STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

For forty-eight years—IRON TRADE REVIEW

Contents . . . March 8, 1937

Volume 100 - No. 10

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

Published every Monday. Subscription in the United States, Cuba, Mexico and Canada, one year $4, two years $6; European and foreign countries, one year $10. Single issues (current copies) 25c.

Entered as second class matter at the postoffice at Cleveland, under the Act of March 3, 1879. Copyright 1937 by the Penton Publishing Co.

Published by the PENTON PUBLISHING CO., Penton Building, Cleveland, O.
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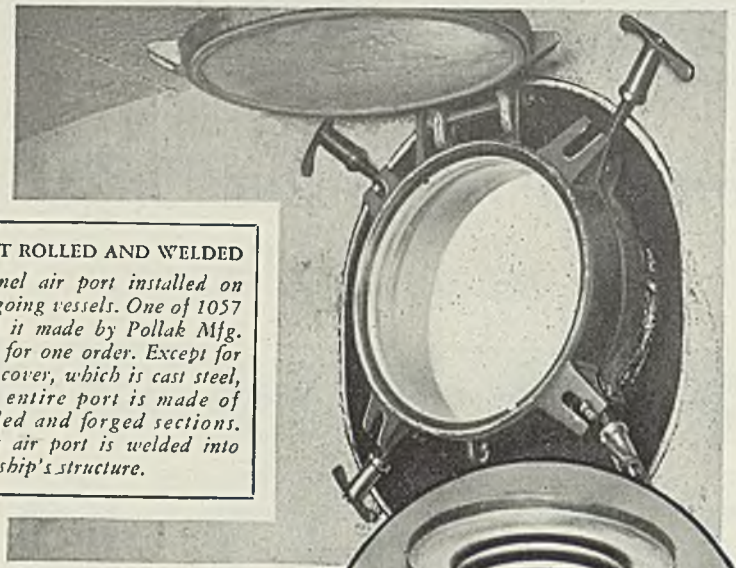
To Resist Stress and Corrosion . . .



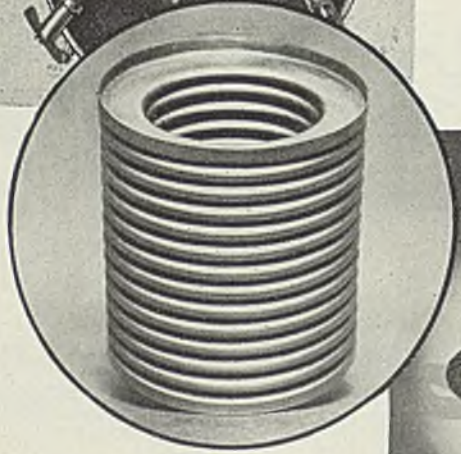
HOT ROLLED AND WELDED

Monel air port installed on seagoing vessels. One of 1057 like it made by Pollak Mfg. Co. for one order. Except for the cover, which is cast steel, the entire port is made of rolled and forged sections. This air port is welded into the ship's structure.

ONE METAL *easy to* FABRICATE

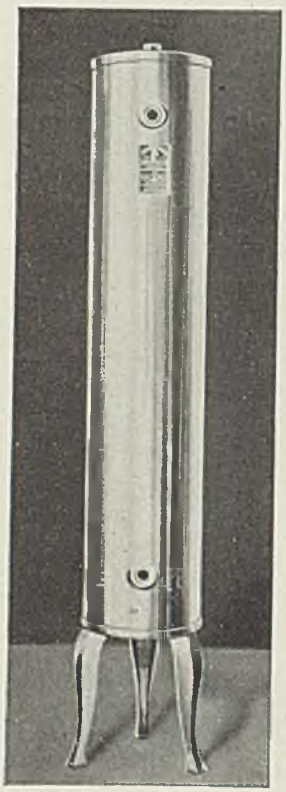
SEAMLESS TUBING—COLD-WORKED

Sylphon bellows, for magnet switch controlling temperature, pressure, and vacuum in ammonia refrigerating service. Monel is used for its resistance to ammonia and its elasticity. The seamless tubing is shaped entirely by cold forming.



ACCESSORIES

Accessories of Monel are carried in stock in a wide range of forms and sizes. Among them: bolts, nuts, rivets, screws, washers, valves, wire rope, sash cord, wire cloth. Monel accessories last.



ROLLED SHEET, SEAM WELDED

The "Whitehead" boiler is fabricated by automatic seam welding from Monel sheet. Tough and sturdy, this boiler is guaranteed for 20 years. Yet it is readily fabricated.

. . . available in all forms, amenable to all fabricating operations.

ONCE you decide that Monel's* strength plus corrosion resistance will save you money, it is a pretty sure bet it can be fabricated your way. You can dope out ways to cut manufacturing costs through improved fabricating methods, without having to worry about whether your equipment can be made that way. Monel fabricates readily into all sorts of equipment, using the regular mill forms readily available in many sizes.

The air port above, for example. Most air ports are cast. To make this one, they used rolled and forged sections. Result, a big saving in weight. Also, they *welded* the port to the ship's side.

And the bellows, made for a temperature control instrument. They are cold-formed from seamless Monel tubing and they are made in production quantities.

Read carefully the captions on this page: each tells its own story of Monel's adaptability: In accessories, threaded parts give longer wear, for there's no rust to make them stick. Automatic seam welding produces a hot water tank that stands higher pressure, and long outlives tanks that cost nearly as much.

Write Inco's engineers for advice on the best way to fabricate your jobs. Few indeed are the fields in which they have not had experience.

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

MONEL

*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.

INCO MONEL

As the Editor Views the News

MANY months will pass before the nation digests the meat of the happenings of the first week of March. The action of steelmakers in granting wage increases and a shorter week, combined with U. S. Steel's recognition of CIO for its Amalgamated members and with the general advance in steel prices, undoubtedly has averted a labor crisis (pp. 19, 37), but meanwhile it has intensified the serious economic problem of inflation and introduced embarrassing new aspects into industry's labor relations situation. The import of these dramatic developments was further complicated Thursday by President Roosevelt's almost hysterical appeal to place all social reforms on a "do-it-now" basis.

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Questions Will Be Answered

The immediate effect of steel's wage and hour action will be reassuring. At the current high rate of activity (p. 24) present employes will receive higher unit wages. More men—probably as many as 30,000—will be hired. Mass purchasing power will be increased. Industry momentarily will be hard pressed to meet demand. But, in the meantime, costs—already high—are being pushed up at an unprecedented rate. Upward adjustments in the cost of living will follow closely in their wake. Will these higher costs offset the advantage of higher unit wages? Will they tend to chill demand for goods, including steel?

• • •

When Waiter Brings Check!

The answers to these questions will not be known for some months—probably not until the American public begins to realize that it will have to pay for the social reforms it has ordered. Steel's wage advances and shorter week were forced by the clamor of politically-inspired popular opinion. Right now the public is enjoying the meal it has ordered. The first few courses of the feast taste good. Noting the effect upon the populace, the President last Thursday asked the chef to send in some additional courses—*now!* It would be far better to save some of the menu for a later day, but the President says "No"; the people must be given everything—from soup to nuts—*now* . . . Some time later, when the waiter brings the checks around, the people may wish they had ordered more wisely.

• • •

Materials for Air Liners

Airplane design is one of the most active frontiers in engineering today. The modern luxury liner of the air is a far cry from the best machines that figured in the World war. Then the nation searched feverishly for spruce suitable for wing and fuselage construction. Today, designers seek metals appropriate for large, comfortable passenger transports. For many of the modern planes they have selected sheets and extruded shapes of aluminum alloy and sheets of stainless steel (p. 42) as the principal materials of construction. The exacting requirements involved in the manufacture of aircraft emphasize the factors of strength and weight in a way that spells progress not only in aeronautical design but in many other fields of engineering construction.

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Modernization Not "Cure-all"

This publication, as well as many others serving the metalworking industries, has stressed the advantages of efficient equipment for manufacturing. In doing so, its editors have been prompted by the knowledge that many companies are seriously handicapped by trying to get results from obsolete, high-cost machinery. Nevertheless, it must be recognized that the slogan "modernize" is not a cure-all, and for that reason we are glad to present a warning (p. 46) against generalizing too freely upon the question of replacing old equipment with new models. The author's advice to judge each case on its own merits is well worth heeding. . . . Manufacturing steel drums under sanitary conditions in sealed rooms supplied with filtered air (p. 52) is a refinement worthy of attention in the development of food containers.

E. L. Shaner

INLAND
4WAY FLOOR PLATE

Safety begins on the FLOOR

fety begins where work begins—on the floor. Behind ery pair of working hands is the problem of safe oting. Safer floors permit faster work and faster ovement of materials. Now is the time to check the floor efficiency of your plant

From 15% to 20% of all serious plant accidents, accord- g to statistics compiled by one large industrial state, are e to men falling. Surprisingly, most of these falls occur er level floor surfaces.

Inland 4-Way Floor Plate not only reduces the danger these accidents but also increases the speed of plant ovements. Inland's exclusive 4-Way pattern provides ual protection against slipping of foot or wheel in all rections. Other important features are quick 4-Way ainage, easy sweeping, 4-Way stiffness and design atching for a continuous pattern floor.

Inland 4-Way Floor Plate is made of rolled steel. It n be used structurally or readily applied over other oor surfaces. It takes hard wear and is economical to e. Write for a free catalog giving full details.

INLAND STEEL

HEETS • STRIP • TIN PLATE • BARS • PLATES • STRUCTURALS • PILING • RAILS AND ACCES

INLAND STEEL CO

Government Forces Steel Into Great Union Experiment

Wide World

"A BIG VICTORY!" Philip Murray, SWOC chairman (right) is telling the Carnegie-Illinois steelworker who calls to congratulate him

The "Big Victory"

UNDER the present wage scale a steel laborer working a full-time 48 hour week at 52½ cents an hour earns $25.20. Under the new setup, working 40 hours at 62½ cents he will earn $25 a week. One of the purposes of the Walsh-Healey law is to restrict the work-week to 40 hours; on government work it is compulsory. With weekly income practically unchanged, the worker will now have the privilege of paying union dues if he wants the SWOC to represent him.

LAST week as the Carnegie-Illinois Steel Corp. signed up with the SWOC, the big question in the industry was "what is back of it all?" This week, and for some weeks to come, the puzzle—and uncertainty—will be "what is ahead?"

Not later than Wednesday this week Carnegie-Illinois and SWOC have agreed to meet and work out conditions and rules for adjusting disputes which may grow out of the primary agreement to recognize the SWOC for collective bargaining.

Meanwhile Philip Murray, SWOC chairman, is driving his 200 organizers to get all steelworkers into the Amalgamated Association of Iron, Steel and Tin Workers, "while the feeling is good."

A big push for agreements is under way, and Murray promises to walk in most any hour now and demand them from independent steel companies.

Possibly in return for the "concession" from Carnegie-Illinois he may go slow for the present on other Steel corporation units. Rumors that Murray had actually requested conferences with independent steel companies could not be verified.

"Back of it all" last week, of course, was the tremendous force of government—supported by 28,000,000 votes—the Walsh-Healey 40-hour week law; a billion dollar national defense program taking shape in congress; a threat of new NRA's—and important, too, John L. Lewis' willingness to accept proportional bargaining rights.

In the brief announcements from steel companies referring to wages, hours and prices the word "compelling" is noted several places. Jones & Laughlin Steel Corp. says in its statement to employe representatives:

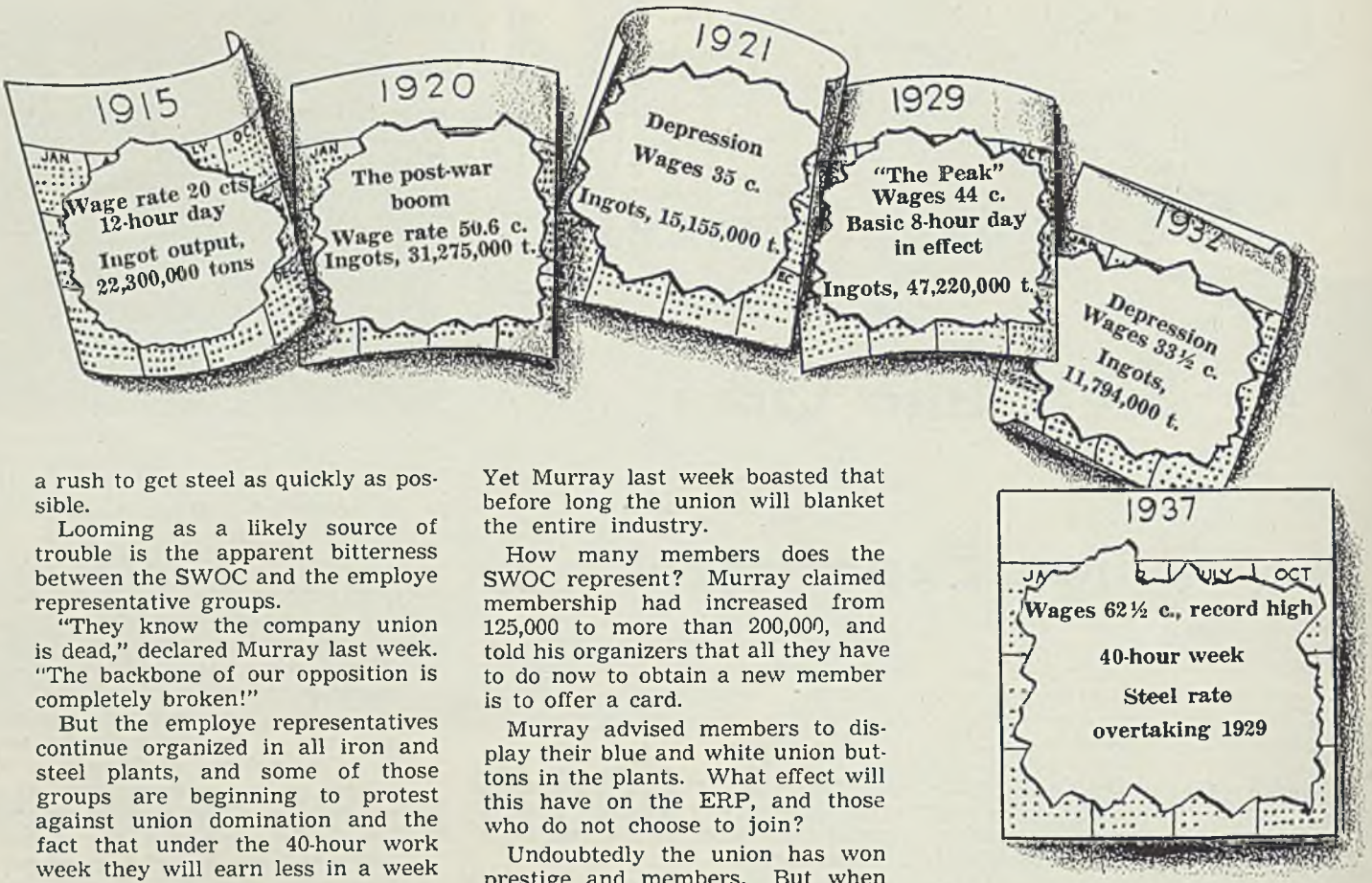
". . . . and inasmuch as public sentiment both in government and industry is uniting to effect . . . a shorter week . . . . tne officers of your corporation are constrained by these compelling reasons to inform you that on March 16 the corporation will adopt the 40-hour week. . . . the question has been decided for you and the corporation . . . and we must ask you to withdraw it from further consideration."

Pressure from the government, pressure from the public, pressure from organized labor! The immediate result:

An advance in hourly wage rates to 62½ cents, 24 per cent above 1929 peak; a reduction in the basic work week from 48 to 40 hours, with time and a half for overtime; an increase of $3 to $8 in steel prices, these on practically the entire front; plus the reversal of the Steel corporation's traditional policy against dealing with organized labor.

Behind this "drama" of big business last week was the smoke of many chimneys—steelworks pushing operations up 2 points to 86 per cent, a rate unprecedented in recent history; books swelling with orders,

WHO REPRESENTS WHO? Counting ballots recently for ERP. Even under the most peaceful conditions the elections frequently gave plant managers headaches. Conferences this week may determine the system for balloting, with both the SWOC and the ERP in the field



a rush to get steel as quickly as possible.

Looming as a likely source of trouble is the apparent bitterness between the SWOC and the employe representative groups.

"They know the company union is dead," declared Murray last week. "The backbone of our opposition is completely broken!"

But the employe representatives continue organized in all iron and steel plants, and some of those groups are beginning to protest against union domination and the fact that under the 40-hour work week they will earn less in a week than heretofore.

"We Were Legally Elected"

Weirton Steel Co.'s employe representative last week sent this letter to T. E. Millsop, president:

"We . . . were legally elected in our respective departments in December and have in our possession documentary evidence in the form of ballots and notarized tally sheets establishing not only our right to bargain collectively for the employes, but who the employes are that we represent. We demand that the CIO or any other organization wishing to bargain for the employes of the Weirton Steel Co. produce proof in the form of documentary evidence as to whom they represent before the company negotiates with them."

A group of Carnegie-Illinois employe representatives, including several of the recently formed grievance committee, sent a telegram to William Green, president, American Federation of Labor, saying:

"Without obligating you or your organization or the employes representation plan, which the committee represents, in any way, the committee members invite you to come to Pittsburgh at your earliest convenience to offer suggestions concerning the future course of the Carnegie-Illinois Steel Corp.'s plan of employe representation."

Green politely but firmly declined.

The agreement with the SWOC prohibits it from using coercion or intimidation to obtain members. Yet Murray last week boasted that before long the union will blanket the entire industry.

How many members does the SWOC represent? Murray claimed membership had increased from 125,000 to more than 200,000, and told his organizers that all they have to do now to obtain a new member is to offer a card.

Murray advised members to display their blue and white union buttons in the plants. What effect will this have on the ERP, and those who do not choose to join?

Undoubtedly the union has won prestige and members. But when the rank and file realize that all benefits will apply equally to all workers, how long will they continue to pay union dues, especially when the new work-week will net them less per week than formerly?

Murray stated that the agreement "sounded the death knell" of the ERP, but the company lost no time in posting this notice:

"The policy of the Carnegie-Illinois Steel Corp. with regard to collective bargaining with its employes remains unchanged. As previously stated on many occasions, the company recognizes the right of its employes to organize and to bargain collectively through representatives of their own choosing.

"The company will recognize any individual or group or organization as the spokesman for those employes whom they represent, but will not recognize any single organization or group as the exclusive bargaining agency for all the employes.

"Under this policy the status of the employe representation plan is likewise unchanged. It will continue as the spokesman for those of the employes who prefer that method of collective bargaining which has proven so mutually satisfactory throughout its experience."

Leaders of the union are going ahead with their plans for a convention in Pittsburgh in the near future, a mustering of all available strength.

When Murray and four associates met with Benjamin F. Fairless, Carnegie-Illinois president, last Monday in Pittsburgh, it was the first time since 1892, about the time of the Homestead steel strike, that an official conference had been held by the company with an outside union.

Wages, Hours

RATES for common labor will be increased 19 per cent, from 52½ cents an hour to 62½ cents. Rates in higher wage brackets will be adjusted equitably, though more moderately. The average advance is estimated at 10 per cent.

Forty hours will constitute the work week with time and one-half for overtime; minimum daily wage will be $5, effective March 16.

Latest available official figures show that in December 537,000 persons, including 485,000 wage earners, were on the steel industry's payrolls. More than 500,000 wage earners are now employed. Reduction of the work week to 40 hours, it is estimated, will increase employment in the mills between 5 and 8 per cent.

Average hourly earnings—including common and skilled labor—now are 73 cents and on the basis of a 10 per cent increase this will become 80 cents, while the average annual income of steel workers will be lifted to $1349 for 1937, presuming the new wage scale continues in effect throughout the year. This com-

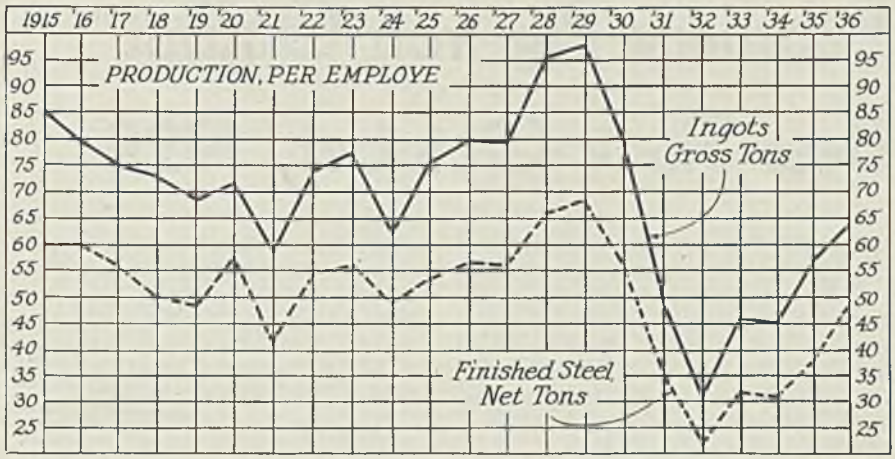
pares with $1184 in 1935; $366 in 1933, the depression low, and the record high of $1742 in 1929.

Steel's annual payroll at present is $950,000,000. It is understood that salaries will be raised, although this has not been stated officially.

The advance of hourly wages to an unprecedented high is another step in progressive wage increases for mill workers. The new hourly wages will be 65 per cent higher than those in effect in 1933 under code regulations, and 42 per cent above 1929 figures. Since 1915 hourly wages have advanced 212½ per cent. During only two periods in the past 22 years have there been recessions in the upward march. First postwar adjustment occurred in 1921 and another decrease followed with the depression in 1931 and 1932.

Hourly wages reached an all-time high in November, 1936, when a general 10 per cent increase brought the basic wage to 52½ cents an hour. At that time subsidiaries of United States Steel Corp. agreed to a plan to keep wages geared to living costs as indicated by the government's index. The increase was granted with the understanding that it was to compensate employes in advance for a 10 per cent increase in living costs over the July 15, 1936, base. When living costs were 10 per cent from that base, wages were to be adjusted accordingly. That point had not been reached last week when Carnegie-Illinois Steel Corp. entered a contract extending to Feb. 28, 1938, providing for a basic wage rate of 62½ cents an hour.

Similar increases were announced by Jones & Laughlin Steel Corp., Wheeling Steel Corp., National Steel Corp., Bethlehem Steel Corp., Republic Steel Corp., Youngstown Sheet & Tube Co., Youngstown, O., Inland Steel Co., National Tube Co., Pittsburgh Steel Co., Sharon Steel Co., Continental Steel Corp., American Steel & Wire Co., and Columbia Steel Co., San Francisco, and others.



Trend of production per employe of the United States Steel Corp. is shown in this chart. In each period of heavy production average tonnage per employe rises and the opposite effect is seen in periods of light production. In the 1921 and 1932 dips the low point is accentuated by effort to spread employment among as many workers as possible, thus reducing the tonnage per man. At 64 tons of ingots and 48 tons of finished steel per employe in 1936, estimated on the basis of nine months actual output, the industry is close to the level of 1930

Prices, Output

CONTINUED heavy production of steel through the present year and probably longer is forecast by conditions now surrounding the industry. In addition to the pressure of world needs sufficient demand for domestic purposes exists to take up all capacity for some time.

Naval plans are before Congress calling for appropriation of $526,000,000, including two additional battleships, with two more to be appropriated for in 1939. This is in addition to a large program of smaller craft.

All departments of domestic consumption are seeking steel, only structural needs falling behind in any degree. The production rate at around 86 per cent of capacity is overtaking the rate of 1929, which was close to or above 90 per cent most of the year.

"Although the higher wages and shorter hours are compelling factors," said W. A. Irvin, president, United States Steel Corp., last week, when prices were increased $3 to $8 a ton, "the rise was inevitable due to the fact that quotations on scrap iron constituting 40 per cent of the makeup of steel have risen from $14.96 per ton to $19.88 since Feb. 1, 1936. This 32 per cent increase in the cost of this principal item of manufacture has been accompanied by increases of over 60 per cent in the cost of copper, 50 per cent lead and zinc, 20 per cent for refractories, and corresponding increases in the cost of coal, coke, limestone, lubricants, etc."

Advances in steel that have been announced so far, plus the $2 a ton increase in pig iron, last week lifted STEEL'S iron and steel composite $2.52 to $39.47, highest since December, 1925. This composite in 1929 averaged $36.48. Further adjustments now in process will again affect the composite.

A widely different condition exists under the present increase from that accompanying the announcement late in 1936 to apply on first quarter shipments. At that time

(Please turn to Page 24)

MORE JOBS FOR STEELWORKERS? With operations approaching capacity, the basic week reduced from 48 to 40 hours, and time and a half for overtime, employment is expected to increase considerably. Steel's wage earners in December numbered 485,000; today, estimated as more than 500,000

February Pig Iron Output Best Since October, 1929

WITH a net gain of seven active blast furnaces, including resumption of two forced to bank in January because of Ohio river floods, average daily production of coke pig iron in the United States in February registered a substantial increase and rose to a level the best since October, 1929.

Average daily production in February was 107,857 gross tons, an increase of 3994 tons, or 3.8 per cent, over the 103,863-ton rate of January. This rate exceeded all months back to October, 1929, with 115,747 tons.

Total output in February was 3,020,006 gross tons, a figure which was less than the January total of 3,219,741 tons by 199,735 tons, or 6.2 per cent. This drop, however, is accounted for by the fact that February was a 3-day shorter month than January.

For the first two months of the current year, production has aggregated 6,239,747 tons, an increase of 61.4 per cent, or 2,371,511 tons, over the 3,868,236-ton output for the two month of 1936.

Relating production to capacity, operations in February were at the rate of 79.5 per cent. Based on the American Iron and Steel institute's new pig iron capacity figure as of Dec. 31, 1936, the revised rate of operation for January is 76.6 per cent.

Active blast furnaces on Feb. 28 totaled 176, or seven more than the 169 blowing on Jan. 31. This figure still stands as the best since May, 1930, with 180 active. Only 120 stacks were making iron in February, a year ago. During the month, six nonmerchant or steelmaking furnaces resumed and one was blown out; of the merchant class, two became active and none was banked.

Blast furnaces resuming in February were: In Ohio: Ohio No. 1, Carnegie-Illinois Steel Corp.; Portsmouth, Wheeling Steel Corp. In Pennsylvania: Bethlehem A, Bethlehem Steel Co.; one Aliquippa, Jones & Laughlin Steel Corp. In Illinois: One Federal, Interlake Iron Corp.; one South Chicago, Wisconsin Steel Co. In Kentucky: Ashland, American Rolling Mill Co. In Tennessee: Rockdale, Tennessee Products Corp.

