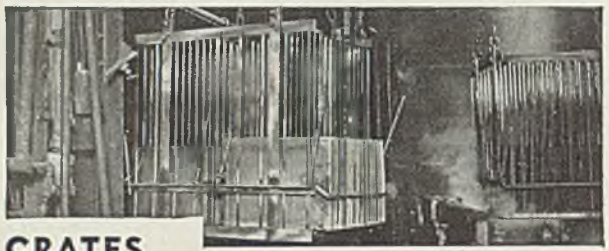
STEEL
FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

Contents

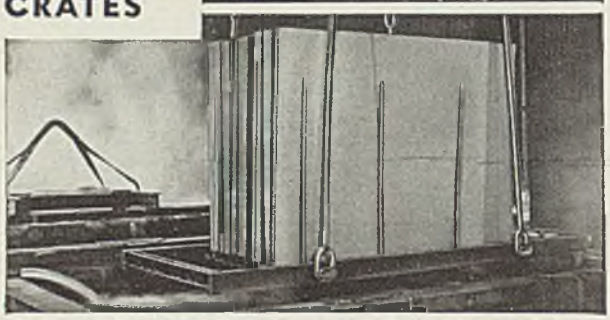
Vol. 101-No. 24 December 13, 1937

IF IT HANDLES PARTS FOR Pickling ... MAKE IT OF Monel

Steel Mills use this tough, corrosion-resistant metal for many different types of Pickling Equipment



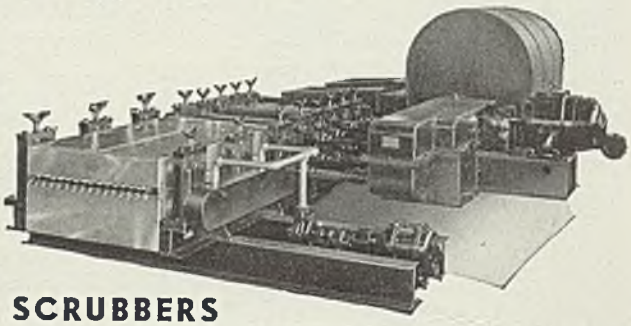
CRATES



Light weight welded Monel crate used for pickling steel sheets prior to tinning. Welded Monel sheet mill crate in lower photo also has eyebars and separator pins of Monel.

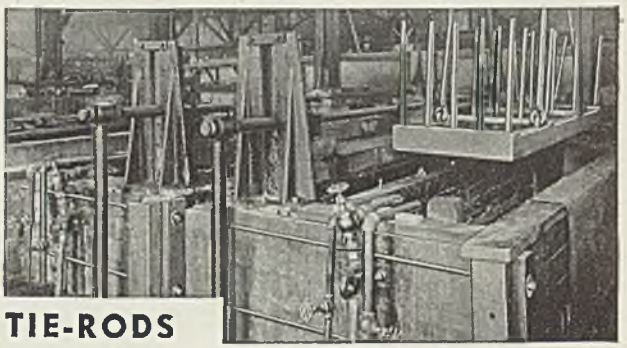
CHAINS, HOOKS

Welded Monel pickling chain, 1" dia. 5' 7⅛" long, 1½" end link with forged Monel hook. All standard sizes are available.



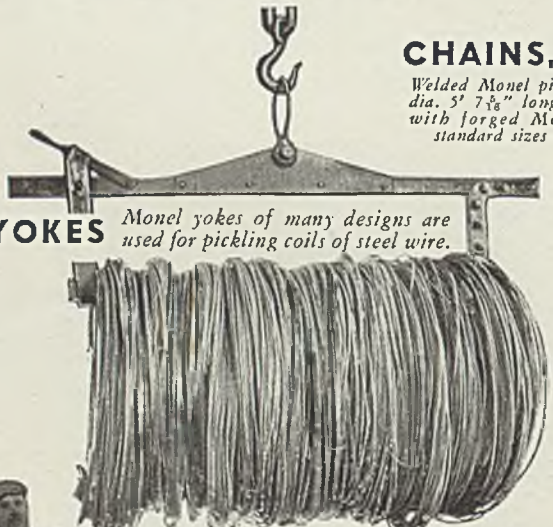
SCRUBBERS

This scrubber scrubs and dries 45-inch steel sheets. Scrub tank and tongues which take hold of sheets are made of Monel.



TIE-RODS

Wood pickling tanks are kept tight with tie-rods of Monel.



YOKES *Monel yokes of many designs are used for pickling coils of steel wire.*

BUILD light weight and long life into your *pickling crates*, by all means. But why stop there? Glance at the photographs on this page and see the many other places where Monel* cuts costs and greatly reduces repairs and replacements in steel mill pickling equipment.

Briefly, you'll save by using Monel for *any* kind of equipment that handles a load and operates in and around pickling acids. The reasons? First: Monel equipment needs no extra weight — for Monel resists corrosion, retains its original strength. Second: Monel's unique combination of strength, toughness and resistance to corrosion assures long years of *dependable service.*

There's a wealth of data you'll appreciate in the two bulletins, "Equipment Designs for the Pickle House" and "A Good Start to a Better Finish". Write for them today.

*Monel is a registered trade-mark applied to an alloy containing approximately two-thirds Nickel and one-third copper. This alloy is mined, smelted, refined, rolled and marketed solely by International Nickel.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street New York, N. Y.

INCO MONEL

As the Editor Views the News

CHANGES in the organization and executive personnel of the United States Steel Corp., announced last Wednesday and Thursday (p. 23), constitute the final major step in one of the most extensive programs of rehabilitation ever attempted in a large American industrial organization. The immediate effect will be to transfer the control of operations from the financial environment of 71 Broadway, New York, to Pittsburgh—"a central location . . . more closely in touch with the atmosphere of steel operations." The change undoubtedly has potentialities for a greater degree of independence and increased authority for officers directly responsible for production, sales and research.

• • •

Closes Its Ranks

The roster of directors of United States Steel of Delaware indicates that the Corporation has gone a long way in 10 years in overcoming a deficiency which once was described by a friendly critic as "the lost generation of Corporation employes." This referred to the hundreds of junior executives denied the opportunity of advancement in the period from 1920 to 1930 because the senior executive positions had become "frozen." Younger men and men comparatively new to the Corporation now sit in positions of authority. Their prominence in the new set-up shows how effectively Big Steel has closed its ranks.

• • •

Constructive Platform

The congress of American industry, held last week under the sponsorship of the National Association of Manufacturers (p. 27) was more constructive in tone and purpose than many of its predecessors. Industry's platform for 1938, as presented by Charles R. Hook, chairman of the resolutions committee, was a sound, sincere answer to the question, "What can industry do to solve its own problems, while awaiting remedial legislation. . . ?" Equally pertinent was the suggestion by Lammot du Pont that capital be mobilized (p. 41) to create 3,000,000 jobs in private industry. The meeting gave a strong impetus to the rising sentiment in congress and throughout the nation for evidence on the part of the federal government that it will co-operate with private enterprise instead of continuing to strangle it. The lines of this issue are clearly defined. A showdown probably will come when congress convenes in regular session in January.

• • •

Too Much Persecution

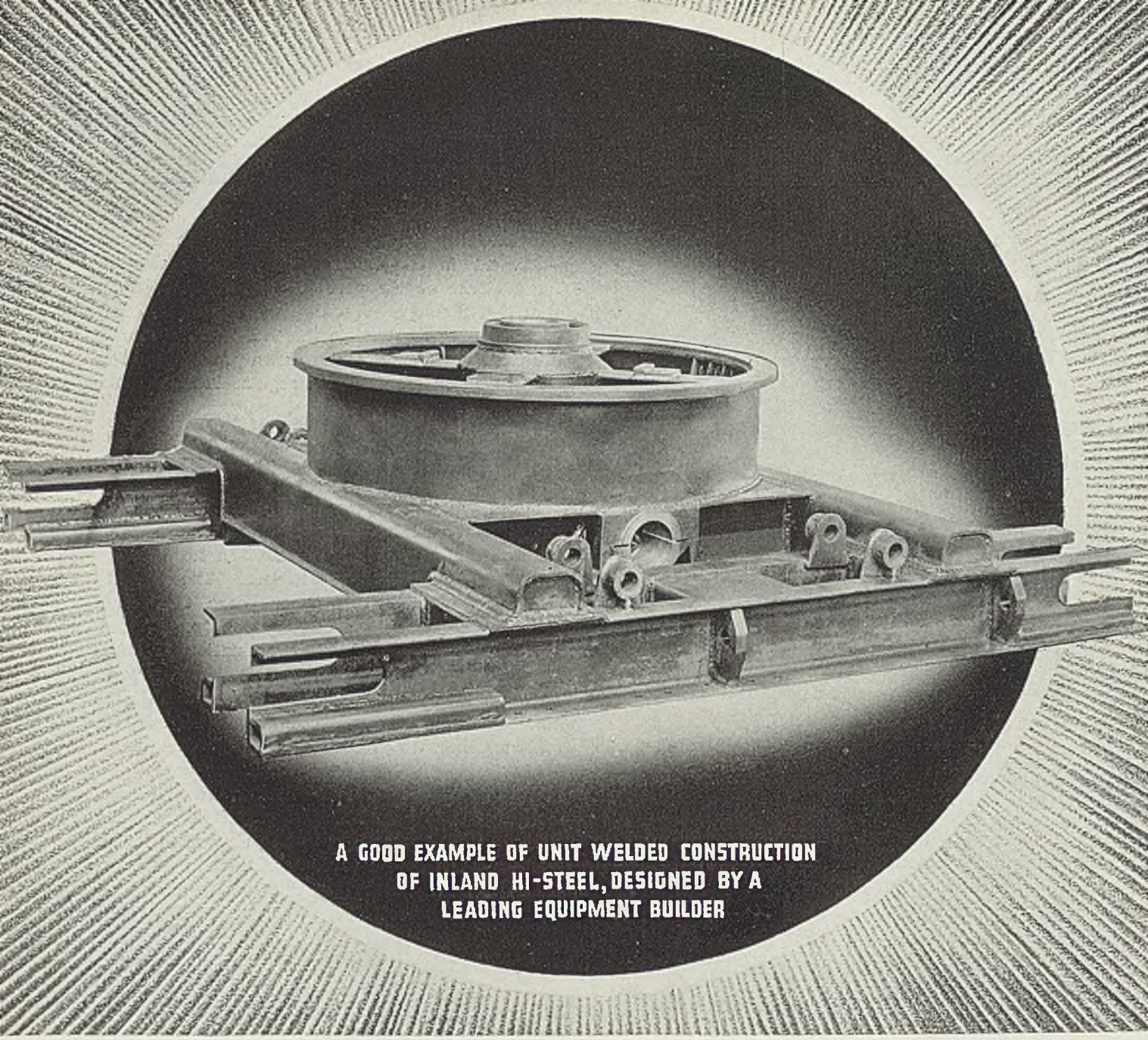
Bureaucracy as represented by the National Labor Relations board has received a black eye through its over-zealous attempts to concern itself with adverse criticism. The NLRB attempt to subpoena the editor of *Mill and Factory* (p. 39) and its reported examination of the editor of a St. Marys, Pa., newspaper have aroused widespread indignation. At the same time Attorney General Cumming's request for a million dollars to prosecute antitrust cases does not set well with those who feel that some of the government's recent suits—notably the oil case at Madison—have been launched on suspiciously flimsy evidence. If the government is sincere in its statements that it wants to co-operate with business, it should put an end to practices which give the appearance of persecution.

• • •

Lubricating Cranes

Lubricating overhead traveling cranes properly is important, especially in plants where the dripping of lubricants is injurious to products and where continuous, uninterrupted crane service is essential. Only a few plants are equipped with the most recently designed cranes. In these establishments the maintenance crews have little difficulty because efficient lubricating systems were installed in the cranes when they were built. In most plants, the crane equipment includes units from several to 20 or 30 years of age. Obviously the older cranes require more attention in respect to lubrication. Lubrication engineers have developed solutions for most of the difficult lubrication problems that can arise (p. 50), even in plants where the equipment embraces units of widely diversified age and design.

E. L. Shaner



A GOOD EXAMPLE OF UNIT WELDED CONSTRUCTION OF INLAND HI-STEEL, DESIGNED BY A LEADING EQUIPMENT BUILDER

IT'S STRONGER AND LIGHTER

Because of Inland Hi-Steel

● Here's a good example of welded, lightweight construction of Inland Hi-Steel—a highly successful product design and sales feature developed by a leading manufacturer of excavators. All forming operations are done in his own plant from flat rolled Inland Hi-Steel.

There has long been a demand for an economical steel of higher strength and greater corrosion resistance . . . also of adequate ductility for ease of fabrication and uniform, stable characteristics when welded or subjected to wide ranges of temperature.

Inland Hi-Steel meets these requirements in every way.

Inland engineers gladly co-operate with equipment manufacturers interested in testing the advantages of Inland Hi-Steel for their products. Adequate samples are freely supplied for this purpose.

Write for Inland Hi-Steel Bulletin No. 10.

SHEETS STRIP TIN PLATE BARS RAILS TRACK ACCESSORIES PLATES FLOOR PLATES STRUCTURALS PILING REINFORCING BARS

INLAND STEEL CO.

General Offices: 38 South Dearborn Street, Chicago, Illinois • Offices in: Detroit, Kansas City, Milwaukee, St. Louis, St. Paul

Younger Generation Takes Lead in New U. S. Steel Set-Up

■ UNITED STATES STEEL CORP. of Delaware—originally chartered in 1933 as an operating concern, and since then almost forgotten—last week became a very live organization.

Plans to centralize practically all major activities, except policy-forming and financial control, in Pittsburgh under the Delaware corporation were unfolded by Big Steel as the latest major change in its ten-year rehabilitation program.

This reorganization, effective Jan. 1, relieves the United States Steel Corp. of New Jersey of direct supervision of 15 subsidiary companies, and shifts the responsibility to Pittsburgh where it will be assumed by the management of the Delaware corporation.

The move is not a merger of the 15 companies. Each will maintain its separate identity and will hold a contractual relationship with the Delaware corporation under which each will arrange for the latter's services in a supervisory capacity.

The Delaware corporation is wholly owned by the parent company. It has no holdings and owns no securities but will function as a management agency.

Will Co-ordinate Activities

The arrangement, according to Myron C. Taylor, who will resign as chairman of the parent corporation next April, is designed to accomplish a closer operating relationship between the various subsidiary companies.

"The United States Steel Corp. of New Jersey will continue to maintain its offices as heretofore (at 71 Broadway, New York)," he said. "Under the proposed arrangement the respective subsidiaries will continue business in their own names as previously. The arrangement described will, it is believed, secure better co-ordination of the activities of the subsidiaries, greater facility and effectiveness in the conduct of current transactions, improve efficiency, and be productive of a more complete identity of interest.

Principal headquarters in Pittsburgh, said Mr. Taylor, will afford a central location more convenient to the management of the subsidiaries and more closely in touch with the atmosphere of steel operations. This arrangement will also bring the staff of the Delaware corporation into closer and more intimate relationship with current activities of the subsidiaries.

15 Subsidiaries Involved

Financial and other matters of broad general policy will continue to be formulated in New York.

Fifteen principal subsidiaries are involved in the plan, only railroads and public service subsidiaries being excluded. Those which will be affected are:

American Bridge Co., American Steel and Wire Co., Carnegie-Illinois Steel Corp., Columbia Steel Co., H. C. Frick Coke Co., Michigan Limestone & Chemical Co., National Tube Co., Oil Well Supply Co., Oliver Iron Mining Co., Pittsburgh Limestone Co., Pittsburgh Steamship Co., Scully Steel Products Co., Tennessee Coal, Iron & Railroad Co., United States Steel Products Co. and Union Supply Co.

"This plan when made effective will conclude the several major basic factors in the plans for the readjustment of the corporation's principal

U.S. Steel of Delaware, New Star for Pittsburgh

■ Concentration of operating and sales management of 15 United States Steel Corp. subsidiaries in Pittsburgh re-establishes that city as pre-eminently the world's steel capital. On the formation of the Corporation in 1901, many of its activities were moved from Pittsburgh—center of the Carnegie organization—to New York; now most of them return. Policy and financial direction continue in New York. Pittsburgh last week expected a small army of executives and office workers; real estate operators were predicting a boom

affairs for the present," Mr. Taylor announced. It is, he indicated, the final step in the ten-year program.

"We began the study of this plan in one form or another in 1929, resulting in many progressive drafts in 1931 and 1932, and in its broad aspects it was agreed upon by the board of directors in 1932. The United States Steel Corp. of Delaware was organized in 1933, as the first step in carrying out the plan. Preoccupation with the passing events of the great depression and the consequent engagement of the organization with respect to national recovery activities, and with other plans heretofore announced, rendered it desirable to postpone further action.

"These plans were resumed, however, with the consolidation of Carnegie-Illinois in 1935, and of American Sheet & Tin Plate Co. with the Carnegie-Illinois in 1936. While we have at times contemplated complete consolidation of all manufacturing properties into one corporation, we have considered that up to the present time this would not be desirable.

Subsidiaries Preserve Autonomy

"The setting up of a management corporation with the new appointments to high executive positions, together with the bringing of officials of the Delaware corporation and the presidents of the subsidiary companies now affected into close relationship through contractual management arrangements and placing the latter upon the board of directors, will, we believe, result in closer co-operation and better co-ordination of activities while preserving the autonomy of the operating companies."

While announcing the plan, Mr. Taylor was asked what the average hours of work of the corporation had been during the year, and he answered:

"Reports for the first nine months which are available indicate that the corporation's employes worked an average of 39.98 hours per week during that period. This is the highest average for a similar period that has been maintained since 1930. In all the years since that time, including 1937, the average weekly hours in the corporation have been less than 40, while the number of employes has steadily risen to a peak in the month of August 1937, when 278,178 were engaged. The present policy continues to be that which was adopted in 1930 of spreading the work."

President of the Delaware corporation will be B. F. Fairless, who, as previously announced, will become president of the parent company Jan. 1. He will maintain offices in both Pittsburgh and New York and will divide his time between the two.

Vice presidents and their assigned duties are: Thomas Moses, raw materials; Walther Mathesius, operations; C. V. McKaig, sales; William Beye, counsel and industrial relations; Max D. Howell, also secretary and treasurer; R. E. Zimmerman, research; C. H. Rhodes, purchases; Harold L. Hughes, special duties, New York.

An executive committee of 12 was appointed and includes: Messrs. Fairless as chairman, Beye, Howell, Mathesius, McKaig, Moses, Zimmerman, J. L. Perry, E. R. Stettinius Jr., E. M. Voorhees, C. F. Hood and B. F. Harris.

Seventeen directors have been elected, including all members of the executive committee and A. N. Diehl, Robert Gregg, G. C. Kimball, L. A. Paddock and C. H. Rhodes. Four more directors are to be elected, bringing the total to 21.

Mr. Hughes, vice president in charge of special duties, is not a member of the directorate or of the executive committee.

It will be noted that practically all of the officers and directors are of the younger generation in Steel corporation affairs.

In view of these latest changes it is assumed that the position of vice president in charge of sales of the United States Steel Corp. (New Jersey), to be vacated by Mr. Gregg, will be automatically eliminated.

With all matters pertaining to production, fabrication, sales, purchases and industrial relations to be centered in Pittsburgh it appears that two vice presidents will be shifted from New York to Pittsburgh, namely Mr. Zimmerman, in charge of research, and Mr. Rhodes, in charge of purchases. Mr. Mathesius, in charge of operations, and Mr. Beye, counsel, and in charge of industrial relations, it is understood, will move from Chicago to Pittsburgh.

Besides this far-reaching organization, important personnel changes are impending in the parent corporation in New York. As announced late in October, Mr. Taylor will retire April 5, 1938, as chairman, but continues as a member of the board of directors and of the finance committee.

Stettinius To Succeed Taylor

Mr. Stettinius, chairman of the finance committee, will succeed Mr. Taylor as chairman of the board, and Mr. Voorhees, now vice chairman of the finance committee, will succeed Mr. Stettinius as chairman of the finance committee. William A. Irvin, president of the corporation, will be succeeded by Mr. Fairless, and become vice chairman of the board.

At Pittsburgh last week the most urgent question was how to provide space for the influx of hundreds of employes, due to move there by Jan. 1, and carry on a smoothly-operating organization.

The corporation has three buildings there, the Carnegie-Illinois, Frick, and Frick Annex, all at Fifth avenue and Diamond street. The Annex and the Carnegie-Illinois building are fairly well-filled now with Carnegie-Illinois officials and those of subsidiaries. It is possible additional space may be required.

Steel Corp. Shipments Off Sharply in November

■ Shipments of finished steel in November by the United States Steel Corp. totaled 587,241 tons, a decline of 205,069 tons from October. In November, 1936, shipments were 882,643.

Cumulative shipments for eleven months of 1937 are 12,336,397 tons, compared with 9,757,767 tons in eleven months of 1936.

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

	1937	1936	1935	1934
Jan.	1,149,918	721,414	534,055	331,777
Feb.	1,133,724	676,315	583,137	385,500
Mar.	1,414,399	783,552	668,056	588,209
April	1,343,644	979,907	591,728	643,009
May	1,304,039	984,097	598,915	745,063
June	1,268,550	886,065	578,108	985,337
July	1,186,752	950,851	547,794	369,938
Aug.	1,107,858	923,703	624,497	378,023
Sept.	1,047,962	961,803	614,933	370,306
Oct.	792,310	1,007,417	686,741	343,962
Nov.	587,241	882,643	681,830	366,119
Dec.	.....	1,067,365	661,515	418,630
Y'rly adj.	.....	†40,859	†23,750	†19,907
Total	.....	10,784,273	7,347,549	5,905,966

†Deduction.

Shipping Board To Spend $20,000,000

■ A building program of approximately $20,000,000 will be begun by the maritime commission within the next two or three weeks, it has been announced.

This program is to include ten or twelve 9000-ton cargo vessels to cost about $1,750,000 each. It is estimated that these ships will use between 5000 and 6000 tons of ship steel.

U. S. Foreign Trade Up 31 Per Cent

■ According to the bureau of foreign and domestic commerce, department of commerce, the total value of our foreign merchandise trade, will amount to approximately $6,400,000,000 for 1937, compared with $4,879,000 last year and only

Officers and Directors of the United States Steel Corp. of Delaware

B. F. Fairless
President

Thomas Moses
Vice President

Walther Mathesius
Vice President

C. V. McKaig
Vice President

William Beye
Vice President

M. D. Howell
V. P., Sec.-Treas.

R. E. Zimmerman
Vice President

C. H. Rhodes
Vice President

H. L. Hughes
Vice President

E. R. Stettinius Jr.

E. M. Voorhees

J. L. Perry

C. F. Hood

B. F. Harris

Robert Gregg

A. N. Diehl

G. C. Kimball

L. A. Paddock

$2,934,000,000 at the low point reached in 1932, showing a gain of 31 per cent over last year and 118 per cent over 1932.

The bureau also reports that this year merchandise exports will exceed imports by an estimated $100,000,000 and possibly more. In 1936 merchandise exports exceeded imports by only $33,000,000.

Irvin Speaks to Nation on Steel

■ "Steel has been one of the greatest factors in improving man's living standards," declared William A. Irvin, president, United States Steel Corp., speaking Dec. 11 on the Carborundum Co.'s broadcast.

Mr. Irvin pointed out that although the public thinks of steel generally in terms of massiveness, there are countless products in everyday use which are so common that their association with steel is frequently forgotten. The speaker illustrated some of the prominent contributions of steel to living comfort, and added in conclusion that "the future holds promise of still greater gifts to come."

"Who's Who" in the Delaware Corporation

B. F. Fairless, president. Now president, Carnegie-Illinois Steel Corp. Relinquishing this post Jan. 1, he also will become president, United States Steel Corp. of New Jersey.

♦

Thomas Moses, vice president in charge of raw materials. Now president, Frick Coke Co.

♦

Walther Mathesius, vice president in charge of operations. Now manager of operations, Chicago district, Carnegie-Illinois Steel Corp.

♦

C. V. McKaig, vice president in charge of sales. Now vice president and sales manager, Carnegie-Illinois Steel Corp.

♦

William Beye, vice president and counsel, in charge of industrial relations. Now vice president in charge of industrial relations, Chicago, United States Steel Corp.

♦

Max D. Howell, vice president, secretary and treasurer. Now vice president, Carnegie-Illinois Steel Corp.

♦

R. E. Zimmerman, vice president in charge of research. Now holding same position with United States Steel Corp.

♦

C. H. Rhodes, vice president in charge of purchases. Now in same position with United States Steel Corp.

♦

Harold L. Hughes, vice president in charge of special duties. He was not, however, named last week as a director in the Delaware corporation. Now vice president, United States Steel Corp.

A. N. Diehl, president, Columbia Steel Co., West coast subsidiary.

♦

Robert Gregg, now vice president in charge of sales, United States Steel Corp., and president-elect, Tennessee Coal, Iron & Railroad Co.

♦

B. F. Harris, president, National Tube Co.

♦

C. F. Hood, vice president in charge of operations, American Steel & Wire Co.

♦

G. C. Kimball, vice president, Chicago district, Carnegie-Illinois Steel Corp.

♦

L. A. Paddock, president, American Bridge Co.

♦

J. L. Perry, president, Tennessee Coal, Iron & Railroad Co., and president-elect, Carnegie-Illinois Steel Corp.

♦

E. R. Stettinius Jr., now chairman, finance committee, United States Steel Corp., elected to succeed M. C. Taylor April 5, as chairman of the board.

♦

E. M. Voorhees, vice chairman, finance committee, United States Steel Corp., recently elected to succeed Mr. Stettinius as chairman of the finance committee.

♦

Executive committee, United States Steel Corp. of Delaware: Messrs. Fairless, chairman; Beye, Harris, Hood, Howell, Mathesius, McKaig, Moses, Perry, Stettinius, Voorhees, Zimmerman.

♦

Four more directors are to be named.

Mechanical Engineers Hear Of Apes and Machines

■ NEED for unity and greater co-ordination in the engineering profession was emphasized by James H. Herron, retiring president of the American Society of Mechanical Engineers at the society's fifty-eighth annual convention in New York, Dec. 6-10.

Mr. Herron, who is president, James H. Herron Co., Cleveland, thought this development should be along material, rather than technical lines, starting possibly with local groups and then advancing the experience and acomplishments of these groups to the larger ones. He also proposed an alternate plan founded on the societies as they now exist for technical purposes, with an additional society formed by the existing organizations to handle the economic phases, for the material welfare of engineers.

Dr. Harvey N. Davis
Elected President, American Society of Mechanical Engineers. See STEEL for Oct. 11, page 33, for the complete list of new officers

In presenting the Towne lecture on "The Simian Basis of Human Mechanics, or Ape to Engineer," Dr. E. A. Hooten, professor of anthropology, Harvard university, Cambridge, Mass., declared somewhat whimsically that he was perturbed, as an anthropologist, by the fact that human invention had outstripped man's organic development.

In his conclusions, Dr. Hooten asserted it was his firm belief that the future of humanity must be built not upon mechanical science, which, up to the present, he believed, is the greatest human achievement, but upon human biology.

"If a man can make machines which are better than himself, cannot he make himself better? We do not need more automobiles, we need fewer fools in the driving seats: we do not need more mechanical robots, we want human animals who still have brains; not more jails, but fewer criminals—there is but one way of making a man, and that is the biological way."

Honors night was featured by introduction of the society's president-elect, Dr. Harvey N. Davis, president, Stevens Institute of Technology, Hoboken, N. J.; conferring of awards; and presentation of the Thurston lecture, "Seeing the Unseen," by R. Merwin Horn, photographic department, Massachusetts Institute of Technology, Cambridge, Mass. Mr. Horn described the development of high-speed photography, by which it is possible to photograph a bullet in flight, at exposures as rapid as 1/500,000-second.

Honorary membership was conferred upon Loranzo Allievi, Rome, for his theories regarding "water hammer," or pressure shock, caused by change of velocity of water flowing through pipes. Signor Allievi was not present, the award being accepted in his behalf by Fulvio Suvich, Italian ambassador to the United States.

Medals Are Awarded

The A. S. M. E. medal for 1937 was presented to Edward P. Bullard, president, Bullard Co., Bridgeport, Conn., for his pre-eminent leadership in development of station-type machine tools.

Dr. Frederick G. Cottrell, Research Corp., Washington, for his outstanding public service, for the invention of electric precipitation, for advancement of the science of gas liquefaction, and for his gifts to engineering research.

Recipient of the Worcester Reed Warner medal was Clarence F. Hirshfeld, chief of research, Detroit Edison Co., Detroit, for his research and contributions to the theory and practice of heat power engineering as exemplified by books and papers.

Alfred J. Buchi, Winterthur, Switzerland, was awarded the Melville medal for his paper "Supercharging Internal Combustion Engines with Blowers Driven by Exhaust-Gas Turbines." Allan P. Stern, Colonial Iron Works, Cleveland, was presented with the Charles P. Main award for his paper on "Influence of the Introduction of Labor-Saving Machinery Upon Employment in the United States."

The society passed a resolution condoling the death on June 15 of Ambrose Swasey, a former president, and recipient of the Herbert Hoover medal last year.

At a management meeting, Mrs. Elinore M. Herrick, regional director of the National Labor Relations board, explained the work of the board and replied to charges that its decisions have been inconsistent and partial.

Speaking at the annual banquet, President Herron, in his remarks on unity, said: "In the minds of many thoughtful engineers there has developed a vision of an all-comprehensive and co-ordinating head for the engineering profession. They have conceived that some plan will be promulgated for unifying the various organized bodies in this very diversified field.

"Naturally, the question arises as to how this may be done—to what interest shall the appeal be made? Some things can be done along technical lines; others along material lines. This is a matter for careful study. In this study we must see beyond our limited technical horizon and into the field of our brother engineers."

Edward P. Bullard
Recipient of A. S. M. E. medal for 1937 for leadership in development of station-type machine tools

Declaring that the advantages and disadvantages must be weighed carefully, the speaker listed the advantages in two separate classes—technical and material. The technical advantages, he said, include a more simplified practice; standards of form; material specifications; proper classification; technical co-operation where practices overlap or conflict; publications, etc.

Material advantages he classified as follows: Civic affairs, national and local; legal status; engineering fees; engineering compensation; ethics; methods of practice; publicity; welfare; publications, etc.

He reviewed the field briefly to see what forces, agencies and groups are working to attain the ends outlined and to appraise some of the

(*Please turn to Page* 49)

Industrial Congress Maps Broad Social Program

■ WHAT can industry do to solve its own problems, while awaiting remedial legislation and evidence of a sincere desire to co-operate on the part of the government?

This theme was emphasized repeatedly at the forty-second congress of American industry, sponsored by the National Association of Manufacturers in New York, Dec. 7 to 9. Deeply concerned over present obstacles to business progress, various committees presented results of thorough studies of many factors influencing industrial conditions. Particularly evident in these reports was a disposition to push adoption of industrial practices which will elevate business in popular esteem.

Charles R. Hook, president, American Rolling Mill Co., Middletown, O., presented the resolutions committee's report, "Industry's Platform for 1938," which was approved by the convention. "What this country needs is business confidence," the platform said. "Business will provide more goods, and therefore more jobs, if it is permitted to face the future with only the natural hazards of legitimate private competition.

Industry Seeks Co-operation

"The 1937 business recession shows that the welfare of the average citizen depends on the welfare of industry. . . . When factories prosper, America prospers. . . .Industry is striving to create better understanding and co-operation among the groups in our society. . . . It is continually removing obstacles in the road to better living."

Mr. Hook's report continued by saying the welfare of the American people and the progress of industry can be assured by: Encouragement of private initiative, the basis of competitive American industry; maintenance and extension of sound industrial practices by industry; equitable employment relations throughout industry; creation of new and broader markets; constructive efforts to alleviate depression effects; sound government policies; co-operation with agriculture; and the maintenance of peace.

Competition and individual initiative, said the report, can be promoted by: Opportunity for the individual to be rewarded according to his achievement and the risk involved; an incentive to capital to invest in existing and new enterprises; limiting government regulation to the prevention of abuses inimical to the public interest; freedom from federal control of prices, wages and hours in manufacturing; taxes that are fair both in amount and in character; constantly increasing research to produce new and wanted products and new jobs.

"Political freedom does not and cannot exist where . . . . there are personal dictators . . . . American industry opposes Fascism, Communism, or government collectivism in any of its forms . . . The manufacturers of the United States want international peace . . . People sometimes say that industry prospers through wars. This is not true."

E. T. Weir
Chairman, National Steel Corp. "Management and labor can get along together," he told the convention

The platform contained a section based upon an extensive study of the relation between industry and agriculture, and showed that the two rise and fall together. "Recognizing that its welfare is linked with that of agriculture," said Mr. Hook, "American industry favors continuing co-operation between the two groups to bring about an equitable price relationship and the maximum exchange of their goods and services."

Mr. Hook urged continued study of recurring booms and depressions in an effort to reduce their harmful effects. The association for a considerable period has been engaged in such a long-term study. It recommended observance by industry of the following policies:

"1. The leveling so far as possible, of seasonal valleys of production and employment.

"2. In periods of business expansion, resistance to price advances which tend to restrict buying and cause price maladjustments.

"3. In periods of business recession, the possible maintenance of volume by prompt adjustment in prices and costs to conform to buyers' lowered purchasing power.

"4. Avoidance both of rigid prices and rigid costs to the extent consistent with the character of the industry and the interests of employes, customers and stockholders.

"5. Analysis by each company of its financial structure to determine if fixed charges may be reduced; avoidance of over-capitalization or financing with borrowed capital beyond ability to pay.

"6. Avoidance of plant expansion merely on the basis of temporary boom orders.

"7. Adequate depreciation charges and the writing off of the value of obsolete physical property.

"8. Building of adequate reserves in forms which can be turned into cash readily when necessary.

"9. Using credit to facilitate the normal flow of goods rather than for speculative purposes or to attract unsound credit risks."

Industrial Peace Desired

Under the head of "Equitable Employment Relations," Mr. Hook said steady employment was one of the objectives of industrial management. He deplored labor controversies on the grounds they retarded business, advocated the following principles for promoting industrial peace, and urged such legislative changes as may be necessary to effectuate these principles:

1. The right to work without regard to membership or non-membership in any organization, and to bargain individually.

2. The right of employes to bargain collectively, and to determine their own organization for so doing.

3. No penalty for employers' failure to deal with any labor organization maintaining a strike for illegal purposes, or by illegal means.

4. Employment, promotion and retention of employes on the basis of merit with due regard for length of service.

5. Legal and social responsibility of both employers and employes for their commitments and their acts.

The convention went on record as opposed to child labor and to sweatshops, and advocated legislation to eliminate both.

Among sound industrial practices, it listed: Fair and equitable treat-

ment to every customer and every supplier; a sound, well-defined labor policy; preservation of credit and goodwill; co-operation with competitors, within legal limits, to the end of serving the public effectively and economically; respect of rights and demands of stockholders; demonstration of business' "citizenship" in its community; and co-operation with and support of government in exercise of its legitimate functions.

In his opening address as president of the association, W. B. Warner, president, McCall Corp., New York, discussed the causes of the present depression, out of which, he said, we cannot climb overnight. The need is for teamwork between capital, labor, management and government. Warning that a free competitive system of business cannot be mixed successfully with a government controlled system, he declared that America must choose. Power to remove the major elements of hesitation, said Mr. Warner, is in the hands of the government. Congress should repeal the undistributed income tax and the capital gains tax, the income tax base should be broadened, and congress should refuse to pass such laws as that contemplating control of wages and hours.

"The more I learn about the American public the more respect I have for it and the more confidence I have in its fairness and good sense and perspicacity, if you give it time to digest new questions and new events," said Raymond Rubicam, chairman, Young & Rubicam Inc., New York. "The average man and woman of 1937 is unquestionably in a stronger position to compare representations made to him or her than was the case in other times."

Recession or Grave Decline?

Whether the present recession is merely a passing phase or is the beginning of a grave decline, said James A. Emery, general counsel of the association, depends largely on federal policy. Pointing out that in the past five years the United States has passed through four general revisions of the tax structure, he hoped that the contemplated fifth revision will provide remedies whose necessity is generally admitted. Remedial revision of the national labor relations act, he said, also would help to stabilize planning and execution of business expansion.

All sides are looking to industry and to industrial science to create millions of new jobs and end unemployment for all who can and will work, said Lammot du Pont, president, E. I. du Pont de Nemours & Co., Wilmington, Del. This attitude is entirely fair, because this responsibility rightly belongs on industry's shoulders and industry accepts it. But today, industry is blanketed by a fog of uncertainty in regard to taxes, labor, the monetary situation, and practically every condition under which industry must operate. Industry can do much to help build prosperity, said Mr. du Pont, if it is given a reasonable assurance as to what answers to these questions it can expect.

Frank Purnell, president, Youngstown Sheet & Tube Co., Youngstown, O., chairman of the association's recently organized committee on industrial working conditions, told of a comprehensive job, now in process, of setting up standards covering all phases of desirable industrial working conditions. Mr. Purnell believed that a good job along these lines will assist tremendously in building esteem for industry.

Recommends Help to Carriers

F. N. Bard, president, Barco Mfg. Co., chairman of the transportation committee, reported on the railroad situation and offered a resolution recommending that all manufacturers take a sympathetic view of the present plight of the railroads and take action whenever possible to help them. It favored a continuance of the present ownership of the roads and said any proposal for government ownership should be opposed.

In a meeting of the national industrial council, held under the auspices of the association immediately prior to the congress, C. M. White, vice president, Republic Steel Corp., Cleveland, reported on that company's experiences earlier this year with CIO. He explained in considerable detail why the company refused to enter into an agreement with that body.

Fundamentally, said Mr. White, the first job of a union organizer is to secure members by claiming the union will bring advantages to the worker through mass bargaining power. On the surface, and as long as it costs him nothing temporarily, the picture may appeal to the prospect. But at present the money (from dues) isn't coming in, and the next step undoubtedly will be a demand for a closed shop and then the checkoff, according to Mr. White.

"Industry's past experience with these two forms of domination has not been a happy one. . . . To any thinking man, therefore, the dangers of the closed shop and the checkoff are readily apparent, and our attitude in fighting the signing of a contract last spring is entirely understandable."

Another speaker was Hartley W. Barclay, editor, *Mill and Factory*, New York, who ignored a subpoena to appear at the national labor relations board hearing at Steubenville, O., with all documents and information used in preparing his recent article, "The True Story of Weirton." His observations at Weirton, said Mr. Barclay, revealed clearly that labor racketeering has been rampant and that government support has been given to many invasions of what he regarded as constitutional rights. He revealed communists have gained considerable weight as labor leaders, and that in some instances WPA funds have been used in advancing CIO educational organization work.

E. T. Weir, chairman, National Steel Corp., said capital and labor can and must get along together. He decried the conception of a business enterprise as something that existed for the exclusive benefit or privilege of one certain group.

"The activity of the federal government in labor matters is an element not previously present in our industrial picture," said Mr. Weir. "It has created an entirely different aspect to the relation of capital and labor and is one of the biggest stumbling blocks to a rational get-together.

"A sound relation between management and labor is not a matter of morals and sentiment. It is a necessity dictated by the economic structure of business. It is just good business sense for all parties to the industrial partnership to try to make the wheels turn smoothly, to produce better goods, to make industry prosper.

Unions Should Be Responsible

"If corporations are to be expected to deal with labor unions, then the unions should be required to make themselves as responsible as the corporations. They should be prohibited from contributing to political campaigns as are corporations. It should be illegal for them to call a strike without first taking the vote of employes in the plan involved. It should be illegal to transport pickets from other plants and industries. Strike violence should be outlawed. The interpretation of the law should not be left to administrative agencies. It should be included in the regular business of our courts. Government should realize that its primary obligation is to protect the right of the worker to work."

Mr. Weir said the cost of strikes in this country in 1936 amounted to about $370,000,000. "This year," he continued, "that loss jumped more than tenfold, to somewhere near five billion dollars. When the final record for the year 1937 is written it will be found that the average American family has paid $160 to $175 as its unwarranted

(*Please turn to Page* 106)

Depict Uses for Steel in Chemistry

■ MORE than 45,000 persons attended the sixteenth exposition of chemical industries at Grand Central Palace, New York, last week, an increase of 30 per cent over the last exposition in 1935. About 525 companies had exhibits, representing a wide range of industries.

Republic Steel Corp., Cleveland, showed various applications of stainless steel for acid lines, agitators, conveyor belts, mixers, shafts, tanks, valves, and similar equipment.

United States Steel Corp. likewise emphasized the growing importance of stainless steels in handling corrosive materials. Its display demonstrated the corrosive resistance of 18-8 steel by subjecting it to boiling 10 per cent nitric acid.

Allegheny Steel Co., Brackenridge, Pa., depicted many applications for stainless steels, not only in the chemical industries, but in other trades as well. Ingersoll Steel & Disc Division of the Borg-Warner Corp., Chicago, pointed out that stainless-clad steel greatly widens use of stainless steels by lowering costs.

Shows X-Ray Equipment

Blaw-Knox Co., Pittsburgh, told about its equipment for the process industries through the lips of a mechanical man. Another interesting exhibit was that of the Pressed Steel Tank Co., Milwaukee. This company only recently installed X-ray equipment which permits it to make class I pressure vessels in smaller sizes. Link-Belt Co., Chicago, demonstrated the operation of its roto-louvre dryer for ores, coal and granular material.

Dings Magnetic Separator Co., Milwaukee, showed for the first time its new type C-F separator designed to remove iron and iron oxides from finely divided material. The machine carries the material over successive magnetic gaps. Non-magnetic material passes through unaffected while that with magnetic properties is deflected into Archimedes screws. It will handle from 1000 to 5000 pounds per hour.

Several instrument companies were represented. Brown Instrument Co., Philadelphia, showed a new pneumatic transmitter for transmitting impulses in hazardous atmospheres pneumatically rather than electrically. This company also is introducing its Electr-O-Line controls for electric motors which consists of a potentiometer and relay for operating proportioning motors accurately.

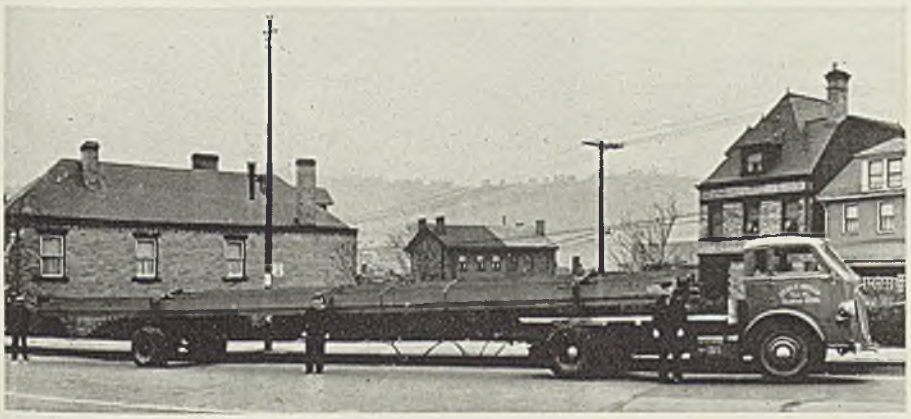
Control Instruments Displayed

Bristol Co., Waterbury, Conn., introduced its new Free-Vane controller for continuous processes involving various variables such as temperature, pressure, flow and liquid level. The controller incorporates a new wide-throttling and reset mechanism of simple design.

Foxboro Co., Foxboro, Mass., had in operation several instruments, including a throttling control which may be manually reset and its Stabilog for the automatic control of temperatures.

Importance of nickel in the chemical industries was shown by the wide number of alloys and applications in the International Nickel Co.'s booth. The Aluminum Co. of America, Pittsburgh, showed aluminum applications for tanks, digesters, condensers, drums, kettles and distillation towers.

Truck Carries 17 Tons of Steel



■ Seventeen tons of 60-foot steel members are hauled by this tractor-trailer outfit. Tractor is an Autocar cab-over-engine streamlined model owned by Charles Rosen, Pittsburgh, a contract hauler for a leading steel interest

Fast Heating in Shell Production

■ APPPROXIMATELY 125 guests of the Ajax Electrothermic Corp., Trenton, N. J., including some of the country's leading engineers, metallurgists and executives, attended a demonstration of the company's high frequency coreless induction furnaces at Frankford arsenal, Philadelphia, Dec. 8.

Demonstration and inspection of the arsenal was followed by a luncheon at which Dr. G. H. Clamer, president and general manager of Ajax, and Lieutenant-Colonel L. H. Campbell, in charge of ammunition production, were the principal speakers.

Two sets of induction furnaces have just been placed in operation at the arsenal. The first consists of a series of three used in conjunction with swaging operations in manufacture of large-caliber shells. The three furnaces operate simultaneously, each heating 6 inches of shell case, 16 inches long with 0.6-inch wall thickness, to a temperature of 1800 degree Fahr., in three minutes.

The furnaces thus turn out one shell case per minute or 60 per hour, ready for the swaging or nose-forming operation. A previous heating process produced only 20 per hour. The induction method results in a minimum of scaling and it also was noted that the heating zone was sharply confined to the desired length. This was caused by the rapidity of heating.

One Generator Is Needed

The second installation comprises two induction furnaces of the same type which heat 14-inch lengths of 22-inch bar, 2⅜ inches in diameter, for a combination piercing and forging operation in the production of small-caliber shells. Three minutes are required to heat the bar to the required temperature of 2200 degrees Fahr., hourly production being 40 units. It is expected these two furnaces will turn out each hour a total of 60 bars, 1¾-inch diameter.

The two sets of furnaces are operated from the same 150-kilowatt, 960-cyle generator set. Full capacity of the generating equipment is required for each set of furnaces so simple switching arrangement is needed.

The Frankford installation stimulated considerable interest on the part of guests. During a luncheon discussion it was brought out that power costs and original costs of induction equipment are higher than for gas- or oil-fired furnaces, but that these factors are more than offset by faster heating and resulting economies in production.

FINANCIAL

BETHLEHEM PAYS EXTRA; $70,000,000 SPENT IN YEAR

■ Board of directors of Bethlehem Steel Corp. last week declared a dividend of $1 per share on common stock, payable Dec. 24, to stockholders of record Dec. 17. This is in addition to the dividend of $1.50 per share declared Oct. 28, also payable on Dec. 24.

In commenting upon the extra dividend, Eugene G. Grace, president, said this brought the common stock distribution for the year up to $5. He said that earnings for the first three quarters amounted to $6.88, and that he believed Bethlehem will be able to keep "in the black" in the current quarter. From an average rate of 85 to 86 per cent in the third quarter Bethlehem's ingot production has dropped to less than 30 per cent.

Mr. Grace said he could see no indications of an early improvement in business, and when asked to comment upon the outlook for 1938, remarked that he couldn't judge that far ahead. He believes, however, that consumers are making real inroads into inventories and is sure steel is being consumed faster than it is being produced.

Bethlehem's new rod and bar mill at Sparrows Point went into operation Dec. 9. It has a capacity of 20,000 tons a month and followed by two weeks the opening of the new 54-inch strip mill there. Mr. Grace added that the company has spent about $70,000,000 on new capital equipment this year and that it has no further large program in contemplation. Mr. Grace stated its new rated ingot capacity, as of Jan. 1, 1938, will be about 10,000,000 tons, as against its last rating of 9,360,000 tons.

DIVIDENDS DECLARED

Republic Steel Corp. declared a dividend of $1.50 per share on 6 per cent cumulative convertible prior preference stock series A, for the quarter ending Dec. 31, payable Dec. 21 to stockholders of record Dec. 13. They also voted a dividend of $13.50 per share on 6 per cent cumulative convertible preferred stock, payable Dec. 21 to stockholders of record Dec. 13. The latter dividend is inclusive of $1.50 rate which has currently been paid and additional $12 against accumulations.

Interlake Steamship Co., Cleveland, declared a dividend of $2.50 per share on the 464,000 shares of common outstanding, payable Dec. 20 to stock of record Dec. 13. This brings total dividends on common this year to $5 per share, and represents the largest dividend since 1929.

