nickel, including the various Monel metals, copper-nickel alloys, nickel silvers, Inconel, nickel-clad steel, nickel electroplate, nickel and alloy welding rods and nickel cast iron.

D. K. Crampton, Chase Brass & Copper Co., Waterbury, Conn., presented a paper entitled "Developments in Wrought Copper Brass Alloys," devoted to some of the newer applications of established alloys, as well as new alloy developments. Copper tubing has found greatly increased uses in water lines, oil, vapor and air lines, while red bronze is an accepted material for use in most corrosive waters. Cupronickels are widely used in condenser tubing and silicon bronzes are used in tanks, kettles, evaporators, bolts and springs.

Some of the newer alloys include aluminum brass for condenser use and the new modification containing

both tin and aluminum. An alloy of great promise is the new nickel aluminum bronze of high nickel and aluminum content.

Presented by W. L. Fink, Aluminum Co. of America, Pittsburgh, a paper "Aluminum and Aluminum Alloys for Chemical Apparatus" cited cases where aluminum and some of its alloys may be advantageously used in construction of apparatus. Where materials are inert or may be suitably inhibited, the high ductility and high thermal and electrical conductivity, as well as the colorless non-toxic nature of its salts makes aluminum suitable. A number of alloys are available, including an Al-clad material resistant to perforation by corrosive liquids. Alloys must be tested under the actual service conditions before specifying, however. Aluminum in the same system with other heavy metals often leads to extensive electrolytic corrosion in some processes.

Lead alloyed with a few hundredths per cent tellurium meets the drastic conditions of the heavy chemical industry, according to G. O. Hiers, National Lead Co., New York. Improved mechanical properties augment good corrosion resistance, producing a superior material of construction. Lead alloyed with antimony up to 28 per cent is used in appreciable quantities because of its physical properties. Pure tin is used with chemicals because of its corrosion resistance and nontoxic nature. Zinc coated metals and die casting alloys are also occasionally used in spite of limited corrosion resistance in many cases.

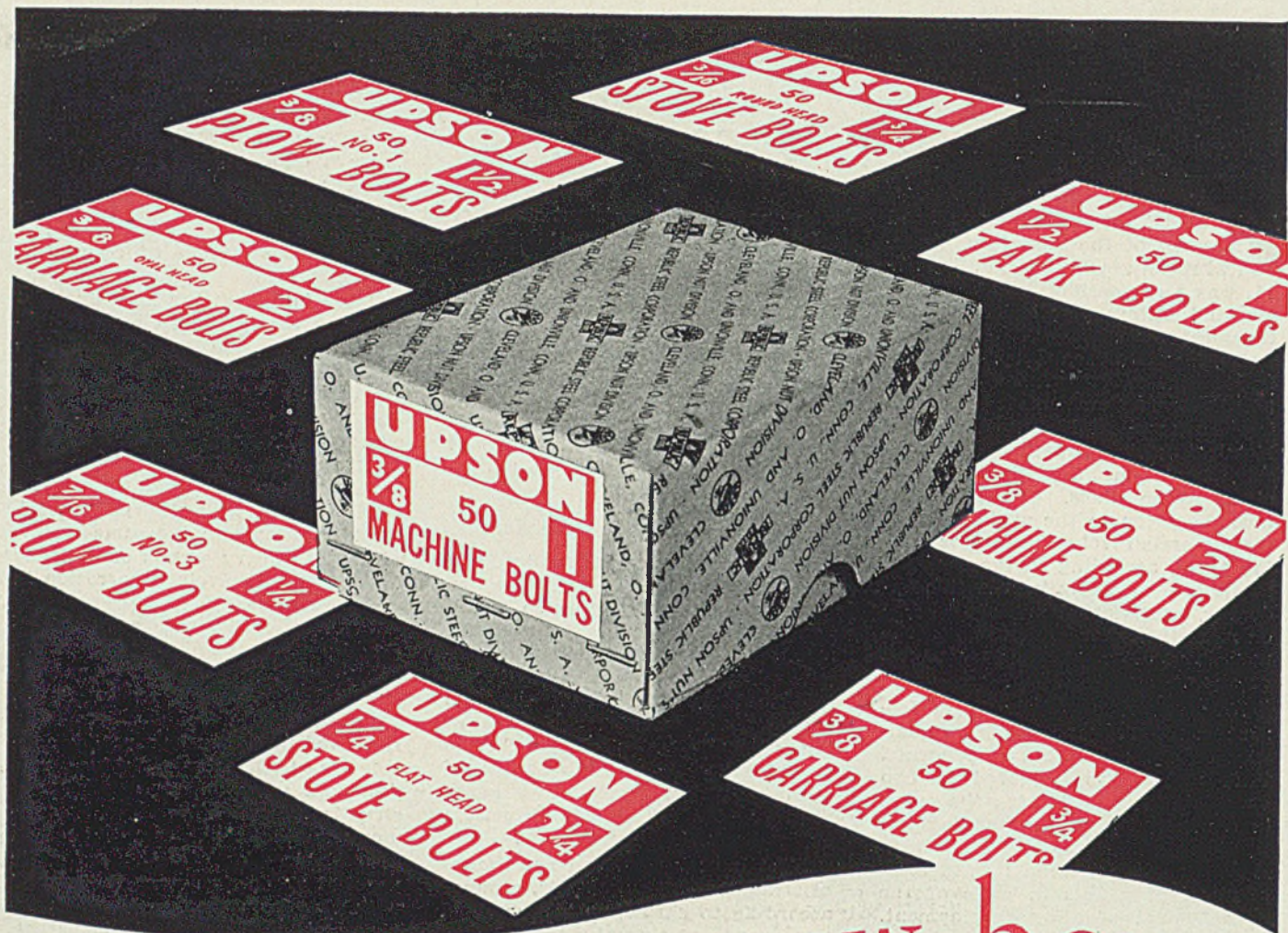
New Text on Mechanisms

Elementary Mechanism, by Philip K. Slaymaker; cloth, 180 pages, 6 x 9 inches; published by D. Van Nostrand Co. Inc., New York; supplied by STEEL, Cleveland, for \$2.25, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

Claiming nothing for novelty in the subject matter, the author bases his claim for recognition on the ever-widening field of the use and application of established methods of motion transmission. The text represents the experience of 28 years of teaching and nine years of drafting office experience in general engineering practice.

Fundamental principles and their application are discussed, developing the subject from elementary concepts and analyzing the material in logical order. Special attention has been paid to motion transmission by linkage because this division of the subject develops principles applicable to all other forms of motion transmission.

Questions at the end of the book are intended to aid the student in testing for himself his mastery of the subject.



new labels...new boxes

BUT INSIDE THE SAME DEPENDABLE



PRODUCTS

The next time you receive a shipment of Upson bolts, nuts, rivets or other headed and threaded products, you'll probably be impressed with the new-style boxes and the new easily-read labels.

These new packages have been designed in keeping with the trend of modern packaging—but inside the packages will be found the same reliable products—the same high quality which has earned for Upson a wide-spread reputation—the same full, true heads; strong, tough shanks; and clean, free-running threads on bolts and in nuts—the same accuracy of size—the same dependable steels.

When you need headed and threaded products, specify Upson. Note the attractive new packages—how well they stack on your shelves—how easily contents are identified by the new labels—and, most of all, note the contents of the packages. You can expect the same quality every time you specify UPSON.

UPSON NUT DIVISION

Republic Steel

C O R P O R A T I O N

GENERAL OFFICES · CLEVELAND, OHIO



VISIT THE REPUBLIC EXHIBIT AT THE GREAT LAKES EXPOSITION, CLEVELAND, OHIO, JUNE 27—OCTOBER 4.

When writing Upson Nut Division Republic Steel Corporation for further information, please address Department ST.

U. S. CONVEYOR AND TRANSMISSION BELTS

BOOK OF FACTS

Back of the blast furnace and rolling mill are arteries of ore, limestone, and coke, all contributing to the big steel system.

From Minnesota to Michigan to the Monongahela River, U. S. Conveyor and Transmission Belts perform an essential service to this far flung industry.

And to that multitude of industries converting the steel into finished consumer devices, U. S. Belts again carry on important assignments in transmitting power and conveying materials.



United States Rubber Company

POWER DRIVES

Dual Belt For Conveyors Cuts Replacement Costs

ORDINARILY a conveyor belt must meet a dual requirement: It must have sufficient strength in the base or fabric to pull or transmit the load, and the surface of the fabric must be protected against sharp or abrasive materials and weather, if in the open, when carrying load. Wear is especially severe in handling coke, crushed stone, ore, coal and similar materials.

The fabric base, which is the strength and transmitting element of the belt, is the more expensive part and must be discarded soon after the protecting surface is worn off. The useful life, therefore, is ordinarily determined by the life of the top wearing surface.

A new type of duplex belt system has been devised which uses two belts for conveying. The inner or transmitting belt, which operates next to the pulleys, is provided with the necessary strength for transmission and sufficient coating for protection from the weather and light wear. The outer, or burden bearing belt, has a heavy protective coating against wear from the materials carried. As the only belt pull is on the return side, comparatively little strength is necessary.

When this top load carrying belt becomes badly worn it is replaced. The protected driving belt will outwear several of the over-riding load-carrying belts, which are said to have about the same useful life as an ordinary conveyor belt but cost much less.

The two belts are entirely separate. The top belt merely rides on the driving belt, which is under tension, and is carried along by friction. The top belt, however, has its own end pulleys and return idlers. The over-riding belt performs a service similar to the half-sole on a shoe and the retread to a tire in that it is replaceable with wear and saves replacement of the more expensive part of the equipment.

Bearings in Storage

ANTIFRICTION bearings for replacement purposes leave the factory in first-class condition, well oiled or greased for protection against rusting in normal atmospheric conditions. The user, however, has no way of knowing how long these bearings lie on the distributor's shelf. They may even

be in his own storeroom for several months.

Many greases and oils harden or gum from standing. Ordinarily this is not sufficient to rust or pit the highly polished metal surfaces, but the result is detrimental to operation. It is advisable that this oil or grease be removed, the bearing cleaned and the lubricant replaced before installation.

To meet this condition of storage one manufacturer of antifriction bearings has announced that all fully enclosed sealed precision bearings are packed with a special grease pretested for stability and wrapped in aluminum foil as a protection against grease oxidation and premature hardening.

Belt Costs

PRIMARY consideration in the purchase of power drives is satisfaction in operation, cost, efficiency and reliability. In many cases satisfaction in operation, efficiency and reliability may be obtained in a number of ways and in some cases at approximately equal costs. This is especially true in connection with properly designed belt drives.

The purchaser too often looks at the unit price of special belts rather than the price per horsepower transmitted. To show that these costs were not out of line with the prices of regular belting, the representative of one large concern handling a wide variety of grades and types of belting figured the belt cost on a certain drive, assuming the use of the proper size of each type and grade of belt sold. In no case did the price vary more than 10 per cent above or below the average.

With the higher grade special belts a smaller or lighter belt could be used. With some of the lower grade belts it would have been necessary to have installed wider pulleys for the load.

One of the important advantages of special belts is their ability to handle power demands which have grown to exceed the original capacity of the installed belts and pulleys. With the rapid improvements in tools and wider use of special alloys many machines are loaded far beyond the original expectations of the manufacturer.

The application of a special belt with increased tractive capacity frequently permits satisfactory and efficient operation without pulley changes. Often on old machines the

pulley is built-in so that increasing its width or diameter is not possible. Thus, even though the special belt apparently costs more than the old one, its cost in relation to the new load is not out of line, especially when its use results in salvaging and increasing the capacity and efficiency of a machine tool.

The only other alternatives are the use of pivoted motor bases, where the center distance may vary, or, on fixed centers, the use of multiple V-belts or chains, either of which require a complete substitution of sheaves or sprockets for the pulleys.

Pertinent Pointers

Where breathers are provided in speed reducers or other enclosed drives, check frequently to see that the opening does not become clogged. In dusty atmospheres, pack the outlet or open down-pipe of the breather with steel wool, being careful not to push it over the bend so that steel particles enter the unit to contaminate the lubricant. Such packing requires frequent replacement or removal and washing in gasoline or kerosene.


Purpose of a bearing is to provide support and alignment to the rotating parts and at the same time prevent excessive wear which would impair the alignment and support or increase the power required for operation. No bearing will provide this service unless properly lubricated and serviced.

After a gear unit has been in operation about a month, it is a good plan to drain and flush out and then refill. This removes any loosened scale from the inside of the case and featheredges or wearings from the gears.

Static from slipping belts is not only a fire hazard but also a danger to operators since the shock has caused men to injure themselves by jumping into danger or falling.

The least expensive lubricant is the one which, when properly applied, results in the lowest cost for maintenance and the least interruption to service.

DO YOU KNOW *how much*
FAIRBANKS PRINTOMATIC
WEIGHERS CAN
save your business?

Then get **YOUR** copy of this 
 new **FREE Bulletin!**

● Can leakage of raw materials be stopped? Can shipping weights and processing stages be automatically and accurately checked? Can waste be prevented?

YES, if a Fairbanks Printomatic Weigher stands as a watchman over every scale operation. Automatically, it prints a record of each weight that passes over the scale. It cannot misread. Faithful, it makes and keeps its own records that management may read in them the way to cutting costs, to reducing waste and losses.

Can a Fairbanks Printomatic Weigher save money for you? Get your copy of our interesting new bulletin on Printomatics, and see what they can do for your present Fairbanks Dial scales, or for those you will later install. For your copy, address Department L491, Fairbanks, Morse & Co., 900 S. Wabash Avenue, Chicago, Ill. And 40 principal cities—a service station at each house.



Printomatic Weighers can be added to many existing Fairbanks scales under a new leasing plan. No large investment is necessary for you to begin enjoying their savings.

6552-SA 40.33

FAIRBANKS  *Scales*
 P R E F E R R E D T H E W O R L D O V E R



CONTAINER STEEL

Oil drums, and cans... Powder barrels... Beer kegs... Containers for food products, all need steel. Granite City Steel Company supplies high quality sheets, tinplate, tin mill black plate, galvanized steel, Ingaclad steel and other grades to a long list of container fabricators.

Granite City Steel Company matches quality with unusual delivery facilities, too. Served by 29 railroads and the Mississippi River, the mill assures better service to the Mississippi Valley, the West and the Southwest.



**GALVANIZED SHEETS
STEEL SHEETS
PLATES AND
TIN PLATE**

GRANITE CITY STEEL CO

GRANITE CITY, ILLINOIS

200 Fifth Ave., New York
3525 Princeton Ave., Dallas
1208 R. A. Long Bldg., Kansas City
8 South Michigan Blvd., Chicago

1805 Boatmen's Bank Bldg., St. Louis
1613 Pioneer Building, St. Paul
1602 Mariner Tower, Milwaukee
1750 Army Street, San Francisco

Operator Qualifications Vary with Job Involved

SEVERAL facts stand out in connection with the continual controversy about qualification of gas and electric arc welding operators. Universal qualification is impractical. A man may be fully qualified to weld the job encountered in a plate or structural shop but be entirely unqualified for any one of a number of other jobs such as pressure vessel welding, naval construction, job shop welding and the like. Purchase contracts requiring "qualified operators" are meaningless unless they also specify which party is to decide whether the operators are qualified and the standards to be met to establish the fact of qualification.

That such difficulties are not academic is illustrated by a case in which seven shops supplied welded steel machinery parts on a large contract. The least acceptable work had been done by operators who were known to be qualified under Par. U-68 of the A.S.M.E. code. They simply did not know how to weld machinery parts.

In electric arc welding, instruments may be used continuously to qualify operators on the basis of the work they actually do on the job. That is valuable. But unless the foreman in charge of the work is competent both as a welding operator and as a manager of operators, there is a field of uncertainty involved.

The whole question of qualification of operators arises from the fact that there is a considerable amount of welded construction in which the public interest is involved. Robot instruments are extremely desirable as a means of eliminating controversies as to whether or not a man can and does make good welds. But supervisory judgment will always be a necessity.

Rapid Developments

THE rapid progress being made in the development of welding processes and their application is common knowledge. The question is often asked: Why? The answer is not difficult to find. The industrial world is under terrific pressure to produce the things people want profitably at a price they can afford to pay. The resistance to cost reduc-

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.

tion in the direction of using welding is less than it is in some other directions and the effort flows in that direction by the operation of natural law.

A contributing factor to the rapid development of welding is the free, open and hard-fought competition in the welding industry itself. One manufacturer will develop a new and useful process or product and immediately attack his competitors

on the customer front, lowering his prices as volume of production increases. The end of the cycle is reached when someone else discovers a better process or product that will sell at much higher prices. The "bull in the china shop" then finds himself in a corner with customers flocking to the competition. There is only one possible solution—a still newer and better process or product.

According to a recently exploded political theory, such conditions wreck the economic structure of the country. The fact is now established and proved that in such industries, the able companies are prosperous and furnish large employment of men, the customer buys at a low price, and rapid technical progress is made. The results shown are economically sound.

Welded Design Effects Savings

A MANUFACTURER of special machinery for the clothing industry obtained several benefits through the complete redesign of a cloth cutter for welded fabrication. Among these benefits, according to the July issue of *Oxy-Acetylene Tips*, published by the Linde Air Products Co., New York, are a total reduction in manufacturing costs of \$1.50 for each item over the former method, plus added savings of about 20 per cent in rejects and another 20 per cent in machining costs.

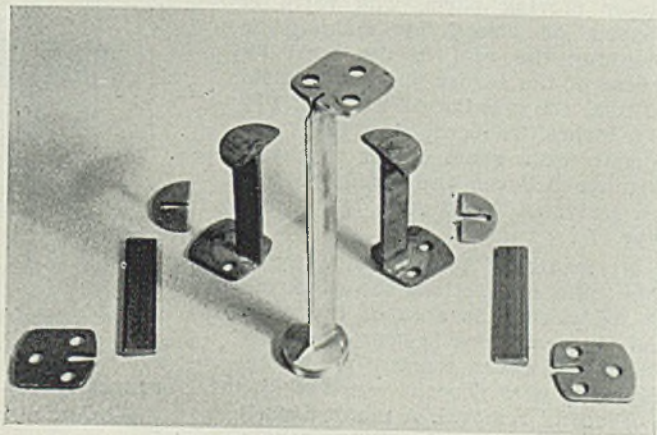
The product, shown in the accompanying illustration, is part of a cloth cutting machine assembly. The center

item, which is completed, consists of a three-holed bracket for the motor, a knife guide and sheath, and the base or footrest by means of which the whole assembly is fitted to the base of the machine.

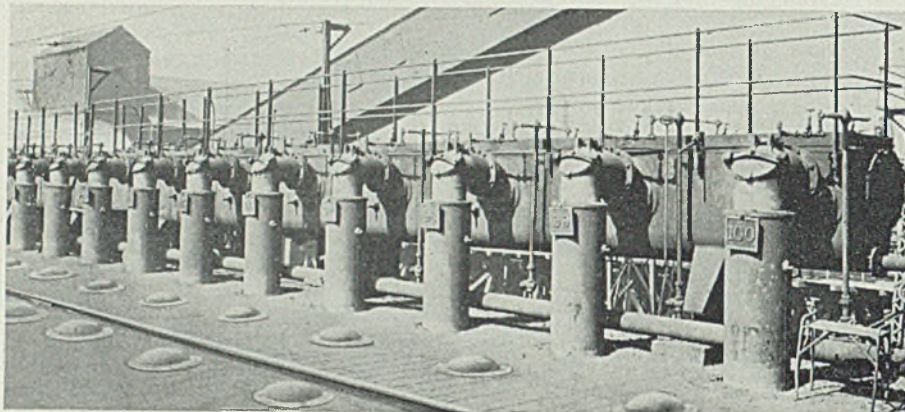
The knife guard consists of two thin strips of metal which fit into the upright support and are pinned into position so that the knife blade will move freely between them. When completely assembled with the motor on top, the footrest on the bottom, and the knife in place, the machine can be used to cut up to 200 layers of silk at one time to practically any desired shape.

As it is now fabricated, the five component parts are stamped out and welded together with high-test steel welding rod. The finished welds are ground smooth and a simple polishing operation leaves the machine without any visible indication of joints.

CLOTH cutter knife guide redesigned for welded assembly saves rejects and machining costs



PROGRESS IN STEELMAKING



Installation of new type valves at an Ohio by-product coke plant

Standpipe Valve for By-Product Ovens Involves No Major Moving Parts

IMPROVEMENT has been made in the design of the liquor sealed standpipe valve for by-product coke ovens, as shown in the accompanying illustrations. The initial battery equipped with this type of valve was at the plant of the Iron-ton By-Product Coke Co., Ironton, O. This 25-oven installation has served for five years without any expense for maintenance, replacement or repair and has made possible a material saving in operating labor costs.

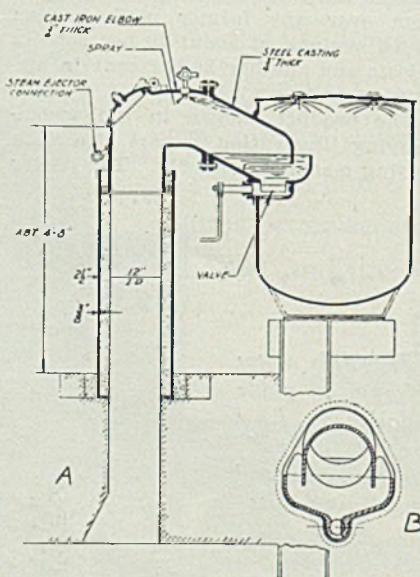
Two additional batteries have been so equipped within the last year, one of 20 ovens at the Semet-Solvay Co., Detroit, and the other of 51 ovens at the Otis Steel Co., Cleveland.

The liquor sealed standpipe valve is unusual in that it involves no major moving parts. The valve is opened or closed by making or breaking the seal in the bowl by means of the corliss plug cock at its bottom, the opening of which is $1\frac{1}{2}$ x 6 inches. The design of the valve permits of a short center to center distance between the standpipe and the main, and also of a low standpipe.

By means of the liquor spray in the angle connection, the material-ly reduced inside area of the valve and the connection is kept constantly cooled and wetted constantly, precluding tar or pitch deposits which require mechanical removal. A minor deposit

of such material is formed on the flat area at the bottom of the angle connection, which can be removed with a light bar at charging time. The gas passage and drain cock opening shown at B in the accompanying diagram are of ample size.

The spray system consists of one in the angle connection and two in the oven collector main, for each oven. The effectiveness of the installation is indicated by the fact that



Arrangement of uptake pipe, liquor-sealed valve and collector main

it eliminates the necessity of "tar chasing" of the main. Operation and inspection of the standpipe valve can be accomplished from the battery top. A daily inspection of the collector main spray system suffices for maintaining satisfactory operating conditions.

This improvement is a development of the Semet-Solvay Engineering Corp., New York.

Assures Uniform Supply

Hot and cold mills proper at a recently completed stripsheet plant are equipped with an automatic electrically-timed device which operates a self-indicating displacement type of grease valves located on the mill bearings. Through these valves grease is supplied to the necessary bearings at regular predetermined intervals and in predetermined quantities. In addition, each battery of valves on the mill housings are equipped with hand push button control so that additional grease can be supplied automatically.

Withstands Drastic Change

Arrangements now are under way for the marketing of a coating to be used on superheated metal surfaces. Being immune to acids, oil, gas, salt, air, ammonia, chlorine and many solvents the new material will protect iron and steel from rust under almost any conditions provided the material coated is subjected to heat. The material can be applied with a brush or spray direct to rusty surfaces; only the loose particles need be removed. The paint then dries at room temperature in one to two hours. Iron and steel surfaces treated with the new material can be heated to a white heat repeatedly without burning, chipping or cracking the coating, even though the white hot coated material is plunged into a bath of cold water. The coating is intended for use where paints and enamels containing organic matter are unsatisfactory. In a recent test a piece of a heavy-gage steel sheet painted on both sides with the material was subjected to the largest burner flame of a welding torch. The steel melted between the paint films but the coating did not break down even when thrust into cold water.

YEARMARKS of Experience

Accumulated over the years, the experience of *Valley Mould* in the art of producing successful ingot moulds amounts to a rich fund of knowledge upon which leading steel men freely draw.

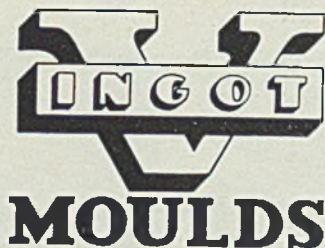
Coming to *Valley Mould* for information is a wise habit with steel leaders today, one which the leaders of tomorrow may wisely adopt.

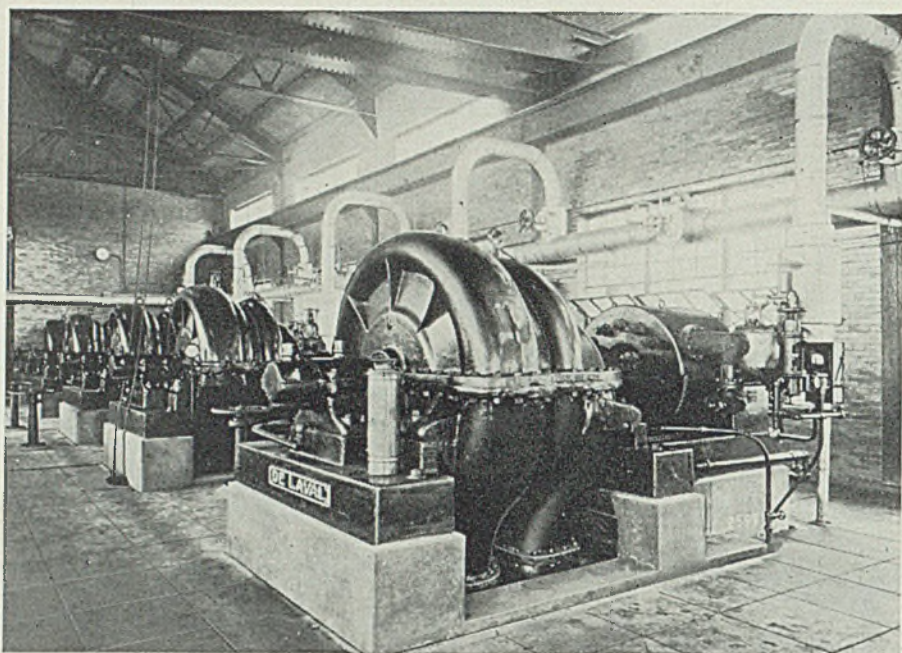
When your work becomes more varied and more complex with added years of service, you will appreciate the confidence and certainty with which you may place your mould problems in the experienced hands of *Valley*.

Learn to bank on *Valley* for moulds that carry the Yearmarks of Experience.

VALLEY MOULD AND IRON CORPORATION, HUBBARD, OHIO

Plants: HUBBARD, O.; SHARPSVILLE, PA.; CHICAGO, ILL.; Western Office: 108 St. & Calumet River, South Chicago, Ill.





By-product coke plant employs these five turbine driven exhausters. The total rating is 135,000 cubic feet per minute against 5.71 pounds per square inch at 3380 revolutions per minute

Power and Heat Problems Yield to Improved Alloys And Better Design

BY C. R. WALLER
Vice President, De Laval Steam
Turbine Co., Trenton, N. J.

MANY manufacturers lose sight of the fact that when they ship a carload of their product, power and heat constitute a definite percentage of its cost and that it is to their advantage to reduce this cost just as much as to lower manufacturing costs by the use of modern machine tools. In this age of streamlining and superefficiencies it may, therefore, be worthwhile to consider briefly what modern developments may do for the users of power and heat. Large central power sta-

tions have undoubtedly led the march of engineering progress, but there are thousands of small manufacturing plants still using boilers and power equipment that may have been modern 25 years ago. During the era when these older plants were designed, the boiler plant invariably was considered separately from the power plant and, as a consequence, the two were not always so co-ordinated as to give the most efficient ultimate result.

Today, we have at our disposal the

fruits of the last two decades of development in metallurgy and machine design. Heat and power problems that looked insurmountable 25 years ago have now become solvable, as many of the old limitations have been removed. The turbine designer of 25 years ago looked forward longingly to the day when he could utilize to the fullest extent the advantages of the upper limits of the thermodynamic cycle, but it has been only in the last few years that, following the development of new alloys, his dream has come true, so that he can now plan his power units with much greater latitude with respect to pressure and temperature limitations. A new field has been opened, the scope of which has not yet been fully visualized.

We must admit that it was necessary for the boilermaker to be at all times figuratively a step ahead of the turbine builder, and due credit should be given to the tremendous advance made in the design of modern boilers, now more appropriately termed "steam generators." With the steam and power generators now available, the engineer designing a new plant or modernizing an old plant is offered tremendous possibilities for reducing overall installation costs, as well as operating costs, and, furthermore, by giving careful study to the problem as a whole, the supplying of heat and power can be combined to create the lowest unit cost for the user.

Comparison of Old and New

In order to picture more closely what all this development may lead to, it is only necessary to compare the steam and power plant combination of 25 years ago with the possibilities that modern metallurgy and machine design have given us today.

The standard steam conditions of 25 years ago can well be set at 250 pounds steam pressure, 100 degrees Fahr. superheat, and for power generation 28 inches vacuum. This gives, at the limit, steam containing 1265 B.t.u. per pound, an available total temperature of 505 degrees Fahr. and power generation at the rate of one brake horsepower for 9½ pounds of steam (13½ pounds per kilowatt).

In 1936 the limits can be placed at 400 pounds and 675 degrees Fahr. total temperature, or at 600 pounds and 750 degrees Fahr. temperature, or at 1200 pounds and 850 degrees Fahr. temperature, with a possible limit for pressure of 1800 pounds, and for working temperatures of 1000 degrees Fahr. With these steam pressures, for power generation we can take 29 inches vacuum as the practical limit for the condensing equipment. The accompanying table gives the B.t.u. delivered by the boiler, the B.t.u. available for effective work, and the steam con-

sumption per brake horsepower of a turbine of between 2000 and 3000 horsepower for each set of conditions, respectively.

For this practical comparison we have assumed that the method of utilizing the heat of the fuel and of transforming it into steam is at the same degree of efficiency for all steam conditions, and it will easily be seen how little extra fuel will be required to make available steam at elevated pressures and temperatures, with the resultant reduction of steam and fuel used for power generation.

As a matter of fact, the improved efficiency of modern steam generators as compared with older boiler plants, makes possible still further fuel savings; that is, by using air heaters, economizers, more efficient boiler heat absorbing surface, better insulated furnaces and improved combustion, a greater percentage of the heat originally in the coal is delivered in the form of steam, so that where 75 per cent boiler efficiency was formerly considered good, designers are now aiming at better than 90 per cent.

Analysis of Costs

It is true that the installation of high-pressure and high-temperature boilers and turbines may be slightly more expensive when first cost is considered, but this additional expense is more than justified when the final cost of power and heat is analyzed. It is today possible to buy high pressure steam generators for steam deliveries as low as 3000 or 4000 pounds per hour, and with practically no upper limit for capacity. To utilize this development in steam generators, we have available for power generation steam turbines of practically any size that may be needed and adaptable for any purpose. By using modern developments in herringbone and worm gears, small turbines can be applied to driving auxiliaries of all kinds, and efficient electric generating units

Effects of Varying Steam Pressures on Turbines

Steam pressure, lbs. per sq. in. gage.....	250	400	600	1200
Temperature at turbine inlet, deg. F.	505	675	750	850
Vacuum, ins. Hg. at turbine exhaust	28	29	29	29
B.t.u. per lb. available at turbine inlet.....	1264.0	1347.5	1379.5	1414.5
B.t.u. per lb. available for power generation considering inlet and outlet conditions.....	100.0	106.6	109.0	111.8
Theoretical steam consumption, lbs. per b.h.p.....	377.5	474.0	515.0	572.5
Estimated lbs. per b.h.p. at turbine coupling.....	6.75	5.37	4.95	4.45
Comparison in percentage	9.64	7.27	6.69	6.10
Actual steam consumption, lbs. per kw. with 95 per cent generator efficiency	100.0	75.2	69.4	63.3
	13.58	10.25	9.43	8.60

can be designed to suit the pressure and temperature conditions available.

The manufacturing industries where heat and steam are used in process work can, with this modern means at their disposal, make remarkable reductions in heat and power costs. The power unit is designed to give the power required for the plant and, at the same time, to act as a reducing valve and distributor of the heat supplied by the steam generator at the pressures and temperatures required by the processes. The results of these combinations are most startling, and in some manufacturing plants today where heat and steam form the essential need of the manufacturing processes, power is a by-product available at practically no cost, steam for heat at different temperatures being obtained without the use of wasteful reducing valves.

British Steel Institute Announces Meeting Papers

British Iron and Steel institute has announced the program for its autumn meeting to be held in Dusseldorf, Germany, Sept. 21-26, by invitation of the Verein Deutscher Eisenhüttenleute acting on behalf of the German iron and steel industry.

Two sessions will be conducted,

both in the Eisenhüttenhaus. The second session will be a joint meeting with the Verein Deutscher Eisenhüttenleute.

To provide further opportunity for discussion of papers presented at the Dusseldorf meeting, the institute has announced additional sessions to be held at the Institution of Civil Engineers, London, Oct. 29-30. A session on the afternoon of Oct. 30 will be conducted jointly with the Institute of British Foundrymen.

Papers scheduled for presentation at the Dusseldorf and London meetings are as follows:

"Fourth Report of the Corrosion Committee," by a joint committee of the Iron and Steel Institute and British Iron and Steel Federation.

"First Report of the Alloy Steels Research Committee," by a joint committee of the Iron and Steel Institute and British Iron and Steel Federation.

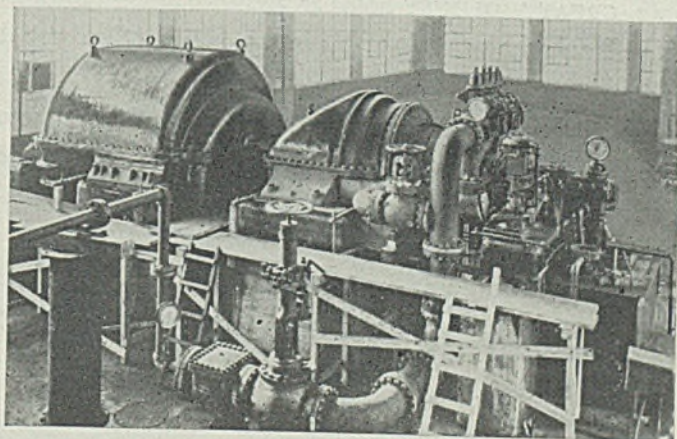
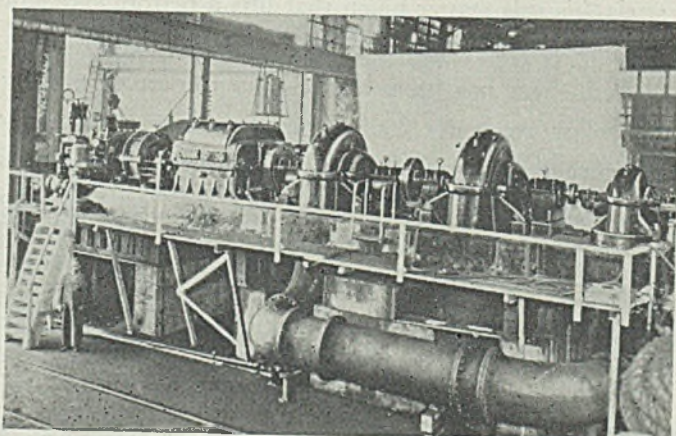
"Second Report of the Steel Castings Research Committee," by a joint committee of the Iron and Steel Institute and British Iron and Steel Federation.

"Technical Developments in German Iron and Steel Production During the Last 15 Years," by E. H. Friedrich, president, Verein Deutscher Eisenhüttenleute.

"Practical Importance of the Damping Capacity of Metals, Especially Steels," by O. Foppl.

"Present-Day Problems of the Rolling Mill Industry," by A. Noll.

"Determination of Gases in Steel by the Hot Extraction Method," by G.



Left, compound steam turbine driving centrifugal pumps under test at De Laval works. Capacity of this unit is 60,000,000 gallons per day against a 360-foot head. Right, a steam turbine-driven blast furnace blower under test at the works. The capacity is 115,000 cubic feet of free air per minute against a pressure of 30 pounds per square inch



More than perfection of detail

A GREAT VIOLINIST holds an audience rapt—oblivious to all save the marvels of his interpretation of a classical masterpiece.

Another musician playing the same notes on the same instrument with a technique equally flawless leaves the audience cold. The difference lies in that intangible something that constitutes mastery of any art.

Equally in leading an orchestra, in directing a motion picture, in drawing a cartoon, in making superfine alloy

steels, it's this master touch that lifts a performance out of the every-day category.

Bethlehem has been building up the art of making fine alloy steels for half a century—longer than any other company in America. In Bethlehem Alloy Steels you will find an added degree of perfection superimposed on the aggregate of the properties specified that reflects the guidance of masters of the steel-making art.

**Alloy
Steels**



BETHLEHEM STEEL COMPANY

Thanheiser.

- "Firing of Open-Hearth Furnaces in German Steelworks," by F. Wescmann.
- "Influence of Vanadium on Nickel-Chromium and Nickel-Chromium-Molybdenum Steels," by H. H. Abram.
- "Investigations Into the Influence of Coke Quality on Blast Furnace Operations," by W. J. Brooke, H. R. B. Walshaw and A. W. Lee.
- "Determination of Nonmetallic Inclusions in Steel and Iron," by E. W. Colbeck, S. W. Craven and W. Murray.
- "Constitution of Blast Furnace Slags in Relation to the Manufacture of Pig Iron," by T. P. Colclough.
- "Reduction of Iron Ores with Solid Carbon," by A. E. Dobner and S. Skramovskiy.
- "Tantalum-Iron Alloys and Tantalum Steels," by R. Genders and R. Harrison.
- "Effect of Nonmetallic Inclusions on the Graphite Size of Gray Cast Iron," by A. L. Norbury and E. Morgan.
- "Morphology of Inclusions in Siderurgical Products. Part III—Chromium Alloys and Chromium Steels," by A. M. Portevin and R. Castro.
- "The Roll Problem in Backed-Up Mills for Cold Reduction," by G. A. V. Russell and S. S. Smith.
- "Controlled Grain Size in Steel," by T. Swinden and G. R. Bolsover.

Corrosion-Resisting Metals Keynote of Symposium

Symposium on corrosion resistant metals in design of machinery and equipment will be a part of the American Society of Mechanical Engineers' annual meeting in New York, Nov. 30 to Dec. 4. The information presented is to be in compact form, of a practical nature, free from lengthy theoretical discussions but still sufficiently complete that when the different papers are assembled they will form

a handy reference for the engineer on the subject of corrosion resistant metals.

Several of the professional divisions of the Society joined in developing the symposium, making it a feature of the meeting where it has been allotted the entire day of Thursday, Dec. 3 with three sessions in the morning, afternoon and evening. T. H. Wickenden, past chairman of the Society's iron and steel division, is chairman of the committee arranging the symposium.

Papers to be presented are as follows:

- "Introduction to Corrosion Resisting Metals," by Dr. F. N. Speller, National Tube Co., Pittsburgh.
- "Alloys of Aluminum," by E. H. Dix Jr., Aluminum Co. of America, New Kensington, Pa.
- "Nickel and Nickel-base Alloys," by F. L. LaQue, International Nickel Co. Inc., New York.
- "Zinc in the Chemical Industries," by E. A. Anderson, New Jersey Zinc Co., Palmerton, Pa.
- "Lead," by G. O. Hiers, National Lead Co., Brooklyn, N. Y.
- "Cast Iron in Chemical Equipment," by Dr. H. L. Maxwell, E. I. du Pont de Nemours & Co. Inc., Wilmington, Del.
- "Copper and Copper-Base Alloys," by R. A. Wilkins, Revere Copper & Brass Inc., Rome, N. Y.
- "Corrosion Resistant Steel (Stainless Type)," by J. H. Critchett, Union Carbide & Carbon Research Laboratories Inc., New York.

New Copper Alloy Resists Corrosion in Water Tanks

With the development of Arcoloy, a new copper alloy used for the manufacture of range boilers and storage tanks, American Radiator Co., New York, announces the completion of the all-copper domestic hot water supply system. This development follows the introduction

by this company within the past two years of a complete line of copper fittings for heating installation and it makes possible the use of a copper storage tank in radiator conditioning installations that include a domestic hot water supply.

Copper content of the new metal is 95 per cent, silicon, phosphorus and other elements being added to make the alloy which develops a corrosion-resisting skin when contacted by acids or alkalis. Volatile acids and alkalis had little effect on the metal in laboratory tests, according to the company. Tensile strength of the new metal averages from 55,000 to 65,000 pounds per square inch, it is claimed.

Practical Work in Air Conditioning Installation

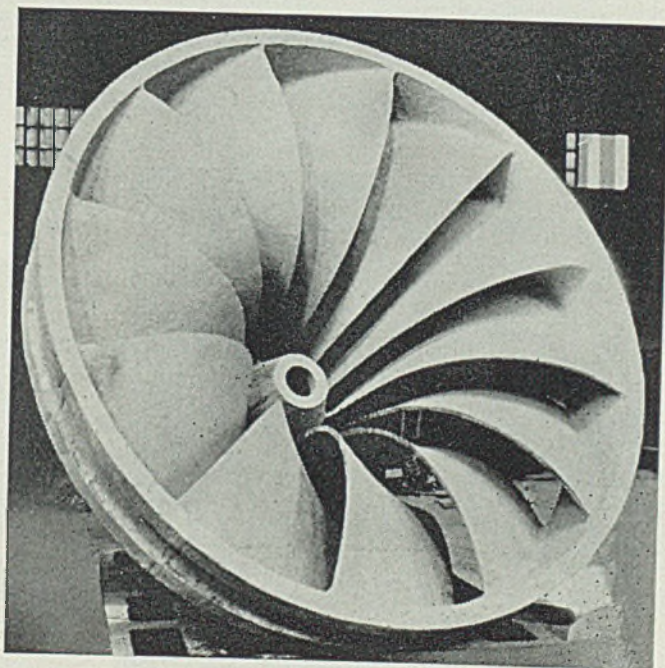
Air Conditioning, by Thomas J. Brett; cloth, 226 pages, 5½ x 8¼ inches; published by American Technical Society, Chicago; supplied by STEEL, Cleveland, for \$2.50, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

This is a practical text on the requirements, design, construction, installation and operation of air ducts for distribution of air for air-conditioning systems installed in various types of buildings and railway cars.