The only stack blowing out was Cambria J, Bethlehem Steel Co., in Pennsylvania.

Carnegie-Illinois Steel Corp. is dismantling No. 1 stack of its Isabella furnaces at Etna, Pa. This reduces the total number of potential blast furnaces in the United States from 243 to 242. Isabella No. 1 furnace was built in 1872, rebuilt in 1902 and last relined in 1930. Based on preponderant production of ferromanganese, its annual capacity was 63,400 gross tons of basic pig iron, ferromanganese and spiegeleisen.

AVERAGE DAILY PRODUCTION
Gross Tons

	1937	1936	1935	1934
Jan.	103,863	65,461	47,692	39,537
Feb.	107,857	63,411	57,675	45,385
March		66,004	57,120	52,438
April		80,316	55,719	57,873
May		85,795	55,986	66,370
June		86,551	51,949	64,563
July		83,735	49,043	39,630
Aug.		87,475	56,767	34,199
Sept.		90,942	59,009	29,969
Oct.		96,509	63,818	30,689
Nov.		98,331	68,876	31,930
Dec.		100,813	68,242	33,161
Ave.		83,832	57,694	43,774

RATE OF OPERATION
(Relation of Production to Capacity)

	1937[1]	1936[2]	1935[3]	1934[4]
Jan.	76.6	48.2	34.2	28.3
Feb.	79.5	46.6	41.4	32.5
March		48.5	41.0	37.5
April		59.1	40.0	41.4
May		63.1	40.2	47.5
June		63.6	37.2	46.3
July		61.5	35.2	28.4
Aug.		64.3	40.7	24.5
Sept.		66.9	42.5	21.5
Oct.		71.0	45.8	22.1
Nov.		72.3	49.5	22.8
Dec.		74.2	49.0	23.7

[1]Based on capacity of 49,512,737 gross tons, Dec. 31, 1936; [2]capacity of 49,777,893 tons, Dec. 31, 1935; [3]capacity of 50,845,741 tons, Dec. 31, 1934; [4]capacity of 50,975,561 tons, Dec. 31, 1933. Capacities by American Iron and Steel Institute.

FEBRUARY IRON PRODUCTION

	No. in blast last day of Feb.	Jan.	Total tonnage Merchant	Nonmerchant
Ohio	38	36	104,297	558,391
Penna.	60	59	117,933*	890,327*
Alabama	15	15	94,450	111,626
Illinois	15	13	74,729	197,754
New York	13	13	55,131	160,149
Colorado	2	2		
Indiana	15	15	17,010*	469,246
Maryland	5	5		
Virginia	1	1		
Kentucky	1	0		
Mass.	0	0		
Tenn.	1	0		
Utah	1	1	17,545*	151,418
West Va.	3	3		
Michigan	4	4		
Minnesota	2	2		
Missouri	0	0		
Total	176	169	481,095*	2,538,911*

*Includes ferro and spiegeleisen.

Great Lakes Awards Furnace

CONTRACT for design and construction of a third blast furnace for Great Lakes Steel Corp., Ecorse, Detroit, has been placed with Arthur G. McKee, Cleveland, with work to start immediately. It will be located on Zug Island, adjacent to Delray, Mich., where two other stacks operated by Hanna Furnace Corp., National Steel subsidiary, are located. This is about 2 miles from Great Lakes mills at Ecorse.

The new stack will have a capacity of about 1000 tons daily and involves, with auxiliary equipment, expenditure of $2,500,000. Present plans call for a 25-foot hearth, although this may be increased to 27 feet if the company so desires. The work will be completed by December.

MONTHLY IRON PRODUCTION
Gross Tons

	1937	1936	1935
Jan.	3,219,741	2,029,304	1,478,443
Feb.	3,020,006	1,838,932	1,614,905
Tot. 2 mo.	6,239,747	3,868,236	3,093,348
March		2,046,121	1,770,990
April		2,409,474	1,671,556
May		2,659,643	1,735,577
June		2,596,528	1,558,463
July		2,595,791	1,520,340
Aug.		2,711,726	1,759,782
Sept.		2,728,257	1,770,259
Oct.		2,991,794	1,978,379
Nov.		2,949,942	2,066,293
Dec.		3,125,192	2,115,496
Total	105,758	30,682,704	21,040,483

The furnace will be located between the present A and B stacks, necessitating removal of old blowing engines and boilers, and driving of 90-foot piling. New blowing equipment has been installed.

Stack A was originally built in 1901, and was entirely rebuilt in 1934 by the McKee company to bring capacity up to about 800 tons daily. Stack B was built by McKee in 1907, and has a capacity of some 700 tons daily. The new furnace will bring hot metal capacity up to about 2500 tons a day, which will strengthen considerably the supply of hot metal for the corporation's 12 open-hearth furnaces. The metal is transferred from blast furnaces to open hearths in 110-ton mixer cars.

New stoves of the standard McKee

type are to be erected and are said to be the largest size ever used in this country, although stoves for new Russian blast furnaces by McKee are of approximately the same size.

A new 42-inch gas line is to be installed to transfer gas from the furnaces to soaking pits and open hearths. Another gas line from the furnaces to the Detroit Edison Co. has been completed by Semet-Solvay Engineering Corp., New York, as noted in STEEL for March 1. The McKee company has installed gas cleaning equipment for the latter.

It is reported on good authority plans are underway for enlarging coke oven capacity at Zug island, as coke requirements will be increased appreciably by the new furnace.

McKee also has received a contract from Appleby-Frodingham Steel Co. Ltd., Scunthorpe, Lincolnshire, England, for the design and construction of a new plant to be located adjacent to its present blast furnace and steelworks at Scunthorpe. Appleby-Frodingham is a constituent of United Steel Companies Ltd. of Great Britain.

The new plant will consist of two blast furnaces with complete auxiliary equipment, including plants for crushing and sintering ore. A coke oven and by-products plant also will be built, although not to be provided by McKee. The entire plant is to be completed in about 15 months.

Capacity of the two furnaces if operated on American ores would be about 1200 tons daily, but will be somewhat less with English ores of lower iron content.

Republic, Gulf States Boards Approve Merger Contract

Boards of directors of Republic Steel Corp. and Gulf States Steel Co. last week approved a contract providing for sale to Republic of all the properties and assets of Gulf (See STEEL, Feb. 8, p. 20). Common stock of Republic will be issued to Gulf in the ratio of 2 1/3 shares of Republic for each one of Gulf outstanding. Republic will assume the outstanding first (closed) mortgage sinking fund 4½ per cent bonds and other indebtedness.

Stockholders of Gulf will shortly be called to vote on the transaction. To make the sale effective a favorable vote by holders of a majority of the outstanding common stock of Gulf will be necessary. No action of Republic stockholders is required. If Gulf stockholders approve this sale, Republic common stock will be distributed to Gulf's stockholders and the Gulf company dissolved.

Pittsburgh Steamship Co. To Build Four New Ships

Pittsburgh Steamship Co., Cleveland, subsidiary of the United States Steel Corp., awarded contract late last week for four bulk freighters, two to Great Lakes Engineering Works, Detroit, and two to American Shipbuilding Co., Cleveland. The latter will be built at Lorain, O., and the others at Ecorse, Mich. They are scheduled for completion April 15, 1938. These are the first bulk cargo carriers ordered on the Great Lakes since 1930.

Each of these ships will have 12,000 tons capacity and will require some 6000 tons of plates, shapes and other steel products. The overall length is 606 feet, with a 32-foot molded depth and 60-foot beam. In an average season each will bring down approximately 350,000 tons of ore. A maximum speed of 14 miles per hour can be reached.

Stokers will be installed, thereby permitting the use of cheaper fuels and the displacement of three firemen. The boats will be driven by electro-turbine propulsion. The cabins will be all steel, streamlined rudders and solid steel propellers are possibilities.

Jones & Laughlin Pushing Aliquippa Expansion Work

Jones & Laughlin Steel Corp., Pittsburgh, has record-sized building crew of 1600 men pushing construction of extensions of its rod mill and open hearth departments at Aliquippa, part of a $7,000,000 expansion program recently announced. Steel work is being placed also for buildings which will add 5000 tons to the annual output capacity of the J. & L. tin plate mills. In a few months Jones & Laughlin will have in service a new 135-ton open-hearth furnace, the first construction of this type in the Pittsburgh area in years. New locomotives, cranes and other equipment are being purchased.

Carnegie-Illinois Opens Gary Rail Plant March 10

The new Brunorized rail plant of Carnegie-Illinois Steel Corp. at Gary, Ind., will be formally opened March 10. This plant is devoted to the heat treatment of steel rails by a recently perfected process. The late John Brunner, formerly manager of the department of metallurgy and inspection for Carnegie-Illinois, was actively identified with the development of this practice.

Taylor Ambassador?

Washington rumors that Myron C. Taylor, chairman of the United States Steel Corp., would resign at the annual stockholders' meeting April 5 and accept an appointment as ambassador to Great Britain, could not be verified. It is known that several diplomatic shifts are under consideration, but although Mr. Taylor and President Roosevelt have had several conferences to discuss the steel labor situation, there has been no word from the White House about any appointment.

Pig Iron and Bessemer Steel Capacity Reduced; Open-Hearth, Electric Up

STEELMAKING capacity in the United States at the end of 1936 was 69,244,694 gross tons annually, compared with 69,428,989 tons the preceding year and with 69,734,701 tons at the end of 1934, the peak year, according to the American Iron and Steel institute.

Blast furnace capacity Dec. 31 was 49,604,737 gross tons annually, a reduction of 265,156 tons for 1936 and the third consecutive annual decrease, comparing with 49,869,893 gross tons at the end of 1934.

Pig iron capacity declined 343,956 gross tons to 48,587,937 tons annually at the end of 1936, while capacity for producing ferroalloys increased 78,800 gross tons to 924,800 tons a year at Dec. 31, 1936, the highest in history.

Pig iron producing capacity is now 8 per cent below the 1924 peak of about 52,700,000 gross tons a year.

Abandonment in 1936 of bessemer converters having capacity of 870,000 gross tons of steel annually was responsible for the decline in total steel capacity, since both openhearth and electric furnace steel capacity increased in 1936.

In the last two years, more than 1,500,000 tons of annual bessemer steel capacity has been abandoned, reflecting the gradual decrease in demand for steel made by this process.

Openhearth steel ingot capacity advanced 685,353 gross tons in 1936 as eight new furnaces were built and several older ones were modernized and enlarged.

Electric furnace capacity was slightly higher at 943,252 gross tons annually, compared with 942,900 tons at the close of 1935.

Production

STEEL ingot operations advanced 2 points last week to 86 per cent, highest level since the second week of September, 1929, when the rate also was 86. Heavier operating schedules in all important steelmaking centers contributed to this advance. Details follow:

Cleveland-Lorain — Held at 79½ per cent for the third consecutive week. Otis Steel Co. continues to operate all 8 units, Corrigan, McKinney division of Republic Steel Corp., 12 of 14, and National Tube Co., Lorain, 11.

Cincinnati—Maintained at 64 per cent. Three available open hearths are idle, and another is being rehabilitated.

Detroit—Up 3 points to 100 per cent, with all open hearths in the district active.

Youngstown — Gained 2½ points to 84 per cent, due to addition of one open hearth each by Youngstown Sheet & Tube Co. at its Brier Hill works, and Carnegie-Illinois Steel Corp. at its Ohio works.

Pittsburgh—Up 1 point to 88 per cent. A blast furnace which had been idle for a few days at McKeesport, Pa., resumed Thursday.

Wheeling—Up 2 points to 96 per cent, highest of this year.

Central eastern seaboard—Ingot operations, limited in some cases by finishing capacity, are pushing slowly forward to around 57 per cent. Further increases are expected before March 31.

Chicago—Increased ½ point to 81 per cent, a new peak for the current movement and on the basis of tonnage output, is near the highest level for this period in history. One additional blast furnace has been lighted, making a total of 30 active.

New England—Held at 97 per cent. Practically all ingot production is being absorbed by steelworks' own finishing departments, as semifinished steel available to outside rolling mills is limited.

Birmingham—Steady at 77 per cent, with little change indicated for the remainder of the quarter.

Buffalo—Up 4 points to 90 per cent, an all-time high for this district. Bethlehem Steel Co. placed the sixth and final unit of its new battery at Lackawanna in production.

St. Louis—Unchanged at 82 per cent.

American Range Corp., Shakopee, Minn., has placed in production a full line of oil burning parlor furnaces of various capacities and also an entirely new line of coal and wood ranges and coal and wood parlor furnaces. The company's plant is running at capacity.

District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended March 6	Change	Same week 1936	Same week 1935
Pittsburgh	88	+ 1	38	38
Chicago	81	+ ½	62	55
Eastern Pa.	57	+ 1	39	28½
Youngstown	84	+ 2½	68	55
Wheeling	96	+ 2	78	92
Cleveland	79½	None	64	74
Buffalo	90	+ 4	42	38
Birmingham	77	None	66	55½
New England	97	None	68	61
Detroit	100	+ 3	94	94
Cincinnati	64	None	76	†
St. Louis	82	None	†	†
Average	86	+ 2	55½	50

†Not reported.

How Wage Increase Has Affected Costs, Prices

(*Concluded from Page* 21)

mills had sufficient unsold capacity to accept heavy tonnages at the former price and to give protections on pending work. The result of this was that lower prices applied on so large a tonnage that benefits of the new prices were not realized until late in first quarter.

At present few mills have any capacity to sell for March delivery and a large tonnage has been booked for second quarter, the price to be that prevailing at time of shipment. Thus mills will begin billing at the new price almost at the beginning of the quarter. Practically no protections are out on pending projects.

For some time delivery has been of more importance than price and steel consumers have sought to obtain preferred position on rolling schedules. Sellers have accepted such tonnage only with the provision that the price be whatever shall rule when delivery is made. The result of this policy has been to provide considerable backlog tonnage for shipment in second quarter at full price.

Costs in Man-Hours

In June, 1935, the bureau of labor announced that as a result of investigations of 15 representative steel companies it has determined that 53 man-hours are required in producing one ton of finished steel, when the industry operates at 55 to 60 per cent. At higher rates of operation greater efficiency is obtained and the number of man-hours probably would be less. The present rate is close to 85 per cent.

The 53 hours are subdivided as follows: For ore and coal extraction 7.75; transportation 8; coke production 1.50; actual manufacture 34.43; administration 1.32. Eliminating administration and transportation factors the number of hours assigned to the industry's coke oven and other manufacturing labor was 43.68.

In December, 1936, after the November wage increase the American Iron and Steel institute reported hourly earnings for the steel industry's workers averaged 73 cents. Applying this to the 43.68 man-hours of labor the result is $31.88, labor cost per ton of finished steel. An average 10 per cent advance in this cost, therefore, is $3.18 per ton.

Full Text of Carnegie Agreement with Union

THIS agreement dated March 2, 1937, between Carnegie-Illinois Steel Corp. and the Steel Workers Organizing committee on behalf of the members of the Amalgamated Association of Iron, Steel and Tin Workers of North America, employed by this corporation.

1. The corporation recognizes the Steel Workers Organizing committee, or its successor, as the collective bargaining agency for those employes of the corporation who are members of the Amalgamated Association of Iron, Steel and Tin Workers of North America (hereinafter referred to as the union). The corporation recognizes and will not interfere with the right of its employes to become members of the union, or its successor. There shall be no discrimination, interference, restraint or coercion by the corporation or any of its agents against any member because of membership in the union, or its successor. The Steel Workers Organizing committee, or its successor, agrees not to intimidate or coerce employes into membership, or to solicit membership on corporation time or plant property.

2. Effective March 16, 1937, there shall be an increase in wages of ten cents an hour on all rates which are at present $4.20 a day, or a minimum for this classification of $5.00 a day for eight hours. Such classifications now receiving less than $4.20 per day, or less than 52½c per hour, shall be increased ten cents per hour. All other classifications shall be equitably adjusted in accordance with the provisions of Section 4 of this agreement.

3. Effective March 16, 1937, there shall be established an eight-hour day, forty hour week. Time and one half shall be paid for all overtime in excess of forty hours in any one week.

4. A joint committee representing the Carnegie-Illinois Steel Corp. and the Steel Workers Organizing committee shall meet not later than March 10, 1937, for the purpose of effectuating a written agreement on working conditions, application of wage rates, hours, rules and a method for adjudication of disputes arising under the terms of the agreement, and which agreement shall incorporate the terms of this agreement.

5. The agreement effectuated pursuant to section 4 hereof, shall be in force until Feb. 28, 1938.

CARNEGIE-ILLINOIS STEEL CORP.,
By B. F. Fairless, president.

STEEL WORKERS ORGANIZING COMMITTEE,
By Philip Murray, chairman; David J. McDonald, secretary-treasurer; Van A. Bittner, director, western region; Clinton S. Golden, northeastern region; Lee Pressman, general counsel.

January Exports 56% Above 1936

EXPORTS of semifinished and finished steel and iron products from the United States in January totaled 128,662 gross tons, valued at $9,327,749, sustaining the high level of monthly shipments prevailing during 1936, according to the metals and minerals division of the department of commerce. When compared with December, 1936, a decline of 4.8 per cent in quantity and 6.7 per cent in value are shown. Against the record of January, 1936, the increase is 56 per cent in quantity and 49 per cent in value.

In 1936 the average monthly level of shipments was approximately 102,000 tons. Consequently, should the January level be maintained through 1937, the total for the year would be well above that of 1936.

Scrap exports in January totaled 72,849 gross tons, valued at $1,148,093 compared with 109,026 tons valued at $1,616,473 in December and 158,962 tons valued at $1,897,762 in January, 1936.

Federal Survey Analyzes Electric Equipment Market

Ninety-five per cent of electric generating capacity in the United States is privately owned and operated, says *Basic Industrial Markets in the United States—Gas and Electric Utilities*, a report just issued by the department of commerce.

Importance of these industries as markets for industrial goods and services is illustrated by their expenditure of $919,417,000 for construction in 1930. This dropped to $129,300,000 in 1933 and increased to $192,855,000 in 1935. Annual income of gas and electric utilities is more than $2,250,000,000, the report reveals.

Manufacturers of equipment for gas and electric utilities will find data needed for their particular work in this report, which is a 157-page booklet with nine large maps, obtainable from the bureau of foreign and domestic commerce, Washington, for ten cents.

Name Stettinius to Council

E. R. Stettinius, chairman of the finance committee of the United States Steel Corp., has been appointed to Secretary of Commerce Roper's business advisory council. He replaces Myron C. Taylor, corporation chairman.

UNITED STATES EXPORTS OF IRON AND STEEL PRODUCTS
Gross Tons

Articles	Jan., 1937	Dec., 1936	Jan., 1936
Pig iron	13,329	3,091	186
Ferromanganese and spiegeleisen	75	13	7
Other ferroalloys	93	382	274
*Ingots, blooms, etc.:			
Not cont'g alloy	1,790	2,359	95
Alloy, inc. stnls.	44		
Bars, iron	90	54	118
Bars, concrete	891	721	250
*Other steel bars:			
Not alloy	4,385	5,778	3,153
Stainless steel	47		
Alloy, not stnls.	335		
Wire rods	3,279	1,467	3,939
Boiler plate	217	133	215
*Other pl. not fab.:			
Not alloy	7,074	21,967	3,190
Stainless steel	2		
Alloy, not stnls.	13		
Skelp	1,531	4,368	812
Sheets, galv. iron	994	244	130
Sheets, galv. steel	5,496	6,250	6,295
*Sheets, blk. steel:			
Not alloy	13,296	10,489	8,816
Stainless steel	46		
Alloy, not stnls.	14		
Sheets, black iron	704	308	616
*Strip, cold-rolled:			
Not alloy	2,276	1,828	2,461
Stainless steel	39		
Alloy, not stnls.	29		
*Strip, hot-rolled:			
Not alloy	5,775	3,392	2,493
Stainless steel	25		
Alloy, not stnls.	107		
Tin plate and taggers' tin	25,232	24,377	18,025
Terne plate	641	306	433
Tanks, ext. lined	553	1,794	2,080
Shapes, not fab.	4,512	7,275	3,348
Shapes, fab.	1,530	3,187	1,051
Plates, fabricated	127	242	129
Metal lath	103	111	73
Frames and sashes	73	128	111
Sheet piling	847	55	285
Rails, 60 lb.	3,835	4,353	3,966
Rails, relaying	1,518		
Rails, relaying	1,518	.....	.....
Rail fastenings	286	794	417
Switches, frgs, etc.	118	74	184
Railroad spikes	234	115	221
R.R. bolts, nuts	58	45	70
Boiler tubes, smls.	734	591	421
Do., welded	24	23	38
Pipe:			
Casing and oil-line seamless.	3,151	4,633	1,817
Do. Welded	786	39	326
Do. Smls. black, except casing.	1,263	446	341
Pipe fittings:			
Malleable-iron screwed	283	380	227
Cst-iron screwed	157	220	91
Pipe, fittings for:			
Cast-iron pres.	1,801	1,839	513
Cast-iron soil	613	417	181
Pipe:			
Wlded blk. steel	1,419	1,502	2,231
Welded black wrought-iron	160	206	210
Wlded galv. steel	2,953	2,091	1,059
Welded galv. wrought-iron	11	67	177
Pipe and fittings:			
Riv. iron, steel	47	117	139
Wire:			
Plain iron, steel	2,547	2,594	2,494
Galvanized	1,653	2,795	2,536
Barbed	3,322	4,769	1,513
*Wov. wire fencing	179	376	231
*Woven wire screen cloth:			
Insect	23	119	74
Other	103		
‡Wire rope	215	292	409
‡Wire strand	36		
†Card clothing	1		
Other wire, mfrs.	539	832	365
Wire nails	1,087	890	675
Horseshoe nails	73	78	55
Tacks	23	31	34
Other nails, staples	203	266	153
Bolts, etc.	698	734	461
Castings:			
*Gray iron, semi-steel	508	742	846
Malleable iron	315		
Steel, not alloy	112	308	210
Alloy, incl. stnls	137		
Car wheels, tires, and axles	628	1,152	285
Horseshoes, calks.	2	3	1
*Forgings, n.e.s.:			
Not alloy	338	413	682
Alloy, incl. stnls	134		
Total I & S prod.	128,662	135,130	82,602
Scrap, iron, steel	68,884	103,298	153,906
Scrap, tin plate	437	582	2,461
†Tin plate circles, strips, cbles, etc.	852		
Wste-wste tin plte	2,676	5,146	2,595
Total scrap	72,849	109,026	158,962
GRAND TOTAL	201,511	244,156	241,564
Iron ore (Tons)	80	160	.....

*No comparable breakdown for previous years.
†New class. No comparable figures available for previous periods.
‡Previously carried under one heading —"Wire Rope".

Financial

INTERLAKE IRON CORP., Chicago, in its consolidated profit statement filed with the SEC, shows net profit of $581,143 after charges and tax provisions, for 1936. This compares with a deficit of $686,607 in the preceding year. No provision was made for surtax on undistributed profits.

* * *

Edward G. Budd Mfg. Co., Philadelphia, reports net profit for 1936 of $991,271, compared with $743,412 in 1935. This is equivalent to 34 cents a share on the 1,656,808 outstanding shares, against 30 cents a share in 1935 on 1,060,618 shares.

* * *

Continental Steel Corp., Kokomo, Ind., reports net sales last year increased 18 per cent over 1935. The company's net income for the year ending Dec. 31, equaled $2.78 a common share, or $736,228.

* * *

The largest earnings in its history have been reported by International Business Machines Corp., New York, for the year ended Dec. 31. Net profits were $7,552,956 after all charges including tax on undistributed profits and compared with $7,090,530 in 1935. The 1936 net earnings equaled $10.22 a share on the 738,934 no par shares outstanding, compared with $9.59 in 1935.

* * *

DIVIDENDS DECLARED

American Rolling Mill Co., Middletown, O., has declared a regular quarterly dividend of 30 cents a share on common stock, payable April 15 to holders of record March 15.

* * *

Midland Steel Products Co., Cleveland, has declared a dividend of 50 cents a share on the common and $2 on the 8 per cent preferred, both payable April 1 to record March 20.

* * *

National Steel Corp., Pittsburgh, declared the regular dividend of 62½ cents per share of capital stock for the first quarter of 1937. There are 2,163,277 outstanding shares and the dividend will be payable March 30 to stockholders of record on March 20.

Men of Industry

O. N. LINDAHL, formerly auditor and assistant secretary, has been appointed comptroller and secretary, Universal Atlas Cement Co., Chicago, a United States Steel Corp. subsidiary. Other appointments announced by the company follow: J. J. Heffernan, assistant secretary; Leonard Wesson, operating manager; S. J. Robison, chief engineer; O. L. Moore, director of tests and research; J. C. Witt, manager research and development; T. A. Hicks, general chemist; G. L. Lindsay, engineer of tests; R. B. Hynes, purchasing agent; E. D. Barry, manager industrial relations; Gordon C. Huth, assistant manager of industrial relations.

John Ahnfelt, operating manager, and A. G. Carlson, chief engineer, with 43 and 34 years of service respectively, have retired under the corporation's retirement plan.

♦ ♦ ♦

T. S. Hammond, president, Whiting Corp., Harvey, Ill., has been elected a director, Illinois Bell Telephone Co., Chicago.

♦ ♦ ♦

Chester R. Pieper, president, Iron Products Corp., La Crosse, Wis., has been elected president of the La Crosse chamber of commerce.

♦ ♦ ♦

J. Paul Fife has been elected to the newly created office of chairman of the board. McKeesport Tin Plate Co., McKeesport, Pa.

♦ ♦ ♦

H. Sydney Snodgrass has been appointed manager, motor coach division, Gar Wood Industries Inc., Detroit. He succeeds Stanley E. Knauss, resigned.

♦ ♦ ♦

William A. Streich, cost accountant, has been appointed auditor, Superior Steel Corp., Pittsburgh. Mr. Streich has been with the company since September, 1928.

♦ ♦ ♦

F. C. Holmgren, salesman for the A. F. Holden Co., New Haven, Conn., covering the New England district, has also been given charge of the New York and Philadelphia territories.

♦ ♦ ♦

Frederick L. Sattley, formerly in charge of Indiana and Kentucky sales for the Trundle Engineering Co., Cleveland, from 1926 to 1935, has been appointed statistician and librarian of the company. He resigned from the company two years ago because of illness.