Sharon Steel Corp. declared regular quarterly dividend of $1.25 on preferred stock and 30 cents on common, both payable Dec. 21 to Dec. 13 record. No action was taken on a special dividend on the common stock. In November preferred holders authorized directors to issue at any time during the remainder of this year up to 8000 shares of the $5 preferred stock, as a dividend on the common stock if the latter considered it advisable.

Crucible Steel Co. of America, New York, has declared a dividend of $3.75 a share on the 7 per cent preferred stock, payable Dec. 24 to record Dec. 14. Of this amount $2 is applicable to arrears on this issue, which at the close of the second quarter amounted to $27 a share.

Tool Builders Ask Profit Tax Repeal

■ Repeal of the tax on undistributed earnings is being urged by the nation's machine tool builders, who, without exception, have found the tax a severe handicap. This was revealed last week by a survey by the National Machine Tool Builders association, Cleveland, covering 135 plants employing about 43,000 men.

Manufacturers of capital goods, these companies experience extreme peaks and valleys in demand which necessitates dependence on earnings in good years to defray losses in bad years. For instance the industry paid out 43 per cent of its surplus accumulated up to 1929 to carry operations over the depression through 1934.

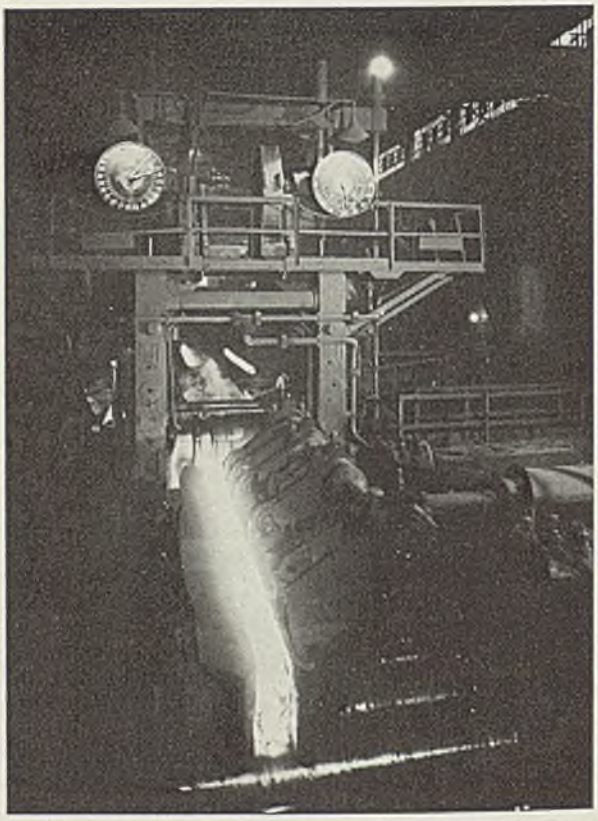
A typical company normally expends 36 per cent of gross sales for payrolls. During the years of 1931 to 1934 it spent an average of 61 per cent for this purpose thus giving employment to its older skilled workers at an abnormally high cost. The difference came out of accumulated surplus.

Greatest problem under the tax law is the inability to accumulate sufficient cash reserve to hold skilled mechanics through possible future depressions. Companies normally distribute 50 per cent of their earnings as dividends now feel compelled to pay out 72 per cent.

Other difficulties created by the tax are: Increased difficulty in financing expansion, both by the tool companies and their customers, especially the smaller companies; guess work in estimating probable earnings; high costs for auditing and legal fees; surpluses in parts in processes, raw material or accessories resulting from large volume of business, not available in cash to pay either taxes or dividends.

In Wisconsin Steel's $6,000,000 Modernization

■ Wisconsin Steel Co., South Chicago, subsidiary of International Harvester Co., has spent $6,000,000 in the past 18 months in modernizing its steel plant, features of which will be described soon in STEEL. Among the major items is this 40-inch, 2-high reversing blooming mill. Photo shows ingot in manipulator at the entering side of the mill, with finished blooms in background. For further reduction the steel passes to a 32-inch, 2-high reversing bloomer which rolls billets from 3 x 4 inches to 8 x 8 inches, and slabs from 5 to 24 inches wide



November Ingots Lowest Since '34

■ OUTPUT of open-hearth and bessemer steel ingots produced in November totaled 2,153,781 gross tons, a decline of almost 37 per cent from October and 59 per cent below the March output, the peak month for 1937, according to figures compiled by the American Iron and Steel institute.

The November total was the lowest of any month since December, 1934, when 1,964,257 gross tons were produced. In October the industry made 3,392,691 tons and in March, this year, 5,216,666 tons. November showed a loss of 50 per cent from the production of November, 1936, when 4,323,025 tons were made.

The 48,045,241 tons produced in the first 11 months this year is nearly 5 per cent greater than output in the corresponding period of 1928, the second largest steel year on record. Production in 11 months of that year totaled 45,846,977 tons. However, 4,000,000 tons were made in December, 1928, raising the total to 49,865,185 tons.

Over the past six months the average of STEEL'S weekly estimates of operating percentages has been remarkably close to the official figures based on actual production as related to capacity. The percentages of capacity engaged and the variations are as follows:

	Steel	Official	Variation
June	74.60	74.46	0.14
July	79.50	78.49	1.01
August	83.60	83.79	0.19
September	76.77	76.52	0.25
October	59.46	58.31	1.15
November	37.54	38.22	0.68

District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended Dec. 11	Change	Same week 1936	Same week 1935
Pittsburgh	19	— 5	75	42
Chicago	24	— 6	77	59
Eastern Pa.	29	— 2	49.5	37
Youngstown	24	—11	79	62
Wheeling	30	None	92	78
Cleveland	31	None	75.5	84
Buffalo	21	None	84	47
Birmingham	45	— 9	74	56
New England	36	+ 4	91	82
Cincinnati	29	+15	92	†
St. Louis	20.6	None	68	†
Detroit	52	+ 2	95	94
Average	27	— 3.5	77.5	54.5

†Not reported.

Steel Ingot Statistics

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

1937	—Open Hearth— Gross tons	Per cent of capacity	—Bessemer— Gross tons	Per cent of capacity	— Total — Gross tons	Per cent of capacity	Weekly production, all companies, gross tons	Number of weeks in month
Jan.	4,433,145	84.20	291,794	54.30	4,724,939	81.43	1,066,578	4.43
Feb.	4,082,163	85.87	331,669	68.35	4,413,832	84.25	1,103,458	4.00
March	4,812,879	91.42	403,787	75.14	5,216,666	89.91	1,177,577	4.43
April	4,681,677	91.83	390,198	74.98	5,071,875	90.27	1,182,255	4.29
May	4,767,269	90.55	386,290	71.88	5,153,559	88.82	1,163,332	4.43
June	3,899,190	76.48	284,572	54.68	4,183,762	74.46	975,236	4.29
July	4,220,561	80.09	336,035	62.67	4,556,596	78.49	1,030,904	4.42
Aug.	4,502,243	85.25	373,428	69.49	4,875,671	83.79	1,100,603	4.43
Sept.	4,029,921	78.98	271,948	52.38	4,301,869	76.52	1,005,110	4.28
Oct.	3,203,447	60.66	189,244	35.22	3,392,691	58.31	765,844	4.43
Nov.	2,040,020	39.89	113,761	21.86	2,153,781	38.22	502,047	4.29
11 mos.	44,672,515	.....	3,372,726	.....	48,045,241	.....	1,006,815	47.72
1936								
Jan.	2,843,415	54.76	196,389	32.21	3,039,804	52.39	686,186	4.43
Feb.	2,754,446	56.76	202,445	35.55	2,956,891	54.53	714,225	4.14
March	3,148,813	60.64	185,040	30.33	3,333,853	57.46	752,563	4.43
April	3,627,830	72.14	304,775	51.62	3,932,605	69.99	914,593	4.29
May	3,735,283	71.93	302,092	49,55	4,037,375	69.58	911,371	4.43
June	3,640,672	72.40	334,897	56.72	3,975,569	70.75	926,706	4.29
July	3,587,764	69.25	326,606	53.69	3,914,370	67.61	885,604	4.42
Aug.	3,833,727	73.83	350,560	57.50	4,184,287	72.11	944,534	4.43
Sept.	3,848,340	76.71	303,048	51.45	4,151,388	74.05	969,950	4.28
Oct.	4,216,536	81.20	317,710	52.11	4,534,246	78.15	1,023,532	4.43
Nov.	3,993,472	79.42	329,553	55.82	4,323,025	76.94	1,007,698	4.29
11 mos.	29,230,298	.....	3,153,115	.....	42,383,413	.....	885,570	47.86
Dec.	4,119,025	79.50	305,342	50.20	4,424,367	76.42	1,000,988	4.42
Total	43,349,323	70.74	3,458,457	48.07	46,807,780	68.36	895,329	52.28

Percentages of capacity for the first six months of 1937 are calculated on weekly capacities of 1,188,452 gross tons for open-hearth ingots, 121,308 tons for bessemer and 1,309,760 tons total, based on annual capacities as of Dec. 31, 1936, as follows: Open-hearth ingots, 61,965,862 gross tons; bessemer, 6,325,000 tons; beginning July 1, 1937, on weekly capacities of 1,192,182 gross tons open-hearth ingots and 121,308 gross tons bessemer, total 1,313,490 gross tons; based on annual capacities as follows: Open-hearth ingots, 62,160,362 gross tons bessemer, 6,325,000 gross tons; for 1936, on weekly capacities of 1,172,160 gross tons open-hearth ingots, 137,624 tons bessemer, 1,309,784 tons total, based on annual capacities as of Dec. 31, 1935, as follows: Open-hearth ingots 61,280,509 gross tons, bessemer 7,195,000 gross tons.

PRODUCTION

■ With practically every large steelmaking center curtailing production last week the national rate dropped 3.5 points to 27 per cent. Schedules for this week in a number of cases call for additional open hearths, with the probability of the rate showing some upward movement, which would be the first rise since the week ending Sept. 18.

Pittsburgh — Down 5 points to 19 per cent. Carnegie-Illinois Steel Corp. is operating at 24 per cent in the Pittsburgh district, against 32 per cent last week. Jones & Laughlin Steel Corp. is at 27 per cent, against 20 per cent last week.

Wheeling — Restoration of two open-hearth furnaces to the active list after midweek brought operations back to 30 per cent, the same as last week.

Detroit — Up 2 points to 52 per cent, with 11 of 21 furnaces melting the full week. Little change is expected over the next few weeks.

Birmingham, Ala.—Down 9 points to 45 per cent, with nine open hearths producing.

St. Louis — Unchanged at 20.6 per cent for the third consecutive week.

Chicago — Off 6 points to 24 per cent as a result of a sharp reduction by one large producer. Two mills increased their output. Two more blast furnaces have been shut down, giving the district 14 active stacks out of 39.

New England — Ingot rate of operations went up for the second week to 36 per cent of capacity from 32 per cent. Most of this gain will be wiped out, however, this week by one producer taking off all open hearths for about two weeks.

Buffalo — Unchanged at 21 per cent, incoming business holding this level steadily. Nine of 43 open hearths are active.

Central eastern seaboard — Down 2 points to 29 per cent. One plant which was down entirely last week expects to put two open hearths on this week.

Youngstown, O. — Down 11 points to an estimated 24 per cent, with 24 open hearths, two bessemers and nine blast furnaces active. Operations next week are expected to increase to 28 per cent as Youngstown Sheet & Tube Co. reopens its Brier Hill plant with four open hearths.

Cleveland — Unchanged at 31 per cent. Addition of two open hearths Monday by Republic Steel Corp. will probably give a higher rate this week.

Cincinnati — Up 15 points to 29 per cent following addition of four open hearths. Staggered operations, as specifications accumulate, cause abrupt changes.

MEN OF INDUSTRY

■ JOHN O'H. ANDERSON has been appointed assistant district sales manager at New York for Jones & Laughlin Steel Corp., Pittsburgh. Mr. Anderson entered the employ of Jones & Laughlin in 1924 in the Pittsburgh works. He became a member of the sales department in 1926 and has been engaged in sales work since that time, having served in Pittsburgh, Washington, Buffalo and Houston, Tex., prior to being assigned to the New York district sales office on Feb. 1, 1937.

♦

Stanley M. Hunter has been appointed manager of sales, American Hoist & Derrick Co., St. Paul.

♦

Herbert Simpson, president, National Engineering Co., Chicago, sailed for Australia, Dec. 8, on a two-month business and pleasure trip.

♦

George A. Seyler, vice president and general manager, Lunkenheimer Co., Cincinnati, has been reelected president of the Industrial Association of Cincinnati.

♦

Raymond F. Holland, identified with the Buffalo Bolt Co., North Tonawanda, N. Y., since 1917, has been named purchasing agent, to succeed the late Dennis F. Cullinan.

♦

F. J. Elliott, formerly with E. F. Houghton & Co., is now Cleveland district sales manager for the Rustless Iron & Steel Corp., Baltimore, with headquarters at 731 Society for Savings building.

♦

Otto W. Seidenbecker has been appointed general sales manager, Wisconsin Steel Co., subsidiary of

Otto W. Seidenbecker

International Harvester Co., Chicago. Mr. Seidenbecker joined the latter company in 1912 in the foreign sales accounting division. In 1923 he was made works auditor of Wisconsin Steel Co.'s mine operations at Benham, Ky.; a year later was appointed assistant auditor of Wisconsin Steel Works; in 1927 became auditor of all operations of Wisconsin Steel Co. and held this position until his recent promotion.

John O'H. Anderson

♦

J. G. Carruthers, assistant general manager of western sales for the Bethlehem Steel Corp., with offices in Cleveland, sustained severe bruises in an automobile accident near Lodi, O., Dec. 5.

♦

Samuel F. Pryor Jr., vice president, Southern Wheel division of American Brake Shoe & Foundry Co., New York, has been named assistant to the president of the company.

♦

Harry J. Kicherer, who has been actively engaged in the manufacturing industry in the Minneapolis area, has become affiliated with the manufacturing staff of the tractor works, International Harvester Co., Chicago.

♦

H. J. Georgen has been added to the sales staff of Michiana Products Corp., Michigan City, Ind., maker of heat resistant and stainless steel alloy castings. His headquarters will be at 80 East Jackson boulevard, Chicago.

♦

Ernest P. Waud has been elected president, Griffin Wheel Co., Chicago. He succeeds Frank L. Whitcomb, who has been elected vice chairman of the board of directors. Mr. Waud entered the company's employ in 1905 as an inspector of chilled railroad car wheels and later became chief inspector, department manager and assistant treasurer. In 1919 he was elected a vice president.

♦

John F. MacEnulty has been appointed president and a director of Pressed Steel Car Co. Inc., Pittsburgh. He was formerly vice president and director of the old Pressed Steel Car Co. and since the reorganization has been vice president in charge of sales, with offices in New York. George H. Fleming, vice president, has been made executive vice president.

♦

A. C. Hansen, superintendent of the Cambria mine of Republic Steel Corp. Negaunee, Mich., has been transferred to the Witherbee Sherman properties at Mineville, N. Y., now operated by Republic, as assistant general superintendent. He will be succeeded at Negaunee by T. A. Flanigan, superintendent at the Julia mine in Virginia, Minn.

♦

Joseph E. Jacobson, Luria Bros. & Co. Inc., Pittsburgh, has been elected president, Pittsburgh chapter of the Institute of Scrap Iron and Steel Inc. Other officers elected include: Vice president, Meyer W. Singer, M. W. Singer & Co.; secretary, H. F. Stocker, H. F. Stocker & Co.; treasurer, David L. Wilkoff, David L. Wilkoff Co., all of Pittsburgh.

♦

C. F. Blackmer, president, American Steel & Wire Co., Cleveland, was tendered a testimonial dinner Dec. 7 by citizens of Waukegan and North Chicago, Ill. in commemoration of the forty-sixth anniversary of the first drawing of wire in the Waukegan-North Chicago area. Mr. Blackmer at one time was superintendent of the Waukegan works and the occasion was a homecoming and reunion of old friends.

Principal speakers at the banquet, besides Mr. Blackmer, included J. A.

George H. Ritchie

Who has been promoted to general superintendent, transportation department, Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., as noted in STEEL, Dec. 6, page 32

Coakley, manager of traffic, United States Steel Corp. subsidiaries; M. W. Reed, vice president, American Steel & Wire Co., and Fred Ingraham, manager of operations in the Chicago district for the Wire company.

♦

Thomas J. Bray Jr., associated with the Carnegie-Illinois Steel Corp. the past two years, has been appointed assistant to the vice president and general manager of sales, with offices in Pittsburgh. He will take over the special duties heretofore performed by Louis C. Lustenberger, now retired, and will also continue as assistant manager of sales of the bar, strip and semifinished materials division of the general sales department in Pittsburgh.

Thomas J. Bray Jr.

DIED:

■ EUGENE J. BUFFINGTON, 74, former president, Illinois Steel Co., in Chicago, Dec. 9. Mr. Buffington served 34 years as president of the Illinois company, now a part of Carnegie-Illinois Steel Corp. A graduate of Vanderbilt university, he became identified with the iron and steel industry in 1884 as a director and treasurer, American Wire Nail Co., Covington, Ky. This company later constructed a wire and nail plant at Anderson, Ind., and when the American Steel & Wire Co. of Illinois acquired this plant in 1898, Mr. Buffington continued as a director, member of the executive committee and treasurer. In January, 1899, he became president of the Illinois company. Mr. Buffington was a director of the United States Steel Corp.

♦

F. A. Whitehead, 52, general superintendent, Copperweld Steel Co., Glassport, Pa., Dec. 4.

♦

E. Lautenschlager, 60, vice president and treasurer, Kroeschell Boiler Co., Chicago and Racine, Wis., Dec. 3.

♦

Louis D. Biersach, 92, co-founder and president, Biersach & Niedermeyer Co., Milwaukee, manufacturer of sheet metal products, Nov. 24.

♦

Leon P. Welch, 57, vice president and plant manager, American Pipe & Steel Corp., Alhambra, Calif., Nov. 21 at his home in San Gabriel, Calif.

♦

Edward J. Stanek, 57, founder and president, Stanek Tool & Mfg. Co., Milwaukee, Dec. 3. He established his firm in 1924 after being tool expert for several large Milwaukee metalworking plants since 1912.

♦

Charles H. Champlain, retired general works manager of the main plant of Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., Dec. 2 in Pittsburgh. He retired in 1934, after being with Westinghouse 36 years.

♦

Harry H. Hunt, 69, electrical engineer and vice president of Stone & Webster Inc., Boston, in that city, Nov. 30. He had been with Stone & Webster since 1900, becoming a partner and vice president in 1920.

♦

Edward M. Freeland, 52, identified with the steel industry for a number of years, Dec. 8 in Pittsburgh. He was the holder of several patents on electrical strips and had been connected with Follansbee Bros. Co., Allegheny Steel Co. and Republic Steel Corp.

♦

David Crighton Howard, 77, former president of Delaney Forge & Iron Works, in Buffalo, Nov. 23. In 1916 he sold his interest in the firm and devoted his time to civic work and national politics. He was a member of the American Society of Mechanical Engineers.

♦

Giles W. Mead, 71, co-founder of the Union Carbide & Carbon Corp., New York, at his home in Beverly Hills, Calif., Dec. 4. Mr. Mead began his career 40 years ago in Chicago where he was associated with the People's Gas Light & Coke Co. He was active in Union Carbide corporation as a director, vice president and treasurer until his retirement two years ago.

♦

Reuben E. Aptekar, 36, assistant general superintendent of foundries, American Brake Shoe & Foundry Co., New York, in that city, Dec. 4. Previous to joining the American Brake Shoe company in 1935, he conducted his own foundry consulting business. Mr. Aptekar had been serving on the sand committee of the American Foundrymen's association and had written numerous articles on foundry sand conditioning.

♦

Willis McKee, 64, iron and steel works engineer in Cleveland for about 20 years, and a brother of Arthur G. McKee, president of Arthur G. McKee & Co., in Cleveland, Dec. 4. Mr. McKee, originator of many improvements in the manufacture of steel, was from 1904 to 1918 general manager of the Elyria Iron & Steel Co., now merged with Steel & Tubes Inc.

Machinery Price Drop "Unlikely"

■ LITTLE likelihood of a downward revision in prices of industrial supplies and machinery in the near future was seen by speakers at a joint meeting of the National Supply and Machinery Distributors association and the American Supply and Machinery Manufacturers association. The meeting, last Thursday, at Westchester Country club, Rye, N. Y., was attended by 178 members from New England and Middle Atlantic states.

Manufacturers discussing the price trend included W. A. Purtell, president, Holo Krome Screw Corp., Hartford, Conn.; D. W. Northup, president, Henry G. Thompson & Son Co., New Haven, Conn.; J. Harvey Williams, president, J. H. Williams & Co., Buffalo; and L. M. Knouse, president, Stanley Electric Tool Co., New Britain, Conn.

More effective merchandising methods and need for strengthening selective distribution were stressed.

Prosser Heads American Saw Mill Machinery Co.

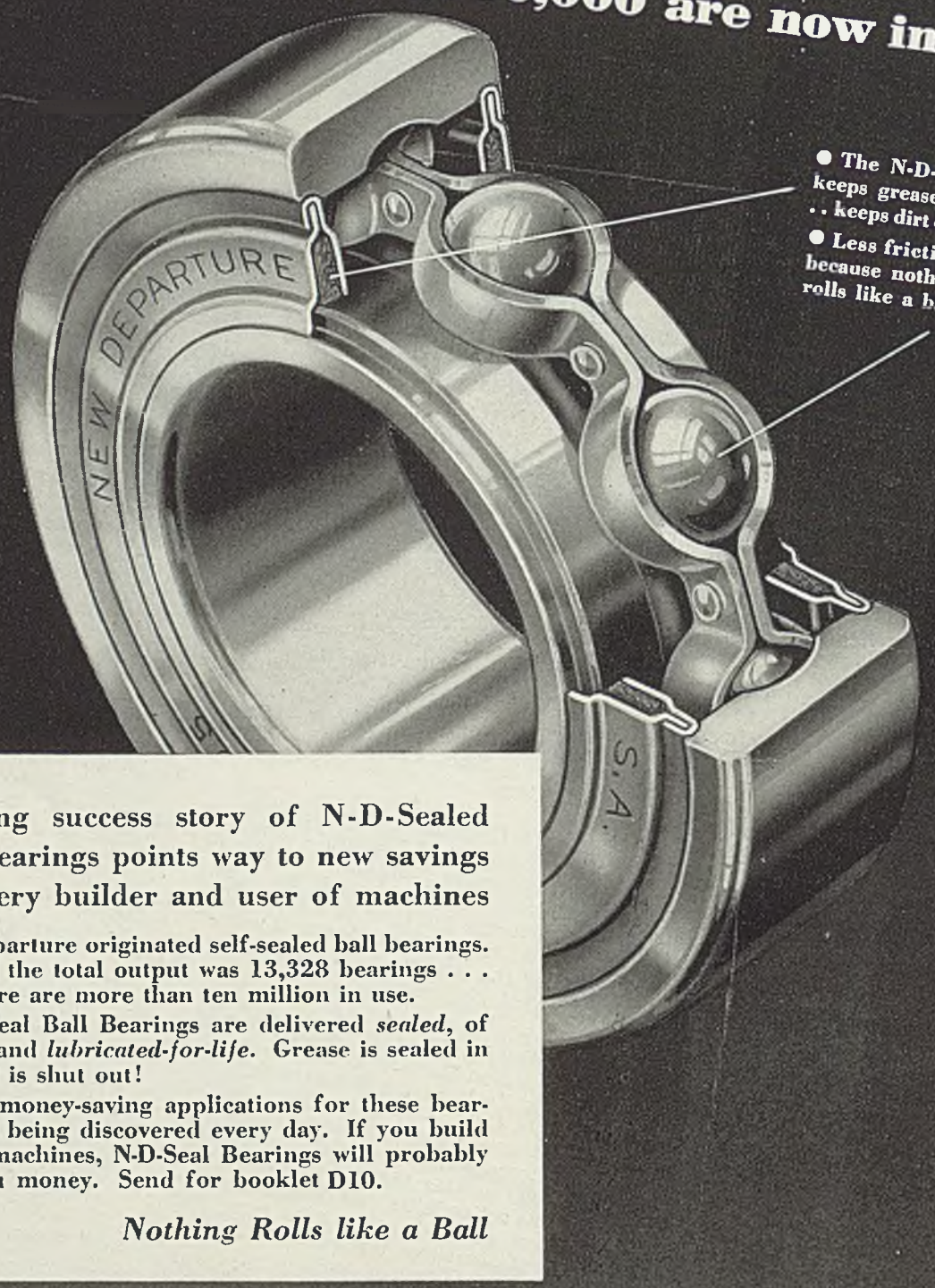
■ Roger D. Prosser, former secretary, has been elected president, American Saw Mill Machinery Co., Hackettstown, N. J. William E. Guild, former general sales manager, was named vice president and treasurer, and Walter D. Briggs, assistant sales manager, now is vice president in charge of sales and secretary.

Mallory L. Fletcher, who has been with the company since its organization 33 years ago and for many years was vice president and treasurer, retires from active service, but remains in an advisory capacity and a member of the board.

General sales offices have been moved to larger quarters at 120 Wall street, New York. The company has increased its sales activity greatly in the past year and has made several innovations in its line of products.

NEW DEPARTURE DID IT!

...and so well 10,000,000 are now in use



● The N-D-Seal keeps grease in .. keeps dirt out.

● Less friction, because nothing rolls like a ball.

Startling success story of N-D-Sealed Ball Bearings points way to new savings for every builder and user of machines

New Departure originated self-sealed ball bearings. In 1928 the total output was 13,328 bearings . . . now there are more than ten million in use.

N-D-Seal Ball Bearings are delivered *sealed*, of course, and *lubricated-for-life*. Grease is sealed in . . . dirt is shut out!

New, money-saving applications for these bearings are being discovered every day. If you build or use machines, N-D-Seal Bearings will probably save you money. Send for booklet D10.

Nothing Rolls like a Ball

NEW DEPARTURE *N-D-Seal* Bearings

New Departure • Division General Motors Corporation • Bristol, Connecticut

NOTHING ROLLS LIKE A BALL

MIRRORS OF MOTORDOM

DETROIT

■ THREE more weeks and the year's race will be run, the records hung up for inspection by historians. As far as automobiles are concerned this brief period cannot pass any too quickly, and thought at the moment centers around what's going to be done "after the first of the year."

Though limping may not be just the word, assembly lines at least are not rolling along in their customary uninterrupted fashion—Ford being the lone exception. Other producers are confining production to three days and four days a week, starting Monday morning and tapering off either Wednesday or Thursday night.

Ford's lines are fast approaching a ceiling, last week hitting 5000 per day. Output is being fed into dealers' hands, and despite optimistic outlook of personnel at the Rouge plant, as yet there is no substantial proof that Ford is going to encounter any better sales than his competitors.

Used Cars Offer Problem

A sorely overburdened used car market is taxing the ability of dealers everywhere to move new cars. Used car values have not moved up commensurately with new car prices, and if anything have dropped a little; they are not expected to improve much before spring. Thus the spread between used and new cars has been widened to the point where buyers with average pocketbooks are balking.

The hue and cry over the used car situation is heard every time new car sales fall into a tailspin, and the demand is reiterated that car builders do something about the used car market. There has been no negation of this demand. Some of the best merchandising brains and a good many million dollars have been assigned by the industry to clearing up excessive stocks of used cars, but the problem remains as critical as ever.

One of the latest steps is that

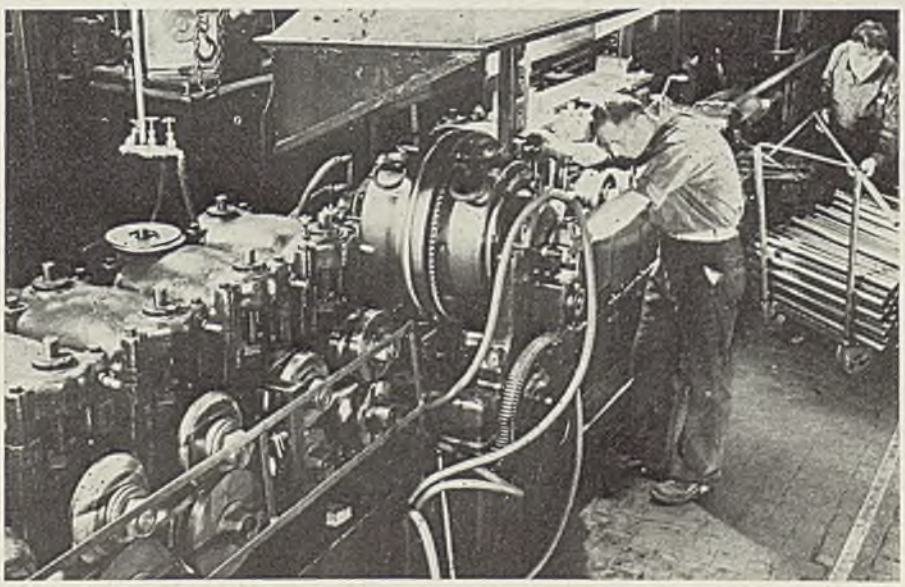
BY A. H. ALLEN
Detroit Editor, STEEL

taken by Cadillac-La Salle, under terms of which a dealer will offer a new car guarantee on selected reconditioned cars. The plan was inaugurated in Cleveland and has now been extended to other Cadillac branches. It calls for replacement of defective parts without charge within 90 days after purchase or up to 4000 miles, and two free inspections at 1000 and 2000 miles, with free inspections thereafter each month.

Another complicating factor in the new car picture this year is the fact that manufacturers have not been able to move an unlimited supply of cars into dealers hands. Retailers are proceeding cautiously and when they have received so many cars they simply refuse to take further deliveries. More than one dealer last year at this time gave the factory blanket instructions to ship as many cars as possible, without regard to models or styles. But all that is changed this year.

Last year a fertile field for new car sales in Detroit was found on parking lots of builders' plants. A dealer would station representatives on a lot, and as the morning shift, for example, poured out of the plant

Fabricating Chevrolet Exhaust Pipe



■ High-speed fabrication of 1¾-inch exhaust pipe for Chevrolet is accomplished continuously from coiled strip steel stock in this interesting setup. The stock is formed to shape by the roll stands at left, passes under the water-cooled seam welder at the center, then through sizing rolls and to a saw which cuts the pipe into sections of the proper length

MIRRORS OF MOTORDOM

to go home, it was a poor day when salesmen could not go back to headquarters with sheaves of orders for new cars. The same technique has been tried this year, but cold stares are about all salesmen get for their efforts.

Intensive merchandising "mop-ups" have been engineered in this area by more than one distributor, some going as far as house-to-house canvassing for new car prospects. Records of former buyers are being dug up to furnish fuel for sales boilers. Chevrolet and Buick, in particular, have been hitting hard in this district.

■ PIECING together various widespread reports gleaned from conversations with observers here, it seems fairly certain Plymouth is about to take some drastic steps to inject new vigor into its 1938 model. Just what these steps will be cannot be stated definitely as yet, but look for some important news from this source within the next month.

Best opinion now is that a completely restyled front end will be offered with the idea of pepping up sales. It remains to be seen how arrangements for cleaning up stocks of the present style will be handled, but this should not prove too much of a problem, since production as yet has not exceeded 35,000 or 40,000.

In this connection, the recent experience of a certain steel company representative here may be illuminating. Passing by the Briggs plant, this gentleman noticed a strange-looking car parked near the entrance. The front-end appearance suggested a cross between a Willys and a Graham; in other respects the model carried out modern streamlines and overall features of present models in the medium-price field. No distinguishing or identifying marks were to be seen anywhere on the car.

Being of a curious turn of mind, the above gentleman inquired of the driver seated behind the wheel as to whether the car was a Willys.

"No," replied the driver with an air of finality.

"Well, what is it then?" asked the determined inquirer.

"Maybe a Plymouth" was the only reply offered by the driver who appeared anxious to avoid any further conversation.

Reports emanating from the recent New York automobile show would have it that Mr. Chrysler was not too enthused over the appearance of the Plymouth, and being more or less the father of style-consciousness in automobiles his decision to "take steps" may be easily understood.

Tongues along motordom's rialto are wagging furiously about a new Hudson model which, so the story goes, is due for appearance in January. It is said to be a light car, possibly in the Willys class, and there are plenty of bets being offered that its imminent birth is not merely fancy. Concrete evidence such a car is about to be unveiled is lacking.

Rumor has both Packard and Ford also thinking about smaller cars, but little credence is given these reports. And recent speculation over a proposed Keller car to appear from Chrysler is still heard in some quarters. To this crop can be added the 100-horsepower 116-inch Ford said to be in the experimental stage at the Rouge. This about covers the harvest of "just around the corner" developments.

Automobile Production

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

	1935	1936	1937
Jan.....	300,335	377,244	399,634
Feb.....	350,346	300,810	383,698
March....	447,894	438,943	519,177
April.....	477,059	527,625	553,415
May.....	381,809	480,518	540,357
June.....	372,085	469,368	521,139
July.....	345,297	451,206	456,909
Aug.....	245,075	275,934	405,064
Sept.....	92,728	139,820	175,620
Oct.....	280,316	230,049	337,979
10 mos...	3,292,944	3,691,517	4,292,992
Nov.	408,550	405,799	*350,000
Dec.....	418,317	518,958	.....
Year.....	4,119,811	4,616,274	.....

Estimated by *Ward's Automotive Reports*

Week ended:	
Nov. 13	85,325
Nov. 20	85,757
Nov. 27	58,955
Dec. 4	86,848
Dec. 11	85,765

	Week ending Dec. 11	Dec. 4
General Motors	31,800	42,075
Chrysler	19,600	20,700
Ford	22,615	13,070
All others	11,750	11,003

*Estimated

■ STEEL buying continues in unseasonally light volume, with both November and December tonnages below anticipations. Ford has made some purchases, but still has a rather large inventory. If assemblies can be held at the present volume, Ford likely will be in the market for a good tonnage around the end of the month, but one steel company reports discussions over weight tolerances on sheets being held with Ford still prevent the release of sheet tonnages.

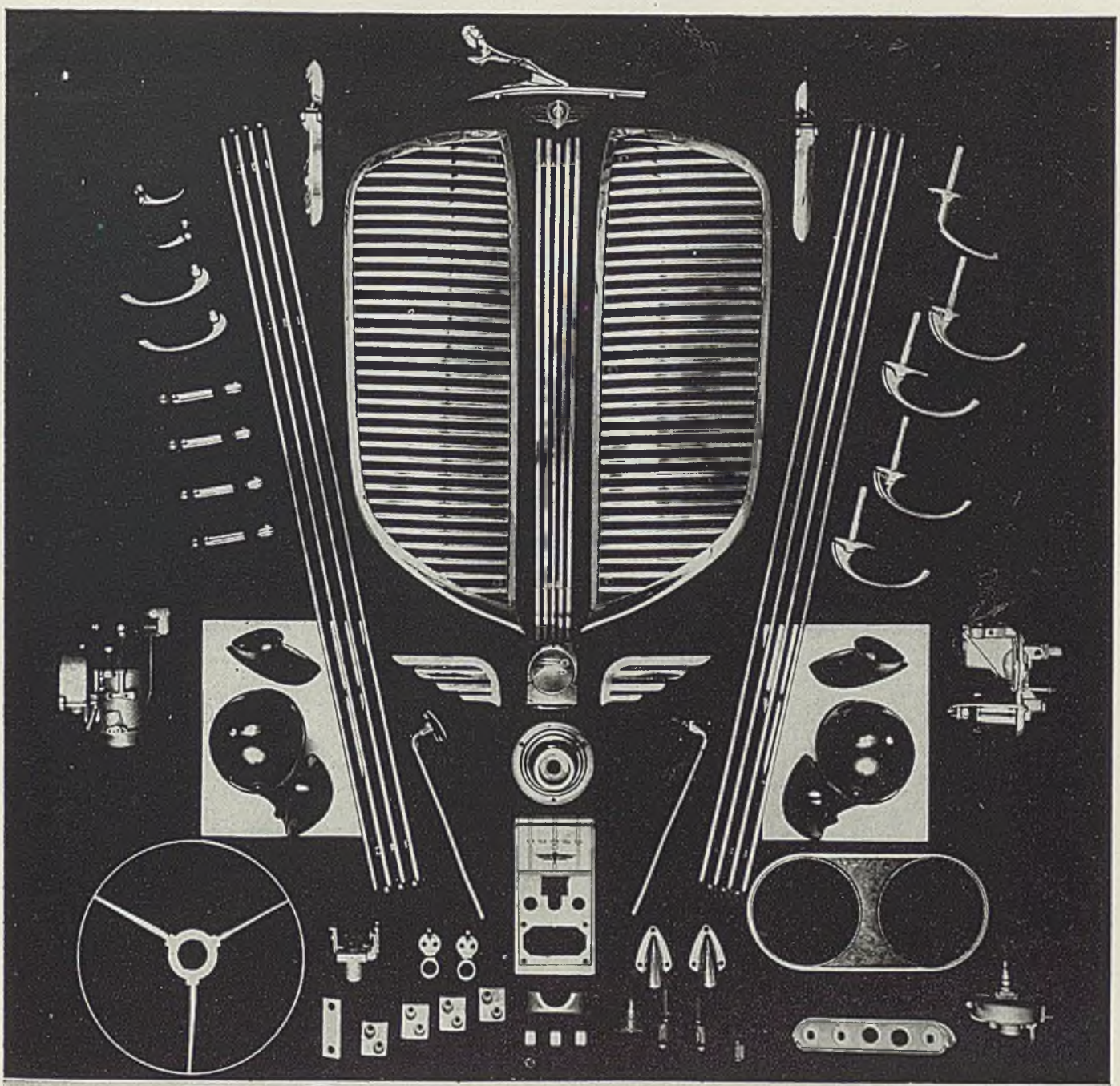
Buick is not taking much steel at the moment, being fairly well covered on both bars and sheets by purchases made at the end of September. Chevrolet has cut January and February production schedules to around 65,000 each, which just about halves the pace maintained by this producer in recent weeks. A consequent reduction in steel requirements is implied.

■ TOOL, die and equipment interests are urging the automotive industry to give early consideration to plans for 1939 models to avoid the frenzied rush in designing departments encountered every year. One body design department here already has some of its staff on overtime, indicating a possible decision to give equipment suppliers more time to figure on next year's needs.

Inquiries for about $75,000 worth of small dies for an accessory manufacturer have been received by one of the die shops here, but in general the tool and die trade is quiet. Machinery orders likewise are at low ebb and here again there is the hope for renewed activity after Jan. 1.

After 23 years of association with the Ford Motor Co., W. C. Cowling has announced his retirement to "realize a lifelong ambition" as yet undisclosed. Mr. Cowling heads up Ford sales activities, although in common with all other Ford executives, excepting Mr. Ford and his son Edsel, has no official title in the organization.

Mayor John L. Carey of Dearborn has ruled that the UAW cannot distribute the Ford edition of its newspapers at the Miller road gates of the company because of the interference with traffic occasioned. The union immediately announced it will demand removal of the mayor from his office "on the grounds of official misconduct." The UAW has been attempting regular distribution of this literature to Ford employes as they come from work.



76 ZINC ALLOY DIE CASTINGS

on a single 1938 car—an indication of their progress in the automotive industry. This alert attitude of automotive engineers, now supported by the test of time, has resulted in an increased use of ZINC Alloy Die Castings on the new car models each succeeding year.

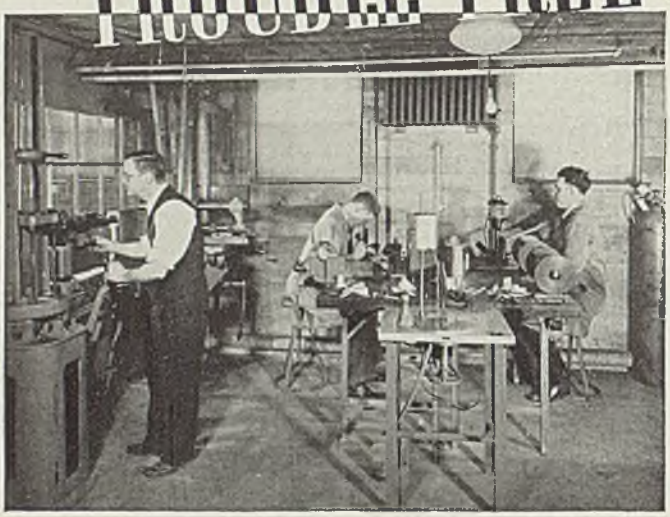
THE NEW JERSEY ZINC COMPANY

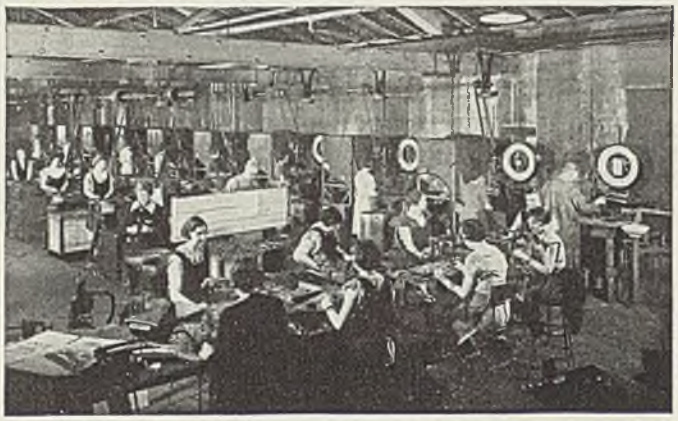
160 Front Street — New York

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

HORSE HEAD SPECIAL 99.99 + % UNIFORM QUALITY **ZINC**

TROUBLE-FREE SPRINGS . . .





MERIT-FUL PERFORMANCE

B-G-R Spring Engineers look for spring trouble before it happens. The results often save your assembly time—and forestall your customer's ill-will. You can have safe, economical springs—always—by using the services of both B-G-R plants. Start your spring right—let B-G-R co-operate with you in design and development problems. You'll get service—the kind you appreciate.

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DIVISION OF ASSOCIATED SPRING CORPORATION

DETROIT PLANT
DETROIT, MICHIGAN

TWO PLANTS

COOK PLANT
ANN ARBOR, MICHIGAN

WINDOWS OF WASHINGTON

WASHINGTON

■ THE STEEL industry will be much interested this week to see what the house of representatives does in connection with the Black-Connery hours and wages bill. It is expected to come on the floor of the house Dec. 13.

In the meantime all classes of labor are crowing over the apparent victory in dislodging the bill from the house rules committee where it has rested since last spring.

In obtaining 218 signatures of house members, a majority, which automatically took the bill out of the rules committee, more log rolling and trading was done than for many a day. It reminded one of the good old log-rolling days of the tariff measures.

It is really strange how many people and organizations take credit for dislodging this bill. Said labor's Nonpartisan league last week: "Securing of the necessary 218 signatures on the petition to discharge the house rules committee from further consideration of the Black-Connery bill completes one more phase of the fight which has been waged by labor's Nonpartisan league for the passage of wage and hours legislation by congress."

New Bills by Berry, Green

It is recalled that this league came into existence through Senator George Berry, who was its active head until he obtained his seat in the senate and he is opposed to the bill as it now stands and has announced that he will substitute an hours and wages bill of his own if he gets a chance. Incidentally his bill is not endorsed by his former colleagues of the labor unions.

Apropos of the wages and hours bill A. F. of L.'s president, William Green, last week made public the text of a new bill drafted by the executive council of that organization and which Mr. Green proposes to have substituted for the measure now pending in the house.

This bill provides for the 40 cents per hour, 40-hours per week for

BY L. M. LAMM

Washington Editor, STEEL

workers in substandard industries engaged in interstate commerce. It provides for a fine of $100 for violation of the law in the case of each employe.

It is further provided that the law shall not affect wage agreements providing for higher pay and shorter hours entered into by collective bargaining nor shall it apply to agricultural, transport and certain other specified classes of labor.

Provision is also made in the AFL bill that in case of emergencies maximum hour provisions shall not apply but employers will be required to pay time and a half for work in excess of eight hours a day or 40 hours a week.

TIN PLATE SCRAP EXPORT RULES ARE CHANGED

Rules of procedure governing issuance of licenses for exportation of tin plate scrap for the year beginning Jan. 1 were announced last week by the state department.

The only important change deals with exportable production. Under the present regulations, for 1937, the quotas of exportable scrap were based on 100 per cent of the production in 1936 by each manufacturer. Under the regulations for 1938 the export quotas will be based on 25 per cent of the production for 1937. This will mean that exportable scrap will probably be much less during 1938 than it is in the present year. The other regulations, except for changes of wording, are essentially the same as for 1937.

Among other things the rules provide that each producer of tin plate scrap who desires to export that commodity during the calendar year 1938, as well as every producer whose scrap is sold to and ultimately exported by third parties, must submit a request for allotment to the secretary of state not later than Dec. 20. He must specify in long tons the quantity of tin plate scrap which he desires to export or to sell for export between Jan. 1, and Dec. 31, 1938.

Provision is made that no producer shall be eligible to receive an allotment until the secretary of state has received a sworn statement from him showing the quantity of tin plate scrap in long tons, produced by him during the calendar year 1936.

STETTINIUS EXALTS VALUE OF INDUSTRIAL TRAINING

Edward R. Stettinius Jr., chairman of the finance committee of the United States Steel Corp., talked over the radio last week in connection with an industrial program of the department of commerce. He spoke on behalf of the Roper business advisory council.

"Industry is ever in need of talent, training and vision," he said. "Inside the shop, industry is striving more and more to provide educational opportunity. Outside the shop, industry supports all efforts to lift America to higher mental and cultural levels. I trust we shall never see the end of this serviceable national ideal, for upon its realization depends the future well being of the nation."

Mr. Stettinius said: "We in industry have an educational duty toward every person in the enterprise. We are doing more along these lines than is generally realized, but the work must be carried forward. Job training is now common. The object is not only to teach a man how to do his job well and increase his earning power, but also to grasp the industrial procedure of which he is a part, that he may see enlarged opportunity for his personal advancement."

"An industrial operation," said Mr. Stettinius, "is not a series of individual efforts, but a mighty achievement in team play. The individual becomes a member of a group, and the group is led by a foreman. In a sense the foreman becomes the key man. Industry

has been slow to recognize this, but now is making up for it by giving special training to foremen, not only in leadership and group psychology, but also in the latest methods developed by science and research."

TRADE AGREEMENT PROGRAM HELD WORLD PEACE AID

Commenting last week on the administration's trade agreement program, on which he seems to be sold, Senator Lonergan, Connecticut, associated trade agreements with disarmament and world peace.

Discussing the trade agreement program the senator said that "its abandonment would seriously undermine the ability of our government to exert a strong influence toward peace. Those who desire to do more than lip service to the cause of peace should, in my opinion, lay aside their criticism of the trade agreements program and give it their hearty support."

Senator Lonergan said that it is his intention to support a further expansion of trade agreements. He predicted that these agreements will become a permanent substitute for the old tariff program of the government.

He cited figures comparing our foreign trade in 1933 with the present and while he did not give full credit to the trade agreements for increased trade, he gave them a large share. He pointed out that imports from trade agreement countries for the first nine months of this year increased by 27.4 per cent over the corresponding period of 1936 while imports from non-agreement countries increased by 44.4 per cent. He said that "the greater relative increase in imports from non-agreement countries would suggest that in making concessions to foreign countries great care should be exercised, and that the United States is not being 'sold down the river,' through trade agreements."

WOULD LOWER PRICES OF FARM EQUIPMENT

A study of what he termed high farm equipment prices is being made by Senator Wheeler, Montana, with a view to asking the federal trade commission to make an investigation.

Senator Wheeler said "it would act as a powerful stimulant to business generally if we could find out what is holding up farm equipment prices and how they could be lowered." Incidentally the commission has made a study of this subject, which was submitted to the last session of congress.