Chapters are devoted to duct requirements for air-conditioning systems, calculations for duct design and construction, inlet and exit duct openings, air recirculation, installation of ducts, material and construction, insulation, and operation of ducts, air distribution, formulas, air ducts for typical buildings and air ducts for transportation service for railroads.

Eight Tons of Cast Steel To Make Power

DESIGNED for a hydroelectric power plant, this cast steel runner weighs 8 tons and is rated to develop 3800 horsepower at a speed of 164 revolutions per minute under a head of 32.5 feet. The runner was cast by the Allegheny Steel Co., Brackenridge, Pa., and machined in the shops of James Leffel & Co., Springfield, O. It is to be used in the Lynchburg, Va., plant of the Appalachian Power Co., New York. Known as the Francis design, the turbine unit has an overall diameter at the bottom of 106 inches and a height from top to bottom of 62 inches



NEW EQUIPMENT

Roller Bearings—

Fafnir Bearing Co., New Britain, Conn., announces a complete series of industrial heavy-duty roller bearings made in an extended range of nearly 100 sizes. Rated capacity of these bearings ranges from 10,000 to 500,000 pounds. In the widened range of bearing sizes, rollers of $\frac{3}{8}$, $1\frac{1}{4}$ and $1\frac{1}{2}$ inches have been utilized in addition to the $1\frac{1}{16}$ -inch diameter used in the bearings previously available. A feature of these roller bearings is the large number of solid rolls which are incorporated, in the cage assembly making for increased load capacity. The cage is fabricated from specially form-rolled spacer bar stock with carburized and hardened end rings. The spacer bars of the cage are riveted to the end ring and accurate assembly keeps the rolls permanently aligned. All parts of the bearings are precision ground and held to close tolerances.

Plier and Screw Driver—

Bonney Forge & Tool Works, Allentown, Pa., has added two new tools to its line. The first, a flashlight screw driver known as No. OF5, has a transparent amber colored plastic handle containing two batteries and a bulb. The blade is $\frac{3}{16}$ inch in diameter and has a $\frac{3}{16}$ -inch tip which is machine ground and magnetized. The blade is 5 inches long and the overall length is $10\frac{1}{2}$ inches. The second tool, a plier, is designed for removing lock ring washers by spreading the snap lock ring and horseshoe type of brake key when removing from brakes, transmissions, differentials,

pedal, clutch and fan pulley shaft assemblies. The plier is drop forged of chrome alloy steel, chrome plated. Outside of the jaws is toothed to prevent any possibility of slipping when removing washers. It is designed to spread any lock washer up to $1\frac{1}{4}$ inches in diameter.

Out-of-Step Relay—

General Electric Co., Schenectady, N. Y., has perfected a new relay to prevent continued operation of synchronous machines out of synchronism with their connected system, or to function to separate large interconnected systems at a specific location in the event of an out-of-step or unstable condition between the sources of power on both sides of this location. The out-of-step relay consists of an instantaneous over-current unit, a single-phase power-directional unit, an auxiliary unit to increase the operating speed, a notching device and a time-delay element for resetting the notching device. All these are mounted in a standard $5\frac{1}{2}$ x 16-inch universal case. A capacitor and resistor for the notching unit are mounted externally.

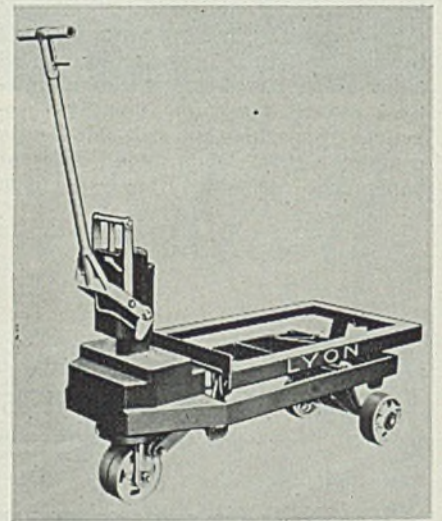
Arc Welder—

Lincoln Electric Co., Cleveland, announces a new line of arc welders to be available Oct. 1. The new models will be known as the Shield-Arc SAE and will supersede the present type of shielded arc welders built by this company which have been on the mar-

ket the past six years. Most important new feature of these machines is a new method of arc control which makes possible adjustment of both arc heat and arc penetration in a continuous sequence of fine increments. The new welders permit the use of either high or low voltage with a wide range of current control. The new machines also have independent excitation, laminated magnetic circuit, all purpose meter, polarity reversing switch and no voltage motor protection. The base and portable parts have been redesigned for a more streamlined effect and a shorter wheelbase. Welders in this series are available in 200, 300, 400 and 600-ampere models driven by an alternating current motor; in 300, 400 and 600-ampere models direct current driven; 200, 300, 400 and 600-ampere models for belt or couple service and 200, 300 and 400-ampere models engine driven.

Hydraulic Lift Truck—

Lyon Iron Works, Greene, N. Y., has added to its line a new model



Lyon hydraulic lift truck which has a total elevation of 10 inches



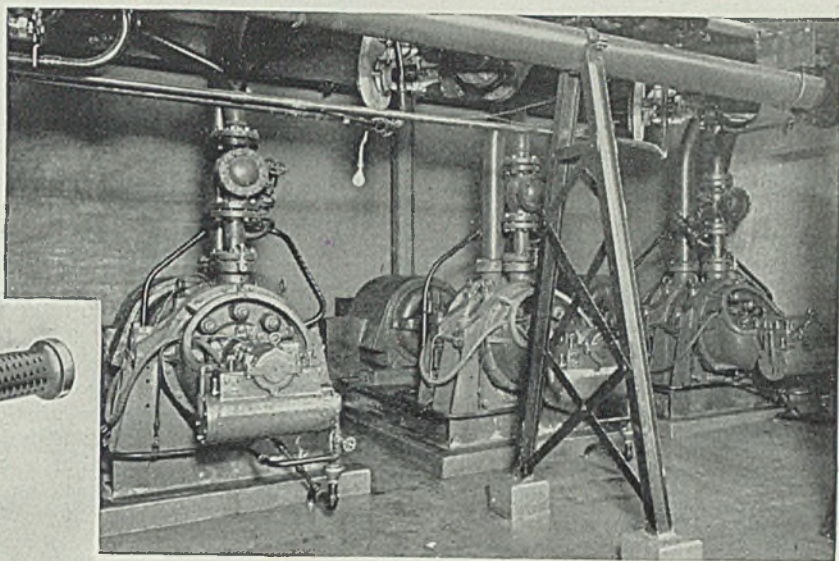
Lincoln SAE shielded arc welder with wide range arc control

hydraulic lift truck having a total elevation of 10 inches, the final four inches being obtained by elevating an auxiliary or top frame through a lever arrangement. The head containing the hydraulic mechanism is the same type as used on the company's standard hydraulic lift truck with 3-inch elevation. The general construction, with the exception of

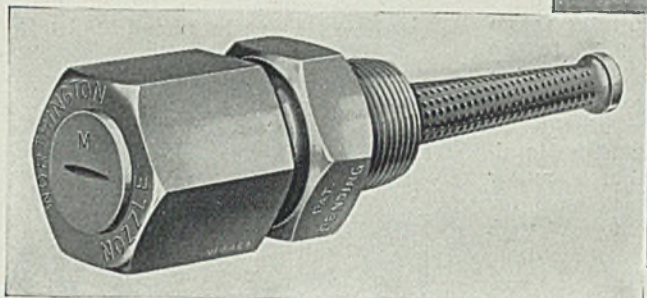
Descaling Systems

COMPLETELY WORTHINGTON EQUIPPED

for
any type
of mill

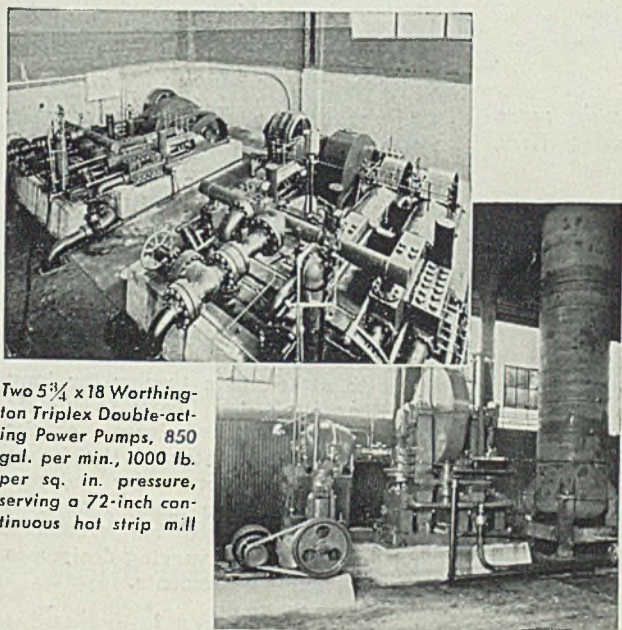


Three of the four Worthington Four-stage Centrifugal Pumps on descaling service at Great Lakes Steel Corporation, Detroit

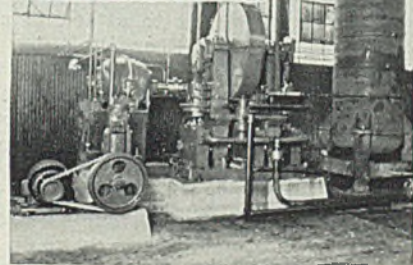


Worthington Standard Spray Nozzle . . . with several exclusive features

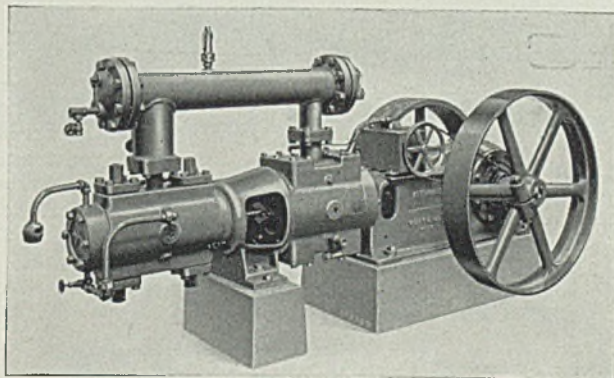
COMPLETE Worthington Descaling Systems assure uninterrupted operation. Worthington equipment includes a wide range of centrifugal and reciprocating pump units . . . air compressors of every type . . . to meet the exact requirements of any mill.



Two 5 1/4 x 18 Worthington Triplex Double-acting Power Pumps, 850 gal. per min., 1000 lb. per sq. in. pressure, serving a 72-inch continuous hot strip mill



A 4 1/2 x 12 Worthington Single-acting Power Pump, 150 gal. per min., 1000 lb. per sq. in. pressure, in descaling service



Worthington Single-tandem Two-stage Compressor for charging hydro-pneumatic accumulator

ONE MAKER... UNDIVIDED RESPONSIBILITY
WORTHINGTON PUMP AND MACHINERY CORPORATION

General Offices: HARRISON, NEW JERSEY - Branch Offices and Representatives in Principal Cities throughout the World

WORTHINGTON

ATLANTA
BOSTON
BUFFALO
CHICAGO
CINCINNATI
CLEVELAND
DALLAS
DENVER
DETROIT
EL PASO
HOUSTON
KANSAS CITY



LOS ANGELES
NEW ORLEANS
NEW YORK
PHILADELPHIA
PITTSBURGH
ST. LOUIS
ST. PAUL
SAN FRANCISCO
SEATTLE
TULSA
WASHINGTON

A-3666

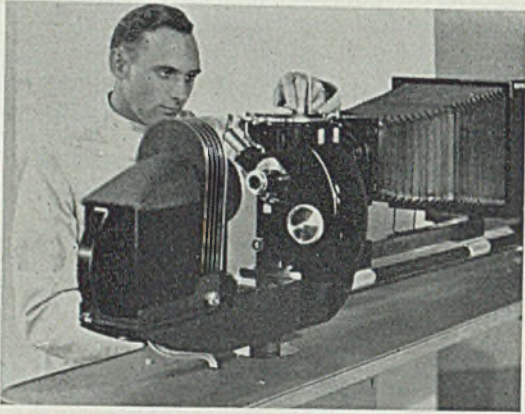
the auxiliary platform, followed the line of the standard truck. The frame is electric arc welded, front wheels are Timken equipped and rear Hyatt, while ball thrust bearings are in the steering mechanism.

Adjustable Wrenches—

J. H. Williams & Co., 75 Spring street, New York, announces two new lines of adjustable wrenches embodying new design features. Square shoulders on the movable jaw shank are said to overcome the wedging and spreading action common to the conventional cylindrical bearing. The design permits a thicker web without thickening the head. The wrenches are drop forged from special carbon steel, or chrome alloy steel. Both lines are available in sizes of 4, 6, 8, 10 and 12 inches.

Auxiliary Truck Frame—

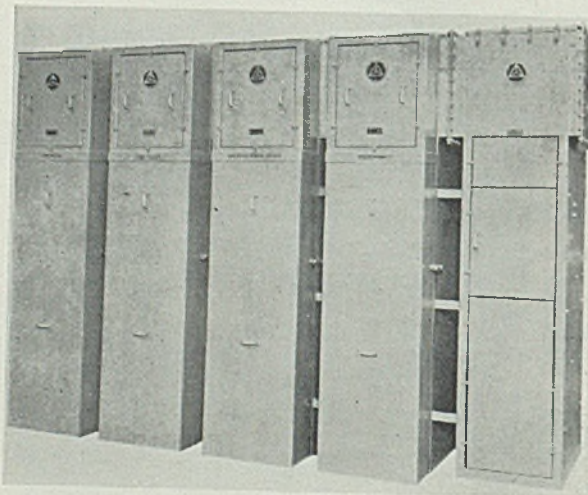
Barrett-Cravens Co., 3255 West Thirtieth street, Chicago, announces



Metallographic outfit manufactured by Bausch & Lomb

a new auxiliary frame for hand lift trucks for use in handling skids of varying clearance. The frame, when mounted on a truck 6 inches high in lowered position can handle skids with an underneath clearance of 6 1/2, 7 1/2, 9 1/2 and 10 1/2 inches. On a 7-inch truck it will handle skids with

underneath clearances up to 12 inches. Operation is by means of an auxiliary handle which raises the auxiliary frame to the height of the skid, a ratchet holding the frame in place. Lifting is then accomplished in the conventional manner. A slight kick on the release bar releases the auxiliary frame. This feature may be installed on all Barrett lift trucks.

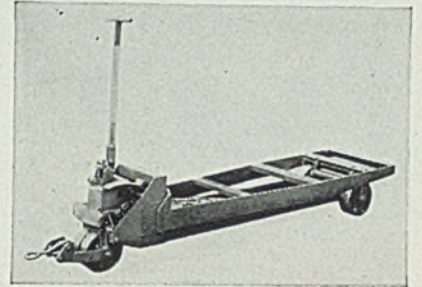


Delta-Star metal clad switchgear for industrial service

microscope; a new stand with adjustable shock absorbers; a large cabinet for accessories and an adjustable cushioned stool. The circular stage is of the revolving type, 6 inches in diameter. A new type vertical illuminator serves for both bright field work and polarized light operations. The dark field illuminator is a glass cube with central stop mounted in a rotating turret with the vertical illuminator prism. A complete battery of six objectives and ten eyepieces is offered to give a full range of standard magnifications required for metallographic work.

Heavy-Duty Hand Lift Truck—

Yale & Towne Mfg. Co., Philadelphia, announces a heavy-duty hand lift truck

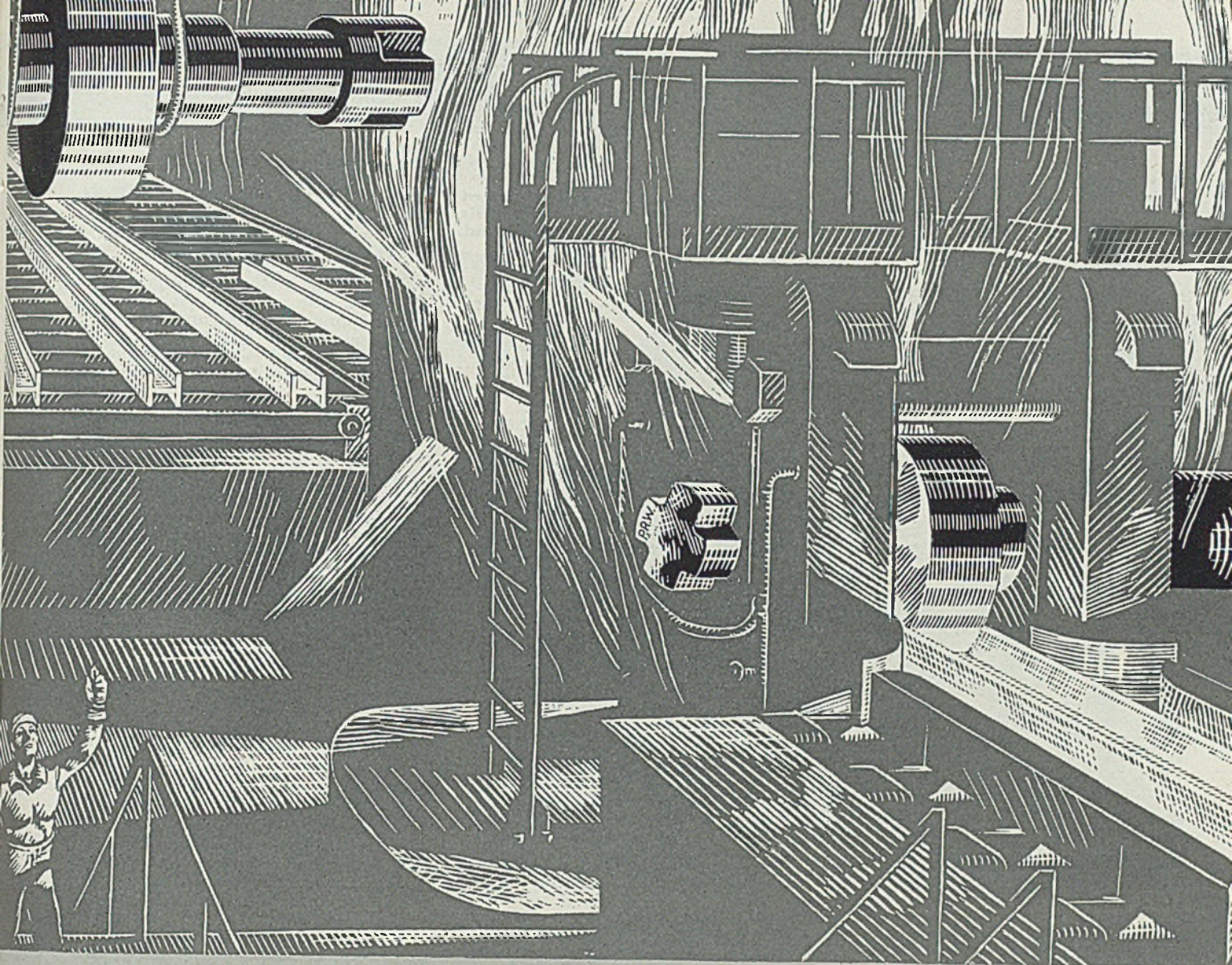


Yale heavy-duty hand lift truck equipped with a coupler for attaching to tractor for handling heavy loads

for handling loads ranging from 5 to 16 tons. A multi-stroke lifting head with chain lift is used to raise the load. Steel wheels with 6-inch face are provided to distribute the weight and eliminate cracking of floors under the heavy loads. Large sealed ball bearings are provided. A coupler is built on the front to attach to a tractor for long hauls or loads too heavy to handle easily. Hydraulic release checks mounted in the center of the frame drop the load without a jar and prevent damage to the load. Frame is built from reinforced bar members, and is furnished in varying designs to suit different requirements.

Switchgear—

Delta-Star Electric Co., Chicago, announces a 7.5-kilovolt metalclad switch-gear for industrial service. The installation, operated from a distant point, has in each of its four units a three-pole, 800-ampere solenoid operated oil circuit breaker with its current transformers, relays and plug disconnectors with their interlocks. The main bus is in the top compartment. The fifth unit houses three potential transformers and a three-pole group operated disconnecting switch interlocked with the door. The fuses, mounted on the switch frame, are equipped with limiting resistors.



PHOENIX ROLLS IN SERVICE

Many years of yesterdays have gone into research to make Phoenix Rolls what they are today—tough, strong and long enduring in service

—designed to reduce your roll problems to the irreducible minimum. It is to your advantage to specify PHOENIX Rolls.

PHOENIX ROLLS

PHOENIX STEEL, for unusual strength; PHOENIX "A" (steel alloy), for strength and wear; PHOENIX METAL—PHOENIX "K", for strength, wear and finish; PHOENIXLOY (uniformly hard), for flat rolling where high finish of extremely thin gauge of material is required to be free from all marks or defects. PHOENIX CHILL; PHOENIX NICKEL CHILL; for all flat rolling requiring finish. Also tube mill rolls of quality material best suited to the kind of service required.

PITTSBURGH ROLLS CORPORATION

PITTSBURGH, PA.



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.

Operator's Instruction Book—Landis Machine Co., Waynesboro, Pa. Booklet giving detailed data covering Landis style LT collapsible taps for straight threads, and style LM receding chaser collapsible taps for

tapered threads, including instructions regarding correct grinding of the chasers.

Bakelite Molding Materials—Bakelite Corp., 247 Park avenue, New York. Booklet dealing with the sub-

ject of bakelite molding materials and their uses, with a brief description of the molding process and needed equipment. Other bakelite products are described in separate booklets, copies of which may be obtained upon request.

Enameling Clay—Ferro Enamel Corp., Cleveland. Folder describing pure dry blend clay and pure dry vallender clay.

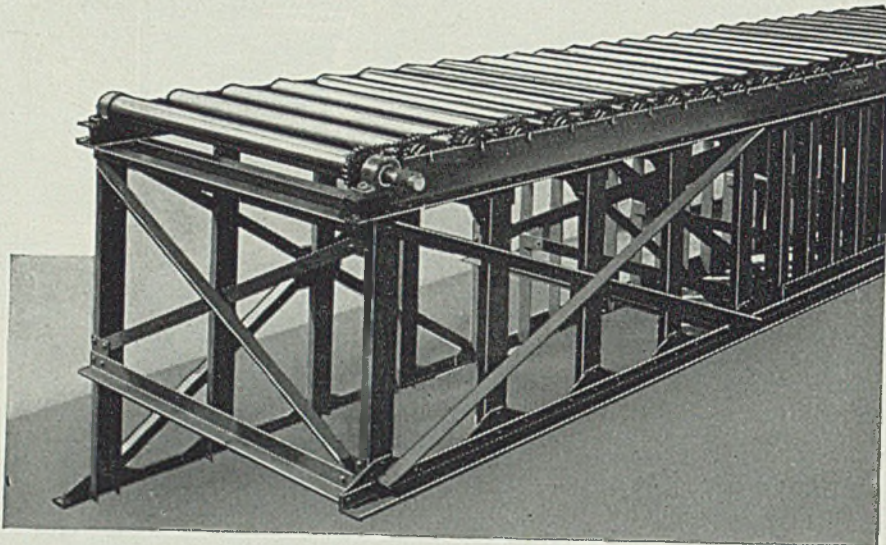
Buckets—Wellman Engineering Co., 7015 Central avenue, Cleveland. Bulletin No. P3-49, covering Williams "Champion" bucket. No. R3-50, describing the cleanup-rehandler. No. P3-51, describing the hook-on single line bucket. No. P3-57, describing multiple-rope buckets.

Thread Grinding Machine—Jones & Lamson Machine Co., Springfield, Vermont. Catalog No. 3M, describing the automatic thread grinding machine. Grinds right and left-hand threads, up to and including 8 inches in diameter and maximum thread length of 9 inches.

Presses—Clearing Machine Corp., 6499 West Sixty-fifth street, Chicago. Bulletin No. 201, presenting a line of triple clearing crankless steel power presses, in standard types, sizes and capacities of large straight side presses. Bulletin No. 202, covering clearing crankless single action power presses, in one, two and four-point suspension types, depending upon size of work.

Illuminating Handbook—Westinghouse Lamp Co., Bloomfield, N. J. Handbook No. A-6545 O, revised edition, elaborating on specialized fields of lighting. Among the new sections are one on sign lighting, street and highway practice and underwater lighting, and discussion of high intensity mercury vapor lamps, used either alone or in combination with tungsten filament lamps. Every section carries its table of footcandle requirements. Other tables carry information on types of reflectors, mounting heights for each, and spacing necessary to distribution of light.

Vibrating Screen—Link-Belt Co., 307 North Michigan avenue, Chicago. Catalog No. 1562, clearance diagrams and dimension tables, on the company's two types of vibrating screens "UP" and "PD" for accurately screening coal, clay, coke, sand, gravel, crushed stone, fertilizer, lime, ore, grain, sugar, chemicals, etc. The "UP" is offered for handling free-screening materials at moderate capacities, for work requiring high speed vibration, and close sizing problems requiring comparatively small screen openings. The "PD" is recommended for the larger screen openings and heavier capacities.

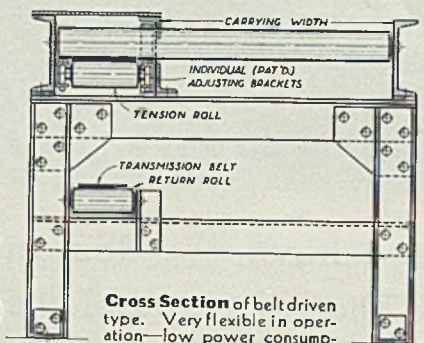


Live Roll Conveyor with "progressive chain" type of drive. Sprockets welded to circumference of rolls, anti-friction bearings.

LIVE ROLL CONVEYORS

● Logan Live Roll Conveyors—for sheets, plates, bars, billets, etc.—are simplifying handling problems and lowering costs in a wide range of steel mill applications. Typical examples are the handling of sheets on Shearing Lines and Scrubber Lines. First cost is reasonable—operating expense nominal.

Bulletin No. 10 gives interesting engineering data on several types of Live Roll units as well as gravity and power conveyors of other kinds. If you haven't your copy, write on your letterhead to Logan Co., 535 Buchanan St., Louisville, Ky. Representatives in principal cities.



Cross Section of belt driven type. Very flexible in operation—low power consumption.

Logan Conveyors
LOUISVILLE

Demand Holds High Rate; Wire Products Cut

Heavy Tonnages Pending

In Marine Work; Scrap

Continues Upward March

FAR from experiencing a summer lull the steel industry shows statistically a forward movement from July to August. More steel is being produced and more finished steel shipped. Steel ingot production in August was 7 per cent higher than in July, a gain of 272,399 tons to the highest level since March, 1930. In eight months of this year total production of ingots is only 4,000,000 tons less than in all of 1935.

Shipment of finished steel by the United States Steel Corp. in August was at the rate of 35,527 tons daily and in July 35,216 tons, indicating acceleration of output and needs of consumers. With one day less work August showed a slight decline in total shipments.

Because of the Labor Day holiday in some producing centers and incidence of considerable repair work on furnaces at Youngstown the national steel operating rate for the week is down two points to 69½ per cent. A rebound next week is indicated, which may carry the rate higher than during August.

Operations in the Buffalo district were up 6 points to 81 per cent; and in the Pittsburgh district 2 points to 72 per cent. Cleveland was down 2½ to 79½ per cent; eastern Pennsylvania 1 to 47½; Youngstown 12 to 67; New England 10 to 70 and Cincinnati 4 to 76. Others were unchanged.

Following announcement of fourth-quarter prices a week ago by the leading interest on a number of items independent producers are sending out announcements to the same effect. Additionally, cold-rolled strip, alloy steel and ferromanganese prices have been reaffirmed. Cold-drawn bars and reinforcing bars remain to be announced for fourth quarter. Seamless tube rounds are automatically increased \$2 per ton by the bar advance, as these are sold on the bar card. Considerable opinion exists to the effect that reinforcing bars will be advanced, following carbon bars.

Adjustment of prices on wire products has been made by a cut of \$4 per ton on nails and several other items. This has been done without announcement and is for September only, with limit of delivery Oct. 15. No price for fourth quarter has been announced.

Award of structural shapes last week at over

MARKET IN TABLOID

DEMAND . . . Mills unable to meet delivery requirements.

PRICES Further changes expected for fourth quarter.

PRODUCTION . . . National rate down 2 points to 69½.

SHIPMENTS . . . Strong.

19,000 tons, was nearly double the 11,129 tons reported the preceding week. In reinforcing bars lettings were almost the same total, 3827 tons for last week and 3935 for the preceding period.

Several unusual tonnages of steel have been placed in the past week or are pending, offering substantial support to production. Contract has been let for the assembly plant of General Motors at Linden, N. J., 6550 tons, and for a subway section 5040 tons is pending. Chicago fabricators estimate close to 90,000 tons of structural work is being figured in that area. Bids have been taken again on the United States liner for which 15,000 tons of hull steel will be required. Several builders submitted bids this time. Taking of bids on a government dry dock for Honolulu, T. H., 40,000 tons of steel, has been deferred from Sept. 30 to Nov. 22.

Railroad buying is restricted, with promise of large orders later. Seaboard Air Line has placed 10,000 tons of rails and a large tonnage of accessories with Tennessee Coal, Iron & Railroad Co. Ten locomotives have been awarded and one road will rebuild 300 box cars in its own shops, requiring a fair tonnage of steel. An inquiry is out for 150 all-steel automobile cars. Steel specifications from carbuilders to mills are heavy for cars already under contract.

Automotive assemblies declined 4878 for the week, to 26,750.

On an advance of 50 cents per ton on heavy melting steel at Chicago STEEL's scrap composite has advanced 8 cents to \$15.87, the eleventh consecutive week of advance. The finished steel composite dropped 40 cents to \$53, on the September reduction of \$4 per ton on wire nails. The iron and steel composite remains unchanged at \$34.10.

COMPOSITE MARKET AVERAGES

	Sept. 12	Sept. 5	Aug. 29	One Month Ago Aug., 1936	Three Months Ago June, 1936	One Year Ago Sept., 1935	Five Years Ago Sept., 1931
Iron and Steel	\$34.10	\$34.10	\$34.03	\$33.88	\$32.79	\$32.82	\$30.61
Finished Steel	53.00	53.40	53.40	53.40	52.20	53.70	48.72
Steelworks Scrap....	15.87	15.79	15.41	14.66	12.55	12.65	8.82

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

	Sept. 12, 1936	Aug., 1936	June, 1936	Sept., 1935		Sept. 12, 1936	Aug., 1936	June, 1936	Sept., 1935
Finished Material					Pig Iron				
Steel bars, Pittsburgh	1.95c	1.95c	1.85c	1.85c	Bessemer, del. Pittsburgh	\$20.8132	20.8132	20.8132	19.81
Steel bars, Chicago	2.00	2.00	1.90	1.85	Basic, Valley	19.00	19.00	19.00	18.00
Steel bars, Philadelphia	2.26	2.26	2.16	2.11	Basic, eastern del. East. Pa.	20.8132	20.8132	20.8132	19.81
Iron bars, Terre Haute, Ind.	1.85	1.85	1.75	1.75	No. 2 fdy., del. Pittsburgh	20.3132	20.3132	20.3132	19.31
Shapes, Pittsburgh	1.90	1.90	1.80	1.80	No. 2 fdy., Chicago	19.50	19.50	19.50	18.50
Shapes, Philadelphia	2.11½	2.11½	2.01½	2.01½	Southern No. 2, Birmingham	15.50	15.50	15.50	14.50
Shapes, Chicago	1.95	1.95	1.85	1.85	Southern No. 2, del. Cincinnati...	19.44	19.44	20.2007	19.38
Tank plates, Pittsburgh	1.90	1.90	1.80	1.80	No. 1 2X eastern, del. Phila.	21.6882	21.6882	21.6882	20.68
Tank plates, Philadelphia	2.09	2.09	1.99	1.99	Malleable, Valley	19.50	19.50	19.50	18.50
Tank plates, Chicago	1.95	1.95	1.85	1.85	Malleable, Chicago	19.50	19.50	19.50	18.50
Sheets, No. 10, hot rolled, Pitts.	1.95	1.95	1.85	1.85	Lake Sup., charcoal, del. Chicago	25.2528	25.2528	25.2528	24.25
Sheets, No. 24, hot ann., Pitts.	2.50	2.50	2.40	2.40	Ferromanganese, del. Pitts.	80.13	80.13	80.13	90.13
Sheets, No. 24, galv., Pitts.	3.20	3.20	3.10	3.10	Gray forge, del. Pittsburgh	19.6741	19.6741	19.6741	18.67
Sheets, No. 10, hot rolled, Gary.	2.05	2.05	1.95	1.95	Scrap				
Sheets, No. 24, hot anneal., Gary.	2.60	2.60	2.50	2.50	Heavy melting steel, Pittsburgh..	\$17.25	16.00	13.80	13.45
Sheets, No. 24, galvan., Gary.	3.30	3.30	3.20	3.20	Heavy melt. steel, No. 2, east. Pa.	13.75	12.80	10.81	11.25
Plain wire, Pittsburgh	2.40	2.40	2.40	2.30	Heavy melting steel, Chicago	16.25	15.45	12.75	12.55
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.25	Rail for rolling, Chicago	16.75	16.40	14.00	13.90
Wire nails, Pittsburgh	1.90	2.10	2.10	2.40	Railroad steel specialties, Chicago	17.25	16.65	14.40	13.75
Semifinished Material					Coke				
Sheet bars, open-hearth, Youngs.	\$30.00	30.00	28.00	28.00	Connellsville, furnace, ovens.	\$3.75	3.45	3.50	3.25
Sheet bars, open-hearth, Pitts.	30.00	30.00	28.00	28.00	Connellsville, foundry, ovens.	4.25	4.25	4.25	4.00
Billets, open-hearth, Pittsburgh.	30.00	30.00	28.00	27.00	Chicago, by-product foundry, del.	9.75	9.75	9.75	9.25
Wire rods, Pittsburgh	38.00	38.00	38.80	38.00					

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.

Sheet Steel		Tin Mill Black No. 28		Corrosion and Heat-Resistant Alloys		Structural Shapes	
Prices Subject to Quantity Extras and Deductions (Except Galvanized)		Pittsburgh	2.75c	Pittsburgh base, cents per lb.		Pittsburgh	1.90c
Hot Rolled No. 10, 24-48 in.		Gary	2.85c	Chrome-Nickel		Philadelphia, del.	2.11½c
Pittsburgh	1.95c	St. Louis, delivered	3.08c	No. 302 No. 304		New York, del.	2.16½c
Gary	2.05c	Cold Rolled No. 10		Bars	23.00 24.00	Boston, delivered....	2.30½c
Chicago, delivered..	2.08c	Pittsburgh	2.60c	Plates	26.00 28.00	Bethlehem	2.00c
Detroit, del.	2.15c	Gary	2.70c	Sheets	33.00 35.00	Chicago	1.95c
New York, del.	2.30c	Detroit, delivered....	2.80c	Hot strip	20.75 22.75	Cleveland, del.	2.10c
Philadelphia, del.	2.26c	Philadelphia, del.	2.91c	Cold strip	27.00 29.00	Buffalo	2.00c
Birmingham	2.10c	New York, del.	2.95c	Straight Chromes		Gulf Ports	2.30c
St. Louis, del.	2.28c	Pacific ports, f.o.b. cars, dock	3.20c	No. 410	No. 430	Birmingham	2.05c
Pacific ports, f.o.b. cars, dock	2.50c	Cold Rolled No. 20		No. 442	No. 446	Pacific ports, f.o.b. cars, dock	2.45c
Hot Rolled Annealed No. 24		Pittsburgh	3.05c	Bars	17.00 18.50 21.00 26.00	Bars	
Pittsburgh	2.50c	Gary	3.15c	Plates	20.00 21.50 24.00 29.00	Soft Steel	
Gary	2.60c	Detroit, delivered....	3.25c	Sheets	25.00 28.00 31.00 35.00	(Base, 3 to 25 tons)	
Chicago, delivered....	2.63c	Philadelphia, del.	3.36c	Hot strip	15.75 16.75 21.75 26.75	Pittsburgh	1.95c
Detroit, delivered....	2.70c	New York, del.	3.40c	Cold stp.	20.50 22.00 27.00 35.00	Chicago or Gary....	2.00c
New York, del.	2.85c	Enameling Sheets					
Philadelphia, del.	2.81c	Pittsburgh, No. 10..	2.45c	Steel Plate			
Birmingham	2.65c	Pittsburgh, No. 20..	3.05c	Pittsburgh	1.90c		
St. Louis, del.	2.82c	Gary, No. 10	2.55c	New York, del.	2.19c		
Pacific ports, f.o.b. cars, dock	3.15c	Gary, No. 20	3.15c	Philadelphia, del.	2.09c		
Galvanized No. 24				Boston, delivered....	2.32c		
Pittsburgh	3.20c	Tin and Terne Plate		Buffalo, delivered....	2.15c		
Gary	3.30c	Gary base, 10 cents higher.		Chicago or Gary	1.95c		
Chicago, delivered..	3.33c	Tin plate, coke base (box) Pittsburgh		Cleveland, del.	2.09½c		
Philadelphia, del.	3.51c	Do., waste-waste..		Birmingham	2.05c		
New York, del.	3.55c	Do., strips		Coatesville, base	2.00c		
Birmingham	3.35c	Long ternes, No. 24 unassorted, Pitts.		Sparrows Pt., base	2.00c		
St. Louis, del.	2.83c	Do., Garv		Pacific ports, f.o.b. cars, dock	2.45c		
Pacific ports, f.o.b. cars, dock	3.80c			St. Louis, delivered..	2.18c		

Bars

Bar Prices, Page 128

Pittsburgh — Heavier bar specifications are beginning to appear following announcement ten days ago that the present 1.95c, Pittsburgh, base on hot-rolled bars will be advanced to 2.05c, f.o.b. Pittsburgh, or 2.075c for delivery within the Pittsburgh district, effective with the fourth quarter. No other changes were made in bar prices or extras and the present and fourth-quarter price continues on the basis of 3 to 25-ton lots of a single size and specification for shipment at one time to one destination. Alloy steel bars have been reaffirmed for fourth quarter at 2.55c, Pittsburgh, and at the six other basing points.

Cleveland — With the exception of hot-rolled bars, prices remain firm and unchanged for fourth quarter. Farm equipment requirements have returned to the strong position held before the drought. Cold bar finishers are having difficulty keeping up with delivery schedules, because of delayed shipments from mills. Demand for commercial cold-drawn alloy bars has held up well in the absence of requirements from auto partsmakers. This condition is due to heavy demand from machine tool builders.

Chicago—Automotive bar releases are increasing and with demand well sustained in other directions, business gradually is improving. Little change is apparent in requirements of the farm implement and tractor industries. Demand from this group still is relatively high for this period and heavier operations are in prospect for coming months. Specifications so far reflect to only a moderate extent the price increase effective Oct. 1. On fourth quarter business billet steel bars are quoted 2.13c, Chicago, with rail steel bars also advanced \$2 a ton to 1.98c, Chicago.

New York—Bar contracts placed last week totaled 456 tons, down about 50 per cent from the previous week. New inquiries also were fewer than recently. A large list of pending projects, however, gives promise of maintaining activity at a good rate. Protective covering against the \$2 advance for fourth quarter, is increasing demand for commercial steel bars. Most mills are already booked well ahead and the question of ultimate deadlines is perplexing consumers, who are trying to whip their requirements in shape as fast as possible. Alloy steel bars are unchanged, although an increase in cold-drawn bars may be announced.

To provide opportunity for adequate coverage one leading seller has

NOW



THAT THE DOG DAYS ARE OVER

... It's a good time for a little action

Follow this simple formula: reach across your desk for your phone—call your local Standard Oil (Ind.) office—ask a Standard Oil engineer to look over your equipment, and to estimate the savings in lubrication and maintenance costs that can be made. *Your part is over. The Standard Oil engineer does the rest.*

It's possible, of course, that no further economies could be made in your plant, but the odds are against this. It is far more likely that the possibilities for new cost reductions and freedom from bothersome operation problems will surprise you. The check-up costs nothing and involves no obligation. Make use of this Standard Oil Service freely, whether for the survey of an entire plant or advice on a single problem in lubrication or other use of a petroleum product.

DON'T MISS EXHIBIT 50-51 AT THE IRON AND STEEL EXPOSITION IN DETROIT SEPT. 22-25

Write for booklets covering lubrication problems in your plant. (List subjects or types of machinery in which you are most interested.) Address: STANDARD OIL COMPANY (Indiana), 910 S. Michigan Avenue, Chicago, Illinois. (404)

Name.....

Address.....

City.....State.....

Copyright 1936, Standard Oil Co.

STANDARD OIL COMPANY (Indiana)

CORRECT LUBRICATION

set Sept. 30 as the deadline for orders at current prices, the \$2 advance for fourth quarter applying thereafter.

Philadelphia — The advance in commercial steel bar prices of \$2 a ton for fourth quarter had stimulated orders. As most sellers at the time of their opening of books for this position were already well booked over the remainder of this month, there is some question as to how much leeway consumers will be allowed in getting under cover at present prices. Under the new schedule commercial steel bars will

be 2.05c, Pittsburgh, or 2.36c, delivered, Philadelphia. Cold-drawn steel prices may also be advanced. Alloy steel bars are unchanged.