♦ ♦ ♦

J. A. Sisto has been re-elected president and chairman, Barium Steel Corp., Canton, O. Other officers re-elected at the annual meeting of officers and directors last week are: C. F. Norsworthy, vice president and treasurer, and L. C. Miller, secretary and assistant treasurer.

♦ ♦ ♦

E. R. Galvin has been appointed general sales manager, Caterpillar Tractor Co., Peoria, Ill. Mr. Galvin left his position as general sales manager of Cleveland Tractor Co. in 1928 to become a district representative for Caterpillar. Shortly thereafter he became sales manager in charge of the eastern sales division and in January, 1936, was appointed assistant general sales manager.

E. R. Galvin

♦ ♦ ♦

N. E. Sacha has been named president, East Shore Machine Products Co., Cleveland, succeeding the late Henry C. Gottschalt. Mr. Sacha was formerly assistant manager and a sales executive. Nellie M. Gottschalt, daughter of the former president, has been elected treasurer, and Fred J. Young, secretary.

♦ ♦ ♦

J. C. Joublanc has been appointed chief metallurgist. Harnischfeger Corp., Milwaukee. For ten years he was connected with the Republic Steel Corp., Cleveland, and for four years with the welding development and research department of one of the country's leading welding equipment manufacturers.

♦ ♦ ♦

W. F. Perkins, vice president in charge of the American Hammered Piston Ring and Bartlett Hayward divisions of Koppers Co., Pittsburgh, and its subsidiary, Maryland Drydock Co., all in Baltimore, also has been placed in complete charge of the company's Western Gas division in Fort Wayne, Ind. R. A. Wickes will continue as general manager of the division under Mr. Perkins.

♦ ♦ ♦

William T. Hugus, assistant manager of industrial relations, Carnegie-Illinois Steel Corp., has been appointed general superintendent of the company's American works at Elwood, Ind. Mr. Hugus was assistant vice president, American Sheet & Tin Plate Co. prior to its merger with Carnegie-Illinois.

♦ ♦ ♦

Ed Provost, well known power plant and equipment engineer, is now associated with Iron & Steel Products Inc., Chicago. Adolph Waleski has been placed in charge of structural work of the company, succeeding P. K. Freese, resigned, and Art Loos has been appointed to assist Messrs. Provost and Waleski in their duties.

♦ ♦ ♦

Robert F. Vogt, assistant chief consulting engineer since 1921, Allis-Chalmers Mfg. Co., Milwaukee, has been appointed chief consulting engineer, to succeed the late J. F. Max Patitz. He has been connected with Allis-Chalmers since 1907, entering as mechanical engineer. He is a member, American Society of Mechanical Engineers.

♦ ♦ ♦

Gustaf E. Anderson has succeeded Frederick W. Zander as manager, Buffalo branch, Crane Co. Mr. Anderson formerly was in charge of Crane Co. operations in the Lima, O., territory. Mr. Zander will do special promotional work for the firm, which is doubling the size of the quarters it now occupies in Buffalo.

♦ ♦ ♦

Garrett A. Connors, vice president and general manager, Youngstown Pressed Steel Co., Warren, O., has been appointed vice president of Sharon Steel Corp., Sharon, Pa. Mr. Connors will direct industrial relations for the Sharon firm in Sharon, Lowellville, Warren and Niles units and will continue in his present capacity with the Youngstown company, a subsidiary.

♦ ♦ ♦

Charles F. Newpher has been appointed assistant to the president, National Screw & Mfg. Co., Cleveland. Recently he resigned his position as manager of sales, bolt and nut division, Republic Steel Corp., Cleveland. Starting in 1911 in an engineering capacity, Mr. Newpher recently rounded out 25 years service with the Republic corporation and its predecessors.

♦ ♦ ♦

J. P. Wright, president, Continental-Diamond Fibre Co., Newark, Del., has also assumed the responsibilities of general manager, following the resignation of L. W. Tarr, and has named three assistants to head up the production end of the business. J. Frank Anderson, vice

president, Haveg Corp., will also serve as assistant to Mr. Wright in charge of plant operation and maintenance; Robert Stewart has been named production manager, and Dr. G. E. Landt has been named technical director.

♦ ♦ ♦

C. Wesley Pomeroy has been elected secretary, Westinghouse Electric & Mfg. Co., succeeding the late Warren H. Jones. Mr. Pomeroy became associated with Westinghouse in 1908. From 1919 to 1934 he was secretary to the president, Westinghouse Electric International Co., and since 1934 had been supervisor of foreign licenses. Albert Olsen has been elected assistant secretary.

♦ ♦ ♦

Harlan W. How has rejoined the staff of Struthers Wells-Titusville Corp. Titusville, Pa., as technical director. He formerly was chief engineer, Buffalo Foundry & Machine Co., and lately, consulting engineer, Blaw-Knox Co., Pittsburgh. Mr. How is located at the Titusville Iron Works Co. division, Titusville, and will devote most of his time to the designing and marketing of an entirely new line of process equipment.

♦ ♦ ♦

Nelson T. Hasenflue has been elected secretary and general manager, Par-Brook Mfg. Co., Cleveland, manufacturer of sheet metal products. He succeeds the late George F. Collister. Previous to joining Par-Brook, Mr. Hasenflue served as secretary, treasurer and general manager, Champion Hardware Co., Geneva, O., for a number of years.

♦ ♦ ♦

William H. Driscoll, former vice president in charge of mechanical equipment, Thompson-Starrett Co., has become associated with the Carrier Corp., Newark, N. J., maker of air conditioning equipment, as vice president in charge of construction. A past president of the American Society of Heating and Ventilating Engineers, Mr. Driscoll has been active also as a member of the executive committee and council.

♦ ♦ ♦

Dr. Harold Moore and W. Murray Morrison have been added to the list of Fellows of the British Institute of Metals. This honor is conferred upon those who have rendered eminent service to the institute. Dr. Moore is a past president of the institute and director of the British Nonferrous Metals Research association. Mr. Morrison, an original member of the institute, is vice chairman and managing director, British Aluminum Co. Ltd.

♦ ♦ ♦

J. A. Dwyer, manager, Philadelphia branch, Crane Co., has been made district manager of all Crane branches in the eastern territory, including all the New England states, metropolitan New York, eastern Pennsylvania, New Jersey, Maryland and the District of Columbia. A total of 18 Crane establishments thus come under the jurisdiction of Mr. Dwyer, whose headquarters will be at the company's New York branch.

H. S. Officer, manager of the Newark branch, succeeds Mr. Dwyer at Philadelphia, and J. H. Geiss moves from Hempstead, L. I., to succeed Mr. Officer as manager at Newark.

♦ ♦ ♦

Paul J. Cnare has been appointed by Claude B. Schneible Co., Chicago, maker of multi-wash dust collectors and multi-louver dewatering tanks, to handle sales in Wisconsin and Minnesota, with headquarters in Milwaukee.

Charles C. Hermann, formerly

Nelson T. Hasenflue

identified with Deere & Co., Waterloo, Iowa, has been placed in charge of the Philadelphia office of Claude B. Schneible, which covers eastern Pennsylvania, Maryland, Delaware and the lower New Jersey territory.

♦ ♦ ♦

Frank J. Enright has resigned as advertising manager of *Metal Progress* and the American Society for Metals, with whom he has been associated for the past six years, to join A. F. Holden Co., New Haven, Conn., manufacturer and developer of heat treating baths, as director of sales and advertising. He began his advertising career over 20 years ago with the McGraw-Hill Publishing Co.

♦ ♦ ♦

John M. Schreiner has been named manager by Black & Decker Mfg. Co., Towson, Md., of its Detroit branch, succeeding the late George W. Stoiber. Mr. Schreiner has been active in the Detroit area for the past 12 years.

W. J. Fenwick, for the past several years co-manager of Black & Decker's Cleveland territory, has been appointed manager of all activities in that branch. G. H. Treslar has been appointed supervisor of the Detroit and Cleveland territories and will co-operate with Messrs. Schreiner and Fenwick in the promotion of sales in these areas.

Died:

MOY LAWRENCE, 56, manager, Youngstown Sheet & Tube Employes' Benefit association, Youngstown, O., in that city, Feb. 23. He had been associated with Youngstown Sheet & Tube Co. for 20 years and became manager of the association about four years ago.

♦ ♦ ♦

Edwin Winsor Reed, 45, vice president and general superintendent, Reed & Prince Mfg. Co., Worcester, Mass., in that city, Feb. 13.

♦ ♦ ♦

Albert H. Schneider, 63, superintendent for 40 years, Crouse-Hinds Co., Syracuse, N. Y., manufacturer of electrical equipment, in Syracuse, recently.

♦ ♦ ♦

Edward N. Sexton, 56, railroad sales manager Air Reduction Sales Corp., New York, in New York, Feb. 15. He became connected with Air Reduction in 1916.

♦ ♦ ♦

L. A. Ramsey, 52, chief application engineer, York Ice Machinery Corp., York, Pa., in that city, Feb. 5. He had been associated with the York company since 1906.

♦ ♦ ♦

George E. Smith, 54, purchasing agent, Line Material Co., South Milwaukee, Wis., maker of transmission line supplies, and transformers, in that city, Feb. 18.

♦ ♦ ♦

Charles Coit Tyler, 75, vice president in charge of all manufacturing operations of Remington Arms Co. plants during the World war, at Hartford, Conn., Feb. 21.

♦ ♦ ♦

John P. Seymour, 72, former works manager, Carborundum Co., Niagara Falls, N. Y., at his home in Buffalo, recently. He formerly was associated with steel companies in Pittsburgh and Buffalo.

♦ ♦ ♦

Marks Angel, 72, president and founder, Roxbury Iron & Metal Co., scrap dealer, Boston, in that city, Feb. 28. Mr. Angel had been engaged in selling iron and steel scrap in the New England territory for more than 50 years.

♦ ♦ ♦

Charles H. Jarvis, 47, factory manager and a director, United Steel & Wire Co., Battle Creek, Mich., in that city, Feb. 23. He was the designer of many automatic welding and wire forming machines used by the company.

Fire Started by Striking Coal Miners Burns for 53 Years, Costs Millions

RESOURCES of the United States government have been enlisted in an attempt to isolate the "world's greatest underground fire" in the coal fields of Ohio's Hocking Valley. Estimated to have destroyed approximately $50,000,000 worth of coal already, the smoldering fire now threatens to consume additional millions of tons.

Deliberately started by striking coal miners, the fire became a Frankenstein to threaten homes and jobs of three generations of miners. In 1884 striking mine workers poured oil on loaded coal cars, ignited them and shoved them into underground mines near New Straitsville. Within 24 hours the workings were honeycombed with fire and beyond control. Ventilation shafts acted as smokestacks.

For half a century the fire has been consuming coal, oil, gas, fireclay, iron ore and limestone, over an area of seven to ten square miles. At times flames break through the surface to ravage farms, highways and buildings. Whole forests have been withered by seeping gases. Working coal mines have been abandoned as flames surround the shafts. Homes and school houses have been given up.

Would Save Adjacent Deposits

Recently engineers of the United States bureau of mines and James Berry, superintendent of the Ohio division of mines, developed a plan to isolate the fire and save coal deposits in neighboring fields. An appropriation of $365,000 was obtained from the government and work was started as a WPA project.

Barriers are to be erected at three points where coal seams in the burning area connect with other coal fields. The project will require 18 months to complete. If successful, the barriers will "bottle up" fire within the area, where mine experts say it will continue to burn many more years.

Barriers will be either trenches or tunnels 16 feet wide and eight to 30 feet deep through the coal, filled with non-combustible material. Longest barrier is at Lost Run in Hocking county south of the fire area and will be more than a mile. This is intended to keep the fire from spreading into the rich deposits between the burning area and the Ohio river, source of one-tenth of the nation's coal supply.

Another, 3000 feet long, will be placed at Martin's Hollow on the western side, and the third, 4600 feet long, will be at the northwestern corner.

Three hundred men, WPA workers, steamshovel operators and experienced miners are employed on the project. Officers in charge are W. J. Fene, chief engineer, federal bureau of mines; J. R. Cavanaugh, director and supervisor; Adam J. Laverty, general superintendent of all operations; R. C. Ridley, safety engineer.

Meetings

NEW GALVANIZERS GROUP TO MEET WITH ZINC INSTITUTE

AMERICAN ZINC INSTITUTE Inc. will hold its nineteenth annual meeting at Hotel Statler, St. Louis, April 26-27. The first day will be devoted to reports of the year's activities and an outlook for zinc mining and smelting. Program for the second day will include developments in merchandising and production of zinc and zinc coated products.

The recently organized Galvanizers committee, sponsored by the institute and comprising technical and operating men in the galvanizing division of the steel industry (see STEEL, Nov. 30, 1936, p. 27), will conduct its second meeting during the same week. It will hold a roundtable conference for committee members only on Monday afternoon and on Tuesday will participate in sessions of the institute. The program will extend into April 28 with a business and technical session. In the afternoon the group will visit Granite City Steel Co.'s new strip mills and galvanizing department at Granite City, Ill.

PREPARE PROGRAM FOR NEW ENGLAND FOUNDRY MEETING

Problems of castings design and certain casting production methods will receive major consideration at the New England foundry conference to be held at Massachusetts Institute of Technology, Cambridge, Mass., April 9-10, under the auspices of the New England Foundrymen's association, American Foundrymen's association and the institute.

Technical sessions will be held morning, afternoon and evening of the first day and morning and afternoon of the second. At dinner Friday evening members will be addressed by Dr. K. T. Compton, president of Massachusetts institute; D. M. Avey, secretary, American Foundrymen's association, Chicago; and W. M. Saunders Jr., president, New England Foundrymen's association, Providence, R. I.

Among the papers listed on the tentative program are the following: "Casting Design—Iron," by E. M. Phillips, General Electric Co., Lynn, Mass.; "Casting Design—Steel," by V. T. Malcolm, Chapman Valve Mfg. Co., Indian Orchard, Mass.; "Casting Design—Nonferrous," by H. J. Roast, Canadian Bronze Co. Ltd., Montreal; "Molding Sand," by W. G. Reichert, Singer Mfg. Co., Elizabethport, N. J.; "Sand Testing Technique and Demonstration," by Earl E. Woodliff, H. W. Dietert Co., Detroit; and "Cupola Operation," by D. J. Reese, International Nickel Co. Inc., New York. Prof. J. M. Lessells of the institute staff will conduct physical

On Hazleton's hill near New Straitsville, O., 35 acres of coal lands are on fire close to the surface, which is dotted with great holes, emitting flames and gases

testing and laboratory demonstrations.

SHEET METAL DISTRIBUTORS PLAN CLEVELAND MEETING

Twenty-sixth annual meeting of the National Association of Sheet Metal Distributors will be held at Hotel Cleveland, Cleveland. May 5-6. All sheet metal distributors and representatives are invited to attend. In setting up its meeting program, the association is asking members for data concerning the distribution of galvanized and black sheets and corrugated roofing, tin and terne plate, eaves trough and conductor pipe, sheet copper and prepared roofing. George A. Fernley, 505 Arch street, Philadelphia, is secretary of the association.

CREDIT MEN PLAN INDUSTRY CONGRESS FOR NEXT JUNE

National Association of Credit Men will hold its forty-second annual convention at the Stevens hotel, Chicago, June 21-24, and in connection with it the Seventh Credit Congress of Industry. Theme of the congress and convention will be "Chart a True Course."

Among the industry groups which will hold conferences are: Building material and construction, Hugh L. Carnahan, Plibrico Jointless Firebrick Co., Chicago, chairman; hardware manufacturers, C. R. Kierstead, J. Wiss & Sons Co., Newark, N. J., chairman; iron and steel, J. N. Moylan, American Steel & Wire Co., Chicago, chairman; reinforcing and bar steel, Robert Young, Bethlehem Steel Co., Bethlehem, Pa., chairman; machinery, machinists and manufacturers supplies, Oscar Iber, O. Iber Co., Chicago, chairman; oil well supply, Fred Carpenter, National Supply Co., Los Angeles, chairman; paint, varnish and lacquer, Fred J. Hamerin, Lilly Varnish Co., Indianapolis, chairman; plumbing and heating, C. H. Rison, Grinnell Co., Providence, R. I., chairman.

Brace Bennitt, 1 Park avenue, New York, is convention director of the association.

WAREHOUSE ASSOCIATION TO HOLD CONVENTION IN MAY

American Steel Warehouse Association Inc. announces its twenty-eighth annual convention to be held at the Greenbrier hotel, White Sulphur Springs, W. Va., May 24-26. W. S. Doxsey, 442 Terminal Tower, Cleveland, is executive secretary.

SIXTH STEEL DEVELOPMENT CONGRESS IN NEW YORK

Delegates from many steel producing countries will attend the sixth international congress for steel development in New York, June 28-July 3, with the American Institute of Steel Construction as host. Five similar conferences in the past five years have met in Europe.

Countries whose representatives participate in the conferences include Belgium, France, Germany, England, Italy, Netherlands, Poland, Roumania, Switzerland, Czechoslovakia and United States. For constant interchange of information between steel producers in these countries, the congress maintains an international documentation office at the Hague, Netherlands, under direction of E. A. van Genderen Stort.

Activities of Steel Users and Makers

SALEM ENGINEERING CO., Salem, O., announces the opening of Salem Engineering Co. (England), with headquarters at First Avenue House, High Holborn, London, W. C. 1. The British company, which now has orders on hand for a considerable volume of equipment and is manufacturing a regular line of products, has received a contract from the Lancashire Steel Corp., Irlam, for the building of Salem circular ingot heating furnaces.

♦ ♦ ♦

Storms Drop Forging Co., Springfield, Mass., has installed equipment for manufacturing brass forgings by the hot pressed method.

♦ ♦ ♦

Fedders Mfg. Co., Buffalo, has developed a complete line of all-season units, in 3 to 15-ton capacities for summer and winter air conditioning.

♦ ♦ ♦

Birmingham Ornamental Iron Co., Birmingham, Ala., recently moved to new quarters at Morris avenue and Forty-fourth street.

♦ ♦ ♦

David J. Joseph Co., iron and steel scrap dealer, Youngstown, O., announces it will move to Middletown, O.

♦ ♦ ♦

R. C. Bursaw Inc., Indianapolis, has been named state sales agent in Indiana for Steelox homes, product of Steel Buildings Inc., Middletown, O.

♦ ♦ ♦

Electric Alloys Co., Elyria, O., producer of castings, announces the opening of a new Cleveland sales office at 5005 Euclid avenue. H. I. Dixon is in charge.

♦ ♦ ♦

Insulation Products Ltd., has been formed in Hamilton, Ont., to produce mineral wool. It will obtain its raw material from the Hamilton works of Steel Co. of Canada Ltd.

♦ ♦ ♦

Utica Radiator Corp., Utica, N. Y., has entered the air conditioning field with a unit said to incorporate new principles of design. It is made in four standard sizes to perform all the functions of air washing and conditioning.

♦ ♦ ♦

Reed Foundry & Machine Co.. Kalamazoo, Mich., manufacturer of steel castings, has opened a new cleaning room fully equipped with modern apparatus, and has installed a new gas-fired annealing furnace for normalizing steel castings.

♦ ♦ ♦

Harry W. Dietert Co. has opened a new plant at 9330 Roselawn avenue, Detroit, which is fully equipped with new and modern facilities for the production of Dietert-Detroit sand, core and mold control equipment.

♦ ♦ ♦

Delta Mfg. Co., 600 East Vienna avenue, Milwaukee, maker of a diversified line of mechanical tools for factories, and home workshops, has added a 6-inch belt surfacer to its products, capable of handling a wide range of sanding, surfacing and finishing operations.

♦ ♦ ♦

James Robertson Co. Ltd. has been appointed exclusive distributor of Link-Belt automatic coal burners in Canada by Link-Belt Co., Chicago. The Robertson company maintains headquarters in Montreal, and has branches in Toronto, St. John, Winnipeg and Saskatoon.

♦ ♦ ♦

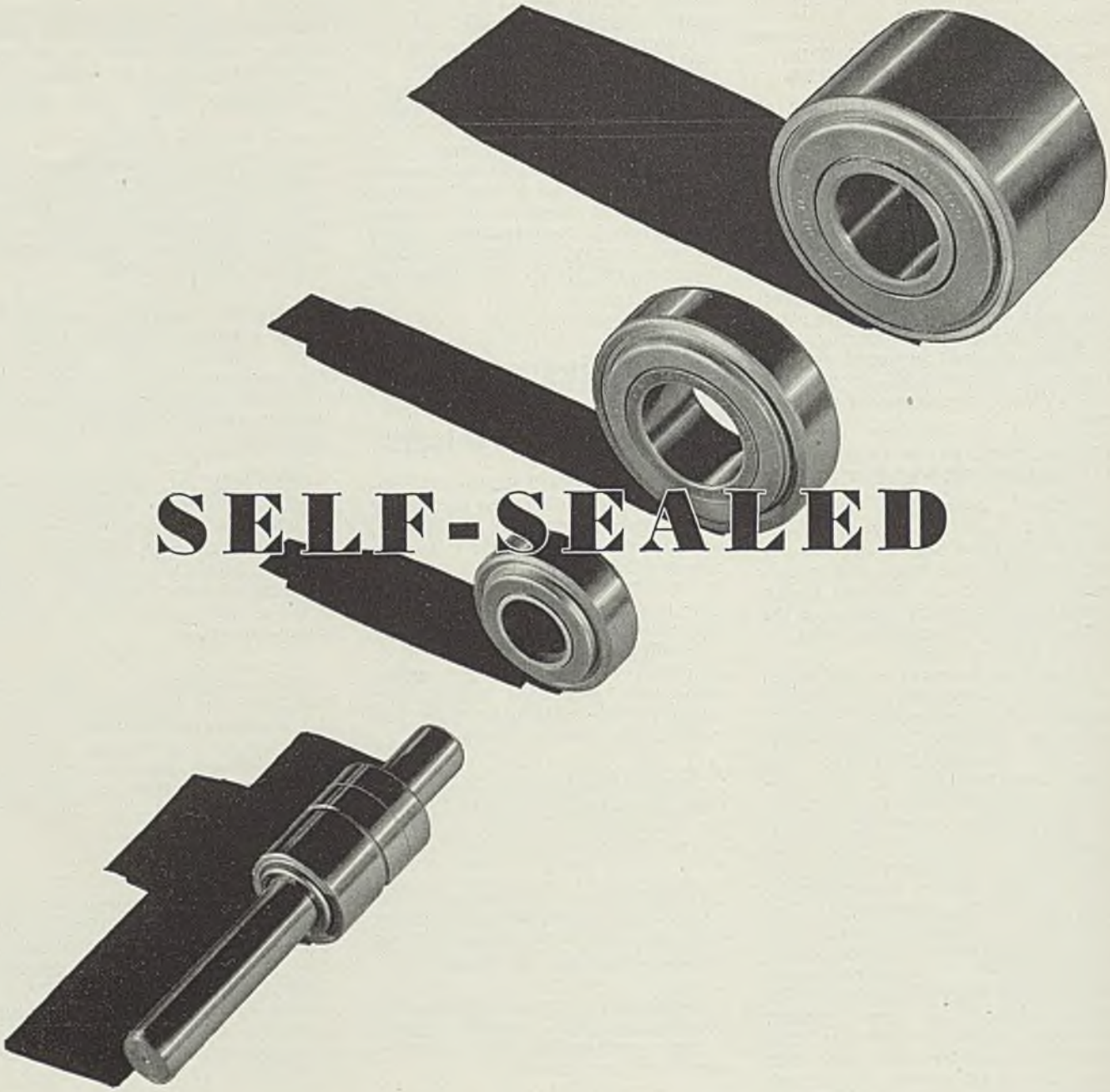
W. S. Yates Associates, 520 North Michigan avenue, Chicago, have recently been appointed to handle the sale of all products of the Audubon Wire Cloth Corp., Philadelphia, manufacturer of metalwove flexible woven wire conveyor and processing belts, and a complete line of woven wire cloth, in the Chicago district.

♦ ♦ ♦

Industrial committee of the chamber of commerce at Kendallville, Ind., is conducting a campaign to raise $6000 to purchase a factory building to be turned over to the Claypool Machine Co., Claypool, Ind., provided that firm will move there. The Claypool plant, which manufactures automobile axles, burned recently.

♦ ♦ ♦

Ellwood City Forge Co., Ellwood City, Pa., has taken over the crankshaft department of Union Drawn Steel Co. at Beaver Falls, Pa., formerly owned by Republic Steel Corp., Cleveland. According to present plans the equipment will be moved from Beaver Falls to Ellwood City next summer. The crankshaft department will be operated under the same personnel with all operating heads and the management retained.



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MIRRORS OF MOTORDOM

DETROIT

CHIEF topics of conversation here last week were the wage-hour-price changes announced by steel companies. As the largest buyer of steel in the country, the auto industry is vitally concerned over upward revisions in steel prices, exerting as they do a major effect on costs.

Of course the increases occasioned no surprise among purchasing agents who had been tipped off some weeks ago that steel wages would be boosted and that prices would thereafter be marked up. Every effort has been made to get hold of all the tonnage possible against a price increase, but wanting the steel and receiving it are two entirely different things.

Estimates vary as to the tonnage now on hand in automobile plants. Certainly though, with production at its currently high level, it is difficult to conceive how car builders can be protected much beyond May 15 with steel at the old prices. Therefore the question comes up: Will car prices be marked up when it becomes necessary to use second-quarter steel in their assembly?

A Matter of Costs

Suppose the increased cost of material—and it is not only steel which is costing car builders more—amounts to $15 on, say, a $700 car. Wage costs are higher; figure another $15 per car. Now at present prices, manufacturers are earning anywhere from $10 to $50 on each car they build. Take $30 from this profit and figure out how to keep on the black side of the ledger.

Nevertheless, it is felt if the industry is true to its philosophy of "more goods for more people," retail prices will not be lifted immediately. Some means will be found to absorb the higher costs in the manufacturing technique. But with the wage-price spiral moving steadily upward it is only reasonable to expect price tags on 1938 models to fall in line. The only doubt which clouds the situation is: Who is going to put on the brakes, and when?

Trusting the future will take care of itself, concern of the moment continues to be over meeting strong retail demand for cars which shows no let-up. While it is understood vigorous spring advertising campaigns are being planned, they probably will be based on the theme of selling one make against another rather than on stimulating demand for automobiles as such.

Production figures echo the tone of retail sales, but supplies of cars are still far behind orders in many localities. Output for the week is estimated at 126,975, General Motors divisions accounting for 49,100, Ford and Lincoln 33,775 and Chrysler 28,800. Production is now at the highest point since the spring and summer months of 1929, and not far below these levels.