FREIGHT RATE DECISION SCHEDULED FOR SPRING

Announcement has been made by the interstate commerce commission that it will begin final hearings in this city Feb. 7 in connection with the 15 per cent freight rate increase case.

It is estimated that this testimony will take only about a week and immediately following that final oral argument will be heard by the commission. There is a possibility, therefore, that a decision can be looked for sometime in the spring, which would mean a decision in six months compared with a year taken by the commission for the general freight rate increase granted recently. Dates have been set for regional hearings in the 15 per cent case.

It was expected that the first hearings would be completed in this city last week. Further hearings will be held in connection with the freight rate increase in Atlanta, Ga., Jan. 10.

PRIVATE YARDS AWARDED TWO NAVAL CRAFT

Awards have been made by the navy department amounting to $29,884,850 for construction of four new ships.

The New York Shipbuilding Corp., Camden, N. J., has been awarded contracts totaling $20,680,555 for construction of two auxiliaries, a 9000-ton destroyer tender and an 8300-ton destroyer tender.

Puget Sound navy yard, Bremerton, Wash., was awarded a contract for a 1500-ton destroyer and the Charleston, S. C., navy yard was also awarded a destroyer contract, the latter two ships to cost $9,204,295.

In making the awards assistant secretary of the navy, Edison, said that his department took into consideration in making the awards to the private yard the desirability of giving work to private firms so that their equipment would be available for emergency work in war time.

NLRB ACTION AGAINST EDITOR AROUSES PROTEST

Much interest has been taken here in the latest move of the national labor relations board which has subponaed the editor of *Mill and Factory* to tell of sources of an article in his publication in which the board was criticized for its handling of the Weirton steel case.

"In my opinion," said Senator Bridges on the floor of the upper house last week, "this is one of the most open attacks on a free press that I have ever known in the history of this country. It is just one more instance of typical arbitrary action and attitude of the national labor relations board. It is amazing that this department of the government has gone to this length."

The editor is understood to have refused to supply the background for his story and the board is to take the matter into the courts.

One of the members of the labor board has explained that it is not because of the story that the action is taken but because reprints of the story were circulated to employes of Weirton.

ROPER WOULD SPREAD TAX BURDEN IN SIMPLER PLAN

Secretary of Commerce Roper said last week that "there is need of a general revision of our entire tax structure in order to simplify the determination of tax liability, to distribute the burden more equitably and to broaden the base of taxation so as to include as taxpayers a large percentage of our earning population."

On this same subject Mr. Roper said that "no one should be overburdened with taxes, but some contribution, however small, tends to increase one's interest in public affairs and a constructive attitude towards one's government. This policy would not only create and maintain patriotism, but would also tend to relieve the erroneous impression now existing in the minds of larger taxpayers that they are being discriminated against."

BUILD 2757 AIRPLANES

Aircraft manufacturers produced 2757 airplanes in the first nine months of this year, a 25 per cent increase over the same months of last year, according to a study made by the bureau of air commerce of the department of commerce.

Of these machines 1821 were for domestic civil use, 484 for delivery to the army and 452 for export.

British Firm Buys Leviathan for Scrap

■ Sale of the 23-year-old liner LEVIATHAN to Metal Industries Ltd., London, was announced last week by the United States Lines. The liner will be taken to England under her own power and broken up for scrap.

A vessel of 48,943 gross tons, the liner, first christened the VATERLAND, was built at Hamburg, Germany, at a cost of $10,000,000. After three voyages under the German flag the ship was interned at Hoboken, N. J., later seized, renamed and used as an American transport during the World war. Reconditioned as a luxury liner, it failed to make a profit, and has been idle for more than three years.

Keel of a new passenger and freight ship to replace the LEVIATHAN will be laid in the spring in the yards of the Newport News Shipbuilding & Dry Dock Co., Newport News, Va., for the United States Lines.

Deny Sunshine to the Growing Tree And It Will Shrivel Up and Die

IN THE depth of the acute phase of the recent depression a certain young man, whom we will call John, graduated from a university. Facing the hopeless prospect of finding a job, he took to his hobby, which happened to be a specialized form of handicraft.

Helped by an indulgent father, he fitted up the basement with certain machines and proceeded to turn out products of novel design. Visitors, seeing these unusual and attractive articles, asked that duplicates be made for them. In the course of a year the demand was sufficient to provide a modest income—but not enough to pay the expense of operation.

John persevered in his hobby; father continued to make up the deficiency between income and outgo. The balance sheet of the second year showed slightly less loss. The business almost broke even in the third year, and from that time to the present it has returned an increasing volume of profit.

Initiative and Perseverance Plus Capital Creates Profitable Small Business and Employment

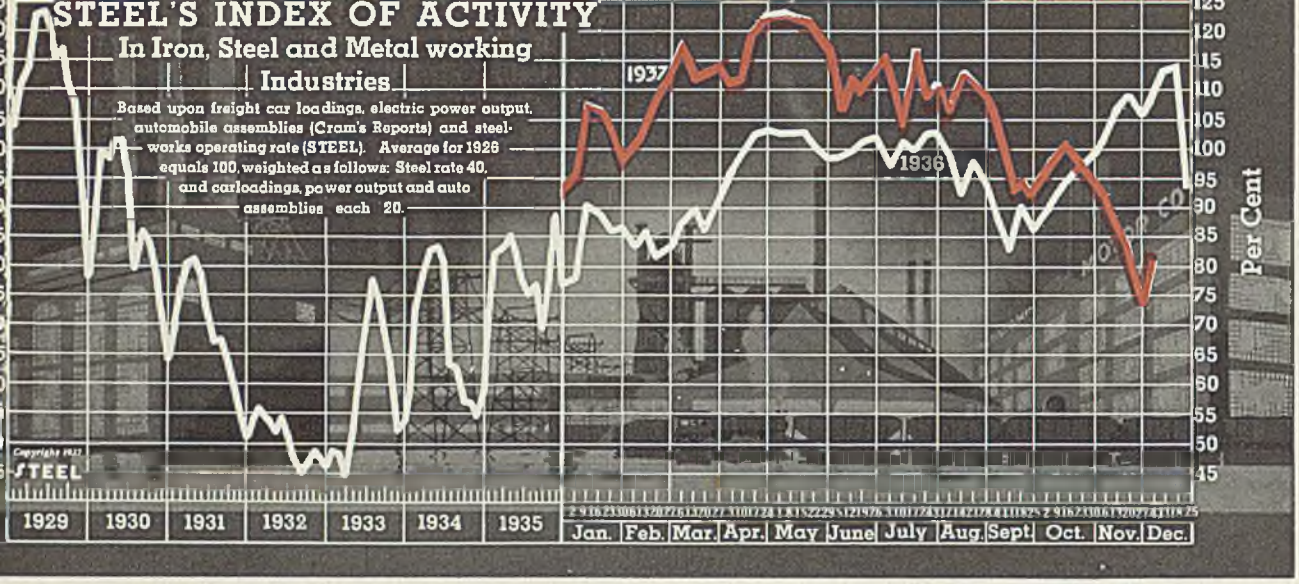
Today John's enterprise, having long since outgrown the basement, is housed in a small rented shop. John employs seven skilled artisans at good wages. He has an alert salesman out soliciting orders. He has a successful business, is a good employer, and even more important, he has developed a new product and created employment for eight persons. He has done this in a virgin field. His business has not been developed by chiseling it from companies already in existence.

John's experience is typical of the private enterprise which has helped to develop this great industrial nation. His father's participation, to the extent of providing the funds in the earlier stages, is typical of the role capital has played in the development of industry.

John and his father represent on a small scale the ideal combination of individual enterprise and private capital which Lammot du Pont envisioned last week when he proposed to the National Association of Manufacturers a plan for mobilizing $25,000,000,000 to create jobs for 3,000,000 men.

Nation Needs Encouragement and Promise of Stability for Entrepreneurs To Restore Prosperity

Multiply the John and father episode by 375,000 and you have the identical proposition which Mr. du Pont offers. Bolster the Johns of the nation, encourage the fathers who are the investors of the country, establish rules for the game which do not change at the mere fancy of persons high in public office—in short, vouchsafe to entrepreneurs a reasonable measure of stability, or to put it more bluntly, square dealing at the hands of the federal government—and this nation will speedily work its way out of its present major difficulties.



STEEL'S index of activity gained 8.6 points to 81.3 in the week ending Dec. 4:

Week ending	1937	1936	1935	1934	1933	1932	1931	1930
Sept. 25	93.0	86.2	68.5	89.3	66.9	48.0	65.2	83.8
Oct. 2	96.0	89.0	73.3	54.7	67.4	47.7	62.4	81.0
Oct. 9	99.0	83.4	74.9	56.4	66.0	48.4	61.5	79.4
Oct. 16	101.8	95.9	77.4	58.2	60.9	48.7	57.9	77.5
Oct. 23	97.5	97.1	82.4	56.3	58.0	48.7	58.2	78.8
Oct. 30	95.7	99.1	86.4	55.0	52.3	48.4	59.2	72.5
Nov. 6	82.4	102.1	88.4	54.9	50.7	48.5	56.0	71.5
Nov. 13	86.5	107.9	88.8	55.2	52.6	47.7	55.5	73.0
Nov. 20	84.9	109.9	90.9	54.4	55.4	49.2	54.8	71.0
Nov. 27	72.7†	105.2	86.0	51.9	49.7	47.5	54.4	66.9
Dec. 4	81.3*	108.4	91.7	56.8	52.6	45.3	52.9	69.2

*Preliminary. †Revised.

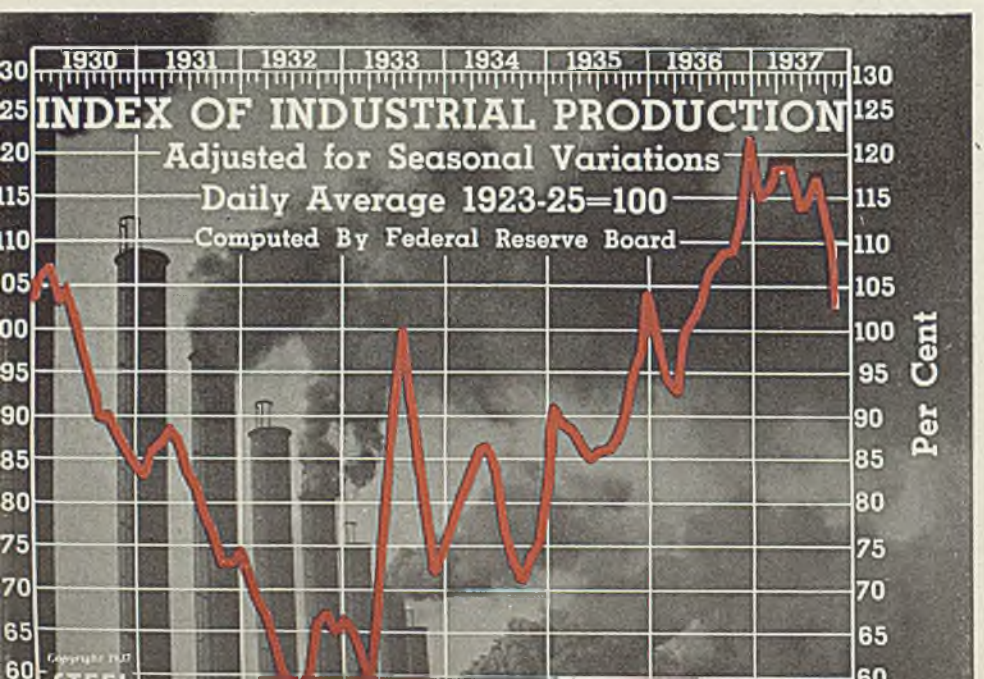
Activity Index Recovers Part of Recent Losses

STEEL'S index of industrial activity advanced sharply in the week ending Dec. 4, after having declined in the seven consecutive previous weeks. It now stands at 81.3, compared with 72.7 in the preceding seven day period.

The abrupt interruption to the downward drift was caused by a substantial gain in automobile output and by better than expected rebounds in freight car loadings and electric power output from the low levels of Thanksgiving week. The rate of steelworks operations suffered a one-point decline.

Obviously unusual circumstances were responsible for the violent fluctuations in the last two weeks. The drop from 84.9 to 72.7 in Thanksgiving week and the rise from 72.7 to 81.3 in the week ending Dec. 4 were accentuated by the erratic activity in the automobile industry. Labor trouble accounted for the sharp curtailment of output in the week ending Nov. 27, while the resumption of operations in struck plants and increased schedules in Ford plants were responsible for the steep upturn in the week ending Dec. 4.

A sidewise movement in activity, with few and slight fluctuations except of seasonal character, is indicated for the remainder of the month.

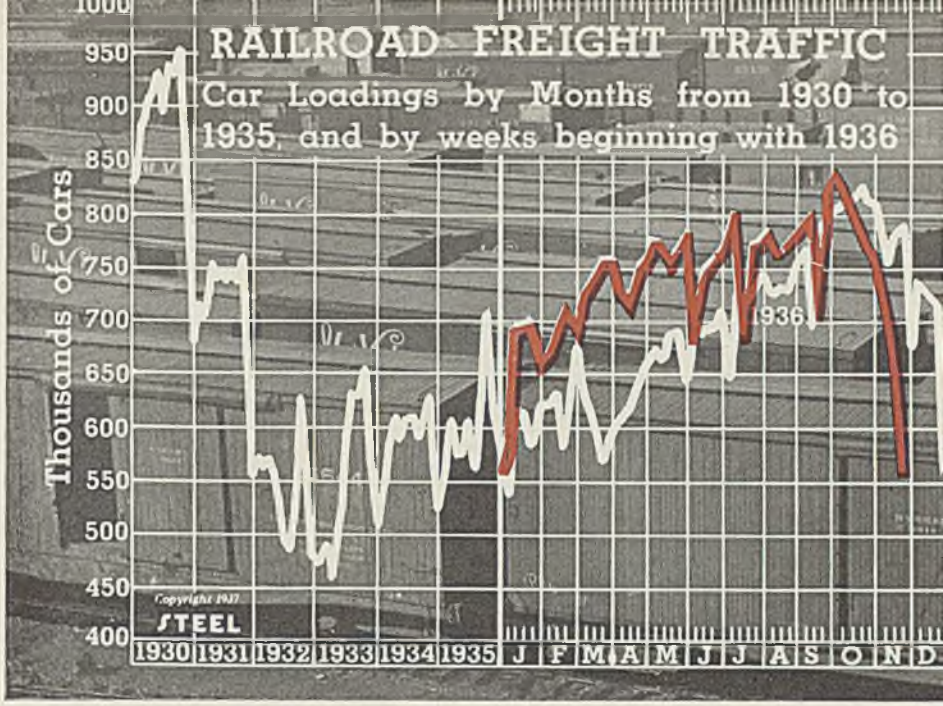


January	115	98	91	78
February	116	94	89	81
March	118	93	88	84
April	118	98	91	78
May	118	101	85	86
June	114	103	91	78
July	114	107	86	75
August	117	108	87	73
September	111	109	89	71
October	103	109	95	73
November	...	114	98	74
December	...	121	104	86

BUSINESS TREND

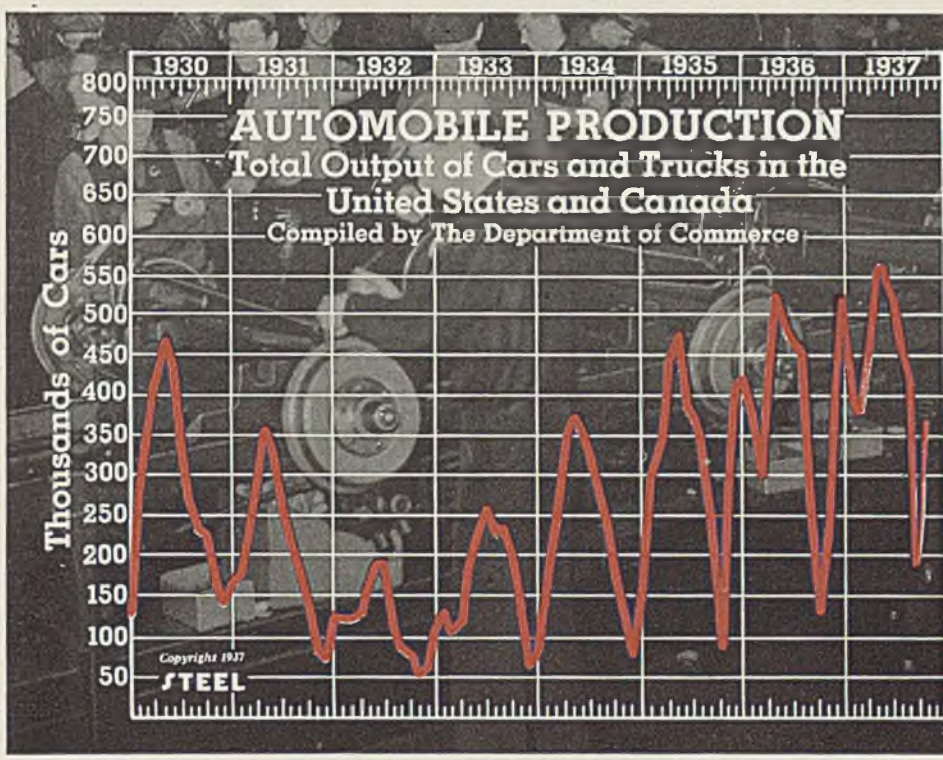
Carloadings Reverse Downward Trend From Oct. 2 Peak

	1937	1936	1935
Nov. 27....	558,627	679,984	570,427
Nov. 20....	647,251	790,500	646,503
Nov. 13....	689,614	784,672	628,330
Nov. 6.....	732,145	759,318	653,525
Oct. 30.....	771,655	814,175	680,622
Oct. 23.....	773,353	815,972	707,826
Oct. 16.....	809,944	826,155	732,947
Oct. 9.....	815,122	820,195	734,274
Oct. 2.....	847,245	819,126	706,877
Sept. 25....	840,446	807,070	630,771
Sept. 18....	826,565	789,510	707,644



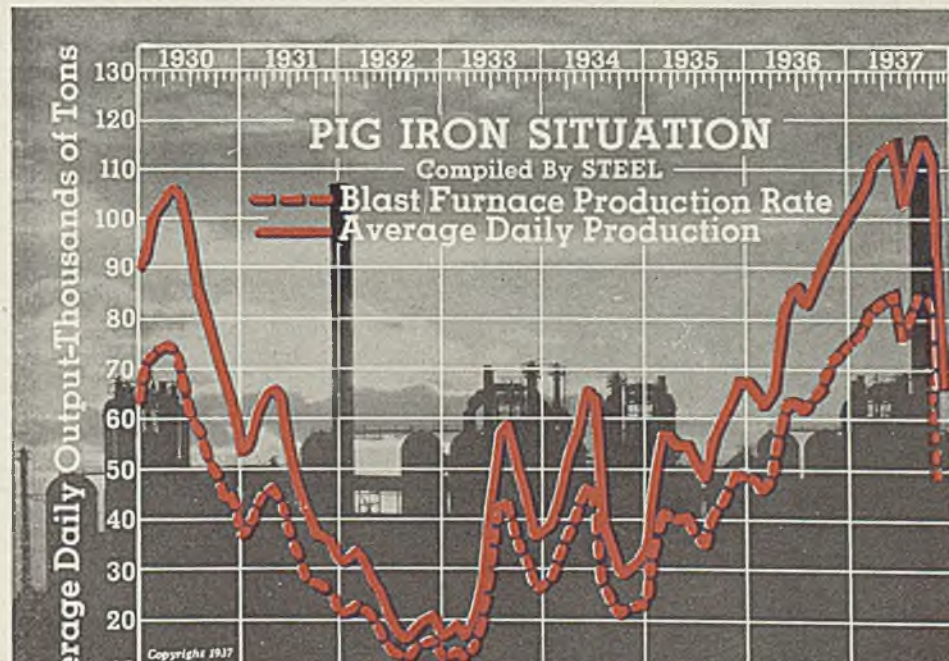
Automobile Production Up Sharply in October

	1937	1936
January	399,634	377,244
February	383,698	300,810
March	518,977	438,943
April	553,415	527,625
May	540,357	480,571
June	521,139	469,868
July	451,481	451,474
August	405,064	275,951
September	175,620	139,820
October	337,979	230,409
November	.....	405,702
December	.....	519,132



November Iron Output Down 19.3 Per Cent

	Daily Average, Tons		Blast Furnace Rate, Per Cent	
	1937	1936	1937	1936
Jan.....	103,863	65,461	76.6	48.2
Feb.....	107,857	63,411	79.5	46.6
March...	111,951	66,004	82.5	48.5
April ..	113,354	80,316	83.7	59.1
May ...	114,360	85,795	84.3	63.1
June ...	103,843	86,551	76.6	63.6
July ...	112,947	83,735	82.9	61.5
Aug.....	116,676	87,475	85.7	64.3
Sept. ...	113,937	90,942	83.7	66.9
Oct. ...	93,259	96,509	68.4	71.0
Nov.....	66,925	98,331,	49.1	72.3
Dec.....	.....	100,813	....	74.2



Controlled Ingot Heating

New type soaking pit operates with continuous controlled fuel service which returns cost advantages through lower gas consumption and higher ingot production

BY W. A. MORTON

President, Amsler-Morton Co., Pittsburgh

■ HEATING ingots for subsequent blooming or slabbing now is being accomplished by a new principle involving simple soaking pit operation and effective automatic control. The heating method is embodied in the new pit known as the Amco pit furnace, made by the Amsler-Morton Co., Pittsburgh.

The pit furnace is equipped with an adequate combustion chamber, which is located with respect to the work to be performed, so that the work is now done in the shortest possible time for metallurgical control and with the greatest overall economies.

Fig. 1—Freshly drawn ingot being placed on chariot for delivery to blooming mill

The pit is rectangular in shape, with the ingots along the walls to form a hollow square or combustion chamber between them. The single firing port is located in the hearth adjacent to the bottom of the ingots and the products of combustion are directed along the ingots from the bottom toward the top of the combustion chamber Fig. 2 shows the combustion chamber and arrangement of ingots surrounding it.

Fuel is delivered through a simple pipe nipple and mixed with air pre heated to about 1600 degrees Fahr. near the bottom of the firing port. A natural convection current is formed which distributes the heat equally, "fountain-like," over all the ingots. Fig. 3 illustrates this natural circulation as portrayed by cigarette smoke and an inverted tumbler.

The gas is applied at extremely low pressure, but its velocity increases rapidly upon release in the pit. The flame entering the combustion chamber is converged and accelerated by the free rising convection current. Turbulence is thereby increased, and this is essential for the proper circulation of the heat, as well as for the recirculation (by induction) of some of the earlier released and slightly cooler gases within the pit. Thus, a constantly rotating envelope of the pit gases is maintained, providing a protective layer around the ingots, keeping the cooler gases from lying stagnant on the hearth, and resulting in a uniform heating. Fig. 4 illustrates this principle of recirculation.

Outlets Remove Gas

The waste gases are removed through outlets near the four corners of the sidewalls and slightly above the coke breeze, the gases passing from the outlets into the recuperator and then to the stack. The unidirectional system of firing permits both the burner port and the waste-gas outlets to be designed and calibrated for their respective functions only. The central firing port eliminates stratified gas and air streams and excessive scaling.

In this new one-hole pit, heat is distributed by regulating its flow to the several damper controlled outlets to exactly balance the radiation losses, which are varied by the location of the pit but are uniform within the pit.

The central vertical firing is in agreement with the basic principle which controls heat transfer by radiation and convection. This principle, which may be noted in the success of the continuous and other modern furnaces, requires the thermal flow to be parallel with the principal axis of the stock. This principle is carried out in this new

form of furnace, which directs the fuel upward and in the longitudinal direction of the ingots.

The new design and its fundamental principle of applying heat are ideal for complete temperature and combustion control. Temperature control is achieved by the use of thermocouples in the waste-gas outlets, wired in parallel to a potentiometer controller which in turn operates a valve in the fuel lines.

Initial firing rate is governed by the metallurgist's schedule for different grades and different pour-to-strip and strip-to-charge intervals. This initial rate is then automatically throttled as the soaking period is approached. When the steel is completely soaked, that is, at a balanced and uniform heat, the thermal input becomes constant and equal to the stack and radiation loss.

The thermocouples are protected during charging and cleaning of the pit and represent a dependable means of automatically controlling the heating of ingots. These couples are of platinum-rhodium construction, and are wired in parallel to a multipoint selector switch. Each thermocouple reading is indicated separately on a double scale potentiometer. For test purposes, the secondary scale is used for indicating base metal thermocouple readings at selected points in waste gas and preheated air flues below 2000 degrees Fahr. throughout the system.

The average reading of the four

Fig. 2—Diagrammatical view of interior of centered-fired soaking pit furnace

temperature control couples is relayed to a single point recording potentiometer controller which functions to operate a control valve in the fuel supply line in accordance with a predetermined setting. The temperature of the control couples may be observed periodically on the indicating potentiometer to permit a check on the operation. In the event of failure of one or more of the couples, the controller operates temporarily from the average temperature of the remainder until replacement is made.

Temperature recorded for control is only relative to the real temperature of the furnace and steel, but it is responsive to the same function as would prevail if the couples were located directly within the furnace. As arranged, they are more dependable and accurate, but, if a record is desired of the actual furnace temperature, a separate thermocouple is installed in the sidewalls independent of the controller.

The temperature control point is adjusted by means of a hand knob on the front of the instrument. The control point temperature is approximately 200 degrees Fahr. below the actual ultimate ingot temperature. The temperature control regulates the thermal input to the furnace in accordance with the predetermined ability of the steel to absorb heat, and the control point setting varies with the rolling temperature requirements or desires for various steels.

Dial Adjusts Rate

The rate of fuel control cutback (throttling rate) as it anticipates control point approach, is adjusted by a dial on the front of the instrument. The correction for load variation (reset) is adjusted by another dial. The maximum initial control valve open position is adjusted by a hand knob on the front of the panel board. Fig. 5 shows the rear view of the control panel and regulating equipment on a four-pit installation.

Unidirectional system of firing has introduced in addition to continuity and high efficiency of the pit, a dependable form of automatic combustion and internal pressure control providing the pit with flexible atmosphere and scale control.

The combustion controller regulates the predetermined ratio of air for the continuous and varying flow of gas. The air supply is made independent of furnace temperature or stack draft by a constant-speed low-pressure fan. This is an important feature, providing positive but controllable flow, insuring an air supply for rapid starting when the recuperator tiles are cool, as after a shutdown or after a heavy charge of cold steel, and giving the furnace a higher than normal fuel and heating rate during the initial stages of every heat. The combustion control instrument consists of an orifice located in the fuel line down stream from the control valve. The pressure differential across this orifice is relayed to a diaphragm regulator which, by means of a piston, operates a butterfly valve in the air line down stream from an orifice plate. The pressure differential across the latter orifice plate is relayed to an indicating pointer gage with a dial calibrated to indicate air flow in cubic feet and pressure differential. The ratio of air to gas is adjusted by a hand knob and setting dial.

Fig. 3—Principle of natural circulation demonstrated by smoke and inverted tumbler

The furnace pressure control maintains a predetermined pressure in the furnace even though operating under various rates of fuel and air flow, and with different atmospheric conditions. This is done by pressure sampling tubes in the sidewalls of the furnace. These furnish static pressure impulses to a diaphragm regulator which controls an oil-operated cylinder connected to a butterfly valve located in the waste-gas flue to the stack. The pressure in the furnace sampling tube is relayed to an indicating pointer gage with a dial calibrated to read in inches of water. The furnace pressure is adjusted by a hand knob and setting dial.

While the furnace is entirely automatically controlled, there is provision for manual operation when needed. Manual operation is possible in the event of power failure, with all apparatus levers being temporarily disconnected. While provision is made for this emergency, it is not of great importance, as all mill operations ordinarily cease when the power fails.

Fuel shutoff, in the event of either power failure or during the opening of the cover, is accomplished by a stalled motor type power-failure valve located in the fuel line. The operation of this valve is initiated by a false power-failure, which is a

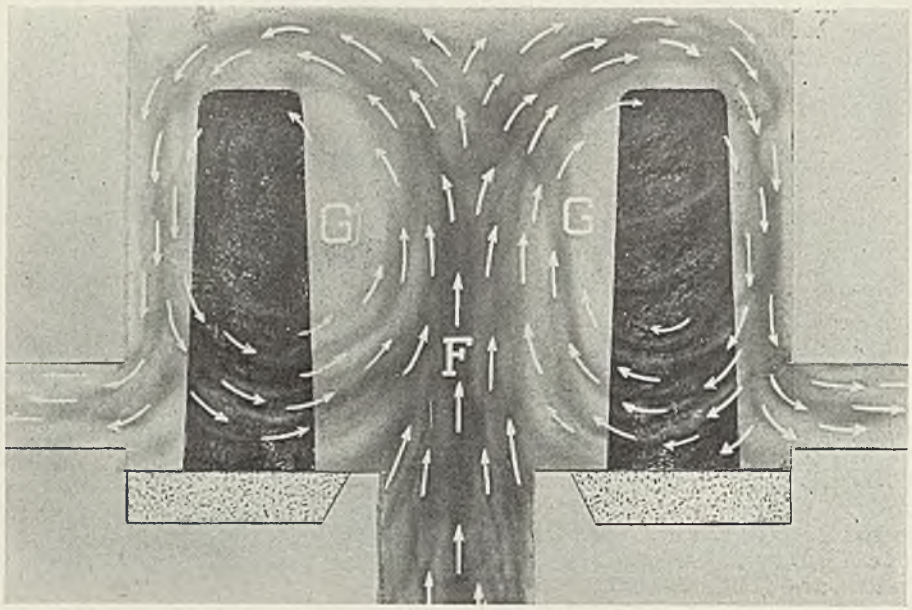


Fig. 4—Principle of recirculation. Vertical firing of uniform heat is shown at F. Cooler gases at ultimate ingot temperature forming a constantly recirculating protective layer around ingots are shown at G

function of the fuel shutoff on covering opening. One safety advantage of this combination of two functions into one valve which operates frequently, is that the hazard of a normal power-failure valve sticking, due to tar in the fuel line, is greatly minimized.

In the event that a delay prevents drawing ingots that are heated and ready to draw, the controls will lower the thermal input into the furnace to balance the radiation and stack losses at set control temperature. This is done automatically and independently of the operator. As a further advantage, this feature may be used to bring the empty pit up to operating temperature preceding start of operations after a mill shutdown of one or more turns.

Proper registration and recording are an important phase of control setups so that some attention is warranted to the potentiometer and flow meter charts. The potentiometer chart is important because it records the following data on the heats involved:

1—Temperature cycle of heat.
2—Overall time of heat for hot and cold steel.
3—Net time of heat.
4—Time for charging.
5—Time for drawing.
6—Number of ingots charged per heat.
7—Delays due to waiting for steel.
8—Mill delays preventing drawing.
9—Bottom-making time.
10—Time required to bring up pit temperature after shutdown period.
11—Time required for making coke additions.

The records are made on a roll chart divided into 10-minute graduations, and in major temperature brackets of 100 degrees Fahr. between 1000 degrees and 3000 degrees, with subordinate 10-degree graduations.

The flow meter chart is important because it records:

1—Rate of flow throughout the heating cycle.
2—Time of starting cut-back, or throttling.
3—Completion of thermal absorption by steel.
4—Rate of heating to guide the operator on future heats.

The charts integrate information on fuel consumption, both from an overall or aggregate aspect as well as in a specific distributional sense. They also combine to make a reference record of the best heating practice for different grades of steel charged at various temperatures.

The light signal, operated automatically by a mercoid switch, indicates that the heating cycle has been completed and (continues to indicate) that the pit is ready to draw. Fig. 8 shows an installation of four 12-foot 9-inch pits. The automatic light signal on the crane girder indicates that the heat is ready to draw.

Prevent Damage

The central location of the new pit's combustion chamber, and its vertical, one-way firing, prevent the impingement of the initial flames of combustion upon the ingots. The larger hole also provides greater fluid activity of the heating medium in a process enabling low velocities, which are essential to control flame temperature, as well as rates of thermal release, and prevent damage to the steel. The practical success of this provision for the elimination of washing is also apparent in the steel content of pit slag, which averages about 22 per cent. This is accompanied by a substantial reduction in the initial quantity of coke used. Fig. 6 shows an ingot being placed into the pit furnace; note the uniformly heated appearance of the ingots in the pit. Fig. 1 illustrates the condition of an ingot as it leaves the pit furnace.

True soaking influence is attained and abnormal temperature variation

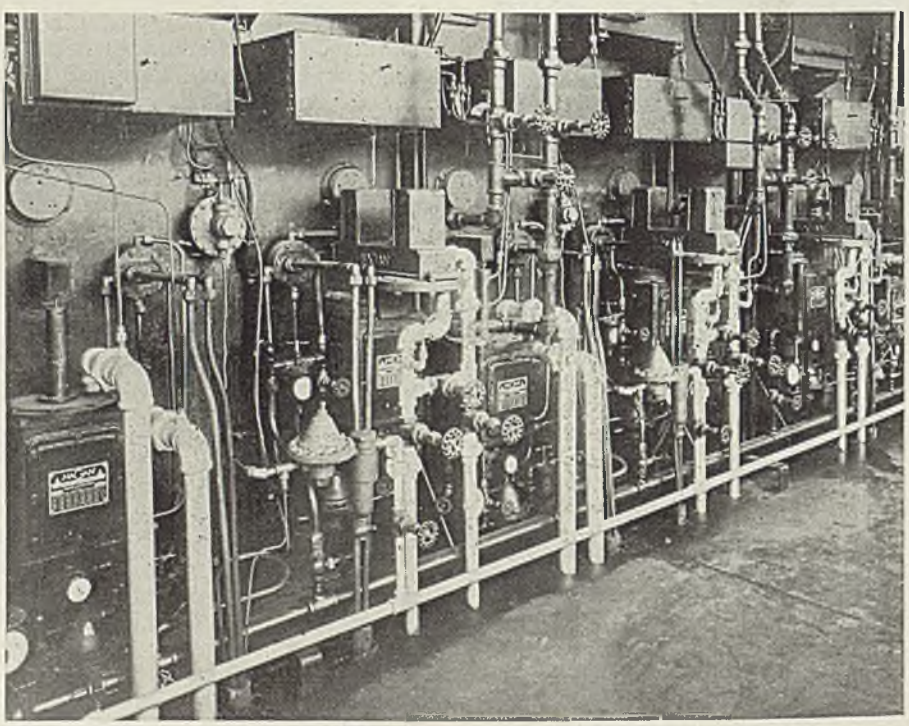


Fig. 5—Regulating equipment at rear of control panel

is avoided by the rotating envelope of circulating gases; as a matter of fact, the absolute duration of the "soaking period" is recorded by the fuel flow meter when the rate of fuel flow levels off and becomes constant to stack and radiation loss. Stratified air and gas streams are avoided by the use of central, vertical firing and reliance on the natural free-rising principal of circulation. The hearth is made unusually thick to insure adequate heat storage beneath the ingots and thus provide a reserve for butt saturation, an important consideration if butt cracks are to be minimized and rolling hazards reduced. Controls can be adjusted to obtain atmospheres ranging from highly reducing to highly oxidizing to govern the amount of pit scaling, or to affect its nature (tight or loose).

Fig. 6—Ingot being charged. Uniformly heated ingots are shown in pit furnace

Special Control for Alloys

In heating alloy and high-carbon steels, where the value of the material is greater, special provision is made in the controls. The pit is generally cooled to prevent initial high-temperature differentials damaging the steels, and a slow heating rate is used in the first part of the cycle. In this type heating, an adjustable timing apparatus is installed with a cut-in, cut-out switch for gradually increasing the low initial firing rate until the temperature differentials have passed the critical range, at which time the heating procedure passes into the automatic heating cycle of medium-carbon steels.

The efficient utilization of direct firing from a single, centrally located burner, and the employment of a continuous, controlled fuel service results in decreased fuel consumption. The combustion chamber is sand sealed and always under positive pressure, thereby preventing casual infiltration of air and minimizing loss of heat. An efficient granular seal between the furnace and cover, as well as the automatic fuel shutoff on cover opening, minimize heat losses in that direction. The method of natural circulation minimizes variation of temperature within a large pit and permits a reduction of thermal input for a given absorption by the steel.

Adaptability to any common industrial fuel is provided, and correct design in such matters as tile thickness and the control of initial and final temperature differentials of the recuperator tile surfaces facilitates the use of blast furnace gas. One large steel plant is now using cold 90-B.t.u. blast furnace gas exclusively in the operation of a series of Amco pits and heating cold steel faster than existing regenerative pits in the same plant heat the same steels.

In the use of mixed gas fuels, where the thermal value varies, a special method of control is used. For example, in the use of a mixture of coke oven gas and natural gas over a thermal value range of 550 to 1050 B.t.u., the air volume is the most constant factor; therefore, the temperature controller operates a control valve in the air line and the gas is ratioed from the air flow by an inversion of the previously-described apparatus.

In connection with this, a gravity sampling system may be installed to indicate or record the gravity of the gas and thus give a measure of the thermal value. In turn, a manual or automatic master gravity corrector linkage and controller may

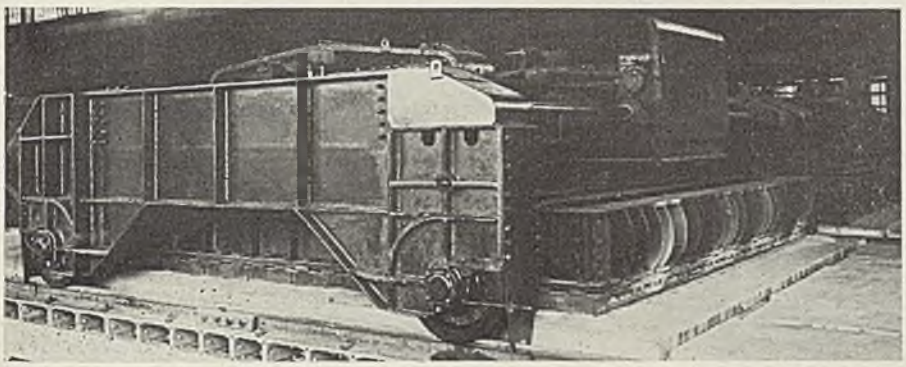
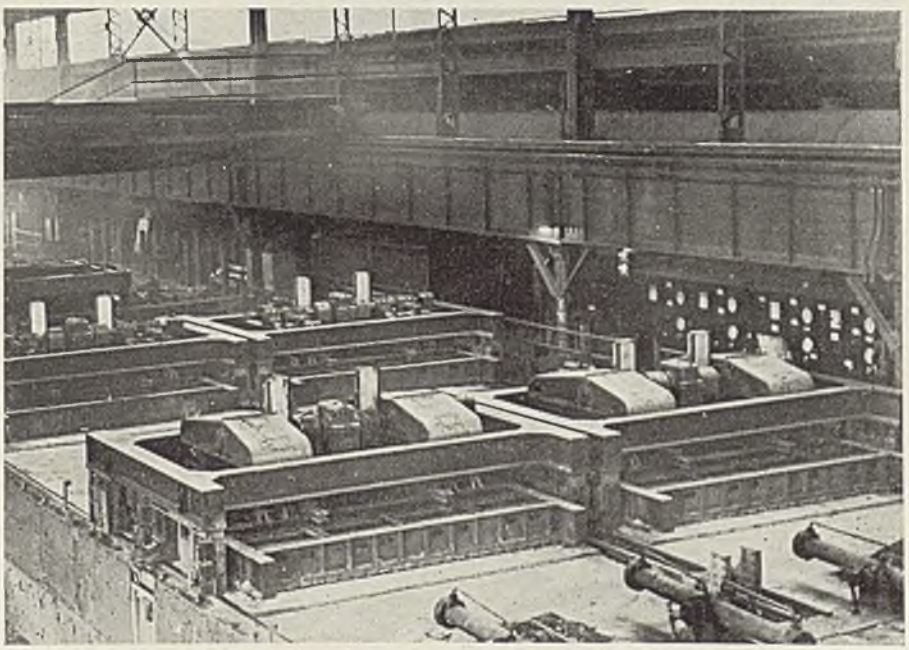


Fig. 7—(Above) View of seal-type cover and carriage. Travel is in both directions. Removing cover automatically shuts off the gas

Fig. 8—(Below) Four 12-foot 9-inch center-fired pit furnaces. Light signal on the crane girder indicates that ingots are ready to draw



be installed which will reapportion the fuel flow ratio relative to the air flow which is constantly controlled by the potentiometer. In this system, the air flow is indicated and the gas flow is recorded. Calculated corrections are made from the record or indication of the gravity meter and the record of the gas flow meter for fuel distribution.

Fuel consumption has been reduced by over 50 per cent, and the net fuel rate is about 110,000 B.t.u. per ton/hour of heating time. Overall per ton consumption on hot steel has been below 180,000 B.t.u., while on cold steel it has averaged under 1,400,000 B.t.u. The tabulation in the accompanying table is based on operations observed and compiled in a plant using one 12-ingot Amco pit. Fuel consumption figures are also shown for the same operation one year later, when tonnage rate had been increased.

Inasmuch as washing of ingots is practically eliminated, the principal source of scale is from fins and portions dislodged by the crane tongs from the surface of the ingot. Therefore, bottom-making may be extended to from two to three weeks with several weekly coke additions. The nature of the slag is so "dry" that it can be removed quickly with an implement attached to the ingot crane. The amount of the slag recovered and the ferrous content of the slag will be noted in the accompanying table covering a week's operation.

An ingot crane and the use of a cleaning tool which is attached thereto lessens the labor for making bottoms. Due to the loose cinder, the bottom is made in 1¼ hours without any protracted demand on the crane time. The time saved by lessening this work alone increases the potential capacity of the pit about 5 per cent and releases the cranes for direct production.

The pit was designed to fit existing mill layouts and, as such, it is usually square with the recuperators for preheating the combustion air located on opposite sides. Each pit is an independent furnace, completely encased in substantial steel plates and supported by heavy buckstays. The walls of the pit are of suitable thickness, arched for stability, and thoroughly protected from the initial flames of combustion by the rectangular wall of ingots, giving the pit maximum service with minimum maintenance.

The cover and the cover supporting and transporting carriage represent a new conception of these important elements. The cover is a flat interlocking arch, suspended by four adjustable rods attached to the lifting carriage. It is encased in a heavy welded frame, having rigid marginal members adjacent to the tracks, and semifloating members spanning the open pit. All marginal members carry alloy flanges adapted to engage the seal trough around the furnace when the cover is closed. A special construction of both cover and refractories places all the refractory elements in compression to give to the flat arch the same refractory retention characteristics as the sprung arch.

Data on 12-Ingot Pit

(Center Fired)

Coal used, pounds	41,310
Coke used pounds	12,408
Bottoms made	1
Labor, hours	13
Number of ingots set	12
Steel heated weekly, tons	1740
Cinder and slag, pounds	6008
Iron slag recovered, pounds	184
Amount of coke returned	5824
Steel content of slag, per cent	22.33
Steel recovered, pounds	41.5
Coke recovery, per cent	42.5
Same Operation One Year Later	
Steel heated weekly, tons	2639
B.t.u. per ton (monthly overall)	190,000
B.t.u. per ton hot ingots	172,000
B.t.u. per ton cold ingots	1,367,000

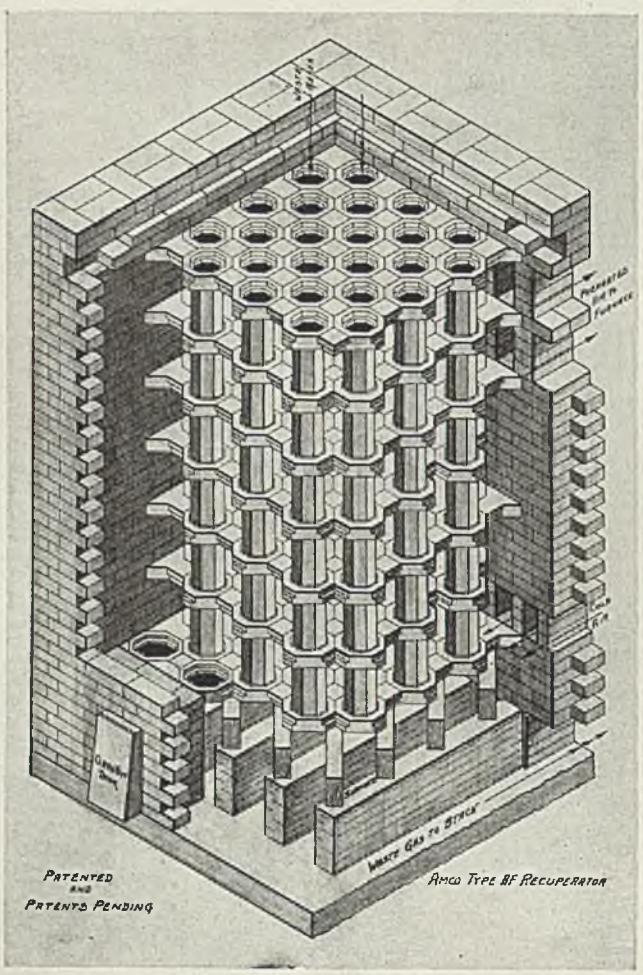


Fig. 9—View of section through recuperator. Gases flow downward through octagonal tubes while air proceeds upward in alternate horizontal directions. A cell may be repaired or replaced while pit is in operation

System Is Synchronized

Through a series of relays and interlocks, the combustion system is synchronized to stop and start fuel and air supply upon opening or closing the furnace. This saves fuel, aids the crane man in quickly locating the ingot to be removed, and protects the cover crane. The cover frame, adjustable relative to the carriage, is readily detached when repairs are to be made and a spare cover may be used to avoid loss of time during relining of a cover. Fig. 7 shows a view of the seal-type cover and carriage.

Charging floor conditions are improved by a concealed low rail construction for the movement of the cover carriage. When the cover is moved away from the pit, the open pit is free of all obstructions. The problem of warped tracks and twisted cover frames is solved by the combination of the seal and the new position of the rail. The charging floor is of first quality firebrick, paved upon a substantial steel structure independent of the pits. Brick is used to reduce heat loss from the covers when opened and to increase the life of the cover refractories. The charging floor is located well below the level of the pit curb to provide clearance between the floor and open cover for avoiding stray tools, and to further avoid unnecessary heat losses from the cover refractories. All concrete foundation walls are protected against dehydration by the introduction of air circulating canals and insulation.

Recuperators, located on opposite sides of the pit, are the Amco

(*Please turn to Page* 80)

Indicate Need for Unity In Engineering Professions

(*Continued from Page* 26)

accomplishments. He said it would seem that technically the profession is doing good work toward unity. In furthering the material interests of the profession a certain lack may be noted in several instances.

He believed that the engineering profession could accomplish more than it has in the past along lines of publicity in the daily press, but—that this could be corrected. But to do so, he said, the engineer must be willing to stretch his sense of technical accuracy and be willing to have ascribed to him accomplishments that are not spectacular or sensational in themselves, but which may become so when embellished by the fancy "truly belonging to the reportorial art, that is, these accomplishments must be dramatized."

He also believed that the registration of engineers is an important element in the unified approach toward the establishment of a means for recognizing the engineer as a professional man. "It must be borne in mind, however, that registration does not create a profession, but only gives a legal status to the individual," he added.

With respect to civic affairs, Mr. Herron said that organized influence pertaining to public welfare may be observed by engineers in their local societies. Matters of engineering fees, compensation, welfare and publications are, in the main, he continued, characteristically the development of each separate branch of professional organization and are not designed to apply or to be adapted to any other organization.

Co-ordination Is Lacking

"Each determines and establishes its own code of ethics and formulates its own method of practice. There seems to be no well-defined effort to co-ordinate these regulations and modify them to the advantage of engineers indiscriminately. What, in all probability must be the way to accomplish what is desired?