Plates

Plate Prices, Page 128

Pittsburgh—The unchanged market of 1.90c, f.o.b. Pittsburgh, on plates for fourth quarter has generally been received by the trade

without comment, although some question has appeared that while bars and small shapes were advanced \$2 a ton, neither plates nor structural shapes were affected. Jones & Laughlin Steel Corp. and other plate producers through last week followed the earlier Carnegie-Illinois Steel Corp. announcement that plates would be unchanged at 1.90c, f.o.b. Pittsburgh, or 1.925c for delivery within the Pittsburgh switching area. The large Honolulu drydock inquiry from the government covering some 40,000 tons, most of which is plates, is occupying the attention of many plate mills and fabricators. Last week it was announced that bids originally set for Sept. 30 had been postponed to Nov. 25. The order for 750 fifty-ton steel gondolas placed by the Boston & Maine railroad recently with Bethlehem Steel Co.'s Johnstown, Pa., plant will account for a large tonnage of plates, estimated to be at least 8000 tons.

Cleveland — Miscellaneous demand for lighter gages has held up remarkably well, causing backlogs in most mills to be extended from four to six weeks. Fabricators are still having difficulty in getting supplies, especially in heavier gages. Shipments continue at the strong pace set during August and according to many there is every reason to believe that they will increase during the next few months, when railroads complete their buying program for the year.

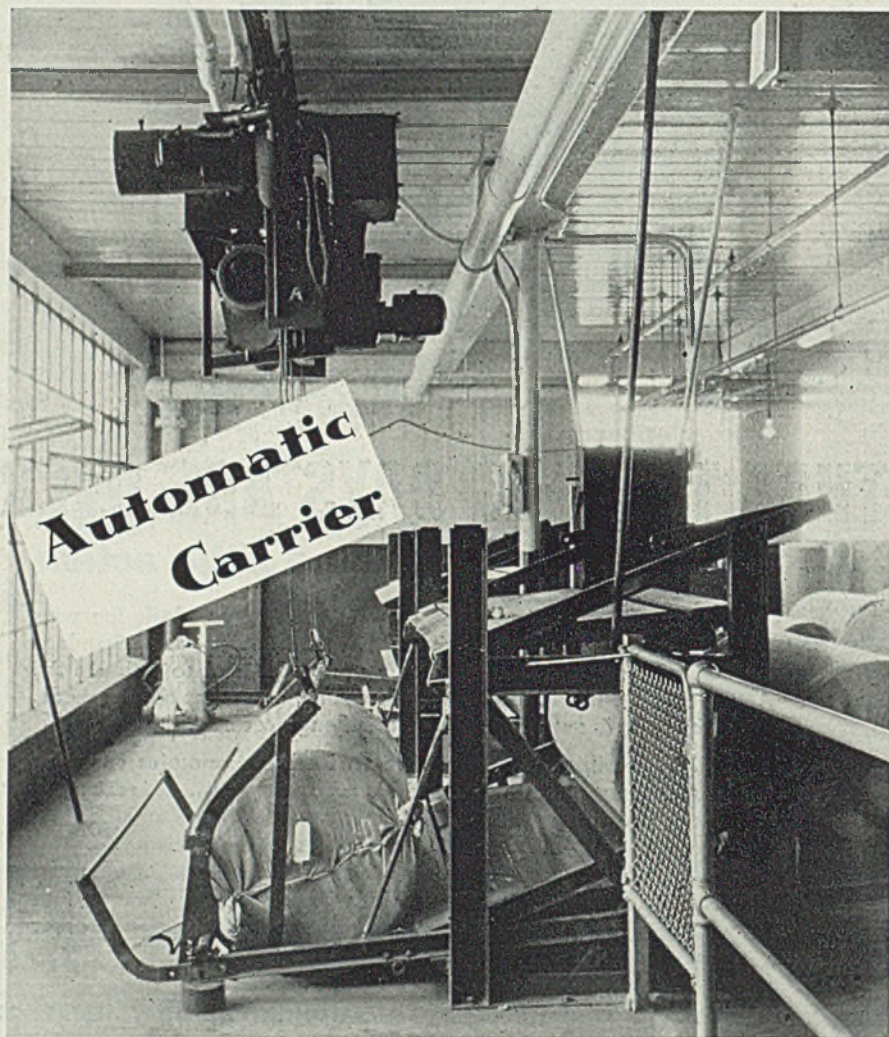
Chicago—Specifications from car builders have been heavier recently, while active shipments to structural fabricators continue. With additional car buying in prospect, a substantial movement of plates is looked for during coming months, while fabricators of heavy products also have a favorable outlook. Miscellaneous demand comprises an important portion of new buying. Plate prices continue unchanged into fourth quarter.

Birmingham, Ala.—Plate mills continue three shifts a day with demand good. Fabricators report considerable business in hand in which plates will be used.

New York—Two awards of plates last week totaled 525 tons, two barges for Standard Oil Company of Louisiana taking 195 tons, and 330 tons to go into a bridge in Wilkinson county, Mississippi.

Tonnage is off somewhat although opening of books for fourth quarter has released some business, even though prices are being extended. Prospects are encouraging, particularly in the railroad field, where a secondary buying wave is expected.

Philadelphia—Eastern plate makers are reaffirming prices for fourth quarter. While word to this effect is releasing some tonnage that was held up pending definite action, volume over the past week has tapered.



From either of two loading tables, heavy rolls are picked up, carried from mill to warehouse and deposited at one of seven stations. Carrier then returns for another load, operating continuously and automatically from a central panel set for any number

of complete round trips.

American MonoTractors eliminate handling in many interesting jobs. Difficult problems are easily solved. Costs are extremely low. Let our engineers explain this new drive for carriers, cranes and hoists.

*Write for new book on MonoTractor
drive for Overhead Handling*

AMERICAN MONORAIL CO.

13102 Athens Ave., Cleveland, O.

Sellers regard this as temporary, however, particularly in view of promising prospects for further buying from railroads and ship yards in particular.

New York Shipbuilding Co., Camden, N. J., was one of two bidders on the liner for the United States lines this past week, with a figure of \$12,995,000 for the new vessel, which is to be a duplicate of the WASHINGTON which it also built. This yard also bid \$13,095,000 for a duplicate of the WASHINGTON but with improved machinery. Federal Shipbuilding Co., Kearny, N. J., submitted a bid of \$16,500,000 on a larger and faster type boat.

Newport News Shipbuilding & Dry Dock Co., Newport News, Va., the only private yard to quote on this ship in the past, did not submit a bid, nor did one other eastern builder, which was also understood to be figuring the job. The proposed vessel will require approximately 15,000 tons of hull steel, depending upon what type will finally be decided upon.

Seattle — Demand is improving, particularly for light gages out of stock. Repairs to the coasting steamer TEXADA, costing \$90,000, have called for more than 100 tons, supplied by local warehouses.

Contracts Placed

- 450 tons, three all-welded dump scows for Louisville, Ky., engineers, to American Bridge Co., Pittsburgh.
- 330 tons, bridge, Wilkinson county, Mississippi, to Virginia Bridge & Iron Co., Roanoke, Va.
- 195 tons, two oil barges for Standard Oil Co. of Louisiana, Louisville, Ky., to Ingalls Iron Works Co., Birmingham, Ala.
- 140 tons, 22-inch welded steel pipe, invitation 880, treasury department, San Bernardino, Calif., to unnamed interest.
- 100 tons, 14-inch welded steel pipe, water and power department, Los Angeles, to unnamed interest.

Contracts Pending

- 40,000 tons, largely plates, United States government floating drydock for shipment to Honolulu, Hawaii; bids of Sept. 30 postponed to Nov. 25.
- 969 tons, Hayfield pumping plant metropolitan water district, Los Angeles, specification 160; L. E. Dixon Co. and Case Construction Co. Inc., Los Angeles, low on general contract at \$2,330,764.
- 900 tons, 24 to 40-inch welded steel pipe, specification X-47, water and power department, Los Angeles; bids opened.
- 150 tons, steel pipe, Conchas dam, Tucumcari, N. Mex., for United States engineer office; bids opened.
- Unstated tonnage, 350,000-gallon water storage tank, Beaver Dam, Wis.; bids soon; William Gergan, city clerk.
- Unstated tonnage, 4700 feet of welded shore and discharge pipe, for Louisville, Ky., engineers; Treadwell Construction Co., Midland, Pa., low at \$21,226.

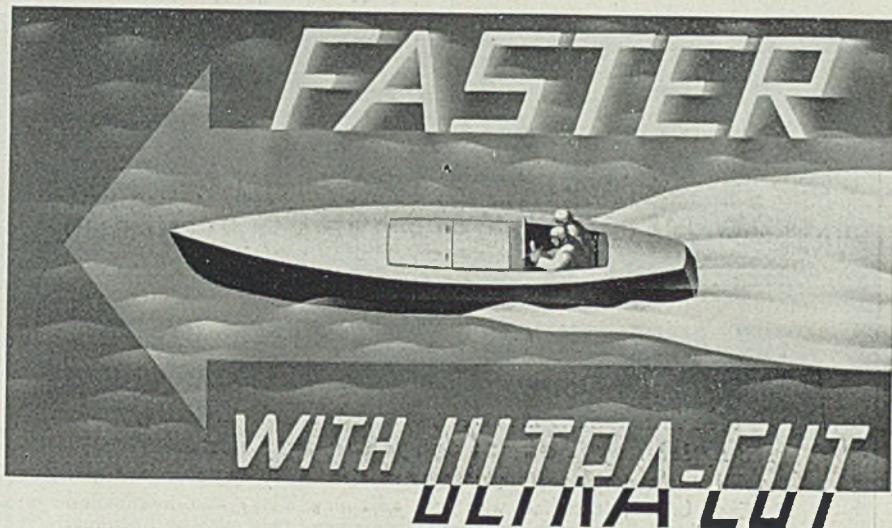
Sheets

Sheet Prices, Page 128

Pittsburgh—Since the announcement of fourth-quarter sheet prices, some trade comment has developed to the effect that while No. 24 gage hot-rolled annealed sheets are advanced \$2 in base price to 2.60c, f.o.b. Pittsburgh, the market on 10 gage hot-rolled sheets has been announced by producers as unchanged from 1.95c. Following the general price announcement to the trade, plus the growing

evidence that sheet deliveries are not easily obtained, last week's specifications placed in this district reached a new weekly high level since June. A number of sheet buyers are arranging their own warehouse space to assure themselves of readily available sheet stocks. An analysis of present buying finds a heavy movement not only in common but full finishes, chief buyers being automobile body shops, refrigerator makers, jobbers, and a considerable share for export.

Cleveland — Demand for enameled sheets has improved considerably since the first of the month.



Just as the speed boat is designed to offer least resistance to the water—ULTRA-CUT Screw Stock is developed to work easily and smoothly under the tool.

This high sulphur grade of Bessemer is an achievement in the development of specialized steels. It is nicely balanced in physical and chemical properties to give maximum machinability without sacrifice of quality in the finished product.

Ultra-Cut gives an average increased production of 30% to 40% over the usual grades of free-machining steels—and even doubles output under favorable conditions. It assures finely finished parts with chip-free operation. Fewer tool grinds and less "down time"—when you run Ultra-Cut Steel on your automatics.

Try Ultra-Cut on your next order for screw stock—and watch your production point upward—and your machining costs downward.

We will exhibit at the American Metal Show in Cleveland, Ohio, October 19 to 23.

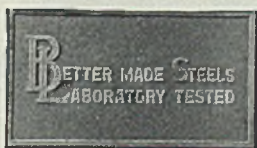
●
Cold Drawn Bars

●
Ground Shafting

●
Screw Stock

●
Special Sections

●
Alloy Steels



BLISS & LAUGHLIN, INC.
HARVEY, ILL. Sales Offices in all Principal Cities BUFFALO, N.Y.

Stove and refrigerator manufacturers have shown strong activity for some time. Most consumers' stocks are normal and apparently little excess buying in anticipation of a general price advance has taken place. However, in most cases buyers estimate needs further in advance. Backlogs are extended four to six weeks. With the exception of blue annealed sheets prices remain firm and unchanged for the fourth quarter.

Chicago—Sheet demand is improving, partly as a result of better releases from the automotive industry. The latter tonnage shortly is expected

to be swelled materially as additional interests start production, of 1937 models, while steady or heavier requirements of miscellaneous users are anticipated. Some increase in specifications also is looked for as a result of price changes announced recently for fourth quarter. Production continues near capacity, with deliveries ranging from three to four weeks on cold-rolled to six to eight weeks on hot-rolled material.

New York—Advance in hot-rolled annealed sheets and revisions in extras for fourth quarter are stimulating an already brisk sheet market. Precisely what the deadline is for business

at present prices is not clear, although some sellers declare shipments must be made by the end of this month. Deliveries, however, are already well extended.

Sept. 15 has been set as the deadline by at least one leading seller of hot-rolled annealed sheets for orders at current prices, with shipments presumably to be made at mill convenience. Thereafter the \$2 advance will apply. This interest is unable to make deliveries this quarter on new business and set the deadline as a concession to customers to enable them to obtain some protection.

Philadelphia—Sheet sellers generally are following the lead of the Carnegie-Illinois Steel Corp., Pittsburgh, in advancing hot-rolled annealed sheets \$2 a ton for fourth quarter and in revising extras on gages and pickling and oiling. Under the new schedule which becomes effective Oct. 1, hot-rolled annealed No. 24 will be 2.91c, delivered. Recent buying has been featured by substantial releases from the two leading auto body makers here.

Cincinnati—Books of the leading sheet producer in this district are filled for third quarter delivery, and some contracts already have been received at the new prices, a \$2 a ton advance on hot-rolled annealed, No. 24 gage, and similar advance on electrical sheets. Extras for oiling and pickling and for gage are altered in accord with Pittsburgh announcements. Rate of buying last week for fourth quarter, which includes considerable automotive needs, points upward from recent levels of 80 to 85 per cent.

St. Louis—Business in steel sheets continues active, with shipments and orders so far this month comparing favorably with the similar period in August. Some sections of the farm implement industry have slowed down, but the stove industry is going strong, and miscellaneous demands hold at the high level of the year.


Bolts, Nuts and Rivets

Bolt, Nut, Rivet Prices, Page 120

Although present prices have been reaffirmed on bolts and nuts for the fourth quarter, moves are on foot to advance the present price of semi-finished hexagon nuts, which are quoted 60-20-15 off list. Some announcement to this effect may be made shortly. Quotations still are irregular on bolts and nuts, though somewhat steadier than earlier in the year. Rivet prices are holding fairly well. Business continues moderately heavier than a month ago. Consumption by the farm implement industry is expected to recover from its recent lull within the next several weeks, while consumption by railroads and railroad equipment builders holds at an active rate.

Bailey...

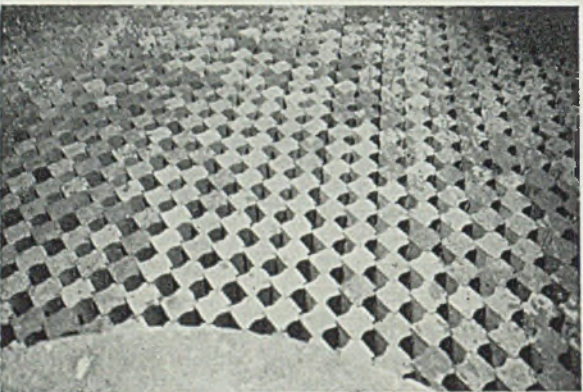
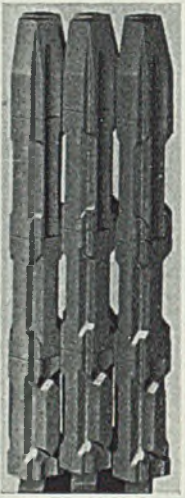
EQUIPMENT



THE AMERICAN OPEN JOINT STOVE CHECKER for BLAST FURNACE STOVES

Five installations in last 4 years prove their efficiency.
Its Efficiency is due to the following points:

1. All bricks designed to give greatest structural strength and weight.
2. Each brick interlocked with four adjoining brick, also interlocked horizontally at each course—so they cannot twist, shift and obstruct flues.
3. Maximum weight in top section of stove where maximum temperature exists.
4. 90% of brick surfaces open to gases as heating surface.
5. Open joint produces complete cross circulation of gases, with no horizontal surfaces.
6. Channelling and dead flues eliminated.
7. Maximum Heating Surface consistent with sufficient weight in each section of stove.
8. Minimum cost per sq. ft. of Heating Surface.

WILLIAM M. BAILEY COMPANY

Engineers

MAGEE BLDG. PITTSBURGH, PA.

European Agents—Ashmore, Benson, Pease & Co. Ltd., Stockton-on-Tees, England

Pipe

Pipe Prices, Page 129

Pittsburgh—Pipe producers have virtually extended present discounts on tubular products for specification and shipments over the balance of the year. Specifications for oil country goods are showing a slight upward trend, and requirements of seamless tubing from the automotive industry have also been improving. The aforementioned assurance that pipe discounts will hold unchanged for the next quarter apparently is not consistent with the advance of \$2 a ton in seamless rounds, although skelp has been announced at 1.80c, all basing points, for the fourth quarter.

Cleveland — Standard wrought pipe for new buildings and repair work of an industrial nature is in active demand. Jobbers' stocks are showing an encouraging rate of turnover but little speculative buying has been felt. Far the greater portion of specifications are for small tonnages. Prices are firm and have been extended for fourth quarter. While there have been no large orders for cast pipe and fittings, miscellaneous small requirements have been satisfactory.

Chicago—Cast pipe inquiries generally are small and are almost entirely for WPA projects. Shipments continue active. Pending business is in fair volume and relatively heavy shipments are in prospect during the next several months. Prices are steady.

New York—New pipe inquiries are slow, although a fair tonnage is pending. Prices are firm. Di Liso Construction Co., Jamaica, N. Y., is low on 165 tons of cast pipe for Kings Park, N. Y.. state hospital.

Seattle — Demand for cast pipe continues slow, with no important projects pending. For the Rainier avenue, Seattle, improvement, 180 tons of 16 inch cast pipe have been placed with United States Pipe & Foundry Co., Burlington, N. J. Palmer Supply Co. is furnishing 45 tons of 6 inch to Bremerton, Wash., which will soon invite bids for a \$27,000 pump house.

Cast Pipe Placed

180 tons, 16-inch, Rainier avenue improvement, Seattle, to United States Pipe & Foundry Co., Burlington, N. J.

Cast Pipe Pending

255 tons, 6-inch cast pipe or asbestos cement pipe, Indian service, department of interior, Albuquerque, N. Mex.; bids opened.
175 tons, 12-inch water main, Painesville, O.; bids Sept. 11.
165 tons, for Kings Park, N. Y., state

hospital; Di Liso Construction Co., Jamaica, N. Y., low.
122 tons, 6 to 10-inch, Whittier, Calif.; bids opened.

Transportation

Track Material Prices, Page 129

Although railroad buying is in the midst of a lull steelmakers are receiving heavy specifications for material entering into cars placed earlier and now under construction. Indications are that this will become heavier as the fall advances.


Elgin, Joliet & Eastern is buying steel for rebuilding of 300 box cars in its own shops. Pittsburgh & Lake Erie is inquiring for 150 all-steel automobile cars. Ten locomotives have been placed in the past week and Duluth, Missabe & Northern is inquiring for two.

Seaboard Air Line has awarded 10,000 tons of rails to Tennessee Coal, Iron & Railroad Co. with an unusually heavy list of accessories, including 750,000 tie plates, 2000 kegs of bolts, 20,000 kegs of spikes and a heavy order of frogs and switches.

Further rail buying by western

Bailey...

EQUIPMENT


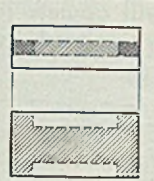

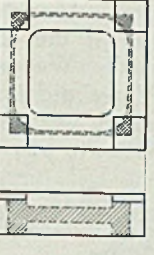
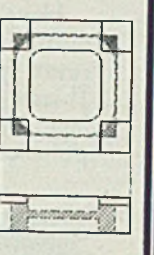


THE "SUPERIOR" CHECKER REGENERATIVE FURNACES

Maximum
Heating Surface and Free Area

*COMPARATIVE "DEAD" BRICK VOLUME OF
STANDARD AND SUPERIOR CHECKERS*

"DEAD BRICK VOLUME" (SHOWN IN SHADED SECTIONS) IS BASED
ON A MAXIMUM HEAT PENETRATION OF ONE INCH

 <p>10' x 41' x 41" 6" x 6" FLUES "DEAD BRICK" 41.4% EFFECTIVE BRICK WEIGHT PER CUBIC FOOT * 342 POUNDS</p>	 <p>9' x 41' x 3" 6" x 6" FLUES "DEAD BRICK" 23.5% EFFECTIVE BRICK WEIGHT PER CUBIC FOOT 348 POUNDS</p>	 <p>9' x 41' x 26" 6" x 6" FLUES "DEAD BRICK" 26.2% EFFECTIVE BRICK WEIGHT PER CUBIC FOOT 347 POUNDS</p>	 <p>"SUPERIOR" 3" DEEP 6" x 6" FLUES "DEAD BRICK" 34% EFFECTIVE BRICK WEIGHT PER CUBIC FOOT 392 POUNDS</p>	 <p>"SUPERIOR" 24" DEEP 5" x 5" FLUES "DEAD BRICK" 3.9% EFFECTIVE BRICK WEIGHT PER CUBIC FOOT 446 POUNDS</p>
--	--	--	---	---

Its use eliminates the "Dead" Brick from the Checker Chamber.

All bricks are interlocked as laid and cannot shift—therefore all flues are in perfect alignment.

There is 40 to 70% less horizontal brick surface on which to accumulate dirt.

WILLIAM M. BAILEY COMPANY

Engineers

MAGEE BLDG. PITTSBURGH, PA.

European Agents—Ashmore, Benson, Pease & Co. Ltd., Stockton-on-Tees, England

roads is expected, covering needs for the remainder of this year and also for early requirements for 1937.

Car Orders Placed

Elgin, Joliet & Eastern, rebuild 300 box cars.

Locomotives Placed

Aliquippa & Southern, one switch engine, to American Locomotive Co., New York.

Green Bay & Western, three locomotives to American Locomotive Co., New York.

Toledo, Peoria & Western, six locomotives,

to American Locomotive Co., New York.

Rail Orders Placed

Seaboard Air Line, 10,000 tons rails, with accessories, to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

Car Orders Pending

Chicago & Eastern Illinois, two rail motor cars; bids asked.

Pittsburgh & Lake Erie, 150 all-steel automobile box cars; bids Sept. 18.

Simonds Saw & Steel Co., Lockport, N. Y., has given employees in service two years or longer an extra week's

pay. Those with shorter service receive half a week's pay; 415 sharing in the disbursement of \$12,000.

Strip

Strip Prices, Page 129

Pittsburgh — The advance of \$2 a ton on rerolling billets and sheet bars for fourth quarter appears to narrow the conversion spread, especially for nonintegrated strip mills, by a like amount, due to the fact that hot-rolled strip steel has already been reaffirmed at 1.95c, Pittsburgh, and cold-rolled strip will doubtless be extended at 2.60c, Pittsburgh or Cleveland. Last week markets on the various stainless steel strip classifications were extended unchanged for fourth quarter. Present demand, while sufficient to give strip mills some sizable backlogs, still does not feature much forward buying into the coming quarter.

Cleveland — Auto partsmakers are in the market for an increasing tonnage of strip for 1937 models. Prices have been extended for fourth quarter. Mills continue to run close to capacity in an effort to improve delivery before auto manufacturers are definitely in the market for heavy requirements. General miscellaneous demand has been strong and well diversified.

Chicago—Prices on both hot and cold-rolled strip steel are being extended unchanged into fourth quarter. Specifications have been heavier, though improvement in automotive releases so far has been only moderate. Succeeding weeks, however, will see rising shipments for motor car use. Miscellaneous demand is holding well in most directions.

New York—Demand for cold-rolled strip is expanding, reflecting increasing requirements of automobile accessory manufacturers. Prices on both hot and cold-rolled strip have been reaffirmed for fourth quarter.

Philadelphia — Prices on both hot and cold strip have been reaffirmed for fourth quarter, and while this has resulted in releases from some consumers who have been awaiting definite word the market continues rather quiet.

Cold Finished

Cold Finished Prices, Page 129

Pittsburgh—The market on cold-finished carbon steel bars and shafting has been advanced \$2 a ton effective with fourth quarter, bringing the market for the final three months to 2.35c, base, Pittsburgh, for one size, shape, grade and shipment at one time to one destination of cold-drawn bars. This price applies for base of 10,000

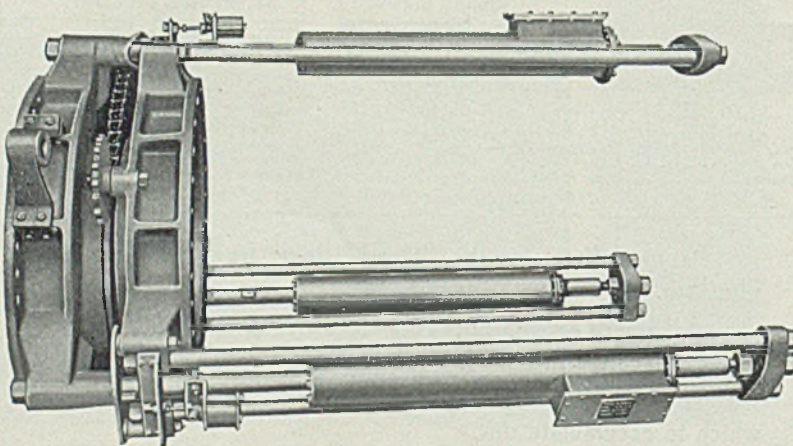
Bailey...

WMB CO. EQUIPMENT

THE THERMAL GOGGLE VALVE WITH ELECTRIC HEATERS FOR THERMAL TUBES

Three (3) Methods of Operation For Price Of One Valve.

Have you a Goggle Valve in your plant that will operate satisfactorily if the Goggle Plate had not been swung for seven years? We were advised by one operator that his Thermal Valve did just that—and it will operate just as satisfactorily seven years from now. Can you afford, from a safety point of view, to buy any other Valve?



(Patented)

WILLIAM M. BAILEY COMPANY

Engineers

MAGEE BLDG.

PITTSBURGH, PA.

European Agents—Ashmore, Benson, Pease & Co. Ltd., Stockton-on-Tees, England

to 19,999-pound lots. Usual deductions for quantity are being extended unchanged as is the observation of other basing points. The advanced market for fourth quarter, therefore, will name Gary, Ind., Cleveland, and Chicago, 2.40c; Buffalo, 2.45c; Detroit, 2.50c; and Eastern Michigan, 2.55c. Meanwhile, specifications against the present 2.25c, Pittsburgh, base continue.

Wire

Wire Prices, Page 120

Pittsburgh—Standard wire nails, both bright and cement coated, have been reduced \$4 a ton to \$1.90 per 100-pound keg, base, Pittsburgh or Cleveland. A \$4 a ton reduction has also affected galvanized nails, now quoted \$3.90 and \$4.40 for 15 gage and finer; polished fence staples, \$2.60; galvanized fence staples, \$2.65, and poultry netting staples, \$4. Wire farm fence has been reduced \$1 per base column to \$57, Pittsburgh or Cleveland, and barbed wire \$4 to 2.40c, Pittsburgh or Cleveland. Neither annealed nor galvanized fence wire has been changed, nor has plain manufacturing wire at 2.40c or high carbon spring wire at 3.05c. All of the above prices, including the reductions, apply only for September shipment and mills are specifying that all specifications against these prices must be completely shipped by Oct. 15. None of the above prices has been announced for the fourth quarter, on which the market will be named in about two weeks.

Cleveland — Nothing has been definitely announced regarding price policy on wire products for fourth quarter. Manufacturer's wire is showing exceptional activity, thereby causing some mills considerable difficulty in meeting deliveries. This increase in demand is not due to speculative buying, as shown by eagerness of consumers to obtain prompt shipments, so they may meet deliveries sought by their customers.

New York—Leading wire sellers are not expected to announce fourth quarter prices for a week or ten days. Meanwhile they have given official recognition to concessions on certain products by making reductions with Sept. 30 as deadline for orders for delivery not beyond Oct. 15.

Chicago—Producers of wire nails and other merchant wire products have recognized recent price weakness by a reduction of \$4 a ton. This lowers wire nails to \$1.90 per keg. No decision has been made regarding fourth quarter prices on these commodities, nor on plain wire. Manufacturers' wire quotations have been fairly steady, with demand generally

well maintained. Increasing competition from foreign imports of wire products, particularly nails and barbed wire, is blamed for unsettlement in the domestic market. Some gain is appearing in wire demand from the automotive industry, while miscellaneous needs are steady.

Tin Plate

Tin Plate Prices, Page 128

Pittsburgh—Tin mill sizes of black sheets have been reaffirmed for fourth quarter at 2.75c, Pittsburgh, for 28 gage base, thus leaving the subject of

the 1937 tin plate contract price the only one of tin mill products as yet unsettled. According to present indications, another two months will elapse before the latter market is determined. Last week's volume of specifications for tin plate evidenced a continued slight decline, but this showing is long overdue. Requirements for general line cans have been the sustaining factor in the market so long that any losses in packers' cans due to drouth have been overshadowed in the interim. The average of tin plate producers' operations is still at about 90 per cent of capacity and was not interrupted by last week's holiday, Sept. 7.

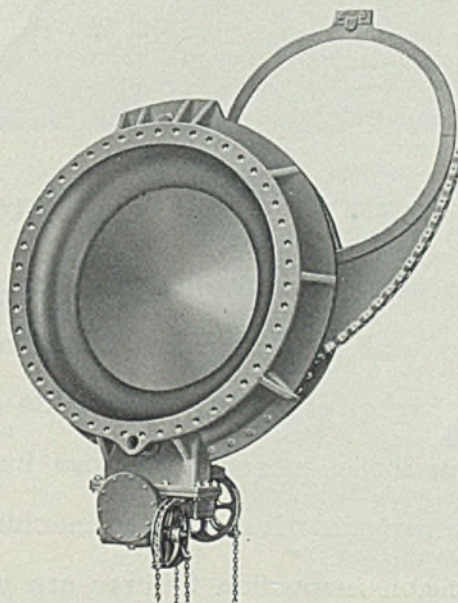
Bailey... EQUIPMENT

THE AMERICAN MECHANICAL GOGGLE VALVE

For Hand or Electric Motor Operation.
Standard Open Type Goggle Plate
or Totally Enclosed Plate.

40 OF THESE VALVES SOLD IN 4 MONTHS

(Patented)



No moving mechanical parts such as gears, screws or toggles inside the gas main to corrode, warp or accumulate dirt.

All operating parts completely enclosed.

No expansion joints required.

Easily installed and operated in vertical or horizontal gas mains; hot or cold, dirty or clean gas mains.

Complete operation in less than one minute.

WILLIAM M. BAILEY COMPANY

Engineers

MAGEE BLDG.

PITTSBURGH, PA.

European Agents—Ashmore, Benson, Pease & Co. Ltd., Stockton-on-Tees, England

Shapes

Structural Shape Prices, Page 128

New York—Four large awards and numerous smaller bookings made up business here in shape contracts. Carleton Co. Inc., general contractor, was low bidder for 4700 tons of shapes and 340 tons of bars for the Sixth avenue subway, route 101, section 8, New York.

Although inquiries are coming out in good volume proposed projects

ready for the bidding stage were fewer than in previous weeks. An inquiry is being made for 250 tons for public school No. 162, Brooklyn, N. Y., which is the first school project to come out in several months.

Pittsburgh—Bids will be taken shortly by federal engineers on about 3000 tons of fabricated structural steel for lift gates at the Emsworth, Pa., dam on the Ohio river just below Pittsburgh. Pittsburgh Joint Stockyards Co., Pittsburgh, is inquiring for a 400-ton building and New York state for about 2900 tons in five

bridges to be bid early this week. Supplementing its recent purchase of 900 tons in steel transmission towers, the Cincinnati Gas & Electric Co. is now inquiring for about 300 tons additional. Although most structural inquiry has fallen off in volume, smaller fabricating shops are still well booked, many, not being able to promise delivery under 60 days. Plain structural shapes at 1.90c, f.o.b. Pittsburgh, or 1.825c for plain delivery within the Pittsburgh switching area, are unchanged for shipment over the balance of the year.

Cleveland — Awards for the week were light, consisting of a number of jobs under 100 tons. However, considerable tonnage is expected to appear soon. Bids went in late last week on a mill building for the Elyria Foundry Co., Elyria, O., involving approximately 430 tons. Two of the three state highway bridges, on which bids were taken Sept. 3, were thrown out because only one bid was received. Fabricators are still having difficulty in obtaining steel from mills and many have discontinued bidding on certain types of jobs involving small tonnages.

Chicago—Structural steel producers estimate that about 90,000 tons of material on which they are figuring is pending. New inquiries are light, while awards of fabricated material continue well below the average of previous months. Fabricators are busy against old orders, however, and heavy shipments of plain material still are being made.

San Francisco — Few structural lettings were placed and totaled less than 600 tons. To date this year 132,251 tons have been booked, compared with 78,404 tons for the same period a year ago. Bids open Sept. 15 for close to 20,000 tons for the federal building, Los Angeles, and on the same date for about 12,000 tons for the union station, Los Angeles.

Seattle — Fabricators have capacity well booked, as a rule, and while no important awards were announced last week, new projects are developing. Pacific Car & Foundry Co., Seattle, is erecting a steel warehouse for the Union Oil Co., Seat-



PRECISION to less than .001 inch

● Horsburgh & Scott Worms are ground within an accuracy of .001" in lead, indexing and contour... a precision in manufacturing that insures higher efficiency, longer life and quieter operation. To obtain these exceedingly close limits, this company developed its own exclusive grinding machines. These machines plus precision inspection fixtures are your guarantee of the finest worms and gears possible.

A 448 page catalog is yours without obligation.

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 HAMILTON AVENUE, CLEVELAND, OHIO, U. S. A.

Shape Awards Compared

	Tons
Week ended Sept. 11.....	19,305
Week ended Sept. 4	11,129
Week ended Aug. 28	30,731
This week, 1935	26,431
Weekly average, 1935	17,081
Weekly average, 1936	22,599
Weekly average, August	28,225
Total to date, 1935	563,247
Total to date, 1936	836,171

tle. Valley Iron Works, Yakima, Wash., has the contract to fabricate and install radial gates at the Cle Elum dam, Wash., for bureau of reclamation.

Shape Contracts Placed

- 6550 tons, assembly plant, Linden, N. J., for General Motors Corp., to American Bridge Co., Pittsburgh.
- 1525 tons, factory buildings, International Harvester Co., Springfield, O., plant, to Gage Structural Steel Co., Chicago.
- 1050 tons, factory building, Kelvinator Corp., Detroit, to Whitehead & Kales Co., Detroit.
- 960 tons, furnace building, for Union Carbide Co., Niagara Falls, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.
- 900 tons, overpass, Dallas, Tex., to Mosher Steel & Machinery Co., Dallas, Tex.
- 900 tons, Pennsylvania railroad sheep and calf house, Jersey City, N. J., to James Stewart Co., New York.
- 800 tons, addition to the cellophane plant of E. I. du Pont de Nemours & Co. Inc., Richmond, Va., to Virginia Bridge & Iron Works, Roanoke, Va.
- 640 tons, bridge, Wilkinson county, Mississippi, to Jones & Laughlin Steel Corp., Pittsburgh.
- 560 tons, highway bridge, Glendale, Calif., for United States engineer corps, to Consolidated Steel Corp., Los Angeles.
- 500 tons, bridge, Seymour, Tex., to Bethlehem Steel Co., Bethlehem, Pa.
- 500 tons, dam, Wisconsin Rapids, Wis., to Wisconsin Bridge & Iron Co., Milwaukee.
- 350 tons, addition, B. F. Goodrich Co. plant, Oaks, Pa., to Phoenix Bridge Co., Phoenixville, Pa.
- 340 tons, bridge, for Southern Pacific Railway Co., Marysville, Calif., to Bethlehem Steel Co., Bethlehem, Pa.
- 330 tons, postoffice, Saginaw, Mich., to Bethlehem Steel Co., Bethlehem, Pa.
- 330 tons, building, for Goodman Mfg. Co., Chicago, to R. C. Mahon Co., Detroit.
- 300 tons, building extensions, Aluminum Co. of America, Alcoa, Tenn., plant to Fort Pitt Bridge Works, Pittsburgh.
- 280 tons, state highway bridge, Indiana county, Pennsylvania, to American Bridge Co., Pittsburgh.
- 275 tons, school, Gouverneur, N. Y., to Lehigh Structural Steel Co., Allentown, Pa.
- 270 tons, Emerson school, Los Angeles, to Bethlehem Steel Co., Bethlehem, Pa.
- 260 tons, building, Lowellville, O., for Sharon Steel Corp., Sharon, Pa., to Pittsburgh Bridge & Iron Co., Pittsburgh.
- 250 tons, addition to wire warehouse, Bethlehem Steel Co., San Francisco, to Bethlehem Steel Co., Bethlehem, Pa.
- 235 tons, state bridge, McKean county, Pennsylvania, through A. A. White Inc., Lebanon, Pa., to the Bethlehem Steel Co., Bethlehem, Pa.
- 200 tons, bridge, Concord, N. H., to Boston Bridge Works Inc., Cambridge, Mass.
- 175 tons, high school, Dover, N. J., to Breen Iron Works, Newark, N. J.
- 175 tons, Florida highway bridge, Palm Beach, Fla., to Virginia Bridge & Iron Co., Roanoke, Va.
- 165 tons, furnace steel, Baytown, Tex., to Mosher Steel & Machinery Co., Dallas, Tex.
- 150 tons, pipe bridge, Detroit, to Lackawanna Steel Construction Co., Buffalo.
- 130 tons, bridge, Sweetwater county, Wyoming, to unnamed interest.
- 105 tons, beam span, Winneshick county, Iowa, to Clinton Bridge Works, Clinton, Iowa.

100 tons, sheet piling, bureau of reclamation, invitation A 42,074-A, Pot-holes, Calif., to unnamed interest.

Shape Contracts Pending

- 5040 tons, Sixth avenue subway, route 101, section 8, New York, Carleton Co. Inc., low bidder.
- 1500 tons, state highway bridge, Erie county, New York; bids Sept. 15.
- 1400 tons, four state highway bridges, scattered locations, New York; bids Sept. 15.
- 1100 tons, eight bridges in Maine; bids Sept. 22.
- 1000 tons, additional wings for New York state hospital, Brooklyn, N. Y.
- 800 tons, Hudson-Midtown tunnel, George M. Brewster & Son, Weehaw-

- ken, N. J., low bidder.
- 800 tons, five Pennsylvania state highway bridges, including three involving 100 tons or over; bids to be opened Sept. 18.
- 800 tons, state bridge, route 193, Juniata county, Pennsylvania; Whittaker & Diehl Co., Harrisburg, Pa., low on general contract.
- 750 tons, mill building for Elyria Foundry Co., Elyria, O.; bids Sept. 10.
- 700 tons, six highway bridges, scattered locations, South Dakota.
- 600 tons, Queens construction shaft, Midtown Hudson tunnel, New York.
- 600 tons, grade crossing elimination, East St. Louis, Ill.
- 400 tons, building, for Pittsburgh Joint Stockyards Co., Pittsburgh.
- 380 tons, trash racks intake structure

SPECIAL SEAMLESS SHELLS SHAPES

A
N
D

DEEP DRAWN TANKS, BOTTLES, ETC.

Is Our Specialty

This Seamless Drawn Tank is
A Crosby Accomplishment



Stamping Specialists Since 1896

An Experience You Should Not Overlook
Send Us Your Next Specification

THE CROSBY COMPANY

BUFFALO, N. Y.

NEW YORK — CHICAGO — PHILADELPHIA — DETROIT — CLEVELAND

Fort Peck, Mont., project; bids to division engineer, Denver, Sept. 25.
 300 tons, transmission towers, for Cincinnati Gas & Electric Co., Cincinnati.
 300 tons, building, General Aniline Works Inc., New York, for plant at Grasselli, N. J.; A. J. Goehler, Jersey City, N. J., low bidder on steel.
 280 tons, state highway bridge, Wellingford, Vt.
 270 tons, state highway bridge, Stamford, Conn.
 250 tons, public school No. 162, Brooklyn.
 210 tons, Boco dam on Little Truckee river, Nevada; bids Sept. 30.
 184 tons, state bridge, Lancaster county, Pennsylvania; Harry T. Campbell Sons Co., Harrisburg, Pa., low on general contract.
 175 tons, state bridge, Tioga county,

Pennsylvania; C. L. Johnson & Son, Mansfield, Pa., low on general contract.
 166 tons, Central avenue bridge for United States engineer office, Los Angeles; bids opened.
 Unstated tonnage, double leaf bascule span, Oshkosh, Wis.; PWA grant in negotiation.

Receivers have been named for Garland Mfg. Co., Pittsburgh, maker of bolts and nuts, following a request for appointment of receivers by the company's leading creditor, the Pittsburgh Tube Co. J. R. Patrick and A. G. Holmes have been named receivers.

Reinforcing

Reinforcing Bar Prices, Page 129

Pittsburgh—In spite of the \$2 a ton advance in merchant steel bars for fourth quarter and the absence of any price announcement by reinforcing bar makers for the same period, no advance in the latter bar mill product has been made for fourth quarter. For the present, the 2.05c, Pittsburgh price on new billet quality bars and 1.95c for rail quality material are officially unchanged and on small lots are governing present sales. A 1350-ton grade crossing elimination in Buffalo is an outstanding inquiry at present, in addition to the weekly Pennsylvania state highway lettings, most of which, however, are for small lots.

Cleveland — Mills are operating at capacity in clearing up backlogs. Most specifications have been for 100 tons or less, from private sources. Bids on an elevator for the Fairchild Milling Co., Cleveland, involving 300 tons of reinforcing bars, are expected to be out soon. Prices remain firm. However, an increase is expected. In view of this considerable buying for stock has been noticed.

Chicago—Extension of current prices on concrete bars is expected for next quarter. The market nominally has been 2.10c, base, for billet bars and 1.95c for rail steel bars, though some irregularity has prevailed. Shipments continue heavy and some new business is appearing. The largest recent order is 820 tons for a local housing project. Some additional tonnage remains to be placed for the outer drive development and for Mississippi river dams.