GM plants are working feverishly trying to catch up with dealers' demands. As an example, Buick has now pushed up across the 1000 per day mark, and is reported to be paying some crews time and a half for overtime work in the effort to move this figure up to 1200 daily. All signs point to a banner year for Buick which in the last three years has shown a sharp reversal of form from the preceding five or six. Observers accord H. H. Curtice, president of Buick, and his staff of smart designers major credit for this comeback.

Chevrolet, with a reputed 100,000 orders on hand, is shooting at a level of 6000 per day.

EYES all were turned on the meeting of UAW and Chrysler officials Wednesday. Through five union locals in seven of the Chrysler plants a list of demands had been prepared including recognition of the UAW as sole bargaining agency, straight seniority, 30-hour week when layoffs start, blanket increase of 10 cents in hourly rates (Chrysler just authorized a 5 per cent increase within the last month), uniform rates in all plants, and several other minor points.

An official statement from B. E. Hutchinson, chairman of the finance committee and vice president of Chrysler, with reference to the meeting pointed out that "the procedure is a usual one. Committees and individuals of this organization and other groups often ask for meetings to discuss matters on behalf of employes whom they claim to represent. We always meet such representatives. . . . The company is currently employing approximately 67,000 workers with a monthly payroll of $8,500,000 to $9,000,000. The average hourly rate is slightly in excess of 90 cents per hour."

Meanwhile sit-down strike lightning continued to strike over the city in widely scattered locations. Difficulties cropped up at Motor Products and Murray Corp., both being quickly settled, and continued in other plants such as Timken-Detroit Axle, Thompson Products, Ferro Stamping, Allied Products and Michigan Malleable Iron. Not forgetting, of course, the "million-dollar babies" in two 5 and 10-cent stores.

Courts Are Kept Busy

Court injunctions to show cause why strikers should not be evicted from occupied plants were being issued with monotonous regularity, but violence was kept at a minimum. UAW organizers and field men were run ragged trying to keep up with various strikes and negotiations.

Announcement of the results of conferences between General Motors and the UAW, now in process for several weeks, is expected momentarily, reports being to the effect all points of discussion have been settled tentatively except minimum hourly and annual wage schedules.

Executives and that great mass of middle-class white-collar workers—the latter, incidentally, being the ones who in the end will hold the so-called "bag" on this wave of labor trouble—shake their heads in

MIRRORS OF MOTORDOM

amazement as weary managements and union organizers carry on a battle of words which has been exceeded rarely if ever in the annals of industry.

PROF. JOHN J. CATON, director of the Chrysler institute of engineering, in a recent address gave striking examples of how Chrysler-trained engineers are contributing to the progress and profit of the corporation. For instance, one research engineer developed a fluid for hydraulic brakes which excelled the previously used duPont fluid in properties and could be made at a saving of 60 cents per gallon. Chrysler uses 300,000 gallons per year. Net saving: $180,000.

Of the $4,000,000 in bonuses which Chrysler distributed at Christmastime, Prof. Caton stated $2,500,000 represented royalties on a patented type of steel developed by "a student engineer."

This will recall the development of Chrysler-sponsored Amola steel (STEEL, April 1, 1935), now widely used for certain automobile parts, and the important role C. Harold Wills played in its perfection. Mr. Wills, one of the better-known engineers in motordom, has been active with Chrysler for about five years, and formerly was with Ford and the late Wills-St. Claire. It is understood experiments are now under way to extend greatly the field of usefulness of this steel which, as its name implies, contains molybdenum (0.15-0.25 per cent) and which several steel producers are licensed to manufacture.

Drying by Induction

But to get back to Prof. Caton's interesting picture of behind-the-scenes engineering activity at Chrysler, he further recalled the adoption of induction heating on drying ovens as an outgrowth of a student engineer's idea. The method originated three years ago when difficulty was being experienced in drying a sprayed rubber paint on metal steering wheels. By induction heating the drying process proceeds from the metal outward instead of from the outer surface inward.

Looking ahead, Prof. Caton visions the system applied to the finishing of automobile bodies, utilizing a rubber-base paint and inductively heated ovens. In the professor's own words, "You would set up a system of magnets, your body (automobile) is conveyed by them and the sprayer walks along with it and the only thing he need be fearful of is that there are no nails in his shoes or money in his pocket, because here is one instance where money would burn a hole in a man's pocket and do a good job of it."

This institute of engineering, by the way, carefully selects a group of likely appearing young men each year for a two-year training period in various branches of engineering work, the men being paid during the time they work. By close observation and interviews, it is possible to determine just where each man fits in the engineering picture, and to adapt his talents to best advantage.

Automobile Production

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

	1935	1936	1937
Jan.	300,335	377,306	399,426
Feb.	350,346	300,874	*352,750
March	447,894	438,992	.....
April	477,059	527,726	.....
May	381,809	480,571	.....
June	372,085	469,355	.....
July	345,297	451,474	.....
Aug.	245,075	275,951	.....
Sept.	92,728	139,785	.....
Oct.	280,316	229,989	.....
Nov.	408,550	405,702	.....
Dec.	418,317	519,132	.....
Year	4,119,811	4,616,857	.....

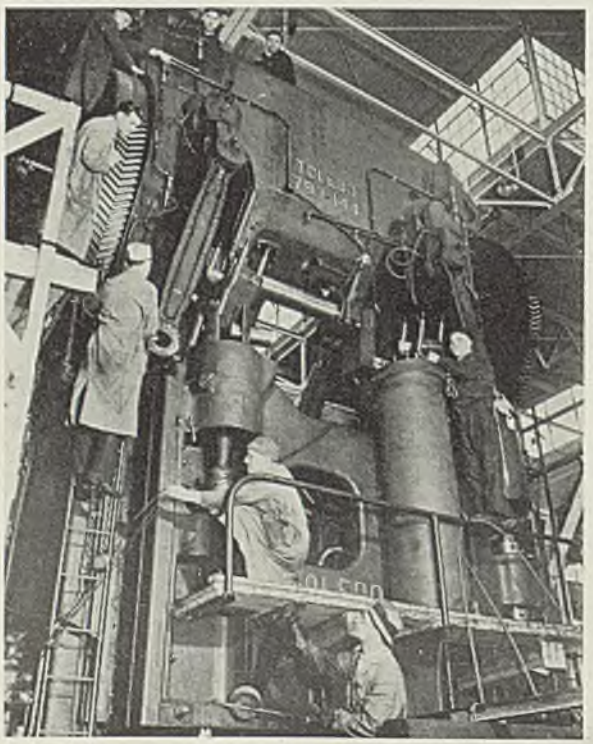
*Estimated.

Calculated by *Cram's Reports*

Week ended:

Feb. 6	72,295
Feb. 13	72,850
Feb. 20	95,698
Feb. 27	111,915
March 6	126,975

Six Floors of Press



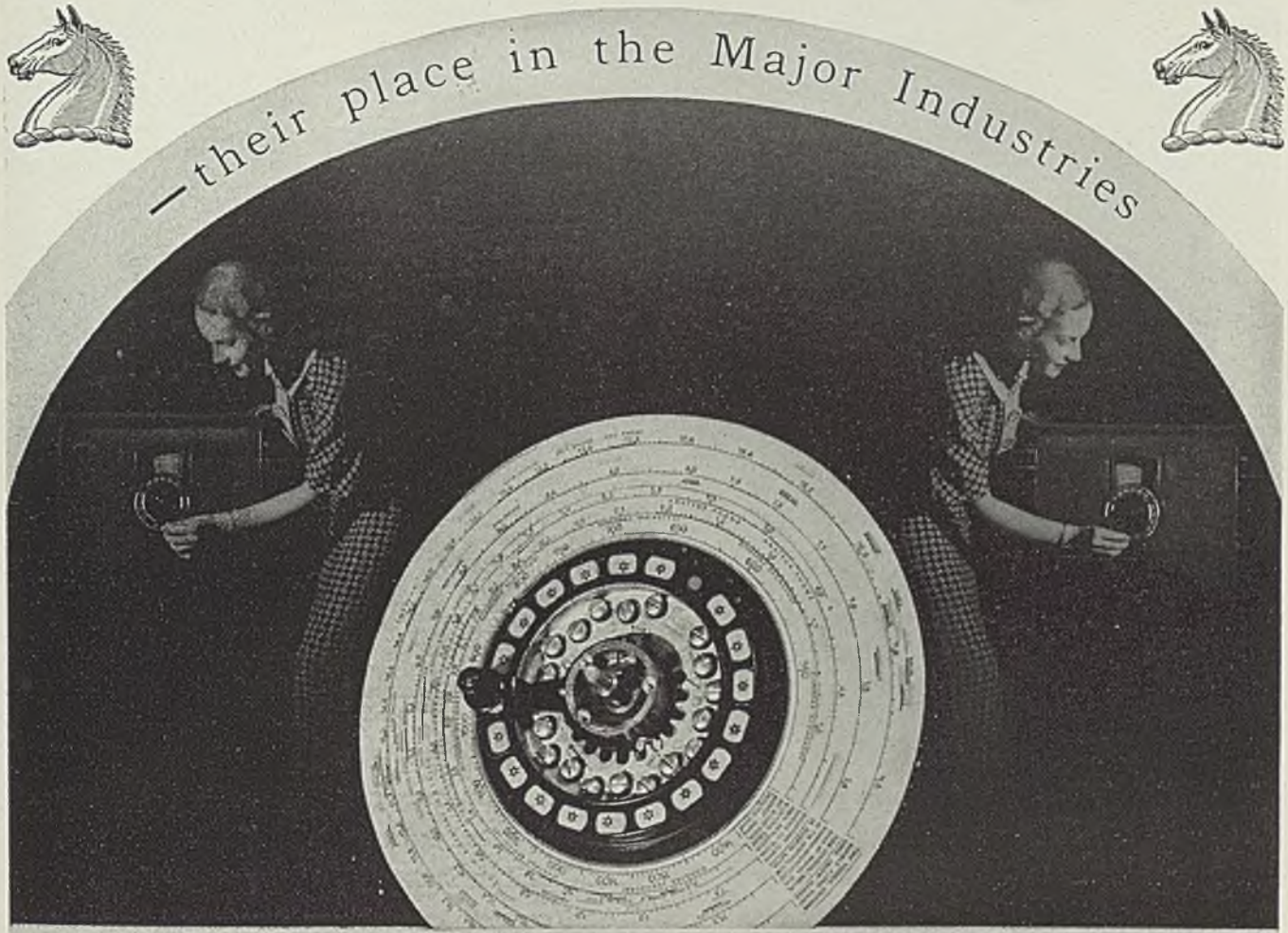
WORKMEN may be seen busy at six different levels on this massive 1500-ton press used for forming one-piece steel tops for Plymouth cars. Widespread acceptance of the steel top has meant much new business for builders of this heavy equipment in the past few years. Dies alone for the operation weigh 86 tons

EXPANSION program involving expenditures of $2,000,000 has been announced by White Motor Co., Cleveland. Plans call for new machinery and tools, general property improvement and the creation of a heavy-duty bus body building division. The latter will employ 150 at the start, will be fitted with all new equipment including overhead assembly lines, will be completed the latter part of May.

Present plant facilities at White Motor are overtaxed and the new program is expected to boost production schedules by 50 per cent. Payroll at the company has been increased about 20 per cent since the first of the year.

Greater portion of the expenditure will be for machine tools, heat treating and testing equipment, construction of a new research laboratory and testing plant.

ZINC ALLOY DIE CASTINGS



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Philco engineers specified a total of 45 ZINC Alloy Die Castings in this assembly—to produce a smooth working device with 19 station stops that can be adjusted independently for micrometer tuning. It is extremely doubtful that this unit would have been economically possible, with the required strength, by any other method of fabrication. The ZINC Alloy Die Cast parts include 19 plunger assemblies (2 die castings in each) 2 tuning stops, dial body with cover and ring, central hub, and tuning crank.

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WINDOWS OF WASHINGTON

WASHINGTON

OFFICIAL Washington felt much better about the steel situation last week following announcement of the reduction in hours and increase in wages. It is no secret that the administration, and its advisers were much worried, not only about the navy steel buying situation and its relation to the Walsh-Healey law, but in connection with a possible steel strike.

As a typical example Representative Maverick, Texas, chairman of the military affairs of the house called a meeting of some influential members of the house to consider drafting a bill for government-owned steel and munitions plants in line with their demand for the nationalization of all defense operations. The meeting was canceled because announcement of the new hour and wage agreement was made public the morning the conference was to have been held.

Again, the navy department announced that it would receive bids March 16 for some 2,000,000 pounds of steel for destroyers and submarines, on which no bids had been made previously because of the Walsh-Healey act.

Navy Officials Gratified

The President was reticent about the steel situation at a press conference last week because he had received no official word but he stated that he hoped the agreement would solve the navy situation. At that time he had received no word from either the navy or labor departments relative to the situation.

Also Miss Perkins and Assistant Secretary of the Navy Edison expressed gratification at the way the situation had worked out. Miss Perkins indicated that she had known about it all the time—believe it or not.

Speaking of the adoption of the 40-hour week by some of the steel companies Secretary Edison stated that he was naturally "very gratified."

"This action on the part of these steel companies", he said, "should now make it possible for the navy department to receive acceptable bids on the navy's requirements for this basic material. New bids will be immediately (March 16) invited by the bureau of supplies and accounts."

The secretary further indicated that it was his sincere hope that other concerns doing business with the navy would now see their way clear to follow the lead of the steel industry.

Some articles that the navy has been unable to obtain up to the present time, aside from steel, include machine tools, and hydraulic gears for ordnance equipment. Also diesel-driven electric generators, refrigerating and air conditioning machinery, etc.

Await Action on Bids

Mr. Edison stressed the point that the conduct of an expeditious and efficient large scale shipbuilding program demands a constant and uninterrupted flow of materials in accordance with a prearranged schedule of deliveries. "Unless this is possible", he said, "a stop and go program would develop which would greatly increase construction time, cause labor discontent through interruption of the continuity of employment and also result in additional cost.

"It is obvious, therefore, that what has happened in steel does not solve all the problems facing the navy. Even the steel situation will not be definitely clarified until the results of the bidding become known."

There was "confusion worse confounded" last week here in connection with navy steel buying before the wage and hour agreement announcement. Rear Admiral Harold R. Stark, chief of the bureau of ordnance of the navy, pointed out how practically impossible it would be for the government to use the Charleston, W. Va., armor plant. He said that it would take at least three years to get it into production and then the tonnage would be small.

Also Senator Walsh, Massachusetts, one of the authors of the Walsh-Healey law and chairman of the naval affairs committee of the senate, made interesting comments on the floor of the senate on the situation.

There is an interesting sidelight story in connection with this activity and the lacing he gave Miss Perkins for not administering the Walsh-Healey law more leniently.

During the course of the hearings at the last session of Congress on this government contract bill, the navy took violent exception to some of its provisions, especially anticipating just the situation that later developed in connection with the purchase of steel.

The naval officers, it is understood, were given definitely to understand by Senator Walsh and other members of the naval affairs committee that the law could not in any way keep them from getting needed supplies for national defense. That is the reason the senator has felt so strongly about the matter.

Law Aimed at Chiselers

Last week the senator again brought the matter up on the floor of the upper house and after discussing in some detail the steel situation he called attention to the fact that "the public contracts law was enacted for the purpose of preventing labor abuses that existed during the depression, and, though suspended during the operation of the NRA, occurred following its being found unconstitutional by the Supreme Court."

"This abuse", he continued, "arose from the fact that the general law requires the lowest bidder on contracts for supplies for the government be given the contract. This resulted in manufacturers and producers who worked their employes the longest hours and paid the lowest wages without regard to any minimum receiving, in many in-

stances, the government contracts. In other words, the government was purchasing its supplies frequently from 'sweat shops' and other manufacturers who were taking advantage of the wide unemployment, to increase hours of labor and lower the standards of working conditions that had existed. The law was not passed for the purpose of regulating industries in general as to hours of employment, or other labor conditions. It was enacted simply for the purpose of giving preference to the lowest bidder who maintained reasonably satisfactory working conditions and awarding to him contracts for government supplies."

HOOK LABOR LEGISLATION WITH SUPREME COURT

There is much talk on Capitol Hill in connection with labor legislation sure of passage at the present session of congress.

There has been every indication, from the White House and other sources close to the President, that effort will be made shortly to take up the hour and wage situation through legislation. It is quite evident, at this time at least, that no effort will be made to have any trade practice paragraphs in any administration legislation. Therefore, the act will not replace the old NRA. It will be strictly labor legislation.

The talk is, of course, that this proposed legislation will be hooked up with any judicial legislation that may be passed. The plan is to force labor to get behind any judicial reform bill, whether it wants to or not. With the labor provisions and wage situation, it will be obligatory for the labor organizations and labor generally to support the judicial reform bill. Of course there is bound to be much wailing and gnashing of teeth about this at the Capitol but it is doubtful if those who do this wailing will have enough voice to force the two issues apart if the administration really wants to go through with a program of labor and judiciary combined.

The President has stated at press conferences recently that this labor legislation is not yet ready. Several persons in and out of the government are said to be working on the problem and apparently not all of the information has been brought together.

The President will make his "fireside" talk to the nation the evening of March 9. He will leave Washington the next day for a two-week vacation. It is known that the court matter will then be in the fire for better or for worse, because hearings are to commence at that time. Those who watch the Washington situation closest smell fire. They say that there is a deliberate plan in having the President leave Washington just as the court matter comes up for consideration in congress. Just what the strategy is no one has even had the temerity to guess up to this time. However, they are confident that there is some major strategy attached to it.

There is no question, however, that all the ground work will have been laid by the White House by the time the President leaves Washington. Of course no one can predict what is to become of the court matter but there is beginning to be a well defined idea here that the President is going to be forced to accept some kind of a compromise. He has stated officially that he will not do this but it is hard to see at this time how it can be avoided.

There is a possibility that labor organizations may insist on having their hour and wage legislation separated from the court reorganization but at the present time everyone thinks that they will be pushed in the same bill.

NRA TRIED TO COVER TOO MUCH GROUND TOO FAST

The report of the President's committee on industrial analysis of the NRA was sent to Congress last week by the President. At a press conference later the President said that he hoped something might be done about it but no recommendations were included in the report itself or the President's message accompanying it.

General conclusions were drawn but no sections were devoted to any special commodity, such as steel. In sending the report to Congress the President said that "in my opinion, it (the report) will point the way to the solution of many vexing problems of legislation and administration in one of the most vital subjects of national concern."

The committee in charge of working up the report included: Prof. J. M. Clark, Columbia University, an economist; William H. Davis, New York, a lawyer; George M. Harrison, Cincinnati, president of the Brotherhood of Railway Clerks; and George H. Mead, Dayton, O., paper manufacturer and former chairman of the Roper business advisory council.

The committee points out that "NRA attempted to cover more ground and at greater speed than could possibly be covered effectively; and its whole program was colored by this fact, and by other facts closely akin to it.

"Both management and labor went too far, with the result that many impracticable and unenforceable provisions were put into the codes to the detriment of the more worthwhile provisions."

The committee points out that considerable parts of American industry are not organized adequately for co-operative action and that the boundaries between industries are not sharply defined so that overlapping of codes and conflicts of authority not only embarrassed the work of the NRA, but that difficulties of this nature "should be recognized as inherent in any attempt to produce a variety of programs initiated by particular industries and directed at their special problems," so that "the thing that has to be guarded against is a lack of co-ordination in the program as a whole, particularly in the trade practice field."

The report stated that "if controls of the NRA type are to be tried again, the experience indicated that the attempt should be limited to a few important industries in order that proper standards of investigation and adequate supervision may be maintained, and should be guided from the start by more definite principles and policies, such as NRA experience indicates as being likely to stand the test of application. Under the type of policy finally adopted by NRA, if strongly adhered to, there is little chance that codes would be proposed in such large numbers as to create serious difficulties, but even that chance might well be guarded against."

GREEN CLAIMS INDUSTRY DODGES RELIEF SUPPORT

Total unemployed in January was 10,041,000, compared with 8,990,000 in December and 11,666,000 in January of last year, according to figures made public by the A. F. of L. last week.

President Green, announcing these figures, called attention to the fact that this year opened with layoffs which added 1,001,000 to the unemployed. This is the first time since January, 1936, he pointed out, that there has been any significant increase in unemployment; with the exception of small layoffs in November, employment has gained steadily for a year. From January to December last year 3,223,000 persons were added to payrolls. Then came the January layoffs, decreasing this gain to 2,222,000 for the year.

Attention is called in the Green statement to a number of developments in the employment situation. For instance, he contends that "industry has failed to provide a living income for its workers, forcing the public to supplement wages to a degree not generally recognized. One large city in the east reports that in 25 per cent of its relief cases it is subsidizing industry, either by adding to low wages so that the families will have enough to keep alive or by supplementing part-time earnings."

Editorial

Steel, Averting Labor Crisis, Intensifies Economic Problem

NO ONE will deny that the dramatic developments of the past week in the labor relations of the steel industry have great historical significance. The action of the largest producer in signing a contract for one year with an "outside" union is in such sharp contrast with the policy that has been pursued in the past that the event probably deserves much of the emphasis devoted to it by the public press.

Nevertheless, it will be well for everybody—employes, union members, employers and laymen—to retain a sane perspective when trying to appraise the real significance of this chapter in the development of labor relations in the steel industry. Epochal as the week's happenings may prove to be eventually, they do not and cannot constitute the final solution of the basic problems involved. On the contrary, the action on recognition and on hours and wages introduces new economic problems which, unless taken in hand vigorously, may become more threatening than the labor relations crisis which apparently has just been averted.

Negotiators in Steel's Labor Situation Yield to Pressure of Mass Opinion of American Public

Persons who think that "recognition" of the union is the most important phase of last week's performance are overlooking several more significant factors. The chief issue was not the one settled at Pittsburgh by Benjamin Fairless and Philip Murray, nor that considered in the conversations of Myron C. Taylor and John L. Lewis, nor the one which concerned Tom M. Girdler, Eugene G. Grace, Frank Purnell, Ernest T. Weir, S. E. Hackett, P. D. Block and the other presidents of independent steel companies in their negotiations with employes and their representatives. All of these men were dealing specifically with the immediate crisis of a threatened strike, but in reality the issue is much more fundamental than that. It involves the extraordinary state of mind which possesses a large proportion of the citizens, not only of the United States, but of other industrial nations.

That state of mind may be described as an impatience with the social progress of the postwar era, and it manifests itself in an intense desire for overnight reforms in the capitalistic system. In this country, this state of unrest has been exploited politically by the present administration, aided by labor organizations of which John L. Lewis is the dominant figure. Therefore, in dealing with the recent strike threat, employers, while superficially working to avert labor trouble, in reality were working to conciliate an antagonistic public opinion.

They have been signally successful in this objective. In the hundreds of newspaper editorials we have read during the past few days, we have failed to find one that did not praise the steel industry for its action in the present crisis. Many publications which have been openly hostile to industry generally have been fulsome in their praise of steel employers. In the eyes of the public, steel's leaders have manifested a high degree of industrial statesmanship. They have regained much of the prestige lost in recent years.

Responsibility for Economic Control Now Will Rest More Heavily upon Public and Government

Also it must be apparent that the labor relations situation in steel represents a much closer approach to real collective bargaining than exists in any other major industry. CIO is recognized only to represent its own members. ERP deals for its members. The closed shop issue is not involved at the moment, nor is the preferred status of CIO for six months effective in steel as it is in the General Motors situation.

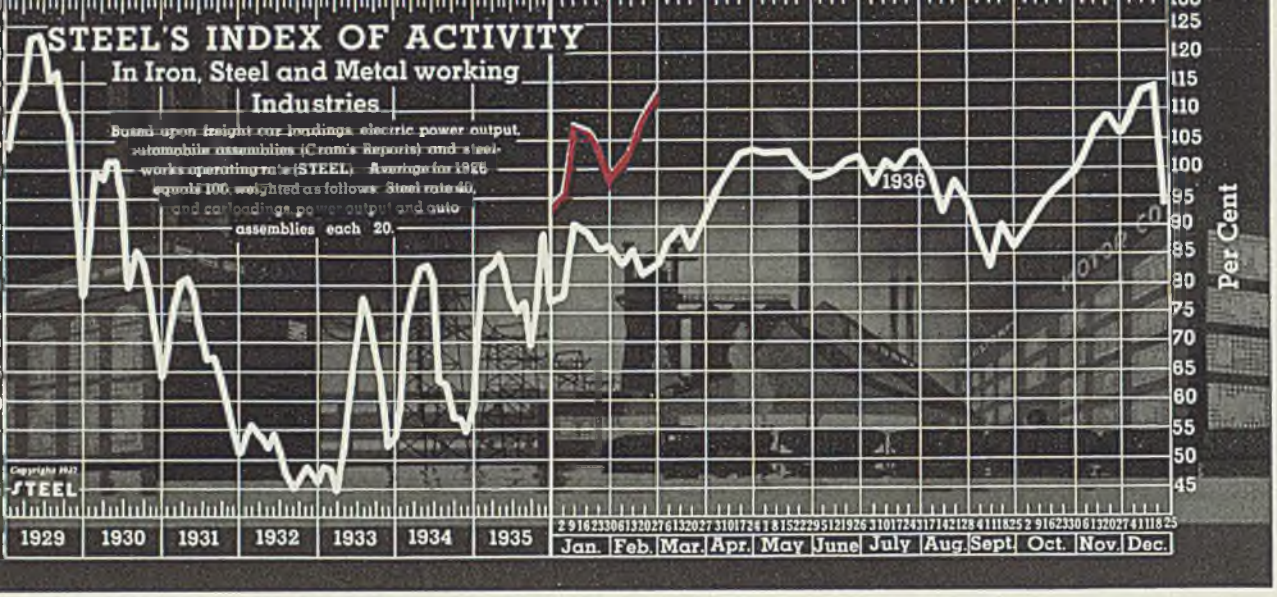
During the life of the contract which expires next Feb. 28, an opportunity will be afforded to see how employes will react to the respective appeals of a CIO union and an employe representation plan. The outcome of this test may exert an important influence upon the future trend of labor relations.

In granting sharp wage advances and shortening the work week to 40 hours, the negotiators undoubtedly bowed to the weight of popular opinion, which at the moment probably is not deeply concerned with the economic consequences of this sudden increase in the cost of production. Already the anticipated increases are being reflecting in advances in steel prices. These sharply rising quotations, following so closely upon the heels of higher prices for commodities affected by the rearmament programs abroad, add fresh fuel to the already seething flame of inflation.

Public opinion, encouraged by the promises of the federal administration, seems to be confident that the economic system can easily absorb the increased burdens imposed by the higher wages and shorter week. The spread-work phase of the situation is expected to ease unemployment and relief. The higher wages are assumed to make for greater mass purchasing power.