Recalling the large number of national organizations of engineers, he posed the question: "If the engineers of this country have such a diversity of technical interests as to demand so many societies, will it be possible to effect a complete unity on the basis of technical advantages?"

Later, he said: "We, as engineers, have been remiss in not utilizing the power that lies in the magnitude of our members and in organizing and marshalling our forces to function in our maximum potential capacity. The intelligence and acumen of our membership have been comparatively dormant in recognizing the breadth of the field of opportunity and culpably slow to initiate activity designed to claim and secure the rewards which are justly ours."

How to unify and co-ordinate the broad legion of engineers into an organic energy requires a motivating purpose. Appeal for unity must be made along some line of desire to which the present organizations do not cater, he said.

Two plans to accomplish this unification have been suggested, he said. One is to continue the present constituted societies, confining their activities to technical topics and to add one or two others to cover our material needs. The other is the plan of the American Medical association and similar to that of the American Bar association. Under this system two branches are maintained covering the technical and material phases along the plan which Euber B. Croft proposed in 1935 for a national engineering society. This would provide for local and state organizations.

Initiative To Be Local

In working out this scheme, he said, the initiative will be taken with the local organization. It is understood that the contemplated set-up is on the basis of material interest alone. Local societies would embrace all professional engineers in whatever branch they may practice, residing in a certain definite area. The local organization would constitute the unit. These would be united to form a state society which would deal with all matters of common interest to the engineers in that area. From the state the national organization could be effected.

Continuing, he said:

"The author has thought that we should do something toward unity and co-ordination. Primarily this should be along material lines. It should start with the smallest unit to be most effective. In the smaller unit whatever difficulties of organization that may be encountered can be ironed out. In this way the state and national groups could profit from the experiences and accomplishments of the smaller groups.

"An alternate plan which might be effective and entails less friction to set up would be founded on the societies as they now exist for technical purposes, but that an additional society be organized by the existing societies to handle those economic phases which are for the material welfare of the engineers. This society might be independent of the present engineering societies and deal with only material interest; however, it would seem that the society should be an outgrowth from the present technical societies, be organized by them and be operated in conjunction with them, not simply a matter of overlapping memberships."

Steady progress in the work of the sub-committee on heavy helical springs was reported by C. T. Edgerton, bureau of statistics, Crucible Steel Co. of America, New York. In the committee's previous report, a year ago, results of fatigue tests on four groups of helical springs—A, B, C and D—were announced. The sub-committee has now practially completed work on group E, with springs made of plain carbon electrical steel, and group F with springs of plain carbon open hearth acid steel. Mr. Edgerton pointed out the group E material was of the same grade of steel as group C but the results in the group C tests were unsatisfactory in some respects.

Results of the endurance tests to date were recapitulated as follows, with the table also including the results obtained by J. B. Johnson in the original tests made under his supervision at Wright field (these latter are denoted by the initials JBJ in the table):

Spring Group	Endurance Limit p.s.i.
Plain Carbon Electric, (JBJ)	93,000
Electric Chrome Vanadium, (JBJ)	77,000
Plain Carbon Electric, Group E..	75,600
Plain Carbon O. H. Basic, Group A	73,470
Plain Carbon O. H. acid, Group F	71,600
Electric Silico Manganesse, (JBJ).	70,000
Plain Carbon O. H. Acid, (JBJ)..	68,000
Electric Silico Vanadium, Group D	62,820
Plain Carbon Electric, Group C..	58,170

Mr. Edgerton said it should be noted in Mr. Johnson's original tests the stress at which the springs ran 1,000,000 cyles was taken as endurance limit. The stress of unlimited endurance is approximately 5000 p.s.i. less than this. Figures given in the table for Mr. Johnson's springs are therefore less by 5000 p.s.i. than the values announced by him.

Springs tested by Mr. Johnson, the speaker pointed out, were all coiled from centerless ground bars, whereas the committee springs have so far been made from bars "as rolled."

The next step in investigation will be a survey of the effect of various surface finishes on the endurance. The grade of steel will be plain carbon electric, selected because of its uniformly good endurance qualities, as indicated by the tests so far, and also because it lends itself to very

close control as to the chemical composition and metallurgical characteristics.

Four new groups of springs are now in the process of manufacture, as follows: Group G—steel "as rolled," with special preparation of billets; group H—steel cold drawn; group J—steel centerless drawn; and group K—steel cold drawn and springs cold coiled.

The results from group K, Mr. Edgerton thought, may prove to be of special interest. The plain carbon electric group originally tested by Mr. Johnson was reported to be cold coiled, which naturally raises the question whether this feature acounted for the remarkable endurance limited obtained.

He said that the sub-committee now has endurance limits on several common spring steels, together with considerable collateral information which will be of value to spring engineers and designers.

Publishes Fatigue Data

D. J. McAdam, metallurgist, division of metallurgy, national bureau of standards, Washington, outlined a study now nearing completion and which will be published in book form in about three months under the auspices of the American Society of Mechanical Engineers. The work will be a resume of the present status of factors affecting fatigue in metals, dealing chiefly with stress concentrates — both mechanical and chemical types. Collaborating in the preparation of this study, in addition to the Society and the bureau of standards, are the American Steel Foundries, represented by R. W. Clyne.

F. P. Zimmerli, chief engineer, Barnes-Gibson-Raymond Inc., Detroit, was unable to be present to submit his papers on "Wire Springs"; it will probably be submitted later.

The session devoted to critical-pressure steam boilers attracted an unexpectedly large attendance. The session was moved to larger quarters, but even they were not large enough, with many unable to get in. The meeting was held under the joint auspices of the research committees on boiler feedwater studies and on critical pressure steam boilers.

First on the program was a paper entitled "Investigation of the Oxidation of Metals by High-Temperature Steam," prepared by A. A. Potter, past president and fellow of the Society and dean of engineering, Purdue university, West Lafayette, Ind.; H. L. Solberg and G. A. Hawkins, professor and assistant professor, respectively, of mechanical engineering, Purdue university.

In this the authors pointed out that inasmuch as steam temperatures in modern central stations were approaching those used for commercial production of hydrogen by reaction between steam and iron, a study was undertaken at Purdue of the oxidation by steam of the various steels available for high-temperature steam service.

They described the apparatus and technique developed for measuring the amount of oxidation due to temperatures up to 1200 degrees Fahr. and pressures up to at least 1600 pounds gage. They presented data showing the effect of temperature from 800 to 1200 degrees Fahr. on the oxidation of low carbon steel in contact with steam at 1200 pounds gage. The rate of oxidation of low carbon steel at 1100 degrees Fahr. is apparently the same at 400 and 1200 pounds steam pressure, they observed.

Apparatus had been developed for operating seven tubes simultaneously under identical conditions and data were presented also to show the comparative oxidation of six steels of different analyses. The investigation is being continued.

Intercrystalline cracking of steel in aqueous solution was discussed in a paper by W. C. Schroeder, A. A. Berk and R. A. O'Brien, research engineer, assistant chemist and assistant metallurgist, respectively, bureau of mines, College Park, Md. Originally, it was pointed out, failure of this type was believed by many to be caused primarily by sodium hydroxide, then later there was the tacit assumption that the action of sodium hydroxide-sodium silicate or very similar solutions served to explain the production of intercrystalline cracks under all conditions.

Surface Conditions Important

However, the authors said the results of their experiment, which, incidentally, is being conducted under a cooperative agreement between the joint research committee on boiler feedwater studies and the United States bureau of mines, indicate that the cracking depends to a marked extent on the surface conditions produced on the steel and may, therefore, be influenced by as many factors as encountered in the corrosion of steel.

It has been found, they said, intercrystalline cracking can be produced in sodium hydroxide solutions containing a number of substances other than sodium silicate, and the particular agent which must be added to the sodium hydroxide depends upon the temperature and conditions of the test. Certain chemicals, they said, may be substituted for the sodium hydroxide itself, such as sodium, or even a dilute nitric acid solution.

Summarizing various results of their tests, they concluded (1) not only one solution but a variety of solutions of different compositions may promote failure; (2) since the reactions may be started or stopped by surface conditions on the steel, they will be extremely sensitive to small changes; (3) since temperature and solution conditions must be quite accurately adjusted to promote cracking, it may occur only intermittently in a boiler; (4) some substances used to prevent cracking do so by changing or producing a new surface film on the steel; and (5) it is not necessary to have an applied load on the steel to produce cracking.

Investigation is being made at present on the action of possible protective agents as well as a study of the action of dilute alkaline solutions in producing intercrystalline cracking, according to the authors of this research. Results of these further investigations will be made public as soon as possible, it was stated.

Other Papers Heard

Other features of the critical-pressure steam boiler session were papers entitled "Decomposition of Sodium—Sulphite Solutions at Elevated Temperatures" and "Some Results from the Research on Flow Nozzles." The former was prepared by F. G. Straus, research associate professor, H. F. Johnstone, associate professor and W. O. Taff, graduate student, chemical engineering, University of Illinois, Urbana, Ill.; the latter by H. S. Bean, senior physicist, National bureau of standards, Washington, and S. R. Beitler, associate professor, mechanical engineering, Ohio State university, Columbus, O.

F. L. Everett, assistant professor of engineering mechanics, University of Michigan, Ann Arbor, Mich., and Arthur McCutchan, engineer, engineering division, Detroit Edison Co., Detroit, described an investigation of a pipe manifold having a full size welded branch connection. Tests were made before and after applying a ring-sized reinforcement to the manifold around the brass pipe and results of these tests were tabulated.

While permanent distortion of a localized nature occurred on the sides of the reinforced manifold at a pressure only 70 per cent of the pressure calculated to cause yielding of the pipe proper, eventual failure occurred in the pipe outside of the reinforced region. This behavior was explained on the supposition that the load was redistributed through such local yielding until the reinforced region around the branch was able to support the full load required to produce failure in the pipe remote from the branch. The authors concluded reinforcement of this sort was adequate for the purpose intended.

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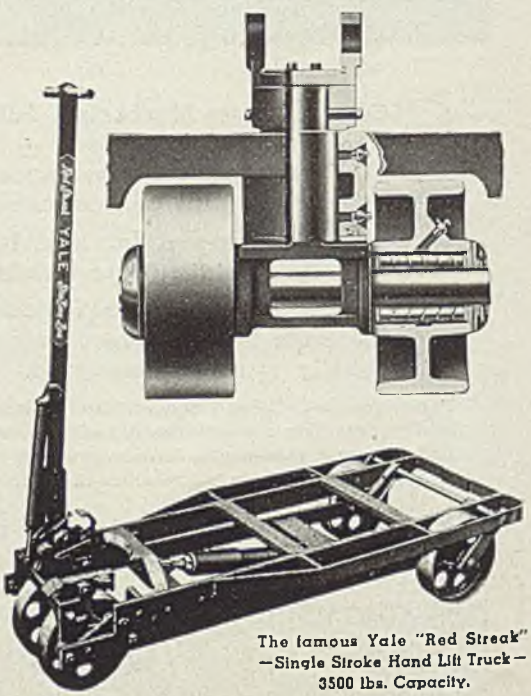

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MATERIALS HANDLING

Dependable Crane Operation Vitally Important in Movement of Materials

BY EDWIN J. RYAN
and
N. M. KIENER
New York and New Jersey Lubricant Co., New York

■ OVERHEAD traveling cranes play such a vital part in the movement of materials of all kinds in connection with the various stages of iron and steel manufacture that the necessity of keeping them in steady operation cannot be overestimated.

Such equipment is subject to continual heavy use and on some occasions to unavoidable abuse. Lubrication which will dependably protect bearings, is, therefore, of vital importance in order to insure efficient and economical operation, guarding against bearing failures which interrupt production schedules and bring about a heavy expense for repairs.

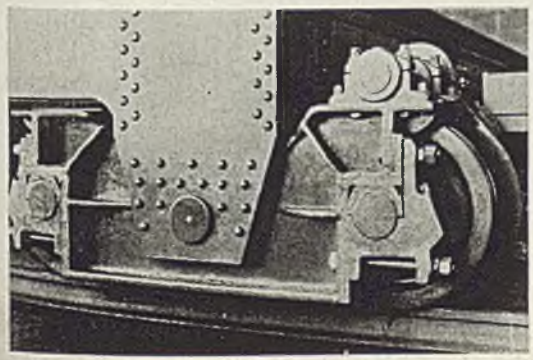
Another point of particular importance is that the products selected must not only lubricate bearings in such a manner as to constantly control frictional wear, but they must not drip or leak. Greases that melt and run out and oils which drip are not only wasteful and expensive to use, they also are a continuous source of damage to semi-finished and finished steel products. For this reason all drippage from overhead traveling cranes should be eliminated.

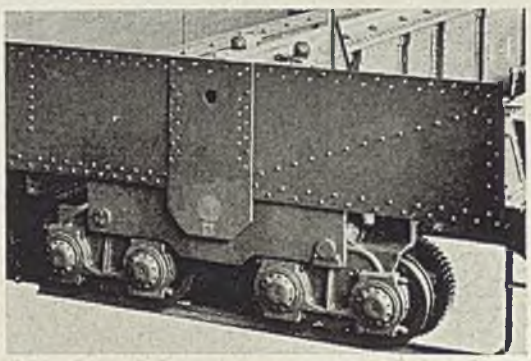
Manufacturers of these cranes have studied this problem from the standpoint of improved bearing performance and prevention of lubricant leakage for many years. Each year definite improvements have been made in the crane bearings proper and the means provided to prevent escape of lubricants.

Lubricant manufacturers too, have been alive to the necessity of perfecting lubricants which would meet satisfactorily the wide range of operating conditions encountered in steel mill practice. They have steadily improved lubricants so as to have available products which would meet temperature conditions ranging from below zero — as in the case of yard cranes operating outdoors — to the high temperatures encountered in the operation of the heaviest ladle cranes.

Newer types of crane installation made during the past few years do not present the same difficulties with regard to lubrication as older equipment. Modern cranes are usually equipped throughout with anti-friction bearings and oil tight gear cases, minimizing the problem of drippage. However, the selection of the proper lubricants is of great importance, as these lubricants must protect the ball or roller bearings and the gears from wear. It is of even greater importance that every precaution be taken by the maintenance force to keep the lubricant absolutely free from dirt.

With few exceptions, grease type lubricants are being used for the lubrication of ball and roller bearings. Such lubricants require less attention than oils and, if properly made, have very little tendency to





Crane bridge equipped with plain track wheel journals is shown at left. At right is ladle crane bridge with anti-friction bearing track wheels. Photos courtesy Morgan Engineering Co.

MATERIALS HANDLING

escape from the bearing closures. In most cases, greases are applied through the use of fittings by means of hand-operated pressure guns. This method allows the operator to inspect the crane at the time of lubrication.

Recently many cranes, especially those operated in open hearth departments in large mills, have been equipped with manually-operated, centralized, lubricating systems. These have so far proved satisfactory.

Employed Several Densities

Until recently, due to the limitations of older types of greases, it was found necessary to employ several densities to meet the wide range of operating conditions, since a grease soft enough to lubricate positively on cranes exposed to low outside temperatures would not be satisfactory on bearings subject to the high temperatures and heavy loads encountered on ladle cranes, strippers and furnace chargers.

This need for carrying several different grades in stock was a nuisance to begin with, and it presented a constant problem as there was always a possibility of the crane operator or oiler using the wrong grade. Today, this trouble has been practically overcome by the perfection of grease type products which have proved outstanding by their ability to lubricate perfectly under wide ranges of temperature and operating conditions.

Some concerns have further improved these wide range products by the addition of extreme pressure elements which enable their products not only to withstand the highest heat encountered during overhead crane operation, but also to cope successfully with high bearing overload.

There are still many thousands of steel mill motors equipped with ring oiling type bearings. While the ring oiling principle itself is an excellent one, motors of this type in some instances have proved an ever present source of annoyance and expense. Unless the lubricant is properly selected, oil is apt to throw out of one end of the bearing to drip on stock underneath.

When it throws or creeps from the inboard end of the motor bearing, the oil gets onto commutators and windings. Windings become oil-soaked, quickly deteriorate and there is danger of a short-circuit and a motor "burn-out."

On newer type cranes trolley and bridge shaft bearings are usually of the antifriction model. On older cranes they are either plain, babbitt or bronze sleeve, and invariably grease lubricated. Application is mainly by means of individual fittings or hand-operated pressure guns. Compression cups and gravity feed pin cups are being used to a limited extent.

Such older types of bearings require careful selection of the lubricant and proper application is of the utmost importance. The product selected must be able to withstand wide ranges of operating temperatures, and be able also to resist the necessarily higher bearing pressure present in plain bearings. Failure to stand up under either condition will bring about bearing heat and lubricant drippage. Further inability to lubricate properly will result in damage to the bearings.

Bearings on bridge and trolley track wheel journals are admittedly the source of more drippage onto rails, girders and stock underneath than any other bearings on cranes. A great deal of attention has been paid to methods of preventing this trouble, more especially as it has come up for discussion at conventions within the past five or six years. Special devices for applying lubricants, as well as lubricants designed to cope with difficulties experienced, have been developed during this period.

In a majority of steel mill installations, both bridge and trolley axles are fitted with MCB type journals. Common practice in the past has been for the crane operator to pack the journals with wool waste. This in turn was saturated with black oil. Additional black oil was added at frequent intervals. In some cases, where drippage is of minor importance, this procedure is still being followed. It appears to be an inexpensive method of lubrication, but the reverse can readily be demonstrated.

Increased rigidity in production and safety inspections called for determined efforts to find better ways of lubricating such bearings. One of the first improved methods was the use of counter-balanced paddles installed in the journals to hold heavy greases in contact with the bearings at all times.

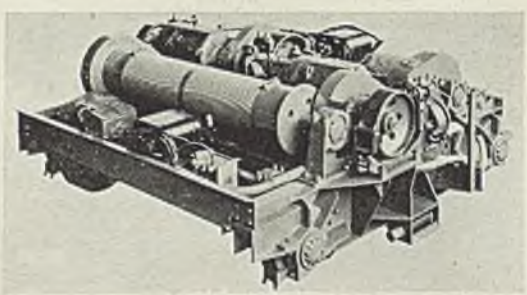
Prevented Drippage

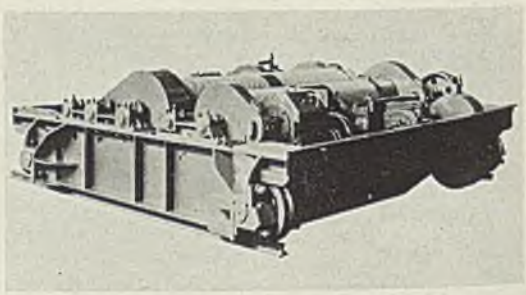
This method, in combination with special high temperature greases proved satisfactory from the standpoint of preventing drippage. Later it was found that, in some instances, cranes would slow up considerably. Difficulty was also experienced because lubricant did not feed up on the flanges dependably. Flanges were often cut off because of this failure of lubricant to reach the proper point. Counter-balanced paddles are still used on some cranes, but mainly for light loads and short hauls.

One better solution was soon discovered in the use of felt wick oilers where the wick is kept in contact with the journal by means of springs. Mills experimenting with this practice have found it the most satisfactory of all methods. In combination with the proper lubricant it goes a long way toward preventing troubles previously experienced. So much so in fact, that this method is being more and more extensively used for track wheel journal lubrication.

A word of caution is wise at this

(*Please turn to Page* 83)





Left view shows a trolley equipped throughout with antifriction bearings, while at right is a trolley with plain bearings

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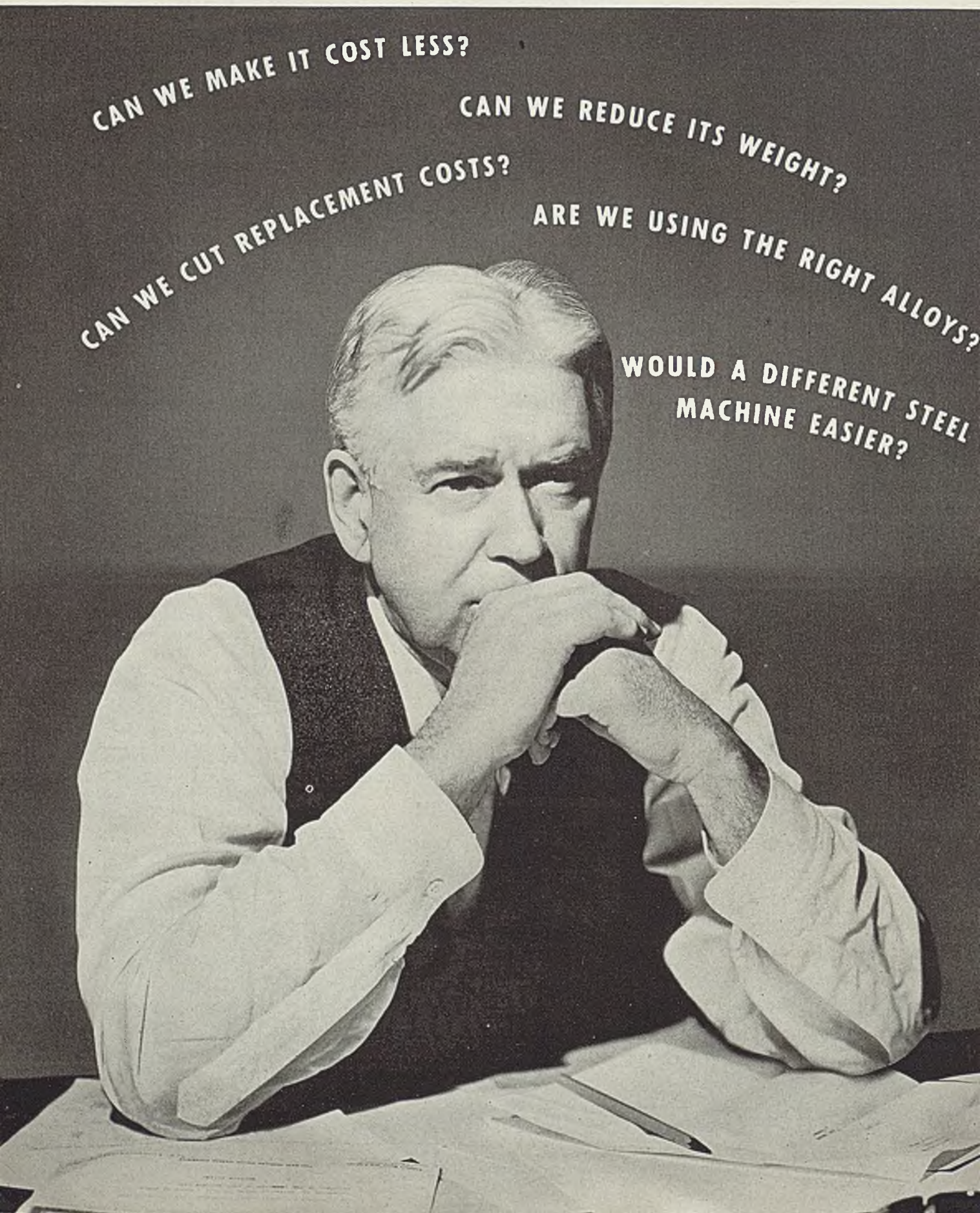

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UNITED STATES STEEL

PROGRESS IN STEELMAKING

Changing Fuels in the Steel Mill

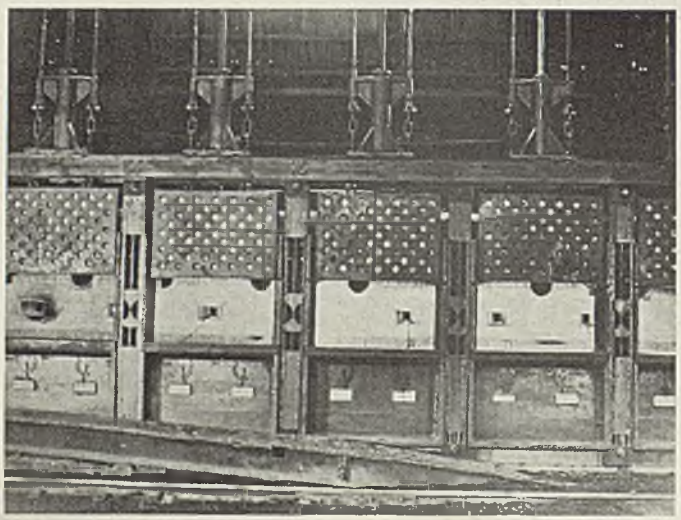
BY J. B. NEALEY
American Gas Association

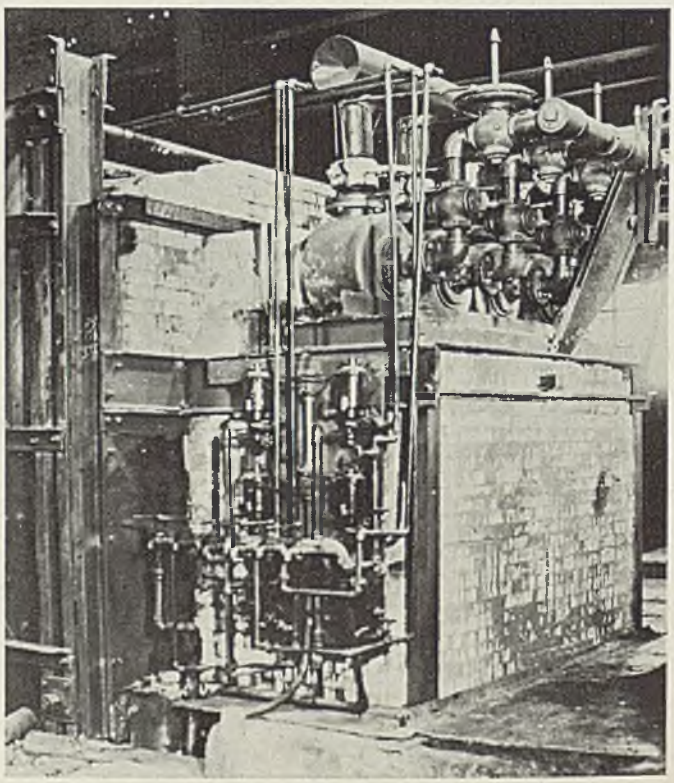
■ ONE OF the problems in steel mill management is that of selecting a correct fuel policy. So many factors are involved that the choice of fuels is sometimes difficult to make. Especially is this so, as every district and community throughout the United States has a different schedule of fuel prices.

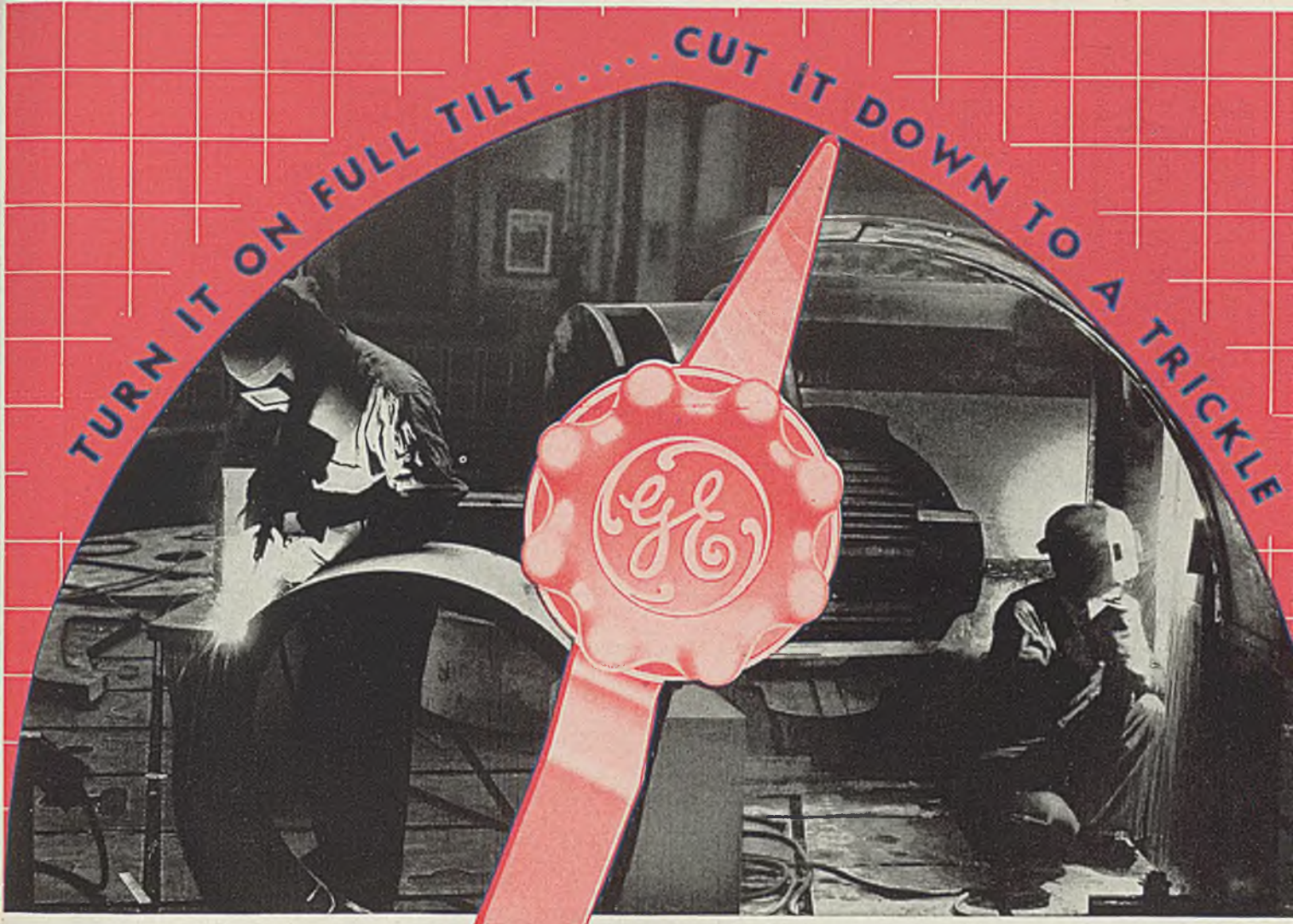
Of interest is a recent shift to gas fuel by Follansbee Bros. Co., Pittsburgh, with a steel plant and sheet mill in Toronto, O., and sheet and tin plate mills in Follansbee, W. Va. For years the furnaces in these plants had been heated with producer gas, coal or oil. Experience gained in experimenting with all fuels finally resulted in the adoption of natural gas as the standard fuel. Economies, increased output and improved quality of product have resulted, it is claimed. With the former fuels sulphur lowered the quality of finish and the resulting percentage of seconds was abnormally high. This situation was speedily corrected with gas.

In addition to other favorable results with gas, maintenance on machinery has been cut appreciably as formerly wear on bearings and other mechanical parts by grit and

Below is a view of ingot heating furnace with doors open to show the gas burner ports, prior to the adoption of end firing. Right view shows combustion system and gas burners located for end firing of one of the ingot heating furnaces. This furnace heats 114 ingots per day with 312,000 cubic feet of gas







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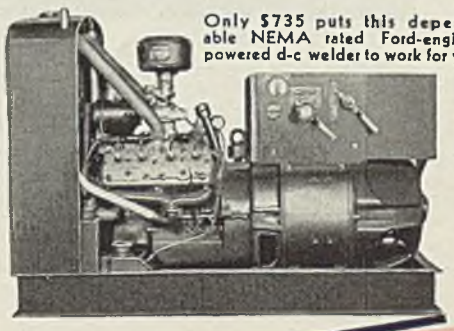

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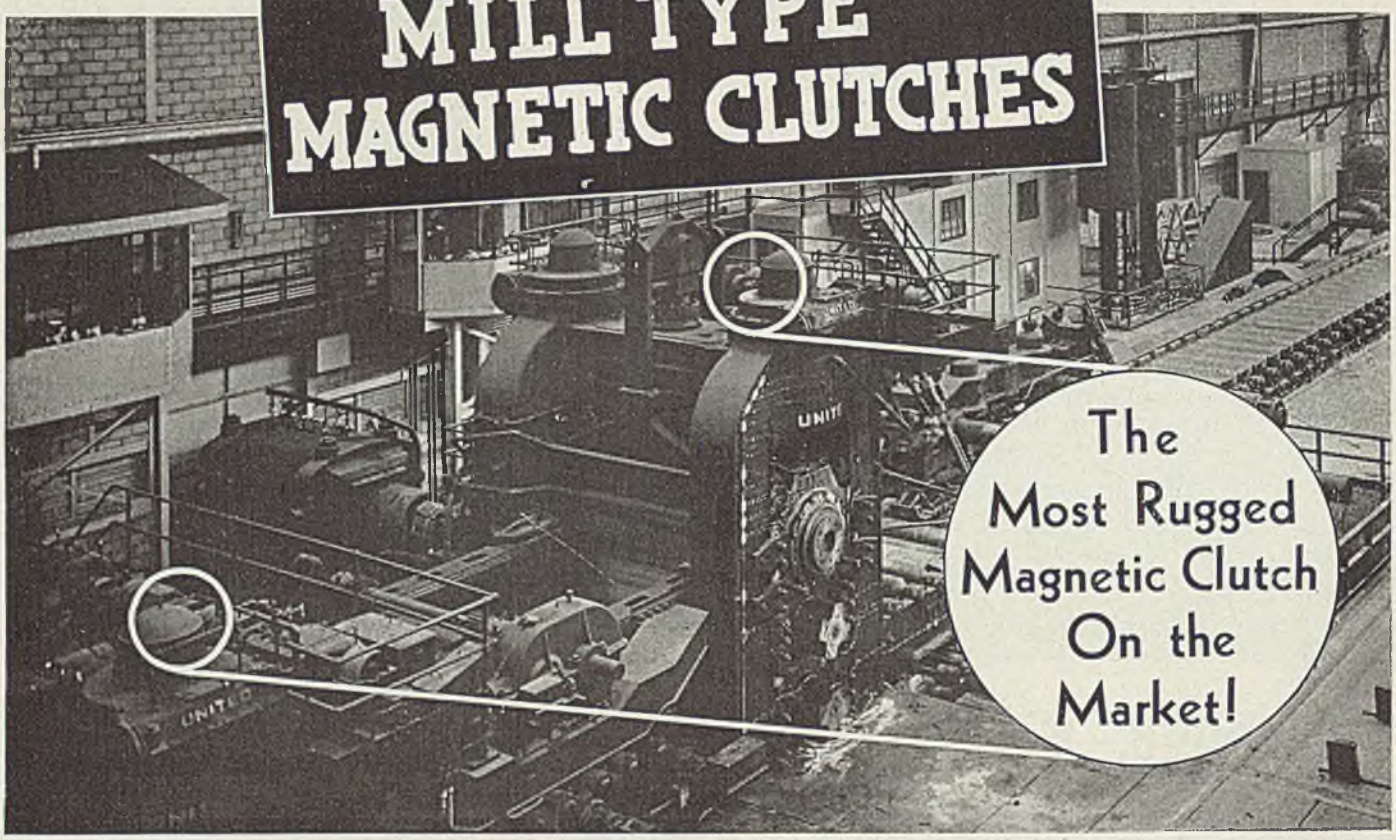
MILL TYPE MAGNETIC CLUTCHES



RUGGED, brute strength construction is the keynote in mill application. Dings Mill Type Magnetic Clutches are as strong as the powerful motors that drive them. Not only are Dings stronger but feature after feature make them better—(1) Steel Hubs for greater tensile strength — not cast iron as others use. (2) Large friction wearing surface for longer, dependable life. (3) Perfect means of adjustment for screw down synchronization and wear. (4) Cap-screws securely locked so they can't come loose. (5) Specially designed grease deflector which allows no grease to reach the friction surface whether in motion or at rest.

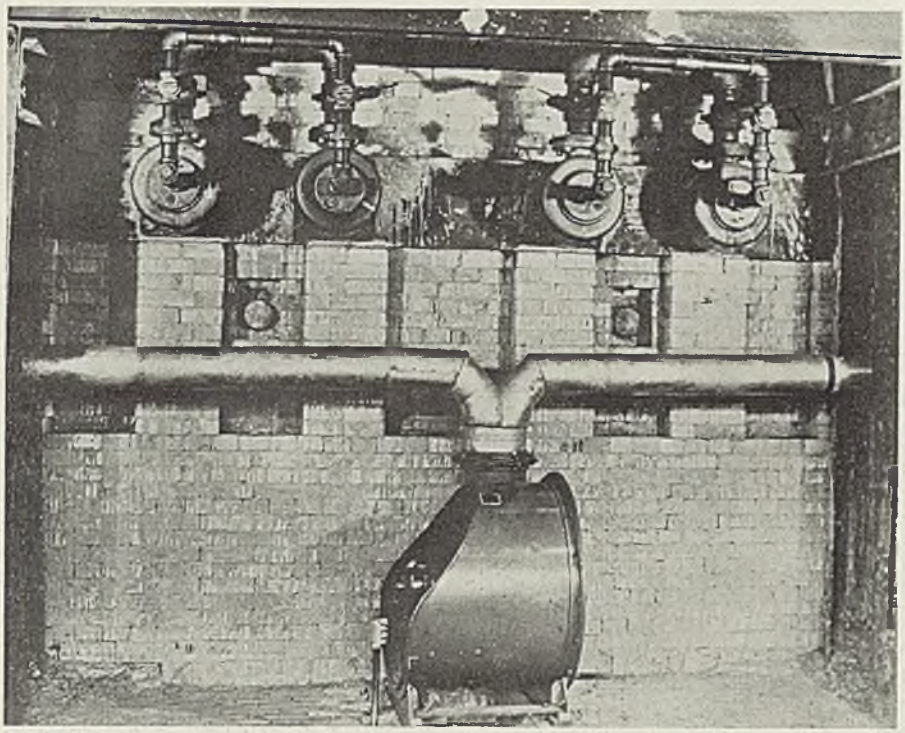
Without maximum clutch efficiency, frequent shutdowns and tie-ups are in order with its resultant production loss and material waste. Let Dings Mill Type Clutches solve your problem as they have done in such plants as Republic Steel Corp., Jones & Laughlin Steel Corp., Ford Motor Co., Carnegie-Illinois Steel Corp., Otis Steel Co., Youngstown Sheet & Tube Co., and many others.

DINGS MAGNETIC SEPARATOR CO.
663 SMITH STREET MILWAUKEE, WISC.

Dings High Intensity MAGNETIC CLUTCHES

Experience that goes back to 1899

Sheet mill furnace showing the combustion system and location of the gas burners. This furnace has shown better production since conversion



dirt was a considerable factor. Refractory maintenance also has been reduced materially and there is now a much better distribution of heat in the furnaces. Clogging of the producer gas burners with tar also was a drawback that has been eliminated with flexible natural gas.

Rebuild Furnaces

To effect the changeover, practically all of the furnaces had to be rebuilt and this was done during weekend shutdowns by the maintenance crew and within the maintenance budget. The job was accomplished during the busiest period ever experienced by this company and without any interference with production.

Instead of soaking pits there are four ingot reheating furnaces, each 30 feet long, one of which has been recently converted from oil to gas firing.

This change increased its output and gives the ingots a better grain structure. The gas burners were first placed in the back walls but flame impingement affected the front doors adversely. Burners were then set at each end of the furnace, but firing is from only one end at a time. Reversals are made the same as with the oil firing. With gas firing preheated air is not used, the reason being that a correct air-gas ratio at all times is considered more advantageous than any increase in efficiency due to the use of hot air. This arrangement corrected the trouble and effected some reduction in gas consumption over back firing.

The gas burner used here is built in a complete unit with a governor by which the proper air-gas ratio is maintained at all rates of flow and with single valve operation. Any desired flame characteristic may be secured by means of the flame control adjustment without changing the mixture setting. While the burner is comparatively new it has received rather wide acceptance among steel mills.

Heat More Ingots

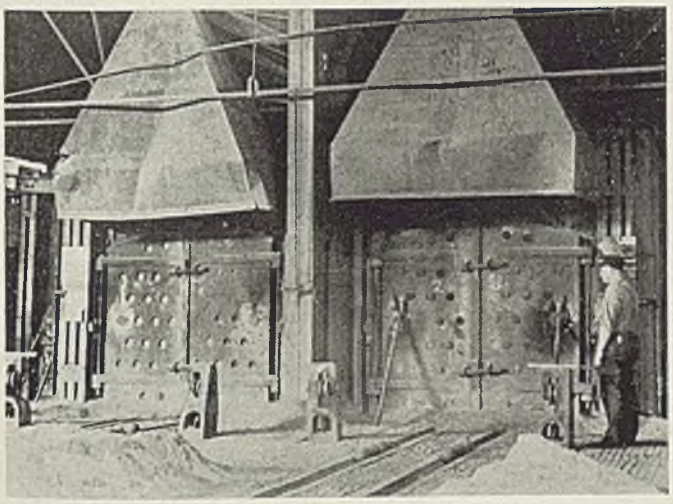
When oil was employed each furnace burned 72 gallons per hour or 1728 gallons per day which at 5 cents per gallon amounted to $86.40. As only 84 ingots could be heated in this time the fuel cost for heating each ingot totaled $1.03. With gas, 114 ingots are heated with 312,000 cubic feet of gas per day. This equals 2737 cubic feet per ingot, which, at 2.8 cents per therm amounts to only 76.6 cents per ingot, a saving of about 26 cents.

A special forging press takes the place of the usual breakdown mill.

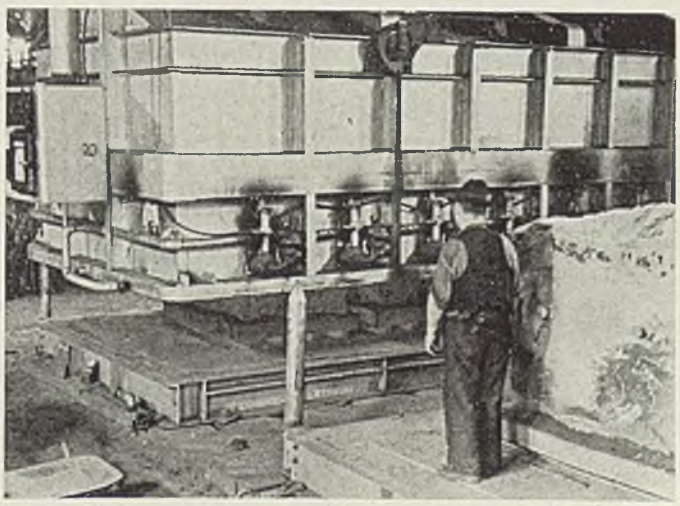
This steam hydraulic press exerts pressure of 100,000 tons on the ingot, which is 12¼ inches square and 5½ feet long. The hot ingot is thus worked down to 5½ inches square when a 30-inch bar mill reduces it to sheet bar stock, which is then sheared to length for the sheet mill. The 22 stands of sheet mill are served with 10 pair and 12 sheet furnaces which have been

(*Please turn to Page* 82)

These annealing furnaces were converted by placing the gas burners in the roof so as to fire straight down on the work. There are two rows of burners



Gas fired annealing furnace with cover being raised. Air blower for the combustion system is mounted on top and the gas burners are located in the sides of the cover



WELDING, ETC.

BY ROBERT E. KINKEAD

Study Lubrication Film to Solve Welding Problems

■ Lubrication experts have made extensive investigations of the strength of films of various substances. Modern high quality lubricants are several thousand times as strong in this respect as oils produced 20 years ago.

Film strength is the resistance offered to breaking of the molecular bond in the lubricant. That there is a parallel situation in welding has become increasingly evident—painful as that fact may be to those who have "known all about welding for 10 years."

The similar conditions seem to be those in which two fluxed and heated surfaces are being welded together by application of mechanical pressure.

The flux has to be squeezed out from between the surfaces or no weld takes place regardless of how much pressure is applied. Under increasing pressure, the flux film simply tends to get thinner if there is no ready escape provided.

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.

Thus two flat plates with flux between them can be pressed with any pressure so long as they are not confined, and, while the flux will escape to some degree around the edges, the film between them will simply get thinner but never quite disappear.

In blacksmith and hammer welding the surfaces are scarfed to permit the whole film to be squeezed out by progressive hammering. All that is accidentally trapped detracts from perfect fusion. In fusion welding where flux is used, the metal is held molten long enough to permit the flux to rise to the surface.

In the various cladding processes which have been proposed and tried, this matter of films, whether of oxides or flux, has always been serious. Failure to deal with it has resulted in many failures. Thus, lubrication engineers in dealing with their problems have contributed materially to the understanding of a vexing problem in welding of metals.

Need New Inventions To Weld Steel Houses

■ The President's insistent pressure for a low cost housing program has prompted a survey of the welding methods available for fabrication of the steel that will become an important material of construction in this field.

In factory built assemblies, thin sheet metal may be welded with spot welding at high speeds. The cost is already so low that any reasonable reduction would not greatly affect the final result. But a great deal of new equipment of modern design will be required. Where members of the assembly are butted together or joined at right angles in either shop or field, the situation with reference to welding methods is not so favorable. Gas and arc welding may be used effectively but the cost is high and a considerable amount of skill is required for the operation.

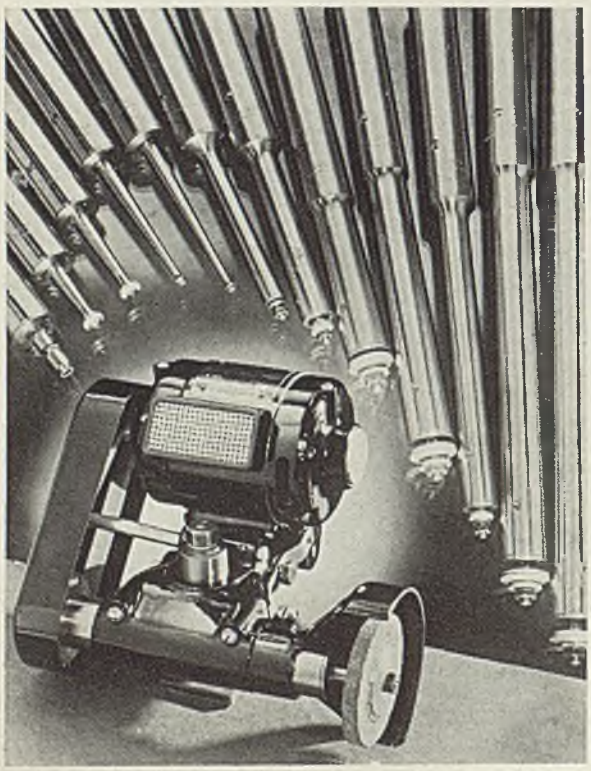
Creative imagination is needed in the gas and arc welding fields to visualize the problems of building construction and produce solutions in the form of apparatus and methods which do not now exist. It seems to make sense to suppose that the welding apparatus should be so simple that craftsmen can use it and get proper results with training of a day or two.

This would clear up a great deal of union difficulty experienced at present. No one can blame a carpenter for not wanting to lose his job to a welder. The apparatus should be low in price and easily portable although built to stand out in all kinds of weather without becoming damaged or inefficient.

Far from being impossible of solution, the job of meeting the above specifications is typical of many that are solved every month in productive industry. It is more a question of mental attitude than facilities. The job is easier than any of the alternatives such as paying the price for brick tile and mortar, convincing construction craftsmen they should give up their jobs to welders, doing without better housing.

Profits are to be earned by producing these welding devices for which there is need.

Presenting a Grinder and Its Quills



■ This pipe organ effect is the result of photographic technique employed by Dumore Co., Racine, Wis., in portraying its No. 5 Master grinder and the wide range of quills available for it. All quills have positive lubricating system and six of them, for deep internal work, have three ball bearings instead of the customary two

YOU CAN CHANGE ONE PART AT A TIME TO WELDED STEEL FOR *PROFITS*

Built from a piece of 2-inch channel and a piece of floor plate, this welded steel foot treadle costs 45c less to produce than the old cast iron design. In addition, the welded part is lighter and unbreakable.

This treadle is one part of a press . . . a product that is being improved and made more profitable by changeover to welded design, one part at a time.

You, too, will profit by changing over your products to welded steel, one part at a time. May we be of service to you?