Philadelphia—Possibility of an advance on reinforcing bars has tended to steady the market here the past few days and also to drive in some tonnage. There is talk of increases of \$2 to \$3 a ton in the official prices, following action now being taken by bar mills generally in advancing merchant bars \$2 for fourth quarter. The present official market is

Nichrome

TRADE MARK REG. U. S. PAT. OFF.

for

HEAT and CORROSION RESISTANCE

Driver-Harris organization has had very wide experience in manufacturing, to close specifications, nickel-chromium and other highly specialized alloys. Years of experience have familiarized its staff with the proper material to resist high temperatures, mechanical stresses—oxidation and chemical corrosion.

NICHROME Nichrome Castings are suitable for operation at temperatures up to 2000° F. They resist oxidation—show marked resistance to corrosion and retain their strength at elevated temperatures.

CHROMAX Cast Chromax is a nickel-chromium-iron alloy suitable for operation at temperatures up to 1900°F. This alloy resists corrosion, heat and oxidation to a marked degree.

CIMET Cast Cimet is a low nickel, high chromium-iron alloy suitable for sulphur bearing fuel applications. It is resistant to heat, corrosion, abrasion and many acid conditions such as sea and mine water, etc.

APPLICATIONS

NICHROME

Retorts
 Carburizing containers
 Annealing containers
 Nitriding containers
 Pyrometer protection tubes
 Lead and salt pots
 Dipping baskets
 Enameling racks
 Glass rolls

Conveyors
 Parts for cement kilns
 Burner tubes
 Diesel Engine Valves
 Oil Burner parts, etc.

CHROMAX

Furnace parts such as trays, pushers, rails, hangers, bearings.

CIMET

Pump parts used under acid conditions
 Radiant tubes and Support brackets
 Oil burner parts
 Walking Beam furnace parts
 Shaft-Normalizing furnace parts
 Roller Shafts

Parts for electric gas and oil furnaces

DRIVER-HARRIS COMPANY

Harrison, New Jersey

Chicago — Detroit
 Cleveland

England — France
 Italy

Concrete Awards Compared

	Tons
Week ended Sept. 11	3,827
Week ended Sept. 4	3,935
Week ended Aug. 28	7,302
This week, 1935	7,065
Weekly average, 1935	6,862
Weekly average, 1936	6,612
Weekly average, August.....	7,011
Total to date, 1935	239,245
Total to date, 1936	244,657

2.05c, Pittsburgh, for billet steel reinforcing bars to the consumer and 1.75c for stock lengths to distributors. In some quarters it is intimated that the advance, if it develops, will be to distributors and not to consumers. However, this is believed in other quarters to be highly unlikely, notwithstanding the \$6 spread which now prevails, as this differential is claimed to have been set up on a close appraisal of costs for warehousing and handling with a fair allowance for profit. A leading award involved 187 tons for an infirmary in Lyons, N. J.

San Francisco — Reinforcing bar lettings aggregated 2441 tons, bringing the total for the year to 178,551 tons as compared with 167,738 tons for the corresponding period in 1935. Awards included 1070 tons for the Air Terminal building, San Francisco, and 440 tons for wharves and roads at Balboa, C. Z., both placed with Bethlehem Steel Co. Gunn, Carle & Co. took 107 tons for the Fisher Body plant, Oakland, Calif.

Seattle — The market is active, mill capacity being taxed and pressed for deliveries. New projects are developing, many of them from private sources. The week's awards totaled 550 tons, of which 225 went to Northwest Steel Rolling Mills, Seattle, for state highway work in Thurston county, Wash., and 225 tons to Bethlehem Steel Co., Seattle, for bridge approaches at Pasco, Wash.

Reinforcing Steel Awards

- 1070 tons, Air Terminal building, San Francisco, to Bethlehem Steel Co., Bethlehem, Pa.
- 820 tons, Julia Lathrop housing project, Chicago, to Calumet Steel Co., Chicago; Henry Ericsson Co., Chicago, general contractor.
- 440 tons, wharves and roads, Balboa, C. Z., to Bethlehem Steel Co., Bethlehem, Pa.
- 250 tons, department of sanitation, garage at Fifty-sixth street and Twelfth avenue, New York, to William Kennedy Construction Co., Brooklyn, N. Y.
- 225 tons, state highway work, Thurston county, Wash., to Northwest Steel Rolling Mills, Seattle.
- 225 tons, state bridge approaches, Pasco, Wash., to Bethlehem Steel Co., Seattle.
- 206 tons, route 25, section 25, to Stulz-Sickles Co., Newark, N. J.
- 187 tons, infirmary, Lyons, N. J., awarded through Delmar Construction Co., Philadelphia, to Concrete Steel Co., Philadelphia.
- 160 tons, store building, Royal Blue Stores, Chicago, to Calumet Steel Co., Chicago.
- 137 tons, auditorium new high school, Sacramento, Calif., to Truscon Steel Co., San Francisco.
- 107 tons, Fisher Body plant, Oakland, Calif., to Gunn, Carle & Co., San Francisco.

Reinforcing Steel Pending

- 1205 tons, Conchas dam, Tucumcari, N. Mex.; bids opened.
- 413 tons, Broadway low level tunnel,

- Oakland, Calif.; bids opened.
- 400 tons, high school, Bellingham, Wash., Hendrickson-Alstrom Co., Seattle, low.
- 375 tons, also 57 tons shapes, road projects in Conner county, Idaho, and Washington county, Utah; bids to bureau of public roads, Ogden, Utah, Sept. 22.
- 342 tons, trash racks, Fort Peck dam, Montana; bids Sept. 25.
- 335 tons, Boco dam, Little Truckee River, Nev.; bids Sept. 30.
- 300 tons, elevator for Fairchild Milling Co., Cleveland; bids soon.
- 204 tons, San Gabriel river bridge near Santa Fe Springs, Calif.; bids Sept. 24.
- 188 tons, bridge over Rio Honda at Rosemead avenue, Los Angeles county, California; bids Sept. 17.

- 176 tons, bureau of reclamation, invitation 44,100-A, Earp, Calif.; bids opened.
- 158 tons, office building, Sixth and Clementina streets, San Francisco; plans being revised.
- 156 tons, bridge on Ocean avenue at Santa Ana river, Orange county, California; bids Sept. 24.
- 140 tons, bureau of reclamation, invitation 42,595-A, Salt River project, Mesa, Ariz.; bids opened.
- 117 tons, water and power department, Los Angeles; bids opened.
- Unstated, state viaduct in Oregon; Parker-Schram Co., Portland, general contractor.
- Unstated, Milwaukee avenue state undercrossing, Portland, Ore.; Hoffman Construction Co., general contractor.



STRAYER

ELECTRICS

For the Heavy Industries

This is industry's latest indorsement of Strayer Electric Buckets.

Three large Industrial Concerns (names on request) recently made exacting investigations, independently, into the work capacity, operating efficiency, and economy of Strayer Electric Buckets and chose these 5 for Bridge and Electric Overhead Crane operation. Together they will work in a dozen kinds of material.

1. Digs to full capacity at every grab. ★
2. Operates within headroom of bucket. ★
3. All electric control and protection. ★
4. Sizes from ½ yd. to 12 yds. ★
5. Guaranteed to dig more per grab than any bucket of equal weight and measured capacity. ★

Our strong guarantee compels the attention of every industrial executive who has anything to say about bulk material handling in his plant.

The guarantee—"A Strayer Electric will dig more per grab than any bucket of equal weight and measured capacity." Make us prove it to your satisfaction—all you need is a lifting hook and convenient electric power. Write today.

BUILT BY

ERIE STEEL CONSTRUCTION CO.

Buckets of all types • Aggregators • Overhead Traveling Cranes
850 GEIST ROAD ERIE, PA.

Pig Iron

Pig Iron Prices Page 130

Pittsburgh—Pig iron requirements of nonintegrated steel mills continue to engage merchant furnaces here, who have now accumulated one of the most sizable backlogs in recent years. A large part of these shipments, to be made via all-water, forecasts a heavy schedule over the coming two to three months before navigation closes. Struthers Iron & Steel

Co. is planning to resume operations in its merchant furnace at Struthers, O., Oct. 15.

Cleveland — Miscellaneous consumers have definitely changed their buying policy since the present price has been extended for fourth quarter. Many have been buying in larger quantities fearful that scrap prices will continue to soar. This condition has also caused foundries to use a considerably higher proportion of pig iron in their mix. Machine tool builders and heating household appliance foundries con-

tinue to dominate the market, however, auto foundries are expected to regain their rightful position within the next two weeks.

Chicago—September pig iron shipments are expected to be about 15 per cent ahead of August, with a further gain indicated for October as a result of tentative foundry operations in the automotive, farm implement and other leading industries. New business for fourth quarter delivery is substantially ahead of the volume prior to the opening of the third period. Prices are firm.

Boston—Volume of orders placed last week was down, due chiefly to the heavy tonnages booked previous to opening Sept. 1 of fourth quarter books at reaffirmed prices. However, the market continues strong.

New York—While there has been little over-buying there is increasing optimism with sentiment the best in possibly six or seven years. Sales are expanding steadily although moderate on the average.

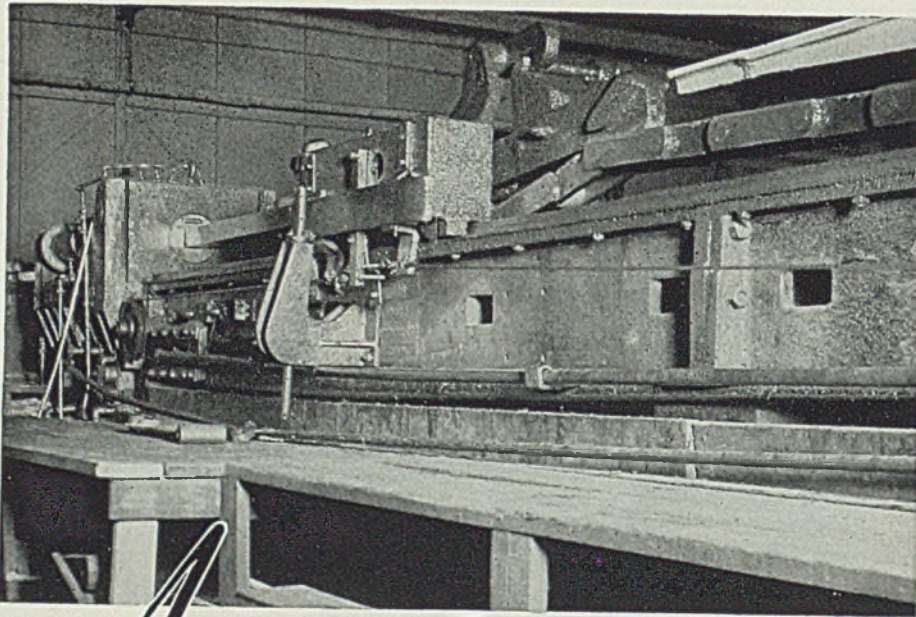
Philadelphia—Pig iron business is satisfactory, according to most sellers. While prices have been extended for fourth quarter, the possibility of an increase within 60 days is stimulating better quarterly contracting than at any time this year.

Buffalo—Sales of pig iron have been very heavy and are continuing at a brisk rate. Consumers are covering for the entire fourth quarter, some indicating they expect to use 50 per cent more iron than they did in earlier periods this year. Rumors of price advances and difficulty of getting some grades for immediate shipment are factors in the forward buying movement.

Cincinnati—Only a few fourth quarter pig iron contracts have been booked, at the reaffirmed prices. Shipments on third quarter contracts will soon be completed, with little tonnage not taken out. More active buying is expected within ten days or two weeks. Movement of iron is little changed from August levels.

St. Louis — Opening of books for fourth quarter at unchanged prices has been followed by a fairly heavy volume of ordering of all grades. Indications are that large tonnages will be taken during the next three weeks, sellers believing that their customers will cover on fourth quarter requirements. The melt is holding up well, and September will prove the largest month in point of shipments so far this year.

Birmingham, Ala.—Sales continue in small lots, for immediate delivery. A little business is being booked for the fourth quarter. Pipe and stove manufacturers are among the prominent spot customers, while machinery makers are buying iron for future needs. Production for the first eight months is slightly below



At your Service

**UNUSUAL FACILITIES for
UNUSUAL REQUIREMENTS
in**

**COLD DRAWN STEEL
WYCKOFF**

Whether your cold drawn steel requirements are extraordinary as to size and shape—or whether they involve an unusual combination of chemical and physical properties, WYCKOFF is equipped to serve you exceedingly well. Inquire about it.

WYCKOFF DRAWN STEEL COMPANY

General Offices: First National Bank Bldg., Pittsburgh, Pa.

Mills at Ambridge, Pa. and Chicago, Ill.

Manufacturers of Carbon and Alloy Steels

Turned and Polished Shafting Turned and Ground Shafting

the total for the entire year of 1935, and indications are there will be greater output at blast furnaces this year than in any year since 1930.

Toronto, Ont. — While demand for merchant pig iron fell off the past week as the result of the holiday, orders again are appearing in better volume. Orders are running from 50 to 200 tons, and additional sales up to 300 tons are pending. No forward delivery contracts have been placed for last quarter, but a few melters are expected to cover before the end of the month.

Scrap

Scrap Prices, Page 131

Pittsburgh — Based on last sales, No. 1 heavy melting steel remains quoted at \$17 to \$17.50, although brokers with short orders are paying \$17.25 and \$17.50 in this district and do not show willingness to make fresh sales into consumption at less than \$18. Therefore, for the time being mills are maintaining a waiting attitude and point out that scrap prices are now reaching a point the closest to pig iron in many years. Recent railroad sales of specialties have confirmed the \$20 to \$20.50 market on coil and leaf spring, and knuckles, couplers and steel wheels are up 25 cents to \$19.75 to \$20.25 for Pittsburgh district shipment. Cast iron borings have advanced 50 cents to \$12.50 to \$13, with machine shop turnings at \$12 to \$12.50, short shoveling turnings, \$12.50 to \$13, and No. 2 steel, flashings, and hand bundles, \$15.50 to \$16.

Cleveland—Further strength is appearing in the Cleveland and Youngstown iron and steel scrap markets with quotations on the heavier grades advancing 25 to 50 cents. More liberal supplies of old materials are appearing in response to the higher quotations, and shipments to consumers are also keeping pace with the broader offerings.

Chicago—Heavy melting steel has been bought by a local mill at \$16.25, an advance of 25 cents a ton over the previous transaction. Quotations on other grades are firm and the entire price structure is strong. Sellers are paying from \$16 upward in covering orders for heavy melting steel, but find sufficient tonnage available to accommodate mills. Scrap is being drawn in the largest volume in a number of years from distant points.

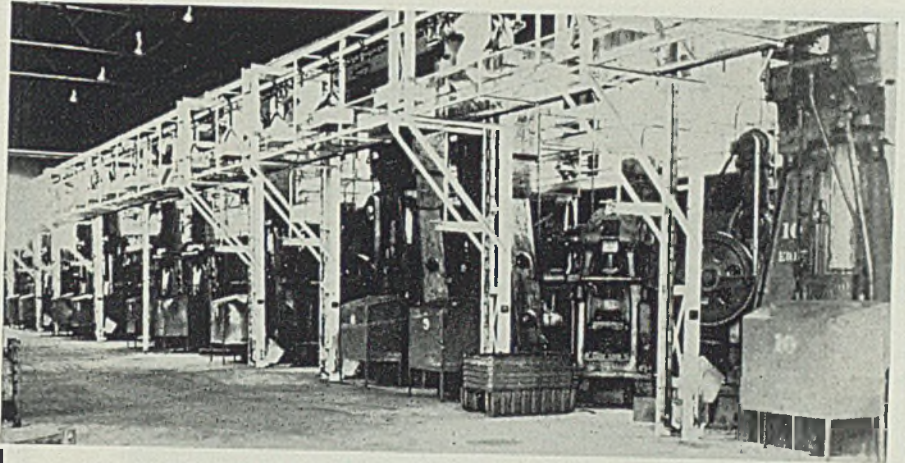
New York—The market here continued at the rapid pace that has been characteristic for some time. Prices on two grades were increased, the spread on heavy breakable cast being increased 25 cents and heavy

melting steel 50 cents. Demand continues unabated.

Philadelphia — While most major grades are unchanged there have been advances in several items of scrap here. Steel axles are now \$18.50 to \$19, delivered consuming point, No. 1 cupola cast \$16.50 to \$17 and mixed yard cast \$14.50. Railroad grate bars, specification pipe and stove plate also have been increased. Melting steel scrap grades and heavy breakable cast are steady. In general, scrap supplies are somewhat freer and the leading consuming interest has withdrawn from the mar-

ket on scrap for Bethlehem, Pa., and also for its plants at Johnstown, Pa., and Lackawanna, N. Y.

Buffalo—Scrap has quieted down in sales volume but an active undercurrent of demand continues as the result of high consumption. Following some minor purchases at \$15 consumers of No. 1 heavy melting steel withdrew their bid when it failed to bring out tonnage from principal dealers. Dealers claim their stocks are small and that they can not buy scrap for delivery at \$15, this also being true in the case of numerous other materials, according to this viewpoint.



Good to the Last Drop

Eleven drop hammers in this line (one does not show) and every last drop an ERIE. The trimming presses you see in the background are ERIES, too, and just as highly satisfactory as the hammers. There are a total of twenty-six ERIE hammers and presses in this one plant of a prominent manufacturer—a recent installation of which we are justly proud.

ERIE FOUNDRY COMPANY
ERIE, PENNA., U. S. A.

Detroit
335 Curtis Bldg.

Chicago
549 Washington Blvd.

Indianapolis
335 Postal Station Bldg.

Paris, France
8 Rue de Rocroy

Outside buying for shipment to Buffalo undoubtedly has been heavy and some consumers may stay out of the local market for another month or longer.

Detroit — The firm undertone persists, although no further important price advances have been made. The market continues at \$13.50 to \$14 on No. 1 steel, hydraulic compressed, \$14 to \$14.50, and blast furnace borings, \$8.50 to \$9. The Chevrolet gear and axle accumulation was sold Sept. 8 at prices within the quoted range.

Cincinnati — Available supplies of iron and steel scrap are restricted

and dealers hold tightly to accumulations. Quotations were advanced 50 cents on heavy melting steel and some other grades, the higher prices being reflected in bids on Louisville & Nashville railroad offerings of 7000 tons, more than one-half unassorted scrap and only 1000 tons of rails. Consumers continue in the market for miscellaneous offerings but the market is without heavy future commitments.

St. Louis—The market for iron and steel scrap continues sharply competitive and additional price advances, ranging from 25 cents to \$1

per ton, have been recorded on a number of important grades. Sellers have booked some new orders and in addition strenuous efforts have been made by certain dealers and brokers to obtain material to apply on contracts.

The present level of prices is the highest since the predepression era, and each week brings still higher quotations. Some increase in offerings has resulted from the upturn and the situation appears more settled than heretofore.

Birmingham, Ala.—Scrap is firming up with a little more tonnage available and consumers realizing higher prices are a fact. Heavy melting steel has been moving a little more freely with the larger consumer purchasing more than 21,500 tons for delivery over a few weeks. Demolition of old box cars continues in this section with the old material being shipped away from here.

Seattle — Oriental buyers indicate renewed interest but negotiations are handicapped by scarcity of transportation and the higher water rates in effect. Tidewater stocks are not heavy and dealers are seeking desirable tonnages. Continued buying by local mills and foundries is sustaining prices, which are unchanged.

Toronto, Ont. — Business in the iron and steel scrap is beginning to show improvement and shipments of heavy melting steel and other steel grades have been resumed to melters in the Hamilton and Montreal district. Foundries are taking machinery cast, malleable and wrought scrap in small lots for spot delivery, but no large contracts have been closed. Prices are firm and unchanged.

Warehouse

Warehouse Prices, Page 132

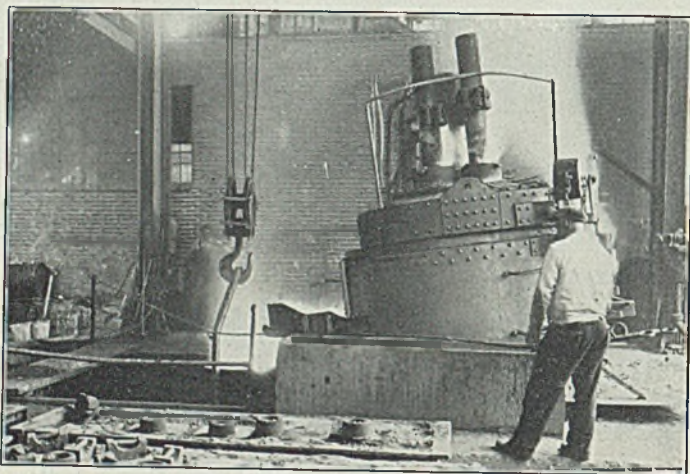
Pittsburgh — Jobbers are expected to announce a \$2 a ton increase on bars out of stock late in September. This would conform with the recent advance by mills affecting fourth-quarter. No other price changes are contemplated.

Cleveland — Specifications for general warehouse products have declined slightly. Many warehouse concerns find themselves short on stocks, because of failure to estimate correctly the heavy demand of the last two months. This condition has caused some concern, in view of difficulty in obtaining prompt deliveries from mills. General requirements have been well diversified, but bars and plates are the most active. Prices are firm and unchanged.

Chicago — Sales were retarded somewhat by the holiday, but make a favorable comparison with the vol-

“Neloy”

Heat Treated Steels for Steel Mill Applications



UNIVERSALLY USED BY THE INDUSTRY

For use in all rolling mills our research engineers have developed a series of special heat treated steels which will increase the wear, stand many times the load, give additional impact resistance, reduce loss of operation time, all of these advantages at a reasonable first cost.

We invite you to visit us at our Booth No. 135 at the Iron & Steel Exposition.

Your copy of our Bulletin No. 2 is ready. Send for it.

NATIONAL-ERIE
ERIE, PENNSYLVANIA



CORPORATION
ESTABLISHED 1906

ume a month ago, in addition to being well ahead of the rate during the corresponding period last year. Some price changes are expected to result from mill revisions next quarter.

New York—The general line of warehouse stocks last week shared in the sustained good business in this district. Prices are steady. A good volume of cold strip is being sold.

Boston—Advance of lead coated, long ternes, No. 24 gage from 5.60c to 5.70c was the only change last week in warehouse prices in this district.

Philadelphia—Warehouse trading has been well sustained, with little variation in the August rate. Prices are unchanged, although certain revision in mill quotations for fourth quarter may result in advances on commercial bars and hot rolled annealed sheets around Oct. 1.

Detroit — Demand for jobbing steel continues to make steady improvement in volume and number of orders. A number of sizable specifications for prompt delivery have been forced on local jobbers. In large part the price is firm, with the exception of continued weakness in nails, bolts and nuts, and wire.

Cincinnati—A holiday cut into volume of warehouses last week, but the general trend of sales this month is slightly upward. Prices are firm.

St. Louis—Daily average sales so far this month have been higher than in July. Demand is well diversified and numerous small users are in the market for sheets, plates, and bars. Some slowing down during the past ten days has been noted in tool steels, but the movement continues well above a year ago.

Seattle — Warehouse business is showing signs of improvement. Light plates, corrugated sheets and bars are moving in greater volume. Although government buying has declined, industrial requirements have increased. Prices are firm.

Metallurgical Coke

Coke Prices, Page 129

The fourth large blast furnace purchase of standard beehive furnace coke was made last week when the Struthers Iron & Steel Co., Struthers, O., negotiated a requirement estimated at 15,000 tons monthly, commencing in October. The company plans to resume blast in its merchant furnace at Struthers about Oct. 15. It is reliably reported that the price was \$3.65, f.o.b. Connellsville, Pa., ovens. Other recent cases of beehive coke being specified for blast furnace use have included purchases by Pittsburgh Steel Co. for its second Monessen, Pa., blast furnace, by Wickwire Spencer Steel Co. for its Tonawanda, N. Y., blast furnace, and

by Pittsburgh Coke & Iron Co. for Sharpville Pa. The present market on standard furnace coke is firmly quoted at \$3.65 to \$3.75 per ton, on common foundry coke at \$4.25 to \$4.50, and on premium foundry coke, \$5.50. Medium sulphur beehive furnace coke is strong at \$3.50 to \$3.60.

In general deliveries of by-product coke are heavier than in August as melters find their schedules heavier. Further increase is expected later in the fall. Prices are unchanged.

Approval of the reorganization plan of Universal Pipe & Radiator

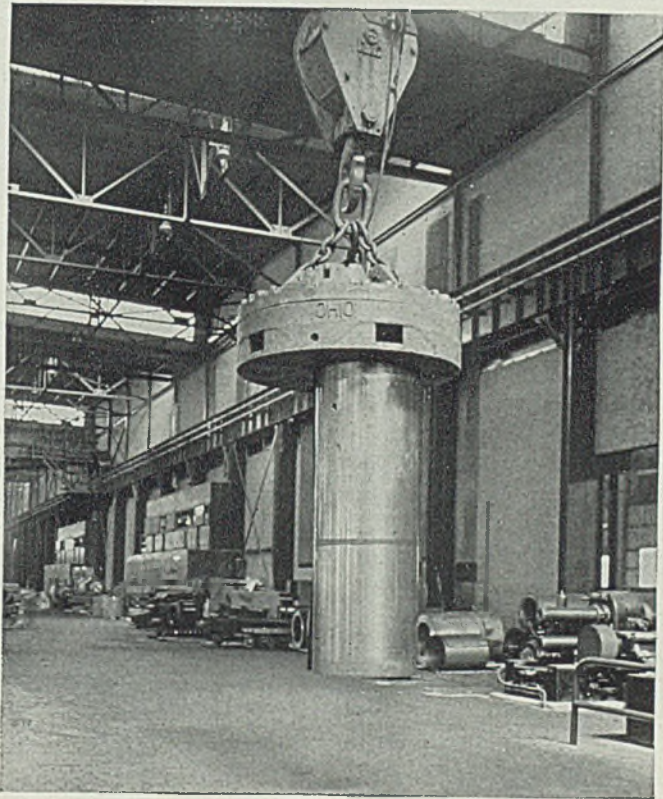
Co. and the Central Foundry Co. has been recently given by Judge Robert Patterson, of the United States district court in New York City.

Semifinished

Semifinished Prices, Page 129

The large base size classification of wire rods, from 15/32 to 47/64-inch, has been reduced \$2 a ton to \$40, base, Pittsburgh or Cleveland. Other base sizes at \$40 for No. 5 to 15/32-inch and \$38, Pittsburgh or Cleveland, for Nos. 4 to 5 gage wire rods are both un-

OHIO



"Special 65" Ohio Magnet lifting wide heavy Coil of Strip Steel VERTICALLY."

OHIO LIFTING MAGNETS—Of improved design giving Maximum All Day Lifting Capacity.

OHIO SEPARATION MAGNETS—With Stronger Pulling Capacity.

OHIO MAGNET CONTROLLERS—With Automatic Quick Drop to speed up operation and With Ohio Arc Suppressor to reduce the arc and make the Contacts and Arc Shields last much longer.

Ask for new Bulletin No. 109

THE OHIO ELECTRIC MFG. CO.
5906 Maurice Avenue
Cleveland, Ohio

changed. The reduction has been made effective immediately, but for the balance of September only. Wire rod producers are advising the trade that orders against these prices must be completed by Oct. 15. These markets do not represent the fourth-quarter price, on which an announcement will be made in about two weeks. Other producers in Pittsburgh, such as Jones & Laughlin Steel Corp., last week followed the \$2 a ton increase in sheet bars, billets, blooms and slabs for effect with fourth quarter, which will raise the gross ton quotation on these items to \$32, f.o.b. Pittsburgh, effective at that time.

Steel in Europe

Foreign Steel Prices, Page 132

London — (By Cable) — Demand for pig iron in Great Britain has demanded greater capacity and an additional stack has been lighted, with a second planned to go into blast about Christmas. Practically all steelworks are producing at capacity but deliveries are still in arrears. Iron and steel export trade is expanding but volume of shipments is limited by home requirements. Tin plate exports are satisfactory with

exports of black and galvanized sheets moderate.

The Continent reports export trade continues active, especially to America, Holland, Sweden, Egypt, South Africa and South America. Belgian and German domestic markets show much more demand.

Refractories

Refractories Prices, Page 130

Pittsburgh — Noticeably heavy demand for refractory brick is reported by refractory producers in this district, whose capacity is heavily taken up by open-hearth, blast furnace and blast furnace stove relinings. Even though virtually all the available blast furnace capacity in this district is now operating, there is strong likelihood that several active blast furnaces will of necessity be down for repairs at an early date. There have been several cases where hot spots have developed on stack linings which have been in blast continually for some time. All refractory brick prices are unchanged.

Behind the Scenes with STEEL

Boots to the Rescue

THROUGH courtesy of Charles McKnight of International Nickel's nickel sales department (what'll you take for a couple thousand nickels, Mac?) and R. E. Zimmerman of U.S. Steel, we are privileged to inspect what may easily be the greatest boon to industrial executives since the mechanical pencil and foithbinders.

Specifically, it is an automatic decider and committee eliminator, devised and perfected by Ed Boots of US Steel's commercial office. We hope he has no objections to our unveiling his invention to STEEL's 60,000 this way; we know many of them will find in the device alleviation from long years of suffering.

But, here, let Mr. Boots tell you about it in his own way:

"Success is invariably won by decisive leaders, men who have grouped around them capable executives who are courageous and skilled in their respective field. These leaders are expert in gaging the reliability of a man's counsel. They weigh it accordingly.

"In the eyes of such men, a committee is a futile and enervating phenomenon.

"For example, when 'Boss' Kettering was asked to subscribe for a monument to Lindbergh, he replied, 'Who is Lindbergh?' The answer came, 'Why, Charles E. Lindbergh, the first man to fly the Atlantic alone.' Mr. Kettering thought a moment, then said, 'Quite a feat, of course. But tell me, did he ever fly it with a committee?'

"When the average business executive is confronted with a 90-10 or 80-20 question, he doesn't appoint a committee—he makes the obvious decision, gets action and receives the stimulation that comes of viewing the successful culmination of one's own judgment.

"That begets assurance, fans the fire of confidence and further stimulates leadership.

"But what happens when it is a 50-50 question?

"Decision is delayed until time presses. Then to save face and give some evidence of action, a committee is appointed and the overhead begins. It's more fun sitting around the company table, smoking company cigars, than going out and tackling the competition. And because it is a close one, the minority boys have plenty of argument. Subcommittees may be formed if heat develops and when finally a 5 to 4 decision is passed back to the

boss, a permanent opposition has developed in some minds, which sets them against the successful operation of a half-hearted ruling.

"All of this is eliminated by the AUTOMATIC DECIDER. With the 'Yes' on one side and 'No' in all languages on the other, you can't go wrong in any language.

"Many religious individuals who would ask for divine guidance in their personal affairs are apt to ignore Providence on decisions that affect the lives of thousands of employes and stockholders.

"The AUTOMATIC DECIDER gives Providence an opportunity to function, for 'In God We Trust' is inscribed on the 'Yes' side. Or if you lean pagan-wise, we have canonized a new Goddess of Decision—MORNERVA—to guard your judgments.

"The DECIDER should be used only on close questions. Its regular use on such questions not only develops a desired confidence in the device, but in the owner himself.

"Its use for the solutions of all personal problems will be found a boon."

If you are real nice and write Mr. Boots a little note, pointing out how direly you need one of his DECIDERS, it is possible he can be persuaded to send you one, although we can't guarantee it. The supply is likely to be exhausted soon.

We have already used the DECIDER with telling effect. Along about 7 a. m. every morning we whisper, "Is it a good idea to get out of bed now?", flip the magic charm and wait. It comes up a "Nein" every time. Great work, Mr. Boots!

* * *

Convention Calls

EXTRA heft of this issue of STEEL is accounted for by the special insert, pages 69-108, signaling the forthcoming 32nd annual convention and 17th annual iron and steel exposition of the Association of Iron and Steel Engineers in Detroit, Sept. 22-25. A squint at the program on page 93 should be the tipoff to a conclave of the best technical brains in the industry.

* * *

Heady

HEADLINE OF THE WEEK: *Man Handling Is Too Expensive*—Mathews conveyor systems in the Aug. 24 issue. We know what you're thinking!

—SHRDLU

Ferroalloys

Ferroalloy Prices, Page 130

New York — Ferromanganese prices have been extended for fourth quarter at \$75, duty paid, Atlantic and Gulf ports, with no change contemplated in other ferroalloys. Shipments are holding up well, following the heavy movement of the past several months.

Coke By-Products

Coke By-Product Prices, Page 129

New York—The usually constant demand for various coke by-products continues to show little fluctuation. Due to a slight seasonal drop in household use of naphthalene demand is lighter from this source than during the summer. Phenol demand remains unchanged. Prices are unchanged.

Quicksilver

New York—Quicksilver prices continue strong but are still mixed and largely nominal. Supplies are limited here and demand light, being confined to small lots which are quotably \$85 to \$87 a virgin flask of 76 pounds, spot delivery. Sales have been made this week at \$86 to \$88, but at least one domestic seller maintains that he will continue to take regular customer business at \$80. Business at the latter price has not been reported.

Nonferrous Metals

Nonferrous Metal Prices, Page 130

New York — Copper consumers watched closely last week the sharp advance in foreign prices to new 5-year highs. Strength in metals on the London Metal exchange was attributed to purchases by France as a hedge against devaluation of the franc rather than to demand for actual consumption.

Copper — Producers here held prices firm at 9.75c, Connecticut, with the opinion widely held that the display of strength abroad is of a temporary nature. Copper and brass mills advanced product prices $\frac{1}{4}$ -cent and lowered discounts on extras on Thursday, Sept. 10. Fabricators stated this advance has no bearing on the virgin copper market but rather an aftermath of the general increase in mill workers' wages of 5 per cent. Buying increased here Thursday and Friday.

Lead — Consumption is expanding steadily and demand last week was active. Undertone of the market was strong but all first hands continued to quote on the basis of 4.45c, East St. Louis.

Zinc — Buying was routine following the buying wave of the preceding week. No definite moves have been taken by sellers to advance prices but this may occur if prices go much higher in London during the early part of this week. Prime western held unchanged at 4.85c, East St. Louis.

Tin — Prices fluctuated widely with easiness predominating toward the latter part of the week. Buying was generally light. Straits spot closed around 44.37 $\frac{1}{2}$ c.

Antimony—Prices held unchanged in a quiet market until Friday when American spot and futures declined $\frac{1}{4}$ -cent to 11.50c and 11.25c, respectively. Chinese futures also eased $\frac{1}{4}$ -cent to 9.50c, c.i.f. in bond New York, while spot held nominally unchanged at 12.50c, duty paid.

Canadian Imports from U. S. Show Decided Growth

Steel and steel products to the value of \$11,250,000 were imported into Canada during July. This compares with \$8,855,000 for July of last year. The value of imports from United States rose from \$6,175,000 to \$8,263,000. Machinery, the leading class of imports, had a value of \$2,230,000, against \$1,487,000 for the corresponding month of 1935. Other imports from the United States included automobile parts, \$1,010,000; farm implements, \$975,000; plates and sheets, \$833,000;

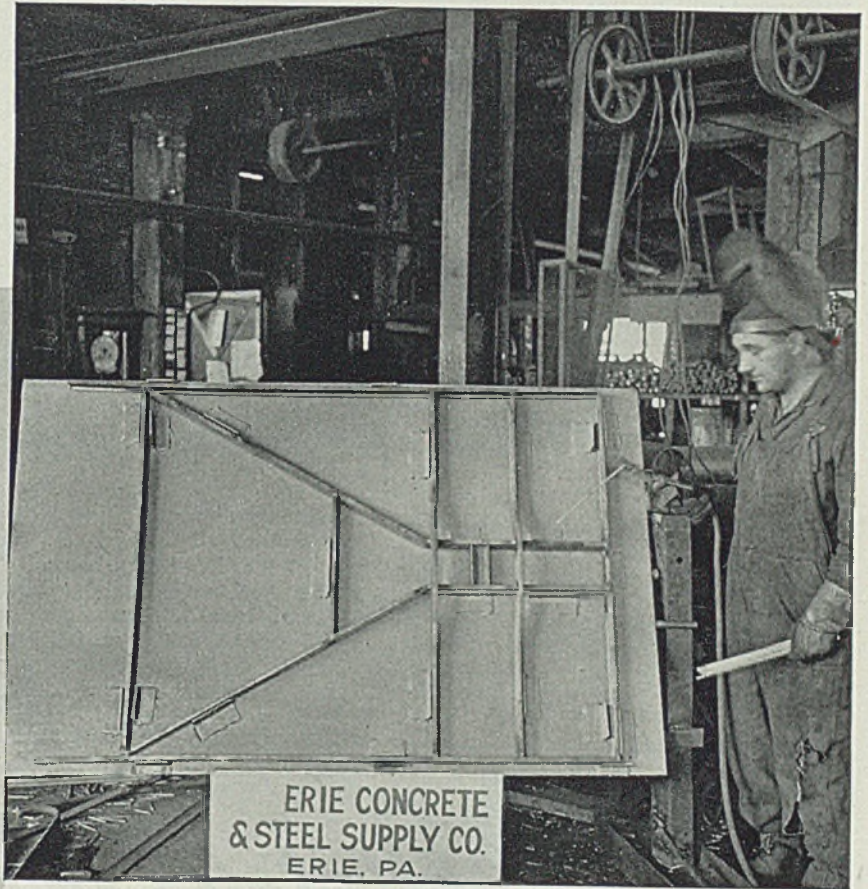
automobiles, \$528,000; rolling mill products (miscellaneous), \$508,000; engines and boilers, \$417,000; stamped and coated products, \$109,000; tools, \$101,000; castings and forgings, \$94,000; tubes and pipes, \$94,000; pigs and ingots, \$85,000; hardware and cutlery, \$70,000.

The month's exports, at \$4,979,000, were slightly below the July, 1935, total of \$5,010,000. Exports to the United States amounted to \$581,000, compared with \$542,000, the two leading items being pig iron and steel ingots, \$184,000, and farm implements, \$173,000.

J & L Builds Midget Mill For Research Workers

A miniature steelworks for developing discoveries of its research engineers will be constructed by the Jones & Laughlin Steel Corp., Pittsburgh. One of the first of its kind in the country, the midget plant will be equipped with actual steelmaking units on a small scale capable of duplicating operations in the big mills.

The construction of this miniature steelworks marks a new approach



WIRE BY PAGE—WORK BY ERIE CONCRETE & STEEL SUPPLY COMPANY Frame for Standard Trailer Co.

● Here is an excellent example of production welding done with Page Welding Electrodes by the Erie Concrete and Steel Supply Co., for the Standard Trailer Co.

The welding of these frames is done entirely with Page Welding Electrodes. It is but one example of many, where excellent results are being obtained.

The characteristics of these better electrodes are such as to assure high tensile strength, a high percentage of ductility, resistance to impact, fatigue and corrosion.

The local Page distributor who serves you carries an ample warehouse stock and can supply you promptly.



Page Steel & Wire Division of the American Chain Company, Inc.
Monessen, Pennsylvania

District Offices: New York, Pittsburgh, Atlanta, Chicago, San Francisco

In Business for Your Safety

PAGE Welding WIRE

to the use of research by industry, bringing it into a position of greater and more practical importance than ever before. In the past, it has been the general practice to turn over discoveries of research engineers to the regular manufacturing departments for testing and development.

Under this new system engineers will develop and test their ideas in the new "pilot plant" where they will have entire control of the miniature steelmaking equipment which will include an iron cupola, an open-hearth furnace, a bessemer converter, a blooming mill, and various finishing devices.

In addition to housing the "pilot plant," the present research staff and equipment will be transferred to the new building which will be constructed along Longworth street in the Hazelwood district, South Side, Pittsburgh.

With the transfer of present research equipment and the purchase of additional machines, the research department in the new building will include practically all the facilities known to science for testing and examining steel, making this department one of the most complete in the country. An enlarged staff of trained scientists and technicians will conduct the experiments. The new project is expected to be in operation by the end of 1936.

Better Cost Records Needed Under New Law, Expert Says

One result of the Robinson-Patman price law may be the hastening of better accounting methods and cost finding systems, in the opinion of

Dean F. W. Shumard, National School of Time Study, Nowalk, Conn.

"The new law," he says, "is not intended to regiment all industrial activities and prices, but it demands, if requested, an accounting of price differentials granted to certain customers and refused to others.

"A plant owner should know in detail exactly what each part and operation costs, not only from the direct labor standpoint, but from the indirect side as well. If his cost statements are complete, they will show actual costs and standard ones. Standard and actual costs, when accurately prepared, will reflect all plant activities by classifications, and besides offering management a better yardstick for measuring cost deviations, a control is likewise offered to keep the legal aspects of all endeavors within due bounds.

Safety Records Win Honors For Westinghouse Divisions

Safety records by two divisions of the Westinghouse Lamp Co., Bloomfield, N. J., recently won certificates of merit from the Newark safety council.

Over a period of nearly seven years, the warehouse and transport division, with a personnel of 100 employes, built up, as of last March 31, a record of 1,122,880 hours without a disabling accident. As of June 1 the record was still unbroken with a total of 1,155,000 man-hours.

The equipment and development division, with a personnel of 500, which established a national record last year, added another year to its record by setting up a total of 1,859,-

891 exposure hours as of March 31. Up to June 1 it had been increased to 1,994,000 man-hours.

Equipment

Pittsburgh — New 900-foot tin plate mill of Pittsburgh Crucible Steel Co., Midland, Pa., is rapidly preparing for commercial production of tin plate by the new electrofinning process (STEEL, July 6, p. 22). A week ago several large motor units were installed in the plant and already rolling tests of a satisfactory nature have resulted. The new mill will be able to produce coils up to 5000 pounds in widths up to 21 inches and in all standard tin plate gage thicknesses. The mill building, fabricated and erected complete by American Bridge Co., and the cold-rolling equipment, produced by the Cold Metal Process Co., Youngstown, O., have now been completed. Temporarily, some of the rolling facilities of the Follansbee Bros. Co. have been used for tests, but the new Pittsburgh Crucible plant will be self-contained at an early date.