But these hopes cannot be fulfilled if the spiral of inflation gets beyond control. Somewhere along the line, someone must call a halt to the present reckless increases in every conceivable line of expenditure.

The action of last week means that a greater burden of responsibility for economic control has been passed on to the public and to its government.



STEEL'S index of activity gained 4.0 points to 112.8 in the week ending Feb. 27:

Week ending	1937	1936	1935	1934	1933	1932	1931	1930
Jan. 16	106.7	89.3	78.1	60.9	49.8	56.2	72.1	91.8
Jan. 23	104.7	86.0	79.5	62.3	50.8	55.8	72.0	96.3
Jan. 30	99.6	86.6	81.8	66.9	49.9	56.2	72.9	97.4
Feb. 6	100.8	83.8	82.7	70.7	48.7	56.0	74.9	100.8
Feb. 13	101.9	85.9	82.8	72.4	48.3	55.5	75.4	100.9
Feb. 20	108.8†	81.8	80.5	75.5	46.0	54.5	76.0	97.7
Feb. 27	112.8*	83.4	81.1	76.8	47.4	55.1	75.8	99.7

†Revised. *Preliminary.

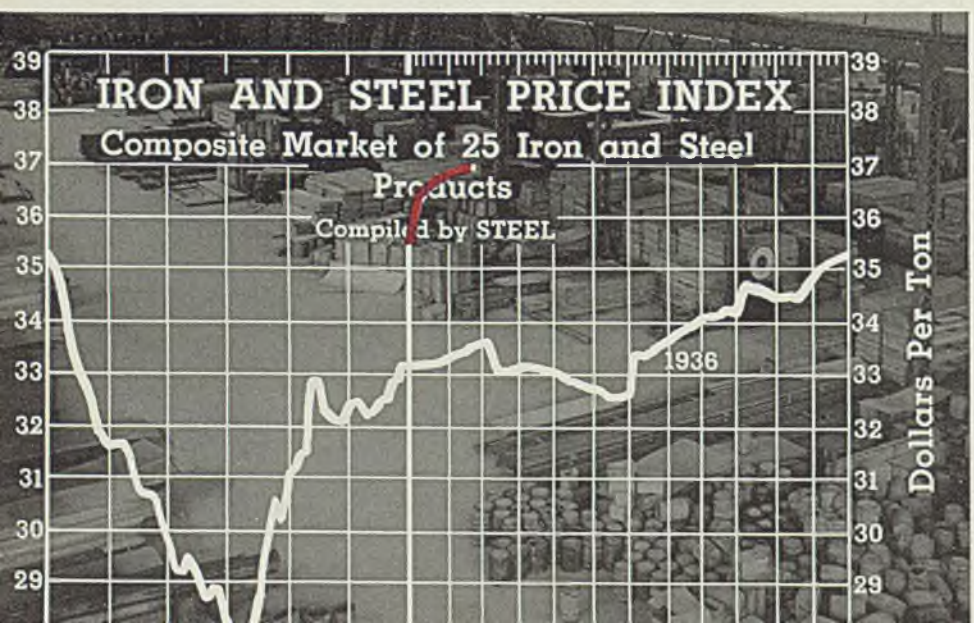
Activity Near Recovery Peak As Prices Begin New Spiral

INDUSTRIAL activity was within a few points of the post-depression high mark at the beginning of March. STEEL'S index for the week ending Feb. 27 stood at 112.8, only 2.0 points below the peak of 114.8, recorded in the week ending Dec. 19, 1936.

The gain of four points during the week was accounted for by a further substantial increase in automobile production and another advance in the rate of steelmaking operations, which factors more than offset minor recessions in freight car loadings and electric power output due to the interruption occasioned by the observance of Washington's birthday.

In this stage setting of brisk industrial activity, the announcement of higher wages and a shorter work week in the steel industry carried inflationary implications which cannot be ignored. The increased costs are being reflected in higher prices, which further impetus to an already positive upward trend in commodity prices will affect living costs promptly.

All of these factors make for a short-term prospect of almost frenzied activity. With the threat of a steel strike removed, production in the second quarter may establish a recovery high.

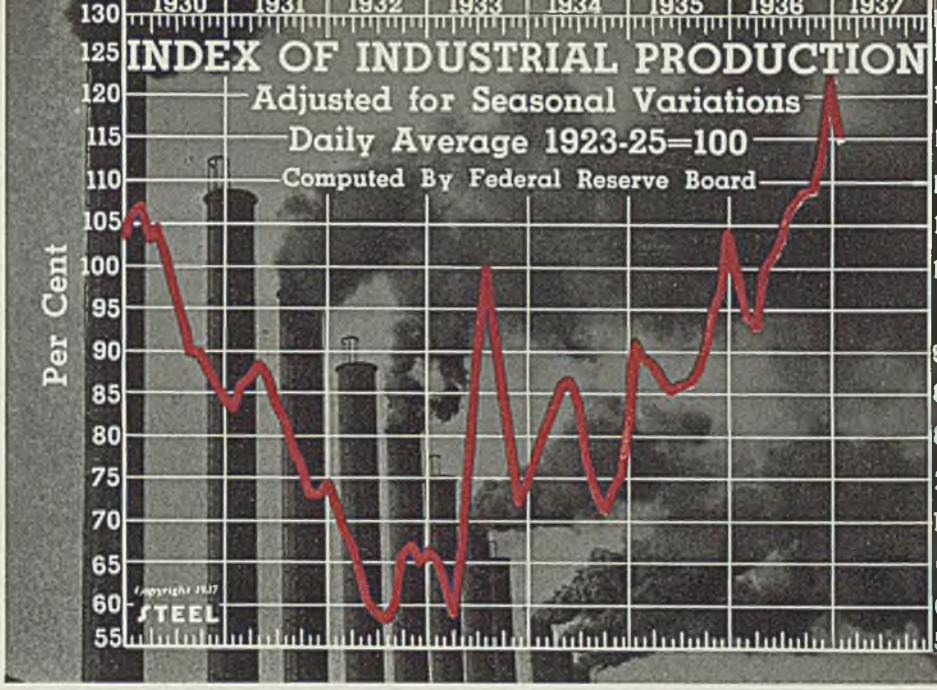


	1937	1936	1935
Feb. 27	$36.95	$33.59	$32.42
Feb. 20	36.71	33.54	32.50
Feb. 13	36.67	33.45	32.54
Feb. 6	36.64	33.44	32.56
Jan. 30	36.62	33.40	32.56
Jan. 23	36.59	33.38	32.60
Jan. 16	36.55	33.34	32.62
Jan. 9	36.52	33.33	32.57
Jan. 2	36.48	33.31	32.51

BUSINESS TREND

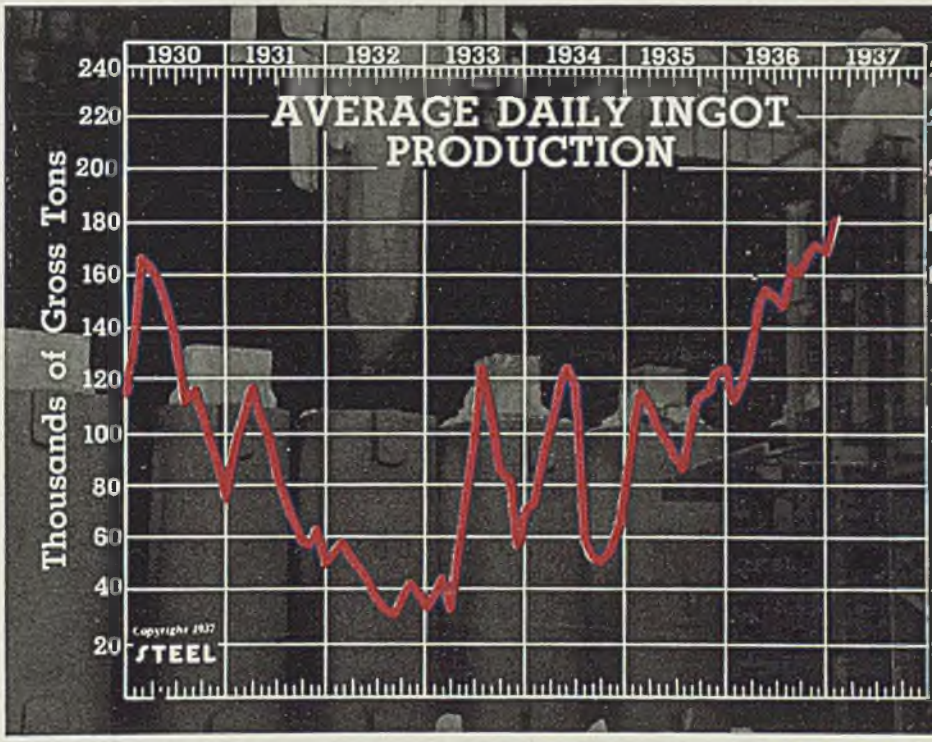
Index of Industrial Production Declines in January

	1937	1936	1935	1934
January	115	98	91	78
February	...	94	89	81
March	...	93	88	84
April	...	100	86	85
May	...	101	85	86
June	...	103	86	84
July	...	107	86	75
August	...	108	87	73
September	...	109	89	71
October	...	109	95	73
November	...	114	98	74
December	...	121	104	86



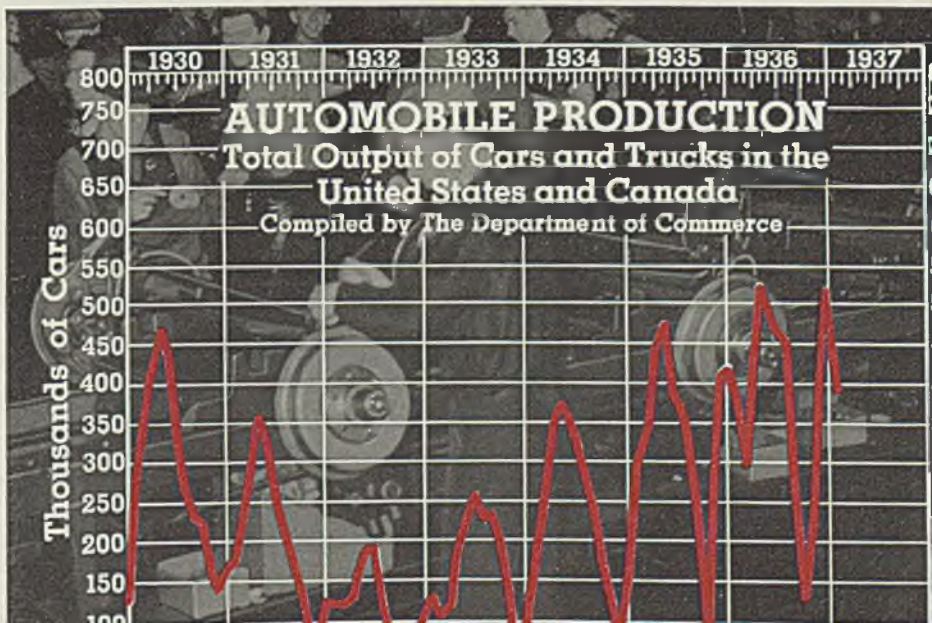
Daily Ingot Output Up Sharply in January

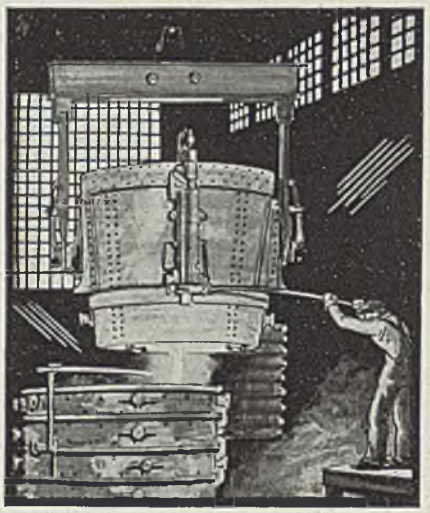
	Gross Tons		
	1937	1936	1935
Jan.	182,181	112,813	106,302
Feb.	.....	118,577	115,595
March	.....	128,576	110,204
April	.....	151,625	101,562
May	.....	155,625	97,543
June	.....	153,263	90,347
July	.....	150,874	87,224
Aug.	.....	161,351	107,997
Sept.	.....	160,043	113,000
Oct.	.....	168,333	116,398
Nov.	.....	173,496	121,170
Dec.	.....	170,448	122,936



January Automobile Output Declines; Above Year Ago

	1937	1936
January	399,426	377,306
February	.....	300,874
March	.....	438,945
April	.....	527,726
May	.....	480,571
June	.....	470,887
July	.....	451,474
August	.....	275,951
September	.....	159,785
October	.....	229,989
November	.....	405,702
December	.....	519,132





Using Ferroalloys in the Iron Foundry

BY JOHN N. LUDWIG JR.
Electro Metallurgical Co.

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THE science of metallurgy as practiced in many foundries is for the most part limited in scope. Qualities of iron are controlled by mixing various percentages of different grades and brands of pig iron with local scrap to produce desired conditions of closeness of grain, fluidity, and machinability. Little thought often is given to economics in operations, in developing lower cost mixtures, and in meeting the advancements imposed by modern engineering requirements.

In accepting business, the alert foundryman today obligates himself further than getting castings made, accepted, and delivered on dates specified by the buyer; he is co-operating closely with the consumer in constant effort to improve quality and serviceability of materials furnished, and with this improvement to lower costs, thus maintaining present market demands and in many cases reclaiming some that have been lost to other types of products. In meeting these varied requirements, alloys now occupy a conspicuous position.

Alloys Are Specified

Ferroalloys commonly used in the foundry are ferrosilicon, ferromanganese, ferrochrome, and ferromolybdenum. Nickel, copper, and calcium-silicon, while not ferroalloys, also are widely used for special requirements. Silico-manganese, ferrovanadium, silicon - zirconium, and silicon-titanium likewise have their definite places in the foundry.

In irons containing from 7 to 90 per cent silicon, ferrosilicon is used both in the cupola and in the ladle to produce softness through its graphitizing effect. The low percentage alloys, 7 to 15 per cent silicon, usually referred to as silvery iron, have been in common use some years for this purpose, but in more recent years, the advantages of the more concentrated alloys, 50 per cent ferrosilicon and particularly silicon briquets, have brought the use of cupola-charged ferrosilicon to the foreground. These advantages we might cite briefly as the greater efficiency with which elements in ferroalloys of higher concentration react, and the influence of silicon during melting of the charge on the absorption of carbon by the iron.

In the special field of light-sectioned castings where free machinability is imperative, high total carbons are essential. By the close control of base silicon, that is, silicon contained in the scrap and pig iron, carbons are maintained safely on the high side with high scrap charges.

Use of ferrosilicon in the form of briquets (together with the use of ferromanganese briquets, which is discussed later) has aided the foundryman in the utilization of high scrap charges — gaining, thereby, irons of greater strengths and fluidity without loss of machinability.

Crushed ferrosilicon is used widely as a ladle addition. For this purpose 50 to 90 per cent silicon grades are used and from 8-mesh down are the preferred sizes. The higher grade of alloy is preferred where large additions are necessary. In many foundries using one base charge, depth of chill is controlled by this means.

Manganese a Scavenger

The well-known scavenging effect of manganese used in the charge has placed this alloy in prominence in foundry metallurgy. In present-day practice, where high scrap charges are used, its benefits are most pronounced in deoxidizing and counteracting the prevailing high sulphur conditions. Without sufficient manganese in such charges, sulphur increases stability of the carbide markedly, thus inhibiting graphitization and producing hardness. Strangely enough, use of ferromanganese is most valuable when melting practice is poor, particularly when excess air is used, and blowholes and dirty castings are a frequent occurrence.

In high-strength irons, usually made from high steel charges, manganese is carried at about 1 per cent. In this type of iron the stabilizing influence on carbides of this amount of manganese is pronounced and it thus increases the strength of the iron.

While spiegel and the silico-

THE accompanying article constitutes a paper presented at a recent meeting of the New Jersey Foundrymen's association in Newark, N. J. The author, John N. Ludwig Jr., is metallurgist, Electro Metallurgical Co., New York

spiegels (approximately 20 per cent manganese pig irons) are of value and benefit for such use, the superior value of the higher concentration alloys, silico-manganese, 80 per cent ferromanganese, and particularly manganese briquets, has been proved in difficult problems. In regard to briquets, it might be stated that their advantage lies in their case of handling — adding exact weights of alloy without weighing, and by their use assuring, because of their protective binder, liberation of the alloy where and as desired. That is in the melting zone.

In some cases marked results are accomplished by use of crushed ferromanganese in the ladle. Small additions, under certain melting conditions, exert a graphitizing effect which results in dead soft, easily machinable but dense and close-grained iron.

In other cases where hardness and wear resistance are desired, ferromanganese up to 4 per cent has been added to the ladle to supplement the effects of chromium and nickel.

The value of chromium in cast iron lies chiefly in its ability to (1) Produce close, dense irons; (2) increase strength; (3) promote wear resistance; (4) promote heat resistance; and (5) promote corrosion resistance.

Chromium Stabilizes Carbides

In large, heavy-section castings, benefit of chromium as a carbide stabilizer prevents formation of the coarse, open structure which often is due to excessive graphitization. In this application, contents from 0.25 to 1.00 per cent find common use. Its use for this purpose, however, must be watched carefully. In shops where light, medium, and heavy-section castings are produced, its use in light to medium castings may cause hardness and difficult machining unless compensating graphitizers, such as nickel or copper, are used in conjunction with it. This, however, should not hinder its use, as many large foundries control hardness by addition.

Chromium, by itself, exerts a strengthening effect in a limited way. To cite some recent data, addition of 0.55 per cent chromium to the ladle of a common 50 per cent pig iron, 50 per cent scrap mixture gave the comparative physical properties shown in the accompanying table. For strengthening, however, it is best supplemented by the accompanying use of nickel, copper or molybdenum.

Chromium in the range of 0.25 to 1 per cent in conjunction with nickel, the latter from 0.50 to 2.75 per cent, assists in producing high-strength iron of a wide range of physical properties. These irons

are usually made in the so-called high steel charges—steel up to 85 or 90 per cent of the charges used; physical properties of a wide range from 32,000 to 55,000 pounds per square inch and brinell hardness numbers from 200 upward are possible of development.

With copper, chromium as high as 1 per cent is used to supplement the strengthening effect of this metal. Chromium with molybdenum in cast iron is commonly known and used. With an addition of 0.50 to 0.75 per cent chromium and molybdenum in about the same range, irons with tensile strengths around 55,000 pounds per square inch are obtained regularly. Transverse strength is 3250 pounds, 18-inch centers; deflection, 0.274-inch; brinell hardness, 255.

For wear resistance, chromium is used alone or in combination with nickel or molybdenum or both. Its influence in reducing graphitic carbon and flake size favors the formation of more finely laminated and harder pearlite. It is used alone up to 3 per cent in cupola irons, and extensively up to 30 per cent in electric furnace or crucible irons. When chromium exceeds about 3 per cent under average cupola iron conditions, brittleness develops; in this range intricate and complex designs are avoided, or more preferably, crucible or electric furnace melting is followed.

By these means, lower carbon, high-chromium irons are being regularly produced and castings made from them are proving of great value in severe service. To mention some of these applications, we can cite the use of high-chromium irons in liner plates in conveyor systems, concentrator chutes, and the like, where equipment is subjected to extreme abrasion by mixtures of hard materials or by abrasive slags which often contain some metal. It has performed well in sandblast nozzles and small crushing rolls, and in general where wear resistance without extreme impact resistance is satisfactory.

To cite one specific example, in a certain pan mill mixing unit about 3 tons of these chrome iron liner plates are now in service. The average composition is about as follows: Chromium, 26.00-29.00; carbon, 2.50-3.00; silicon, 0.50-1.00; and manganese, 0.50-1.00 per cent. The average life of the steel liner plates was from four to 10 weeks. It is predicted that the chromium iron plates will last from one to four years.

In conjunction with nickel (4.5 per cent nickel, 1.5 per cent chromium), we find chromium used widely in the production of a trade-named wear-resistant iron. Records of the excellent performance of this material in service are widely publicized and, therefore, are omitted here. For abrasion-resisting application such as rolls, mill guides, etc., combinations such as 1.5 chromium, 0.25 molybdenum, and 0.50 per cent nickel (all approximate) in cast iron may be cited as successful applications of the 3-alloy type.

Resistant to Corrosion

Chromium additions enhance the resistance of iron toward heat more than any other common element. Failure due to heat is caused, first, by the phenomenon of growth which begins to take place at moderately low temperatures, say 700 degrees Fahr., and second, by oxidation or scaling in service occurring from 1000 degrees Fahr. upward. Chromium-bearing cast irons are being used in these heat applications. For resistance to growth, small additions of chromium are made; the resistance to growth varies almost directly as the chromium content of the iron.

This is definitely indicated by a study of about 20 commercial heat-resisting brands and grades of iron, made in as many different foundries, after 55 cycles of heating and cooling to and from 1500 degrees Fahr., with change in volume plotted against increase in percent-

(*Please turn to Page* 62)

Effect of Chromium Upon Physical Properties

Tap No.	Transverse Deflection 1500-lb. load, inches	2000-lb. load, inches	Final Deflection, inches	Load, pounds	Corrected Load, pounds	Size, inches	Rockwell B Hardness	Additions
1.....	0.22	0.30	0.38	2450	2450	1 x 2	90–104	Chrome
1.....	0.26	0.38	0.44	2140	2140	1 x 2	68–92	No chrome
2.....	0.21	0.30	0.37	2340	2340	1 x 2	86–100	Chrome
3.....	....	....	0.54	1100	2450	0.67 x 2.0	90–100	Chrome

All-Metal "Mainliners" Set New Standards in Deluxe Air Travel

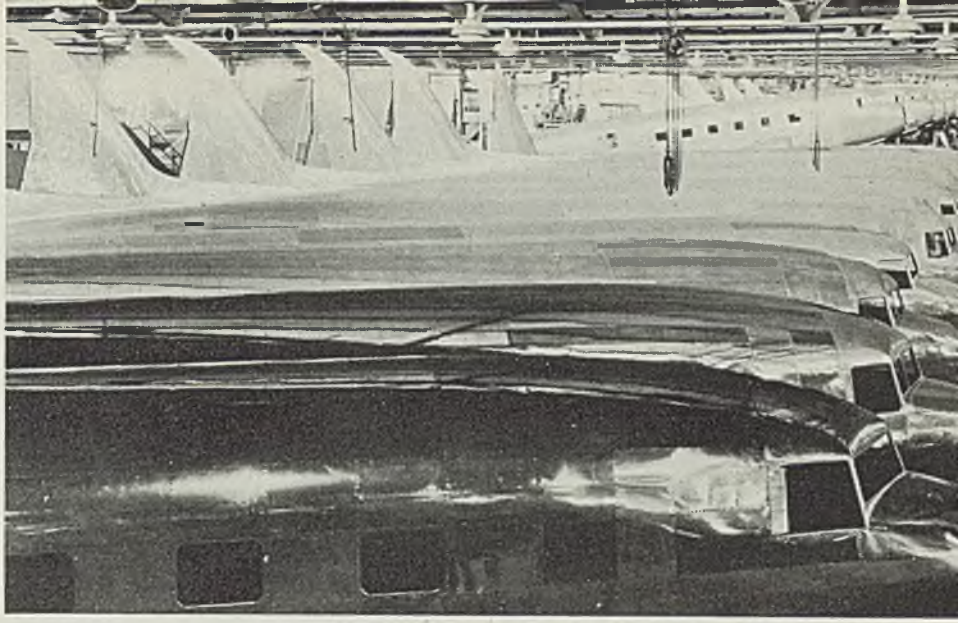
SPEED, power and luxury are combined in the new $3,000,000 fleet of "Skylounge Mainliners" recently placed on a nonstop New York-Chicago run by United Air Lines, and shortly to go on a coast-to-coast schedule. Powered by two 1150-horsepower motors, the new extra-fare transports are equipped with 14 swivel chairs, comfortably spaced in the cabin, as shown in one of the illustrations. The New York-Chicago hop is made in 3 hours and 55 minutes.

Structural development of the new planes, built to United specifications by Douglas Aircraft Co., Santa Monica, Calif., is a direct outgrowth of an earlier Douglas transport known as the DC-2. The wing of the new ship is longer, stronger and has an improved wing tip. Definite aerodynamic advantage over the DC-2 results from the increased aspect ratio (wing span/wingchord) and tip efficiency on the wing. Fuselage is more nearly round and has a higher strength-to-weight ratio than the DC-2, especially in torsion.

From the standpoint of general arrangement, it was desired to have a cabin unobstructed by bulkheads, nacelles well ahead of the wing leading edge housing the retractable landing gear, and finally high aspect ratio. When worked out, this arrangement necessitated placing the cabin completely above the wing, sweeping back the outer part of the wing in order to get the landing gear well forward of the center of gravity and to have the center of gravity well forward on the wing for stability as determined by wind tunnel tests. The cabin is 8 feet in width and the ceiling is 6 feet 6 inches, giving ample headroom. In addition to carrying 14 passengers and baggage the airliners also have special compartments for air mail and air express.

In deciding upon the type of construction to be used for the wind and tail surfaces, a detailed study of all the possible types of metal construction was made. In developing a structure with the maximum of strength and rigidity, with a minimum of weight, it is preferable to have a wing with the material so distributed that there is no great variation in the stresses in various parts. At the same time, the wing must have little or no torsional deflection, with a minimum of vertical deflection and no excessively large unsupported flat metal surfaces; in a highly stressed airplane, such as

ALUMINUM alloy "skin" shows up strikingly in this ground view of one of the 28-ship fleet of extra-fare "mainliners"



AN AIRCRAFT assembly line! Here are shown the metal fuselages for the new fleet of transports in the Douglas plant

these transports, torsional rigidity of the wing is of paramount importance in the prevention of wing flutter at high speeds.

In determining wing construction, single, two, three and multispar designs were considered as well as shell type and multi-cellular designs. Since Douglas and its associated companies have had more than six years of continuous successful experience with the multicellular type of wing it was finally decided upon for the United fleet. In this type of structure there is a flat skin reinforced locally by numerous longitudinals and ribs. The bending is taken by a combination of flat skin and numerous stiffeners.

Simple flat sheets or webs carry the shear load. Torsion is taken by the skin and frequent ribs preserve the contour and divide the structure up into a number of small rigid boxes or cells. Major loads being carried in the outer surface of the wing, attachment is simple and an inspection of the exterior gives a ready indication of the structural condition. Unit stresses in the material are low and therefore the deflections are at a minimum.