Write for Machine Design Application Sheets. Issued Periodically.

THE LINCOLN ELECTRIC COMPANY • DEPT. Y-450, CLEVELAND, OHIO

Largest Manufacturers of Arc Welding Equipment in the World

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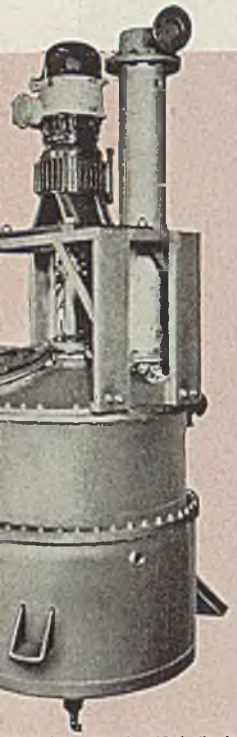
BUILDS LIGHTER AND STRONGER PRODUCTS • FASTER • AT LESS COST

Another advantage of Rolled Steel Design . .

YOU PICK YOUR STEEL

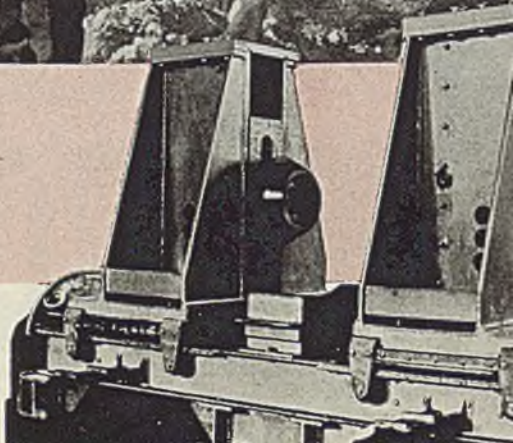


Stainless Steel (18-8 Stabil- is often the best choice for ed chemical machinery like power agitated autoclave, be- it will last indefinitely and not contaminate most corro- products. This special modi- on of USS Stainless Steel can t, fabricated and welded with ss in its corrosion-resistance.

onstruction like this concrete ng drum USS Abrasion-Re- g Steel withstands the con- pound and grind, reduces age, ensures long life. A lt unit to build unless you rolled steel and welded con- tion.

30 CUBIC YARDS AT ONE GULP! *USS* MAN-TEN *all welded rolled steel construction gives this heavy duty dipper the strength and abrasion resistance to keep it on the job in this grueling service. The thousands of pounds of weight* MAN-TEN *construction saves can be converted into increased dipper capacity making it possible for the shovel to do more work with no increase in power.*

(Right) *Welded Rolled Steel and steel castings are combined in this cone-type uncoiler for tin plate mill to realize the most efficient and economical construction. Correct design and the proper selection of materials make this unit strong, rigid, free from vibration, eminently practical from every point of view.*



(Left) *USS* MAN-TEN *rolled steel construction gives this trolley the safety that crane equipment demands. With tensile strength of 85,000 lb. per. sq. in. min. and yield point of 55,000 lb. per. sq. in. min.* MAN-TEN *permits weight reduction far below conventional con-*

TO FIT YOUR JOB

from an amazing variety of "staple" and "special" steels

ROLLED steel design—the technique of building up heavy machine beds, frames, supports, housings, wheels, drums, etc. by welding together component parts of rolled steel cut-to-shape—offers many important advantages:—

Rolled steel is highly uniform; it reduces the possibility of failure in service due to blow holes, segregation and non-uniform structure.

Rolled steel's physical properties are readily determined from the actual section being used and the properties are very uniform throughout the metal.

Rolled steel is free from brittleness, possesses excellent fatigue properties.

Rolled steel design eliminates the costly pattern problem, the shrinkage problem, and the necessity of adapting designs for pattern draw and metal flow.

Rolled steel design trims off all parasite poundage, all metal not actually needed to carry stresses or provide rigidity. It often reduces dead weight by half and more.

Rolled steel design looks modern and is modern, eliminates useless ornamentation, employs straight lines and plane surfaces. It increases eye appeal and saleability.

Rolled steel permits machine design to be mobile and liquid; makes possible the quick incorporation of style changes, model changes and new improvements without costly pattern write-offs.

In general, rolled steel design (economically combined with castings at strategic points) is the cheapest, strongest, safest, most attractive method of machine construction.

IN ADDITION—and this is perhaps its most important advantage—*rolled steel design enables you to make use of a great variety of special shapes and special steels.*

Various products such as billets, slabs, bars, pipe, tubing, forgings, rolled sections, etc. simplify the cost and difficulties of fabrication.

Special steels provide special properties where you need them to overcome various destructive forces. Higher hardening steels to carry heavier bearing pressures. Fatigue-resisting steels. Heat-resisting steels. Abrasion-resisting steels. High tensile steels for high unit stresses. Stainless steels for corrosion resistance. A special steel with special properties for virtually every special need.

To machine designers, fabricators, foundries, and welderies . . . we offer the widest range of special steels. Grade for grade, they are the finest steels it is now possible to make.

SPECIAL STEE WITH SPECIA PROPERTIES

to overcome destructive forc

Here is just a sample of the va of special steels we offer—sp steels to make your designs stro or harder or abrasion-resistant hent-resistant or fatigue-resistan corrosion-resistant or whatever- need.

USS High Tensile Steels
- USS COR-TEN
- USS MAN-TEN
- USS SIL-TEN

USS Steel for Low Temperature Service
USS Abrasion-Resisting St
USS 11/14% Manganese S
USS Stainless Steels
USS Carilloy Alloy Steels

OPPORTUNITY

Perhaps the greatest opportunity to improve present heavy machinery lies in the skillful combination of rolled steel and castings . . . and the specification, for each rolled steel part, of the precise steel most suitable to overcome the destructive forces to which that part will be subject in service.

For example, it will often be advantageous to combine in one unit a section of USS A-R Steel to resist abrasion at a certain point, with USS High Tensile Steels to provide strength and save weight, and with a grade of USS Carilloy to carry heavy bearing stresses.

CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
COLUMBIA STEEL COMPANY, *San Francisco*
TENNESSEE COAL, IRON and RAILROAD COMPANY, *Birmingham*
United States Steel Products Company, New York, *Export Distributors*

USS

UNITED STATES STEEL

POWER DRIVES

Obtaining Co-operation of Maintenance Departments

■ NO PRODUCTION enterprise can operate smoothly and with a minimum of interruptions without the whole-hearted co-operation of the maintenance department, the foremen and others in charge of production.

How to obtain continued co-operation depends to a large extent upon the personality of the head of the maintenance department, the individuals under him and the attitude and interest of the management.

Peculiarly, some managers encourage argument and ill-feeling between various departments. However, such a situation usually necessitates spending many hours in hearing both sides and a compromise in favor of one side one time and the other the next. Such lack of harmony seldom gets the results that could be obtained by all working for a common aim.

As the maintenance department must contact the men in all departments with various types of personalities, the possession of good mixing, personal characteristics is necessary. The men in the force must be fair but firm and must have a real interest in the equipment they service. The head of the maintenance department should insist that he alone should do all arguing.

One of the main causes of differences between the maintenance force and the foreman lies in the costs assessed for the different items of work performed. When the foreman receives a lump sum charge at the end of the month he feels that it is exorbitant. Usually only a few items of work can be remembered offhand; the majority of the items generally have been forgotten.

One of the most satisfactory methods of preventing such disagreements is to supply a monthly itemized list of all maintenance work performed in each department to the foreman in charge, together with materials and labor costs on each item. This puts the foreman on the defensive, as he must then justify the necessity for the work. He also realizes that the best way to reduce this charge is to do all he can by supervision of operators and equipment to remove all possible causes within his control.

By checking over the items of cost he will become more interested in backing up the maintenance head on the desirability of changing parts of the equipment that frequently cause trouble. The maintenance head knows that equipment requiring excessive maintenance should be replaced but, as the expense is against the production department, the foreman may object.

To see the number and cost of interruptions for servicing and know that each interruption means so many minutes lost time is a very convincing argument for approval of the appropriation for the change, not only to the foreman but also to the management. When both work together for an appropriation, the management is more likely to approve than if one objects.

Usually, where work is not of an emergency nature, as shifts or additions of equipment, rebuilding, or other changes, the maintenance department is required to provide an estimate of the cost for the foreman's approval before going ahead with the work. With this estimate as a basis, the foreman and maintenance head can go over the proposal and in many cases make changes that will simplify the work and reduce the cost.

Such proposals, if the estimated costs are exceeded, call for an explanation. However, savings on one piece of work are permitted to balance extra costs on another. In one plant the totals of actual and estimated costs in a year were within $100 of each other on many thousand dollars' worth of work.

Needless to say, where the foremen can see the cost, what has been done and have an opportunity to discuss and approve the more expensive items, there is much more harmony in the plant. In such cases the foremen soon learn to ask for suggestions that will reduce their cost. Also, they are much more willing to listen to explanations of the causes of trouble, which, under other conditions, they would resent as an effort to place the blame on them.

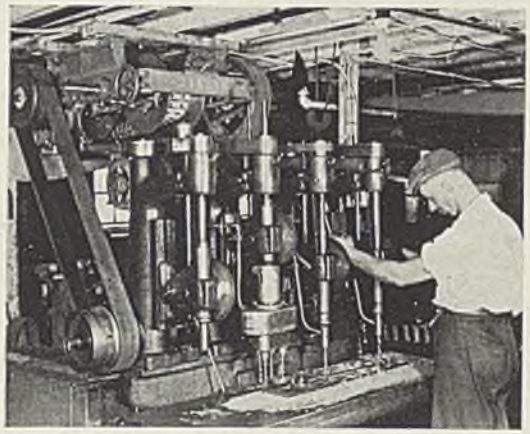
In a number of plants, the plant engineer in charge of all maintenance work has been placed in charge of the factory as superintendent, or, in one case, as assistant to the vice president in charge of manufacturing. This was largely because of their ability to work harmoniously with the different department executives and staffs and their wide knowledge of the work, as obtained through study of individual problems in co-operation with the foremen.

Selective Drill Speeds

■ A wide range of work necessitated changes in drill speeds on a multiple press. This involved stopping the press, removing the belt and reversing the spindle drive pulleys. And all this only gave two speeds.

To change pulleys required several minutes and then gave only a high and low speed instead of the best speed for each size drill.

A variable speed transmission unit was installed to drive the jackshaft which in turn operated the spindles.



Using a variable speed transmission unit on this multiple - spindle drill press quickly gives proper speed for any drill size. Photo courtesy Reeves Pulley Co., Columbus, Ind.

Now it is possible to obtain any speed desired easily and quickly by simply turning the handwheel on the variable speed transmission unit. Since proper speeds for any particular drilling operation are now obtainable so easily, the operator is more likely to adjust the speed to suit the drill size than if belts and pulleys had to be shifted. Also, using the proper speed for each drill size results in greater output, longer drill life and less frequent sharpening. The foreman estimates that 60 per cent of the time formerly spent in changing speeds is now saved.

Brake Inspection and Adjustment Is Important

■ Where inspection and adjustment of brakes on cranes or other equipment is left to the operator they are likely to be adjusted too tightly.

This throws an excessive strain on the motor, gears and shafting, as well as increasing the wear on the brake lining. Usually it is better to place this responsibility in the hands of the electrician who inspects the motor. With the increasing application of brakes to machine tools and manufacturing operations in the hands of workers who are not familiar with the adjustments, the need of expert attention is increased.

The frequency of inspection is determined by the accuracy of motion control required and the possibility of damage or danger to equipment or operators if the brakes do not hold properly. The operator, of course, should be held responsible for reporting immediately any indications of trouble, either in the holding or release of the brakes.

Placing full responsibility for adjustment on one man or one department provides not only greater experience but also prevents changing the adjustment to meet the whims of the operator after it has been made by the inspector. Shop tinkering by operators is a frequent cause of improper operation and trouble in all types of equipment. Brakes, where used in equipment, are as important as in an automobile and should receive as reliable servicing.

In adjusting electrically-operated brakes, the amount of air gap in the magnet is important, as the amount of pull depends upon this distance. Also, in solenoid-operated brakes, adjustment for wear alone may change the position of the core of the solenoid so that it is not located properly for the pull. These points are better understood by the electrician than by the operator.

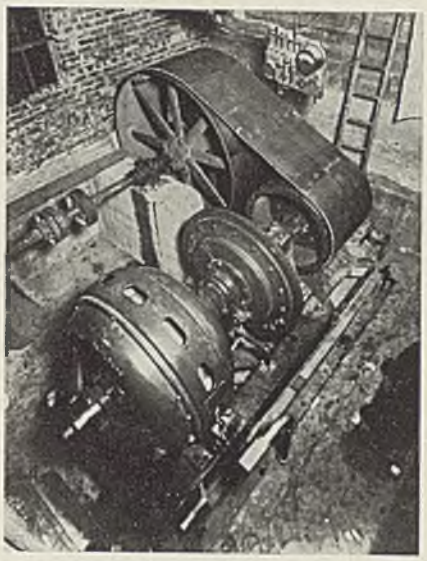
Largest Pivoted Base Is of Welded Steel

■ Accompanying illustrations show before and after installation views of what is said to be the largest pivoted motor base ever built. It is of welded steel construction and is used to mount a bedplate which carries a 375-horsepower synchronous motor and pulley on outboard bearings.

The pivoted base is 66 x 154 inches and weighs approximately 5000 pounds. It supports the motor, bedplate and outboard bearings, a total weight of 14,300 pounds. The installation is in a pit and replaces an engine drive in a mill.

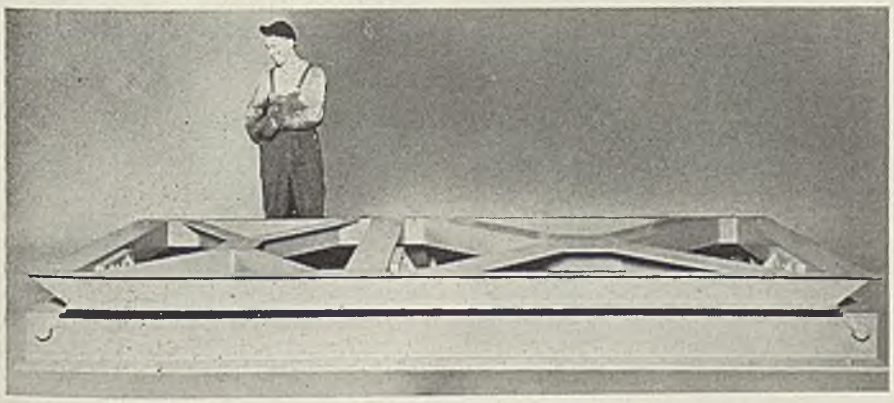
Uses Magnetic Coupling

Synchronous motor operates at 450 revolutions per minute and uses a magnetic coupling to pick up the load after starting. The motor pulley is 40 inches in diameter with a 36-inch face and the driven pulley is 80 inches in diameter with face of 36 inches. Shafts are on 72-inch centers. The belt is of 3-ply leather and is 34 inches in width.



The 350-horsepower synchronous motor, bedplate, 40 x 36-inch pulley and outboard bearings are pit mounted on the pivoted base Photo courtesy Rockwood Mfg. Co., Indianapolis

Base pivots on a 3-inch shaft which is supported in three bearings. The two bolt heads, shown one at each end of the base, are the adjusting screws for maintaining alignment and belt tension. They provide an adjustment which accommodates considerable belt stretch. They are adjusted by turning alternately until the motor is level in the running position.



This large pivoted motor base weighs 5000 pounds and measures 66 x 155 inches. Photo courtesy Rockwood Mfg. Co., Indianapolis

CARBURIZING—

Its History—Selection of Steels and Type of Case—A New Hardenability Test—Materials and Equipment—Production Practice

PART III

■ VARIOUS types of solid carburizing compounds and the materials of which they are composed were discussed by S. L. Widrig, metallurgist, Spicer Mfg. Co., Toledo, O. Compounds consist of three principal constituents—charcoal, binder and energizer. In a good compound each constituent is selected carefully to serve its specific purpose in the most economical manner. Importance of good adhesion of the energizing agent to the base charcoal was emphasized. Proper proportion of energizer to charcoal must be maintained if good results are to be attained. Mr. Widrig pointed out that poorly designed conveying systems and excess screening or dusting result in high energizer loss, and energizer lost in handling must be replaced by additions of new compound in order to maintain a proper balance. Parts to be box quenched are carburized most economically in certain types of compound which are slow burning when exposed to air at elevated temperatures.

L. E. Webb, Frost Gear & Forge division of Clark Equipment Co., Jackson, Mich., described a compound now in use at his plant. Base materials are properly sized pure coal tar carbon and corn cob charcoal. The coal tar carbon is one of the purest forms of commercial carbon and has a fixed carbon content of about 95-98 per cent, with ash content of about 1 per cent. In its manufacture the base carbons are energized with the usual activators, the activated particles then being coated with a shell of pure carbon and then calcined at steel treating temperatures. This shell or coating prevents the loss of the energizing material and also adds considerably to the mechanical strength of each pellet or particle. Thus, dusting loss is low, shrinkage is low and economy is high.

Considerable improvement in methods of handling carburizers in production has been accomplished due to the increase of box quenched carburizing, according to H. E. Martin, E. F. Houghton & Co., Detroit. He cited one installation where equipment has been added to cool the compound after dumping from the boxes. After cooling it is conveyed pneumatically to a dust collector where the fines are removed and compound of the proper mesh falls into a used material hopper. By means of a screw conveyor at the bottom of this hopper and in a companion hopper carrying the new compound the speed of the screws determines the mixture of old and new compound delivered to the loading deck.

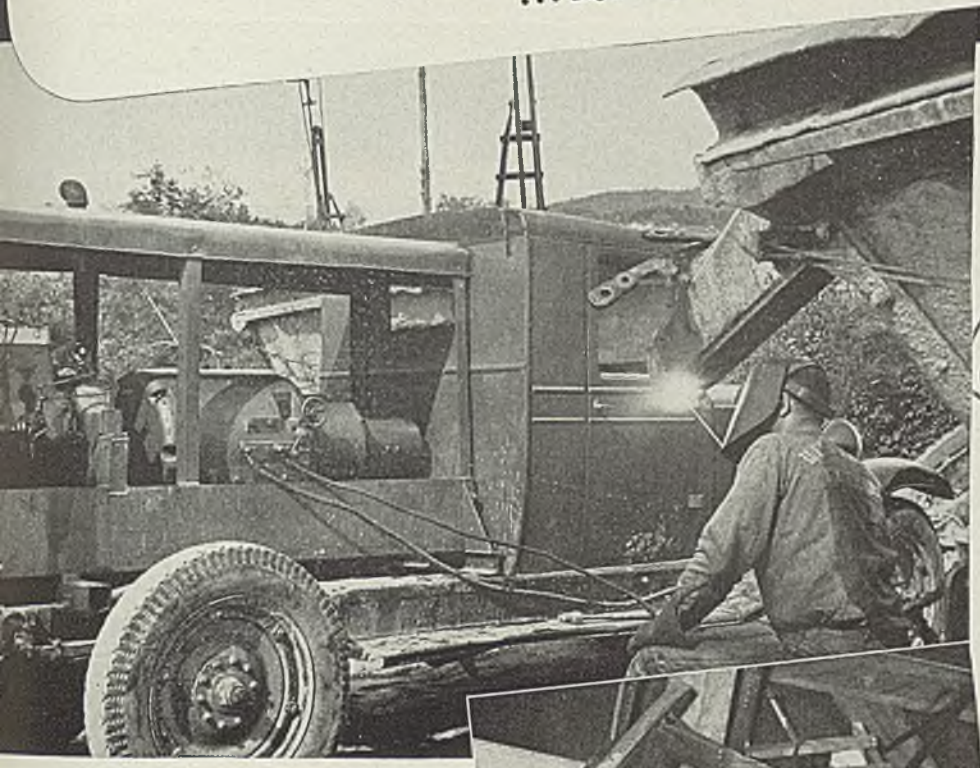
On the accompanying pages STEEL presents the third and concluding part of its review of the comprehensive carburizing symposium conducted during the nineteenth annual convention of the American Society for Metals in Atlantic City, N. J., Oct. 18-22. Part I appeared in STEEL for Nov. 15, page 48; Part II on page 36 of STEEL for Nov. 29

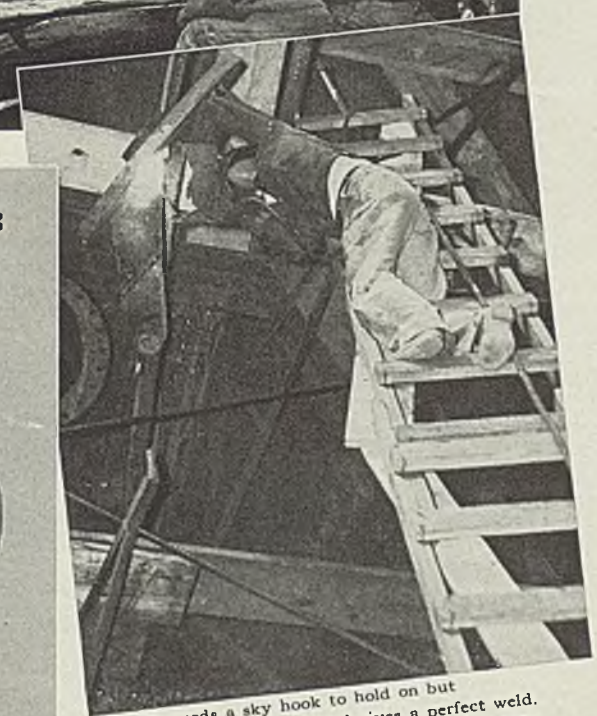
Fine grained carburized case (left) compared with coarse grained case (right). From McMullan paper

■ Turning to the matter of what steels to use in the carburizing process, O. W. McMullan, Youngstown Sheet & Tube Co., Youngstown, O., listed four general requirements of carburizing steels: (1) Ability to absorb carbon at the usual carburizing temperature at a reasonable rate, uniformly and to a sufficiently high carbon content; (2) ability to harden satisfactorily in a quenching medium suitable

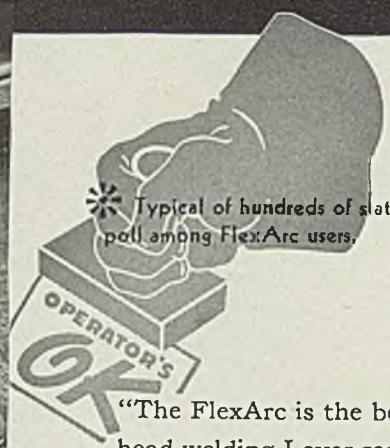
"THE FLEXARC IS BEST FOR OVERHEAD"

... says Siegfried Runge, Cambridge, Mass.





He needs a sky hook to hold on but
The metal flows up and gives a perfect weld.



Typical of hundreds of statements from nati
poll among FlexArc users.

"The FlexArc is the best machine fo
head welding I ever ran across," say
ator Runge. "With it I get bette
and more feet per hour. In my opi
is as good a machine as any shop
can ask for."

For overhead or downhand welding
type FlexArc owners and operator
whelmingly endorse the steady ar
plicity of control and ease of op
made possible by FlexArc's revolut
new generator and Single Dial C
The FlexArc is the only welding m
that does not require all the nuisan
gets—reactor, exciter, rheostat, amm
voltmeters—all causes of trouble
job.

What FlexArc has done for others it
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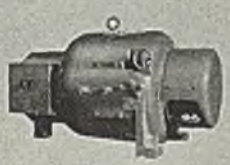
write your FlexArc Distributor tod
ask him to put a new FlexArc in you
for a thorough tryout on your ow
You'll quickly see why the new Fle
today's best welding buy!

A FLEXARC FOR EVERY JOB

Portable Motor Generator



Stationary Motor Generator

Generator Only

Engine Driven

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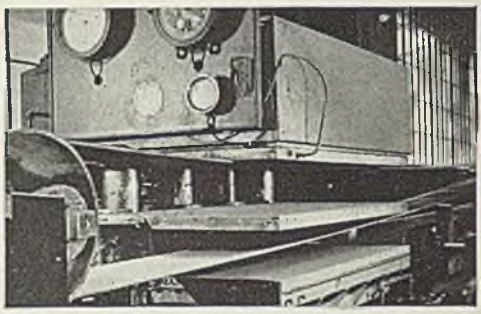
When you're belting a tough



CONTROLLED... Devices illustrated are on one end of the endless belt press at Passaic Factory – making U. S. Endless Royal Cord Belts.

In order to assure uniformity in U. S. Rubber Products these devices are installed throughout to positively regulate temperature and time during vulcanization.

In addition, the performance of the automatic controls is checked by recording thermometers.

When one realizes that over 2,000 vulcanizations are checked daily it is apparent what an important part these devices play in producing uniform U. S. Rubber Belts.

COPPER MILL COMPRESSOR DRIVE: This difficult, short center drive—now equipped with a U. S. Royal Cord Transmission Belt—

drive call on U·S·RUBBE

U. S. Rubber Transmission Belts Give Service Beyond Price and Specifications

What is the best way to buy a belt? By Price? By Specifications?...*Specifications* are important: whether duck or cord, flexibility, quality of friction, number of plies, must be known in relation to specific horsepower, load, speed, tension, and size of pulleys. *Price* is important, for you want the most belt service for the least money.

But the *best* way to judge belt value is by *performance*... performance that goes *beyond* price and specifications! The performance value of U. S. Rubber Transmission Belts is not built only upon specifications, it is not written solely in terms of price. U. S. Rubber Transmission Belts give Service Beyond Price and Specifications because every belt has built into it *extra* capacity for hard work and long useful life.

When you're belting a tough drive—call on U. S. Rubber.

UNITED STATES RUBBER COMPANY
US
TRADE MARK

IDEA BOOK FREE! Get your copy of the valuable new U. S. Transmission Belt Album. Numerous "on the spot" photographs show U. S. Transmission Belts operating tough drives in many different industries. Shows, also, U. S. Belts in the making. Write for it today.

United States Rubber Company

United States Rubber Products, Inc., New York, N. Y.

for the article quenched and without undue distortion; (3) reasonable strength and toughness after carburizing and hardening; and (4) satisfactory machinability for the machining process used.

Steels used generally for carburizing include S.A.E. 1010, 1015, X1015, 1020, X1020, 1025, 1112, 1115, 1120, X1314, X1315, 2015 2115, 2315, 2320, 2515, 3115, 3120, 3215, 3220, 3312, 3415, 4615, 4620, 4815, 4820, 6115 and 6120.

Grain size affects the machinability, suitability of heat treatments, distortion during hardening, and physical properties of steels. Coarse-grained steels machine more easily and harden more deeply. Probably largely because of being deeper hardening they distort more during quenching. They are not suitable for direct quenching or for single low reheating below the Ac_3 point of the core if a high degree of toughness is desirable. Double treatment greatly improves the toughness. Particularly if the case contains coarse cementite envelopes, a single low reheat for quenching will leave a brittle case which may spall or chip in the corners under shock loads in service. Such a case is more susceptible to grinding checks also.

Treating Fine-Grained Steel

Because fine-grained steels do not coarsen at the carburizing temperature, they give tough products when direct quenched or single treated at temperatures that do not affect the core grain size. They are shallower hardening and distort less. The case also does not harden as readily as in coarse grained steels, and with plain carbon steels, especially if there is considerable tendency toward abnormality, soft spots may occur. Low hardenability may be found in large sections of low-alloy steels also. Fine-grained steels do not machine as readily but the difference can be mostly eliminated by normalizing at temperatures high enough to make them coarse-grained.

To summarize: Carbon steels require water or other drastic cooling media to produce maximum case hardness; the core of larger sections will not quench to a uniform structure and soft spots may occur in the case; abnormality even in small sections causes soft spots in the case; the water hardening required produces distortion in thin sections and intricate shapes; carbon steels are not as strong and are more brittle than most alloy steels. Steels X1015 and X1020 have a higher manganese range and are used for larger sections or wherever their higher hardenability is required. Small parts are sometimes oil-quenched if case hardness requirements are not too high. The higher manganese also improves machinability in soft low carbon steels.

Uses of Manganese

Sulphur may be added purposely to increase machinability in which case manganese must be on the high side. Steel made by the bessemer process is apt to be abnormal and have soft spots in the hardened case but may be suitable for some applications. Carbon steel in grades suitable for the application are used for all purposes where the superior or special properties of alloy steels are not required.

Manganese steels tend to be coarse-grained and brittle but this difficulty can be mostly overcome by making the steel fine-grained by the ladle practice. Manganese lowers the critical points, making it possible to use lower quenching temperatures with the attending advantages. These steels, like all the other alloy carburizing steels except those of medium carbon content, may be water quenched but, unless the manganese content is too low or the section too large, may be oil-quenched also, lessening distortion as already mentioned.

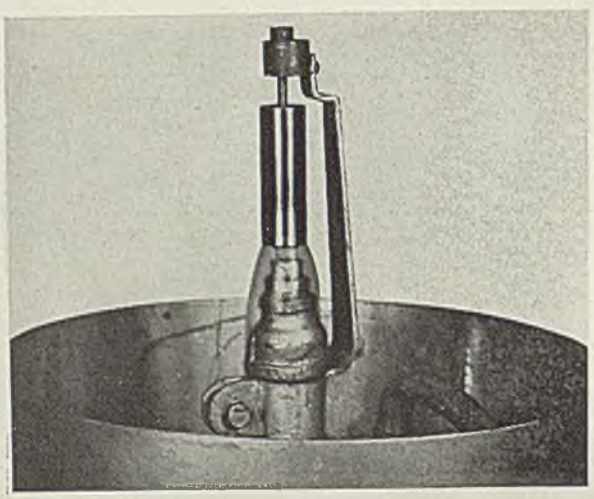
An advantage of managese not obtainable from other alloying elements is its use in high-sulphur free-machining steels where its presence is necessary to prevent red shortness while the steel is being hot worked. While all the manganese present may not be necessary for this purpose, better hot working properties are obtained than when manganese is low and better machinability may be obtained with low carbon contents. While it seems reasonable that other alloying elements might be added to the high-sulphur steels, this is not being done. Sufficient manganese must be present anyway to overcome red shortness and it simplifies the composition to get the additional hardenability required by adding more manganese rather than other alloying elements.

Nickel imparts toughness and strength to steel. It lowers the critical range and hardening temperatures required with consequent reduction in scaling, decarburization and distortion. Nickel helps to retain austenite on cooling and with high nickel, such as in S.A.E. 2515, a high percentage of austenite will form in the outer layers of the case if quenching temperatures are high. Austenite is plastic and objectional flowing may take place under high loads. It is difficult to maintain file hardness in high-nickel steels as the amount of austenite increases. The use of low quenching temperatures will remove this difficulty. If high quenching temperatures are necessary, the amount of austenite can be reduced by keeping the maximum carbon content of the case lower. The case on nickel steels softens at low draw temperatures.

Obtaining Hard Case

For maximum case hardness the drawing temperature should be 275 degrees Fahr, or less for 5 per cent nickel steels. The effect of nickel on critical temperatures and physical properties increases with the amount, S.A.E. 2015 for example being comparatively less different from carbon steel than the tough, strong S.A.E. 2515 which is suitable for heavy-duty parts.

Chromium in carburizing steels increases the strength and hardness of the core when quenched and produces hard wear-resistant cases. Normally these steels are coarse-grained, rather brittle, and sensitive to small changes in hardening temperature. As with manganese steels, these objections can be overcome by the addition of elements which will produce a fine grain. Chromium steels are not used extensively for carburizing and their failure to become established perhaps dates back to the days of lack of grain size control,



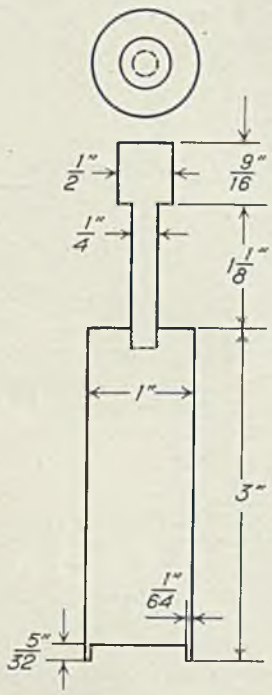
Test piece and adapter hung on fixture so that water can be sprayed on the bottom face. Paper of Jominy and Boegehold

their coarseness and brittleness.

Because of their low cost and with the grain size control now possible greater consideration for the use of chromium steels would appear to be justified. The intention is not to infer, however, that either the chromium or manganese steels can be made equivalent in toughness to fine-grained nickel steel, for example, but rather that there is much less difference among the steels if fine-grained than there would be if all were made without any attempt at grain size control. The greatest present use of chromium case hardened steels is in the medium carbon range, light cased for such purposes as automotive transmission gears.

The addition of both nickel and chromium to carburizing steels gives one of the most useful combinations suitable for almost any application as both elements may be varied over a rather wide range. Nickel adds toughness lacking in the straight chromium steels and chromium adds hardness and wear resistance not given by nickel. Both add to the hardenability and strength of the core making the higher alloy contents suitable for large sections or highly stressed parts. Machining becomes rather difficult when the alloy content is high.

The nickel-molybdenum steels also represent a good combination of elements as molybdenum is a carbide former and adds wear resistance. The 4600 series, when fine-grained, appears especially well suited for direct quenching. Cases



Quench test specimen adopted for use in new hardenability test. Paper of Jominy and Boegehold

with high carbon and direct quenched contain considerable austenite but file hardness can be obtained readily and the amount of distortion is small. The 4600 series has become popular for automotive differential and transmission gears. The higher nickel steels, S.A.E. 4815 and 4820, are being used for heavy-duty gears. Molybdenum raises the temperature at which the hardened case starts to lose hardness. This is an advantage in parts which become heated in service.

The chromium-vanadium steels bring together desirable characteristics also in that vanadium makes the steel fine-grained, overcoming the brittleness of straight chromium steels, and the hardenability from chromium offsets weakness from shallow hardening imparted by small amounts of vanadium. Vanadium raises the critical temperatures which results in greater scaling, decarburization and distortion at the higher heat treating temperatures necessary. On the other hand these steels appear well suited for reheating in cyanide which eliminates scale and decarburization and at the same time the steel is free from a soft skin sometimes found on other carburized steels after quenching from cyanide.

Chromium-molybdenum steels of low carbon content are not used for carburizing. It is quite probable this is a result of an experience in the early days of their development. Case hardened parts made from them proved to be brittle and failed in service. This occurred before the time of grain size inspection and the steels probably were coarse-grained. Whether this brittleness can be overcome by modern steelmaking practices apparently has not yet been fully determined. Much experimental work is now being done upon them and the near future will probably again see their use in production parts.

■ Troubles caused by decarburization in furnace atmospheres were investigated by John A. Webber, production manager, Interstate Drop Forge Co., Milwaukee, who reviewed past investigations on the effect of the various gases present in the products of combustion of fuel-fired furnaces and some of the methods being used to overcome decarburization.

Mr. Webber concluded that decarburization is more rapid at the ordinary hardening temperatures when gas furnaces are operated on the reducing side, this probably being due to the presence of moist hydrogen. It cannot be due entirely to the protection of the scale formed in the oxidizing atmosphere because the depth of decarburization in the reducing atmosphere is deeper than the thickness of the scale formed in the oxidizing atmosphere.

Most methods of preventing the formation of scale increase rather than decrease decarburization.

There is a definite mixture of CO and CO_2, and CH_4 and H_2 in equilibrium with the carbon content of steel at each temperature in the heat treating range and above.

Charcoal decarburizes steel at 1450 degrees Fahr. and the presence of moisture increases the loss of carbon at the surface.

■ Details of a new hardenability test for carburizing steels were presented by W. E. Jominy and A. L. Boegehold, metallurgical department, research laboratories, General Motors Corp., Detroit. The test permits the grading of carburizing steels of various compositions and grain sizes according to their relative hardenability.

The well-known McQuaid-Ehn test gives a fair idea of what hardness characteristics may be expected when steels of like composition but different grain sizes are compared, but it provides no means of comparing steels in which the composition is varied. Furthermore, steels within the usual specifications for grain size and composition may vary considerably in hardness characteristics so that there is a definite need for a direct means of measuring this property of steel.

A number of schemes for measuring the deep hardening characteristics of carburized steels were tried before a satisfactory method was found. These included wedge-shaped specimens, disks, cylinders inserted in a large disk, and others, but each was discarded as impractical or inaccurate. A type of test bar which finally was found satisfactory is shown in the accompanying sketch. The test bar proper, that is the bar 3 inches long and 1 inch in diameter, is made of the steel to be tested. An adapter which is shown screwed into the test bar can be made of any convenient steel and re-used several times. The test piece with adapter screwed in place is then carburized 8 hours at 1700 degrees Fahr., removed from the carburizing box and hung on a fixture so that water is sprayed on the bottom face as shown in the accompanying illustration. The cup shape of the bottom face deflects the water down and cooling on this face only is accomplished.

When the sample is cooled it is removed from the fixture, polished with emery paper and the hardness measured at various points on the surface from the water-cooled end

(*Please turn to Page* 81)

NEW EQUIPMENT

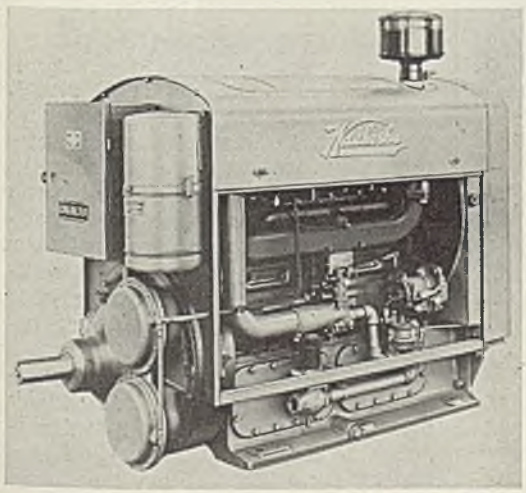
Gas Engine Eliminates Usual Manual Operations

■ Waukesha Motor Co., Waukesha, Wis., is manufacturing an automatically-controlled gas engine on which the usual manual operations required for starting, stopping, controlling speed or applying load are eliminated.

Even the clutch is automatic, and it disengages if an overload pulls down the engine speed, and re-engages after speed picks up. Unit is a heavy-duty, high compression, Waukesha 4 or 6-cylinder gas engine with conventional mounting, radiator, fan, sheet steel enclosure centrifugal built-in governor and gas carburetor.

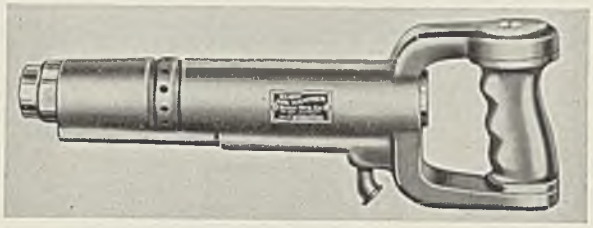
Clutch and power take-off, however, have a special vacuum operating mechanism that permits the engine to start and attain full speed governed before the load is applied. Besides automatic clutch, there is an electric control assembly in the steel cabinet on rear of the unit house, in which are housed master switch, three safety switches to stop engine in case oil or water supply fail or to limit length of the cranking operation in case fuel fails, and a time-cycle switch that starts and stops the unit at preselected intervals.

Gages show oil pressure, manifold vacuum and charging current from the generator. Units may be controlled by gas, air or fluid pressure, by fluid level, temperature low or high voltage relays or manually. They burn artificial or natural gas, butane or propane and are furnished in a wide range of sizes.



Master switch, three safety switches and a time-cycle switch are mounted in steel cabinet at rear of this automatically - controlled gas engine

This model D pneumatic triggerless hammer is capable of delivering 2950 blows per minute under 100 pounds pressure



Pneumatic Hammer Is Equipped with Holder

■ Borm Mfg. Co., Elgin, Ill., has placed on the market a new Elgin triggerless pneumatic hammer, which is operated by pushing the hammer against the work. An added feature of the hammer is a tool holder which locks the tools in position, eliminating the necessity of holding the tools while working with the hammer.

Standard hexagon tool shanks are machined around their circumference to provide a ring groove a short distance from their ends. Retaining balls in hammer sleeve engage this groove. The sleeve itself is backed up by a spring which presses it toward the nose of the hammer and permits a valve-lifting ball to ride in a sleeve recess where it is inoperative with respect to a valve-lifting push rod. When the hammer is pressed forward with the end of the tool against a resisting surface, the tool and sleeve move inward against the action of the spring, causing the ball to raise the push rod and open the valve.

Hammer comes in three models, B, C and D. The first is suitable for general purpose applications and will handle star drills up to 1 inch in diameter. It also is suitable for light chipping and scaling. Model C handles 1¼ inch star drill and model D takes a 1¾ inch drill. Weight of the hammer is about 13½ pounds.

Conveyor Belt Uses Heavy-Duty Cords

■ B. F. Goodrich Co., Akron, O., has introduced a new conveyor belt of cord construction which, it is claimed, gives longer wear, more resistance to moisture and acid penetration, transverse and longitudinal flexibility and more freedom of motion.

Instead of plies of woven fabric, plies of weftless cords such as in heavy-duty truck tires are used. Having no transverse or filler threads obstructing their freedom of movement, the cords are free to distort themselves, thus supplementing the cushioning qualities of the cover to a degree where the belt resists impact, cutting and gouging. Longitudinal flexibility permits the

belt to flex easily over all pulleys without setting up stresses that may cause ply separation.

Resistance to moisture and acid penetration is accomplished by impregnation of the carcass with rubber. Each individual cord is surrounded by a layer of rubber. Should a gouge or cut penetrate the carcass of the belt, there would be only one or two chords involved since the plies are made of parallel chords running lengthwise. The moisture can penetrate no farther because of the absence of wicking action as in the woven fabric. Belts may be obtained in any length, width or number of plies.

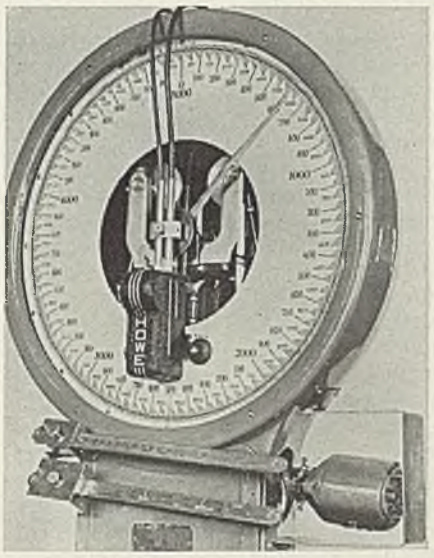
Cut-Off Attachment Is Made for Dial Scales

■ Howe Scale Co., Rutland, Vt., is manufacturing a highly-sensitive, electric, cut-off attachment that can be used with any dial scale and can be adjusted to open or shut hoppers, batching equipment, control valves and other units connected with the operation of weighing materials.

Unit utilizes the reflection of a frictionless beam of light. With it any make of dial scale can be converted quickly for automatic weighing and filling operations. Alterations, adjustments or changes to the scale are said to be unnecessary, dial scale mechanism in no way being interfered with.

Action is positive and high sensitivity to minute movements of the dial pointer claimed. Attachment is adjustable over full 360 degrees of the scale. Several units may be used on the same dial to obtain combinations and sequence of control. A No. 1 unit may be set for dribble; No. 2 unit set for complete cut-off. Materials handling or delivery conveyors may be controlled by weighing operation.

An optical unit contains the electric eye, a small incandescent lamp that shines constantly on the photocell, and interception of which provides the cut-off. The optical unit is mounted on the dial by three suction cups. Relay unit is usually mounted



Optical unit of Howe cut-off attachment fastens to dial by means of three suction cups

on the rear of the scale. Pilot lights on top of relay unit indicate when relay contacts are open or closed.

Units operate on 110-volt, 50 to 60-cycle, alternating-current and take approximately 40 watts.

Oil Burners Automatic

■ Hauck Mfg. Co., 126 Tenth street, Brooklyn, N. Y., is manufacturing proportional oil burners which automatically proportion and maintain correct, straight line, air-oil ratio from minimum to maximum capacity, giving temperature control over a wide operating range and producing controlled furnace atmosphere with carbon dioxide readings between 13 and 15 per cent.

Air and oil supply is automatically controlled and maintained by moving a lever, which simultaneously adjust the primary and secondary air orifices. Very low flame

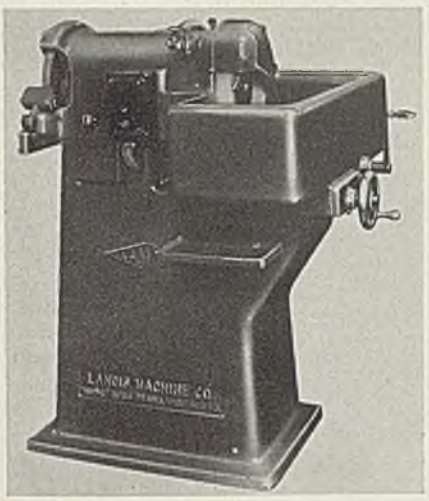
turndown can be obtained. Since air is controlled by burner nozzle orifices, maximum atomizing air pressures and constant air velocity are maintained at the point of oil atomization. Reduced air pressure is eliminated at point of oil atomization when burner is turned down, it is claimed.

A battery of burners may be operated from one control motor with each burner being its own individual air-oil mixer, not affecting the other proportioning burners in the group.

Three Models in New Line of Chaser Grinders

■ Landis Machine Co., Waynesboro, Pa., has announced a new line of chaser grinders consisting of three models that cover the entire range of sizes of Landis chasers.

The new grinders are all motorized, the grinding wheels being



All new Landis chaser grinders are motorized, and grinding wheels mounted directly on armature shaft

mounted directly on the armature shaft of the motor, eliminating gear or chain drives. Two grinding wheels, one cup and one straight, are supplied as standard equipment. Straight wheel is used for grinding the rake angles of Landis bolt chasers wherever leadscrew is not used. A rest that is adjustable to any angle is provided to facilitate this operation. The straight wheel may also be used for miscellaneous grinding.

Cup wheel is used for grinding the lead and rake angles of all pipe chasers and bolt chasers when the thread is to be cut with the use of a leadscrew. Motors are of ball-bearing, continuous-duty type. A ball thrust bearing on the armature shaft assumes the thrust load of grinding chasers on the face of the cup wheel.

The model O machine is a small unit designed for grinding Landis chasers for the smaller sizes of Landis die heads. No. 1 model is a heavier duty machine for grinding all chasers up to 1⅞-inch wide. No. 1½ model is an extra heavy-duty machine designed for grinding the largest chasers under the most severe production conditions.

Grinds Heavy Work

■ James Clark Electric Co., Louisville, Ky., has announced a 5-horse-power grinder with narrow type base for floor mounting, which is designed for heavy production work.

Motor is totally enclosed with the roter shaft mounted in heavy-duty, precision type, ball bearings, grease lubricated. Grit and dirt is prevented from entering the motor by overall housings.

Standard equipment includes an adjustable hood for wheel and the latest type safety switch designed to give complete protection against overload and under-voltage. Grinder is easily accessible by operator and at the same time provides safe operation.

Controlled Ingot Heating

(*Concluded from Page 48*)

patented type. Fig. 9 shows a sectional view. They are encased in steel plates and heavily braced with buckstays. All walls are of appreciable thickness and are completely insulated.

The recuperator can be likened in principle to a vertical fire tube boiler, except that waste gases are passed vertically downward while air is moved in alternate directions horizontally from bottom to top of the assembled structures. This change from the conventional horizontal pass type is of recent origin.

The recuperator is a series of vertically extending, octagonal, tubular members; each column forming a separate passageway for waste gases; adjacent columns are staggered to provide tortuous passageways for the air to insure maximum wiping or turbulent action during the movement of the air through the assembly. The structure is not tied into the enclosing walls, and as each pit has a series of cells with separate outlets and controls, a cell in an emergency may be replaced or repaired while the pit is in operation. The first recuperators of this type on pit furnaces continue to show normal service after a series of floods and 20 months of otherwise continuous operation.