Superior Steel Corp. here is nearing completion of alterations to its 14-inch mill at Carnegie, Pa., which includes the installation of new heating furnaces among other changes.

Builders of locomotive cranes are interested in inquiries from the St. Paul district army engineers for 18 traveling cranes to be placed on top of roller top dams now under construction.

Chicago—Delivery is becoming an increasingly important factor in machine tool sales. Those interests able to make earliest shipment generally are able to obtain orders in spite of price differences. Better used machine tools are few and buyers are unable to have their requirements satisfied promptly from this source of supply. In most instances machine tool builders have been unable to improve their deliveries during the past 30 days. August for some sellers was the best month so far this year.

While machinery and equipment orders from railroads are light, some roads are seeking prices for 1937 budget-making purposes. These prices are being requested earlier than usual and are taken to indicate the likelihood of better railroad buying next year. Allis-Chalmers Mfg. Co. is expected to close within the next two to three weeks on its large list pending for its new Springfield plant.

Seattle — Business continues active although it has declined from the mid-season peak. Alaska is still a heavy buyer, while highway machinery and logging equipment are moving in fair volume. Diesel engine makers report business quiet but prospects for an active fall and winter are good.



Whitey Sez:

All work, no play makes all men dumb bells. Do your playing at the American Welding Society stag and banquet, both held week of October 19. Good time assured.

Arc-Welding Electrodes

for welding all corrosion and heat resisting products. Send for data book.

MAURATH



INC

7300 UNION AVENUE · CLEVELAND

OHIO

Construction and Enterprise

Ohio

AKRON, O.—B. F. Goodrich Co. will build a tire manufacturing plant at Oaks, Pa. General construction contract has been given to Robert E. Lamb & Co., 841 North Nineteenth street, Philadelphia.

BEDFORD, O.—City plans construction of sewage treatment plant for which PWA has allotted \$70,360. Rollin F. MacDowell, Chester-Twelfth building, Cleveland, is engineer.

BERGHOLTZ, O.—Village considering construction of water distribution system to cost \$53,000. PWA grant and loan have been applied for. A bond issue will be submitted to voters at November election. Clarence Hackathorn is village clerk. Harrop & Hopkins, 541 Wood street, Pittsburgh, engineers.

CARROLLTON, O.—Village plans building sewage disposal plant costing \$50,000 to \$60,000, and voters will pass on issuance of bonds at November election. Arnold, Rosch & Hartline, New Philadelphia, O., are engineers.

CLEVELAND—City, division of water and heat, room 105, City hall, is taking bids due noon Sept. 18 for machine shop equipment, including two feed water heaters, one sump pump, three complete lathes and one milling machine.

CLEVELAND — Republic Steel Corp., C. M. White in charge of operations, Republic building, will build a new blast furnace on the foundations of present No. 4 stack, at a cost of over \$1,000,000. Arthur G. McKee Co., 2422 Euclid avenue, has general contract. Bids for materials will probably be asked about Nov. 10. (Noted Steel Sept. 7.)

COLUMBUS, O.—P. W. Maetzel, city engineer, City hall, will ask bids Sept. 29 for furnishing and installing nine motor driven horizontal centrifugal pumps costing \$30,000 in return pumping stations 1 and 2.

DAYTON, O. — Standard Register Co., Campbell street, plans to install electric power equipment in new addition to its plant, at a cost over \$100,000. Austin Co., 16112 Euclid avenue, Cleveland, is engineer.

EAST LIVERPOOL, O. — Council has authorized legislation for financing construction of proposed municipal power plant and distribution system at a cost of \$1,500,000. Bonds will be issued for \$825,000, and \$675,000 in federal funds will be sought. An election will be held in November on the bond issue.

ELMORE, O.—Village taking bids due noon Sept. 19 for alterations to light plant, including installation of new switchboard, transformers, meters, and change from 25 cycle to 60 cycle system.

FREMONT, O. — S. E. Hyman Co. plans installation of electric power equipment in new two-story addition to automobile fabricating plant of 18,000 square feet. Cost will be close to \$30,000.

HILLSBORO, O. — Intercounty Rural Electric Corp., J. E. Garrelson manager, plans erecting 170 miles of rural transmission lines to serve 781 customers in Clinton, Highland, Fayette, Ross and Pike counties.

REA has loaned \$253,200 for the purpose.

HURON, O. — City considering construction of new sewer system and pump house to cost about \$98,300. City engineer is Wilbert Henleman.

JEFFERSONVILLE, O. — Village plans building waterworks plant costing about \$61,000. A bond issue for village's share of costs will be submitted at November election, and WPA funds will be applied for in

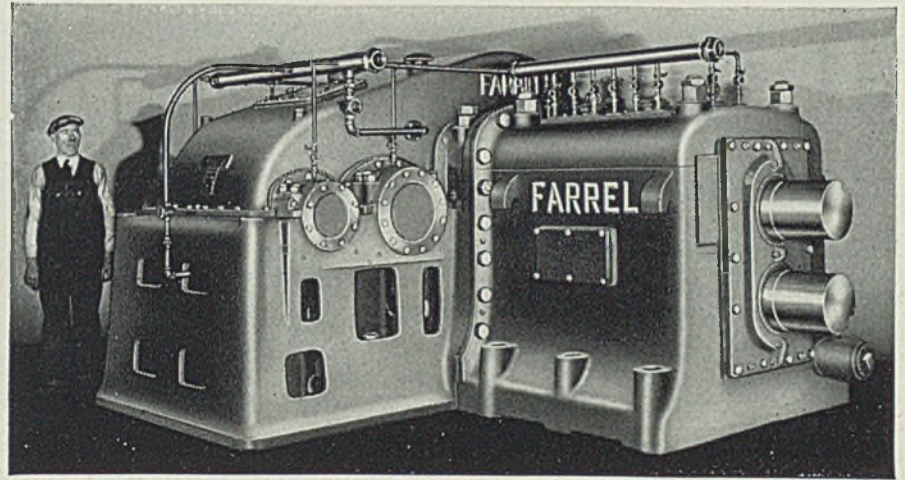
addition. Engineer is Marcus Shoup, Schmidt building, Xenia, O.

LEETONIA, O.—Mellinger Lumber Co. plans to rebuild lumber planing mill which was recently destroyed by fire.

LIBERTY CENTER, O.—Village plans complete waterworks plant and distribution system costing about \$53,000, voters having approved a bond issue of \$15,000 at a special election Sept. 1. Bryan Jennings is clerk of board of public affairs. Champe, Pinkbeiner & Associates, 1025 Nicholas building, Toledo, O., engineers.

MIDDLETOWN, O.—City is taking bids due noon Sept. 15 for chlorinator and ammoniator for Water street pumping station. W. J. Braun is city manager.

MILLERSBURG, O. — City will



SPACE-SAVING COMPACTNESS

THE ILLUSTRATION — 400 H.P. Double Reduction Drive with Integral Pinion Stand . . . Sykes continuous tooth herringbone gears and mill pinions . . . tapered roller bearings throughout, including main shaft center bearing of extra large thrust capacity . . . central lubricating system . . . built-in sprays for the gear teeth . . . flood lubricated bearings.

FARREL ROLLING MILL EQUIPMENT also includes: Rolling Mills—Chilled Iron and Special Alloy Iron or Steel Rolls—Universal Mill Spindles—Rod Mill Tables and Manipulating Equipment—Rod Collars—Lead Presses for Pipe or Rod—Roll Grinding Machines—Roll Calipers—Gears—Mill Pinions—Drives up to 10,000 H.P.

This combined drive and pinion stand is one of four Farrel-Sykes units recently installed for a high speed, four-high continuous cold mill.

Combining the double reduction drive and pinion stand in a single unit reduces the overall length—an advantage where floor space is limited.

The design provides for rigid connection of both units to assure permanence of alignment. Sykes generated gears and mill pinions, tapered roller bearings throughout and other features of design guarantee maximum efficiency . . . smooth, quiet operation . . . long life and trouble-free service.

This unit is typical of the advanced engineering applied to Farrel Heavy Duty Rolling Mill Drives. They are designed not only to meet the requirements of modern rolling mill practice but especially to fit the particular conditions in every individual case. *They are engineered to fit the job.*

Farrel engineers are available for consultation on your drive problems. No obligation, of course.

FARREL-BIRMINGHAM

Company, Inc.

110 Main St., Ansonia, Conn.—322 Vulcan St., Buffalo, N. Y.

vote at November election on issuance of \$50,000 bonds to finance construction of sewage disposal plant costing \$50,000. Arnold, Rosch & Hartline, New Philadelphia, O., engineers.

MORRISTOWN, O. — Village taking bids due noon Sept. 16 for equipment for waterworks system, including one 75,000-gallon sealed tank and tower and deep well plunger pump. Total cost estimated \$40,000. R. F. MacDowell, Chester-Twelfth building, Cleveland, is engineer; Helen Milner, village clerk.

WAYNESVILLE, O.—Village considering construction of sewage disposal plant and distribution system to cost \$89,000, of which village would supply \$20,000 through bond issue to

be voted on at November election. A. K. Day is mayor, Morton Shepard. Dayton Industries building, Dayton, O., engineer.

WELLSVILLE, O.—City is considering water system improvements, to include construction of filtration plant, though city council has temporarily shelved project. Engineer is Morris-Knowles Co., Westinghouse building, Pittsburgh.

WILLOUGHBY, O.—Village plans extending water distribution system and building booster pumping station at total cost of \$39,000. WPA will supply all labor and half of materials. Plans are being prepared by Paul D. Cook, county sanitary engineer, Painesville, O.

WOOSTER, O.—Board of control will probably ask bids in about 30 days for erection of 40,000-gallon storage tank costing \$15,000 at Kill-buck pumping station.

Michigan

DETROIT — Huron River Silica Co. plans construction of a \$170,000 modern chemical plant in northern Monroe county, near the Huron river at South Rockwood, Mich.

DETROIT — Precision Spring Corp. will build a 150-foot factory building costing \$80,000 on North Wilson avenue. Austin Co., 248 General Motors building, has general contract.

DETROIT — Giffels & Vallet Inc., 606 Marquette building, L. Rossetti associate, engineers and architects, are preparing plans for alterations to pressed steel buildings at Ford Co. Rouge plant. Giffels & Vallet also are in charge of plans for new steel mill foundations and building alterations for an unnamed Detroit manufacturer and for a new boiler installation for a Detroit steel company.

FLINT, MICH. — City engineering department, O. K. Phillips chief engineer, has completed plans for construction of a 200 x 200 feet water softening plant, two stories, at a cost of \$500,000, and bids will be asked after Sept. 20. Shoecraft, McNamee & Drury, American Savings Bank building, Ann Arbor, Mich., engineers. (Noted STEEL Aug. 24.)

GRAND HAVEN, MICH. — Board of public works has authorized expenditure of \$178,000 to double capacity of municipal power plant. Largest single item will be for a \$125,000 diesel engine to drive a 1600-kilowatt generator.

GRAND RAPIDS, MICH. — Winged Home Trailer Co. has been incorporated to manufacture domestic and commercial trailers of all kinds. Walter J. Conlon, 311 North Scoville avenue, Oak Park, Ill., is correspondent.

GRAND RAPIDS, MICH. — Air Reduction Co., 60 East Forty-second street, New York, is starting construction of a factory unit on property adjacent to the Fisher Body Corp. plant.

MENOMINEE, MICH. — Signal Electric Mfg. Co. has started construction of a two-story, \$20,000 plant addition, for manufacturing electric fans and other electrical appliances. O. H. Henes is secretary and general manager.

MIDLAND, MICH. — Council has approved plans for extensions and improvements to municipal power plant, to include installation of motor driven pumping units and accessory equipment, costing \$85,000. City engineering department is in charge.

MUSKEGON, MICH. — Muskegon Motor Specialties Co. plans installation of electric power equipment in one-story addition to automobile crankshaft and camshaft manufacturing plant. Cost will be about \$40,000. Benjamin & McLaughlin, 203 Watson building, Grand Rapids, Mich., are architects.

Illinois

CHICAGO — Fleishmann Malting Co., 327 South LaSalle street, plans construction of a \$400,000 five-story malt factory at 2136-46 West Fifty-second street.

CHICAGO—Poldi Steel Corp., Prague, Czechoslovakia, large European steel producer has leased a building at 1724 Carroll avenue for an American branch. Paul Kruger will be manager.

CHICAGO—Chicago Aul Co., 404



● It's as simple as that. Hotel Cleveland adjoins this city's big Union Passenger Terminal. And when you're here, you're at the heart of Cleveland's business (daytime) and pleasure (night-time) life.

You save time and taxi fare getting to your hotel from the train and from hotel to any place in the city you're likely to visit.

Of course, convenience is only one of the many reasons you'll like Hotel Cleveland. The exceptional food is another and perhaps the chief reason is the atmosphere you'll find that this is *your* hotel . . . everyone from doorman to manager makes you feel very welcome and very much at home. Try it, and you'll enjoy it.

Rooms from \$2.50 for one,
\$4 for two

HOTEL CLEVELAND
Cleveland

OFF THE TRAIN
UP THE RAMP
STEP INTO *Comfort* AT
Hotel Cleveland

East Seventy-ninth street, has been incorporated to manufacture tools, dies, castings, etc., by Victor M. and Josephine F. Johnson and William G. Malmer. Correspondent is Jack Rosen, 160 North LaSalle street.

CHICAGO—Boldi Steel Co., 1404 Harris Trust building, has been incorporated by I. V. Cage, Fern Ferguson and R. Van Arsdale. Correspondent is Chapman & Cutler, 111 West Monroe street.

CHICAGO — Gas-O-Machine Products Co., 2532 West Irving Park boulevard has been incorporated by Fred Stoneberg and Harry J. Shintz, to manufacture apparatus, machinery and electrical products. Mr. Shintz is correspondent, 139 North Clark street.

EVANSVILLE, ILL.—City plans construction of waterworks and sewage system and either PWA or WPA aid will be sought. J. G. Cooney, 3303 Roland avenue, Belleville, Ill. is engineer.

QUINCY, ILL.—Gardner-Denver Co., South Front street, is building a new foundry building costing \$250,000, and machinery is expected to cost \$100,000.

SPRINGFIELD, ILL. — T. L. Arzt Foundry Co., 2300 Bloomingdale avenue, has been incorporated by T. L. Arzt, Leo S. Sikunski, and Joseph M. Arzt, to carry on a general foundry and machine shop trade. Correspondent is P. F. Murray, 716 Ashland block.

Indiana

ELKHART, IND.—Committee of city counsel has recommended that city establish its own electric generating plant, which might be built in city waterworks pumping station.

INDIANAPOLIS—Universal Corp., 254 North Capitol avenue, has been organized to manufacture rotary motors, engines and motor vehicles. Charles M. Tumey, same address, is correspondent.

INDIANAPOLIS—International Harvester Co., 606 North Michigan avenue, Chicago, plans installation of power equipment in branch plant on West Washington street here. The branch will have 100,000 square feet of floor space and will cost \$125,000. Company engineers are in charge.

KOKOMO, IND. — Continental Steel Corp. plans expenditures of \$300,000 for plant extensions during the coming fiscal year. D. A. Williams is president.

KOKOMO, IND. — Gowdy Boiler factory, William Gowdy owner, was damaged by fire recently.

MUNCIE, IND.—Kuhner Packing Co., Thirteenth and North Elm streets, plans constructing disposal plant. C. Hurd, 1039 Architects building, Indianapolis, is engineer.

PORTLAND, IND. — Board of public works will ask bids soon for extensions and improvements to municipal power plant, to include purchase of 3500-kilowatt turbogenerator and auxiliary equipment, and a fund of \$192,000 has been arranged with federal aid. Bevington-Williams Inc., Indiana Pythian building, Indianapolis, is engineer.

New York

ALBANY, N. Y.—C. A. Holmquist, director of sanitation, division of state health department, State building, has recommended construction of sewage disposal plants costing around \$25,000 in the following cities throughout New York state: Amsterdam, Clinton, Illion, New York Mills, Old Forge, Oriskany Falls and Sher-

ill. Either PWA or WPA aid may be sought in all cases.

BUFFALO—Henry & Henry Inc., 304 Michigan avenue, is taking bids for construction of factory building and boiler house at 1208 Northland avenue. H. E. Plumer & Associates, 775 Main street, are engineers.

BUFFALO—Iroquois Brewing Co., 230 Pratt street, plans building brewery addition costing about \$37,000. J. Schultz & Son, 1370 Main street, are engineers in charge.

BUFFALO—Fedders Mfg. Co., 57 Tonawanda street, will ask bids sometime in September for construction of boiler house, to include installation of boilers, automatic stokers, and other mechanical equipment.

at a total cost of \$50,000. Industrial Planning Corp., 27 Delaware avenue, is engineer in charge.


CARTHAGE, N. Y. — National Paper Products Co. plans installing electric power equipment in 225 x 235-foot addition to paper products mill. Cost will be over \$200,000. G. E. Emigh is superintendent.

LOCKPORT, N. Y.—Simonds Saw & Steel Co., Ohio street, A. Gould manager, is taking bids for construction of a foundry costing over \$37,000.

NIAGARA FALLS, N. Y.—E. I. duPont de Nemours & Co., Buffalo avenue, is taking bids for building a boiler house costing around \$40,000.

ONEIDA, N. Y.—City plans con-

SMOOTH ACCELERATION . . .
POSITIVE SYNCHRONIZATION
• REMOTE CONTROL • UNIFORM
TORQUE • DEPENDABLE • SAFE •
• POSITIVE ACTION



MODERN MACHINES DEMAND MODERN MAGNETIC POWER TRANSMISSION

Smooth pick-up of the load, increasing speed without shock, holding a uniform torque, instantly disengaging . . . these are but a few of the many advantages exclusive to Stearns Magnetic power transmission. Magnetic clutches in standard

sizes ranging from 3 inches in diameter (torque rating 40 in. lbs.) to 46 inches diameter (torque rating 60,900 ft. lbs.); and Magnetic clutch and brake combination units available in a wide range of sizes and ratings. Investigate for your drives, write.

STEARNS MAGNETIC

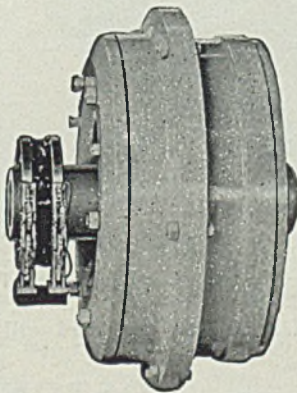
Mfg. Co.
FORMERLY MAGNETIC MFG. CO.
650 S. 28th Street
Milwaukee, Wis.



MAGNETIC CLUTCHES AND BRAKES

HEAVY DUTY MAGNETIC CLUTCH

Stearns Magnetic Clutch of the type installed on power presses at Chrysler motor. Operate in conjunction with Stearns Magnetic Brakes for completely safe operation of tremendous power presses.



Since
1903
BRIGHTON
Fire Brick

No matter how large, or how small your requirements may be—no matter how quickly they must be met, Brighton will meet them with an unfailing and highly personalized service.

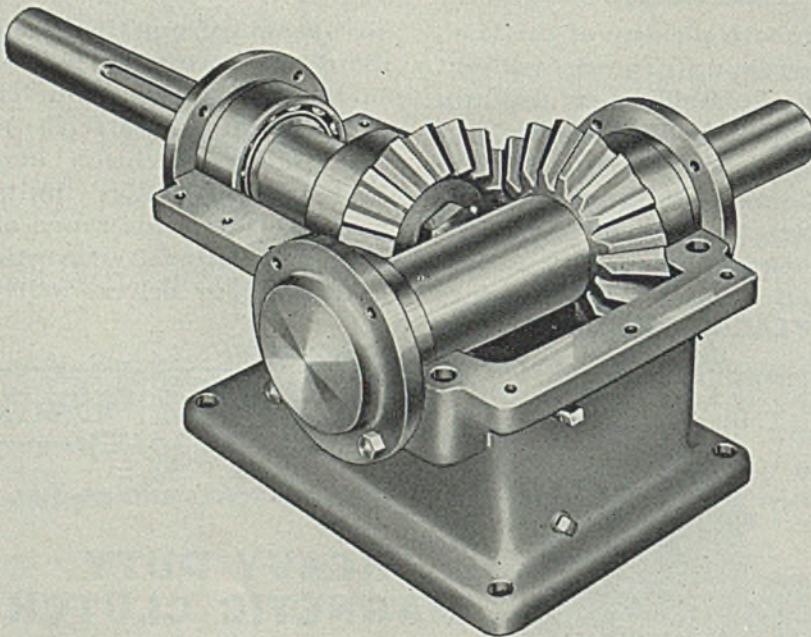
For 33 years Brighton has withstood the ravages of wars and depressions. Brighton has been tested by time. Specify Brighton on your next order.

BRIGHTON FIRE BRICK CO.

New Brighton, Penna.

Phone 1220

GRANT SPEED REDUCERS



Another example of Grant's complete line of Reduction Units, Mitre and Bevel Gear Reducers. Three stock sizes, 1 to 22 h.p.

Your inquiries for any type of stock or special reducers or gears will receive prompt and cheerful attention.

GRANT GEAR WORKS — BOSTON

struction of filtration plant costing over \$23,000. Either PWA or WPA aid will be sought.

ROCHESTER, N. Y.—Haloid Co., 6 Haloid street, will construct soon a plant addition costing about \$35,000. S. Firestone, 61 South avenue, is engineer.

TOTTENVILLE, N. Y.—S. S. White Dental Mfg. Co., 211 South Twelfth street, Philadelphia, will install electric power equipment in four-story factory addition at Princes Bay, Tottenville. Cost will be about \$100,000.

VERNON, N. Y.—City plans building filtration plant costing around \$23,000, and will seek either PWA or WPA aid.

New Jersey

LINDEN, N. J.—General Motors Corp., General Motors building, Detroit, will build a new assembly plant here to cost \$5,575,000 when fully equipped. It will have a capacity of 120,000 automobiles a year. W. S. Roberts of Detroit will be plant manager.

PLAINFIELD, N. J.—Condenser Corp. of America, 257 Cornelison avenue, Jersey City, N. J., and its subsidiary, Cornell-Dubilier Corp., 4401 Bronx boulevard, New York, manufacturers of radio condensers, etc., plan installation of electric power equipment in plant at South Plainfield, where the former factory of the Spicer Mfg. Co. has been acquired.

Pennsylvania

LEECHBURG, PA.—Penn Glenn Oil Works, Todd Glenn president. First street, plans building paint plant. E. Cook, 217 Broad building, New Kensington, Pa., is engineer.

MYERSTOWN, PA.—Council is planning municipal electric light and power plant at an estimated cost of \$152,700, with federal funds of \$68,700.

PHILADELPHIA—Frankford arsenal, ordnance department, is taking bids until Sept. 21 for a plain punch press, invitation 314-37-87, and for automatic screw machines, invitation 314-37-88.

PITTSBURGH—L. M. Johnston, director public works, city-county building, plans installation of one pulverized coal burning boiler, with automatic stoker and coal and ash handling equipment, for Diamond Market building. H. E. D. Johnson is city engineer.

Connecticut

ROCKVILLE, CONN.—M. T. Stevens & Sons Co., North Andover, Mass., plans installation of electric power equipment in new two-story dye house at branch textile mill at Rockville, to be 50 x 180 feet, costing \$75,000.

Massachusetts

BOSTON—E. L. Snyder, 15 Kneeland street, is taking bids for construction of a diesel engine power plant, to include installation of three diesel electric sets of 150-kilowatts each. R. R. Burnham, 38 Chauncey street, is engineer.

Maine

SKOWHEGAN, ME.—Skowhegan Water Co., care of Northeast Water & Electric Service Corp., Howe avenue, Millbury, Mass., is taking bids for construction of filtration plant.

Alabama

BESSEMER, ALA.—Flower Valve &

Foundry Co. will spend \$1,250,000 for remodeling plant of Bessemer Foundry & Machine Co., recently purchased. Machinery will be installed for manufacturing valves, hydrants and other specialties in addition to regular foundry work.

BIRMINGHAM — Tennessee Coal, Iron and Railroad Co. plans extensions and improvement in steam power plant at No. 2 works at Fairfield, near Birmingham. This work will be in conjunction with expansion and modernization of coke plant, including installation of new oven units and other equipment at a cost of over \$1,500,000. J. L. Perry is president.

DOTHAN, ALA. — City will ask bids soon for constructing \$48,000 sewage disposal plant. E. H. Stewart is city engineer, City Hall.

FAIRFIELD, ALA. — City council considering ordinance calling for a special election Sept. 21 to pass on question of city acquiring and operating a municipal light and power system.

Kentucky

CATLETTSBURG, KY. — Carbide & Carbon Chemical Corp., 30 East Forty-second street, New York, subsidiary of Union Carbide & Carbon Corp., proposes to install heavy duty motors and other electrical equipment, electric hoists and conveyors in a new plant here. Total project, including a compressor plant, will cost about \$1,000,000.

GREENBRIER, KY. — Old Greenbrier Distillery Co. proposes to build a \$100,000 power house at the distillery. J. F. Conway and C. E. Keith, Bardstown, Ky., are organizers of this new firm.

LEXINGTON, KY. — City may revise plans for a waterworks system and asks PWA for \$1,614,455. Original application was rejected.

LOUISVILLE, KY. — Union Sand & Gravel Co. seeks permission from the war department to construct an unloading pier on the Ohio river near Uniontown, Ky.

OWENTON, KY. — City plans construction of electric power plant, and will vote on issuance of \$75,000 bonds.

Missouri

BOONEVILLE, MO. — Voters have authorized issuance of \$75,000 bonds for installation of water softening and filtration unit at city water plant.

COLUMBIA, MO. — Boone County Co-operative Electric association, F. H. Henderson president, plans construction of 127 miles of rural electric lines to cost \$65,000. Baumes, McDevitt Co., Railway Exchange building, St. Louis, engineer.

HINE, MO. — St. Louis County Water Co., 6600 Delmar boulevard, University City, Mo., plans construction of water filtration plant adjacent to high pumping station on Missouri river, at estimated cost of \$750,000.

POPLAR BLUFF, MO. — Board of public works will receive bids Sept. 16 for furnishing steam boiler stoker and auxiliary equipment for municipal power plant. Other equipment needed will be one 400-horsepower cross drum water tube boiler, spreader type coal stoker, boiler feed water heater, and instruments and combustion control. Hugo L. Boeving is president of board of public works. (Noted STEEL Sept. 7.)

ST. LOUIS — Griesedieck Bros. Brewing Co., 1920 Shenandoah avenue, plans installation of electric power equipment, mechanical handling equipment, and other machinery in two additions

A STUDY IN "BLACK AND WHITE"



MOUNTING costs in both labor and materials are in part, responsible to the manufacturer's consistent switch to steel stampings. Not only have stampings proved themselves economically correct, but they have become more practical in application.

To justify this lower stamping cost, your product must be studied by men thoroughly skilled in stamping practice and backed by a plant modernly equipped with presses of great productive range . . . These are *your* facilities at Parish and Parish welcomes *your* blue-prints and specifications.

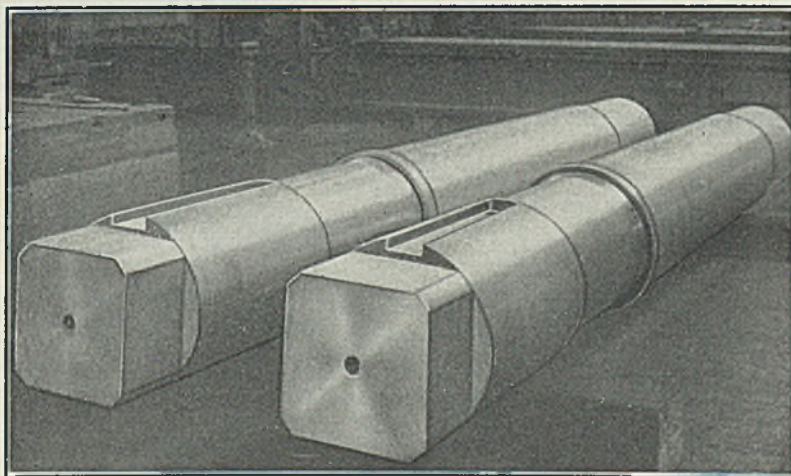
PARISH PRESSED STEEL CO.

Specialists in difficult stamping design

Robeson & Weiser Sts., READING, PA.

Pacific Coast Rep.: F. Somers Peterson Co., 57 California St., San Francisco, Cal.

QUALITY FORGINGS



17,000 lb. Sugar Mill Shaft

**Rolled Steel Wheels — Rolled Steel Rings and Flanges
Forgings — Steel Castings — Steel Tires
Springs — Gear Blanks**

STANDARD STEEL WORKS COMPANY

BURNHAM, MIFFLIN CO., PENNA.

District Offices

New York

**Philadelphia
Portland, O.**

**Chicago
St. Louis**

San Francisco

to brewery. One addition is to be four-story, 60 x 60 feet, the other two-story, 90 x 100 feet. Total cost will be over \$125,000. Janssen & Janssen, Chemical building, St. Louis, are architects.

ST. MARY'S, MO.—City will ask bids probably in September for constructing waterworks and distribution system costing \$30,000. Russell & Axon, Roosevelt building, Delmar boulevard, St. Louis, engineers.

Arkansas

BENTON, ARK.—City will spend approximately \$36,000 for construction of new waterworks plant.

EL DORADO, ARK.—Lion Oil Re-

fining Co. will install power equipment, pumping machinery, and other mechanical equipment in new addition to lubricating oil works. Bids will probably be asked some time in September, and cost is estimated at \$140,000. J. J. Allison & Associates, El Dorado, are engineers in charge.

HAMPTON, ARK.—City plans expenditure of about \$27,000 for constructing new waterworks plant.

MOUNTAIN HOME, ARK.—City plans building new waterworks plant at cost of \$34,545.

Oklahoma

BLACKWELL, OKLA.—Turvey

Brothers plan enlarging machine shop, erecting additions and improving present plant.

EDMUND, OKLA.—Phillips Petroleum Co., Bartlesville, Okla., plans constructing gasoline absorption plant costing \$200,000. A. H. Rivey, Bartlesville, is consulting engineer.

HOLDENVILLE, OKLA.—City plans making waterworks improvements, including installation of emergency pump, at total cost of \$60,000.

PENSACOLA, OKLA.—United States engineers are surveying possibilities of building proposed \$16,000,000 power project on Grand river in northeast Oklahoma. J. Howard Langley, Pryor, Okla., is chairman of Grand River Dam Authority. Col. E. R. Reybold is district engineer, Memphis, Tenn.

Texas

CORPUS CHRISTI, TEX.—Corpus Christi Refining Corp., J. F. Whitehurst vice president and general manager, plans building refinery with capacity of 5000 barrels daily, at a cost of \$150,000. The same corporation also plans construction of a vapor recovery plant with a capacity of 1,500,000 cubic feet daily, at a cost of \$100,000.

ELDORADO, TEX.—City will ask bids soon for construction of municipal waterworks to cost approximately \$70,000, with PWA aid of \$47,000 likely. H. R. F. Holland, Frost building, San Antonio, Tex., engineer.

GEORGETOWN, TEX.—City council is planning extensions and improvements to municipal power plant, including installation of new diesel engine generating unit and accessory equipment. A bond issue of \$60,000 has been arranged. Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, Mo., engineer.

PARIS, TEX.—City has voted bonds of \$60,000 to finance construction of sewage disposal plant. Hawley, Freese & Nichols, Capps building, Ft. Worth, Tex., is engineers.

PORT ISABEL, TEX.—City plans repairs and improvements to pumping station along Rio Grande river. T. Hunt is mayor, City hall, and A. Tamm is engineer. Irrigation building, Harlingen, Tex.

WESLACO, TEX.—Rio Grande Valley Citrus Growers association plans construction of \$40,000 citrus processing plant, 100 x 200 feet.

Wisconsin

CENTER VALLEY, WIS.—Ontagmie Producers Co-operative association, care of Klingler & Becker, Amery, Wis., architects, plans installation of electric power equipment in two-story milk and dairy products plant at cost of \$75,000.

HUDSON, WIS.—City plans installation of \$10,000 pumping equipment in waterworks plant. Banister Engineering Co. 510 North Prior avenue, St. Paul, is engineer. G. R. Horsford is city clerk, City hall.

MEDFORD, WIS.—Hurd Millwork Corp., Harry Hurd, president, plans immediate construction of a new sash and door factory to replace plant recently destroyed by fire.

Minnesota

AUSTIN, MINN.—George A. Hormel & Co., meat packer, plans installation of

**ROTARY
KNIVES
SHEARING
... BLADES**

There is a BRAEBURN KNIFE for every shearing problem, whether hot or cold, billets or blooms, bars or sheets.

With our years of experience in the manufacture and heat treatment of alloy and tool steels, we are well equipped to SPECIFY and furnish rotary knives and shear blades for any purpose.

Write for our recommendations.

**BRAEBURN ALLOY STEEL
CORPORATION**

Braeburn (Pittsburgh District) Penna.



**PLAN
YOUR INVESTMENTS**

To advance sound theories of Planned Investment Programs, as opposed to random security purchases and sales, Brookmire has developed two Planned Investment Programs adaptable to the individual investor.

Both portfolios are selected to secure maximum participation in current economic developments through diversified investments in common stocks. In one Program *income* is paramount, while the other is devoted solely to *capital enhancement*.

Write for complimentary copy of Bulletin 57J

BROOKMIRE

Corporation — Investment Counselors and
Administrative Economists — Founded 1904
551 Fifth Avenue, New York

four new ice-making machines, each of 30 tons capacity per day, in freezer plant.

BRAHAM, MINN. — Pick Co-operative Electric association has been allotted \$81,000 of REA funds for construction of 80 miles of electric lines to serve 236 farms in Pine, Isanti, Chisago and Kanabec counties.

CHASKA, MINN. — City will take bids Sept. 22 for a motor driven deep well turbine pump and for a centrifugal motor driven pump.

CHATFIELD, MINN. — Village plans construction of a municipal light and power plant costing \$100,000. R. M. Culvert is village clerk.

CHISHOLM, MINN.—Village plans construction of municipal power plant to cost over \$75,000. F. Centa is village clerk.

HOPKINS, MINN. — Council is arranging for federal aid as part of cost of \$217,500 for new proposed municipal power plant, which will include installation of diesel engine generating units and accessories. Power Engineering Co., Metropolitan Life building, Minneapolis, is engineer.

NORTHFIELD, MINN. — St. Olaf College, L. W. Boe president, plans power plant addition with installation of equipment, costing \$185,000. C. Hodgdon, 111 West Monroe street, Chicago, is engineer.

PLAINVIEW, MINN. — Village plans building sewage disposal plant costing about \$105,000, and PWA aid has been sought. Burlingame & Hitchcock, 526 Sexton building, Minneapolis, are engineers. I. M. Richmond is village clerk.

SPRING VALLEY, MINN.—City has voted for \$25,000 bond issue to finance part of cost of construction of planned sewage disposal plant, with PWA possibly supplying rest of cost. J. N. Ostrud is village clerk, E. G. Briggs engineer, 1957 University avenue, St. Paul.

ST. PAUL, MINN. — Morris Rifkin & Son, 227 North Fifth street, Minneapolis, will construct a packing plant to cost \$100,000, including a metal stack and conveyors.

VIRGINIA, MINN. — City plans purchase of new generating equipment for municipal light plant to cost \$100,000. M. C. Bright is superintendent of water and light department.

Kansas

WELLINGTON, KANS.—Public Utilities department, E. W. Merrifield superintendent, plans extensions and improvements in municipal power plant, including installation of turbogenerator and accessory equipment, costing \$125,000. Black & Veatch, 4706 Broadway, Kansas City, Mo., are engineers.

North Dakota

MARMARTH, N. DAK. — Montana-Dakota Utilities Co. will build a compressor plant to compress natural gas from oil wells near here.

South Dakota

BIG STONE CITY, S. DAK.—City plans installation of new water distribution system to include construction of pump house and storage tank

at total cost of \$50,000. Federal aid is being sought. Dakota Engineering Co., Mitchell, S. Dak., engineer.

JAVA, S. DAK.—City plans new water system to include construction of pump house and storage tanks at cost of \$40,000. PWA aid is sought. Dakota Engineering Co., Mitchell, S. Dak., engineer.

PIERRE, S. DAK. — Edward Quinn will build a one-story machine shop, 36 x 100 feet.

Iowa

ALTA, IOWA — Village will take bids Sept. 21 for construction of new power plant building and for one diesel engine generating unit of either 375 or 450-

horsepower. Buell & Winter Engineering Co., Insurance Exchange building, Sioux City, Iowa, engineer.

CENTERVILLE, IOWA — Rathbun Coal Co., Roy Harbour manager, plans immediate construction of a new mine tipple.

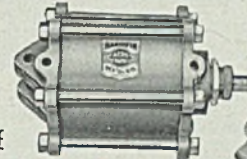
DAVIENPORT, IOWA—City has made preliminary plans for construction of \$800,000 sewage disposal plant and has applied for \$385,000 PWA grant. Consoer, Townsend & Quinlan, 205 West Wacker drive, Chicago, are engineers.

DES MOINES, IOWA — Des Moines Street Railway Co., 114 Eleventh street,

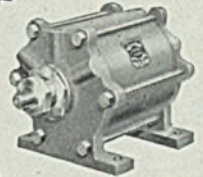
(Please turn to Page 159)

"LEAKPROOF" ...

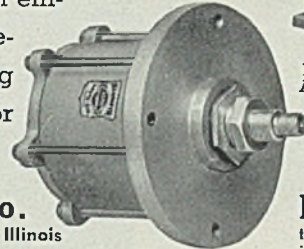
Hannifin outside adjustment of piston packing means correct adjustment, sustained high efficiency piston seal, and reduced friction, assuring maximum power. Write for Bulletin 34-S.



Model BR—Double Acting Air Cylinder



Model CR—Double Acting Air Cylinder



Model IR—Double Acting Air Cylinder

HANNIFIN MFG. CO.
621-631 So. Kalmar Ave., Chicago, Illinois
ENGINEERS • DESIGNERS
MANUFACTURERS
Pneumatic and Hydraulic Production Tool Equipment

EIGHT mounting types, sizes 1 to 16 inch bore, for any length stroke. Other sizes to order. Single acting and double acting types.

HANNIFIN "Leak-Proof" AIR CYLINDERS

more tonnage

with the

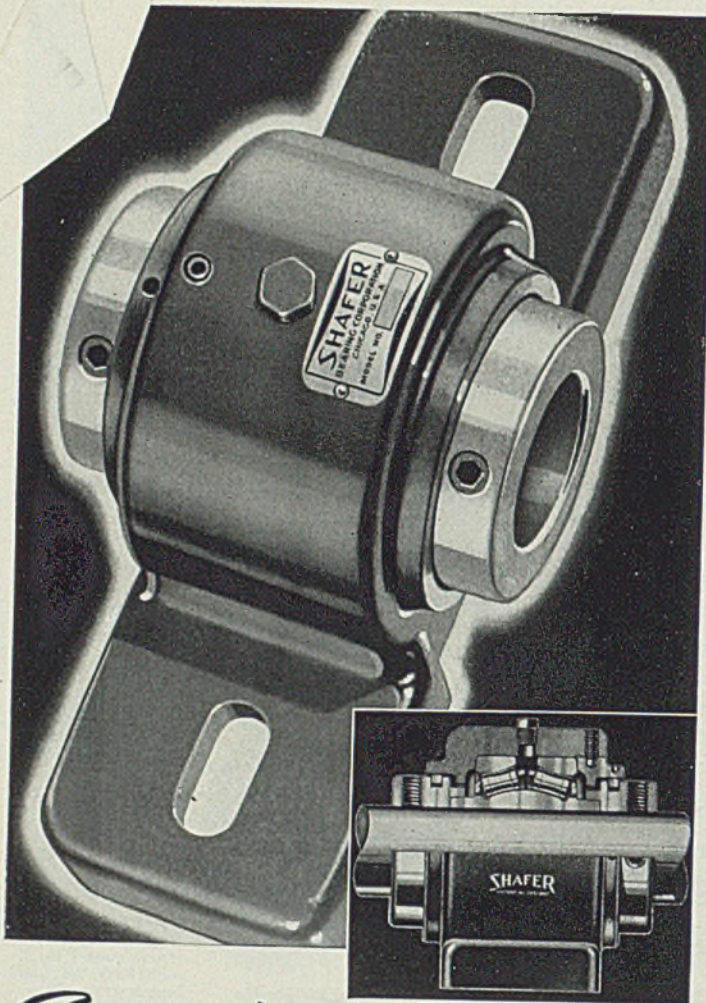


See the Houghton Line of industrial oils, leather belting, leather packings, and metal working products, in **BOOTHS No. 214 and 215 at the IRON and STEEL SHOW, Detroit, Mich.**

Rod Mill Belt

Used in leading steel mills because it insures uninterrupted production and decreased cost per ton of steel. For full details write to E. F. HOUGHTON & CO., 240 W. Scmerset St., Philadelphia, Pa.

THE HOUGHTON LINE OF INDUSTRIAL OILS AND LEATHERS



Everything you need
in a PILLOW BLOCK!

All the performance features an industrial bearing should have are brought together in the compact, easily installed Shafer Pillow Block. The exclusive design of Shafer self-aligning Roller Bearings used in these pillow blocks combines

1. Generous capacity for radial, or thrust, or combined radial-thrust loads.
2. Integral self-alignment.
3. Simple adjustability.

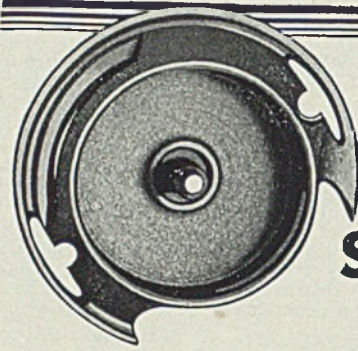
Thousands of users have found that this exclusive combination of features in Shafer Bearings assures consistent, superior bearing service even under the most difficult operating conditions. Only Shafer offers the simple **CONCAVE** roller design that maintains efficient roller bearing action under all conditions.