Fuselage Described

In the fuselage the structural problem was basically the same. However, the Douglas company had the experience of having built more than 20 airplanes with metal monocoque fuselages. This experience resulted in the present fuselage construction of the Mainliners. It comprises a smooth stressed skin with closely spaced overstrength bulkheads in contact with the stressed skin covering and numerous longitudinal stringers (either flanged members or extruded angles) as a rigid part of the skin and passing through the bulkheads. Thus all parts are rigidly attached together with the skin having only small unsupported areas.

The tail wheel structure is a complete departure from any previous plane built by Douglas. The fuselage incorporates an internal cone so that the upper part of the tail wheel fork swivels above the lower fuselage line. The loads, both taxiing and landing, are distributed throughout the structure in such a manner as to minimize failures at this point. A center bearing is provided on the tail wheel post. The loads from this bearing are distributed evenly into the fuselage. The upper bearing takes care of the landing load and dissipates the landing loads as evenly as possible.

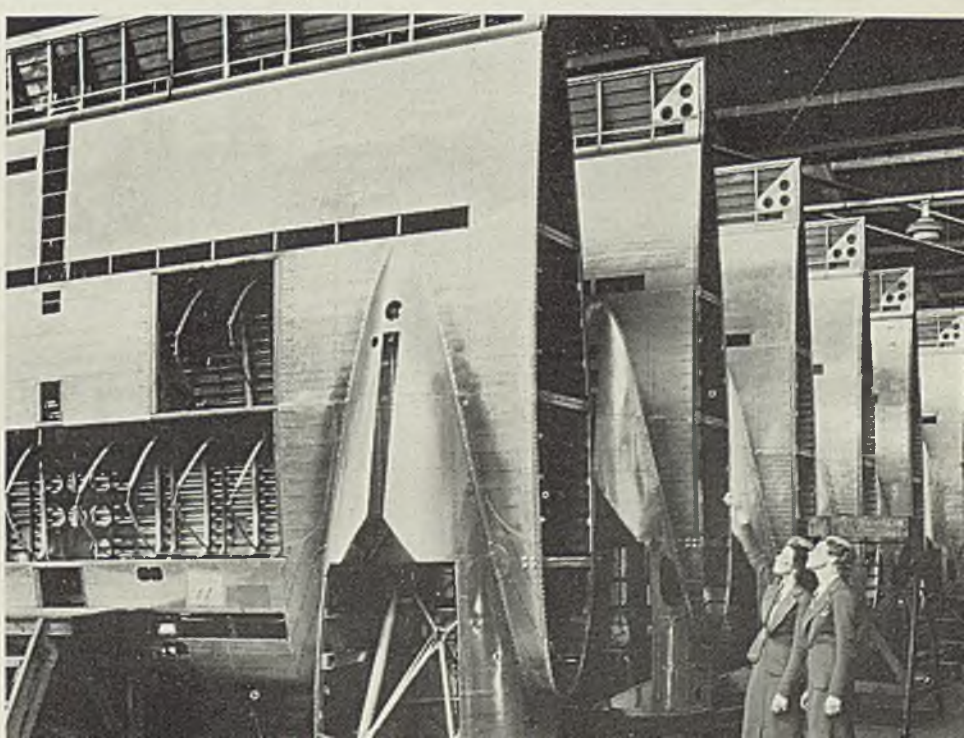
The fuselage is of semimonocoque construction consisting essentially of transverse frames of 24ST Alclad aluminum sheet and longitudinal members of 24ST extruded bulb angle, with some special longitudinal members of 24ST Alclad sheet formed as channels. The fuselage and wing covering is 24ST Alclad sheet, the wing construction being of the same material. The wing consists of three main panels, with the center panel built in two sections, front and rear. The two outer panels each have three sections: The main section, the detachable rear section and the inboard end, and the detachable tip.

The fuselage walls are only 2½ inches thick, but in this space vertical pillars rigidly fixed to the wing were placed and bulkheads through the fuselage were eliminated.

The construction in general is of 24ST Alclad aluminum, with some stainless steel sheet. A considerable amount of seamless aircraft also is used.

Development of the 1150-horsepower motors represents a notable advance in aircraft motors of the radial, air-cooled design. They are 14-cylinder, twin-row Wasp engines manufactured by Pratt & Whitney Aircraft Co., East Hartford, Conn. Each engine weighs 1250 pounds and delivers one horsepower for each 1.25 pounds of weight at 1000 horsepower rating, while at maximum capacity it delivers one horsepower for each 1.09 pounds.

Each engine must pass a block test of 100 hours at take-off rating of 1000 horsepower. Features include completely automatic valve gear lubrication, automatic mixture control, enlarged cylinder head cooling fins—a total cooling area of 21,-



TWO HOSTESSES are dwarfed beside these partially finished wings and nacelles which support the 1150-horsepower engines

SPACIOUS, unobstructed cabin provides comfortable chairs for 14 passengers, with racks for baggage. Mail and air express is carried in a separate section

000 square inches, and patented pressure baffles to increase the cooling temperature and keep down fuel consumption. Tests have already indicated a fuel consumption of 0.45-pound per brake horsepower hour.

To insure passenger comfort under all conditions, a thorough study of the heating and ventilating system was made. Manually adjustable hot and cold air ducts are installed next to every seat as well as in the dressing rooms and lavatories. Because of this, and because noise and vibration are reduced to a minimum, air sickness on the new transport is rare.

Capacity of the steam heating system is sufficient to provide a temperature of 70 degrees in the cabin with 20 degrees below zero outside and with an airflow of 800 cubic feet per minute. Cabin air temperature is regulated automatically by a thermostat.

The boiler for the heating system is of tubular construction. The heat system radiator is also of the tubular type, with a tubular header. Steam lines are of aluminum. The system is a pressure type, eliminating the condenser tank with a resulting saving in weight.

Minute details for passenger comfort have been carefully worked out. They include such innovations as sponge-rubber footstools and hot meals served with "genuine" silverware and china, not to mention a magnetized checkerboard and eight-power binoculars for the passengers to view the swiftly-moving panorama below.

Each ship is manned by two pilots and a stewardess. An automatic "robot" pilot has been installed in each of the 28 transports along with many other modern aircraft improvements such as multiple radio equipment, inter-plane telephone, automatic mixture control, de-icers and new sound-proofing devices.

Gives Plan To Curb Silicosis

A SIX-POINT program for protecting the health of industrial workers, and a definite plan of medical research designed to help curb industrial disease, is recommended to the Air Hygiene Foundation of America, Pittsburgh, by its medical committee in a report on "Silicosis and Allied Disorders."

The report outlines the following program of health control for the guidance of employers:

"A practical program of pre-employment examination of all workers exposed to dust containing silica is essential. Such examinations should include a complete physical examination of each individual, a careful history of past occupational exposure to dust, and a chest roentgenogram (X-ray).

"The value of such procedure may be summarized thus:

"1. Protection of prospective employes, who may have diseased lungs, from silica exposure.

"2. Discovery of hazardous jobs, as a result of finding the silicosis cases, in order to eradicate these hazards.

"3. Discovery of active and open cases of tuberculosis which are in contact with other employes, especially protecting the younger workers who are susceptible to contact infection.

"4. Discovery, through periodic examination of those with inactive tuberculosis, of any reactivation of their tuberculosis, so as to protect especially the younger employes. This also offers the infected individual a better chance of cure.

"5. Discovery of early cases of silicosis through periodic examination in order to give added protection from further excessive dust exposure.

"6. Determination, through periodic physical examination, of the effectiveness of the dust control program."

In recommending projects for medical research, the report states:

"There is no phase of employe health which concerns the employer more than does the question of dust diseases, and the ever increasing extent to which the employes' health is being made a responsibility of the employer demands that every available opportunity for increasing our knowledge be explored."

New Copper Alloy Bulletin

Bridgeport Brass Co., Bridgeport, Conn., has inaugurated a new monthly publication known as *Copper Alloy Bulletin*. It is intended as a clearing house for news of developments in brass, bronze and copper. The initial issue, that for March, discusses some of the new copper alloys, the impingement corrosion resistance of aluminum brass, the fatigue and corrosion-fatigue properties of aircraft bronzes and other interesting subjects.

WHEN MOTORS DIE

-SO DO MEN

*Shell's "Invisible Element" is a combination of Shell's unmatched world-wide resources; decades of cumulative experience and research by Shell's engineers and scientists; Shell's modern laboratories and refineries. It is the determination to make lubrication more efficient, more economical for you.

Between Tragedy and Safety... Failure and Profit ...stands Shell's *"Invisible Element"**

A TRAWLER smashes her way through mountainous seas, homeward bound. Below decks an engineer stands by a perfectly functioning Diesel, confident in her performance . . . she's lubricated with Shell products!

Wherever wheels must turn . . . in mills and mines and ships at sea . . . Shell engineers have set for themselves the task of developing a more perfect, more economical lubricant.

Into every gallon of Shell Lubricating Oil, every pound of Shell Grease, have gone the efforts of these men.

As a result, Shell offers a line of lubricants which is successfully meeting *thousands of industry's varied needs.* Preventing wear, conserving power . . . providing real savings in maintenance costs.

* * *

Do you face a particular lubrication problem which Shell might help you solve? A request addressed to Shell Industrial Lubricants Division, Shell Building, San Francisco; or Shell Building, St. Louis; or 50 West 50th St., New York, will bring a representative to your offices at no obligation to you.

Shell Oils in Action!

Captain Frederick B. Wrege, skipper of the *Effort III*, testifies to the outstanding performance of Shell Marine Argus Oil!

"For your information, I wish to state that my fishing boat, *Effort III*, is equipped with 180 H.P. Fairbanks-Morse Diesel Engines, and for quite some time I have been using Shell Marine Argus Oil 46 for the lubrication of this equipment.

"Upon examination of the engines, after six months of operation, the following interesting facts were observed: (1) No evidence of ring sticking. (2) Practically no carbon deposits present. (3) Absolutely no sludging of lubricant. (4) No cylinder, wrist-pin or crankpin wear.

"I further observed an agreeable reduction in oil consumption while using Shell Marine Argus Oil 46."

***Signed:* FREDERICK B. WREGE**

SHELL **INDUSTRIAL LUBRICANTS**

March 8, 1937

What Price New Equipment?

BY GEORGE T. TRUNDLE JR.
President, Trundle Engineering Co., Cleveland

THERE seems to be a widespread feeling today on the part of industrialists that most of their present equipment ought to be replaced by new machines, and that if new machinery could be installed throughout their plants production problems largely would be solved.

This is natural. Most of the country's productive equipment is old—10, 20 or 30 years old. Shop superintendents and production experts constantly are pressing executives to make replacements. Equipment and machinery manufacturers continually are advocating the purchase of new machines and presenting figures showing what new machines can do.

But would replacement actually accomplish the results expected of it? Would replacement really cut down production costs and add to productivity?

What Will New Machines Do?

Too few business men these days stop to figure out the answers to these questions. They talk in broad generalities about what new machinery would do, without getting down to brass tacks and finding out specifically just what new machinery could do for them, on the various operations in their own shops.

The point is that the actual value of replacement never can be measured in terms of generalities. It must be reckoned in terms of specific cases.

"If we would get some new equipment in here," says the production manager, "I'll bet we could save $200,000 a year." What new equipment? How would the savings be effected? Would the savings really materialize?

In order to pin plant rehabilitation down to actual facts, it is necessary to consider each old machine, and the machine which might replace it, as an individual case; then to estimate specifically what savings might be effected by replacement, in the light of the nature and volume of the work to be done.

It is the writer's firm belief thousands of dollars are spent in this country every year in purchases of new equipment not justified by actual facts.

Backwardness Does Not Pay

There is no doubt even more money is lost by failure to purchase new equipment actually needed. Hundreds of companies have gone to the wall because they were too backward to keep productive facilities in step with the times. Do not for a moment get the impression the writer is opposed to any program of plant rehabilitation which will actually justify itself in dollars and cents. But most emphatically a warning should be sounded against going blindfold into the purchase of new machinery simply because it is *new* machinery.

In the course of studying production methods and profit margins in a large number of plants in a wide variety of fields, experience shows that whether a company's machinery is old or new is far from being the determining factor in a company's success. Age of the equipment is not the vital question. The point at issue is: Will new equipment do the job desired more efficiently and at less cost than existing equipment? Thus, machinery two years old may be rendered completely obsolete by a new process. On the other hand, there are instances in which machinery 25 years old can do the job required just as economically and as efficiently as could the most modern machines.

In scientifically studying a company's affairs, the final objective is always net profit. Because a machine is new is no guarantee it will make money. Too often have dollars flown out the window because some executive bought a list of new machinery on general principles, instead of reserving decision until he had studied actual costs in the light of operations to be performed upon the various individual machines in his plant.

Justifying Replacements

There are three situation in which replacement of old machines by new is obviously justifiable. These are:

(1) When quality or accuracy is the major purpose. If old machines are incapable of turning out a product up to the specifications demanded in the trade, there is no question about the necessity of purchasing new machines.

(2) When cost of upkeep and repairs of old machinery is excessive. Naturally when machines begin to "eat their heads off" in maintenance costs they must be replaced. Everyone who has tried to drive an automobile too long understands this principle.

(3) When savings effected by new equipment are so evident and so large that there can be no question

about the matter. Thus, if it is perfectly evident on the face of things that a certain machine tool will pay for itself in 12 to 18 months on an operation which without question will be continued for that length of time, there is little doubt about the advisability of its purchase.

But unless one of these considerations is entirely self-evident, the desirability of purchasing new equipment becomes a matter for careful study indeed.

The first point to be studied is that of actual performance versus theoretical performance. This is chiefly a question of volume, and arrangement of flow of production. Calculation of the saving which may be effected by a new machine is usually done on the basis of a specified volume within a specified time. Now such figures may be absolutely correct, but if the volume of production and continuity of production do not occur upon the basis figured, the anticipated saving will not be effected.

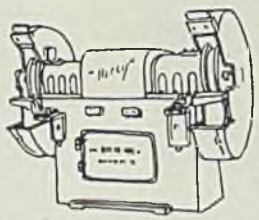
"This machine," says the production manager, "will save us $2000 a month."

But will this saving actually materialize? The savings are figured, let us say, on the assumption that the machine will turn out 1000 units a day, and that it will operate at least 8 hours every working day. But will the orders come through in lots of at least 1000 apiece? and will production be arranged in such volume that the machine will operate 8 hours every day, month in and month out?

Idleness Kills Savings

It costs money to adjust a machine for small runs. It is expensive to allow a machine to remain idle. If equipment is idle, the savings contemplated are eaten up by interest, taxes and overhead. There is a great difference between what a machine is capable of doing, and what the machine actually does. The former assumes a theoretical ideal flow of production; the latter is a matter of practical experience.

To be specific: A certain plant bought an expensive machine tool, anticipating substantial savings in production costs. The savings estimates were based on turning out units in large quantities. On this basis the units in question could be made at a cost of 5 cents each. What actually happened, however, was that orders called for lots of only 25! A study showed on this small quantity basis cost of production on the new machine ran 25 cents per unit instead of 5 cents—a cost substantially higher than had been obtained with the use of the old equipment. In this case the installation of the new machine resulted in a loss instead of a saving. A saving could have been effected, *if* actual



flow of production had lived up to the theoretical flow on which estimates had been made. But it is exactly that "if" which is the vital point in question.

Tool and Die Costs

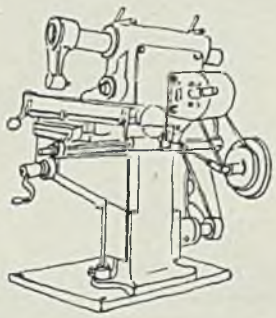
Another extremely important point is the cost of tools and dies. Such costs may mount up to more than the savings brought about by the new machine upon which they must be used.

A simple illustration is that of a machine tool of considerable adaptability, capable of working on a diversity of products. If the machine works consecutively on one product for three months, only one tool and die set-up may be involved. But if during three months production varies, and the set-up is shifted to handle five different products in succession, five tool and die set-ups become necessary, each involving additional expense. The margin between profit and loss on that machine may lie in this single factor. The machine might show a substantial saving if kept on the same job, whereas it might show a loss if shifted through five different jobs.

It is imperative, therefore, in calculating possible savings on new equipment, to consider the frequency of job change which may be involved.

To find out whether new equipment really will produce the anticipated savings, it is necessary first to know present actual costs on existing equipments; and second, to consider possible performance of contemplated new equipment not in the light of theoretical volume and flow of production, but in the light of actual experienced volume and flow of production.

Consider a recent investigation of a company manufacturing certain



types of farm equipment. Practically all machinery in the company's plant was at least 25 years old; and yet the most careful study of costs indicated not a dime could be saved by the purchase of new equipment. The nature of production and the flow of production were such that the old machines could do the job just as economically and effectively as could new machines.

Now in a plant with a different type of product and a different rate of production flow, the case might have been just the reverse. Instances are found, of course, in which practically all production equipment may be so obsolete for the purposes intended it may be advisable to junk the plant and start out fresh. It all depends on the nature of the work, the volume of the work, the flow of production, tool and die costs, and the other specific facts involved — and these can only be determined by the most careful kind of case study.

Summing up this question of plant equipment, it must be kept in mind above all else that machinery is no substitute for management. The best production equipment in the world will not earn a profit if management fails to suit the product to the market, falls down on advertising and selling, maintains an improper administrative set-up, or scrambles the company's finances.

Faulty Management Is Costly

Faulty plant operation alone in many cases may be sufficient to offset all the potential cost-savings of the best equipment. The improper scheduling of flow of work through a department, for instance, boosts costs enormously. In a plant where there is a fairly continuous progression of production, from raw material to finished product, a hold-up of one hour in one department may result in one hour's idleness in practically the entire plant. Suppose the plant employs 1000 men. This means 1000 man-hours lost. At an average of 90 cents an hour this would be $900.

In order to realize cost-savings anticipated on new equipment, it is also necessary to have trained men who can operate that equipment correctly. Unskilled or untrained men are no more capable of turning out good work at the proper rate on new machines than they are on old machines. In many cases, management attributes to equipment deficiencies production troubles which in fact are due to deficiencies in the caliber, training and intelligence of its workmen.

Working conditions also enter the picture. Possibly the need is not new machines but new paint, better lighting, better ventliation, better drinking water, better sanitation and lavatory facilities.

WHERE *Craftsmanship* COUNTS

Timepieces contrived by guild watchmakers hundreds of years ago still keep perfect time today—because the guild craftsman gave his work the loving care of a doting parent! Every individual part received his unflagging, minute attention. Precise . . . Perceiving . . . Persevering . . . the perfection of the finished product was his only goal!!

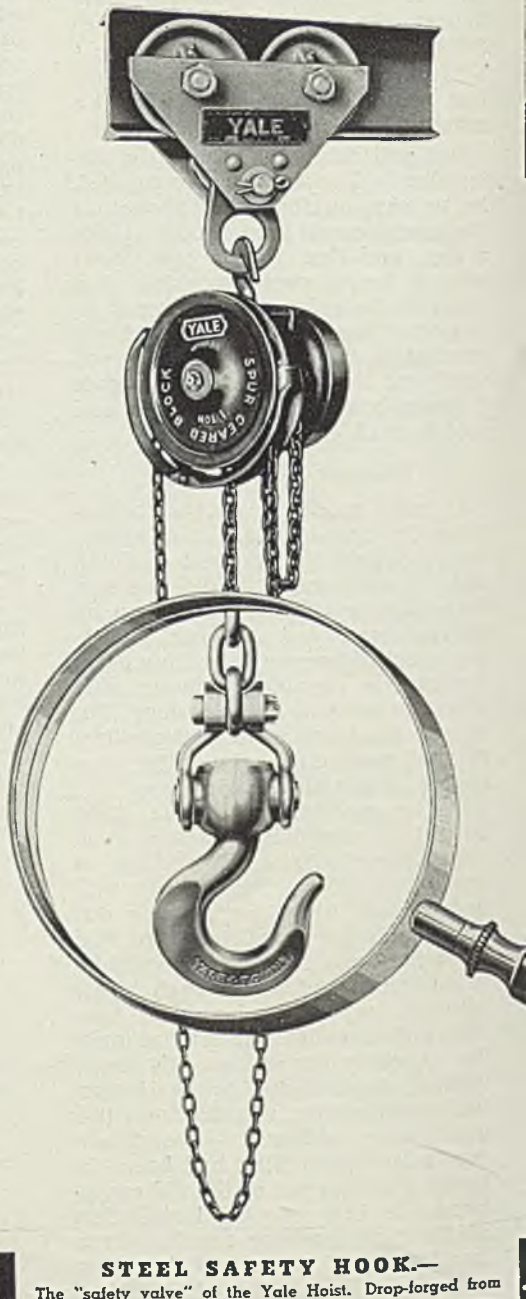
Because of their guidance by this same basic principle, YALE has maintained undisputed leadership in the chain hoist field for three-quarters of a century!!

And the supreme quality of YALE CHAIN HOISTS reflects their strict adherence to the ideals of the old guild craftsmen!!
Made of the finest materials throughout, any one of ten different points would immediately stamp the YALE CHAIN HOIST as the best that money could buy!!

In constructing these superior hoists, safety was given paramount consideration! Every YALE hoist is equipped with Steel Safety Hooks . . . Hooks drop-forged from Special Steel to give visible warning when overstrained . . . Hooks which, if overtaxed, open slowly—without fracture—before any other part of the hoist is strained!!

This is only one of the ten features that has made YALE the dominant factor in the CHAIN HOIST field that it is today!! Any YALE distributor will be glad to tell you all about the other nine!!

CAPACITIES: 300 POUNDS TO 40 TONS



SPEED ECONOMY TRADE **YALE** MARK **SAFETY EFFICIENCY**

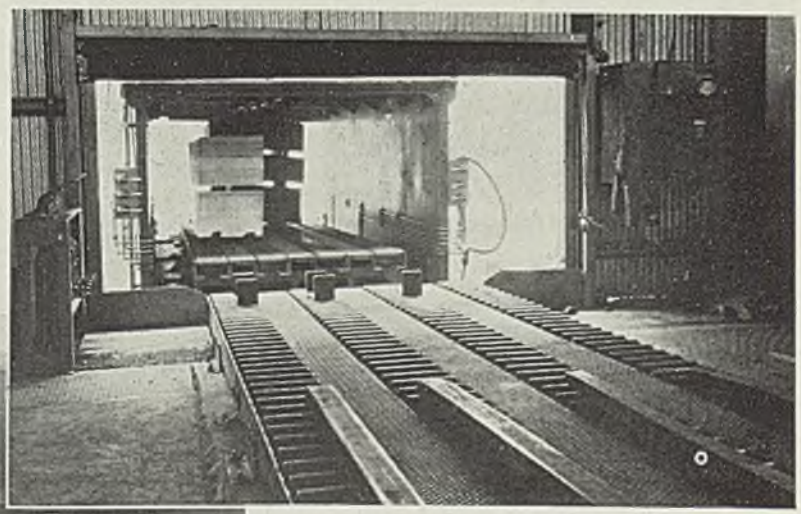
STEEL SAFETY HOOK.—
The "safety valve" of the Yale Hoist. Drop-forged from special steel, it opens slowly, without fracture, before any other part of the block is overstressed — protecting the mechanism, the load, and workman.

MATERIALS HANDLING

Conveyor Units Are Aid in Handling Continuous Mill Sheet Production

DEVELOPMENT of continuous sheet production has brought greater necessity for additional materials handling facilities and some of the recent innovations are decidedly unusual. Fig. 1, for example, shows a troughed belt conveyor used in one of the large steel mills as a stacking unit for sheets cut on a flying shear. The trough is designed to pile the sheets with a minimum amount of friction. It is said that the edges of the conveyor rarely contact the sheet itself.

A novel transfer car used for conveying piles of steel sheets from one building to another is shown in Fig. 2. Four parallel lines of roller conveyors comprise a mobile storage. The car loading platform is set at the same elevation as the sections of the conveyor on the car and the piles of sheets are transferred to and unloaded from the car at both buildings included in this operation. The conveyors are fittted with brakes to control the movement of piles on and off them. This transfer car is designed for 100-ton capacity.



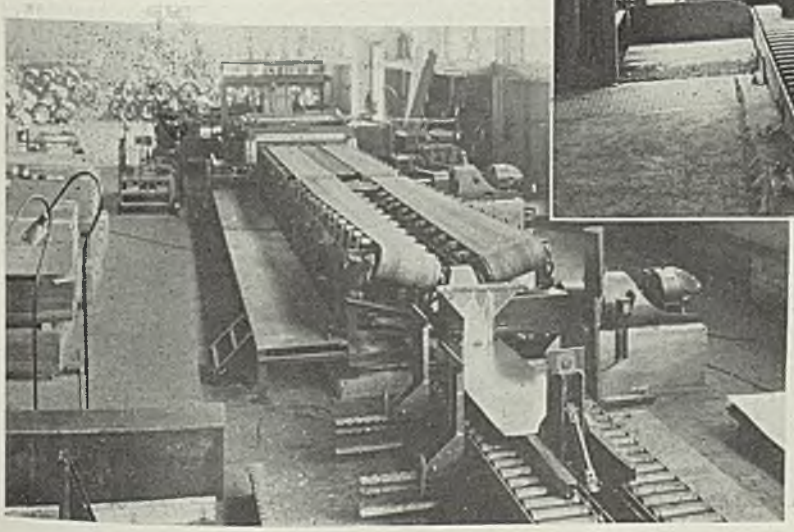


FIG. 1 (below)—This troughed belt conveyor serves as a stacking unit for sheets cut on a flying shear. Fig. 2 (right)—With the use of this transfer car, steel sheets are transferred from one building to another. Photos courtesy Mathews Conveyer Co.

• • •

Buys Fireless Locomotive

CONTINENTAL CAN CO., INC., Chicago, has purchased a new 42-ton fireless-type locomotive from the Heisler Locomotive Works. This locomotive is being used for shifting freight cars in and around the West Grand avenue plant. It handles incoming shipments and also places outgoing cars in a location where they can be picked up by the receiving railroad without loss of time.