All joints in the recuperators are horizontal and sealed by the weight of the structure. A first-class air hardening fire cement is used for setting all tile.

Recuperators of this type are made of materials or by processes which produce properties of low porosity and high conductivity. This also reduces the modulus of rupture in service. These recuperators may be obtained in die cast clay, silicon carbide, and electrocast mullite. The life of tile in recuperators is increased by selection of materials adapted for the work to be done, and is further extended by correct design in such matters as tile thickness and control of initial and final temperature differentials.

Combustion air is positively supplied to the pit through the recuperators by a low-pressure fan piped to the cold end of the recuperator. A noticeable difference in initial pickup is thus developed, especially when heating cold steel.

Insures Uniform Heating

The simultaneous entry of the waste gases into all of the flues, and their equal distribution by a distributing chamber, minimizes the initial shock of the waste-gas flow by the immediate relative cooling effect of all the air being preheated. The spacing of the hollow tile flue units insures uniform heating and counter-cooling, thereby avoiding unequal heating and preventing internal stresses which might produce leakage or failure.

Employment of sound principles in this compact construction makes it possible to utilize all the available preheat without endangering the structure or the steel, and without excessive delivery losses. The air preheat temperature is averaging about 1600 degrees Fahr. when using a high B.t.u. fuel and 1800 degrees Fahr. on low B.t.u. fuel. This temperature varies but slightly throughout each heat. This steady condition, by controlling steady flame temperatures, is an important adjunct to precise control and helps to avoid burning or washing the steel, and imparts fast "pick-up" to the furnace.

Waste gases, after passage through the recuperators, may be conducted through metallic preheaters to heat blast furnace gas for subsequent delivery to the firing port of the pit. However, the use of tiles or higher conductivity will permit the dispensing of gas preheaters by increasing the air preheat to approximately 1800 degrees Fahr.

Carburizing—Its History And Production Practice

(*Concluded from Page 76*)

to the adapter end. After this measurement is made a strip of metal is removed by grinding to a depth of 0.015-inch and another series of hardness readings is made. From these two series of readings the hardening characteristics of the steel are ascertained.

Tests made on a wide range of carburizing steels have supplied hardenability data of considerable value, and the authors indicate that the use of the test in combination with the McQuaid-Ehn test may be worthwhile as a regular procedure on steels for more important parts.

Utility of the test from a production standpoint was hailed by L. A. Danse, metallurgist, Cadillac Motor Car division, General Motors Corp., Detroit, who believed the development would give much assistance to production departments in difficulties with suppliers over steel specifications.

■ Classifying carburized cases into four categories—up to 0.020-inch, between 0.020 and 0.040-inch, between 0.040 and 0.060-inch, and over 0.060-inch total penetration—A. L. Boegehold and C. J. Tobin of General Motors research laboratories, presented a discussion of the manner in which various types of stresses imposed upon automotive parts are taken into consideration in determining the kind of case required to provide successful operation in service. Such stresses are the result of crushing loads, bending loads and of sliding, rolling and abrasion.

■ Requirements necessary for the production of light carburized cases were summarized by V. T. Malcolm, Chapman Valve Mfg. Co., Indian Orchard, Mass. Parts on which such cases are used include, vacuum cleaner, typewriter and sewing machine parts, shackles, timing gears, checks and lathe centers, chain links, cams and small gears and the like. Means for determining hardness, depth of case, wear resistance and brittleness and impact were considered. General requirements dictate a hardness of not less than 800 Vickers brinell, case depth from 0.005 to 0.040-inch and finishing tolerance of not over 0.003-inch on the diameter.

New Rollers Produced

■ Hardened and ground rolls for cold rolling work, made from homogeneous alloy steel are among the new productions of Tool Steel Gear & Pinion Co., Elmwood place, Cincinnati.

Special heat treating equipment was installed to produce these rolls which are made to a maximum size of about 20-inch body diameter by 60-inch working face, with overall length not over 125 inches. Scleroscope hardness on the working face of the rolls will run about 100, dropping to about 40 to 50 on the necks.

Exhibits Metal Finishes

■ Of interest to users of industrial finishes is an exhibit at Metals & Plastics Bureau, International Building, Rockefeller Center, New York, set up by Roxalin Flexible Lacquer Co., Elizabeth, N. J.

The exhibit demonstrates lacquers, enamels and synthetics for metal, wood and other bases. A group of illustrations shows a "twisting and bending" test for lacquers. There are also photos of the Trail Blazer, their salesman on wheels, carrying more than 200 samples of products finished with their materials.

A "live" feature of the exhibit is a revolving drum which demonstrates four of this company's leading products.

Changing Fuels In the Steel Mill

(*Concluded from Page* 61)

changed from powdered coal to gas firing.

Seven box annealers have been converted from coal to gas while two 320-foot, semi-muffle, tunnel type annealing kilns are now heated with natural gas as against clean producer gas formerly.

Some Direct Fired

At the Follansbee plant are 15 hot mills with 8 pair and sheet furnaces which have been converted from powdered coal to natural gas. These furnaces are about 10 feet long and the gas burners are located in the back walls. While some of these are direct fired, others contain baffles against which the gas burners fire and which serve to distribute the heat more evenly. Also, 33 box annealers are in process of being changed from powdered coal to gas. Among the unique units here is a high temperature annealer. Certain high grade sheets require a high temperature, 2000 degrees Fahr. anneal and are in the furnace for 10 days. A new type of gas fired furnace was designed and built here. It has a circular arch. With this type of arch there is no thrust against the walls and no buckstays are needed.

Annealing boxes with balls and tracks are used with this furnace, which is 9 x 18½ feet. Eight gas burners are located close to the bottom, 4 on each side, and they fire against upright baffles inside the furnace. These throw the heat to the roof where it is deflected downward on the work and finally goes out through openings in the hearth and a flue under the center of the furnace. The walls are 2 feet 10 inches high and 22½ inches thick, and are constructed of insulating refractory and firebrick. The roof is of insulating refractory 9 inches thick. With an automatic temperature control and recording pyrometer, remarkable economies are claimed for this unit. The ordinary annealers in this plant were converted by placing gas burners in the roofs so that they fire straight down. There are two rows of 4 gas burners each, each row located in the roof close to the sidewalls.

A newly installed gas heated annealer of the bell type consists of a single cover and two bases. While this furnace is in operation with one base the other base is being loaded. The cover contains the 18 gas burners and is lifted on and off the bases by crane. The sheets are put on the base, 8 x 22 feet, in piles and the piles are covered with light steel boxes to preserve a neutral atmosphere. Air is supplied to the burners at 6-ounce pressure from a blower on top of the cover.

Gas manifold is equipped with a zero governor. Gas and air are correctly proportioned for complete combustion. An automatic temperature controller operates an on-and-off valve in the air line.

Pot Life Lengthened

In the tinning division the tin pots were changed over to gas immersion heating some time ago. Prior to this change, and with flame impingement, from one to one and a half years was considered good pot life.

With gas immersion burners, pot life is indefinite, those in this plant having been in operation for 7 years without change. The submerged gas melting elements used here are of heat resisting cast iron. A single burner head, located in the element itself, fires a premixed and completely combustible air-gas mixture, under pressure, into the horizontal crossover. An air-gas pipe and vent complete the unit. A turn down ratio of 100 to 1 facilitates automatic temperature control. Thermal efficiency of this unit is high.

Lubricating Bearings On Cranes Is Important

(*Concluded from Page* 54)

point. For trouble-free performance with wick feed systems, the lubricant chosen must withstand heavy loads at high operating temperatures and should not form a glaze on the felt surfaces. Any lubricant which forms such a glaze interferes with the ability of the felt wicks to feed constantly. In time these wicks will fail to feed a sufficient quantity to keep bearings properly lubricated.

Another solution of the problem is by the use of combinations of springy horse hair and wool yarn impregnated with grades of lubricant which feed at the proper speed to insure good lubrication. Preparation of such hair and wool yarn greases requires a thorough understanding of conditions so as to assure the manufacture of a product which will lubricate properly within the range of temperatures to be encountered.

On the latest models of cranes all gears are enclosed in an oil tight housing. This simplifies their lubrication to a very considerable degree. Usually such enclosed gears require a light bodied lubricant with a special extreme pressure element added. Great care must be exercised in the selection of such extreme pressure lubricants. "EP" elements of certain types have an adverse effect on some metals.

Open gears, or gears running in an oil bath, (though not totally enclosed) call for somewhat more study — if they are to be efficiently lubricated. Spur and herringbone gears running in oil baths previously caused considerable drippage and throwing off of lubricant, but study by engineering departments and lubricants developed to remedy this trouble have reduced the loss of the product applied and insured more constant lubrication.

On open gears a heavy viscous lubricant, heated before applying and then put on with a brush, will give best results. For spur and herringbone gears, a lubricant should be used which will cling to gear teeth, coating them with a heavy durable film and eliminating metal to metal contact. They should also be of such nature as not to "heavy up" during low temperature periods nor thin out when subjected to heat.

Lubrication of hoist cables and wire rope can do a great deal to increase service life. The product used, however, must be of such nature that it will penetrate between the strands, right through to the core of the cable. Forming a heavy film of lubricant on the surface of wire rope is of no value. In fact, it is a definite disadvantage as the surplus lubricant is bound to cling to drums and sheaves, eventually piling up to the point where it will throw off.

Testing V-Belts

■ Working drawings have been prepared by the Society of Automotive Engineers standards committee, 29 West Thirty-ninth street, New York, from which a machine may be constructed to test V-belts by methods given in the 1937 SAE handbook.

Design of fixture has been made as simple as possible to give uniformly comparable results and long service. Drawings may be purchased from the society's standards department.

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

Gears—Gear Grinding Machine Co., Conant road and Grand Trunk railway, Detroit, has published a booklet on gear measuring instruments. The booklet contains engineering data and illustrations of various instruments.

Heat Treating—E. F. Houghton & Co., Philadelphia, has published a 16-page booklet on salt baths used in the heat treating of steel. The booklet also contains engineering data.

Truck Batteries—USL Battery Corp., Niagara Falls, N. Y., has issued an 8-page bulletin describing construction features of new storage batteries for industrial service.

Gas tractor—Mercury Mfg. Co., Chicago, is distributing bulletin 206, describing and illustrating a new heavy-duty industrial haulage unit and including specifications.

Flooring Material — Flexrock Co., 800 North Delaware avenue, Philadelphia, has released a folder containing information on the application and advantages of Flexrock floor compound.

Pre-Fabricated Homes—Harnischfeger Corp., 6785 West Greenfield avenue, Milwaukee, has released a booklet containing interesting illustrations and information on the construction of Pre-Fab homes.

Screw Drivers — Continental Screw Co., New Bedford, Mass., has printed a folder illustrating and imparting information on the different types of Phillips screw drivers, screws and bits.

Forging—Drop Forging Association, 605 Hanna building, Cleveland, has issued a 4-page folder with illustrations and information on how forgings reduce deadweight and bulk.

Nickel Applications — International Nickel Co., 67 Wall street, New York, has published a 26-page booklet of engineering data, including 400 applications for nickel, Monel and Inconel under corrosive conditions.

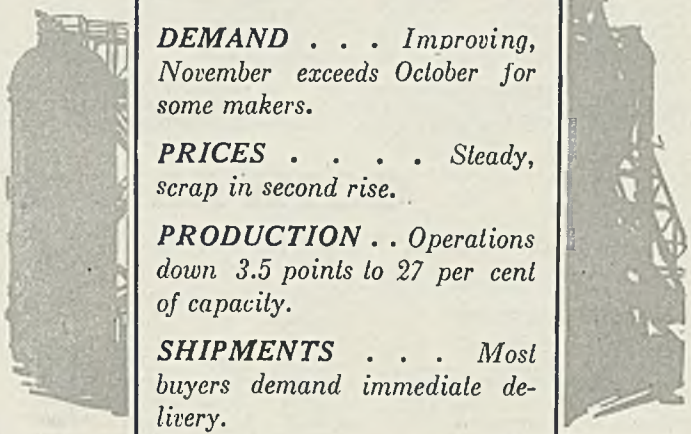
Refractories — Johns-Manville, 22 East Fortieth street, New York, has issued a 48-page illustrated booklet on heating, and entitled "The Dramatic Story of Man's Age-Old Struggle to Control Nature's Most Powerful Force."

Lubricants — E. F. Houghton & Co., Third, American and Somerset streets, Philadelphia, has prepared an illustrated booklet giving factual descriptions of modern lubricants and their applications. The booklet is entitled "Less Oil—Less Often."

Couplings—Bartlett Hayward division, Koppers Co., Baltimore, has issued a catalog on Fast's self-aligning couplings. Material on solving problems of misalignment, principles of lubrication, types of couplings and other information is included in the 40-page catalog.

Better Steel Buying Improves Sentiment

Scrap Price Gains; Ingot Output Down; Autos Are Steady



MARKET IN TABLOID

DEMAND *. . . Improving, November exceeds October for some makers.*

PRICES *. . . . Steady, scrap in second rise.*

PRODUCTION *. . Operations down 3.5 points to 27 per cent of capacity.*

SHIPMENTS *. . . Most buyers demand immediate delivery.*

SLIGHT signs of improvement in the steel market apparent a week ago have been multiplied and a distinct change in sentiment has taken place. In both eastern and western centers encouragement has come from a slightly better volume of orders from miscellaneous sources.

In some cases important sellers last week booked the best tonnage in six to eight weeks and a midwestern mill has increased operations 10 points on the basis of increased orders where two weeks ago it had expected to decrease output.

The increase in buying is in small lots for immediate delivery, indicating inventories are being depleted and assortments broken, a harbinger of larger buying after the year's end.

Steel operations last week declined further, losing 3.5 points to 27 per cent of ingot capacity. This was caused by curtailment of a few points at all important centers, and practically no increases of importance. However, in a number of instances schedules for this week call for additional open hearths and the rate may recover a few points. Pittsburgh declined 5 points to 19 per cent, Chicago 6 points to 24, Eastern Pennsylvania 2 points to 29, Youngstown 11 points to 24 and Birmingham 9 points to 45. New England gained 4 points to 36 and Detroit 2 points to 52. There was no change from the preceding week at Wheeling 30 per cent, Cleveland 31, Buffalo 21 and St. Louis 20.6. Cincinnati regained the 15 points lost the previous week, to 29 per cent.

Although miscellaneous buying is the better indicator of a turn in the market a number of large single projects aid in building mill backlogs. Southern pig iron interests will profit from an order for 10,000 tons of 30-inch cast iron pipe placed with a Birmingham foundry, sufficient for five months' production. A fabricator in the Birmingham district has received specifications on 12,000 tons of structural steel for the Baton Rouge, Miss., bridge. Two navy tenders requiring 12,500 tons of steel have been placed with eastern private yards and two others to navy yards. Standard Oil Co. of New Jersey is considering bids on eight tankers and it is believed it will buy 12.

Various adjustments are being made in prices and allowances to meet current conditions. Reinforcing bars from warehouse have been marked down $2 per ton and the jobber functional allowance has been reduced from $8 to $6. On flat galvanized sheets and formed roofing and siding, carload and jobber discounts have been readjusted. Prices on ferromanganese and other ferroalloys have been reaffirmed for first quarter.

Although much less in volume than usual at the year's end, railroad buying of rails and rolling stock continues to give mills fair tonnages, mostly for rolling in January and later months. Last week some 61,000 tons of rails were placed by western roads.

Production of steel ingots in November was 2,153,781 gross tons, almost 37 per cent less than October output and 59 per cent below March, the high tonnage this year. This was the lowest monthly production since December, 1934. In spite of this low record for last month, cumulative production for eleven months is only 7 per cent lower than for the corresponding period in 1929, the alltime peak, and 4 per cent below the similar period of 1928, the second highest. November operations were at 38.22 per cent of capacity, compared with 90.27 per cent in April, the year's high rate.

Automobile assemblies sagged slightly to 85,765, compared with 86,848 the preceding week. Ford has attained a rate of about 5000 daily and last week produced 22,615 units, against 13,070 the week before. General Motors' output was off to 31,800 from 42,075 and Chrysler's to 19,600 from 20,700. Independents accounted for 11,750, compared with 11,003 in the preceding period. Most producers, Ford excepted, are expected to continue at the lower schedules now in effect until after the first of the year.

For the second consecutive week the composite of steelworks scrap prices has advanced, gaining 17 cents, to $13.08. This was caused by stronger prices in Eastern Pennsylvania, partially from export competition. The iron and steel composite was carried up 2 cents to $38.88 by the scrap advance. Finished steel composite is steady at $61.70.

COMPOSITE MARKET AVERAGES

	Dec. 11	Dec. 4	Nov. 27	One Month Ago Nov., 1937	Three Months Ago Sept., 1937	One Year Ago Dec., 1936	Five Years Ago Dec., 1932
Iron and Steel	$38.88	$38.86	$38.86	$38.96	$40.16	$35.15	$28.28
Finished Steel	61.70	61.70	61.70	61.70	61.70	53.90	46.74
Steelworks Scrap..	13.08	12.91	12.75	13.32	18.99	16.92	6.41

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.

COMPARISON OF PRICES

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

Finished Material

	Dec. 11, 1937	Nov. 1937	Sept. 1937	Dec. 1936
Steel bars, Pittsburgh	2.45c	2.45c	2.45c	2.05c
Steel bars, Chicago	2.50	2.50	2.50	2.10
Steel bars, Philadelphia	2.74	2.74	2.74	2.36
Iron bars, Terre Haute, Ind.	2.35	2.35	2.35	1.95
Shapes, Pittsburgh	2.25	2.25	2.25	1.90
Shapes, Philadelphia	2.45½	2.46	2.46	2.12
Shapes, Chicago	2.30	2.30	2.30	1.95
Tank plates, Pittsburgh	2.25	2.25	2.25	1.90
Tank plates, Philadelphia	2.43½	2.44	2.44	2.09
Tank plates, Chicago	2.30	2.30	2.30	1.95
Sheets, No. 10, hot rolled, Pitts.	2.40	2.40	2.40	2.10
Sheets, No. 24, hot ann., Pitts.	3.15	3.15	3.15	2.75
Sheets, No. 24, galv., Pitts.	3.80	3.80	3.80	3.35
Sheets, No. 10, hot rolled, Gary	2.50	2.50	2.50	2.25
Sheets, No. 24, hot anneal., Gary	3.25	3.25	3.25	2.90
Sheets, No. 24, galvan., Gary	3.90	3.90	3.90	3.50
Plain wire, Pittsburgh	2.90	2.90	2.90	2.60
Tin plate, per base box, Pitts.	$5.35	$5.35	$5.35	$5.25
Wire nails, Pittsburgh	2.75	2.75	2.75	2.20

Semifinished Material

Sheet, bars, open-hearth, Youngs.	$37.00	$37.00	$37.00	$32.50
Sheet bars, open-hearth, Pitts.	37.00	37.00	37.00	32.50
Billets, open-hearth, Pittsburgh	37.00	37.00	37.00	32.50
Wire rods, No. 5 to 9/32-inch, Pitts.	47.00	47.00	47.00	40.75

Pig Iron

	Dec. 11, 1937	Nov. 1937	Sept. 1937	Dec. 1936
Bessemer, del. Pittsburgh	$25.26	$25.26	$25.26	$21.8132
Basic, Valley	23.50	23.50	23.50	20.00
Basic, eastern del. East. Pa.	25.26	25.26	25.26	21.81
No. 2 fdy., del. Pittsburgh	25.21	25.21	25.21	21.3132
No. 2 fdy., Chicago	24.00	24.00	24.00	20.50
Southern No. 2, Birmingham	20.38	20.38	20.38	16.88
Southern No. 2, del. Cincinnati	23.89	23.89	23.69	19.69
No. 2 X eastern, del. Phila.	26.135	26.14	26.14	22.68
Malleable, Valley	24.00	24.00	24.00	20.50
Malleable, Chicago	24.00	24.00	24.00	20.50
Lake Sup., charcoal, del. Chicago	30.24	30.14	30.04	26.2528
Gray forge, del. Pittsburgh	24.17	24.17	24.17	20.6741
Ferromanganese, del. Pittsburgh	107.49	107.35	107.29	82.65

Scrap

Heavy melting steel, Pittsburgh	$13.25	$14.10	$20.40	$18.55
Heavy melt. steel, No. 2, E. Pa.	14.25	12.25	16.69	14.13
Heavy melting steel, Chicago	11.75	12.55	17.85	17.00
Rails for rolling, Chicago	14.25	15.10	20.35	17.25
Railroad steel specialties, Chicago	15.75	16.75	20.50	19.00

Coke

Connellsville, furnace, ovens	$4.37	$4.37	$4.45	$4.00
Connellsville, foundry, ovens	5.25	5.25	5.25	4.40
Chicago, by-product foundry, del.	11.00	11.00	11.00	9.75

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

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

Sheet Steel

Prices Subject to Quantity Extras and deductions (Except Galvanized)

Hot Rolled No. 10, 24-48 in.

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53½c
Detroit, del.	2.60c
New York, del.	2.74c
Philadelphia, del.	2.70c
Birmingham	2.55c
St. Louis, del.	2.63c
Granite City, Ill.	2.60c
Pacific ports, f.o.b. dock	2.96c

Hot Rolled Annealed No. 24

Pittsburgh	3.15c
Gary	3.25c
Chicago, delivered	3.28½c
Detroit, delivered	3.35c
New York, delivered	3.49c
Philadelphia, del.	3.45c
Birmingham	3.30c
St. Louis, del.	3.38c
Granite City, Ill.	3.35c
Pacific ports, f.o.b. dock	3.81c

Galvanized No. 24

Pittsburgh	3.80c
Gary	3.90c
Chicago, delivered	3.93½c
Philadelphia, del.	4.10c
New York, delivered	4.14c
Birmingham	3.95c
St. Louis, del.	4.03c
Granite City, Ill.	4.00c
Pacific ports, f.o.b. dock	4.41c

Tin Mill Black No. 28

Pittsburgh	3.30c
Gary	3.40c
St. Louis, delivered	3.53c
Granite City, Ill.	3.50c

Cold Rolled No. 10

Pittsburgh	3.10c
Gary	3.20c
Detroit, delivered	3.31c
Philadelphia, del.	3.40c
New York, del.	3.44c
St. Louis, del.	3.33c
Granite City, Ill.	3.30c
Pacific ports, f.o.b. dock	3.71c

Cold Rolled No. 20

Pittsburgh	3.55c
Gary	3.65c
Detroit, delivered	3.76c
Philadelphia, del.	3.85c
New York, del.	3.89c
St. Louis	3.78c
Granite City, Ill.	3.75c

Enameling Sheets

Pittsburgh, No. 10	2.90c
Pittsburgh, No. 20	3.50c
Gary, No. 10	3.00c
Gary, No. 20	3.60c
St. Louis, No. 10	3.13c
St. Louis, No. 20	3.73c

Tin and Terne Plate

Gary base, 10 cents higher

Tin plate, coke (base box) Pittsburgh	$5.35
Waste-waste, 2.75c; strip	2.50c
Long ternes, No. 24, unassorted, Pitts.	4.10c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	28.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	23.00	28.00
Cold stp.	22.00	22.50	28.50	36.50

Steel Plate

Pittsburgh	2.25c
New York, del.	2.54c
Philadelphia, del.	2.44½c
Boston, delivered	2.66c
Buffalo, delivered	2.49½c
Chicago or Gary	2.30c
Cleveland, del.	2.45½c
Birmingham	2.40c
Coatesville, base	2.35c
Sparrows Pt., base	2.35c
Pacific ports, f.o.b. cars, dock	2.81c
St. Louis, delivered	2.52c

Structural Shapes

Pittsburgh	2.25c
Philadelphia, del.	2.46½c
New York, del.	2.51½c
Boston, delivered	2.64½c
Bethlehem	2.35c
Chicago	2.30c
Cleveland, del.	2.46c
Buffalo	2.35c
Gulf Ports	2.66c
Birmingham	2.40c
Pacific ports, f.o.b. cars, dock	2.81c
St. Louis, del.	2.52c

Bars

Soft Steel
(Base, 3 to 25 tons)

Pittsburgh	2.45c
Chicago or Gary	2.50c
Duluth	2.60c
Birmingham	2.60c
Cleveland	2.50c
Buffalo	2.55c
Detroit, delivered	2.60c
Pacific ports, f.o.b. cars, dock	3.01c
Philadelphia, del.	2.75c
Boston, delivered	2.86c
New York, del.	2.79c
Pittsburgh, forg. qual.	2.80c

Rail Steel
To Manufacturing Trade

Pittsburgh	2.30c
Chicago or Gary	2.35c
Cleveland	2.35c
Moline, Ill.	2.35c
Buffalo	2.40c
Birmingham	2.45c

Iron

Terre Haute, Ind.	2.35c
Chicago	2.40c
Philadelphia	2.64c
Pittsburgh, refined	3.50-8.00c

Reinforcing

New billet, straight lengths, quoted by distributors

Pittsburgh	2.55c
Chicago, Gary, Buffalo, Cleve., Birm., Young.	2.60c
Gulf ports	2.91c
Pacific coast ports, f.o.b. car docks	2.96c
Philadelphia, del.	2.85c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	2.40c
Chicago, Buffalo, Cleveland, Birm., Young.	2.45c
Gulf ports	2.81c

Wire Products

Prices apply to mixed carloads, base; less carloads subject to quantity extras.

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	$2.75
Cement coated nails	$2.75

(Per pound)

Polished staples	3.45c
Galv. fence staples	3.70c
Barbed wire, galv.	3.40c
Annealed fence wire	3.15c
Galv. fence wire	3.55c
Woven wire fencing (base C. L. column)	74
Single loop bale ties, (base C. L. column)	63

To Manufacturing Trade

Plain wire, 6-9 ga.	2.90c
Galvanized wire	2.95c

Anderson, Ind. (merchant products only) and Chicago up $1; Duluth and Worcester up $2; Birmingham up $3.

Spring wire, Pitts. or Cleveland	3.50c

Do., Chicago up $1, Worc. $2.

Cold-Finished Carbon Bars and Shafting

Pittsburgh	2.90c
Chicago	2.95c
Gary, Ind.	2.95c
Detroit	2.95c
Cleveland	2.95c
Buffalo	3.00c

Subject to quantity deductions and extras. List dated Aug. 26, 1935; revised Oct. 1, 1936.

Alloy Steel Bars (Hot)

(*Base, 3 to 25 tons*)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem	3.00c

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

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

Piling

Pittsburgh	2.60c
Chicago, Buffalo	2.70c

Strip and Hoops

(Base, hot-rolled, 25-1 ton)

(Base, cold-rolled, 25-3 tons)

Hot strip to 23⅛-in. Pittsburgh	2.40c
Chicago or Gary	2.50c
Birmingham base	2.55c
Detroit, del.	2.61c
Philadelphia, del.	2.70c
New York, del.	2.74c
Cooperage hoop, Pittsburgh	2.50c
Chicago	2.60c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland	3.20c
Detroit, del.	3.41c
Worcester, Mass.	3.40c

Carbon	Cleve. Pitts.	Worcester, Mass.
0.26—0.50	3.20c	4.30c
0.51—0.75	4.45c	4.65c
0.76—1.00	6.30c	6.50c
Over 1.00	8.50c	8.70c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$42.50
Relay rails, Pittsburgh, 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pittsburgh, Chicago	$43.00
Do., rerolling quality	42.00
Angle bars, billet, Gary, Pittsburgh, So. Chicago	2.80c
Do., axle steel	3.35c
Spikes, R. R. base	3.15c
Track bolts, base	4.35c
Tie plates, base	$46.00

Base, light rails 25 to 60 lbs.; 20 lbs. up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts

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

Carriage and Machine

½ x 6 and smaller	65-5 off
Do. larger, to 1-in.	60-10 off
Do. 1⅛ and 1¼-in.	60-5 off
Tire bolts	50 off

Plow Bolts

All sizes	65-5 off

Stove Bolts

In packages with nuts attached 70 off; in packages with nuts separate 70-10 off; in bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts	50-10-5 off
Elevator bolts	50-10-5 off

Nuts

S. A. E. semifinished hex.: ½ to 7/8-inch	60-10 off
Do., 9/16 to 1-inch	60-5 off
Do., over 1-inch	60 off

Hexagon Cap Screws

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

Square Head Set Screws

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

Rivets, Wrought Washers

Structural, Pittsburgh, Cleveland	3.60c
Structural, Chicago	3.70c
7/8-inch and smaller, Pitts., Chi., Cleve.	65-5 off

Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75 off

Cut Nails

Cut nails, C. L. Pitts. (10% disc. on all extras)	$3.60
Do., less carloads, 5 kegs or more, no discount on any extras	$3.90
Do., under 5 kegs no disc. on any extras	$4.05

Welded Iron, Steel Pipe

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

Butt Weld

Steel

In.	Blk.	Galv.
½	59½	49
¾	62½	53
1—3	64½	55½

Iron

¾	26	8
1—1¼	30	14
1½	34	16½
2	33½	16

Lap Weld

Steel

2	57	47½
2½—3	60	50½
3½—6	62	52½
7 and 8	61	50½
9 and 10	60½	50

Iron

2	26½	10
2½—3½	27½	12½
4	29½	16
4½—8	28½	15
9—12	24½	10

Line Pipe

Steel

1 to 3, butt weld	63½
2, lap weld	56
2½ to 3, lap weld	59
3½ to 6, lap weld	61
7 and 8, lap weld	60
10-inch, lap weld	59½
12-inch, lap weld	58½

Butt Weld

Iron

	Blk.	Galv.
¾	25	7
1 and 1¼	29	13
1½	33	15½
2	32½	15

Lap Weld

1½	23½	7
2	25½	9
2½ to 3½	26½	11½
4	28½	15
4½ to 8	27½	14
9 to 12	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet, f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Weld

Sizes	Steel	Charcoal Iron
1½" OD x 13 Ga.	$10.45	$23.71
1¾" OD x 13 Ga.	11.89	22.93
2" OD x 13 Ga.	13.31	19.35
2" OD x 11 Ga.	15.49	23.36
2¼" OD x 13 Ga.	14.82	21.68
2¼" OD x 11 Ga.	17.38	26.02
2½" OD x 12 Ga.	17.82	26.57
2¾" OD x 12 Ga.	18.86	29.00
3" OD x 12 Ga.	19.73	31.36
3½" OD x 11 Ga.	24.89	39.81
4" OD x 10 Ga.	30.81	49.90
5" OD x 9 Ga.	47.57	73.93
6" OD x 7 Ga.	73.25	....

Seamless

	Hot Rolled	Cold Drawn
1" OD x 13 Ga.	$ 8.41	$ 9.46
1¼" OD x 13 Ga.	9.96	11.21
1½" OD x 13 Ga.	11.00	12.38
1¾" OD x 13 Ga.	12.51	14.09
2" OD x 13 Ga.	14.02	15.78
2¼" OD x 13 Ga.	15.63	17.60
2¼" OD x 12 Ga.	17.21	19.37
2½" OD x 12 Ga.	18.85	21.22
2¾" OD x 12 Ga.	19.98	22.49
3" OD x 12 Ga.	20.97	23.60
4½" OD x 10 Ga.	40.15	45.19
3½" OD x 11 Ga.	26.47	29.79
4" OD x 10 Ga.	32.83	36.94
5" OD x 9 Ga.	50.38	56.71
6" OD x 7 Ga.	77.35	87.07

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$46.00-47.00
4-in., Birmingham	49.00-50.00
4-in., Chicago	57.20-58.20
6 to 24-in., Chicago	54.20-55.20
6-in. & over, east fdy.	50.00
Do., 4-in.	53.00

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

Semifinished Steel

Billets and Blooms

4 x 4-*inch base; gross ton*

Pitts., Chi., Cleve., Buffalo, Young., Birm.	$37.00
Philadelphia	42.30
Duluth	39.00

Forging Billets

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

Pitts., Chicago, Buffalo	43.00
Forging, Duluth	45.00

Sheet Bars

Pitts., Cleve., Young., Sparrows Point	37.00

Slabs

Pitts., Chicago, Cleveland, Youngstown	37.00

Wire Rods

Pitts., Cleve., No. 5 to 9/32-inch incl.	47.00
Do., over 9/32 to 11/64-inch incl.	52.00

Chicago up $1; Worcester up $2.

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt.	2.10c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$4.00- 4.50
Connellsville, fdry.	5.00- 5.50
Connell. prem. fdry.	5.75- 6.25
New River fdry.	6.50- 6.75
Wise county fdry.	5.75- 6.00
Wise county fur.	4.75- 5.00

By-Product Foundry

Newark, N. J., del.	10.88-11.35
Chi., ov., outside del.	10.25
Chicago, del.	11.00
Milwaukee, ovens	11.00
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.50
Indianapolis, del.	10.50
Cincinnati, del.	10.50
Cleveland, del.	11.05
Buffalo, del.	10.50
Detroit, del.	11.10
Philadelphia, del.	10.60

Coke By-Products

Spot, gal. Producers' Plants

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

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16.25c
do. (450 lbs.)	15.25c

Eastern Plants, per lb.

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

Per ton, bulk, f.o.b. oven or port Sulphate of ammonia	$29.00

Pig Iron

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

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$25.00	$25.50	$23.50	$26.00
Birdsboro, Pa.	25.00	25.50	24.50	26.00
Birmingham, Ala.‡	20.38	.....	19.38	25.00
Buffalo	24.00	24.50	23.00	25.00
Chicago	24.00	24.00	23.50	24.50
Cleveland	24.00	24.00	23.50	24.50
Detroit	24.00	24.00	23.50	24.50
Duluth	24.50	24.50	.....	25.00
Erie, Pa.	24.00	24.50	23.50	25.00
Everett, Mass.	25.75	26.25	25.25	26.75
Granite City, Ill.	24.00	24.00	23.50	24.50
Hamilton, O.	24.00	24.00	23.50	.....
Neville Island, Pa.	24.00	24.00	23.50	24.50
Provo, Utah	22.00	.....	.....	.....
Sharpsville, Pa.	24.00	24.00	23.50	24.50
Sparrow's Point, Md.	25.00	.....	24.50	.....
Swedeland, Pa.	25.00	25.50	24.50	26.00
Toledo, O.	24.00	24.00	23.50	24.50
Youngstown, O.	24.00	24.00	23.50	24.50

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

Delivered from Basing Points:				
Akron, O., from Cleveland	25.39	25.39	24.89	25.89
Baltimore from Birmingham	25.78	.....	24.66	.....
Boston from Birmingham	26.57	.....	26.07	.....
Boston from Everett, Mass.	26.30	26.80	25.80	27.30
Boston from Buffalo	26.45	26.95	25.95	27.45
Brooklyn, N. Y., from Bethlehem	27.47	27.97	.....	.....
Brooklyn, N. Y., from Bmghm.	27.25	.....	.....	.....
Canton, O., from Cleveland	25.39	25.39	24.89	25.89
Chicago from Birmingham	24.42	.....	24.30	.....
Cincinnati from Hamilton, O.	24.27	25.11	24.61	.....
Cincinnati from Birmingham	23.89	.....	22.89	.....
Cleveland from Birmingham	24.32	.....	23.82	.....
Mansfield, O., from Toledo, O.	25.94	25.94	25.44	25.44
Milwaukee from Chicago	25.10	25.10	24.60	25.10
Muskegon, Mich., from Chicago, Toledo or Detroit	27.10	27.10	26.60	27.60
Newark, N. J., from Birmingham	26.21	.....	.....	.....
Newark, N. J, from Bethlehem	26.53	27.03	.....	.....
Philadelphia from Birmingham	25.58	.....	25.46	.....
Philadelphia from Swedeland, Pa.	25.84	26.34	25.34	.....
Pittsburgh district from Neville Island	[Neville, base plus 63c, 76c, and $1.13 switch'g charges			
Saginaw, Mich., from Detroit	26.45	26.45	25.95	25.95
St. Louis, northern	24.55	24.55	24.05	.....
St. Louis from Birmingham	†24.12	.....	23.82	.....
St. Paul from Duluth	26.08	26.08	.....	26.58

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $28.50, Phila. base, standard and copper bearing, $29.63.

Gray Forge

Valley furnace $23.50
Pitts. dist. fur. 23.50

Charcoal

Lake Superior fur. $27.00
do., del. Chicago 30.24
Lyles, Tenn. 26.50

Silvery†

Jackson county, O., base: 6-6.50 per cent $28.50; 6.51-7—$29.00; 7-7.50—$29.50; 7.51-8—$30.00; 8-8.50—$30.50; 8.51-9—$31.00; 9-9.50—$31.50; Buffalo $1.25 higher.

Bessemer Ferrosilicon†

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

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

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

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky. $64.60

First Quality

Pa., Ill., Md., Mo., Ky. 51.30
Alabama, Georgia 51.30
New Jersey 56.00

Second Quality

Pa., Ill., Ky., Md., Mo. 46.55
Georgia, Alabama 41.80
New Jersey 51.00

Ohio

First quality 43.70
Intermediate 39.90
Second quality 35.15

Malleable Bung Brick

All bases $59.85

Silica Brick

Pennsylvania $51.30
Joliet, E. Chicago 59.85
Birmingham, Ala. 51.30

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press $30.00
Wire cut $28.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags) $45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags) 43.00

Base Brick

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

Chrome brick $49.00
Chem. bonded chrome 49.00
Magnesite brick 69.00
Chem. bonded magnesite 59.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton $23.50-24.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail $20.00
Do., for barge $22.00
No. 2 lump 22.00-23.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82%, tidewater, duty pd. $102.50
Do., Baltimore, base 102.50
Do., del. Pittsburgh 107.49
Spiegeleisen, 19-21% dom. Palmerton, Pa., spot 33.00
Do., New Orleans 33.00
Do., 26-28%, Palmerton 39.00
Ferrosilicon, 50% freight allowed, c.l. 69.50
Do., less carload 77.00
Do., 75 per cent 126-130.00
Spot, $5 a ton higher.
Silicoman., 2½ carbon 106.50
2% carbon 111.50; 1%, 121.50
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del. 10.50
Ferrotungsten, stand., lb. con. del. cars 2.95-3.00
Ferrovanadium, 35 to 40% lb., cont. 2.70-2.90
Ferrotitanium, c. l., prod-plant, frt. all., net ton 142.50
Spot, carlots 145.00
Spot, ton lots 150.00
Ferrophosphorus, per ton, c. l., 17-19% Rockdale, Tenn., basis, 18%, $3 unitage 63.50
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $3 unitage 80.00
Ferromolybdenum, stand. 55-65%, lb. 0.95
Molybdate, lb. cont. 0.80

†Carloads. Quan. diff. apply.

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin, New York: Spot	Straits Tin, New York: Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony American Spot, N. Y.	Nickel Cathodes
Dec. 4	10.50	11.12½	10.02½	44.87½	44.87½	5.00	4.85	5.00	20.00	14.75	35.00
Dec. 6	10.50	11.12½	10.02½	44.75	44.75	5.00	4.85	5.00	20.00	14.50	35.00
Dec. 7	10.50	11.12½	10.02½	44.00	44.00	5.00	4.85	5.00	20.00	14.25	35.00
Dec. 8	10.50	11.12½	10.02½	43.75	43.75	5.00	4.85	5.00	20.00	14.25	35.00
Dec. 9	10.25	11.12½	10.02½	43.87½	43.87½	5.00	4.85	5.00	20.00	14.25	35.00
Dec. 10	10.25	11.12½	9.77½	44.75	44.75	5.00	4.85	5.00	20.00	14.25	35.00

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 11.00c Conn. copper

Sheets

Yellow brass (high) 17.37½
Copper, hot rolled 19.12½
Lead, cut to jobbers 8.50
Zinc, 100-lb. base 10.50

Tubes

High, yellow brass 20.12½
Seamless copper 19.87½

Rods

High yellow brass 13.37½
Copper, hot rolled 15.62½

Anodes

Copper, untrimmed 16.37½

Wire

Yellow brass (high) 17.62½

OLD METALS

Nom. Del. buying prices

No. 1 Composition Red Brass

New York 5.50-5.75
*Cleveland 6.25-6.50
Chicago 5.75-6.00
*St. Louis 5.75-6.00

Heavy Copper and Wire

New York, No. 1 ..... 7.50-7.75
Cleveland, No. 1 ..... 7.25-7.50
Chicago, No. 1 ..... 7.50-7.75
St. Louis 7.25-7.50

Composition Brass Borings

New York 5.00-5.25

Light Copper

New York 5.50-5.75
Cleveland 5.25-5.50
Chicago 5.25-5.50
St. Louis 5.00-5.25

Light Brass

*Cleveland 3.25-3.50
Chicago 3.75-4.00
*St. Louis 3.25-3.75

Lead

*New York 3.75-4.00
Cleveland 3.25-3.50
Chicago 3.75-4.00
St. Louis 3.25-3.50

Zinc

*New York 2.12½-2.37½
Cleveland 2.00-2.25
*St. Louis 2.25-2.50

Aluminum

*Borings, Cleveland 6.75-7.00
*Mixed cast, Cleve. 9.75-10.00
*Clips, soft, Cleve. 11.75-12.00
*Mixed cast, St. L. 9.25-9.75

SECONDARY METALS

Brass, ingot, 85-5-5-5, lcl. 11.25
*Stand. No. 12 alum. 17.00-17.50

WAREHOUSE IRON AND STEEL PRICES

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS

Baltimore	4.00c
Birmingham	3.85c
Boston††	4.05c
Buffalo	3.90c
Chattanooga	4.21c
Chicago (j)	3.85c
Cincinnati	4.05c
Cleveland	3.75c
Detroit	3.93½c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.96c-4.11c
New Orleans	4.20c
New York‡ (d)	4.12c
Pitts. (h)	3.80c
Philadelphia	4.00c
Portland	4.50c
San Francisco	4.20c
Seattle	4.45c
St. Louis	4.09c
St. Paul	4.10c-4.25c
Tulsa	3.35c

IRON BARS

Portland	3.50c
Chattanooga	4.21c
Baltimore*	3.25c
Cincinnati	4.05c
New York‡ (d)	3.65c
Philadelphia	4.00c
St. Louis	4.09c

REINFORCING BARS

Buffalo	3.10c
Birmingham	3.85c
Chattanooga	4.21c
Cleveland (c)	2.55c
Cincinnati	3.75c
Houston	3.25c
Los Angeles, c.l.	2.975c
New Orleans*	3.24c
Pitts., plain (h)	2.55c
Pitts., twisted squares (h)	3.95c
San Francisco	2.97½c
Seattle	2.975c
St. Louis	3.99c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES

Baltimore	3.90c
Birmingham	3.75c
Boston††	3.92c
Buffalo	3.80c
Chattanooga	4.11c
Chicago	3.75c
Cincinnati	3.95c
Cleveland	3.86c
Detroit	3.95c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.86c
New Orleans	4.10c
New York‡ (d)	3.97c
Philadelphia	3.90c
Pittsburgh (h)	3.70c
Portland (l)	4.25c
San Francisco	4.05c
Seattle (l)	4.25c
St. Louis	3.99c
St. Paul	4.00c
Tulsa	3.60c

PLATES

Baltimore	3.90c
Birmingham	3.75c
Boston††	3.93c
Buffalo	3.80c
Chattanooga	4.11c
Chicago	3.75c
Cincinnati	3.95c
Cleve., ¼-in., o'r	3.86c
Detroit	3.95c
Detroit, ⅜-in.	4.15c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.86c
New Orleans	4.10c
New York‡ (d)	4.00c
Philadelphia	3.90c
Phila. floor	5.25c
Pittsburgh (h)	3.70c
Portland	4.25c
San Francisco	4.05c
Seattle	4.25c
St. Louis	3.99c
St. Paul	4.00c
Tulsa	3.60c

NO. 10 BLUE

Baltimore	3.95c
Birmingham	3.80c
Boston (g)	4.00c
Buffalo, 8-10 ga.	3.97c
Chattanooga	4.16c
Chicago	3.85c
Cincinnati,	4.00c
Cleveland	3.91c
Det. 8-10 ga.	3.93½c
Houston	3.45c
Los Angeles	4.50c
Milwaukee	3.96c
New Orleans	4.35c
New York‡ (d)	4.07c
Portland	4.25c
Philadelphia	4.00c
Pittsburgh (h)	3.75c
San Francisco	4.30c
Seattle	4.50c
St. Louis	4.39c
St. Paul	4.10c
Tulsa	3.80c

NO. 24 BLACK

Baltimore*†	4.50c
Birmingham	4.55c
Boston (g)	4.75c
Buffalo	4.80c
Chattanooga*	4.06c
Chicago	4.45c-5.10c
Cincinnati	4.75c
Cleveland	4.66c
Detroit	4.68½c
Los Angeles	5.05c
Milwaukee	4.56c-5.21c
New York‡ (d)	4.82c
Philadelphia	4.65c
Pitts.** (h)	4.75c
Portland	5.15c
Seattle	5.35c
San Francisco	5.15c
St. Louis	4.84c
St. Paul	4.75c
Tulsa	4.85c

NO. 24 GALV. SHEETS

Baltimore*†	4.70c
Birmingham	5.20c
Buffalo	5.45c
Boston (g)	5.30c
Chattanooga*	4.76c
Chicago (h)	5.10c-5.75c
Cincinnati	5.40c
Cleveland	5.31c
Detroit	5.40c
Houston	4.50c
Los Angeles	5.75c
Milwaukee	5.21c-5.86c
New Orleans*	5.75c
N. Y. ov. 10 bd.	5.00c
Philadelphia	5.30c
Pitts.** (h)	5.40c
Portland	5.90c
San Francisco	5.85c
Seattle	5.90c
St. Louis	5.49c
St. Paul	5.40c
Tulsa	5.20c

BANDS

Baltimore	4.20c
Birmingham	4.05c
Boston††	4.25c
Buffalo	4.22c
Chattanooga	4.41c
Cincinnati	4.25c
Cleveland	4.16c
Chicago	4.10c
Detroit, ⅛ & Und.	4.185c
Houston	3.35c
Los Angeles	4.80c
Milwaukee	4.21c
New Orleans	4.75c
New York‡ (d)	4.32c
Philadelphia	4.10c
Pittsburgh (h)	4.00c
Portland	5.00c
San Francisco	4.80c
Seattle	4.95c
St. Louis	4.34c
St. Paul	4.35c

HOOPS

Baltimore	4.45c
Boston††	5.25c
Buffalo	4.22c
Chicago	4.10c
Cincinnati	4.25c
Detroit, 14 & Und.	4.185c
Los Angeles	6.55c
Milwaukee	4.21c
New York‡ (d)	4.32c
Philadelphia	4.35c
Pittsburgh (h)	4.50c
Portland	6.50c
San Francisco	6.50c
Seattle	6.30c
St. Louis	4.34c
St. Paul	4.35c

COLD FIN. STEEL

Baltimore (c)	4.50c
Birmingham	4.91c
Boston*	4.65c
Buffalo (h)	4.35c
Chattanooga*	4.86c
Chicago (h)	4.30c
Cincinnati	4.50c
Cleveland (h)	4.30c
Detroit	4.30c
Los Ang. (f) (d)	6.85c
Milwaukee	4.41c
New Orleans	5.10c
New York‡ (d)	4.57c
Philadelphia	4.53c
Pittsburgh	4.15c
Portland (f) (d)	7.10c
San Fran. (f) (d)	6.80c
Seattle (f) (d)	7.10c
St. Louis	4.54c
St. Paul	4.77c
Tulsa	4.80c

COLD ROLLED STRIP

Boston	3.845c
Buffalo	3.79c
Chicago	3.87c
Cincinnati	3.82c
Cleveland (b)	3.60c
Detroit	3.43c
New York‡ (d)	3.92c
St. Louis	4.54c

TOOL STEELS

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

	Base
High speed	69c
High carbon, Cr.	45c
Oil hardening	26c
Special tool	24c
Extra tool	20c
Regular tool	16c
Water hardening	12½c

Uniform extras apply.