Shafer Pillow Blocks are available in a full range of sizes from 11/16 to 12 inch bore, for light, medium, and heavy duty, and in all types of mountings. Also Flange Units, Cartridge Units, Duplex Units, Take-up Units, Hanger Boxes, Conveyor Rolls, Radial-thrust Roller Bearings. Write for Catalog 12-A.

SHAFER BEARING CORPORATION
 6535 West Grand Avenue - - - Chicago, Illinois

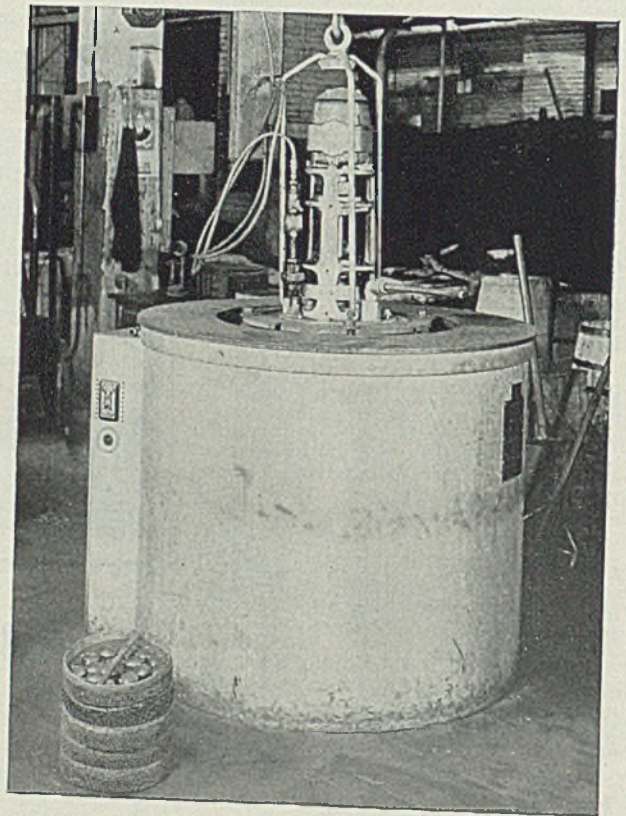


SELF-ALIGNING ROLLER BEARINGS



**SHUTTLES
 AND
 HEVI DUTY FURNACES**

The intricate Rotary Shuttle on the White Sewing Machine is selective carburized in an HD 1020 Electric Vertical Retort Carburizer. The use of this furnace not only saves four operations, but carburizes the shuttles with less distortion than by other methods.



Hevi-Duty Vertical Furnace in the plant of White Sewing Machine Co., Cleveland, Ohio

Send for Bulletin No. 931A, it describes the Electric Vertical Retort Carburizer.

TRADE MARK
HEVI-DUTY
 REG. U.S. PAT. OFF.

HEAT TREATING FURNACES
 « ELECTRIC EXCLUSIVELY »

HEVI-DUTY ELECTRIC CO.
 MILWAUKEE WISCONSIN

(Continued from Page 157)

C. W. Gifford president and general manager, plans installation of new boilers in its power plant.

HAMPTON, IOWA — Franklin County Rural Electric Co-operative has been allotted \$418,000 REA funds for construction of 418 miles of rural transmission lines to serve about 1357 farms in Franklin and Cerro Gordo counties.

HARLAN, IOWA—Shelby County Rural Electric Co-operative, Harlan, plans constructing rural transmission lines in Shelby, Cass, Harrison and Pottawattamie counties. REA has allotted \$267,500 for project.

HUMBOLDT, IOWA — Humboldt County Rural Electrification association has been allotted \$245,000 REA funds for construction of 259 miles of rural electric lines to serve 680 farms in Humboldt and Kossuth counties.

MUSCATINE, IOWA — Northern Gravel Co., Co., E. W. Boynton president, will rebuild its plant which was recently destroyed by fire.

ONAWA, IOWA — City will take bids Sept. 24 for construction of municipal power plant to cost \$130,000, including installation of two 625-horsepower diesel engines. Buell & Winter Engineering Co., Insurance Exchange building, Sioux City, Iowa, engineers.

ROCKWELL CITY, IOWA—Calhoun County Rural Electric Co-operative, Rockwell City, plans erection of 287 miles of transmission lines in Calhoun, Webster, Carroll and Sac counties. REA has allotted \$278,000.

WEBSTER CITY, IOWA — Valley Bronze & Machine Works, castings manufacturers, formerly of Valley Junction, Iowa, has leased a factory building here and will install equipment. Howard A. and George Wilhelm are proprietors.

Nebraska

BASSETT, NEBR.—City has applied to WPA for grant to meet part of cost of construction of planned sewage disposal plant costing \$35,000. Scott & Scott, Lincoln, Nebr., are engineers.

BEEMER, NEBR. — Cummings County Rural Power Plant district, O. R. Toman engineer, plans constructing 300 miles of transmission lines in county.

COLUMBUS, NEBR. — City voted at election August 20 for \$250,000 bond issue to finance construction of a municipal electric distribution system, electricity to be obtained from the Loup River Public Power district.

HASTINGS, NEBR.—South Nebraska Rural Power Plant district, O. R. Toman engineer, plans erecting 500 miles of transmission lines in district, costing \$486,000.

LINCOLN, NEBR. — Lancaster County Rural Power Plant district, G. E. Johnson engineer, Hastings, Nebr., plans erection of 330 miles of transmission lines in county.

OMAHA, NEBR.—Metropolitan Utilities district, T. A. Leisen chief engineer and general manager, Harney and Eighteenth streets, will purchase a 30,000,000-gallon electric pump to be installed at the Florence pumping station.

Colorado

CRAIG, COLO.—City has made preliminary plans for constructing

filtration plant costing \$20,000. B. Lowther, 710 Colorado building, Denver, is engineer.

Montana

BILLINGS, MONT.—Voters have approved a \$50,000 bond issue, subject to \$40,000 PWA grant, to finance water system improvements.

CUTBANK, MONT. — Northwest Refining Co., organized by Louis B. O'Neil and associates, plans construction of an oil refinery, of 2500 barrels per day capacity.

HARDIN, MONT. — Holly Sugar

Corp. plans construction soon of a beet sugar factory with an annual capacity of 500,000 bags of sugar.

MISSOULA, MONT. — Westmont Tractor & Equipment Co., Roy Robinson president, plans construction of a one-story 100 x 130-foot tractor service building, including a machine shop.

Idaho

GENESEEE, IDAHO. — City plans construction of water pumping plant with aid of \$25,454 PWA allotment. H. J. Smith, Moscow, Idaho, engineer.

MOSCOW, IDAHO—Purity Cream—
(Please turn to Page 161)

These Springs Look Alike



This spring has a long, and useful life of one hundred million or more compressions.



This spring may fail before reaching one hundred thousand compressions.

THE DIFFERENCE?

Here

Carefully selected materials; Proper design and manufacturing methods; controlled heat-treating; and the Fifty Years Experience of

RAYMOND MFG. CO.
Corry, Pa.
Producers of Superior Springs

Here

Ordinary spring wire, Out-of-date methods, poorly regulated heat treatment, lack of broad experience, produce the ordinary spring, perhaps useful fifty years ago, but worse than useless in the high grade engineered products of today.

SAFETY

(TRADE MARK REGISTERED)

STEEL STAMPS

(PAT. RE 17846)

**NEVER
SAFE**

**ALWAYS
SAFE**

**Will Not Mushroom nor Spall
50% More Service**

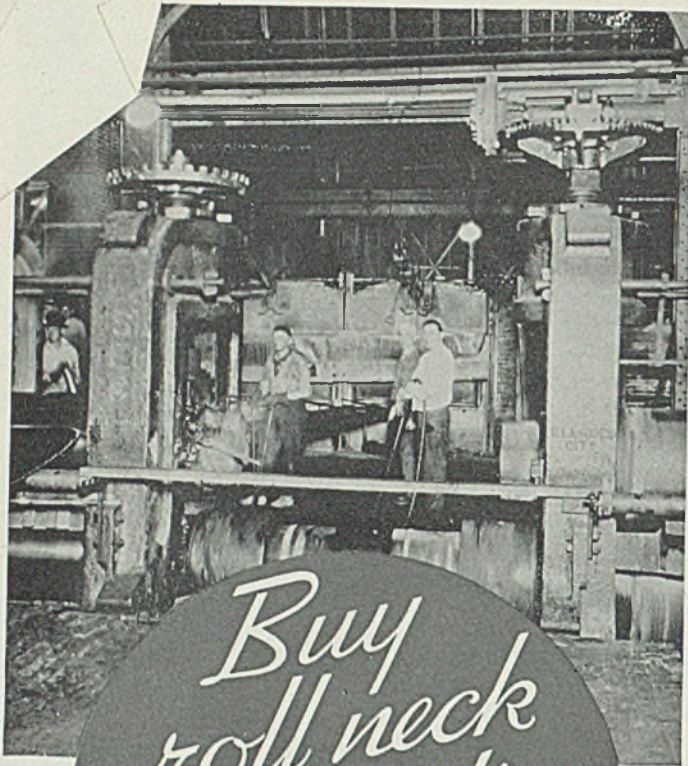
BOTH STAMPS ILLUSTRATED MADE 18,000
IMPRESSIONS ON THE SAME STAMPING JOB.

Which do you want in your shop?



LETTER & FIGURE SETS ROLLER DIES
INSPECTOR HAMMERS TYPE & HOLDERS
HAND & PNEUMATIC CHISELS
ALL TYPES OF STEEL DIES FOR HAND OR
POWER OPERATION

M. E. CUNNINGHAM COMPANY
EAST CARSON STREET PITTSBURGH, PA.



*Buy
roll neck
lubrication*

**NOT
LUBRICANTS**

The difference in price between the cheapest and the best roll neck lubricants is absolutely negligible in figuring costs. Life of brasses, savings in power and lubricating labor outweigh all other factors. With Dixon's Roll Neck Lubricants, you will use less lubricant, save much power, prolong life of brasses and reduce lubricating labor. In many cases, the savings exceed \$1000 a year. With field equipment developed by Dixon engineers, your savings can be determined in advance—without cost, obligation or inconvenience.

Write Dept. RN 18 and details will be sent to you.

SEE THE DIXON EXHIBIT
BOOTH 136, IRON & STEEL ENGINEERS CONVENTION
AND EXHIBITION

DETROIT, SEPTEMBER 22-25 INCLUSIVE

JOSEPH DIXON CRUCIBLE CO.

JERSEY CITY NEW JERSEY

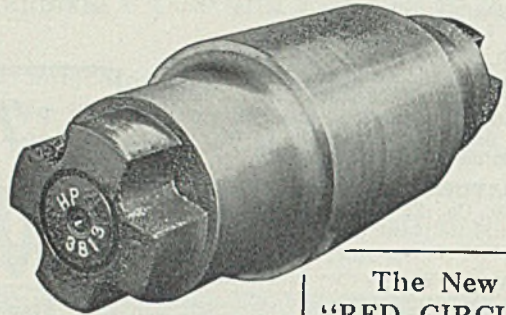


DIXON'S GRAPHITE PRODUCTIONS



Chilled ROLLS, and Rolling Mill Machinery

Air Furnace and
Gray Iron CASTINGS



The New
"RED CIRCLE"
Heat Treated
Chilled Rolls
for SHEET
and TIN MILLS

Roll Lathes, Sheet and Tin Mill Shears of all kinds; Steam Doublers; Stretcher Levelers and Rolling Mill Machinery built to specification. We shall be glad to figure on your requirements.

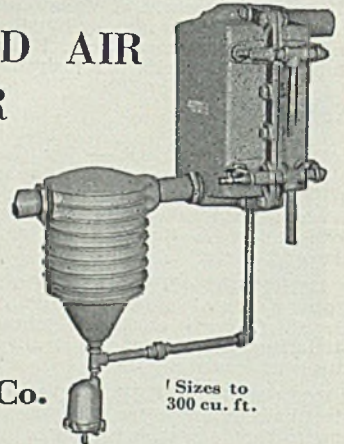
Hyde Park Foundry & Machine Co.
HYDE PARK, PA., U. S. A.
(Pittsburgh District)

COMPRESSED AIR DRYER

Thoroughly extracts water and oil from compressed air by a simple scientific method. Eliminates operating troubles in all pneumatic equipment. Installed by many leading industrial plants.

Cost nothing to operate—No moving parts to wear out—Automatic in service.

Ruemelin Mfg. Co.
1572 First St.
Milwaukee, Wis.



Sizes to
300 cu. ft.

SIMONDS TREATED GEARS

Also—

- Ramsey Silent Chain Drives
- Gates Vulco Rope Drives
- All Steel Silent Pinions
- Bakelite Silent Pinions

TREATED gears for all kinds of service cut and finished to specifications.

Ample equipment for light and heavy gears... Prompt delivery.

The SIMONDS Mfg. Co.
25th St. - PITTSBURGH, PA.

(Concluded from Page 159)

ery Co. is constructing a \$15,000 plant, for which John E. Thomas, Moscow, has general contract.

Pacific Coast

GLENDALE, CALIF. — Southern California Gas Co. will erect two buildings, one housing the transmission and distributing department, costing \$35,000 at Doran street and San Fernando road.

LOS ANGELES—Emil Brown & Co., sheet metal works, 300 East Ninth street, will construct a plant addition, 120 x 160 feet.

LOS ANGELES — Timken-Detroit Axle Co., 100 Clark avenue, Detroit, will construct a plant in Los Angeles to cost several hundred thousand dollars. W. F. Rockwell is president.

LOS ANGELES — Sunset Oil Co. is building a new blending and distributing plant at Alameda and Santa Fe streets, at a cost of approximately \$150,000. One unit of the plant will be a canning shop for canning motor oil.

PLACERVILLE, CALIF. — City plans construction of sewage disposal plant costing \$65,000. H. N. Jenks, 2701 Benvenue avenue, Berkeley, Calif., is engineer in charge.

SAN FRANCISCO — General Brewing Corp., 2601 Newhall avenue, plans installing electric power equipment in new additions to plant which will cost over \$225,000. Fred H. Meyer, Kohl building, is architect.

SAN JOSE, CALIF.—City council plans bond issue of \$500,000 to finance either purchase of present San Jose power properties, or construction of new municipal plant.

WALNUT CREEK, CALIF.—City has voted approval of issuance of \$50,000 bonds to finance construction of waterworks system including a 300,000-gallon tank with pumps. WPA has granted \$88,000. G. Oliver is city engineer, City hall.

EUGENE, OREG. — City water board is planning construction of a transmission line from the McKenzie power plant, at estimated cost of \$70,000.

EUGENE, OREG. — State board of control, Capitol building, Salem, Oreg., has rejected bids for construction of addition to power plant at University of Oregon in Eugene and will probably ask bids again soon. Estimated cost is \$65,000, including equipment.

BELLINGHAM, WASH. — City plans installing equipment for chlorinating water, to cost about \$10,000. J. M. Adams is engineer, City hall.

BREMERTON, WASH.—City will ask bids soon for construction of 34 x 44-foot pumphouse with chlorinating equipment and pumps, to cost \$55,778. C. C. Casad is engineer, City hall.

HOQUIAM, WASH.—Grays Harbor Pulp & Paper Co., Twenty-third street and Railroad avenue, plans building plant addition to house plup digester and screening units, bleaching plant and a filtration plant. Cost is estimated at \$150,000.

LYNDEN, WASH. — City plans construction of sewage disposal plant costing \$40,706. Baar & Cunningham, Spalding building, Portland, Oreg., engineers.

PASCO, WASH.—D. W. McGhee, manager water department, City hall, will ask bids soon for a city

chlorinating system.

SEATTLE—Milwaukee Sausage Co., 808 Twentieth street, plans installing electric power equipment in new one-story meat processing and packing plant on Fourth avenue, South at a cost of \$65,000. W. C. Jackson is the company architect.

Canada

KEREMEOS, B. C. — Keremeos Fruits Ltd., Railway avenue, plans construction of canning plant costing \$35,000.

VANCOUVER, B. C.—Valley Planning Mills Ltd., 185 Second avenue, North plans building sawmill, planing mill and shingle mill at cost of \$40,000.

VICTORIA, B. C.—Point Ellice Lumber Co. Ltd., 2516 Pleasant street, plans erection of pulp, saw and shingle mills, to cost \$50,000.

WINNIPEG, MAN. — J. Ferbeck, engineer, 7514 Sherbrooke street, West, is preparing plans for a sugar beet processing plant to cost \$250,000.

WINNIPEG, MAN.—Conley Mines Ltd. will build ore smelting and reducing plant at a cost of \$50,000. A. N. McCharles, care of company, is in charge of plans.

NEW GLASGOW, N. S.—Picton County Power board, G. R. Saunders manager, plans construction of new power generating plant costing \$250,000.

TRURO, N. S.—Spencer Bros. & Turner Ltd. plans construction of woodworking plant costing \$40,000.

BEAUVILLE, ONT.—Grape Growers association, J. A. Challes secretary, St. Catharines, Ont., plans building factory for recovering cellulose through processing grape vine and fruit trimmings. Cost estimated at \$150,000 to \$200,000.

BROCKVILLE, ONT. — Eugene Phillips Electric Works, Kingston road, is considering building a 1 story

addition to its plant, 75 x 100 feet, with new equipment installed. B. Dillon, King street, is preparing plans.

HAMILTON, ONT. — Hamilton Cotton Co., 304 Mary street, will soon begin construction of a \$40,000 boiler house.

HAMILTON, ONT. — Highway Homes Ltd., 414 Imperial Bank building, plans construction of power plant with filtration equipment, costing \$35,000.

SMITHVILLE, ONT. — Howard Smith Paper Co. Ltd., 407 McGill street, Montreal, Que., plans construction of chemical plant here at cost of \$75,000.

WALLACEBURG, ONT. — Schultz Die Casting Co. of Canada, A. St. Clair Gordon manager, plans erection of new factory costing \$50,000.

AMOS, QUE.—Sigma Mines Ltd., care of Faskin & Co., Excelsior Life building, Toronto, Ont., subsidiary of Dome Mine Ltd., C. C. Calvin secretary, has voted expenditure of \$470,000 for 1936, to include cost of construction of 500-ton mill.

MONTREAL, QUE.—Carnett Paint Co. Ltd., K. Heydenreich manager, 5838 Fifth avenue, plans construction of \$40,000 plant.

MONTREAL, QUE. —Demon-Oxer Co. Inc., care of Harold & Long, 204 Notre Dame avenue, West, plans construction of \$50,000 plant for manufacturing motors and engines.

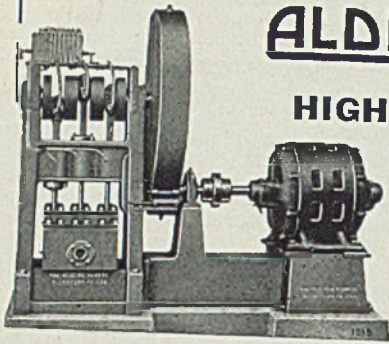
BATTLEFORD, SASK.—Battleford Ellison Oil Development & Refinery Co. Ltd., plans building oil refinery at cost of \$100,000.

Alaska

SEWARD, ALASKA—City will ask bids Oct. 12 for construction of hydroelectric project costing \$140,000, to include power house, transmission system, generators and miscellaneous buildings. Hubbell & Waller, Alaska building, Seattle, engineers. A. D. Balderston is city clerk.

KRON
CRANE SCALES

Weigh it accurately enroute. Avoid costly delays and extra handling. Use a Kron Crane Scale.
THE **KRON** CO.
BRIDGEPORT CONN.



ALDRICH

HIGH PRESSURE PUMPS

Are a quality product. Fitted with Automatic Suction Valve Control, permits continuous operation but intermittent delivery to any form of accumulator.

The ALDRICH PUMP CO., Allentown, Pa.

H. A. BRASSERT & CO.

CONSULTING ENGINEERS
for Iron, Steel,
Fuel and Heavy Metallurgical Industries.
PROJECTS, PLANT DESIGN
CONSTRUCTION, OPERATION
MARKETS, FINANCE
AND MANAGEMENT

310 South Michigan Ave.

Chicago, Ill.

THOMAS

SPACING MACHINE COMPANY
PITTSBURGH

PUNCHING & SHEARING MACHINERY

For Low Cost Industrial Heating

"We Guarantee Results"

F. & D. Producer Gas Systems

Using Bituminous and Anthracite Coals Raw and Scrubbed Gas for Displaying Oil. City and Natural Gas, Coal and Coke in Furnaces of all descriptions.

Flinn & Dreffeln Co., 308 W. Washington St., Chicago, Ill.

BEFORE BUYING A CRANE OR HOIST—WRITE US!

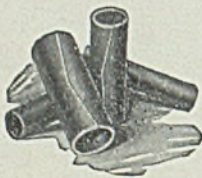
MODERN ELECTRIC AND HAND OPERATED CRANES AND ELECTRIC HOISTS FOR ALL INDUSTRIES... TO LIFT LOADS OF 500 POUNDS TO 450 TONS

SHAW-BOX CRANE & HOIST CO., INC.

MUSKEGON

MICHIGAN

DIVISION OF MANNING, MAXWELL & MOORE, INC.



Roller Bearing Sleeves
Machinery Spacers
Split Bushings

GIFFORD ENGINE COMPANY
Eaton Rapids, Michigan

THOMSON-GIBB ELECTRIC WELDING CO.

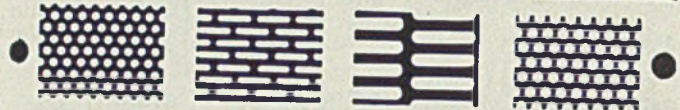
FLASHES

NEWS, IDEAS AND INFORMATION ABOUT PRODUCTION WELDING OF INTEREST TO EVERY MANUFACTURER WHO WANTS BETTER, FASTER PRODUCTION AT LOWER COST

DO YOU GET YOUR COPY EACH MONTH?

SCREENS

of Perforated Metal



The Harrington & King Co.

PERFORATING

5634 Filmore St., Chicago, Ill.
New York Office—114 Liberty St.



Moore Rapid LECTROMELT Furnaces

Standard Sizes 25 lbs. to 100 Tons Capacity
Most Rapid and efficient for making
Tool Steels, Alloy Steels, Forging Steels
Steel Castings, Malleable Iron, Grey Iron,
Carbide, Ferro-Alloys, etc.

PITTSBURGH LECTROMELT FURNACE CORP.
P.O. BOX 1257, FOOT OF 32ND ST. PITTSBURGH, PA. U.S.A.

SC&H Furnaces are made for annealing, cast hardening, carburizing, forging, cyaniding, lead hardening & oil tempering.

STRONG CARLISLE & HAMMOND

1400 W. 3rd St., Cleveland, O.

SC&H Furnaces are built in all sizes of Oven, Pot, Continuous, and Special Types for Electric, Oil or Gas application.

OHIO

LOCOMOTIVE CRANES
CRAWLER CRANES
SHOVELS

THE OHIO LOCOMOTIVE CRANE CO.
MIDDLETOWN, OHIO

JAMES CRISWELL COMPANY

Furnace Engineers & Contractors

Open Hearth, Soaking Pits and heating furnaces

Keenan Bldg.

Pittsburgh, Pa.

STAINLESS STEEL SHEET

AUTOMATICALLY POLISHED

ON EXCELSIOR

TAINLESS STEEL POLISHING MACHINE

35-YEARS POLISHING MACHINE EXPERIENCE

EXCELSIOR TOOL & MACHINE CO
EAST ST. LOUIS, ILLINOIS.

ESTABLISHED 1892 INCORPORATED 1902

Pickling of Iron and Steel—By Wallace G. Imhof

This book covers many phases of pickling room practice and construction and maintenance of pickling equipment.

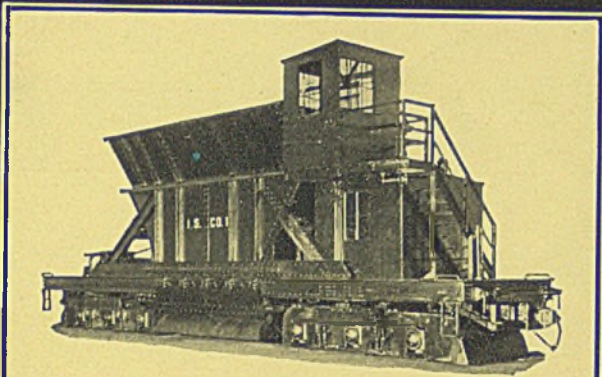
Price Postpaid \$5.15 (25s.6d)

THE PENTON PUBLISHING CO.
Book Department
1213 W. 3rd St. Cleveland, O.

520-S

ATLAS CARS

OFFER LOWER COST HAULAGE



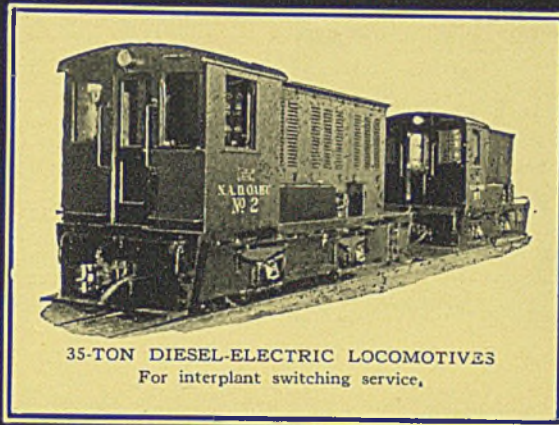
100-TON CAPACITY GABLE BOTTOM
SIDE DUMP CAR

6-wheel trucks of welded steel construction and provided with self-aligning roller bearings. Operator's cab is at an elevated position, where loading, as well as the movements of the car, can be observed. Bottom of the hopper and discharge gates are equipped with electrically operated heaters to prevent freezing of material in severe weather.

Lower costs and greater efficiency in transporting by the use of Atlas Cars will help considerably towards operating your plant at a profit.

For Stockhouse and Ore Yard

Scale Charging Cars with Atlas Indicating and Recording Mechanism for Weighing Scales. Type printing of weights or burdens on tape is now available. Ore Transfers all Capacities.



35-TON DIESEL-ELECTRIC LOCOMOTIVES
For interplant switching service,

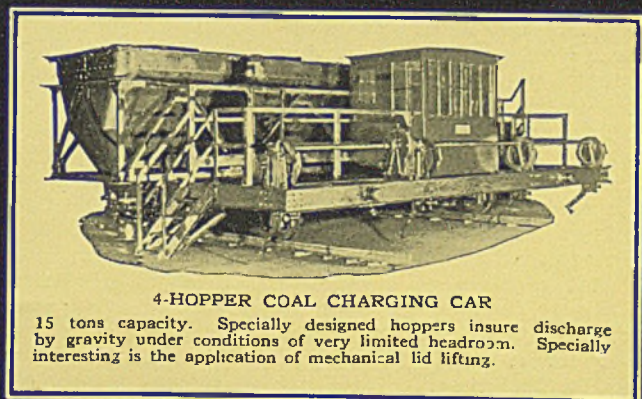
For By-Product Coke Plants

Coal Charging Larries
Pushers and Levelers
Door Machines
Coke Quenching Cars
Coke Guides
Quencher Locomotives

For Interplant Haulage

Diesel-Electric Locomotives
Gas-Electric Locomotives

Pusher Locomotives for Coal and Ore Docks
Storage Battery and Electric Cars of All Kinds
Annealing Furnace Cars—Cars and Equipment
for Continuous Tunnel Kilns



4-HOPPER COAL CHARGING CAR
15 tons capacity. Specially designed hoppers insure discharge by gravity under conditions of very limited headroom. Specially interesting is the application of mechanical lid lifting.

THE ATLAS CAR & MFG. CO.

Engineers Manufacturers

CLEVELAND, OHIO



A Forward View of

MEN, MACHINES

Acknowledgement is made to Republic Steel Corp., Cleveland, for supplying steel plant illustrations used on these and succeeding pages

IMAGINATIVE men in the iron and steel industry will sense a significant timeliness and appropriateness in the scheduling of the thirty-second annual convention and exposition of the Association of Iron and Steel Engineers in Detroit.

The iron and steel producing industry is recovering from one of the most harrowing depressions it has ever encountered. It is emerging from this chastening experience with reborn confidence, renewed courage, fresh ideas and an intense desire to forge ahead rapidly to make up for lost time.

Detroit in September, 1936, provides a most suitable setting for a convention and exposition in which these hopes and ambitions of iron and steel producers will be reflected. It is the capital of motordom, and as such it breathes the spirit of vigor, resourcefulness and success which is characteristic of the automotive industry. In convening in Detroit, iron and steel engineers will be exposed to the contagious enthusiasm of their

industry's most important and most progressive customer.

But there is a further advantage in holding the current convention in the Michigan metropolis. Detroit is the hub of the newest important steelworks and rolling mill district. The steelmaking and finishing facilities of Ford Motor Co., Great Lakes Steel Corp., Detroit Steel Corp., Detroit Seamless Steel Tubes Co., Rotary Electric Steel Co., Republic Steel Corp., Michigan Seamless Tube Co. and other companies mirror the extent to which the magnet of motordom's markets has drawn producing and finishing capacity into the Southern Michigan area.

In the atmosphere of progressiveness which pervades the convention city, visiting engineers of iron and steel will find it natural to consider the problems of their industry more from the standpoint of the future than of the past. Rich though the traditions of iron and steel may be, there comes a time in the development of every industry when it is desirable to shift emphasis from the

disappointments and successes which are history to the problems and opportunities ahead. Detroit encourages this shifting of perspective, because its eminence — perhaps to a greater extent than in any other city in the world—has been achieved by men whose natural impulse is to flaunt traditions and to break precedents.

Looking ahead in iron and steel, one envisions great advances in many directions. It is almost certain that production and finishing technic will be improved, that marked progress in metallurgy will be made, that better merchandising methods will be evolved and that new markets will be developed and old ones expanded.

We know that the direction of greatest progress lies within the scope of these activities, but we do not know definitely nor in detail just where spectacular developments will occur which will exert great influence upon the future of iron and steel.

Just ahead lie discoveries or de-

the Steel Industry—

AND MARKETS



velopments as important as the perfection of by-product coking processes, the application of the continuous rolling principle to wide strip and sheets, or the creation of the stainless steels.

Whatever the character of future important discoveries and wherever the path of progress may lead, the extent to which the industry can capitalize upon these newly found opportunities will depend largely upon the ability of its management. And in the period just ahead, management's key problems are men, machines and markets.

IN THIS trinity, no factor takes precedent over men. Today the ability of the personnel of the iron and steel industry is more important than at any time in recent years.

One reason for this is that, because of conditions which need not be detailed here, the personnel in many companies during the period from 1920 to 1933 became stratified. Advancements were not as rapid as they should have been. In the easy-

going flush days of 1928 and 1929 many individuals who should have been retired were retained in positions where they contributed little to the interest of their companies.

Later the pressure of depression prevented steel producers from hiring new men. As a result, the infusion of new blood into decadent organizations practically ceased for a period of several years.

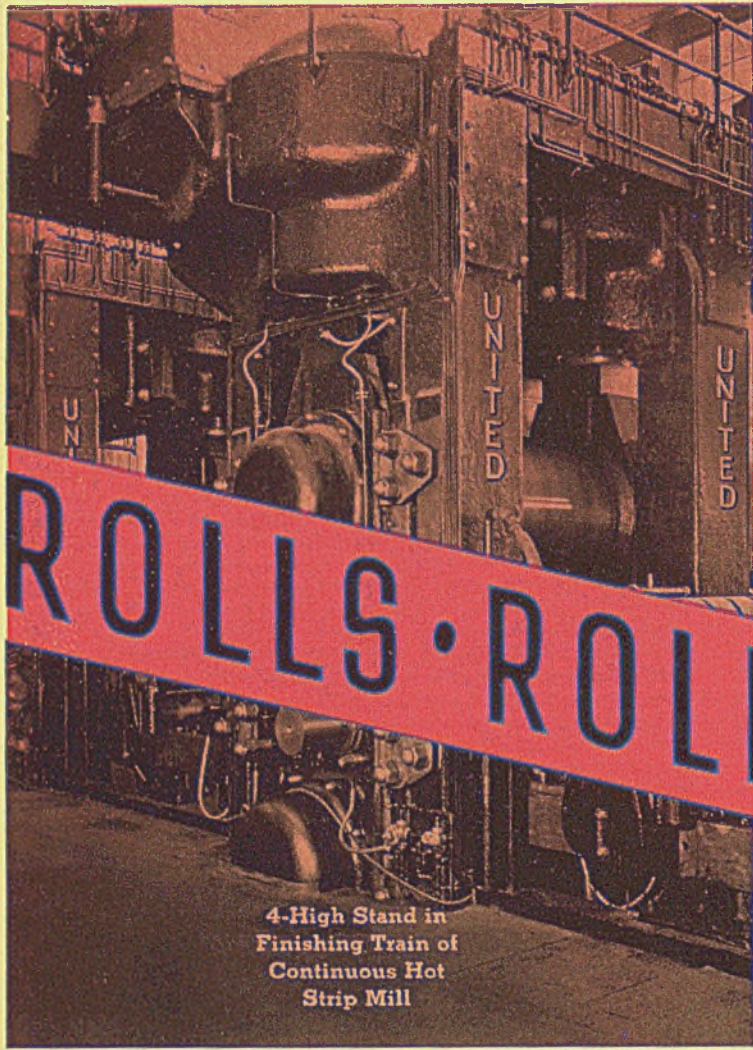
With the return of business in 1934, 1935 and 1936, the managements of many companies began to give serious attention to the personnel problem. To them fell the job of making up for a "lost generation" in iron and steel. They brought many new men into the picture, advanced worthy individuals rapidly, made drastic shifts in many departments and in general revamped organizations more thoroughly than at any time in many decades. The executive personnel of iron and steel has been almost completely reconstructed in a short time.

Similarly the ranks of steel's employes have changed in recent years.

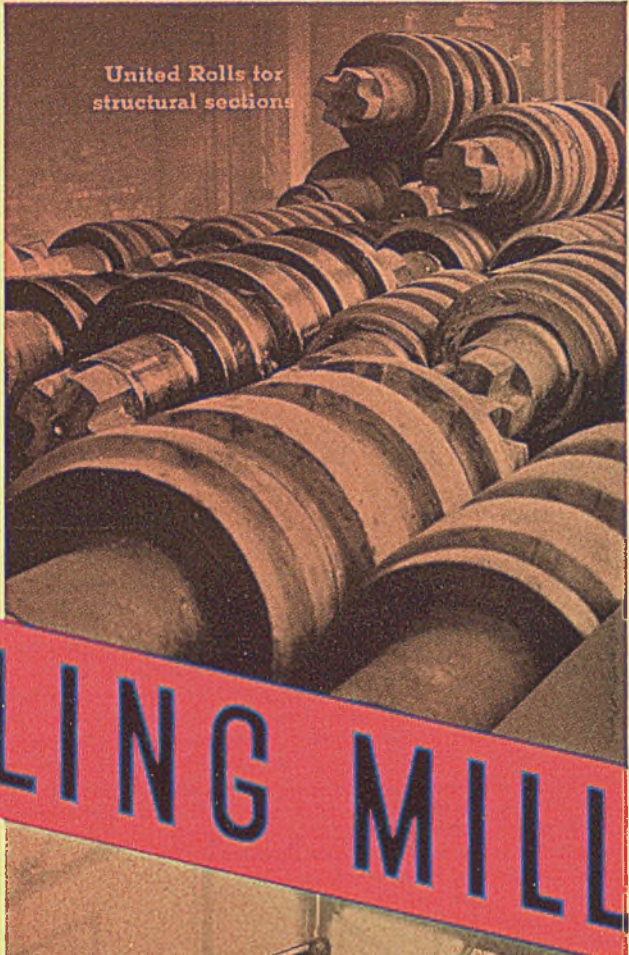
Today the industry employs 498,000 wage earners, the largest number ever entered on its payrolls. Their average weekly wages, taking the month of March for example, are exactly \$4.13 above the level for all major manufacturing industries.

Steel has done a commendable job in improving the caliber of its personnel. It has been successful in establishing a healthier morale. Nevertheless, it cannot rest on these laurels. It must complete the work. It must go into the business of training men more systematically and more thoroughly. It must prepare for acute shortages in certain skilled trades. It must develop a new breed of foremen and superintendents who understand the principles of enlightened employer-employee relations more thoroughly than the key men of the last generation.

ANY consideration of steel, either as an industry or a material, these days naturally centers around the remarkable strides being made by producers of flat-rolled steel prod-

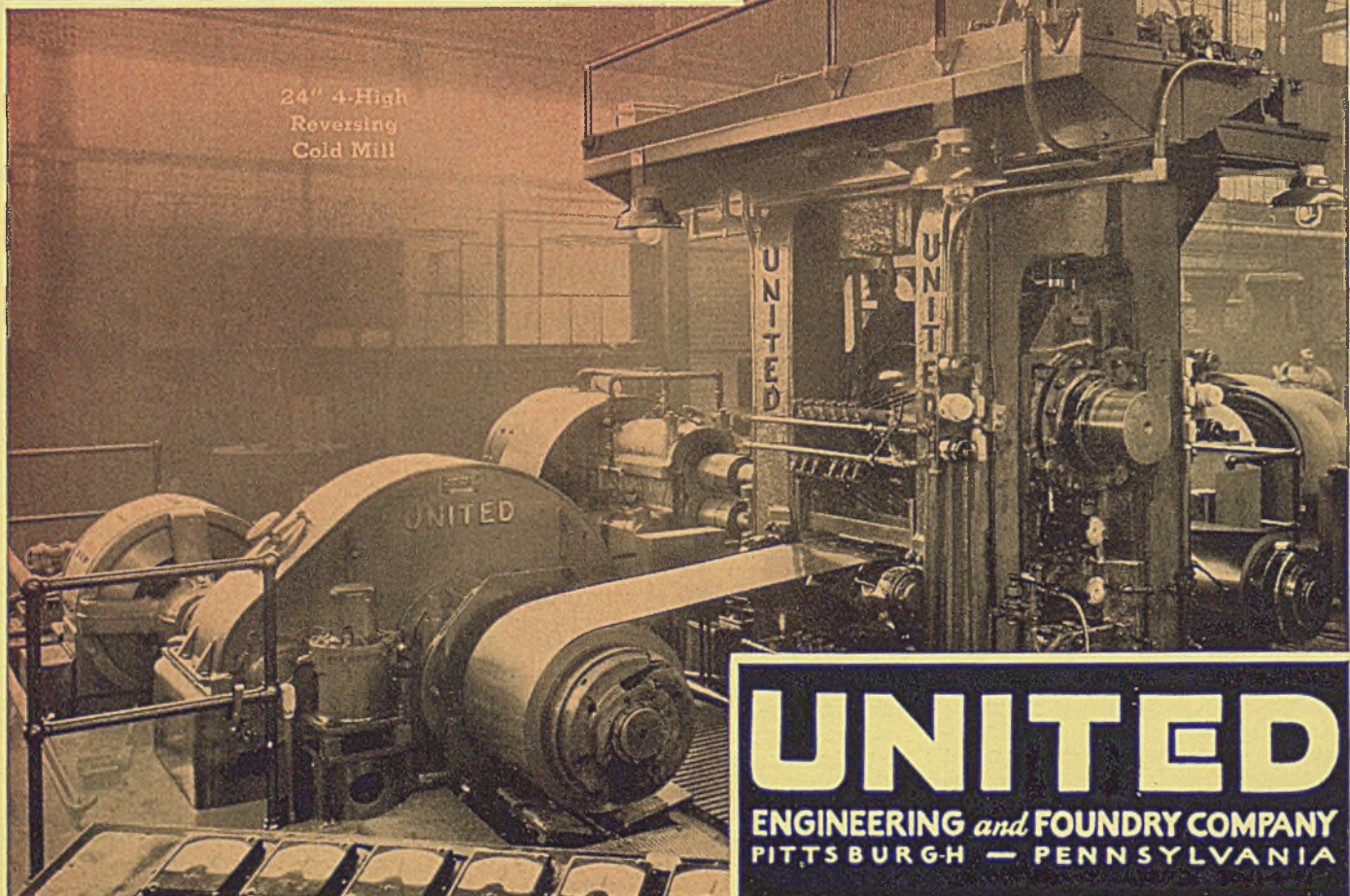


4-High Stand in
Finishing Train of
Continuous Hot
Strip Mill



United Rolls for
structural sections

ROLLS • ROLLING MILL



24" 4-High
Reversing
Cold Mill

UNITED
ENGINEERING and FOUNDRY COMPANY
PITTSBURGH — PENNSYLVANIA

4-High Roughing
Stand and Edger
in Continuous
Hot Strip Mill

EQUIPMENT

U
N
I
T
E
D

78" Rotary
Flying Shear

52" x 96"
Back-up Roll for
4-High Mill



ucts—in particular, wide sheets, broad strip or stripsheet, by whatever term you choose to identify the material. In the last decade there have been built or are now under construction 21 continuous mills, capable of ribboning out some 9,500,000 tons of broad strip annually. Investment in this enormous equipment has been estimated to approximate some \$200,000,000—and the end is not yet in sight.

Since the first of these giant mills was laid down in 1926 at the plant of Columbia Steel Co. in Butler, Pa., now a division of American Rolling Mill Co., width of material coming off the rolls has been steadily extended, until today 92-inch strip is being rolled, and a mill now under construction in the Pittsburgh district will be capable of turning out heavy-gage strip 100 inches wide. Granting that the first 100 inches are the hardest, it is conceivable that future consumer requirements may dictate installation of 110-inch, even 120-inch mills, although the limits of mechanical equipment and rolls are certainly being approached, and the cost of wider rolls becomes almost prohibitive.

Battle Is to the Swift

Why the mad race for broad strip capacity? Where is the market for 9,500,000 tons of flat-rolled steel in a year, when the best total ever achieved for sheet, strip and tin plate combined was only 8,500,000 tons? The only apparent answer to these questions is: Competition. With lush automotive markets beckoning for flat-rolled steel, any producer not equipped to supply this material begins to feel the pinch when he sees competitors with wide strip mills booking heavy tonnages.