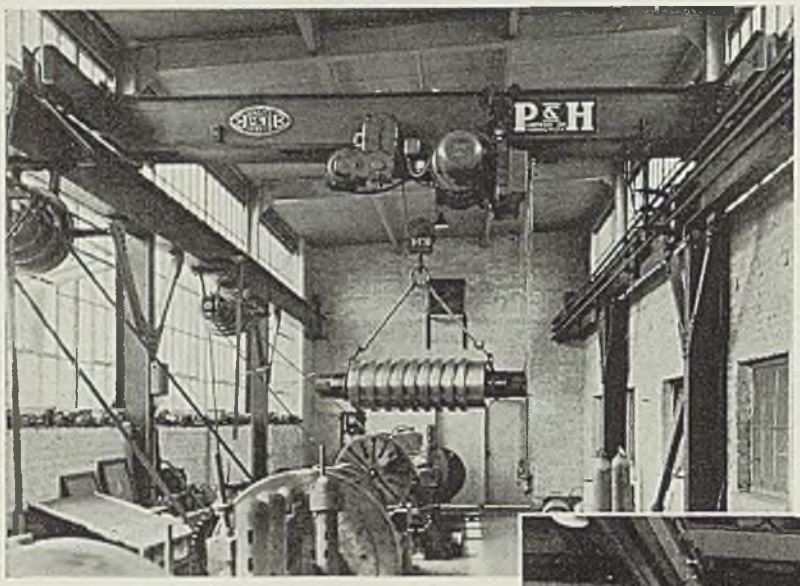
• • •

Dual Purpose Equipment Speeds Up Handling

COUPLING of different types of materials handling equipment into special dual-purpose machines is a noticeable trend in industrial practice. In the lift truck line, for example, conveyors are being built into the machines to serve as truck platforms, providing rapid and easy interchange of loads from fixed mill conveyors and from other units of transportation, and effecting more expeditious unloading. Forks have been added to hand lift trucks to simplify handling of pallet loads in locations where the heavier duty powered trucks are not available or practical.

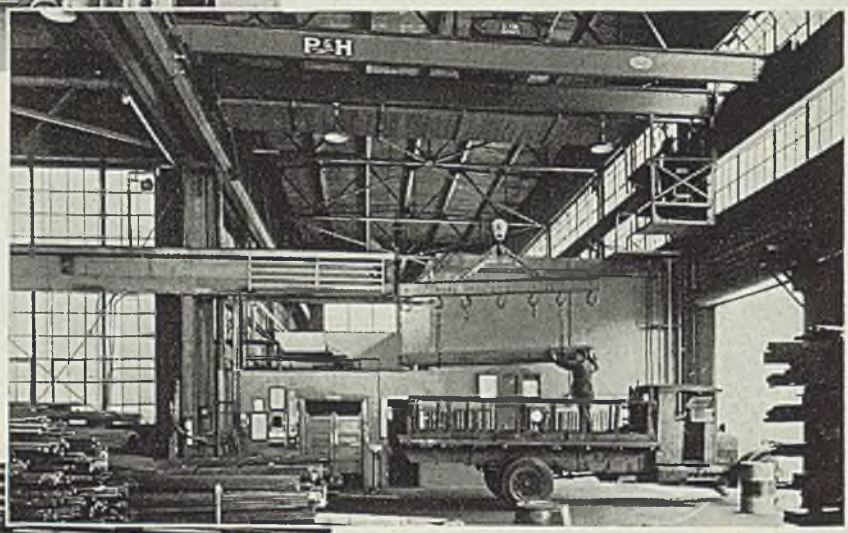
Dump bodies are being attached to live trailers, as shown in an ac-

(*Please turn to Page 67*)



THE 3-ton floor-operated single I-beam crane with motor-driven trolley and bridge, shown in the illustration at left, was erected in the machine shop of a large eastern steel company to serve a line of machines handling special work

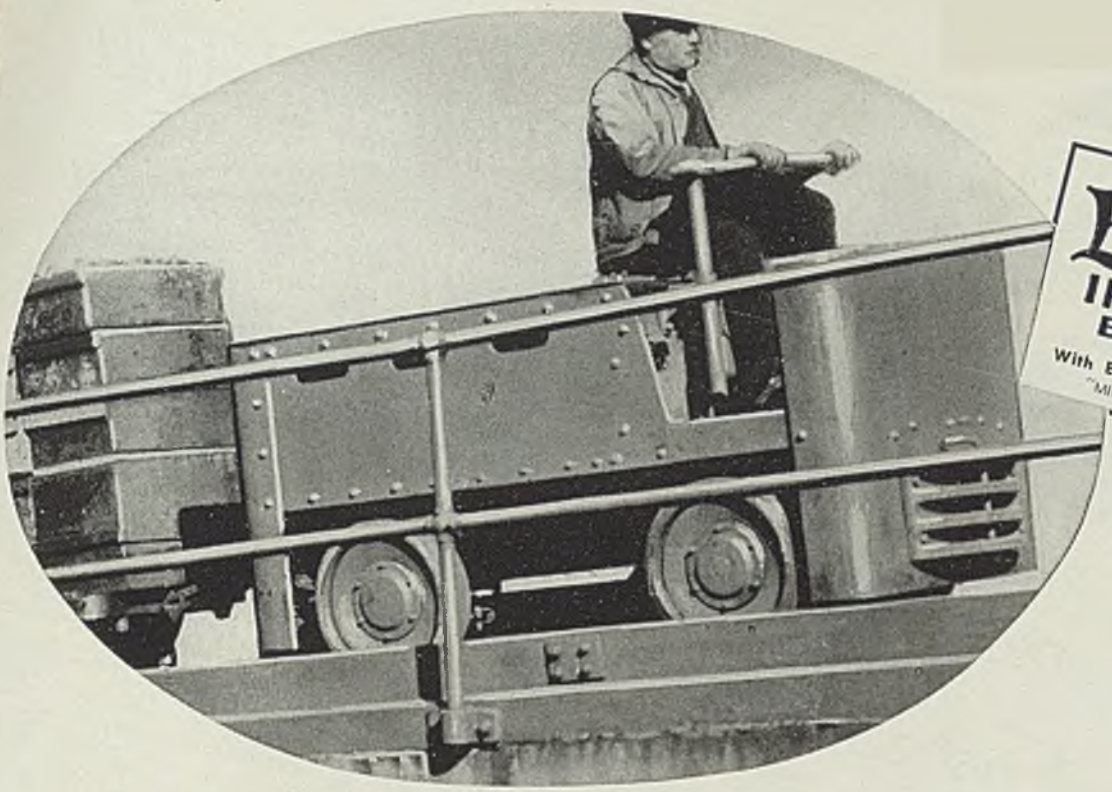
Handling Steel By Overhead Traveling Cranes



ON the shipping floor of a New York steel warehouse (above) a 5-ton capacity I-beam crane picks up a load of bars and deposits it on a motor truck. A switch track runs into the warehouse, as shown in the illustration below. Incoming shipments of steel bars are removed from the cars and transferred to the shipping floor by a 10-ton capacity traveling crane of 97-foot span

LARGE steel plates are handled with dispatch in the plant shown above since installation of the 5-ton double I-beam crane. More efficient utilization of warehouse space is another notable result achieved through use of this equipment

—Photos courtesy Harnischfeger Corp.

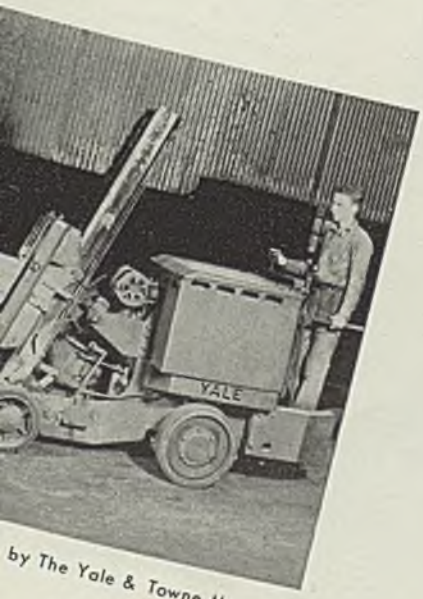


Exide
IRONCLAD
BATTERIES
With Exide MIPOR Separators
"MIPOR," Reg. U. S. Pat. Off.

"With steep ramps and unpaved roads EXIDE-IRONCLADS have given us excellent performance"

"FOR eighteen years, Exide-Ironclad Batteries have propelled our electric industrial trucks under severe conditions. Some outside roadways are unpaved, with rain and snow causing the usual mud and ruts; inside roadways are paved but on different levels, which necessitate ramps of various grades, some rather steep. They are in use daily, year in and year out, with long hours at a stretch.

"These batteries have given such satisfactory performance that whenever replacements are necessary the order will call for 'Exide-Ironclad'."



by The Yale & Towne Manufacturing Co.

Here is a letter from a large manufacturing firm using a number of electric industrial trucks. It brings out a highly important point—Exide-Ironclad *performance.* The tremendous and sustained power of these batteries makes them ideal for handling exceptional loads and negotiating exceedingly steep grades. An eighteen-year experience such as that mentioned above is ample demonstration of the ability of the Exide-Ironclad Battery to handle difficult jobs.

Exide-Ironclads have the four essentials for material handling service under modern production conditions . . . high power ability, high electrical ability, extreme ruggedness, and long life. Write for free booklet, "In Selecting Any Motive Power Battery Be Sure."

THE ELECTRIC STORAGE BATTERY CO., Philadelphia
The World's Largest Manufacturers of Storage Batteries for Every Purpose
Exide Batteries of Canada, Limited, Toronto

SURFACE TREATMENT AND FINISHING OF METALS

Steel Containers for Food Products Finished Under Sanitary Conditions

STEEL barrels and drums with sanitary linings, proof against attacks by chemicals, food products and the like, are now finished in sealed rooms supplied with filtered air and the linings then baked on in specially built gas fired ovens at the plant of the National Steel Barrel Co., Cleveland. The lining was developed by this company as well as a ring and simple locking device which holds the head on with an air-tight seal. Straight-line mechanical production has been established and a high rate of output has been achieved with a minimum of machines.

Steel sheets, 16 to 22 gage, are brought to the head of the line on trucks, already sheared to the proper lengths and widths. Here they are first passed through rolls which form them to barrel shape and they are then rolled to the automatic welder which welds the seam. A stripping machine then works down both sides of the flash of the weld and the inside of the seam is polished with a small rotary burnisher. A roll table takes the shells to the flanging operation which is started on a small horizontal machine and finished in a press which rolls the top for an open end and flanges the other for the bottom.

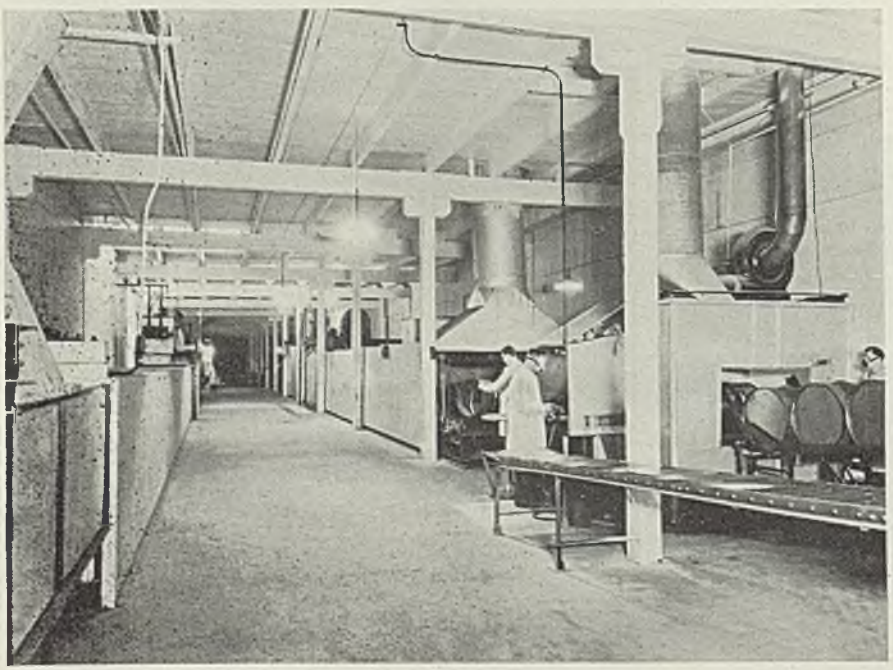
The flanged shells pass to a machine which produces the stiffening corrugations by means of an expanding die arrangement. If the drums are to be used as oil containers, additional corrugations, known as "ICC" corrugations, are rolled into the shells. They are then set up in a machine where the bottoms are put in with a double seamer. Testing under air pressure for leaks is the final operation prior to finishing.

Covers are manufactured in a separate department but production is synchronized with production of shells since barrels are manufactured only upon order. This company does not stock barrels of any type since production is so systematized that finished barrels are flowing from the end of the production line shortly after the order is received.

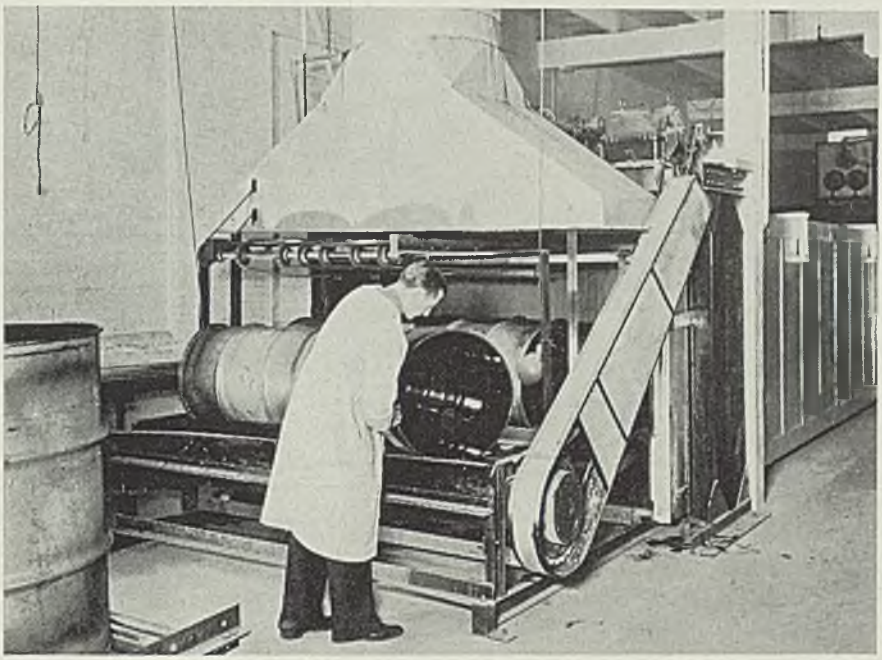
Air Is Filtered

Cover and barrel production lines converge just prior to entering the finishing department. After cleaning they are placed on long gravity conveyors which carry them into an air filtered room where the finishing equipment is located.

The first finishing operation is to coat the interior surface of the barrel and cover with a finish which will meet the requirements of the purchaser. Since manufacturers of many different types of food products as well as producers of oils and greases, paints, lacquers and many



Barrels and covers enter the finishing department simultaneously on parallel conveyors. The men on the right are applying the interior finish to both covers and barrels and placing them in the conveyor oven. Exterior finishes are baked in oven on return conveyor shown left



Inspecting the interior finish at discharge end of baking oven. Separate conveyor for covers can be seen at upper left of discharge opening. Covers are clamped temporarily to barrels and the assemblies placed on a conveyor which carries them to the booth where exterior finishes are applied

industrial solvents purchase their containers from this company, the finishing department must maintain a stock of enamels suitable for each purpose, which can be drawn upon at a moment's notice. Finishes, in all cases, are applied by spray. Barrels are conveyed directly to the lower conveyor of a gas oven and covers are placed manually on an upper conveyor in the same oven.

This double conveyor oven is of the forced convection type and is 100 feet long, 8 feet long and 4½ feet high. A platform or hearth, along which the barrels roll, is wide enough to accommodate two rows of work. A type of conveyor which rolls the barrels is used to prevent the enamel from flowing to the bottom during the plastic stage of the baking operation. Temperature and air flow are thermostatically controlled with provision made for automatic shut-off of gas in the event of fan failure.

Guard Against Odors

When the barrels emerge from the oven they are up-ended and conveyed under exhaust ducts which draw out any residual vapors which might be present. This insures against odors developing inside the barrels during subsequent operations. Following this the covers are inserted and locked in place with temporary clamps, after which they are placed on a conveyor which carries them to a spray booth where the exterior finish is applied. Here again stocks of several colors must be maintained since many purchasers require colors which are associated with their trade marks, or are identified with certain food stuffs.

Exterior finishes are baked in an oven similar to the one just described. It is 120 feet long and 4 feet square in cross section. The length of the oven is designed to provide a 20-minute baking period using the same conveyor speed as in the first. The exterior enamel requires a baking temperature of 250 degrees Fahr. and the last 20 feet of the oven is a cooling chamber into which cold air is blown from the bottom.

The conveyor extends approximately 20 feet beyond the oven where the finished barrels are transferred mechanically to another conveyor which takes them directly to boxcars.

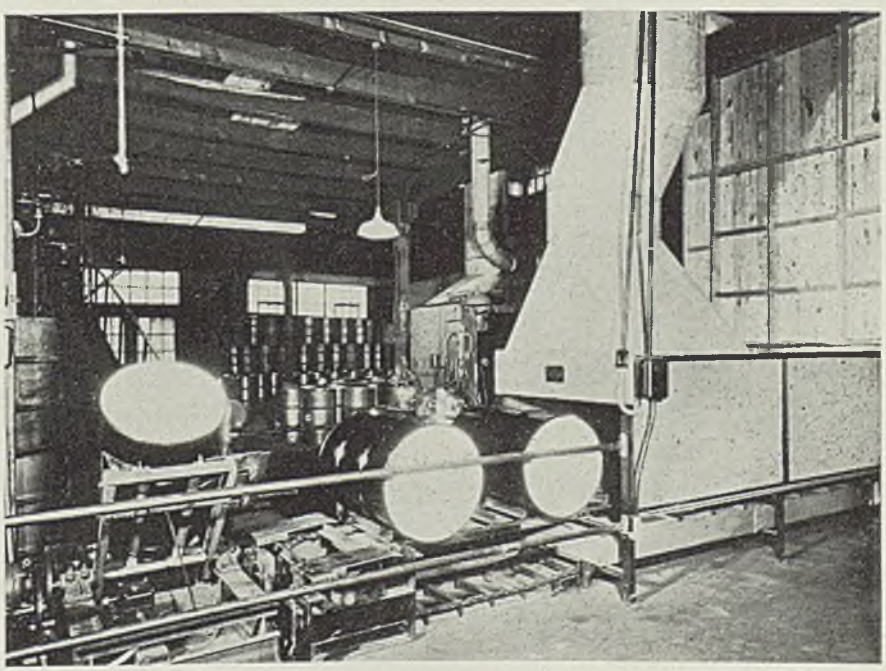
The above procedure applies to barrels finished in plain colors and having no decorative band in the center or lithographed design on the cover. Designs or trademarks can be applied to covers by one of two methods, lithographing or stenciling. In the case of lithographed covers the designs or trademarks are imprinted on sheet steel and formed into covers as needed. Stenciled designs are applied in the plant and deserve special mention.

Silk Stencils Used

The stencil is first cut in a nitrocellulose sheet mounted on a paper backing. After the cut-out portions have been removed, the sheet is laid on a strip of silk, stretched tightly on a wooden frame, and moistened with a special solvent. When the solvent has dried, the nitrocellulose is firmly adherent to the silk, permitting the paper backing to be pulled off. The enamel passing through the open portions of this type of stencil must also pass through the silk screen. This requires close control over the viscosity of the enamel. With this type of stencil, trade marks, company names and other identifying markings are placed on covers or the barrel drums.

The clamping rings which fasten

(*Please turn to Page* 64)



Barrels emerging from the discharge end of the oven which bakes the exterior finish are automatically up-ended and conveyed directly to box cars. The clamping rings described in this article are installed enroute

THREE LETTERS

THAT SPELL STEEL

THE letters USS are a symbol of the finest in any type of steel. They are your assurance of a product,— first, made in mills with modern equipment and methods—second, made by skilled workmen who take pride in their jobs, and third—backed by research laboratories that are never content with past achievements.

To carry on this tradition United States Steel is investing more than a hundred million dollars during 1937 in new plants and equipment, employing more men, at higher wages, than ever before in its history. Truly, the world moves forward with Steel.

USS

POWER DRIVES

Proper Approach and Sound Logic Gain Appropriation for New Equipment

A GROUP of industrial operating men were discussing how to persuade the "chief," who sat in the front office and was only partially familiar with their problems, to approve expenditures for changes. Finally one of the men spoke of having recently spent several thousand dollars in improvements, to which the others chorused, "How did you get the money?" His story may help others "educate the boss," as they put it.

"When I took my present position plant conditions were discouraging, to put it midly," he replied. "When I asked for a considerable appropriation to put the plant in condition it was turned down flat. My job was to run the plant and not to buy a new one, he told me.

Improvements Without Cost

"My next attack was to see what I could do without extra appropriations. By careful study I located changes and improvements here and there which could be easily made by the regular force. In each case I determined the operating cost both before and after the change, which amounted to a saving of about $1000 per year.

"I then selected about a dozen jobs, obtained costs under operating conditions and carefully estimated probable conservative savings if necessary expenditures were made. My estimates indicated that with about $300 I could save $1500. Armed with all of this data I awaited a favorable opportunity.

"One day the boss came through the shop rather jubilant over landing a big order. Pulling out my data I told him of the changes made at no cost and the results. Of course he was pleased. I explained that now the 'rabbits were all out of the hat' more changes would require slight expenditures. 'If you will appropriate $300 I'll guarantee $1500 return, extra profit, and you will need the improvements to handle the work on this big order.' I got it.

"Since that time I have been turned down only once and that was because he was considering some other changes in production which would require entirely different facilities. However, every request is accompanied by a complete estimate of present costs, cost of changes and conservative savings. Later a report shows actual savings, which in every case has exceeded the estimates. Too often," he added, "requests for expenditures are little more than 'panhandling.' If you have shown what you can do and know what you want and why, any business man will listen to your story."

Proper Presentation Important

In contrast an executive in a manufacturing plant recently related to the writer an experience with his plant engineer, a good man, too, in his work. The engineer requested the purchase of a new type of testing unit costing $250 with the argument that it was "the newest thing out" and would save time in making certain tests. Further inquiry brought out that probably 50 hours a year could be saved. The query, "Do you have any men worth $5 per hour?" ended the interview.

Later the plant engineer brought up this same turndown as an example of the shortsightedness of his chief. Half of the reasons told the writer, none of which had been given to his chief, probably would have gained the authorization to purchase. To the question, "Did you tell him all of that?" his reply was, "I didn't get the chance." His story had been told wrong end to.

♦ ♦ ♦

Numerous types of protective devices against single-phase operation of three-phase motors prevent damage to the motor.

♦ ♦ ♦

An example of the increasing tendency toward automatic lubrication is found in a big press recently installed in the Detroit area. This unit required 22 barrels of oil to "fill up" before starting.

♦ ♦ ♦

The application of brakes and clutches for automatic starting and stopping at definite points in a cycle of operations is a development of drives practically unknown only a few years ago.

♦ ♦ ♦

Where motors or control with special characteristics are necessary they should be used. However, such use necessitates carrying extra spare equipment as a safeguard against interruptions. Therefore, it always pays to see how closely standard interchangeable equipment will serve the purpose.

♦ ♦ ♦

Consider influence of weight on time required to mount tackle overhead for handling equipment. By using alloy steel in tackle blocks their weight may be decreased from one-third to one-half, according to a recent announcement by a manufacturer. This reduction permits speeding up this work with a corresponding saving in time and cost.

♦ ♦ ♦

Application of variable speed transmission equipment to existing production equipment is usually easily made because of the wide variety of types and models available from the manufacturers of such equipment. In no case is it more difficult than attaching individual motor drive. In some types the individual motor is built into the transmission and all attached as a unit.

A.S.T.M. Corrosion Testing Symposium Paves Way for Standardization of Methods

FOR some time, American Society for Testing Materials committees A-5 on corrosion of iron and steel and B-3 on corrosion of nonferrous metals and alloys have felt that the society should take some steps toward standardizing methods of corrosion testing. Taking cognizance of this sentiment, a joint committee was established to develop a program of action.

After consideration of the various problems, the committee concluded that a preliminary step should be the preparation of a symposium covering all important phases of corrosion testing including tests in the laboratory and in service. Such a symposium, therefore, was conducted during the society's 1937 regional meeting at the Palmer House, Chicago, March 2-3.

The regional meeting was held in connection with the spring group meetings of A. S. T. M. committees beginning March 1 and ending March 5. Many of the society's standing committees and subgroups convened during this period. Registration was slightly ahead of the 1936 gathering, when more than 600 attended.

Six Papers Are Read

Six papers constituted the corrosion testing symposium program. One of these dealt with the underlying principles of testing and served as an introduction to the remaining papers which were devoted to specific tests under gaseous, immersion and soil conditions. F. N. Speller, director, department of metallurgy and research, National Tube Co., Pittsburgh, and chairman of the joint committee presided at the session.

The introductory paper, titled "Principles of Corrosion Testing," was prepared by R. B. Mears, Aluminum Co. of America, New Kensington, Pa., and C. W. Borgmann, National Tube Co., Pittsburgh. This paper emphasized the desirability of standardization of corrosion tests and the difficulties involved. So far only two tests have been adopted as standard by the society. One of the difficulties in arriving at standardization has been the lack of correlation between the laboratory tests and service life. This partly is a consequence of the fact that corrosion resistance is a property dependent upon both the nature of the metal and the character of the environment and various metals react dissimilarly in different environments.

Tests to determine the most suitable material for withstanding a certain environment are of greatest interest to consumers of metal products, it was pointed out. "Once a list of prospective materials is composed, the next step is the elimination of all materials which cannot be commercially obtained in the forms desired or which do not have suitable physical (or other) properties. Simple laboratory corrosion tests, which most closely meet the conditions of use, should be conducted on the remaining materials. In planning such tests, care should be taken to select a proper test technique so that the pertinent properties of the metal may be measured.

"On the basis of these tests an additional selection of materials can often be made from considerations of the total cost of the various metals. Materials still remaining can be further selected by field tests of small specimens in an already existing plant or by service tests using the selected materials as actual equipment in a model or pilot plant. On the basis of these results, final selection for the particular application can be made. When it is not possible to include the pilot plant procedure, it is often possible to substitute sections of the equipment made from the new materials."

Actual Exposure Must Be Used

It was indicated that while some form of accelerated corrosion test, which in a short time would give a rating of behavior of various materials similar to that obtained when these materials were actually exposed in service, would be most convenient, such a test has not yet been developed and it is doubtful if such a test can ever be devised. Rather than strive to devise an accelerated service corrosion test, the authors recommended the working out of special property tests and their use in conjunction with actual exposure tests in the various environments in which one is interested.