BOLTS AND NUTS

(100 pounds or over)

	Discount
Birmingham	50-10
Chicago (a)	55 to 60
Cleveland	60-5-5
Detroit	70-10
Milwaukee	60 to 65
New Orleans	60
Pittsburgh	65-5

(a) Under 100 lbs., 50 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Quantity base; (e) New mill classif. (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less; (l) Under 3 in.; (j) Shapes other than rounds, flats, fillet angles, 0.15c higher.

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

‡Domestic steel; *Plus quantity extras; **One to 9 bundles; *† 50 or more bundles; †New extras apply; ††Base 10,000 lbs., extras on less.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Dec. 9

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

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
PIG IRON			
Foundry, 2.50-3.00 Silicon	$30.00 6 0 0	$21.46	2 13 0
Basic bessemer	....	20.95	2 12 0
Hematite, Phos. .03-.05	36.25 7 5 0	.....	.....
SEMIFINISHED STEEL			
Billets	$39.38 7 17 6	$43 11	5 7 6
Wire rods, No. 5 gage	54.13 10 16 6	48.13	6 0 0
FINISHED STEEL			
Standard rails	$50.63 10 2 6	$46.12	5 15 0
Merchant bars	2.73c 12 5 0	2.17c to 2.27c	6 0 0 to 6 5 0
Structural shapes	2.37c 10 12 6	1.94c	5 7 6
Plates, ¼ in. or 5 mm.	2.58c 11 11 3	2.59c	7 2 6
Sheets, black, 24 gage or 0.5 mm	3.34c 15 0 0	3.18c	8 15 0††
Sheets, gal., 24 gage, corr.	4.18c 18 15 0	3.99c	11 0 0
Bands and strips	3.07c 13 15 0	2.36c	6 10 0
Plain wire, base	4.35c 19 10 0	2.54c	7 0 0
Galvanized wire, base	5.18c 23 5 0	3.18c	8 15 0
Wire nails, base	4.13c 18 10 0	2.90c	8 0 0
Tin plate, box 108 lbs.	$ 5.81 1 3 3	.....	.....

British ferromanganese $102.50 delivered Atlantic seaboard, duty-paid.

Domestic Prices at Works or Furnace—Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$26.50	5 6 0(a)	$18.84‡	554	$25.84‡	760	$25.41 63
Basic bessemer pig iron	25.00	5 0 0(a)	.....	.....	.....	.....	28.03 (b) 69.50
Furnace coke	9.38	1 17 6	6.43	189	7.31	215	7.66 19
Billets	39.38	7 17 6	28.56	840	32.64	960	38.92 96.50
Standard rails	2.26c	10 2 6	1.730c	1,150	2.06c	1,375	2.38c 132
Merchant bars	2.55c	11 9 0	1.62c	1,080	1.65c	1,100	1.98c 110
Structural shapes	2.46c	11 0 6	1.58c	1,055	1.65c	1,100	1.93c 107
Plates, ¼-in. or 5 mm.	2.61c	11 14 3	2.03c	1,350	2.06c	1,375	2.29c 127
Sheets, black	3.51c	15 15 0§	2.25c	1,500‡	2.36c	1,575‡	2.59c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	4.35c	19 10 0	3.30c	2,200	4.50c	3,000	6.66c 370
Plain wire	4.35c	19 10 0	2.28c	1,520	2.48c	1,650	3.11c 173
Bands and strips	2.72c	12 4 0	1.82c	1,210	2.33c	1,550	2.29c 127

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

**Gold pound sterling carries a premium of 64.7 per cent over paper sterling.

IRON AND STEEL SCRAP PRICES

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

HEAVY MELTING STEEL

Birmingham, No. 1.	10.00
Birmingham, No. 2.	9.00
Bos. dock No. 1 exp.	13.50-14.00
N. Eng. del. No. 1..	13.50
Buffalo, No. 1.....	12.50-13.00
Buffalo, No. 2.....	11.50-12.00
Chicago, No. 1	11.50-12.00
Cleveland, No. 1....	12.50-13.00
Cleveland, No. 2....	11.50-12.00
Detroit, No. 1.....	9.00- 9.50
Eastern Pa., No. 1..	14.50-15.00
Eastern Pa., No. 2..	13.00-13.50
Federal, Ill.	11.00-11.50
Granite City, R. R..	12.00-12.50
Granite City, No. 2.	11.00-11.50
New York, No. 1....	†11.00
N. Y. dock No. 1 exp.	13.50
Pitts., No. 1 (R. R.)	14.50-15.00
Pitts., No. 1 (dlr.)..	13.00-13.50
Pittsburgh, No. 2...	12.00-12.50
St. Louis, R. R.....	12.00-12.50
St. Louis, No. 2.....	11.00-11.50
San Francisco, No. 1	14.00-15.00
Seattle, No. 1	8.00
Seattle, No. 2	7.00
Toronto, dirs. No. 1.	12.00
Toronto, No. 2	11.00
Valleys, No. 1	13.50-14.00

COMPRESSED SHEETS

Buffalo, dealers ...	11.50-12.00
Chicago, factory ...	10.50-11.00
Chicago, dealer	10.00-10.50
Cleveland	12.00-12.50
Detroit	9.75-10.25
E. Pa., new mat. ..	14.50-15.00
E. Pa., old mat.....	10.50-11.00
Pittsburgh	13.00-13.50
St. Louis	7.25- 7.75
Valleys	12.50-13.00

BUNDLED SHEETS

Buffalo	9.50-10.00
Cincinnati, del.	9.50-10.00
Cleveland	9.00- 9.50
Pittsburgh	12.00-12.50
St. Louis	6.75- 7.00
Toronto, dealers ...	8.00

SHEET CLIPPINGS, LOOSE

Chicago	6.25- 6.75
Cincinnati	6.00- 6.50
Detroit	6.50- 7.00
St. Louis	5.50- 6.00

STEEL RAILS, SHORT

Birmingham	15.00
Buffalo	18.00-18.50
Chicago (3 ft.)	15.00-15.50
Chicago (2 ft.)	15.50-16.00
Cincinnati, del.	17.00-17.50
Detroit	14.50-15.00
Pitts., 3 ft. and less	17.50-18.00
St. Louis, 2 ft. & less	15.00-15.50

STEEL RAILS, SCRAP

Boston district	†11.00
Buffalo	15.50-16.00
Chicago	12.00-12.50
Cleveland	16.50-17.00
Pittsburgh	14.50-15.00
St. Louis	12.75-13.25
Seattle	10.00

STOVE PLATE

Birmingham	8.00- 8.50
Boston, district	†7.00- 7.25
Buffalo	11.50-12.00
Chicago, net	8.50- 9.00
Cincinnati, dealers..	5.50- 6.00
Detroit, net	8.50- 9.00
Eastern Pa.	12.50-13.00
New York, fdry. ...	†8.50- 9.00
St. Louis	9.00- 9.50
Toronto, deal'rs, net	10.00

SPRINGS

Buffalo	18.00-18.50
Chicago, coil	17.00-17.50
Chicago, leaf	15.50-16.00
Eastern Pa.	18.00-18.50
Pittsburgh	17.50-18.00
St. Louis	14.75-15.25

ANGLE BARS—STEEL

Chicago	14.00-14.50
St. Louis	12.50-13.00

RAILROAD SPECIALTIES

Chicago	15.50-16.00

LOW PHOSPHORUS

Buffalo, crops	18.50-19.00
Cleveland, crops ...	19.50-20.50
Eastern Pa., crops..	19.00-19.50
Pittsburgh, crops...	18.00-18.50

FROGS, SWITCHES

Chicago	11.50-12.00
St. Louis, cut	12.50-13.00

SHOVELING STEEL

Federal, Ill.	11.00-11.50
Granite City, Ill....	11.00-11.50
Toronto, dealers....	10.00

RAILROAD WROUGHT

Birmingham	11.00-11.50
Boston district	†9.00- 9.50
Buffalo, No. 1	11.00-11.50
Buffalo, No. 2	13.00-13.50
Chicago, No. 1 net..	10.00-10.50
Cincinnati, No. 2...	9.50-10.00
Eastern Pa., No. 1..	15.50-16.00
St. Louis, No. 1....	8.00- 8.50
St. Louis, No. 2....	11.00-11.50
Toronto, No. 1 dlr...	16.00

SPECIFICATION PIPE

Eastern Pa.	13.50-14.00
New York	†9.00- 9.50

BUSHELING

Buffalo, No. 1	11.50-12.00
Chicago, No. 1	10.00-10.50
Cincin., No. 1, deal..	8.50- 9.00
Cincinnati, No. 2...	3.00- 3.50
Cleveland, No. 2...	8.50- 9.00
Detroit, No. 1, new.	9.00- 9.50
Valleys, new, No. 1	12.50-13.00
Toronto, dealers....	9.00

MACHINE TURNINGS

Birmingham	6.00- 7.00
Buffalo	9.00- 9.50
Chicago	6.50- 7.00
Cincinnati, dealers..	4.00- 4.50
Cleveland	7.50- 8.00
Detroit	5.00- 5.50
Eastern Pa.	8.50- 9.00
New York	†5.00- 5.50
Pittsburgh	7.00- 7.50
St. Louis	5.00- 5.50
Toronto, dealers ...	8.00- 8.50
Valleys	9.50-10.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	†2.00
Buffalo	9.00- 9.50
Cincinnati, dealers..	3.50- 4.00
Cleveland	9.00- 9.50
Detroit	6.00- 6.50
Eastern Pa.	8.00- 8.50
New York	†4.50- 5.00
Pittsburgh	7.00- 7.50
Toronto, dealers....	8.00- 8.50

CAST IRON BORINGS

Birmingham	6.00- 7.00
Boston dist. chem...	†7.50- 8.00
Bos. dist. for mills	†7.00- 7.50
Buffalo	9.00- 9.50
Chicago	7.00- 7.50
Cincinnati, dealers..	3.50- 4.00
Cleveland	9.00- 9.50
Detroit	6.00- 6.50
E. Pa., chemical....	13.50-14.00
New York	†4.50- 5.00
St. Louis	5.00- 5.50
Toronto, dealers....	9.00

PIPE AND FLUES

Cincinnati, dealers..	7.00- 7.50
Chicago, net	7.50- 8.00

RAILROAD GRATE BARS

Buffalo	9.50-10.00
Chicago, net	8.50- 9.00
Cincinnati	5.50- 6.00
Eastern Pa.	12.50-13.00
New York	†8.50- 9.00
St. Louis	9.00- 9.50

FORGE FLASHINGS

Boston district	†6.50
Buffalo	11.50-12.00
Cleveland	11.00-11.50
Detroit	8.50- 9.00
Pittsburgh	12.00-12.50

FORGE SCRAP

Boston district	†6.50
Chicago, heavy	15.50-16.00

ARCH BARS, TRANSOMS

St. Louis	15.50-16.00

AXLE TURNINGS

Boston district	†7.50
Buffalo	13.00-13.50
Chicago, elec. fur...	11.50-12.00
Eastern Pa.	12.00-12.50
St. Louis	9.50-10.00
Toronto	9.50

STEEL CAR AXLES

Birmingham	16.00-17.00
Buffalo	18.00-18.50
Boston district	†14.00
Chicago, net	17.00-17.50
Eastern Pa.	20.50-21.50
St. Louis	18.50-19.00

SHAFTING

Boston district	†15.00
New York	†15.50-16.00
Eastern Pa.	19.00-19.50
St. Louis	13.00-13.50

CAR WHEELS

Birmingham	14.00-15.00
Boston dist., iron...	†10.00
Buffalo, steel	18.50-19.00
Chicago, iron	14.50-15.00
Chicago, rolled steel	15.50-16.00
Cincinnati, iron	15.00-15.50
Eastern Pa., iron..	16.50-17.00
Eastern Pa., steel..	18.00-18.50
Pittsburgh, iron	15.00-15.50
Pittsburgh, steel ..	17.50-18.00
St. Louis, iron	14.00-14.50
St. Louis, steel	14.75-15.25

NO. 1 CAST SCRAP

Birmingham	14.00-14.50
Boston, No. 1 mach.	†11.00
N. Eng. del. No. 2..	12.00
N. Eng. del. textile.	15.50-16.00
Buffalo, cupola	13.50-14.00
Buffalo, mach.	14.50-15.00
Chicago, agri. net..	10.50-11.00
Chicago, auto	11.50-12.00
Chicago, railr'd net	10.50-11.00
Chicago, mach. net.	12.00-12.50
Cincin., mach. cup...	10.50-11.00
Cleveland, mach....	17.00-17.50
Eastern Pa., cupola.	16.00-16.50
E. Pa., mixed yard.	13.50-14.00
Pittsburgh, cupola..	16.00-16.50
San Francisco, del..	13.50-14.00
Seattle	8.00
St. Louis, No. 1....	12.00-12.50
St. L., No. 1, mach.	12.50-13.00
Toronto, No. 1, mach., net	14.00-15.00

HEAVY CAST

Boston dist. break..	†8.50
N. Eng., del.	12.50-13.00
Buffalo, break	11.50-12.00
Cleveland, break....	14.50-15.50
Detroit, break.	10.00-10.50
Detroit, auto net...	12.50-13.00
Eastern Pa.	14.00-14.50
New York, break. ..	†10.50-11.00
Pittsburgh	13.00-13.50

MALLEABLE

Birmingham, R. R.	12.50-13.50
New England, del...	16.00
Buffalo	14.00-14.50
Chicago, R. R.	14.00-14.50
Cincin., agri. del...	10.50-11.00
Cleveland, rail	15.50-16.00
Detroit, auto	11.50-12.00
Eastern Pa., R. R. ..	16.50-17.50
Pittsburgh, rail	13.75-14.25
St. Louis, R. R.	14.00-14.50

RAILS FOR ROLLING

5 feet and over

Birmingham	16.00-17.00
Boston	†12.00
Chicago	14.00-14.50
Eastern Pa.	18.00-18.50
New York	†15.00-15.50
St. Louis	13.75-14.25

LOCOMOTIVE TIRES

Chicago (cut)	16.00-16.50
St. Louis, No. 1	14.75-15.25

LOW PHOS. PUNCHINGS

Buffalo	17.50-18.00
Chicago	14.00-14.50
Eastern Pa.	18.00-18.50
Pittsburgh (heavy).	16.00-16.50
Pittsburgh (light)..	14.00-14.50
Seattle	15.00

Iron Ore

Lake Superior Ore

Gross ton, 51½%

Lower Lake Ports

Old range bessemer.....	$5.25
Mesabi nonbess.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbess.	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-10.00
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, f.a.s. Atlantic

Foreign manganiferous ore, 45.55% iron, 6-10% man. nom.	12.00
No. Afr. low phos.	nominal
Swedish low phos...	17.00-18.00
Spanish No. Africa basic, 50 to 60% nom.	12.00
Tungsten, sh. ton, unit, duty paid...nom.	$24.00
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f..	$25.50-26.50

Manganese Ore

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52% .. .. non.	45.00
So. African, 50-52% ..... non.	45.00
Indian, 50-52%	Nominal

Sheets

Sheet Prices, Page 86

Pittsburgh — Orders for steel sheets are in slightly larger volume but for delivery early next year. Evidently buyers are seeking preferred position for early 1938 shipment. Some prompt shipment business also is going, but it appears largely supplementary to orders now on books. The trade's feeling is that considerable sheet business will be placed late this month, or after inventory, which may step up mill operating rates.

Formed roofing and flat galvanized sheet sales practices have been changed somewhat. The 15-cent quantity discount for 100 pounds now is made to apply to individual sales of 40,000 pounds, or more, for shipment at one time to one destination. Previously this discount had applied to 80,000 pounds of the light gage. A functional discount of 10 cents per 100 pounds now is given on flat galvanized sheets to jobbers and dealers on material for retail purposes. Heretofore this functional discount was not granted.

Independent sheet mill operations have sagged a trifle, mills rolling common black sheets dropping to 32 per cent of capacity, against 36 per cent last week, while jobbing mills retain their unchanged rate at 28 per cent, and galvanizing mills also are unchanged at 36 per cent.

Cleveland — Producers announced late last week that the $2 a ton jobbers discount has been restored on flat galvanized sheets and formed roofing of 26, 28 and 29 gage only. An adjustment in quantity discounts also went into effect on formed roofing sheets. The carload discount of 15 cents per 100 pounds now applies on 40,000 pounds instead of 80,000 pounds. Volume of specifications remain unchanged at the discouraging level during the latter part of November. Current buying is limited to small tonnages for only actual requirements. Some orders have appeared for shipment in January, but have not reached any appreciable volume. Most producers are attempting to bunch orders so as to operate at least some of their finishing mills that are now closed. If such a move is successful it will be of much benefit to those workers now unemployed, particularly during the holiday season.

Chicago — Sheet demand continues to benefit from the small volume of inventories of many consumers. This situation also is reflected in automotive demand. Rush shipment frequently is requested as a consequence of the low status of

consumers' stocks but total improvement is relatively small from the standpoint of tonnage. .Deliveries continue three weeks and less, producers' backlogs permitting prompt rolling of new business.

Boston—Sheet buying is less active as several consumers who have been taking car lots from time to time are curtailing specifications in line with operations. Heating and sheet metal shops have passed their active season, which in some respects was disappointing to sellers of sheets. Jobbers are buying little and miscellaneous industrial needs are spotty.

New York — Incoming sheet business remains at the low rate of the last two or three weeks with little general improvement in sight after the turn of the year. Consumers, meanwhile, are making fair inroads into stocks, although the average operating rate of sheet fabricators continues downward. Mills can make deliveries promptly on practically all grades.

Philadelphia — The market for steel sheets shows little life except for light miscellaneous buying. Leading automotive interests have made few additional commitments. One plant is more active on Ford work but the material is being bought at Detroit. Stove and radio makers are operating at a low rate and contributing little in new orders or releases.

St. Louis — Moderate betterment is noted in demand for steel sheets. The improvement is confined largely to miscellaneous users. An east side mill sold a round tonnage of sheets for delivery in January. This is the first transaction of size reported in several weeks. Consumption by the principal groups of users continues to decrease, but consumer inventories are also declining and purchasing is looked for after the first week of the new year. There has been some expansion in the movement of galvanized sheets, mainly to the south.

Birmingham, Ala. — Anticipated demand for sheets has failed thus far to materialize, although producers are confident the new year will bring new impetus, due to the extremely low ebb of dealer stocks.

Strip

Strip Prices, Page 87

Pittsburgh—Strip steel mills continue to receive a fair inflow of new business, much of it in narrower widths of cold-rolled. Hot-rolled is in fair demand but not quite so heavy as last week. Cold strip mills are operating around 30 per cent, against 31 per cent last week; but hot-rolled mill operations are unchanged this week at 30 per cent. Most of the new business is miscellaneous in character, auto partsmakers not adding appreciably to their commitments at this time.

Cleveland — Inventory position of most consumers of hot and cold-rolled strip has improved somewhat, but not to the extent hoped for. This is primarily due to curtailed operations among most consumers, which in effect has distorted present inventories far out of proportion to current requirements. According to some sellers a few orders have been received recently from customers who have not been in the market in over two months, indicating that some customers have need for more material.

Chicago—While strip demand still is slow, business is showing small gains. Automotive shipments are slightly heavier and some consumers are in the market for the first time in several months. Only small stocks will be carried over into next year by most users. Prompt delivery is available on both hot and cold-rolled.

Boston—Narrow cold strip operations are around 30 per cent of capacity as buying of a fill-in character continues. While some producers have specifications for shipment early next quarter the tonnage is negligible and most incoming volume is for small lots with prompt shipment specified. Several strip consuming industries in New England have further curtailed consumption, notably shoe manufacturing. Shoe shanks take a substantial tonnage of cold strip under normal conditions. Hot strip demand is dull. Prices are holding.

New York—Strip demand, cold-rolled and hot, continues light with eastern mill operations around 30 per cent of capacity. Most cold rollers are heavily stocked with hot strip while consumers of the former continue to work off inventories with some curtailment in operations. Prompt delivery is asked on all specifications and individual orders are small. Reaffirming of tin plate prices for the first nine months of next year has added confidence as to strip and other light steel prices next quarter.

Philadelphia — Recent quiet in demand for steel strip continues although some demand from stamping plants is noted. Prices are well maintained.

Birmingham, Ala. — Strip production is at the lowest mark of several months since the sustaining force of cotton ties is no longer evident.

Plates

Plate Prices, Page 86

Philadelphia — Platemakers here are inclined to believe the low point has been passed, as miscellaneous buying is a little better. The total volume, however, is greatly restricted, evidenced by the fact that at least three mills are operating only one furnace each. New York Shipbuilding Co., Camden, N. J., has been awarded two tenders by the navy department, involving about 12,500 tons of steel, including 9000 tons of plates. Yards in this vicinity expect to be allotted part of the Standard Oil Co. of New Jersey tankers, on which bids have been taken. Bids have been placed on eight but chances are good that 12 may be bought.

Cleveland — Sellers note little change in currently disappointing volume of orders from miscellaneous sources. The local mill is operating only when orders have accumulated for a week to ten days operation. Considerable tonnage is involved in miscellaneous ship repairs soon after the first of the year.

Chicago — Plate demand has been stimulated slightly by better releases against orders for freight car material. Miscellaneous buying is a shade better but activity still is restricted and deliveries of one week to ten days are available on new business. Tank fabricators still are fairly busy despite the sharp reduction in backlogs the past several months.

Boston—Plate business is being placed in dribbling lots with few full car orders. The larger orders, few in number, are made up of a variety of specifications, delivery on some of which are subject to delay depending on mill rolling schedules. There is no advance buying in volume. The Boston & Maine railroad has closed its repair shops at Billerica, Mass., and Concord, N. H., until after the first of the year.

New York — Construction of two destroyers taking several thousand tons each, mostly plates, has been awarded to the Charleston, S. C., and Puget Sound, Wash., navy yards.

Birmingham, Ala.—Nothing more substantial than scattered odds and ends is contributing to the production of plates. While there is reason to anticipate an increase in demand, it is not probable any perceptible improvement will be seen immediately.

Seattle — In addition to opening bids for 20,000 tons of plates required for penstocks and inlet pipes,

Coulee project, bureau of reclamation, Denver, will open tenders Jan. 6 for erection of a fabricating plant at the site as the large diameter pipes cannot be transported overland. Same office has not announced awards of unstated tonnages involved in the Owyhee penstock project, bids opened Nov. 24. Bids are in for 1200 tons involved in a land dredge line for Fort Peck, Mont. Tacoma opened bids Dec. 6 for 700 tons of 36 and 48-inch water supply line. Pittsburgh-Des Moines Steel Co. is low for a large water tank, 165 tons, for McNeil Island prison, Wash. Figures exceed appropriation and award is pending.

Plate Contracts Placed

1500 tons, oil tanker, Socony-Vacuum Oil Co., to Manitowoc Ship Building Corp., Manitowoc, Wis.

350 tons, seven tanks, Gulf Oil Corp., Alabama and Tennessee, to Chattanooga Boiler & Tank Co., Chattanooga, Tenn.

125 tons, 250,000-gallon tank and tower, Vancouver, Wash., to Seattle Boiler Works, Seattle.

100 tons, 12-in. welded steel pipe, Pomona, Calif., to Southern Pipe & Casing Co., Los Angeles.

Plate Contracts Pending

20,000 tons, penstocks and inlet pipes Coulee dam, Washington; bids to bureau of reclamation, Denver, Jan. 6.

14,000 tons armor plate, navy department; bids Dec. 29 to chief bureau of ordnance, Washington.

1200 tons, land dredge line, Fort Peck, Mont.; bids in.

700 tons, 36 and 48-inch water supply pipe, Tacoma, Wash.; bids in.

165 tons, water tank and tower, McNeil Island Prison, Washington; Pittsburgh-Des Moines Steel Co., low.

Bars

Bar Prices, Page 86

Pittsburgh—Against the impending inventory season, little new buying of hot-rolled steel bars is noted in common steel or alloy bars. Such purchases as are being made are for fill-in purposes and of miscellaneous sizes for depleted stocks.

Cleveland — Consumers of alloy and commercial carbon steel bars have shown little interest in specifying for more than actual requirements. Local forging concerns still have a substantial stock when related to their current rate of operations. Some have depleted inventory to the point where renewed buying has become necessary, but this is not general and because of this no real buying movement is expected until the middle of January.

Chicago — Bar sales show moderate improvement. A small increase in automotive needs is ac-

companied by better demand from miscellaneous consumers who have found stock replenishment necessary. Orders frequently call for rush shipment, indicative of the low state of inventories. Bar producers generally are able to give prompt shipment. Farm equipment manufacturers expect a maintenance of good business and current operations are based on that assumption.

Boston — Commercial bar buying continues light and irregular with small orders for alloy and forging material fairly well maintained. Bids are being taken on 100 tons of nickel steel bars, alloy steel rod and hexagon steel nuts for Charlestown, Mass., navy yard, mostly bars, closing Dec. 14.

New York—Commercial steel bar demand is light, with consumers reducing inventories as much as possible and making only such replacements as are absolutely necessary pending the approaching inventory season. Machine tool builders relatively are still specifying the most actively, but not on the scale of two months or even one month ago. Railroad and bolt and nut specifications continue exceedingly light. Cold drawn bar business is also lagging.

Philadelphia — Some miscellaneous bar demand is noted, but the volume is expected to be restricted for at least a month. Railroads are holding in abeyance fairly heavy requisitions for bars and other material for ordinary maintenance work, perhaps until some inkling is given of possible rate increase. Prices are generally steady.

Pipe

Pipe Prices, Page 87

Cleveland — Steel and cast iron pipe awards are limited to small tonnages individually, although the aggregate has offered considerable encouragement. J. B. Clow & Son Co., Cleveland, was low bidder on 455 tons of cast pipe for an extension to the water distribution system, Sandusky, O. The same company was awarded 120 tons of cast pipe for a water distribution PWA project at Geneva, O. Jobber stocks of standard steel pipe while ample to satisfy current requirements, are well below normal. Prices are firm.

Chicago—Chicago has asked bids for 375 tons of 16-inch pipe but most other inquiries are small. Some orders are in the formative stage but sellers anticipate little immediate improvement in buying. Shipments are light and backlogs are small.

New York—Low bid on 302 tons, 12-inch cement-lined cast pipe for New York city, was $56.20, delivered, and on 113 tons, 20-inch, $55.60, bids closing Dec. 3, the material being awarded the low foundries. New inquiry is light, but several substantial lots are expected out for estimates soon after the first of the year. Miscellaneous small-lot demand is fairly active.

Philadelphia — Pipe manufacturers are encouraged over prospects for residential construction program. Current operations are now around 35 per cent.

Birmingham, Ala. — Pipe is the brightest spot in the district's picture this week with announcement by American Cast Iron Pipe Co. of a 10,000-ton order from Corpus Christi, Tex. The new business is valued at more than $450,000 and will assure production in that department for at least five months. Specifications call for 30-inch pipe for a 16-mile water line.

San Francisco—Close to 1200 tons of cast iron pipe was placed and brought the total for the year to 27,061 tons, compared with 45,137 tons for the corresponding period

in 1936. Largest award called for 715 tons for the East Bay municipal utility district, Oakland.

Seattle—Low bidder for construction of the Ninth avenue SW cast iron pipe line, Seattle, involving 1300 tons of 8-inch, is Queen City Construction Co., Seattle. Award awaits federal approval. D. M. Manning, Hysham, Mont., is low at $52,659 for water system reconstruction at Three Forks, Mont., involving 450 tons of 6, 8 and 10-inch cast iron. Vancouver, Wash., opened bids Dec. 6 for about 300 tons of cast iron. Ontario, Oreg., will receive bids Dec. 16 for a low pressure system, $66,000 available, including intake, reservoir, pipe and accessories. Crane Co., Seattle, has been awarded 250 tons, 2 to 10-inch o. d. steel pipe and fittings for King county district No. 7. Award of 7000 feet of 10-inch steel pipe is pending at Toledo, Oreg.

Steel Pipe Placed

250 tons, 2 to 10-inch mains, King county district No. 7, Seattle, to Crane Co., Seattle.

Unstated tonnage, 50 lengths, 24--inch shore, pipe, U. S. engineer, New Orleans, to Treadwell Construction Co., Midland, Pa., schedule No. 1096-38.207.

Cast Pipe Placed

10,000 tons 30-inch, for Corpus Christi, Tex., to American Cast Iron Pipe Co., Birmingham, Ala.

715 tons, 6 and 8-inch, East Bay municipal utility district, Oakland, Calif.; allocated as follows: to United States Pipe & Foundry Co., Burlington, N. J., 383 tons 6-inch and to American Cast Iron Pipe Co., Birmingham, Ala., 332 tons.

415 tons, 12 and 20-inch, cement-lined, New York City, 302 tons, 12-inch, to United States Pipe & Foundry Co., Burlington, N. J., and 113 tons, 20-inch, to Donaldson Iron Works, Emaus, Pa.

181 tons, 4 to 8-inch, Class 250, San Bernardino, Calif., to National Cast Iron Pipe Co., Birmingham, Ala.

150 tons, 16 and 18-inch, Holtville, Calif., to United States Pipe & Foundry Co., Burlington, N. J.

Cast Pipe Pending

1300 tons, 8-inch, Ninth avenue SW district improvement, Seattle; Queen City Construction Co., Seattle, low.

450 tons, 6, 8 and 10-inch for Three Forks, Mont.; D. M. Manning, Hysham, Mont., low.

431 tons, 6 to 10-inch, Three Forks, Mont.; general contract to D. M. Manning Hysham, Mont. 294 tons, disposal plant, Pueblo, Colo.; bids Dec. 15.

375 tons, 16-inch, Chicago; bids Dec. 14.

300 tons, Vancouver, Wash., improvement; bids opened.

Unstated tonnage, 225,000 feet of 6 to 16-inch water mains, Lake, Wis.; Wenzel & Henoch Co., Milwaukee, low bidder on general contract at $669,550.

Wire

Wire Prices, Page 87

Pittsburgh — Slightly less business has developed in wire and wire products than last week. Jobbers are not expected to re-enter the market until after the end of the year, and regular consumers are expected to do likewise until after inventory.

Cleveland — Specifications for merchant wire products and manufacturers' wire continue to lag, showing little change over the past two weeks. One seller reports receiving a few orders of a moderate tonnage from some customers who have not been in the market within the last two to three months, indicating to some extent that inventories in a few instances at least have been depleted to the point where additional buying has become necessary. Most producers have substantially curtailed operating schedules and have generally followed the stagger system in dividing up the work among the men.

Chicago — Wire orders continue small, with little change shown in total business despite occasional gains in demand from manufacturers' wire consumers. Wire use is expected to be light for the next several weeks while jobbers in many

Behind the Scenes with STEEL

He Reads

■ Herewith we present in person one of STEEL's authors, Edwin J. Ryan, whose opus done in conjunction with Mr. N. M. Kiener appears on page 53 of this week's book. Both of these gentlemen are from the N'Yawk 'n' Noo Joisey Lubricant Co., and this photo is merely another step in our unending flood of propaganda intended to prove reader-

ship of STEEL, which really needs no proving at all to the 68,000 and more gentlemen who *do* read it each week. Mr. Ryan sent this photo to us to prove two things—(a) that he knows which end of a magazine to hold up when having his picture taken, and (b) that he is not left-handed. Furthermore, we know he is reading the Materials Handling story on page 54 of the November 15 issue. We are going to write in to headquarters of the Junior G-Men any day now and ask for a promotion, or anyhow exchange our brass badge for a stainless steel one.

Oyez and Yoicks

■ TO OUR desk has come a proclamation, size large x long, issued by the most estimable governor of the Commonwealth of Pennsylvania and suitable for framing. Proclaiming thanksgiving for 300 years of Godly Civilization, the epistle says in effect that there will be celebrating of the 300 years next year. The only connection to STEEL which could be located in the sheet was the large amount of land stolen from the Indians to start the whole thing going.

Big Man

■ Chicago has long been noted for the mass production methods used by its underworld in creating colossal crimes. However, recently we were notified of a new effort which takes some sort of a prize for elephantine antics. The lad who pulled this stuff has since been incarcerated, to make the world safe for industrialists. When dragged into the courtroom, he was charged with having stolen such items as four buildings, some electric cranes and hoists, a few derricks, some boilers, and numerous machine tools. Fortunately the judge sent him up for a stretch, or he would probably have worked up to a point where he could carry off a few blast furnaces and definitely affect pig iron production in the windy city.

Java Book?

■ AMONG the more interesting of our correspondence lately has been a letter from the most respectful Yau Hoan-te, of Ban Hong Liong & Co., No. 80-82 Slomprettan street, Sourabaya, Java. Yau ordered a couple of books and asked for a list so he could look for another. Sort of piques our curiosities. After we found out from our vice-president in charge of Where Things Are that Sourabaya is in Java, we looked it up on a map to see what it looked like. Fine thing, these far flung metal industries, to be of interest even in far off Java. Wonder what kind of a boy Yau is.

—SHRDLU

cases are out of the market and are taking only limited shipments of merchant products.

Boston—Not until consumer inventories are materially lower is wire buying expected to improve. When this point will be reached is problematical, most sellers hopefully expecting a mild upturn next quarter, although stocks are being worked off more slowly than expected by most manufacturing industries. Textile mill equipment plants have slowed down. It is also evident many consumers overbought earlier in the year and are striving to clear out this stock. While light, buying is well diversified, for prompt shipment. Finishing mill operations in few instances are better than 30 per cent. Most producers have substantial supplies of wire rods. Prices are firm and unchanged.

New York—Wire buying appears to have leveled off at the recent low rate, dullness affecting practically all wire products with consumers working mostly on inventories. While consumption has declined further, material is still being worked off at a higher rate than current buying. In line with purchasers' determination to lower inventories, there is little activity in wire rods. Wire mill activities are estimated at 30-35 per cent. Volume booked for first quarter shipment is small. Wire prices are firm. A mild improvement in export demand for wire rods is noted, demand from abroad for rods having been small for some months. Exporters claim to be getting prices under domestic quotations on this business.

Birmingham, Ala.—Production of wire is at the lowest point of several months, but there is increasing evidence consumers will not be able to defer active buying a great deal longer, due to the low mark of stocks. Demand now, however, is particularly slow.

Rails, Cars

Track Material Prices, Page 87

Western railroads seem to be more confident of future conditions than eastern and last week placed 61,500 tons of rails with various mills, for early 1938 delivery. Northern Pacific has placed 30,000 tons, Western Pacific 22,000 tons and Southern Pacific 9500 tons in addition to its previous order for more than 30,000 tons. With orders from several roads in the Southeast these orders are giving the start of a good rail backlog.

Atchison, Topeka & Santa Fe has placed seven diesel locomotives with Electro-Motive Corp. and 43 stain-

less steel streamlined cars with Edward G. Budd Mfg. Co. for a fleet of fast trains. Bids will be opened Dec. 13 on 400 freight cars for Western Pacific.

St. Louis & San Francisco has asked court approval of a budget of $3,464,336 for 1938. This includes 75 miles of 112-pound rails, with accessories and 20 cabooses to be built in its own shops. St. Louis Southwestern is said to be preparing to build five freight locomotives in its own shops, believing it can do so more cheaply than to buy elsewhere. Missouri Pacific has been given court permission to loan $250,000 to Missouri Pacific Transportation Co., a subsidiary, for purchase of 20 highway buses.

The army will close bids Dec. 28 on 5 to 35 gasoline tank cars of 10,000 gallons capacity. Chesapeake & Ohio is inquiring for 14 passenger locomotive tenders and the White Pass & Yukon railroad for one locomotive.

Purchase of 275 freight cars in November is the smallest monthly total since August, 1936. Little prospect of buying this month is apparent. Comparisons follow:

	1937	1936	1935	1934
Jan.	17,806	2,050	24	152
Feb.	4,972	6,900	806	19,725
March ...	8,155	632	0	30
April	9,772	4,427	350	800
May	4,732	8,900	2	717
June	548	5,200	5,151	1,835
July	1,030	7,229	500	19
Aug.	1,475	225	200	105
Sept.	1,216	1,750	875	7
Oct.	1,355	2,210	1,250	75
Nov.	275	1,550	100	254
11 mos....	51,336	41,073	10,158	23,719
Dec.	.....	23,450	10,050	110
Total		64,643	19,308	23,829

Car Orders Placed

Atchison, Topeka & Santa Fe, 43 stainless steel passenger cars, to Edward G. Budd Mfg. Co., Philadelphia, Pa.

Locomotives Placed

Atchison, Topeka & Santa Fe, five 1800-horsepower and two 3600-horsepower diesel locomotives to Electro-Motive Corp., LaGrange, Ill.

Rail Orders Placed

Northern Pacific, 30,000 tons; 20,000 tons to Carnegie-Illinois Steel Corp., Chicago, 9000 tons to Bethlehem Steel Co., Bethlehem, Pa., 1000 tons to Colorado Fuel & Iron Co., Denver.

Southern Pacific, 9500 tons additional, for Texas-Louisiana line, to Bethlehem Steel Co., Bethlehem, Pa.

Western Pacific, 22,000 tons 100 and 112-pound rails and 6000 tons track fastenings to Columbia Steel Co., San Francisco, and Colorado Fuel & Iron Corp., Denver.

Metallurgical Coke

Coke Prices, Page 87

Further reduction in blast furnace activity in the Pittsburgh district has resulted in reducing beehive oven activities and softened furnace coke 25 cents. Foundries continue good operations and since fewer ovens are producing that grade its price is unchanged. By-product coke from steelworks oven surplus is steady at $5.50.

Shapes

Structural Shape Prices, Page 86

Chicago—Most fabricated shape inquiries are small while awards also are confined to lots of a few hundred tons at a time. There is some possibility that bids on the LaCrosse, Wis., bridge, involving 3100 tons, may be rejected.

San Francisco—Little change is noted in the structural shape market and inquiries continue to come forth slowly for figures. The largest award went to Columbia Steel Co., San Francisco, involving 277 tons for a telephone building at Glendale, Calif. The United States engineer office, Los Angeles, has taken bids on 248 tons for the Geneva street

eral hundred tons about to come out for bids.

Pittsburgh — Recent awards have and the West Brand boulevard bridges, and will open bids on Dec. 15 for 235 tons, for the Long Beach-Pacific Electric Railway bridge. Awards aggregated 1715 tons and brought the total for the year to 140,554 tons compared with 165,428 tons in 1936.

Seattle — Fabricating plants in Washington and Oregon are still working on backlogs and new projects are developing indicating fair tonnages for the first quarter. American Bridge Co. Pittsburgh has been awarded 425 tons for a bureau of roads bridge, Yellowstone Trail, Mont. Bids will likely be called in January for the Puget Island bridge, Wash., calling for 1000 tons, and for the Washington-Idaho span, also 1000 tons.

Birmingham, Ala.—A new note of optimism has appeared with disclosure that Ingalls Iron Works Co., Birmingham, has received specifications on approximately 12,000 tons for the Baton Rouge, La., bridge. While fabrication has not yet started, preliminary drawing room operations are completed, and work is expected to get under way on the business not later than Jan. 1.

Cleveland — Structural fabricators continue comparatively active on a number of small awards well under 100 tons. This work is primarily of a private nature, although considerable tonnage is pending for state bridges on which bids have been taken. Largest award last week went to W. B. Pollock Co., Youngstown, O., involving approximately 150 tons for platform and hand rails, in connection with Republic Steel Corp's. No. 3 blast furnace, Youngstown, O. Fabricated prices remain spotty, but mill prices are firm.

New York — Structural steel contracts are near the low point for the year with active pending inquiry light, although 3000 tons, mostly shapes, for the Flushing river bridge superstructure and the Northern boulevard grade separation closed Dec. 9. Buying is expected to be small the balance of the year with some pending tonnage held up for a clarification of conditions. Favorable factors include the selling of $10,000,000 bonds for New York state grade crossings and the approval of a city school building program of more than 40 units. Bids for the latter, estimated at 25.000 to 35,000 tons, to start early next year.

Philadelphia — Private work continues at low ebb, but Pennsylvania state institutional program is fairly active. Bids on Farm Show building, Harrisburg, requiring 1900 tons, will be taken Dec. 23. Bids also go in Dec. 21, on 2600 tons for a bridge at Hancock, Me. Close competition is evident for jobs available, but mill base prices are holding.

Shape Contracts Placed

5000 tons, tool and die shop, Ford Motor Co., Detroit, to Bethlehem Steel Co., Bethlehem, Pa.

850 tons, bridge, Abbeville, La., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

750 tons, warehouse, J. I. Case Co., Burlington, Iowa, to Rock Island Bridge & Iron Works, Rock Island, Ill.

455 tons, bridges, Flathead, Mont., to Minneapolis-Moline Power Implement Co., Minneapolis. Reported last week as going to unnamed interests.

440 tons, state highway bridge FAGH-442, Emerson, Iowa, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

425 tons, bureau of roads bridge, Yellowstone Trail, Mont., to American Bridge Co., Pittsburgh; G. D. Lyons, Spokane, general contractor.

310 tons, steam electric station, North Wichita, Kans., to Ben Sibbitt Iron & Foundry Co., Wichita.

300 tons, building, Libbey-Owens-Ford Glass Co., Streator, Ill., to Bethlehem Steel Co., Bethlehem, Pa.

280 tons, St. Michael's novitiate, Englewood, N. J., to F. G. Schaefer Iron Works, Edgewater, N. J.

277 tons, telephone building, Glendale, Calif., to Columbia Steel Co., San Francisco.

275 tons, bottling plant, Coca Cola Co., Providence, R. I., to J. H. Tower Iron Works, Providence, R. I.; Rowley Construction Co., Pawtucket, R. I., general contractor. Reported last week as going to another shop.

270 tons, state bridge, Tejon street, Colorado Springs, Colo., to Kansas City Structural Steel Co., Kansas City, Mo.

250 tons, building, Seagram-Distillers Corp., Lawrenceburg, Ind., to Louisville Bridge & Iron Co., Louisville, Ky.

230 tons, two bridges, Brookings county, South Dakota, to Bethlehem Steel Co., Bethlehem, Pa.

220 tons, New Jersey state bridges, Monmouth and Bergen counties.

190 tons, bridge, route 16, section 46-SF, Minneapolis, St. Paul & Sault Ste. Marie railway, Mundelein, Ill., to Milwaukee Bridge Co., Milwaukee.

185 tons, tractor plant addition, J. I. Case Co., Racine, Wis., to Lakeside Bridge & Steel Co., Milwaukee.

175 tons, mill building addition, Lisbon,

Shape Awards Compared

	Tons
Week ended Dec. 11	10,987
Week ended Dec. 4	13,526
Week ended Nov. 27.....	8,668
This week, 1936	26,985
Weekly average, 1936.....	16,332
Weekly average, 1937	23,585
Weekly average, November	24,633
Total to date, 1936.....	1,096,334
Total to date, 1937	1,179,223

Includes awards of 100 tons or more.

Me., to Lyons Iron Works, Inc., Manchester, N. H.

160 tons, grain storage building, J. Eichler Brewing Co., Brooklyn, N. Y., to Voepel Sons, Inc., New York.

150 tons, platform and hand rails, is connection with Republic Steel Corp's No. 3 blast furnace, Youngstown, O., to W. B. Pollock Co., Youngstown, O.

140 tons, 3 gate hoists, Alcove dam, Wyo., to unnamed interest.

125 tons, highway project RC 3911, Tioga county, New York, to Lackawanna Steel Construction Co., Buffalo; through Connell & Laub Co., Roscoe, N. Y.

125 tons, grade separation, Linden street, Queens, N. Y., Triborough Bridge authority, to Bethlehem Steel Co., Bethlehem, Pa.

125 tons, store building, Montgomery-Ward Co., Morgantown, W. Va., to Ingalls Iron Works, Birmingham.

120 tons, state highway bridge RC-3911, Apalachin, N. Y., to Lackawanna Steel Construction Corp., Buffalo.

100 tons, five passenger elevator shafts, for Pennsylvania railroad, Harrisburg, Pa., to American Steel Engineering Co., Philadelphia; Arundel Corp., Baltimore, general contractor.

Shape Contracts Pending

4000 tons, state bridge, Shetuckit river, Norwich, Conn.; N. Benvenuti & Sons, New London, Conn., low.

3120 tons, Mississippi river bridge, La Crosse, Wis.; Klug & Smith Co., Milwaukee, low bidder.

3000 tons, Flushing river bridge superstructure and Northern boulevard grade separation, New York; James Stewart & Co., New York, low.

3000 tons, extension to Briggs stadium, Detroit Baseball club, Detroit.

2600 tons, Potomac river bridge, Hancock, Md.; bids Dec. 21.

1900 tons, Farm show building, Harrisburg, Pa.; bids Dec. 23.

1000 tons, Puget Island bridge, Washington state; bids expected in January.

600 tons, school, Vestal, N. Y.

600 tons, sheet and H steel piling, piers Puget Island bridge, Wash.; Parker & Schram, Portland, low.

570 tons, high school building, Union free school district No. 1, Bay Shore, N. Y.

475 tons, bridge, Oyster Bay, N. Y.; to be rebid Dec. 20.

430 tons, state bridges in Flathead and Gallatin counties, Montana; Thomas Stanton, Great Falls, general contractor.

400 tons, Pulaski high school, Milwaukee; Milwaukee Bridge Co., Milwaukee, low bidder.

400 tons, addition public school 119, Bronx, N. Y.

325 tons crane runway, Water and Power department, Los Angeles; Bethlehem Steel Co., Los Angeles, low.

325 tons, bridge, Malcola, Ala.

300 tons, Harrisburg State hospital, Harrisburg, Pa.; bids Dec. 21.

300 tons, alterations and additions, Montgomery Ward & Co., Trenton, N. J.; bids Dec. 20.

300 tons, building, Houston, Tex.

290 tons, hangar and shop for Sand Point air station, Seattle; bids to supply officer Puget Sound navy yard, Wash., Dec. 20.

250 tons, Skykomish river state bridge, Wash.; Neukirch Bros., Seattle, general contractors.

250 tons, bridge repairs, Catawissa, Pa.; bids in; includes 24,000 square feet of steel flooring.

248 tons, Geneva street and West Brand boulevard bridges, United States engineer office, Los Angeles; Consolidated Steel Corp., Los Angeles, low.

240 tons, Paint creek bridge, Ross county, Ohio.

240 tons, high school building, Farrell, Pa.

235 tons, bridge, United States engineer, Los Angeles; bids Dec. 15 direct on steel.

235 tons, Long Beach main line Pacific Electric railway bridge, United States engineer office, Los Angeles; bids Dec. 15.

220 tons, state bridge Wahkiakum county, Washington; Mirene Co., Portland, general contractor.

210 tons, state highway bridge No. 1588, White Cloud, Ind.

200 tons, addition school 134, Queens, N. Y.

200 tons, school building, central rural school district No. 1, Elba, N. Y.

200 tons, state overpass bridges, Perth Amboy, N. J.

200 tons, bridge, Sylvania, Ga.

200 tons, power plant, Panhandle Power & Light Co., Sun Ray, Tex.

200 tons, bridge, Corydon, Ind.

190 tons, state highway bridge No. 1581, Hillsdale, Ind.

190 tons, state highway viaduct, Crowell, Nebr.

184 tons, hospital, Elizabethtown, Pa.; bids in.

180 tons, bridge, Auburn prison, Auburn, N. Y.; bids Dec. 14.

180 tons, state highway bridge 1586-B, Poland, Ind.

175 tons, building, Montgomery Ward & Co., Waterloo, Iowa.

175 tons, bridge, route 25 sections three C, N. J.; bids Dec. 20.

170 tons, school building, Union school district No. 7, Hartsdale, N. Y.

170 tons, theater, Harrisburg, Pa.

158 tons, Duquesne avenue bridge, United States engineer office, Los Angeles; bids opened.

150 tons, township high school, Niles Center, Ill.

150 tons, bridge No. 38, Chesapeake & Ohio railway, Brighton, O.

150 tons, approach spans, Boston & Maine railroad, Bangor, Me.

140 tons, central school, Dundee, N. Y.; bids in.