Fifteen millions dollars' expenditure to keep up with the procession becomes worthwhile insurance. And some executives take the opinion that if the money were not spent for new capacity, the government would take it in taxes and profit levies. So new strip mills are drawn up, submitted to directors and O.K'd. The race is on, and much to the satisfaction of designers and builders of rolling mills and auxiliary equipment, both mechanical and electrical.

Manna for Designers

The development has provided the latter interests an ideal opportunity to display their ingenuity and resourcefulness in improving designs and efficientizing them. For instance, descaling of the steel in transit through roll stands is now accomplished at high pressure—1000 pounds per square inch and more. Newly developed instruments indicate and record rolling temperatures in a fraction of the time formerly required. Pressures exerted by rolls now can be measured accurately by a device which utilizes the stretch of the housing as a means of actuating the instrument. By proper proportioning of mechanical and electrical parts, housing stretches as minute as 0.00001-inch can be detected and translated in terms of rolling load.

Furnaces for reheating slabs have been improved to the point where hourly production of 75 gross tons heated to rolling temperature is possible. Application of efficient recuperators and thorough insulation of furnaces have been contributing factors.

Important advances in annealing furnaces for sheets and coiled strip forecast more advantageous use of

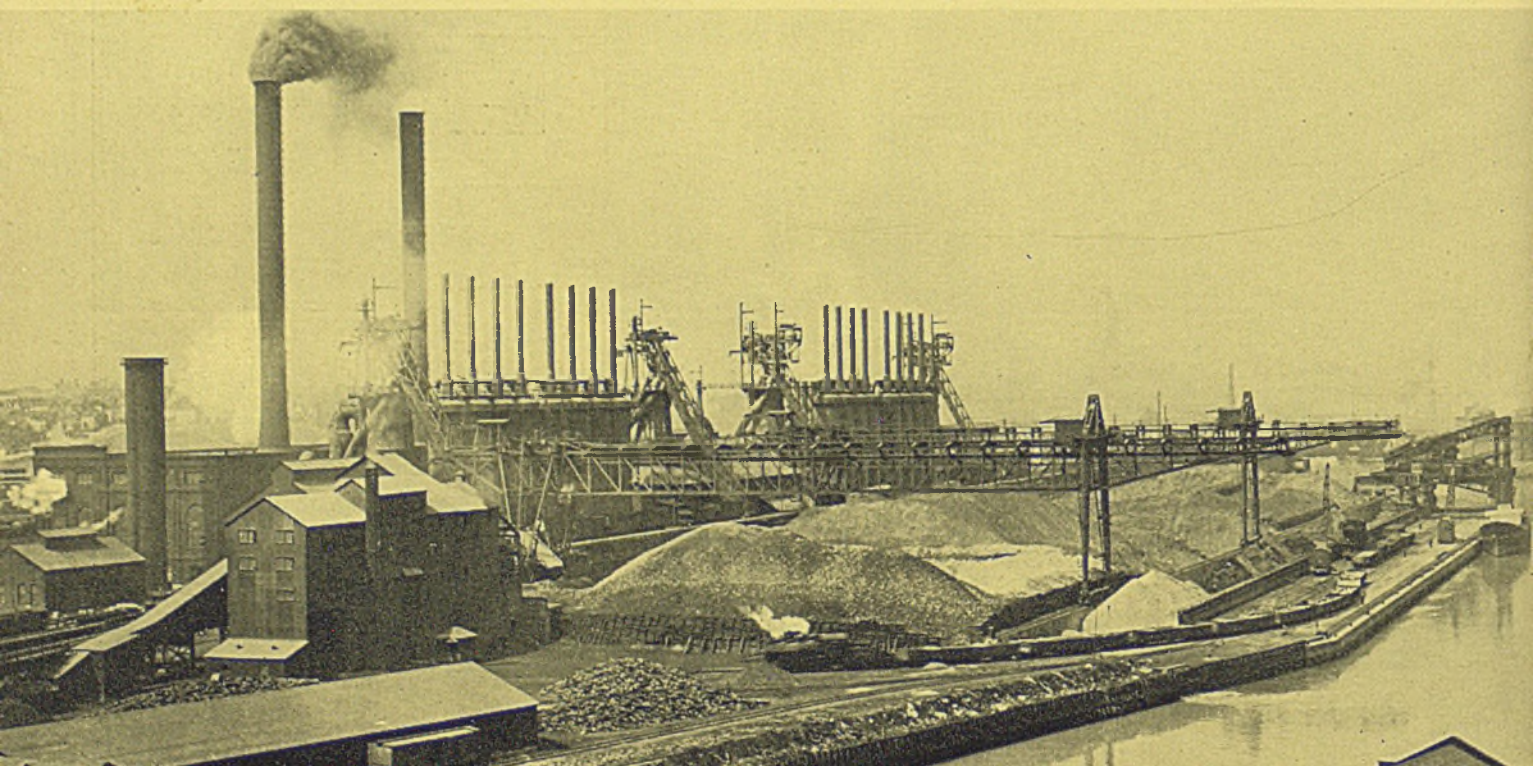
annealed sheets and deep drawing black plate because of the wider range of properties available. In these furnaces, the charge is completely sealed by a light-gage inner hood of corrugated sheets. Heating is accomplished by an outer furnace unit which may be lowered over the charge, using gas fired into vertical or horizontal alloy tubes; or electric heating elements.

DIRECT or low-temperature reduction of iron ore for years has been the subject of extensive investigation and research, involving the expenditure of many millions. Its practical application still appears remote. Prior to the depression, experiments with large rotary kilns were made by the National Tube Co. at Lorain, O., with only moderate success being reported. This work was later abandoned.

William H. Smith of the General Reduction Co. in Detroit for a good many years has been an ardent proponent of a direct reduction process, proposing to use equipment which resembles a battery of coke ovens and in which iron ore is reduced to metallic iron at low temperatures, compared with those prevalent in the blast furnace.

For the past 15 years, Alfred Musso and Frank Hodson of the Burden Iron Co. have been working on a process for reduction of iron ore at temperatures 800 to 1000 degrees lower than those of the blast furnace. Thousands of tests are said to have been made, and almost every known grade of iron ore has been used, best results being obtained with the high iron content magnetite ores.

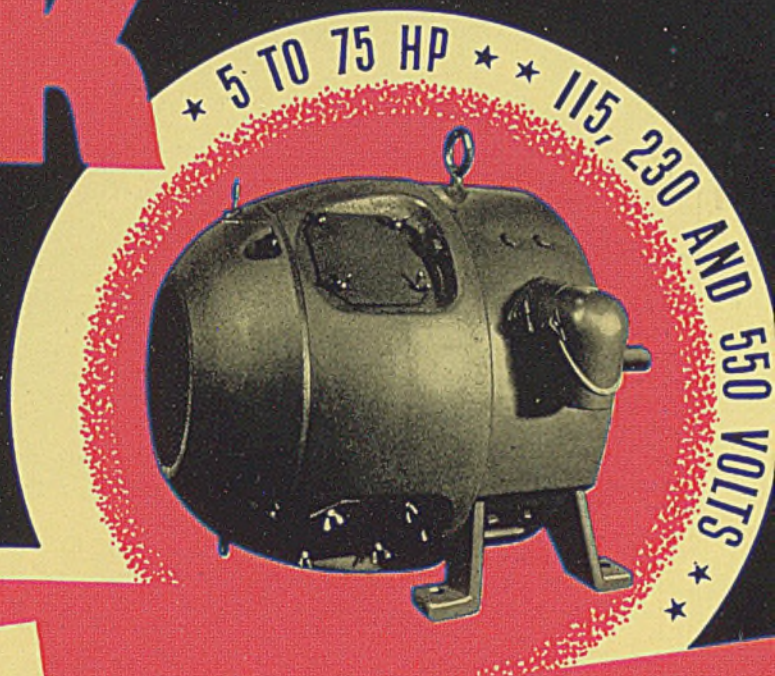
Concerning the process, Mr. Hodson states: "The low-temperature



INDUSTRY'S FAVORITE DC MOTOR

the Famous
SK

NOW IN A NEW AND MODERN
FAN-COOLED
TOTALLY-ENCLOSED DESIGN!



It has all the proved features of the famous SK motor. With its mica insulation, vacuum impregnated field coils and unexcelled commutation, the Type SK long ago earned the distinction of being "Industry's Favorite Direct Current Motor."

Now it is available in a new and improved fan-cooled design.

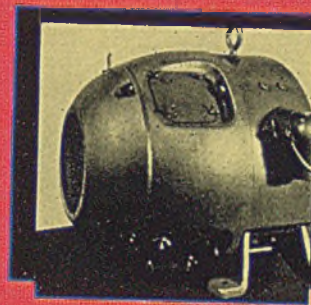
Before you buy any totally-enclosed, fan-cooled d-c. drives, see this modern motor at Detroit this month and check the "More Mileage" features illustrated at the right.

★ ★ ★

*More Mileage—Convert the turning motion of an electric motor into distance—and you will be amazed at the mileage that can pile up during its lifetime. Make sure of "More Mileage"—longer, trouble-free life—by specifying Westinghouse motors and control.

J 20091

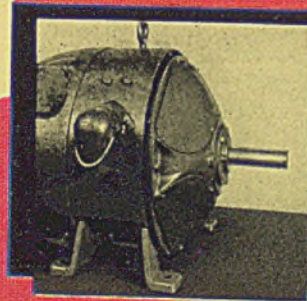
NO OTHER TOTALLY-ENCLOSED, FAN-COOLED MOTOR HAS ALL THESE "MORE-MILEAGE"* FEATURES



Unobstructed Flow of Cooling Air—Fan on commutator end of motor. No pulleys, pinions or other obstructions to interfere with free entrance of cooling air.



Ease of Inspection—Important from the practical point of view. Simply loosen four thumb screws to remove covers for inspection of commutator and brushes.



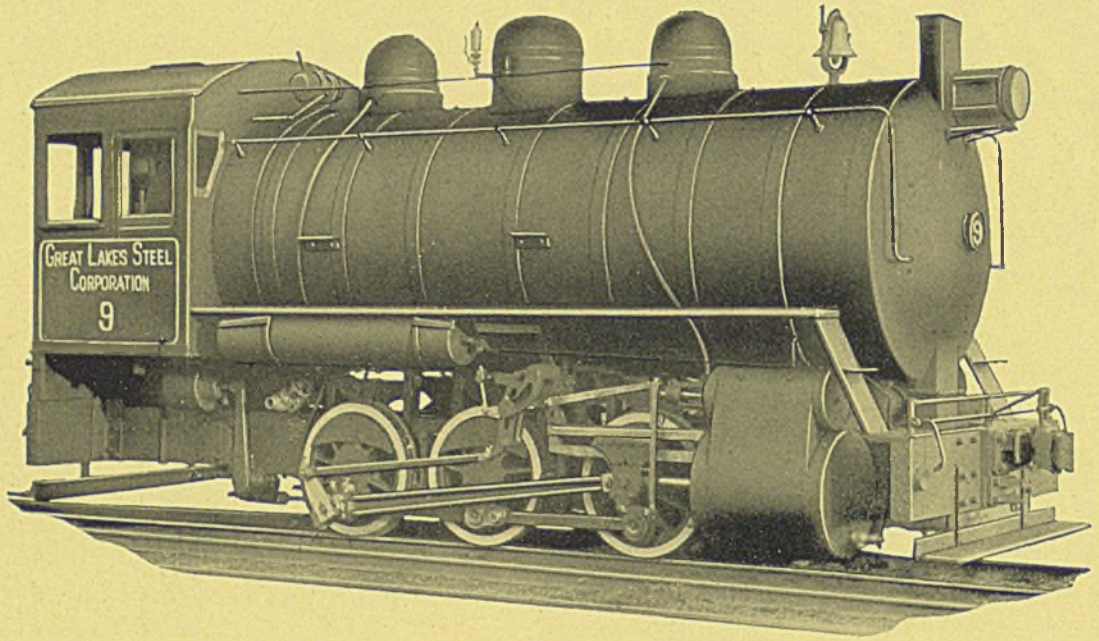
Load Connected Close to Bearing—With fan on commutator end, the distance between rear bearing and load is reduced to the minimum.



Cast Double Bracket and heavy boiler plate frame enclosure provide directed flow of cooling air over entire motor to insure



Westinghouse



**For 21 Years PORTER FIRELESS STEAM
LOCOMOTIVES have led the World in
Economy...Performance...Efficiency...Safety**

SEE IT IN ACTION—At the Great Lakes Steel Corporation during your Inspection Tour of their plant . . . check its remarkable record in service . . . note how smoothly and silently it runs . . . how handy it is for inside as well as outside plant duty, due to its smokeless fireless operation—then you can appreciate the profitable possibilities of the Porter Fireless in your plant.

H. K. PORTER COMPANY

Established 1866 . . . PITTSBURGH, PENNA.

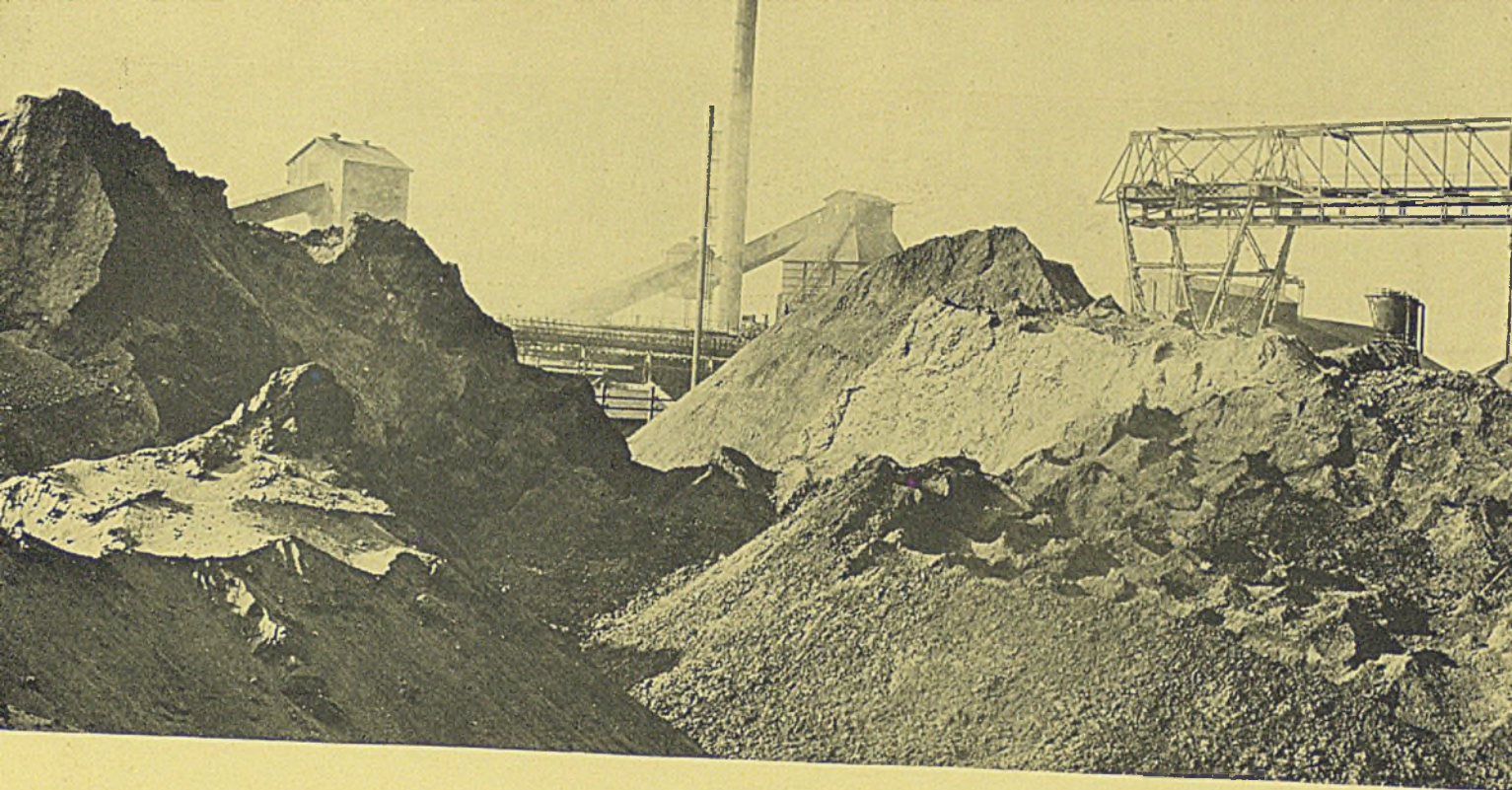
A new illustrated Bulletin of interesting facts and figures about the Porter Fireless Locomotive—including the remarkable Porter Geared Fireless—will be mailed on request.



PORTER PIONEERED THE FIRELESS 21 years of intensive construction and operation experience in every major industry is back of every Porter Fireless Locomotive.



USED THROUGHOUT THE UNITED STATES FOR 21 YEARS



method of reduction such as we will employ effects direct reduction of the ore to iron without contamination either by nitrogen, oxygen or physical elements, silicon, carbon, sulphur. The iron never reaches a fluid condition, so there is no slag contamination.

"The resultant product can be made into steel much more quickly than can pig iron; it can be the base for a high quality wrought iron, and also for any standard ferrous product made today. The addition of alloying elements can also be made part of the basic reduction process."

Question Feasibility

Most practical steel men today are unwilling to acknowledge any great possibilities for the direct reduction process, which would obsolete present blast furnace reduction methods to a large extent. Dr. Albert Sauveur, eminent metallographer and metallurgist, in a recent discussion, observed that he had "little faith in the eventual commercial success of the direct reduction of iron ore. On final analysis it can only supply us with metallic iron, which must be remelted to be converted into steel; it must therefore compete with steel scrap. Unless it can be produced at a lower cost than scrap can be bought, it does not seem to hold much promise of commercial success."

Dr. Sauveur points out that direct reduction of ore is now being accomplished in the reduction zone of blast furnaces, but that "unfortunately as soon as we have produced this sponge iron we immediately proceed to introduce carbon into it, thus transforming it into pig iron. If we could extract it from the furnace through a suitable opening in

the brickwork at the lower level of the zone of reduction, we would have sponge iron. . . Consider the low cost of that direct reduction, seeing that it requires only about one-third of a ton of coke to produce one ton of iron, assuming the iron to enter the furnace in the form of ferric oxide. If we use more coke in our blast furnaces, it is because of the necessity of melting the reduced iron and resulting slag."

Plans Out To Refit Stacks

Certainly if steelmakers foresaw any immediate possibilities for direct reduction methods, they would go slow in spending any appreciable sums for blast furnace construction or modernization. Of course, there have been no new blast furnaces built since 1928, but extensive plans are reported in the making for modernization and repair of present stacks. There are 252 stacks standing in this country, of which 146 are now in blast. Estimates indicate that only about 20 of the remainder could be put in shape to blow in within a month, and further that some \$25,000,000 will be required to recommit stacks out of blast for some time and rehabilitate those in operation throughout the depression.

With scrap prices mounting steadily — about \$15 per ton compared with less than \$9 five years ago — an extensive program of blast furnace renovizing appears both imperative and imminent, if present steel-making operations are to be continued. Ratio of pig iron production to steel production decreased from 91.7 per cent in 1919 to 58.5 per cent in 1933, but since then the trend has been reversed and the percentage for the first seven months of 1936 is placed at 64.0, with a

higher value for the year anticipated.

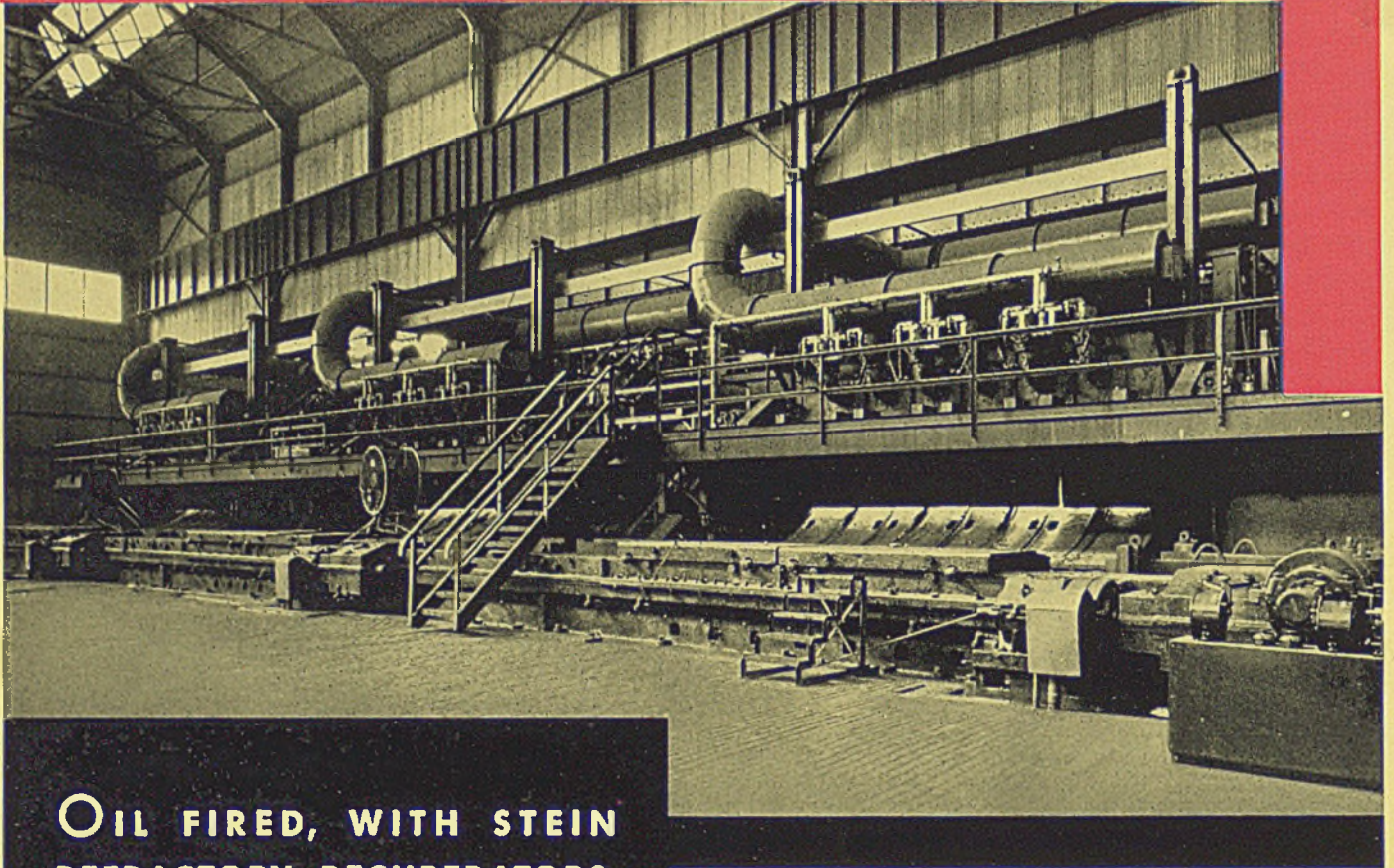
WHAT about bessemer steel? Since 1857 when the first bessemer rail was rolled in England, the process had a meteoric rise only later to be far outdistanced by the open-hearth method of steelmaking. Sixty per cent of the steel produced in 1900 in the United States was bessemer steel — about 6,700,000 tons. By 1929, bessemer steel was only a small fraction of the 54,000,000 tons of steel produced that year. But it appears that bessemer steel may have been given a raw deal; at least in the opinion of Dr. Sauveur who is "daring enough" to predict that in future years bessemer steel will be made in increasing proportions. If it can be confirmed that as much as 0.2 per cent of phosphorus may be present in low-carbon steel with beneficial results, it should help in reviving interest in the bessemer process, for it is evident that the basic open-hearth furnace is not the best tool for production of steel containing this amount of phosphorus — an element which may prove to have been overly maligned for its effects on steel properties.

THAT we are living in the age of alloys is unanimous opinion. Special metals to meet special needs. "Tailor-made" steels, to use a phrase coined by L. S. Hamaker of the Berger Mfg. Co., Republic subsidiary.

Two major points account for the rapid development of alloy steels. One is the precipitate rise of the automotive industry with a product which demanded special properties in steels, such as toughness, corro-

CONTINUOUS HEATING FURNACES

FOR BILLETS, SLABS AND ROUNDS



**OIL FIRED, WITH STEIN
REFRACTORY RECUPERATORS,
AND ZONE CONTROL... ARE
MEETING DEMAND FOR HIGH
PRODUCTION RATE, EXACT
UNIFORMITY, AND ECONOMY
OF OPERATION AT**

Great Lakes Steel
AND MANY OTHER MILLS



THESE SC Continuous Slab Heating Furnaces at Great Lakes Steel provide a constant supply of slabs, uniformly heated to 2250° F. to the continuous strip mill. Here, as elsewhere, they have proved economical and dependable in operation.

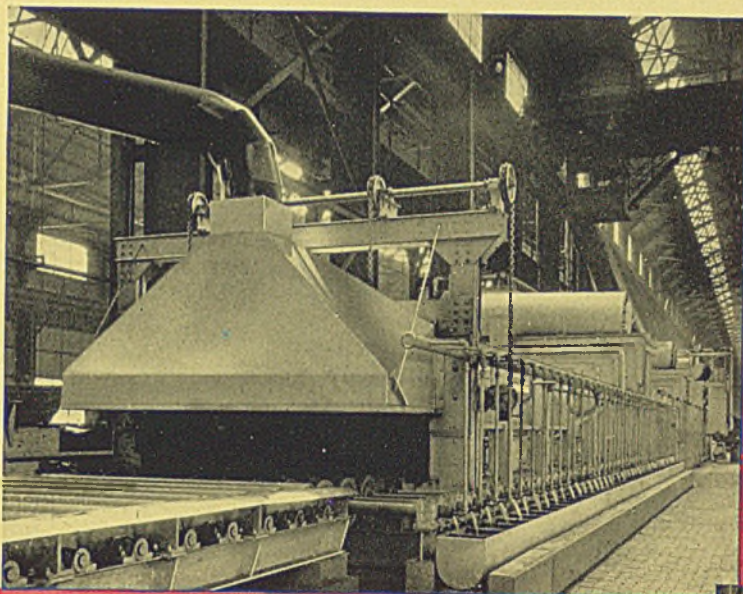
Surface Combustion continuous reheating furnaces are engineered by the Chapman-Stein division. Long experience of this personnel in steel plant operation provides the experience to build into these furnaces not only high thermal efficiency but exceptionally heavy construction to withstand the severe heavy duty to which such installations are subjected.

In steel mills everywhere, Surface Combustion is maintaining an enviable reputation for the best possible modern furnace development, design, engineering and construction.

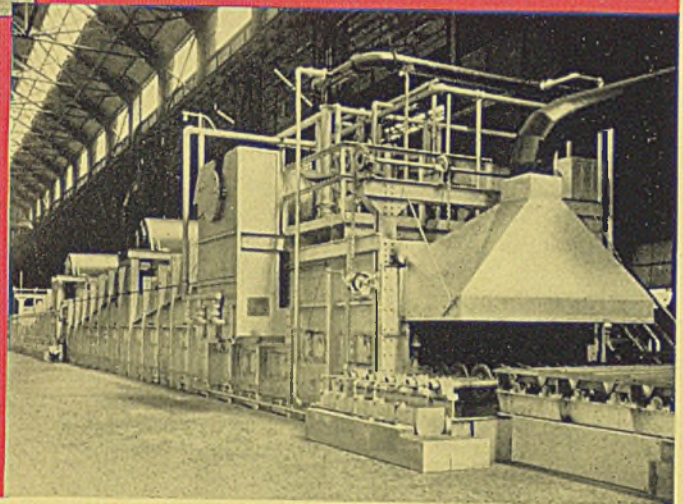
SURFACE COMBUSTION CORPORATION, Toledo, O.



DISC TYPE SHEET NORMALIZING FURNACE



**FIRED BY SC OIL GASIFICATION
HAS ADVANTAGES OF GAS FURNACE
. . . . EFFECTS MANY OPERATING
ECONOMIES AND IMPROVES THE
QUALITY AND UNIFORMITY OF
NORMALIZED SHEETS**



The SC Disc Type Sheet Normalizing installation at the Great Lakes Steel Hot Strip Mill pictured above utilizes the Oil Gasification method developed by Surface Combustion, by which heavy crude oil is actually converted into gas, giving the furnace all the advantages of gas heating.

This installation is said to be the widest dry shaft normalizing furnace in operation. It is equipped with a specially designed alloy shaft type conveyor and can be used both in normalizing and blue annealing. High speed travel of sheets through the cooling chamber is possible, irrespective of the rate of travel through the heating chamber. This is desirable in controlling the temperature at which blue annealed material is roller leveled.



Capacity, when normalizing 72 inch sheets of 18 gauge steel, is approximately 16,700 pounds net work per hour heated from cold to a maximum temperature of 1900° F. Capacity when blue annealing 72 inch sheets of 10 gauge steel, is approximately 38,000 pounds net per hour heated from cold to a temperature of 1650° F.

Grain growth in the sheets being normalized is controlled in the cooling chamber. Close, accurate temperature control in both the heating and cooling chambers is easily and automatically maintained. High quality and uniformity of production and many operating economies are assured. Write for further, more detailed information.

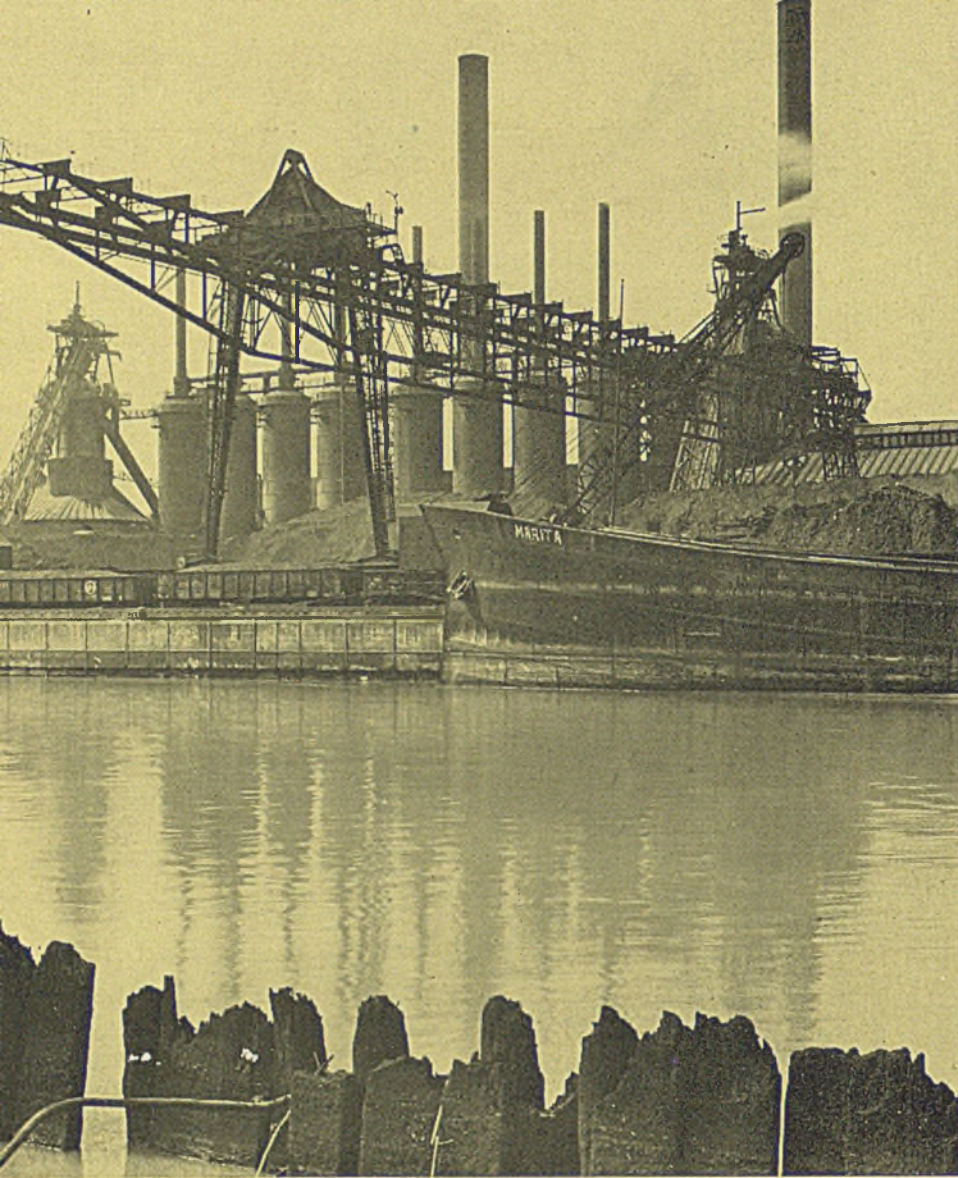
SURFACE COMBUSTION CORPORATION, Toledo, Ohio



Surface Combustion

Toledo, Ohio » Sales and Engineering Service in Principal Cities

Builders of ONE WAY FIRED SOAKING PITS » » BILLET HEATERS » » PACK OR PAIR, ANNEALING, CONTROLLED ATMOSPHERE FURNACES » » NORMALIZERS



sion resistance, high strength. These could be supplied only by introduction of alloys into former types of steels.

The second factor is seen in the slow but certain shift of the steel industry from the production phase to the distribution or merchandising phase, in which steelmakers were compelled to make a steel to do a certain job, if they wanted the order. Perhaps this second factor is somewhat corollary to the first, but possibly it is more a result of the country coming of age industrially. That is, railroads were pushed to the limits of the country; expansion of industry and settled territory had reached a more or less static point; demands for large quantities of plain carbon steel dwindled. More and more the selling of steel had to conform to specialized demand.

And so today we have the heat and corrosion resisting steels for a thousand uses, the high-tensile low-alloy steels, free-machining steels, high-speed tool and die steels, and many others — all developed for specific purposes and providing material which gives better service at

less cost. This is not to infer that the use of carbon steel as such has passed. Many million tons of it are being used annually, but it must be made to closer and more exacting specifications, and the demands of the user are reflected by more attention to precision methods all the way back through rolling mill, blooming mill, soaking pit, open-hearth furnace and blast furnace. Skilled steel mill operators have long since ceased to inherit their ability by word of mouth from their predecessors. There are no more closely guarded operating secrets handed down from father to son, never to escape into the light of the world.

Thorough, practical research has put an end to that. Mutual interchange of ideas among technicians, as exemplified by this iron and steel engineers' convention in Detroit, has broadened out far beyond the dreams of those pioneers who gathered at the first convention of the association. And there is every indication that the open and free discussion of operating technique will continue to expand in years to come. For by this means, the industry is finding fewer

and fewer detours on the road to perfection of its product.

As aptly expressed by Eugene G. Grace, president of Bethlehem Steel, "Not only have we improved quality and stimulated new uses for steel through research and technology, but also through large investments and engineering prowess there have been vast improvements in processes and equipment resulting in increased as well as more efficient production. . . . It may surprise some to know that technical progress has been the chief factor which has made possible a reduction of more than \$11 per ton in the average price of steel today as compared with 1923."

JUST as carefully planned research helps to improve the quality and properties of steel, so does research open the door to new market opportunities. Analysis of problems involved in the construction of various types of equipment and products often suggests the need for a new type of material. When the steel producer understands the need, he can readily furnish a product to fit it.

Consider the case of transport equipment—railroad cars, trucks, buses and the like. When it was shown a few years ago that appreciable savings in dead load could be effected by the use of strong aluminum alloys, steel producers were quick to sense the market for a stronger type of steel which could be used in lighter section to permit weight reduction without any sacrifice of strength. The result was the widespread introduction of the so-called low-alloy high-tensile steels which now are being marketed by nearly all leading producers and are finding considerable acceptance for use in vehicles for road and rail transport. Economy of weight is further bulwarked by added corrosion resistance shown by this type of steel.

Other shining examples of the development of new market possibilities are found in the container field. Cans for beer and motor oil are common in all parts of the country, and constitute one important reason why steel requirements for the container industry in 1935 stood third in the listing of major consuming groups, taking over 9 per cent of the steel produced. This year and next, this proportion probably will increase still further.

Style trends in industrial and consumer goods are accounting for more steel. Streamlining of everything from locomotives to pencils means more steel—strip and sheets. Vogue for stainless steel has invaded the home and restaurant markets, with a consequent demand for more tonnage in the well-known 18-8 chrome-nickel steels. A recent innovation in the form of venetian blinds formed from light-gage steel suggests another expanding market.

Program for A. I. S. E.

Convention Lists

27 Technical Papers

EIGHT technical sessions with a total of 27 papers, a large exhibition of equipment, two fine steel plant inspection trips and several social events forecast a busy week for the Association of Iron and Steel Engineers during its thirty-second convention and seventeenth Iron and Steel exposition in Detroit, Sept. 22-25.

Headquarters are to be maintained at Hotel Statler and there all technical sessions and social features will be held. Sessions will be held morning and afternoon, Tuesday, Sept. 22, with an official exposition visit and exhibitors' dance occupying the evening. Another session on Wednesday morning will be followed with a visit to the

plant of Great Lakes Steel Corp. during the afternoon.

Simultaneous technical sessions of various divisions will be held Thursday morning and afternoon and four divisions will assemble early in the afternoon to hear one paper. A formal reception in the evening will conclude the day's program. On Friday convention visitors will inspect the Ford Motor Co. plant.

The Iron and Steel exposition will be housed in Conventional Hall with more than 135 manufacturers of equipment and supplies represented. This number compares with 120 last year and less than 100 in 1934. The exposition will be open four days. (See Page 99)

Tuesday, Sept. 22

9:00 A. M.—HOTEL STATLER
ASSEMBLY HALL

Annual meeting and business session.

"Developments in the Iron and Steel Industry During 1935-36," by W. H. Burr, electrical and mechanical superintendent, Lukens Steel Co., Coatesville, Pa.

"Steel Sheets for Today's Motor Car—Mechanical and Electrical Problems of Fabrication," by Thomas P. Archer, vice president in charge of operations, Fisher Body Corp., Detroit, and R. A. Geuder, electrical engineer, Reliance Electric & Engineering Co., Cleveland.

"Developments in the Flat Rolled Steel Industry During 1935-36," by Stephen Badlam, consulting engineer, Pittsburgh.

"Seasonal and Present Economic Trend of the Automobile Business," by C. E. Wilson, vice president, General Motors Corp., Detroit.

1:15 P. M.—HOTEL STATLER MAIN
BALLROOM

"The Steel and Automotive Industries," by B. F. Fairless, president, Carnegie-Illinois Steel Corp., Pittsburgh.

"Material Handling Facilities for Hot and Cold Strip Mills," by Fred M. Gillies, assistant general superintendent, Inland Steel Co., Indiana Harbor, Ind.

"Electrical Applications in Contin-

ous Hot Strip Mills," by L. A. Umansky, industrial engineering department, General Electric Co., Schenectady, N. Y.

"Operation of Runout Tables, Coiler Drives and Adjustable Speed Frequency Sets Interpreted Through the Oscillograph," by F. E. Harrell, assistant chief engineer, and W. R. Hough, experimental engineer, Reliance Electric & Engineering Co., Cleveland.

7:30 P. M.—CONVENTION HALL

National officers, national engineering committees, members and will visit Iron and Steel exposition.

9:30 P. M.—HOTEL STATLER BALLROOM
Exhibitors informal dance.

Wednesday, Sept. 23

9:15 A. M.—HOTEL STATLER LARGE
BANQUET ROOM

"Bright Annealing and Normalizing Auto-Body Stock Steel in Electric Furnaces," by F. T. Hague, manager, D. C. engineering department, and P. H. Brace, manager, metallurgical department, research division, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

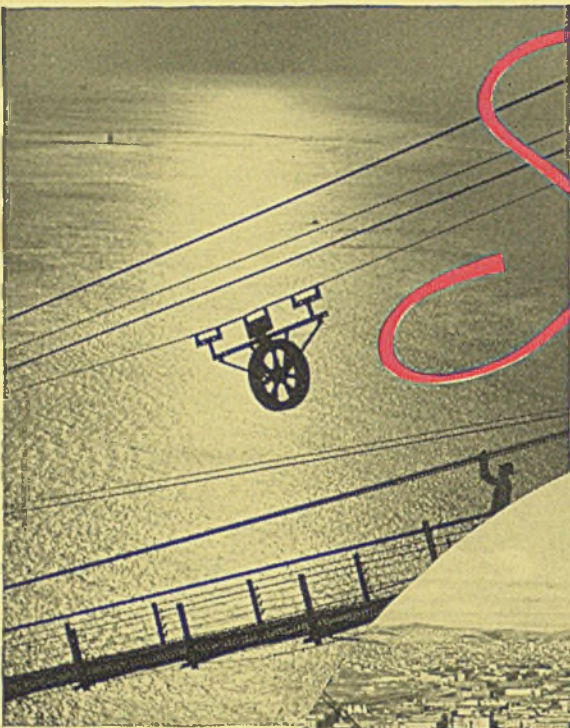
(Please turn to Page 97)



H. G. R. BENNETT

Assistant general superintendent, Duquesne, Pa., works, Carnegie-Illinois Steel Corp., and president of the A. I. S. E.

Spun in

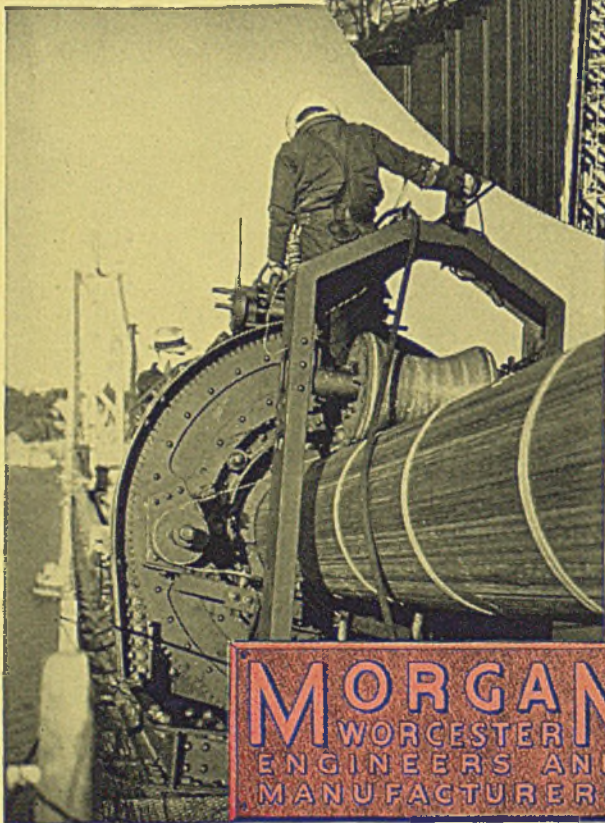


Gabriel Moulin Studios

Above: Like mythology's phantom chariot, a magic spinning wheel weaves tiny wires into strands.