120 tons, roof trusses, Berkshire Symphonic Corp., Stockbridge,, Mass.

118 tons, addition, U. S. Gypsum Co., Philadelphia; bids in.

118 tons, hospital, Warren, Pa.; bids in.

100 tons, bridges Roza, Wash., irrigation project; Midwest Steel & Iron works, Denver, low.

Unstated, four wheel gates and hoists for Seminoe dam, Wyo., Phillips & Davies, Inc., Kenton, O., low.

Reinforcing

Reinforcing Bar Prices, Page 87

New York — Except for a 500-ton sewer project, Queens, N. Y., new inquiry is light. With 1285 tons being figured for a New Jersey tunnel approach and the Flushing river bridge, few large jobs are now pending and buying is generally in small lots. Steel piling inquiry is also sluggish with a Queens sewer project taking sev-

been a bit more numerous but the tonnages individually are small, none being over 350 tons. Sudden advent of near-zero weather is expected to slow up shipments. Prices of billet steel bars have been reduced by $2 a ton to 2.45c, Pittsburgh; 2.50c, Chicago, Cleveland, Buffalo, etc. Rail steel bars also have been reduced $2 a ton, with some sharp competition developing between rival mills in the Middle West.

Cleveland — A reduction of $2 per ton on billet and rail steel bars out of jobbers' stocks went into effect late last week. The mill base price to jobbers remains unchanged at 2.20c, Cleveland, but their functional allowance has been reduced from $8 to $6 a ton. The old mill base price to consumers has been reduced from 2.60c to 2.50c, Cleveland. New work continues spotty, limited to small tonnages. Most fabricators have more than ample stocks to satisfy current schedules.

Chicago — Awards have been few and inquiries are made up principally of small lots. A few pending jobs will take a fairly substantial tonnage, while several additional projects are in prospect. Bar distributors have only moderate backlogs while unfilled orders of producers also are light. Shipments, however, show only a moderate decrease since 30 days ago.

Birmingham, Ala. — Nothing more than scattered business, with production considerably down, is available in this district.

San Francisco — Little new reinforcing bar business has come out for figures and awards were limited to less than 650 tons. Unnamed interests took the largest letting, 207 tons for a crossing in San Luis Obispo county, California. Approximately 750 tons will be required in the barracks and warehouse for Hickam Field, T. H., up for figures on Dec. 30. Pending business does not exceed 2800 tons.

Seattle — Rolling mill operations have been adjusted to care for occasional small tonnages. Prospects for the balance of the year are not promising. In addition to 1157 tons for the Coulee projects, on which no award has been announced, about 700 tons are pending in Washington state and county jobs. School construction is rather active but only small tonnages of less than 100 tons each are involved.

Philadelphia — Pennsylvania state work includes 400 tons for the farm show building, Harrisburg, and 200 tons for the Harrisburg state hospital, on which bids are due Dec. 23 and 21 respectively. Some bar tonnage remains to be placed for several state jobs awarded to general contractors. Private work displaying little life despite slightly improved general run of small orders.

Boston — Confined to small miscellaneous needs, reinforcing steel buying is light with inquiry pending estimated at approximately 1000 tons, some of which will not be placed until early next year. Joseph T. Ryerson & Son Inc., was awarded the reinforcing steel for the Slades Ferry bridge, Fall River-Somerset, Mass.

Reinforcing Steel Awards

360 tons, building, Wisconsin Malting Co., Manitowoc, Wis., to Laclede Steel Co., St. Louis.
207 tons, crossing of Southern Pacific track, San Luis Obispo county, California, to unnamed interest.
200 tons, building, Masonic Home, St. Louis to Laclede Steel Co., St. Louis.
175 tons, school, Stillwater, Minn., to Truscon Steel Co., Youngstown, O.
142 tons, five culverts, in Montezuma and Dolores county, Colorado, to unnamed interests.
130 tons, bottling plant, Coca Cola Co., Providence, R. I., to Truscon Steel Co., Youngstown; through Rowley Construction Co., Pawtucket, R. I.
110 tons, power plant, Edison Electric Illuminating Co., Boston, to Northern Steel Co., Boston.
108 tons, Jughandle Creek bridge, Mendocino county, California, to Ceco Steel Products Co., San Francisco.
100 tons, swimming pool, Wellesley college, Wellesley, Mass., to Northern Steel Co., Boston.
100 tons, Abbott hospital addition, Minneapolis, to Cowin & Co., Minneapolis.
100 tons, school, St. Cloud, Minn., to Cowin & Co., Minneapolis.
100 tons, state highway bridge, Fargo, N. Dak., to Bethlehem Steel Co., Bethlehem, Pa.
100 tons, state highway bridge, Vermillion county, Illinois, to Calumet Steel Co., Chicago.
100 tons, state highway bridge, St. Paul, Minn., to Bethlehem Steel Co., Bethlehem, Pa.

Reinforcing Steel Pending

1600 tons, dam at Fort Peck, Mont.; Fegles Construction Co., Minneapolis, low.
750 tons, barracks and warehouse, Hickam Field, T. H.; bids Dec. 30.
500 tons, Jamaica sewage treatment

Concrete Bars Compared

	Tons
Week ended Dec. 11	2,032
Week ended Dec. 4	4,056
Week ended Nov. 27	4,635
This week, 1936	2,141
Weekly average, 1936	6,065
Weekly average, 1937	6,096
Weekly average, November	6,282
Total to date, 1936	318,058
Total to date, 1937	304,807

Includes awards of 100 tons or more.

plant, Queens, N. Y.; Luang Construction Co., Brooklyn, low.
400 tons, Farm Show building, Harrisburg, Pa. ;bids Dec. 23.
400 tons, Columbia avenue viaduct, city of Cincinnati, to Penker Construction Co., Cincinnati.
375 tons, high school, Norton, Kans.
375 tons, bridge, Lafayette street, Bay City, Mich.
200 tons, Harrisburg state hospital, Harrisburg, Pa.; bids Dec 21.
175 tons, Pulaski high school, Milwaukee; Kroening Engineering Co., Milwaukee, low.
175 tons, highway bridges, Middlesex county, New Jersey.
160 tons, postoffice, Canal street, New York, T. J. Waters Co., New York, low.
155 tons, highway work, Santa Cruz county, California; bids opened.
150 tons, highway projects, Blue Ridge parkway, North Carolina; bids Jan. 6 and 11 to bureau of public roads, agricultural department, Washington.
135 tons, Olympia boulevard bridge, Los Angeles; bids opened.
130 tons, Indiana women's prison, Indianapolis, Ind.
125 tons, foundations, sub station C, for Pacific Gas & Electric Co., Oakland, Calif.; bids opened.
119 tons, service building, for Cincinnati Chemical Co. Cincinnati.
100 tons, junior high school, Winona, Minn.
100 tons, bureau of roads bridge, Mount Rainier National Park, Wash.; Sam Orino, Bonneville, Oreg., general contractor.
100 tons, state bridge Grant county, Oreg.; Leonard & Slate, Portland, low.
100 tons, central school, Dundee, N. Y.; bids in.

Pig Iron

Pig Iron Prices, Page 88

Pittsburgh — With foundries limiting operating rates, sales of No. 2 foundry and malleable continue to be in scattered lots. A little basic is being sold. A partial survey made here indicates stocks on consumers' banks are not large and further purchases for first-quarter delivery may be expected within a reasonable time.

Cleveland — Sellers here report new business practically at a standstill. Many foundries have shut down completely until the end of the year for inventory purposes. Those still operating are on only a two or three-day schedule each week. Volume of contracting for first quarter delivery since prices were extended for that period has been light. No forward buying has appeared as foundries continue their policy of reducing inventories, and ordering only for actual requirements.

Chicago — Pig iron is slow, restricted by a further decrease in foundry operations, and December shipments are expected to show a decrease from November. Automotive consumption is unimproved but farm equipment manufacturers generally are operating at a high seasonal level. Foundries' stocks of iron, while low, will not require extensive replenishment until operations increase. New business is made up of small lots for early needs. Market is steady.

New York — Pig iron consumers continue to reduce stocks, making few new purchases. Sellers assert orders are still at approximately the lowest rate of the year to date.

Philadelphia — Pig iron market is slightly more active with consumers placing carlot orders for December requirements. Many consumers have placed few commitments for fourth quarter and stocks are now at the point where replenishment is necessary despite present curtailed rate of operations.

Buffalo — Pig iron shipments against contracts are further curtailed as foundries reduce inventories. Bookings for first quarter are developing slowly. A substantial amount of current quarter orders probably will be carried over into the new year. New buying is negligible and limited to immediate requirements. Producers hope for a revival in demand when foundries complete inventories.

Cincinnati—The foundry melt has slowed, resulting in further dullness in pig iron. Unless there is abrupt improvement in demand for castings, active buying may not be had until the middle or latter part of the quarter.

St. Louis — New purchasing of pig iron is confined to occasional small lots for spot shipment. However, shipments are holding up well, the daily average being only slightly below November. The melt as a whole continues to recede, with the most noticeable decline being in the stove industry. Highest rate of activity is in the farm implement industry, but even here seasonal recession is noted. Jobbing foundries report new business light and backlogs shrinking.

Birmingham, Ala. — Some further recession in output of pig iron is noted with removal by Gulfsteel division of Republic Steel Corp. of its Gadsden furnace. Otherwise, the picture remains unchanged with shipments holding up fairly well and a minimum of iron being stacked. Some optimism was given the pig iron situation in the South, however, with receipt by the American Cast Iron Pipe Co. of an order for 10,000 tons of 30-inch pipe for Corpus Christi, Tex.

Toronto, Ont.—With the year-end holiday season starting within the next couple of weeks, business in

the Canadian steel markets is beginning to taper and merchant pig iron sales have dropped from their previous high peak. Current awards are for lots of 50 to 200 tons with demand entirely for spot delivery. Weekly sales have fallen to less than 2000 tons. Producers have not yet opened books for first quarter and no forward buying is being done. Melters also are concerned with holding stocks at a minimum during inventory. Prices are firm and unchanged.

Scrap

Scrap Prices, Page 90

Pittsburgh — The scrap market here is developing strength but rather irregularly, with some of the railroad specialties gaining 50 cents to $1 on the strength of information from the closing of several important railroad lists in the past week. There is a better feeling in the trade and shipments are moving a trifle better. A leading consumer recently released shipment in part on some of its older orders, but since has reinstated some of the suspensions where plants are inoperative. This market appears to be about ready for some important movement, and meanwhile, brokers and dealers are keenly awaiting developments.

Chicago — A steadier tone has replaced the consistent weakness which had prevailed in the scrap market here for several months. Consumer buying still is light but prices paid by dealers and brokers represent advances over recent lows.

New York — Shipment of heavy melting steel to Pennsylvania has been resumed by at least one dealer, although the volume is light, with $11, f.o.b., being paid for No. 1 and $9 for No. 2. This development, coupled with steady prices being paid for barge delivery, is accompanied by improved sentiment in the scrap trade. Prices and deliveries indicate the low price has practically been reached.

Philadelphia—The scrap market shows further strength, attributable in part to export demand. Mills are well supplied in view of the current low rate of operations but some interest in additional commitments is evidenced as it is realized scrap is cheap at current levels. It is believed little tonnage could be bought at present prices, especially in areas competitive with export buying. Most dealers are not heavily stocked and generally are inclined to hold material for better prices. Stove plate and grate bars are up 50 cents on buying at the top of this range. Borings and turnings are moving to a district furnace on an $8.50 order. One mill is reported bringing in outside turnings on the basis of $7.50.

Buffalo — Sentiment in the iron and steel scrap market was bolstered further by partial lifting of the embargo on shipments by the leading consumer. The embargo has been in effect for about two months. Occasional inquiries for small lots are also appearing from mills. Inasmuch as consumers are well supplied it is believed the present low prices, more than lack of stock, are responsible for the interest shown.

Detroit—Improvement in other scrap centers is reflected here only sentimentally. Meanwhile dealers are marking time and see no likelihood of any upswing until after the first of the year. The Chevrolet list up for bidding this week went to out-of-town brokers at higher prices than the prevailing quotations here, but these sales are not considered as making the market here. These brokers took the tonnage for speculation and will hold the material for higher prices.

Cincinnati — Quotations on iron and steel scrap are unchanged. Steelmaking requirements are restricted and adequately covered by inventories. Dealer offerings have dwindled, the market conditions being such that they prefer to hold material, believing prices are at or near the bottom.

St. Louis — Prices of iron and steel scrap are nominally unchanged, but the tone of the market is noticeably firmer, and the belief prevails that the bottom of the current decline has been reached. Steel mills and other consumers are putting out quiet feelers for substantial tonnages, and it is understood that several would purchase at present prices if dealers were willing to sell.

Birmingham, Ala.—Scrap is stagnant with further price recessions likely before the end of the year after sliding already to the lowest mark of the season.

Seattle—Sales are confined to occasional small lots for foundry use as there is no mill and export demand. Dealers will not buy except at attractive prices for speculation.

Toronto, Ont.—Demand for iron and steel scrap is specialized with active trading reported in heavy melting steel, machinery cast, stove plate and wrought scrap. Other lines are moving slowly and dealers again are building up yard stocks.

Warehouse

Warehouse Prices, Page 89

Cleveland — Warehouse distributors report little change in character of orders, as most consumers continue to buy on a hand to mouth basis. Total sales and shipments during November were less than 50 per cent of the March peak and a still further decline is anticipated through the remainder of this month as the year-end inventory period nears. Prices remain firm.

Chicago—While sales are declining seasonally, some business is being received from consumers whose inventories have become depleted, and such demand is helping support

sales. Warehouses anticipate a continuation of present prices into first quarter.

New York — Buying from warehouse has declined. Recent reduction in galvanized sheets has not stimulated orders. Jobbers are buying little from mills, working off stocks instead.

Buffalo—Downward trend in sales from stock is not expected to turn until after the first quarter of next year. Sales are well below November and December last year.

Detroit—Steel jobbers continue to mark time, current sales being in comparable volume with other lines. Condition of inventories is being watched closely in smaller manufacturing plants where they have been excessive. This will be the key to trend of business in January; sentiment now is decidedly nonbullish for the first half of next year, although much may depend upon what is done to or for business at the current session of congress.

St. Louis — Colder weather has stimulated movement of certain seasonal items, notably tubular goods and certain grades of sheets. General manufacturing trade is fairly steady. Galvanized sheets are in fair demand and unchanged in price.

Tin Plate

Tin Plate Prices, Page 86

New York — Contracting in tin plate, since the recent affirmation of prices, is expected to get under way in larger volume as the month progresses. So far there has been only a modest amount. Meanwhile, requirements of most consumers are being supplied from stocks which were laid in prior to October 1 when contracts expired at the old prices.

Reaffirmation of domestic prices has not as yet stimulated export inquiry, but there is still a strong possibility. One explanation for the relative dearth in foreign demand recently has not only been uncertainty as to the trend in tin plate prices here but question as to how greatly engaged will be the sources of supply in various other producing countries.

Pittsburgh — Such tin plate mills as are operating are busy cleaning up the miscellaneous odds and ends at the tag end of the current season and very little new business is being booked as yet. Negotiations with canners and other users of tin plate have not yet started on the 1938 requirements. Largely, since tin plate prices have been reaffirmed for next year, these will cover tonnage needs in the new season ahead which have not been figured out yet.

Steel in Europe

Foreign Steel Prices, Page 89

London — (*By Cable*) — The nucleus of an iron and steel merchants' federation has just been formed and is expected to co-operate with the manufacturers' federation in controlling domestic prices and protecting the ultimate user. Members will have to qualify to obtain the official rebates. The present membership includes billets, bar iron, and steel merchants, light rails and tin plate. Scrap prices have been fixed for first half of 1938, practically at the present level. The markets generally are quiet and works are fully occupied well into 1938.

Iron Ore

Iron Ore Prices, Page 90

Cleveland — A new record was established this past season in iron ore tonnage moved through the locks at Sault Sainte Marie, Mich. Most of the ore originated from the Mesabi range in Minnesota. November

ore tonnage amounted to 1,583,732 tons, bringing the season's total to 65,575,278 short tons, well above the 47,069,935 tons locked through in 1936 and is nearly a million tons above the best previous record of 64,827,025 tons in 1929.

Nonferrous Metals

Nonferrous Metal Prices, Page 88

New York — Unsettlement in copper with electrolytic easing ¼-cent to 10.25c, Connecticut, and a reduction of 40 points in the tin export quota for the first quarter of 1938 were the outstanding developments in nonferrous metals last week.

Copper — Competition for business coupled with efforts of custom smelters to balance sales against ore intake developed an easy undertone in the domestic market. Prices eased to the 10.25-cent level on Thursday. Primary mine producers' market was quotably unchanged at 11.00c, Connecticut, although one producer quoted 10.50c.

Lead — Total sales for the week were satisfactory with buying interest centered in prompt metal.

Zinc — Business so far this month has exceeded the total for November although the daily pace usually was rather quiet. Prime western zinc held at 5.00c, East St. Louis, despite an increase of 17,167 tons in domestic supplies.

Tin — Prices fluctuated between 43.75c and 44.75c for Straits spot. The market advanced to the latter level on the reduction in the export quota to 70 per cent for the first quarter.

Industrial Congress Maps Broad Social Program

(*Concluded from Page* 28)

and undeserved share of the cost of labor disputes."

Among the directors of the association elected for 1938 are:

B. F. Campbell, vice president, Alabama Dry Dock & Shipbuilding Co., Mobile, Ala.; F. F. Barnes, president, Associated Spring Corp., Bristol, Conn.; C. R. Burt, president, Niles-Bement-Pond Co., Hartford, Conn.; Lammot du Pont, president, E. I. du Pont de Nemours & Co. Inc., Wilmington, Del.; Alfred Kauffmann, president, Link Belt Co., Chicago; W. A. Carson, president, Sunbeam Electric Mfg. Co., Evansville, Ind.; Guy Wainwright, president, Diamond Chain & Mfg. Co., Indianapolis; G. O. Boomer, vice president, Ewald Iron Co., Louisville; C. C. Carlton, secretary, Motor Wheel Corp., Lansing, Mich.; S. Wells Utley, president, Detroit Steel Casting Co., Detroit; Edgar M. Queeny, president, Monsanto Chemical Co., St. Louis; Howard I. Young, president, American Zinc, Lead & Smelting Co., St. Louis; O. E. Braitmayer, vice president, International Business Machines Corp., New York; W. T. Holliday, president, Standard Oil Co. of Ohio, Cleveland; J. F. Lincoln, president, Lincoln Electric Co., Cleveland; Frank Purnell, president, Youngstown Sheet & Tube Co., Youngstown, O.; T. H. Banfield, president, Iron Fireman Mfg. Co., Portland, Oreg.; W. F. Detwiler, executive vice president, Allegheny Steel Co., Brackenridge, Pa.; W. H. Taylor, president, Philadelphia Electric Co., Philadelphia; H. W. Van Benschoten, vice president, Knoxville Iron Co., Knoxville, Tenn.; R. C. Kuldell, president, Hughes Tool Co., Houston, Tex.; Paul Pigott, president, Pacific Car & Foundry Co., Seattle; W. W. Holloway, president, Wheeling Steel Corp., Wheeling, W. Va.; Walter J. Kohler, chairman, Kohler Co., Kohler, Wis.; George S. Whyte, president, MacWhyte Co., Kenosha, Wis.

Directors-at-large: Vincent Bendix, president, Bendix Aviation Corp., South Bend, Ind.; W. Gibson Carey Jr., president, Yale & Towne Mfg. Co., New York; F. B. Davis Jr., president, United States Rubber Co., New York; T. M. Girdler, chairman, Republic Steel Corp., Cleveland; J. C. Hilton, vice president, Standard Oil Co. of New Jersey, New York; Charles R. Hook, president, American Rolling Mill Co., Middletown, O.; George H. Houston, president, Baldwin Locomotive Works, Philadelphia, and E. T. Weir, chairman, National Steel Corp., Pittsburgh.

Hellstrom Heads Dust Control Equipment Group

■ John Hellstrom, vice president, American Air Filter Co., Louisville, Ky., has been elected chairman of the Dust Control Equipment association, Cleveland. S. S. Parsons, Parsons Engineering Corp., Cleveland, was elected vice chairman, and Arthur J. Tuscany, Penton building, Cleveland, continues as executive secretary and treasurer.

Members of the association are: American Air Filter Co.; Parsons Engineering Corp.; American Foundry Equipment Co., Mishawaka, Ind.; W. W. Sly Mfg. Co., Cleveland; C. B. Schneible Co., Chicago, Ill.; and Whiting Corp., Harvey, Ill.

Ferroalloys

Ferroalloy Prices, Page 88

New York — Ferromanganese and other ferroalloys generally have been reaffirmed in price for next quarter. There have been some minor revisions in less than carlot prices on high and low carbon ferrochrome, 50, 75 and 90 per cent ferrosilicon and silicomanganese but these are exceptions to the rule and have been due, it is believed, to re-estimates of packing and crushing charges.

This reaffirmation leaves the quotation on ferromanganese at $102.50, duty paid, Atlantic and Gulf ports

and domestic spiegeleisen, 19 to 21 per cent, at $33, Palmerton, Pa., and 26 to 28 per cent, at $39.

Equipment

Chicago—Machinery and equipment markets continue slow but many manufacturers still have sufficient backlogs to permit continuation of active production. Inquiries are restricted by uncertainty but equipment sellers anticipate a definite change in sentiment will release some business now being held in abeyance. Railroads are counted on for but little demand pending a favorable outcome of the freight rate increase petition.

Seattle—Industrial buying is light and volume of business comes largely from state and county sources. Pacific Northwest counties are purchasing snow removal equipment. Electrical goods and pumping equipment are in best demand.

Construction and Enterprise

Ohio

BUCYRUS, O.—Board of control takes bids in 60 days for modern sewage disposal plant located on city farm. Cost $135,000. F. G. Brown, Marion, O., city engineer.

CLEVELAND—Atlantic Refining Co., care L. M. Goldsmith, chief engineer, 260 South Broad street, is completing plans for three steel storage tanks and 390 feet of railroad siding on Eggers road.

CLEVELAND—Station WGAR, John F. Patt, manager, Auditorium building, plans 175 foot steel tower and one-story radio transmitting station and has applied to the government for a permit. Cost $40,000. Dickerson & Barrett, 3030 Euclid avenue, architects.

CLEVELAND—Department of public utilities, city hall, is considering report by Peter F. Loftus, Oliver building, Pittsburgh, consulting engineer, concerning expansion and improvements in municipal power plant on Fifty-third street to run over period of 60 months. Includes immediate installation of new boiler plant and coal handling equipment, cost $441,870; extensions and betterments in generating division, including new turbo-generator unit with accessories and rated output of 15,000 kilowatts under present steam pressure and 25,000 kilowatts when high pressure steam is available, cost $2,130,600; three new high-pressure steam boilers and accessories, cost $2,726,950. Total cost including building improvements $5,300,000. Frank O. Wallene, director.

KENTON, O.—Board of control receives bids in 60 days for addition to waterworks plant and installation of water softening equipment. Cost $60,000.

LAKEWOOD, O.—City plans construction of sewage treatment plant. R. G. Curren, city law director, will submit bond legislation to city council. Cost $145,825. E. A. Fisher, city engineer.

WRIGHT FIELD, DAYTON, O.—War department, air corps, will receive bids until 10 a. m., Dec. 16, for one motor-generator set, 110 kilovolt-ampere unity power factor, 110 volts, 3 phase, 420 cycle, delivery Dayton, O.; 425 taper pin spiral flute reamers, Pratt & Whitney No. 458.

WRIGHT FIELD, DAYTON, O.—War department, air corps, takes bids to 10 a.m. Dec. 21, for transformers, series multiple 6.6 ampere 60 cycle in accordance with air corps specification No. 40088-E and 32139 dated Aug. 24, 1937. Includes 455 40 watt, 150 100 watt, 3 130 watt, and 6 500 watt transformers.

WRIGHT FIELD, DAYTON, O.—War department, air corps, will receive bids until 10 a. m. Dec. 16 for 1650 combination slip joint 8-inch crescent L28 pliers, delivery Middletown, Pa., Osborn, O., Duncan, Tex., San Diego, Calif., Hawaiian air depot, Philadelphia, Pa., air depot, Panama air depot.

Illinois

CHICAGO—Sanitary District of Chicago will take bids to Dec. 16 for furnishing and installation of pump and blower house piping, air filtering equipment at Southeast sewage treatment works division LL, Stickney village, Cook county.

CHICAGO—Regensteiner Corp., 310 South Racine avenue, plans installation of motors and controls, regulators, conveyors and other equipment in new two-story printing plant at 40 West Van Buren street. Cost $200,000. Alfred S. Alschuler, 28 East Jackson boulevard, architect.

CHICAGO — Arlavox Manufacturing Co., 430 South Green street, has been incorporated to deal in machinery and electrical and mechanical devices, with 1000 preferred voting shares. Incorporators, W. T. Parodes, G. Welna, A. Stachelek. Correspondent Samuel M. Ash, 105 West Madison street, Chicago.

DANVILLE, ILL. — Chicago & Eastern Illinois railroad, J. S. McBridge, chief engineer, Sixty-sixth and Union avenue, plans construction of coach shops. Cost $100,000.

MENDOTA, ILL.—City soon takes bids on primary and secondary settling tanks, sludge digestion tanks, drying beds, pump house and laboratory building for sewage disposal plant.

PEORIA, ILL. — Peoria Brewing Co., 1700 South Washington street, plans erection of brewing plant.

WAUKEGAN, ILL.—Schiller Brewing Co., Carl and Frank Schiller, plans remodeling building into brewery including installation of complete equipment for brewing operations.

Michigan

ADRIAN, MICH.—Southeastern Michigan Electric Co., Adrian, Mich., has plans under way for new electric generating plant on local site with extension in transmission and distributing lines planned.

DETROIT — Gray Marine Motor Co. will erect an addition to its plant on East Lafayette avenue. Smith, Hinchman and Grylls, Detroit, architects.

DETROIT — Progressive Welder Co. will erect a new plant on Outer drive. I. M. Lewis, Detroit, architect.

WYANDOTTE, MICH.—Michigan Alkali Co. plans expansion of power plant with installation of additional generating equipment and auxiliaries for service at new plant unit for producing chlorine and caustic soda by an electric process. Includes motors and controls switchgear, conveyors, regulators and other equipment with facilities for initial capacity of 100 tons chlorine and 120 tons caustic soda per day. Cost $1,000,000. Work begins soon.

Connecticut

BRIDGEPORT, CONN. — United Illuminating Co., 1119 Broad street, plans

erection of transformer plant at Housatonic avenue and Congress street. Cost $40,000.

New York

BUFFALO—Plans have been revived for construction of steam generating plant for Buffalo, Niagara & Eastern Power Corp., subsidiary of Niagara Hudson Power Corp. Cost, $8,000,000.

New Jersey

NEW BRUNSWICK, N. J.—Mack Iron & Metal Co. Inc. has been incorporated with 2500 shares of no par stock. Philip M. Brenner, agent.

RARITAN, N. J.—Board of commissioners, Raritan township, township hall, Piscataway, will receive bids until Dec. 16 on a sewage treatment plant. R. P. Watson, 46 Patterson street, New Brunswick, N. J., engineer.

Pennsylvania

ALLENTOWN, PA. — Pennsylvania Power & Light Co., Allentown and Altoona, Pa., is planning construction of an underground conduit line in Maple street between Fifth and Tenth streets, including removal of present overhead wire and poles and one or more new substations. Cost to exceed $25,000.

Indiana

BATESVILLE, IND.—Board of public works soon takes bids for construction of sewage treatment plant, laterals, branch and pumping station. Dec. 2 bids not approved by PWA.

EVANSVILLE, IND.—Board of public works, G. H. Bosse, chairman, plans waterworks improvement including four new filters, new coagulating basins, pumping station, repairing equipment and flood prevention. Cost $400,000.

MUNCIE, IND.—Board of public works has retained C. Hurd, consulting engineer, 1038 Architects & Builders building, Indianapolis, to make survey and recommendations on type of pumping equipment necessary to assure adequate water supply for the city during peak season.

Alabama

BIRMINGHAM, ALA.—W. M. Smith & Co., Forty-fifth to Forty-eighth street, First avenue, north, wants to purchase either a hydraulic or crank shaft driven second hand square forming press with capacity 3 by 4 feet.

MUSCLE SHOALS, ALA. — Electro-Metallurgical Co., subsidiary of Union Carbide & Carbon Corp., 30 East Forty-second street, New York, has acquired two tracts of land at Stevenson Hollow and will build a plant to manufacture calcium chloride, ferro-alloys and other electric furnace products on Tennessee river near Wilson dam. Maturity before March 1938. Cost $5,000,000.

Maryland

PIKESVILLE, MD.—County commissioners of Baltimore county, Towson, Md., receive bids Dec. 20 for furnishing and installing pumping equipment at Pikesville pumping station. Samuel A. Green, Towson, chief engineer.

District of Columbia

WASHINGTON—Department of agriculture takes bids to Dec. 17 for electric welding set, delivery Rideway, Mo.

WASHINGTON—Office of general purchasing officer, Panama Canal, will receive bids until 10:30 a. m., Dec. 15, schedule 3306, for 50 angle valves and 20 check valves, delivery Cristobal or Balboa, Canal Zone.

WASHINGTON — Veterans administration, Arlington building, will take bids to 11 a.m., Dec. 22, for two suspended type unit coolers in accordance with Veterans administration specification approved Oct. 25, 1937 with motors designed for operation on 115 volts, single phase 60 cycle current, for cold storage rooms, delivery Rutland, Mass.

WASHINGTON—Office of the general purchasing officer, Panama Canal, will receive bids to 10:30 a.m. Dec. 21, for various amounts of steel bars, scrap iron, sheet aluminum, fencing material, drill rods, phosphor-bronze wire, machine screws, jam nuts, lock washers, tinner's rivets, and one spraying machine, delivery Cristobal or Balboa, Canal Zone.

WASHINGTON — Bureau of supplies and accounts, navy department, will receive bids until 10 a.m., Dec. 17, schedule 2246, for one motor-driven radial drilling machine, delivery San Pedro, Calif.; schedule 2247, one pedestal type motor-driven grinder, delivery San Pedro, Calif,; schedule 2248, one motor-driven band saw machine, delivery San Pedro, Calif.; schedule 2249, one sensitive single spindle motor-driven drill, delivery San Diego, Calif.; schedule 2250, one hand-operated turret punch, delivery San Diego, Calif.; schedule 2251, one horizontal boring, drilling and milling motor-driven machine, delivery San Diego, Calif.; schedule 2254, one heavy duty motor-driven pedestal grinder, delivery San Diego, Calif.; schedule 2286, socket wrenches, delivery various east and west coast points; until Dec. 21, schedule 2294, rough-machined steel forgings, delivery various east coast points; schedule 2297, steel cable, delivery various east and west coast points; schedule 2225, plate, sheet and slab (spelter) zinc, delivery various east and west coast points.

Florida

PENSACOLA, FLA.—Bureau of yards and docks, navy department, will receive bids for an automatic telephone system at naval air station, Pensacola, Fla. (Specification 8558)

Georgia

ATLANTA, GA.—Three story building housing O. B. Andrews Paper Box Co., Spring and Packard streets, destroyed by fire. Equipment also lost.

CAMILLA, GA.—Mitchell County Electric Membership Corp., Robert Culpepper Jr., receives bids to Dec. 21 for constructing 74 miles primary line to be built in Mitchell and Colquitt counties, including 280 watt-hour meters and pole inspection service on 1000 poles. J. B. McCrary Engineering Corp., Atlanta, Ga., engineer.

LOUISVILLE, GA.—Jefferson County Electric Membership Corp., Judge Rufus G. Price, receives bids to Dec. 17 for constructing 75 miles of primary lines in Jefferson and Washington counties, including 450 watthour meters and pole inspection service for 1000 poles. J. B. McCrary Engineering Corp., Atlanta, Ga., engineer.

North Carolina

ENKA, N. C.—American Enka Corp., near Asheville, N. C., plans installation of motors and controls, conveyors and other equipment in new addition to rayon mills. Work to begin soon. Cost $500,000. Main offices, 271 Church street, New York.

SILER CITY, N. C. — Mock-Judson-Voehringer Inc. with plant at Greensboro, N. C., will erect $40,000 building and install machinery to manufacture full fashioned hosiery. Cost of machinery $200,000.

Louisiana

BATON ROUGE, LA.—Ethyl Gasoline Corp., 135 East Forty-second street, New York, plans installation of motors and controls, conveyors, transformers and accessories and other equipment in new multi-unit plant for production of chemicals used in high-test gasoline compounding to be located on site adjoining

present Ethyl fluid works of company. Cost $4,500,000.

BOSSIER CITY, LA.—City, H. L. Fuller, mayor, is making engineering survey to determine cost of installing water treatment plant, 14 miles of 16-inch cast iron supply mains and other equipment. Cost is $350,000. Garrett Engineering Co., Box 1726, Houston, Tex., engineer.

LAKE CHARLES, LA.—Date of opening bids for construction of sewage treatment plant No. 2 has been postponed from Nov. 30 to last week in December by board of commissioners of first sewerage district. Bonds totaling $262,000 available, including cost of intercepting sewers. J. M. Fourmy, Hammond, La., engineer.

Tennessee

CHATTANOOGA, TENN. — Lookout Oil & Refining Co., 4608 Kirkland avenue, (subsidiary of Armour & Co., Chicago) plans power house and factory building. Company architect has plans. Cost $100,000.

MEMPHIS, TENN. — Tennessee valley authority, Knoxville, Tenn., will take bids to Dec. 15 for fabricating and delivering conveying machinery including gear head motor and drive, conveyor belting, revolving brush outfit, structural steel conveyor spans and drive end framing for Chickamauga dam construction plant. C. H. Garity, director of purchases.

West Virginia

HUNTINGTON, W. VA.—United States engineer takes bids to Dec. 16, invitation 516-38-56, for double cylinder single drum swinging engine, delivery Marietta, O.

Virginia

NORFOLK, VA.—City has authorized plans for new municipal electric power plant at South Norfolk and takes bids for equipment at an early date. Cost $330,000. Wiley & Hughes, Peoples' National Bank building, Lynchburg, Va., consulting engineers.

Missouri

JEFFERSON CITY, MO.—State building commission will receive bids from Dec. 15 to Jan. 1 for plant improvements for state penitentiary, including alterations to present boiler plant, new turbine building, electric distribution, transformer station, yard lighting and electrical work in boiler plant and turbine building, power and water piping and equipment; steam and water distribution within buildings and remodeling old steam distribution lines.

ST. LOUIS—Magnus Metal Division of National Lead Co., L. J. Lyons, plant manager, is erecting a building to be used for pattern and machine shop and brass bronze factory.

ST. LOUIS—Marlo Coil Co., 1635 Manchester, manufacturer of air-conditioning equipment is constructing addition to factory, including new machinery and equipment.

ST. LOUIS—Sterling Aluminum Products Co., 2914 North Market street, is constructing a new plant at 2925 North Market street to manufacture aluminum pistons. Cost of plant and machinery and equipment is $60,000.

ST. LOUIS—Boulder Lead & Zinc Co., Frank Peters, president, has been incorporated to engage in general mining, smelting and refining. Will open new lead fields in Joplin district and have main offices in St. Louis. Capital is $10,000.

ST. LOUIS—Ryan Equipment Corp., Thomas H. Ryan Jr., president, has been incorporated with paid-in capital of $15,000 and will deal in all types of material handling devices, railroad, industrial and construction equipment. Machinery will be purchased in the future.

Oklahoma

CHEROKEE, OKLA.—Alfalfa County Electric association is planning construction of 80 miles of rural electric lines near here. REA has allotted $90,000. C. H. Guernsey, Cherokee, Okla., engineer.

LUCIEN, OKLA.—Four 500-barrel crude oil tanks on the Shell Petroleum Corp. lease, 1½ miles south of here were damaged by fire.

Wisconsin

BALSAM LAKE, Wis.—Polk county highway department is taking bids through E. F. Klinger, architect, Amery, Wis., for new warehouse, garage and machine shop for which purpose county board has appropriated $97,000. (Noted in Dec. 6 issue).

BARABOO, WIS.—City is taking bids until Dec. 21 for construction of municipal sewerage plant, including disposal works and complete pumping and auxiliary equipment. A. F. Reiner, city clerk.

BELOIT, WIS.—O. A. Hillery, Beloit, has recently taken over the old Beloit Brass Works in South Beloit and will operate it as the Superior Brass Foundry, doing a jobbing business.

EDGERTON, WIS.—Highway Trailer Co., manufacturer of auto trucks and trailers is planning construction of a new factory building.

GREEN BAY, WIS.—Fort Howard Paper Co., manufacturer of crepe and other paper products, plans construction of an addition to the paper mill. Harry W. Williams, Northern building, architect.

MADISON, WIS.—Wisconsin state highway commission, Thomas F. Davlin, chairman, will build a highway research laboratory and sign manufacturing plant. Cost $175,000.

MENOMONIE, WIS.—Dunn County Co-operative has been allotted $155,000 REA funds for construction of rural transmission lines. Banister Engineering Co., 556 North Prior avenue, St. Paul, Minn., engineer.

MILWAUKEE—Master Lock Co., 926 West Juneau avenue, is starting work on an addition and extensive alterations of factory building at 2640 North Thirty-second street. P. E. Yolles, president.

MILWAUKEE—Wisconsin Public Service Corp., Milwaukee, has doubled its construction budget for 1938 to include building of new $1,500,000 hydroelectric plant on Wisconsin river between Merrill and Tomahawk, Wis., and extensions of rural lines, costing $600,000. A. G. Carson, Bollin building, Green Bay, Wis., engineer.

Minnesota

CLOQUET, MINN.—Wood Conversion Co., manufacturer of insulation products plans improvement to power plant and installation of new power plant equipment. Ralph D. Thomas & Associates, 1200 Second avenue South, Minneapolis, engineers.

MINNEAPOLIS—Smith Welding Equipment Corp. has been incorporated with a capital stock of $100,000 to manufacture welding equipment.

MINNEAPOLIS — Woodworking machinery crated for removal to new quarters was damaged by fire two weeks ago at Dahlin Bros. & Davis Co., 515 First avenue.

MINNEAPOLIS—Northern States Power Co. plans to spend $9,055,000 in the northwest next year as part of construction activity pledged to federal government. Includes $4,542,700 for improvement or expansion of steam plants; $1,946,500 for new distribution lines and equipment, and smaller amounts for hydro-electric plants, substations, gas generating equipment and buildings.

SLEEPY EYE, MINN.—City, A. J.

Thomas, city clerk, takes bids to 7:30 p.m. Dec. 16, for furnishing all labor, material and equipment for additions and changes in present power plant building, including furnishing and installation of diesel engine generating unit, together with auxiliary equipment and rearrangement of switchboard and station wiring. G. M. Orr & Co., 542 Arcade building, Minneapolis, consulting engineer.

Texas

ATLANTA, TEX.—City, care T. R. Riche, plans election soon to vote on bonds to finance construction of waterworks and sewer system. Cost $90,000. F. J. Von Zuben, 1013 Electric building, Fort Worth, Tex., engineer.

BRENHAM, TEX.—City, Reese B. Lockett, mayor will construct light and power system including three 525-horsepower diesel engines with generators, switchboards, power plant building, distribution system and street lighting system. Cost $310,000. Garrett Engineering Co., Box 1726, Houston, Tex., engineer.

BRYAN, TEX.—City has initial requisition of $61,219 available for starting rural electrification project in Brazos, Burleson and Robertson counties. Brown & Root, Eagle Ford road, Dallas, general contractor, William G. Morrison, Professional building, Waco, project engineer.

CORPUS CHRISTI, TEX.—Amsco Refining Co., West Broadway, plans installation of motors and controls, conveyors, electric pumping machinery and other equipment in new addition to oil refining plant to double present capacity. Cost exceeds $400,000.

CORPUS CHRISTI, TEX. — Barnsdall Refining Co., Nixon building, will start construction soon on new refinery with capacity of 5500 barrels daily. Will manufacture bunker fuel oil and 77 octane gasoline. Crude oil will come from Placede field through 70-mile pipe line.

DALLAS, TEX.—City receives bids to Dec. 17 for 2 sanitary sewer projects and sewage disposal plant. Federal aid will be given for disposal plant. Cost of entire project $1,300,000.

HOUSTON, TEX.—Motor Machine & Supply Co. has been incorporated here with a capital of $20,000. Incorporators are Robert R. Gannaway and Doyle T. Gibson.

LIBERTY, TEX.—City, A. C. Miles, mayor, plans light and power system including diesel engine generating station, distribution system and street lighting system. Cost $100,000. Garrett Engineering Co., Box 1726, Houston, Tex., engineer.

PLEASANTON, TEX.—City, A. R. Troell, mayor, receives bids about Dec. 28 for water works extension and addition including 8, 6 and 4-inch cast-iron mains, extensions and additions, elevated tank and tower, fire hydrants, valves. Estimated cost $44,500. Garrett Engineering Co., Box 1726, Houston, Tex., engineer.

SAN ANTONIO, TEX.—Roegelein Packing Co., Milam building, receives bids Dec. 20 for extension of packing plant, 1701 Brazos street, including concrete floors, beef coolers, refrigeration unit, etc. W. E. Simpson Co., Milam building, consulting engineer.

Iowa

ALLISON, IOWA—Butler County Rural Electric Co-operative has been allotted $105,000 additional REA funds for construction of rural transmission lines in Butler and Hardin counties. Same amount was previously allotted. Total project includes 235 miles of lines. Cost $210,000.

CEDAR RAPIDS, IOWA—Iowa Electric Light & Power Co., Cedar Rapids, Iowa, plans extensions in transmission lines in part of Linn county. Has applied for permission.

DES MOINES, IOWA—Economy Forms Corp., manufacturer of steel forms for concrete construction, has started construction of one-story factory.

PERRY, IOWA—City, Donald Kanealy, clerk, has submitted application to WPA for aid in construction of new sewage disposal plant costing about $100,000. Buell & Winter Engineering Co., Insurance Exchange building, Sioux City, Iowa, consulting engineer.

WEST LIBERTY, IOWA—City, Charles Mackey, clerk, is contemplating construction of a filtration plant.

Nebraska

CRETE, NEB.—Norris Rural Public Power district has filed application with state railway commission for permission to construct 130 miles rural transmission lines in Jefferson and Saline counties. Cost is $150,000. H. A. Davis, Crete, Neb., consulting engineer.

FREMONT, NEB.—Plans nearing completion for construction of addition to municipal power plant consisting of complete boiler unit with 75,000 pounds pressure per hour capacity and building. Black & Veatch, 4706 Broadway, Kansas City, Mo., consulting engineers.

KEARNEY, NEB.—State board of control, Henry Behrens, chairman, state house, Lincoln, Neb., has approved construction of new power house at state tuberculosis hospital. Contract for construction will be let about April 1, 1938. Cost $45,000. John P. Helleberg, Kearney, Neb., architect.

Montana

KALISPELL, MONT.—Flathead Power Co. plans erection of 133 miles of rural power lines. Cost $144,000. J. M. Garrison and H. Garber, Helena, Mont., engineers.

Pacific Coast

LOS ANGELES—Junior Steel Co., 1960 South Alameda street, has acquired an acre at Alameda street and Washington boulevard on which it will build improvements to cost $50,000. Company distributes Jones & Laughlin Steel Corp. products, including steel beams for first floors in residential buildings.

REDDING, CALIF. — United States forest service supply depot, Government Island, Oakland, Calif., will receive bids on 1740 lineal feet of 4-inch pipe and 9000 feet 1¾ inch rough steel pipe.

STOCKTON, CALIF.—Pacific Gas & Electric Corp. in a co-operative agreement with Tidewater Associated Oil Co. will erect steam generating plant near Avon, Contra Costa county, California. Cost, $5,000,000.

STOCKTON, CALIF.—General Petroleum Corp. will build a marine terminal on Stockton ship canal, which will include storage and loading tanks and docking facilities. Richfield Oil Co. is planning similar terminal on adjoining site. Cost of General Petroleum Corp. terminal is $250,000.

GRAND COULEE, WASH.—Bureau of reclamation will take bids to Jan. 6, 1938 at Denver, for construction of rolling mill to fabricate 20,000 tons of plates for penstocks and inlet tubes for Coulee project. Material to be shipped to Electric City and rolled into pipes too large to be shipped by rail in fabricated form. Estimated cost is $2,000,000.

Canada

SARNIA, ONT. — Imperial Oil Ltd., R. V. Le Sueur, president, plans improvements and addition of new equipment to properties at Regina, Sask., and Calgary, Alta. including pipe line to connect the plants. Cost $850,000.

ST. LAURENT, QUE. — Dewey & Almy Chemical Co. Ltd., Farnham, plans construction of new plant. Cost including equipment $145,000.

Comments

Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

Named for Mrs. Tom Carnegie

To the Editor:

Note on page 28 of Dec. 6 issue of STEEL you state that the No. 1 "Lucy furnace" was named after the wife of Andrew Carnegie. This is incorrect. Andrew Carnegie was not married for over twenty-five years after the original "No. 1 Lucy" was building in 1872, which was named "Lucy" after the wife of Tom Carnegie, Andrew's brother.

Andrew's wife's name was Margret, for whom the Margret Morrison school of the Carnegie Institute of Technology is named.

E. L. MESSLER

1015 *House Building,*
Pittsburgh.

Praise for an Editorial

To the Editor:

I think your editorial in your Nov. 29th issue is exceedingly constructive and helpful and I hope it will receive wide notice.

To this end I have sent a copy with the following letter, to the editor of the *Atlanta Constitution*, Atlanta, Ga.:

"The sentiments expressed in the attached editorial taken from the Nov. 29 issue of the magazine STEEL are I think so constructive and helpful to our nation, particularly at this time, that I am calling it to your attention.

"There is a crying need of better understanding and co-operation of the peoples of our nation. In aiding to establish a national policy of tolerance and unity our newspapers and periodicals can be most helpful, in the accomplishment of which I believe your excellent paper will gladly co-operate."

ALFRED D. KENNEDY

President,
Davidson-Kennedy Co.,
Atlanta, Ga .

EDITOR'S NOTE—This editorial was headed: "Why not Stress Common Bond of Interest and Promote Teamwork!"

For Institute Membership

To the Editor:

I note that the American Iron and Steel institute is to limit attendance at the May meeting to actual members of the institute, excluding friends formerly invited as guests by various members.

As a long-time member of the industry, though not of the institute I feel this exclusion as a great deprivation and would like to know the requirements for membership, with a view to possibly making application for membership. Would it be possible for you to ascertain these and publish them. Possibly others in my position would have a like desire. I really feel as though I could not miss the inspiration I get from the association with steel men and from the papers presented at the sessions.

W. K. G.

Gary, Ind.

EDITOR'S NOTE—There are three classes of members of the institute, active, honorary, (limited to 50), and associate. Nominations must be in writing, signed by a member, stating occupation and qualifications of the applicant, seconded by another member. One proposer must be an active member. The nomination is considered by the committee on membership at the next meeting after receipt and election is by majority of the committee. Applicants for active membership must be residents of North America, 21 years old or over, of good character and standing and engaged directly in the iron and steel industry. By the latter is meant active association with production of iron or steel, from ore to finishing mill. Associate members are persons with similar qualifications, indirectly associated with the industry. Entrance fee is $20 and annual dues are $20. Corporations or partnerships engaged in the iron and steel industry, one or more of whose officers are individual members, are eligible to company membership, one officer to be appointed as personal representative to vote for the company. Company membership dues are based on volume of sales.

Fight Against Corrosion

To the Editor:

Study by the bureau of standards, as reported in STEEL, Dec. 6, page 41, to determine means for preventing corrosion of materials in houses built of steel is an important undertaking and should result in standardizing the work of many independent workers who have achieved great success. Protection of hidden parts of the house where condensation of atmospheric moisture may do harm has engaged much attention as it is regarded as essential to permanence of the structure.

W. L. S.

Youngstown, O.

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