Below: All strands being spun; a powerful radial jack squeezes 37 into one cable.

Gabriel Moulin Studios



Wide World Photos, Inc.

Above: At a cost of \$77,000,000., the great San Francisco-Oakland Bay Bridge—8½ miles long—will link the peninsula with the mainland.

Right: George Washington Bridge at New York. Temperature variations can cause the center of the span to move a maximum distance of 10 feet vertically.

R9

MORGAN
WORCESTER
ENGINEERS AND
MANUFACTURERS

Continuous

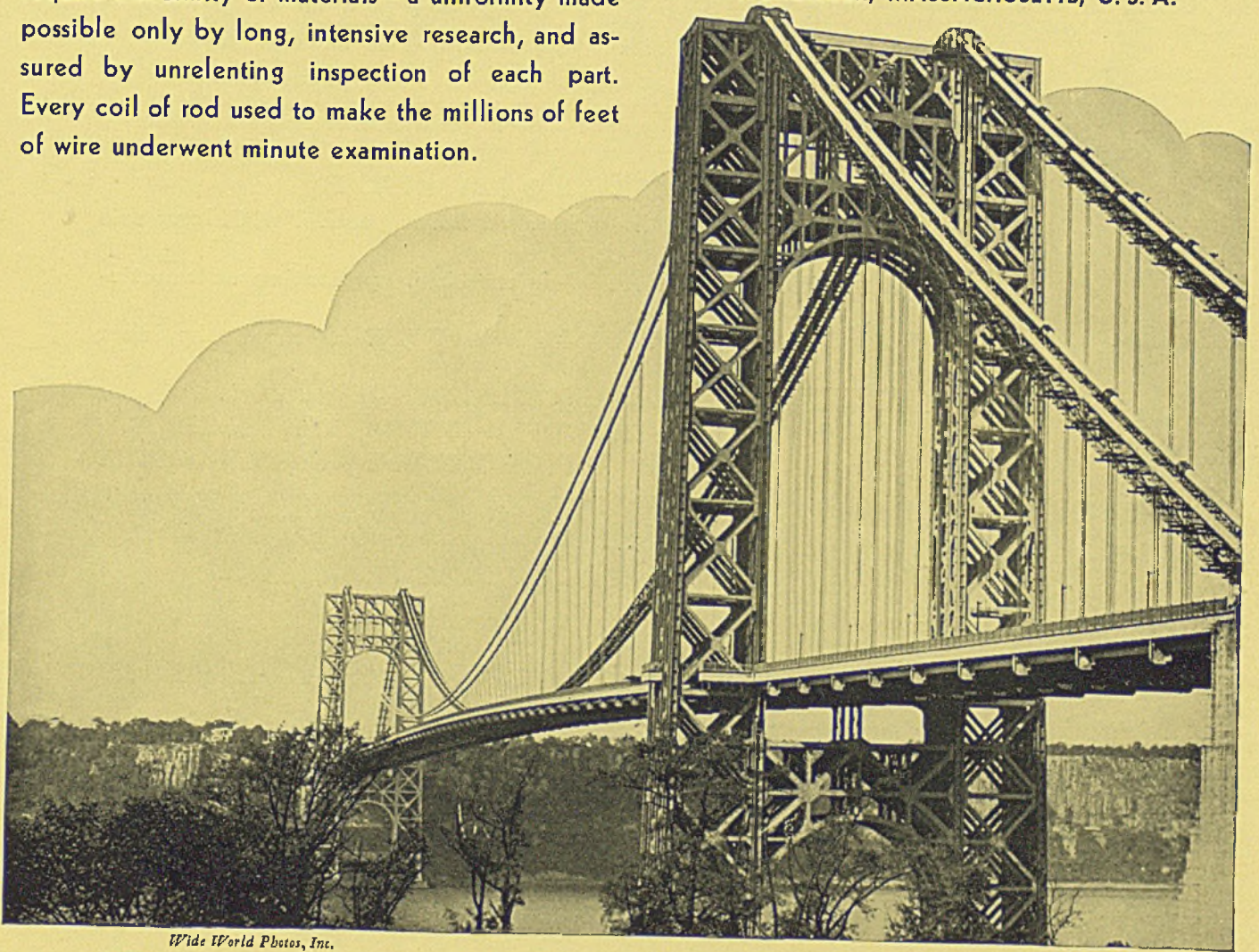
the Skies

THE pattern of a mighty bridge is being traced against the Pacific sky. Moving tirelessly, magic spinning wheels form giant cables from millions of feet of wire—and a bridge comes into being.

Great structures, such as those illustrated here, require uniformity of materials—a uniformity made possible only by long, intensive research, and assured by unrelenting inspection of each part. Every coil of rod used to make the millions of feet of wire underwent minute examination.

It is a source of pride to the Morgan Construction Company that all wire rod used in the making of steel wire for the George Washington and San Francisco-Oakland Bay Bridges were rolled on mills built by Morgan.

MORGAN CONSTRUCTION COMPANY
WORCESTER, MASSACHUSETTS, U. S. A.



Wide World Photos, Inc.

Rod Rolling Mills

CENTER

FIRING

HEAT FOLLOWS

PRINCIPAL

AXIS OF

STOCK

Simple as

ABC

* NEW

— yet the only right way!

2 x 2 = 4

THE



PIT FURNACE

For the first time a successful recuperative type furnace is offered that embodies continuous center firing through the hearth, and in which the flow of the heated gases of combustion is parallel with the principal axis of the stock.

OPERATING ADVANTAGES

UNIFORM HEATING—controlled flame parallel with long axis of ingots.

WASHING ELIMINATED—correct fuel application automatically regulated.

BOTTOM MAKING WEEKLY—saves coke, labor—adds extra heat daily.

INCREASED TONNAGE—up to 100%.

SEALED COVER—CRANE TYPE CARRIAGE.

LOWEST FUEL CONSUMPTION IN INDUSTRY

200,000 btu. per gross ton hot steel

1,400,000 btu. per gross ton cold steel

1,800,000 btu. per hour holding at 2250° F.

CONTROLLED HEAT CIRCULATION
DEPENDABLE RECUPERATION.

AMCO METHOD—available as direct fired furnace.

ADAPTED AND DESIGNED—for conversion of existing Pits.

USES ALL FUELS.

FUEL SYSTEM—fully automatic—Draft control

(United States and Foreign Patents Allowed and Pending)

* We can't, in the limits of the space, do full justice to this development so we strongly urge those in any way interested in soaking pits to write for detailed information.



THE AMCO METHOD (PATENTED)

The AMSLER-MORTON Company

Fulton Bldg., Pittsburgh, Pa.

Fours et Fumisterie
Paris

Amco K-T-G
Sheffield, Eng.

(Concluded from page 93)

"Sheet and Strip Steel for Deep Drawing Purposes," by Joseph Winlock, chief metallurgist, Edward G. Budd Mfg. Co., Philadelphia.

"Heat Treating Alloy Bar Stock in Electric Furnaces," by Dr. Marcus A. Grossmann, director of research, Carnegie-Illinois Steel Corp., Chicago.

"Development of the Great Lakes Steel Corp.," by George R. Fink, president, Great Lakes Steel Corp., Ecorse, Mich.

12:45 P. M.—HOTEL STATLER

Inspection trip to Great Lakes Steel Corp., Ecorse, Mich.

Thursday, Sept. 24

9:15 A. M.—HOTEL STATLER LARGE BANQUET ROOM

Combustion Engineering Division

"Automatic Control in Open-Hearth Furnaces," by A. F. Spitzglass, vice president, Republic Flow Meters Co., Chicago.

"Soaking Pits," by P. M. Ofill, vice president, Amsler-Morton Co., Pittsburgh.

"The Trend in Refractories Application in the Steel Plant," by A. V. Leun, refractory engineer, Bethlehem Steel Co., Bethlehem, Pa.

"Recuperators for Continuous Slab Heating Furnaces," by W. H. Fitch, manager, recuperator department, Carborundum Co., Perth Amboy, N. J.

9:30 A. M.—HOTEL STATLER SMALL BANQUET ROOM

Lubrication Engineering Division

"Centralized Lubrication and Roll Cooling Systems," by T. J. Kauf-



C. L. MC GRANAHAN

Assistant general superintendent, Aliquippa, Pa., works, Jones & Laughlin Steel Corp., and director-at-large of the A. I. S. E.

feld, special representative, DeLaval Separator Co., Pittsburgh, Pa.

"Lubrication of Steel Mill Equipment," by C. J. Klein, chief engineer, Weirton Steel Co., Weirton, W. Va.

"Some Ideas in Lubrication," by Arthur W. Burwell, technical director, Alox Corp., Niagara Falls, N. Y.

1:15 P. M.—HOTEL STATLER BALLROOM FLOOR

Mechanical, Electrical, Lubrication and Welding Engineering Divisions

"Developments in Rolling Mills at the Ford Motor Co." by M. Stone, engineer, United Engineering & Foundry Co., Pittsburgh.

2:00 P. M.—HOTEL STATLER SMALL BANQUET ROOM

Welding Engineering Division

"Developments in Welding During 1935-36," by Grover A. Hughes, electrical engineer, Truscon Steel Co., Youngstown, O.

"Resistance Welding in Steel Plants," by Walter Anderson, vice president, and Malcomb Clark, general manager, Taylor-Winfield Corp., Warren, O.

"How Arc Welding Aids in the Use of Standard Steel Mill Products in the Electrical Industry," by O. A. Tilton, industrial engineering department, General Electric Co., Schenectady, N. Y.

"Commercial Welding as Applied to Steel Mills," by H. A. Woofter, chief engineer, Federal Machine & Welder Co., Warren, O.

2:15 P. M.—HOTEL STATLER LARGE BANQUET ROOM

Combustion Engineering Division

"Gas Distribution at the Ford Motor Co.," by F. J. Harlow, manager, industrial division, Philgas department, Phillips Petroleum Co., Detroit.

"Study of Blast Furnace Charging," by Gordon Fox, vice president, Freyn Engineering Co., Chicago.

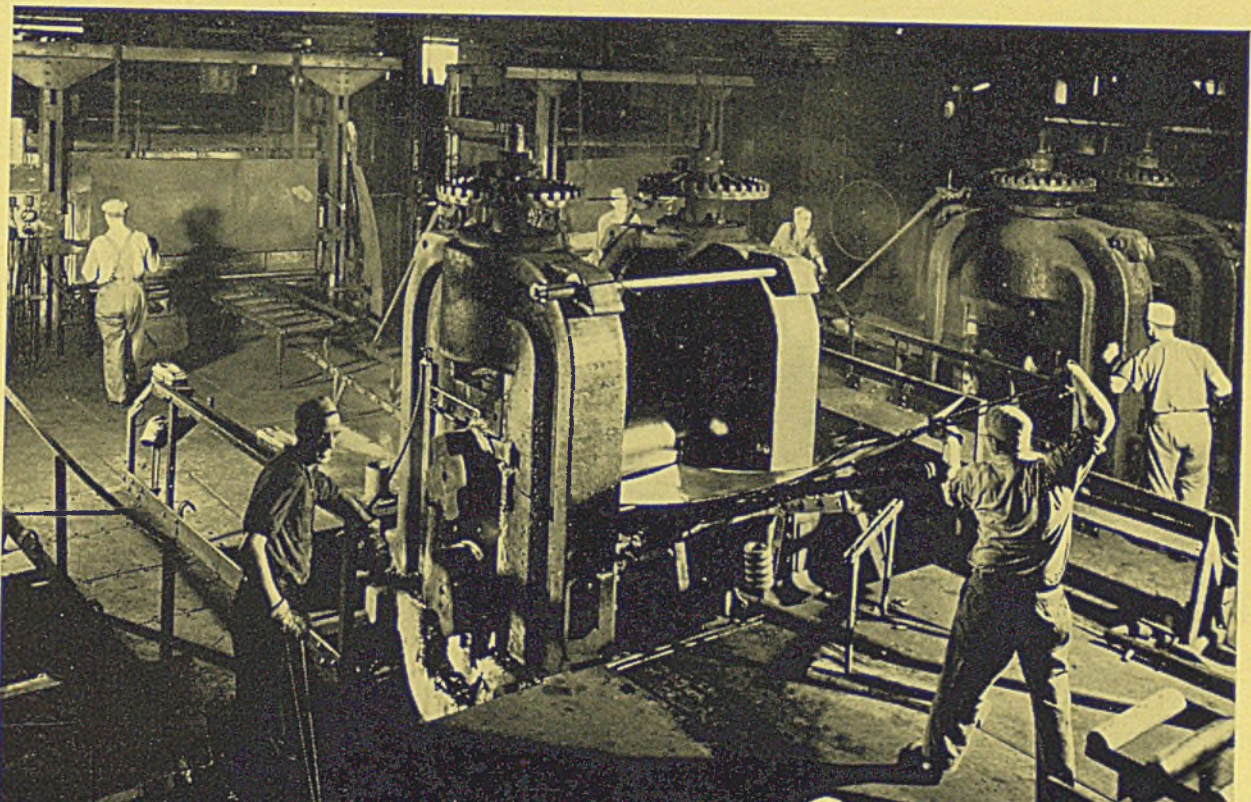
"Inhibitors and Their Probable Mechanism," by G. Walter Esau, metallurgical engineer, E. F. Houghton & Co., Philadelphia.

9:30 P. M.—HOTEL STATLER BALLROOM
Formal reception.

Friday, Sept. 25

9:45 A. M.—HOTEL STATLER

Inspection trip to steel plant, rolling mills and assembly line of Ford Motor Co., Dearborn, Mich.



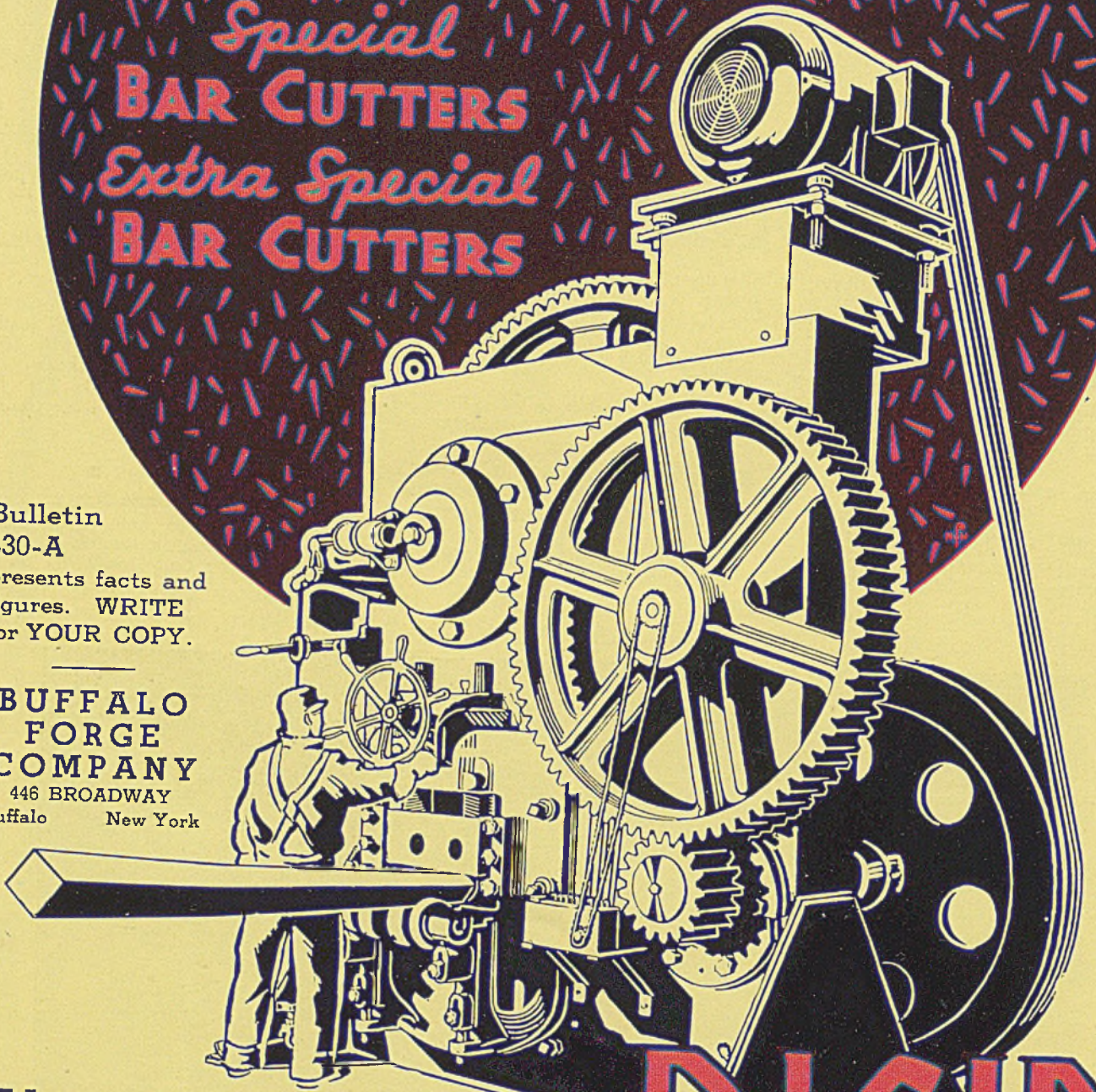
Buffalo

BILLET SHEARS • BAR CUTTERS

Special
BAR CUTTERS
Extra Special
BAR CUTTERS

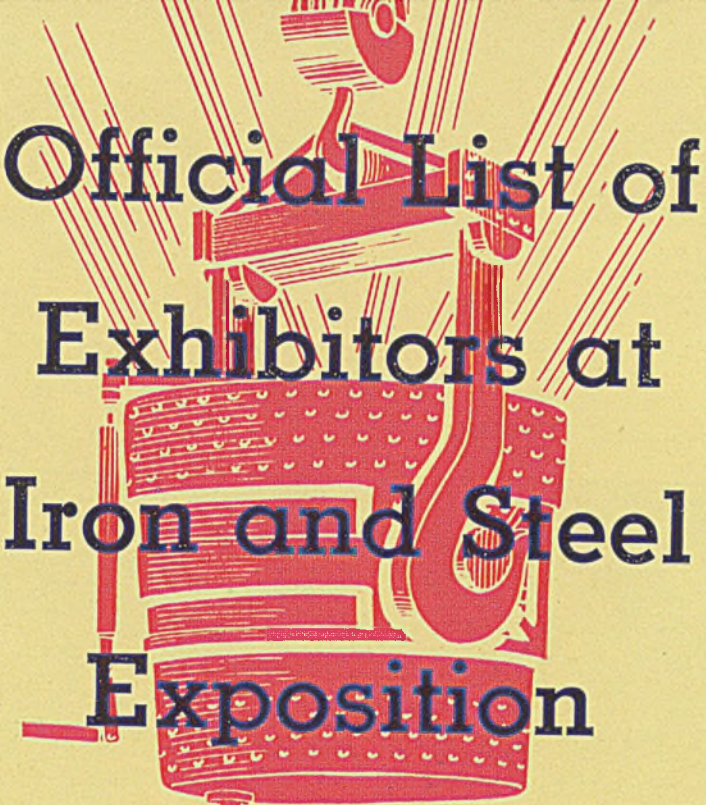
Bulletin
330-A
presents facts and
figures. WRITE
for YOUR COPY.

**BUFFALO
FORGE
COMPANY**
446 BROADWAY
Buffalo New York



Electrically Welded
Frames Are

RIGID



Official List of Exhibitors at Iron and Steel Exposition

EXPOSITION HOURS

Tuesday	1:00 P.M. to 10:00 P.M.	Thursday	10:00 A.M. to 10:00 P.M.
Wednesday	10:00 A.M. to 10:00 P.M.	Friday	10:00 A.M. to 10:00 P.M.

LOCATION—Convention Hall, Detroit

A

<i>Exhibitor</i>	<i>Space No.</i>
Ajax Flexible Coupling Co., Westfield, N. Y.	4
Allen-Bradley Co., Milwaukee	248-249
Alliance Machine Co., Alliance, O.	5
Louis Allis Co., Milwaukee	156
Allis-Chalmers Mfg. Co., Milwaukee	206-208
Aluminum Company of America, Pittsburgh	171-173
American Air Filter Co. Inc., Louisville, Ky.	153
American Car & Foundry Co., New York	157-158
Amsler-Morton Co. Inc., Pittsburgh	36
Anaconda Wire & Cable Co., New York	177
Appleton Electric Co., Chicago	52
Askania Regulator Co., Chicago	121
Atlas Car & Mfg. Co., Cleveland	28-29
Atlas Mineral Products Co., Mertztown, Pa.	67
Automatic Transportation Co., Chicago	148-150

B

Bailey Meter Co., Cleveland	71
Baker-Raulang Co., Cleveland	80, 120
Bantam Ball Bearing Co., South Bend, Ind.	99-100
Barrett-Cravens Co., Chicago	360
Bartlett-Hayward Co., Baltimore	188
Becker Bros. Carbon Co., Chicago	53
Benjamin Electric Mfg. Co., Desplaines, Ill.	204-205
James G. Biddle Co., Philadelphia	194
H. A. Brassert & Co., Chicago	141, 168
Bristol Co., Waterbury, Conn.	74-75
Brown Instrument Co., Philadelphia	77-78

Bull Dog Electric Products Co., Detroit	129-130
Bussmann Mfg. Co., St. Louis	212

C

Carborundum Co., Perth Amboy, N. J.	327-328
Chicago Rawhide Mfg. Co., Chicago	96
Clark Controller Co., Cleveland	32-33, 58-59
Cleveland Crane & Engineering Co., Cleveland	102
Colts Patent Fire Arms Mfg. Co., Hartford, Conn.	66
Continental Machine Specialties Inc., Minneapolis	42
Continental Roll & Steel Foundry Co., E. Chicago, Ind.	82
Crocker-Wheeler Electric Mfg. Co., Ampere, N. J.	64-65
Crouse-Hinds Co., Syracuse, N. Y.	60-61
Cuno Engineering Corp., Meriden, Conn.	76
Cutler-Hammer Inc., Milwaukee	68, 73, 127

D

De Laval Separator Co., New York	92-93
Delta-Star Electric Co., Chicago	103
Detroit Edison Co., Detroit	62
Joseph Dixon Crucible Co., Jersey City, N. J.	136
Driver-Harris Co., Harrison, N. J.	46-47

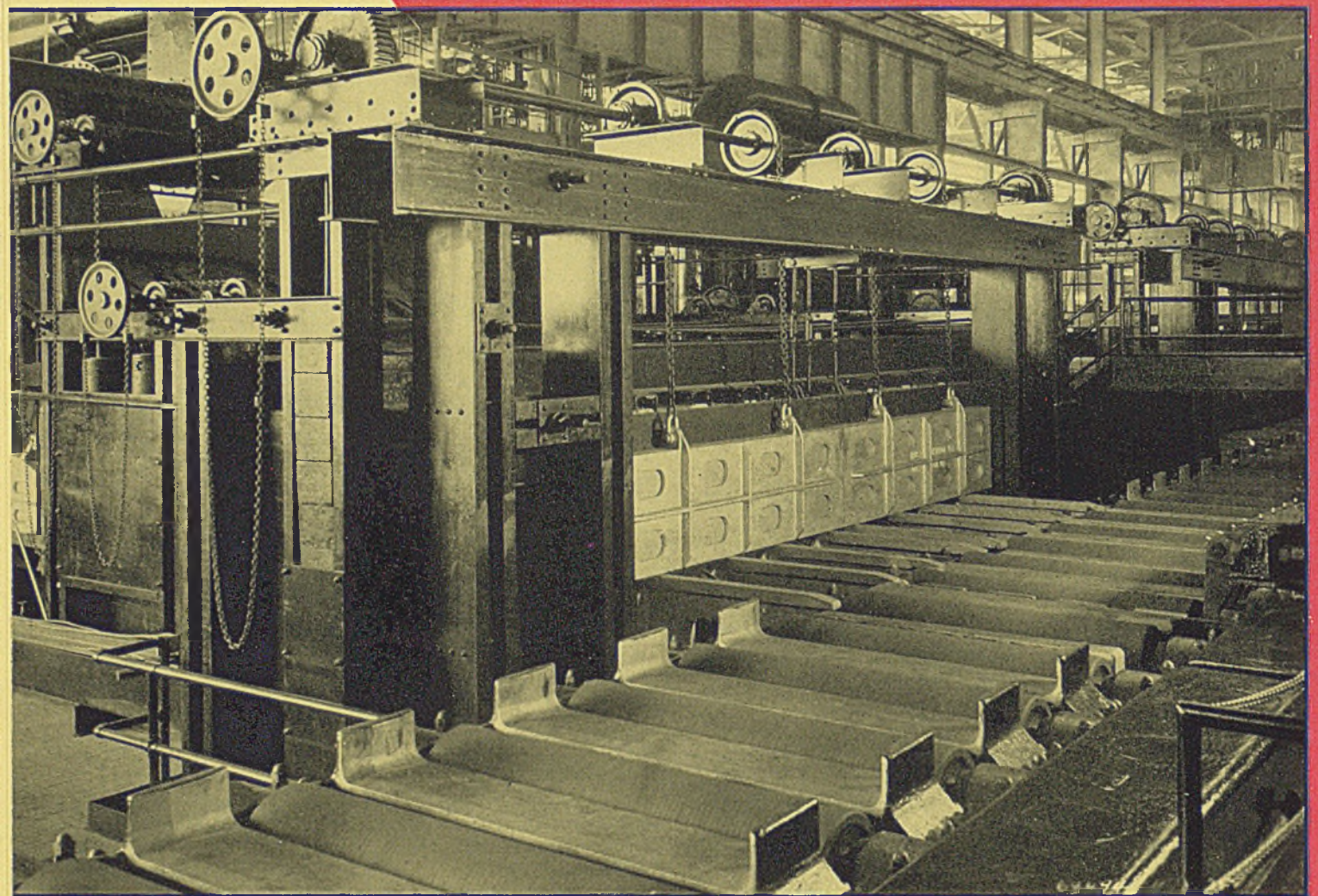
E

Edison Storage Battery Co., Orange, N. J.	118
Electric Controller & Mfg. Co., Cleveland	7-9
Electric Service Supplies Co., Philadelphia	131
Electric Storage Battery Co., Philadelphia	133

(Please turn to Page 104)

CARBORUNDUM COMPANY SERVES FORD MILL IN NEW CONTINUOUS

Slab heating furnaces for Ford Mill.

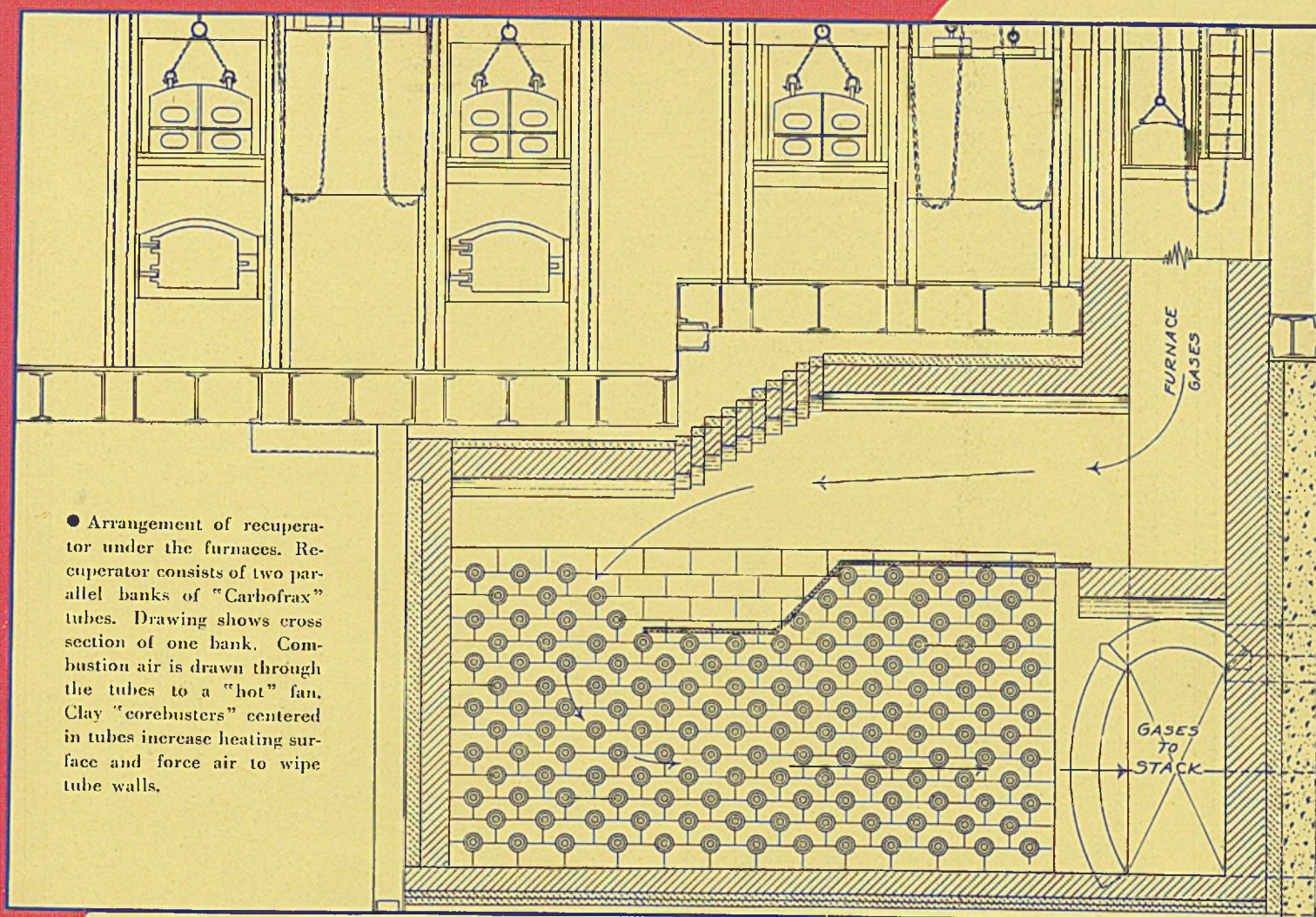


THE installation of a CARBORUNDUM COMPANY RECUPERATOR in the Ford Motor Company's new mill is further proof of the wide acceptance of this equipment by engineers of the Steel Industry. Three million five hundred thousand tons of steel is the annual capacity of the slab and billet heating furnaces which have been equipped with this recuperator within the past two and one-half years.

The Carborundum Company Recuperator is flexible in design, requires a minimum of space,

THE CARBORUNDUM COMPANY

COMPANY RECUPERATOR MOTOR COMPANY US HOT STRIP MILL



● Arrangement of recuperator under the furnaces. Recuperator consists of two parallel banks of "Carbofrax" tubes. Drawing shows cross section of one bank. Combustion air is drawn through the tubes to a "hot" fan. Clay "corebusters" centered in tubes increase heating surface and force air to wipe tube walls.

and can be installed at low first cost. It provides uniform air temperature, minimum air leakage and high heat transfer. This results in efficient operation and fast pick up. Unusual accessibility and durability assure low maintenance charges and the elimination of shutdowns. Our engineers will be glad to call for a complete discussion.

THE CARBORUNDUM COMPANY, REFRACTORY DIVISION, PERTH AMBOY, N. J.

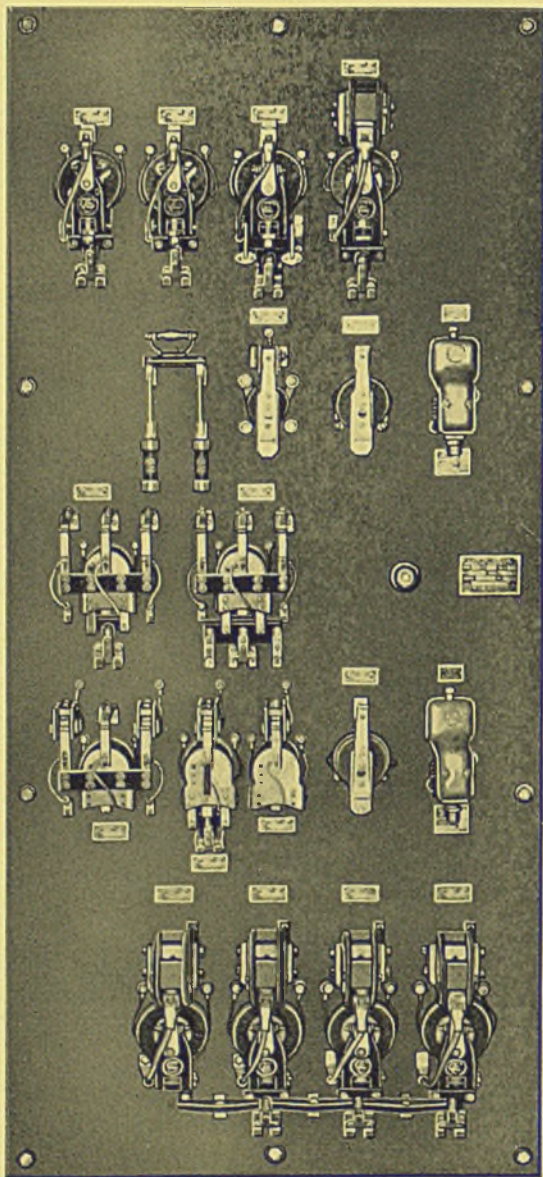
REG. U. S. PAT. OFF.

(Carborundum is a registered trade-mark of The Carborundum Company.)

THE CARBORUNDUM COMPANY

CLARK SUNDH

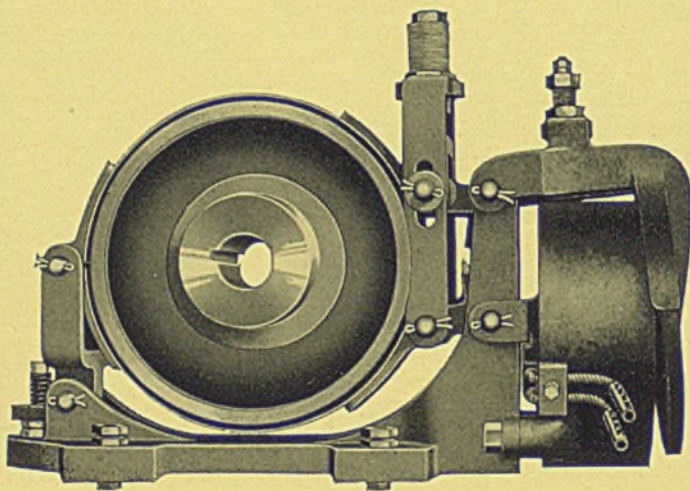
Heavy Duty
Industrial Control



CLARK CONTROL keeps right up to date with new applications and modernization. This is exemplified by the **special Clark Control panel** as shown and which is one of many we have furnished for the modern Continuous Strip Pickling Lines.

Of the installations which have been completely engineered and manufactured by the control industry, Clark has approximately fifty per cent.

Clark Brakes have been improved. Heavier steel shoes now support thick moulded linings. Adjustable bushings in the base make perfect alignment easy. Low pressures per square inch with high torque result in low maintenance cost.



THE CLARK CONTROLLER CO.
1146 E. 152ND ST.
CLEVELAND, OHIO



BUILT BY



MORGAN

Engineering

In the Bar Mill OF FORD MOTOR COMPANY

● Here is one of the 15-ton, 96'0" span Morgan Cranes serving the bar mill of the Ford Motor Company in the River Rouge plant. Like all Morgan Cranes it has every known safety device—a safe crane for the management to own and a safe crane to operate. Designed and constructed to traditional Morgan standards of rugged stability, it is as

dependable as the famous motor car it helps to build. After 55 years of crane help, it may be assumed that the reputation earned by Morgan will never be sacrificed merely to sell another crane. Morgan standards are high, but no higher than seems necessary to build a crane to perform dependably and safely over a long period of time.

★ DESIGNERS • MANUFACTURERS • CONTRACTORS
★ Blooming Mills • Plate Mills • Structural Mills
★ Electric Traveling Cranes • Charging Machines
★ Ingot Stripping Machines • Soaking Pit Cranes
★ Electric Welded Fabrication • Ladle Cranes
★ Steam Hammers • Steam Hydraulic Forging
★ Presses • Special Machinery for Steel Mills

★ THE MORGAN ENGINEERING CO.,
★ Alliance, Ohio
★ Pittsburgh, 1420 Oliver Bldg. • New York, 11 W. 42nd St.

★

<i>Exhibitor</i>	<i>Space No.</i>
Elliott Co., Jeanette, Pa.	134
Elwell-Parker Electric Co., Cleveland	19, 72

F

Fazrel-Birmingham Co., Buffalo	44
Farval Corp., Cleveland	201-203
Foxboro Co., Foxboro, Mass.	40-41

G

Gatke Corp., Chicago	30-31
General Electric Co., Schenectady, N. Y.	163
General Electric Supply Corp., Bridgeport, Conn.	192
General Electric Vapor Lamp Co., Hoboken, N. J.	14-18
R. M. Gordon Co., Pittsburgh	159
Graybar Electric Co., New York	152
Great Lakes Steel Corp., Ecorse, Mich.	83-85, 115-117
Great Western Fuse Co., New York	169

H

Hagan Corp., Pittsburgh	195-197
Harnischfeger Corp., Milwaukee	94-95
Hays Corp., Michigan City, Ind.	54
Hobart Bros. Co., Troy, O.	287-288
Hodson Corp., Chicago	1-3
Holophane Co. Inc., New York	185
Homestead Valve Mfg. Co., Coraopolis, Pa.	70
E. F. Houghton & Co., Philadelphia	214-215
Hyatt Roller Bearing Co., Harrison, N. J.	199-200

I

I-T-E Circuit Breaker Co., Philadelphia	56-57
Independent Air Filter Co., Chicago	137

J

Jefferson Electric Co., Bellwood, Ill.	69
Johns-Manville Sales Corp., New York	24-25

K

Kane & Roach Inc., Syracuse, N. Y.	161
C. M. Kemp Mfg. Co., Baltimore	45
Keystone Lubricating Co., Philadelphia	174

L

Le Carbone Co., Boonton, N. J.	91
Leeds & Northrup Co., Philadelphia	22-23
Lintern Corp., Cleveland	138

M

Mackintosh-Hemphill Co., Pittsburgh	79
Mathews Conveyer Co., Ellwood City, Pa.	6
Mesta Machine Co., Pittsburgh	186-187
Michigan Steel Casting Co., Detroit	154-155
Miller Co., Ivanhoe Division, Meriden, Conn.	106-107
Morgan Construction Co., Worcester, Mass.	166-167
Morgan Engineering Co., Alliance, O.	139-140
Morganite Brush Co. Inc., Long Island City, N. Y.	175

N

National Carbon Co., Cleveland	128, 181
National Electric Coil Co., Columbus, O.	189

National-Erie Corp., Erie, Pa.	135
New York & New Jersey Lubricant Co., New York	88
Norma-Hoffmann Bearings Corp., Stamford, Conn.	63
Northern Engineering Works, Detroit	143

O

Otis Elevator Co., New York	124
-----------------------------------	-----

P

Penola Inc., Pittsburgh	147
Poole Foundry & Machine Co., Baltimore	165
Post-Glover Electric Co., Cincinnati	178
Pure Carbon Co., St. Marys, Pa.	132
Pure Oil Co., Chicago	162
Pyle National Co., Chicago	89-90

R

Railway & Industrial Engineering Co., Greensburg, Pa.	34-35
Ready Power Co., Detroit	142
Reliance Electric & Engineering Co., Cleveland	10-12
Republic Flow Meters Co., Chicago	145-146
Rockbestos Products Corp., New Haven, Conn.	43
Rollway Bearing Co. Inc., Syracuse, N. Y.	191
Joseph T. Ryerson & Son Inc., Chicago	193

S

SKF Industries Inc., Philadelphia	209-210
Socony-Vacuum Oil Co. Inc., New York	190
Speer Carbon Co., St. Marys, Pa.	160
Square D Co., Detroit, Mich.	86-87
Standard Conveyer Co., St. Paul	37
Standard Oil Co. of New Jersey, New York	50-51
STEEL, Cleveland	48-49
D. A. Stuart & Co., Chicago	198

T

C. J. Tagliabue Mfg. Co., Brooklyn, N. Y.	38-39
Texas Co., New York	97
Thompson Electric Co., Cleveland	170
Timken Roller Bearing Co., Canton, O.	182-184
Tool Steel Gear & Pinion Co., Cincinnati	122-123
Trabon Engineering Corp., Cleveland	81, 119
Trumbull Electric Mfg. Co., Plainville, Conn.	20-21

U

United American Bosch Corp., Springfield, Mass.	26-27
United Engineering & Foundry Co., Pittsburgh	125-126
United States Graphite Co., Saginaw, Mich.	164
R. E. Uptegraff Mfg. Co. Inc., Pittsburgh	55

W

Wagner Electric Co., St. Louis	179-180
Westinghouse Electric & Mfg. Co., E. Pittsburgh, Pa.	108-114
Weston Electrical Instrument Corp., Newark, N. J.	176
Wheeler Reflector Co., Boston	101
Edwin L. Wiegand Co., Pittsburgh	98
Daniel Woodhead Co., Chicago	151

Y

Yale & Towne Mfg. Co., Stamford, Conn.	211
York Oil Burner Co. Inc., York, Pa.	144