The following tests were stated by the authors as believed ready for standardization, based on the amount of data now at hand: Laboratory tests—impingement attack, intercrystalline corrosion, frequency of sites of initial attack, corrosion-fatigue, partial immersion tests and spray tests; field tests—atmospheric exposure, soil corrosion tests and immersion tests.

Atmospheric corrosion testing is carried out for at least two purposes, it was pointed out in a paper on this subject by H. S. Rawdon, chief, division of metallurgy, national bureau of standards, Washington. The primary purpose is to determine the rate at which the metal is attached chemically by various agents to guard against an atmospheric corrosive attack. The latter may consist of surface coatings or the chemical treatment of the metal to produce a shield for the metal beneath.

Field Conditions Vary

Atmospheric tests may be made either in the laboratory or in the field. The former usually are spray tests. In field tests it is common practice to choose a number of locations in which the atmospheric conditions differ markedly among themselves. Results of field tests sometimes are misleading if they are not correlated with data as to the environment. A striking example is that of lead-coated steel exposed in a rural or marine atmosphere, as contrasted with an industrial atmosphere. The speckled rusted surface after only a relatively short exposure in a rural atmosphere is in marked contrast to the freedom from rusting in an industrial atmosphere after even a much longer exposure.

While rather accurate knowledge of the prevailing character of the atmosphere is desirable, detailed studies along this line have not been feasible. Apparently the changes in the character of the atmosphere over the years covered by the test are so great that no valid correlation can be deduced.

A fundamental requirement for

specimens to be used in field tests, if quantitative data are desired, is a large area to weight ratio. This is imperative when the progress of corrosion is to be followed by change-of-weight determinations and it is important even when only visual observations are to be made. This requirements practically limits quantitative tests to sheet material or to thin plates.

A favorite method of orienting the sheet samples in many previous atmospheric corrosion tests has been to arrange them in an east-west line facing south and inclined at an angle of 30 degrees to the horizontal, although both north and south exposure have been used when sufficient comparison specimens were available. Contact with the supporting rack should be guarded against. Small grooved porcelain insulators have proved to be excellent for holding specimens, particularly sheet materials.

Numerical Rating Desirable

Definite recommendations concerning the frequency of inspection cannot be made, according to Mr. Rawdon. This must be determined by the purpose in view, the nature of the material and the environment. Uniformity in nomenclature or descriptive terms used in describing the appearance of corroded specimens is most desirable, and the results of visual inspections should be expressed by a numerical rating whenever possible. Recommendations concerning methods which are satisfactory for cleaning specimens prior to weighing are desirable. Such methods will vary with the accuracy desired and upon the purpose of the test.

Precision used in making change-of-weight determinations must be varied according to the purpose of the test. All changes in weight should be calculated on the basis of unit of area and unit of time. The conversion of change-of-weight data into units of "penetration per year" is not so necessary and helpful in atmospheric corrosion tests as in other forms of corrosion testing.

Change-of-strength determinations preferably should be made on specimens machined from material after it has been corroded than on specimens which have corroded after being machined. A change in ductility is a more sensitive indicator of the effect of corrosion than the accompanying change in tensile strength. Tests of this kind are essential for evaluating properly the corrosion behavior of certain types of metallic materials.

Practice of laboratories of the Aluminum Co. of America, New Kensington, Pa., in employing salt spray tests was described in a paper prepared by E. H. Dix Jr. and J. J. Bowman of that company. Illustrations of the boxes and other equipment used in conducting the tests were shown. A solution of 3½ per cent sodium chloride in distilled water was recommended and the use of fresh solution rather than recirculation of the liquid was favored. Spray jets employed are monel metal, though hard rubber also has been found satisfactory. A pressure of 30 pounds has been found desirable, while the temperature should be kept below 35 to 40 degrees Cent. Generally reliable results have been obtained in testing aluminum alloys by this method.

Discussing alternate immersion and water-line tests, D. K. Crampton, research director, Chase Brass & Copper Co., Waterbury, Conn., indicated that the loss of tensile strength is a better measure of corrosion of copper alloys than loss in weight. Damage to a specimen by dezincification, selective solution or by pitting is shown clearly by the percentage of original tensile strength lost during the test. Corrosion by general thinning causes only a small percentage in tensile strength, thus bringing the test results more nearly in accord with service behavior. In addition, the specimens need not be cleaned after corrosion, thereby eliminating possibility of error, while difference in density is not reflected in the loss of tensile strength though it may affect the weight.

The alternate immersion test, as carried out by the author, consists of dipping the specimens in and out of the solution at a definite rate. Samples are suspended by silk line from a crank over glass rods so that as the crank rotates the specimens are raised and lowered alternately in jars containing the corrosive solutions. Water in the heating bath is kept in constant motion and its temperature is kept relatively constant. A hood covering the machine maintains a humid atmosphere above the solutions.

Must Apply Data Correctly

In water line testing, the specimens are suspended stationary so that the water level is constant at about the center of the pieces. Measurement and tensile testing of specimens are the same as with the alternate immersion test. The author pointed out that the data obtained from this test should be applied properly only in rating different alloys against water line attack, and that the relative rating of different alloys will not necessarily hold where other types of corrosion are present.

"Total Immersion Testing" was discussed by R. J. McKay and F. L. LaQue, development and research division, International Nickel Co. Inc., New York. While the authors did not recommend the adoption of any particular apparatus or test, it was recommended that a procedure be set up which would provide proper control of, for instance, four vital features—composition of solution, temperature, aeration and velocity—and as many others as may be dictated by the consensus of informed opinion. A review of reports on corrosion testing over a recent ten-year period shows a tendency toward better control and more complete reporting, but much additional attention should be paid to the four controlling factors named, it was stated by the authors.

A summary on "Soil Corrosion Testing" was included in a paper on this subject by K. H. Logan, S. P. Ewing and I. A. Denison, national bureau of standards, Washington. Such testing involves: Corrosiveness of the soil; relation between pit depth and area; and relation between pit depth and time. Corrosiveness of a soil toward ferrous metals may be determined by measuring the voltage at various current densities of a cell in which the electrodes are steel and the electrolyte is the soil under test.

Make Use of Equations

The average current density corresponding to a range of voltage up to 0.3-volt is expressed in terms of the average depth of the deepest pit to be expected on 1 square foot at 12 years. By means of an equation in which the depth of the deepest pit on a given area is expressed as a function of (1) the corrosiveness of the soil, (2) the area exposed, and (3) the period of exposure, the estimated depth of pit may be calculated to the desired area and time. A general equation was given for the estimation of the number of holes, if any, in pipe as a function of the corrosiveness of the soil, time, and wall thickness.

Empirical equations in which the depth of pit is expressed as power functions of time and exposed area were described, and the constants of the equation were related to the properties of the soil. The slope of the pit depth-time curve when plotted on logarithmic co-ordinates was shown to be determined largely by the aeration of the soil, the more poorly aerated soil having a steeper slope.

The precision and range of application of the suggested procedure for soil corrosion tests is limited by imperfect understanding of certain features of soil corrosion, such as the exact nature of the relation connecting pit depth with exposed area. Although this method is not sufficiently well established to be adopted generally, it is believed to constitute a basis on which a standard method might be developed.

WELDING, ETC.

BY ROBERT E. KINKEAD

1,000,000 P. S. I.

PROF. P. W. BRIDGMAN of Harvard university studies the effect of enormous pressures on various materials; reports results embarrassing to many theories. At pressures approaching 1,000,000 pounds per square inch, shear resistance is increased many times; failure by slippage occurs, but when the slippage stops, the material promptly welds together—cold.

Research in abstract science is carried out here by capitalistic endowment, in U. S. S. R. by expropriation of national wealth. Two widely divergent civilizations; both recognize its necessity. Practical results follow as a matter of course.

In steel mill operation it has always been difficult to explain why a backing up roll and a work roll in a strip mill would continue to operate in view of the fact shearing stresses are many times the normal strength of the material from which the rolls are made. Prof. Bridgman's studies indicate the shearing resistance increases as the shearing stress increases. Others have guessed it; this scientist perhaps has proved it.

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

Cold welding has been demonstrated to be possible over a long period of time. This work proves it can be done in short periods of time if enough pressure is applied. It has been a fair assumption for a long time that if a given force is applied to produce a rupture of the molecular bond, the same force applied in the reverse direction would re-establish the bond. The difficulty has always been that no one knew how to apply the force in a manner to accomplish the result. Then too, the original rupture was probably a tear and many times the force would be required to re-establish the bond. The apparatus used in this case shows a greatly advanced understanding of the behavior of materials under any degree of stress.

Prof. Bridgman's work is of signal importance.

◆ ◆ ◆

Welding Phenomena

CERTAIN phenomena sometimes arouse a train of thought which results in an invention of importance. In the field of molecular bonds, which is the field of welding, nothing is more intriguing than the behavior of optical flats or Johannsen gages when "wrung" together. They stick together so tightly that in attempting to separate them by movement perpendicular to the seized surfaces, the material may be broken.

No theory based on vacuum pressure can account for that. A molecular bond has been established in the plane of contact. That is also the definition of a weld and the weld would behave in the same manner if the fusion line were as perfectly plain as the surfaces of the gages. In other words, it would be weak in resistance to lateral slippage but strong in resistance to perpendicular forces. Welds without heat are easy to make if the surfaces to be welded together are perfectly plane and clean.

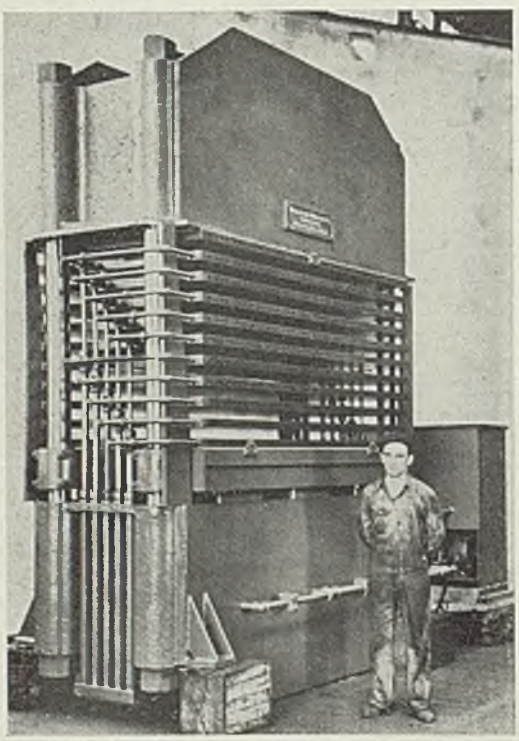
Arc welds with 0.1-ampere 60-cycle alternating current are made without the slightest difficulty. In fact, on relay contacts such welding is a source of great difficulty to electrical experts. Tungsten and molybdenum are used for such contact points to inhibit welding.

◆ ◆ ◆

Profitless Prosperity

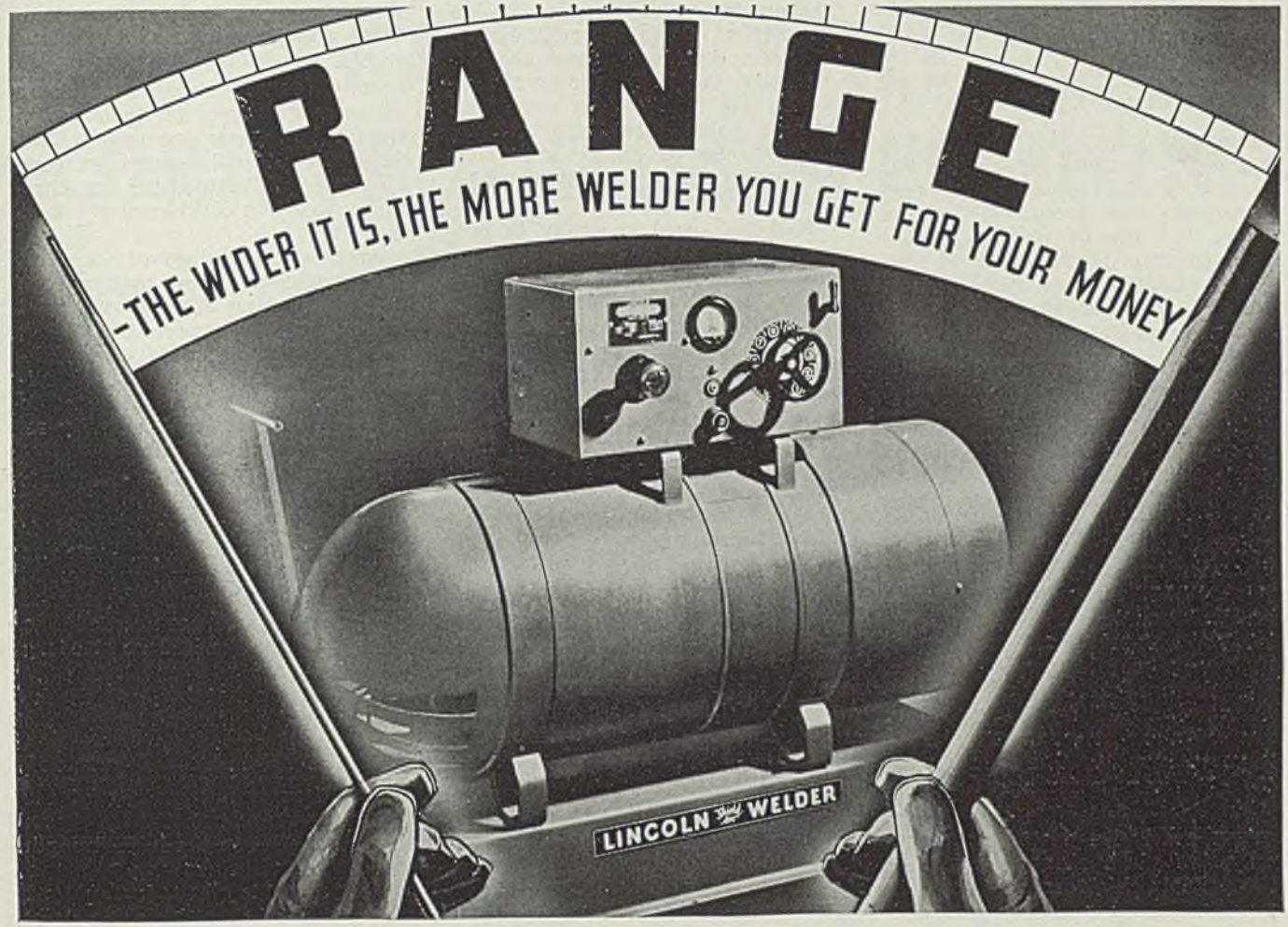
THE days of profitless prosperity are not far distant for many manufacturers, particularly those who fabricate metal in some form. Taxation and rise in labor rates will soon wipe out the economies and cost reductions which have come about from the flood of business in 1936. The situation in the large welding departments is so evident the only possible explanation of failure to deal effectively with it is no one in authority has had the time or inclination.

Most welding departments need technical improvement, need more automatic machinery, need incentive systems. Such matters may be scheduled by dates for executive handling so that a definte constructive program can be carried out in a specified length of time. Failure to carry out such a program will bring profitless prosperity measurably closer. With such a program, a firm may count on going through the peak years of this coming boom earning profits while less alert companies are crying into their soup because they cannot earn profits "with prices where they are."



Press Builds Plywood

LIVE steam and 500-ton pressure build plywood in this press built by Williams, White & Co., Moline, Ill. Wood plies spread with glue are placed in the openings between the hot plates and the center. Pressure is applied and live steam, introduced into the hot plate, bakes the glue. Steel plate used in the construction of the machine is an inch thick and is electrically welded. Photo courtesy Lincoln Electric Co., Cleveland



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Using Ferroalloys in the Iron Foundry

(*Continued from Page* 41)

ages of chromium up to about 1.25 per cent chromium. For grate bar service, iron of about 1 per cent chromium has given four to ten times the life of that obtainable with common irons.

For oxidation resistance and service at higher temperatures, 1200 to 2000 degrees Fahr., chromium from 15 to 35 per cent has successfully enhanced the life of stoker links and furnace parts ten times, and only with the use of material of this nature are certain types of installations possible.

In a boiler installation in which high-chrome iron performance was studied, two pipes 8 inches inside diameter and 28 inches long, containing 27.25 chromium, 2.12 carbon and 1.32 per cent silicon, served as burners for pulverized coal. They replaced pipes of 10-gage sheet steel which were continually being replaced every 15 days. One pipe showed a slight crack after about 2 years service. The second continued in service for about 4 years when the boiler was discontinued.

The conclusion reached after an extensive plant survey on use of these plain high-chrome irons in pipes, roasting pans, retorts, etc., was that, in general, chrome iron will resist oxidation almost indefinitely at temperatures up to 2000 degrees Fahr., and it has actually been employed in certain equipment for relatively long periods at 2200 degrees Fahr. However, at these higher temperatures the alloy iron loses much of its mechanical strength and is likely to become deformed.

Resist Heat Satisfactorily

In heat-resistance service an alloy of 14 per cent nickel, 6 per cent copper and 4 per cent chromium has proved highly satisfactory. The alloy lends itself to easy cupola production and while more expensive than the 15 per cent chromium irons, has the advantage of being less brittle and more machinable than the latter. For corrosion resistance, the high-chromium and chromium-nickel-copper types find wide application.

For production of small quantities of chromium cast irons, a special foundry grade of ferrochrome, crushed to 20 mesh down, permits easy and satisfactory absorption in the ladle—up to about 1.50 per cent chromium addition. For alloying two or more cupola charges or adding over 1.50 per cent chromium, lump ferrochrome or, preferably, chrome briquets are used with the charges in the cupola. By the latter method, chromium additions up to 24 per cent have been made successfully, but at 15 per cent chromium, the high carbon absorption in the cupola induces brittleness and makes preferable the use of the electric or crucible furnace, where lower carbons are possible.

Nickel is used generally to promote machinability on light sections and for increasing strength of iron when used in combination with other alloys—chromium and molybdenum. Its use supplements silicon in reducing chill and its benefits accrue usually in reducing silicon or by altering the base charge. In irons of lower silicon content, it is by the use of nickel that the economic benefit of its addition may be obtained, and simple additions of nickel to iron are not generally economically justified.

Supplementing chromium, nickel usually is added in the ratio of two and one-half times as much as chromium. A favorite combination is nickel 1.50 per cent, chromium 0.60 per cent. This gives a strong, machinable iron. In combination with molybdenum, nickel gives high-strength irons. Irons of 0.75 nickel, 0.50 per cent molybdenum regularly meet 50,000 pounds per square inch tensile requirements without great loss in machinability.

Use of Nickel Is Simple

The role of nickel in special wear and heat-resistant castings already has been referred to. Use of nickel is simple for the foundryman. Added as pig nickel to the cupola, it usually comes down well in the charges for which it is desired, and when used in the ladle as nickel "F" shot, its absorption is easy and uniform.

Molybdenum is finding increased use due to its marked effect in strengthening cast iron. Its use also promotes uniformity of hardness throughout the section. It is utilized by itself or in combination with nickel or chromium or both. When used alone in the range of 1 per cent, tensile strengths in the range of 50,000 pounds per square inch are easily obtainable. In structure these irons are generally close grained; microscopically, they have more finely divided graphite particles and base matrix of pearlitic sorbite constitution.

Molybdenum - chromium irons have been referred to; their use in wear resistance is prominent. Likewise, use of molybdenum in combination with both nickel and chromium has been considered previously.

An interesting study of the effect of molybdenum shows that in irons of approximately 3.25 per cent total carbon and 0.50 per cent chromium, other elements normal, molybdenum, while said to be a mild carbide former, with small additions up to about 0.25 per cent, actually reduces the depth of chill.

Introduction of molybdenum into cast iron is simple and a high recovery is usual. The element is commonly introduced in the form of the crushed ferroalloy added to the stream as the metal flows from the cupola, or added to handle ladles —the weighed additions being placed in envelopes deposited in the bottom of the hot ladle at the instant that the ladle is plunged into the metal stream.

As previously mentioned, calcium-silicon though not strictly of the ferroalloy type, has come to play an important part in the high-strength iron field. It has a strong graphitizing effect and is generally employed as a ladle addition to a base metal which would otherwise be hard as cast.

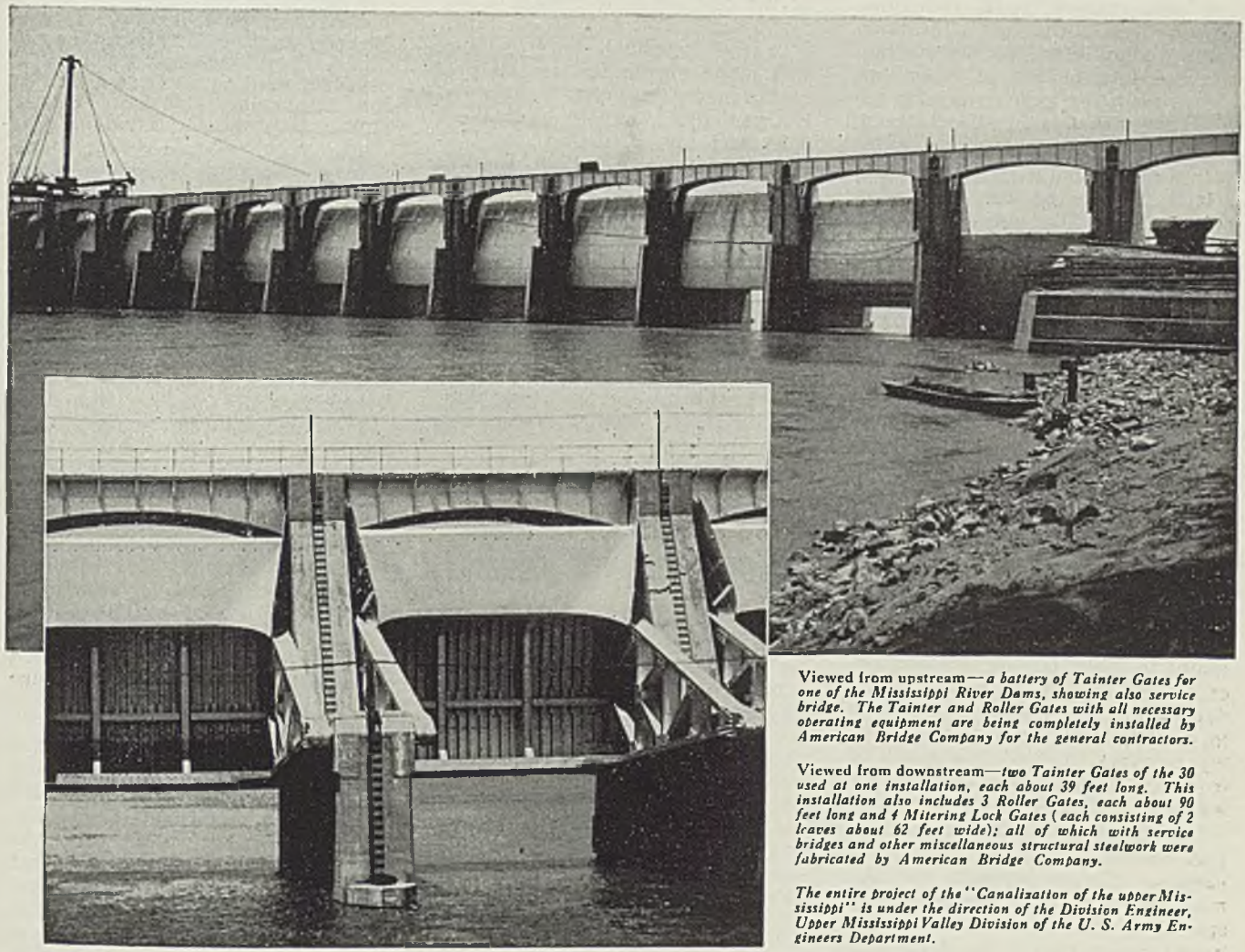
Obtaining Wear Resistance

By use of ferrovanadium, vanadium is added in small percentages to cast iron, particularly to harden the iron and give resistance to wear. Its most notable effect is in giving a fine structure and increasing resistance to impact in white iron or chilled castings. Comparative physical properties of plain iron and one to which 0.50 per cent chromium and 0.06 per cent vanadium were used showed an increase in 300 pounds in transverse strength (18-inch center bar, 1400 pounds), and impact values of 6.7 foot-pounds, compared with 3.5 foot-pounds in the plain iron.

Ability of titanium to graphitize has rendered it valuable in certain applications in the production of close-grained irons with finely divided graphite. An alloy which is satisfactory for introducing titanium, particularly in the ladle, is the silicon-titanium alloy. When used alone to about 0.20 per cent titanium, appreciable increase in tensile and transverse strengths with an increase in deflection has been found. When used in conjunction with 0.50 per cent chromium and 1 per cent copper, interesting improvement in strength and grain refinement is

GATES OF STEEL CONTROL MISSISSIPPI'S FLOW

to make usable waterway



Viewed from upstream—*a battery of Tainter Gates for one of the Mississippi River Dams, showing also service bridge. The Tainter and Roller Gates with all necessary operating equipment are being completely installed by American Bridge Company for the general contractors.*

Viewed from downstream—*two Tainter Gates of the 30 used at one installation, each about 39 feet long. This installation also includes 3 Roller Gates, each about 90 feet long and 4 Mitering Lock Gates (each consisting of 2 leaves about 62 feet wide); all of which with service bridges and other miscellaneous structural steelwork were fabricated by American Bridge Company.*

The entire project of the "Canalization of the upper Mississippi" is under the direction of the Division Engineer, Upper Mississippi Valley Division of the U. S. Army Engineers Department.

AMERICAN Bridge Company has furnished, or is now furnishing, for numerous Mississippi River Locks and Dams, partial or complete installations of gates of all types—Tainter, Roller and Miter—complete with operating and heating equipment, service bridges, emergency bulkheads, stoplogs and other miscellaneous steelwork needed for operation and maintenance.

Specialties of this kind demand the utmost in accurate fabrication of heavy sections, to meet the most exacting specifications as to workmanship and materials. They must be built true to minimum tolerances for exact alignment and water-tight contacts.

American Bridge Company has acquired wide experience over a period of years in structural steel and plate work for water storage and control.

AMERICAN BRIDGE COMPANY

General Offices: Frick Building, Pittsburgh, Pa.

Baltimore · Boston · Chicago · Cincinnati · Cleveland · Denver · Detroit
Duluth · Minneapolis · New York · Philadelphia · St. Louis

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* · United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL

possible. Where clean and good machine finish is essential, this combination of alloys is advantageous.

Studies in the use of silicon-zirconium as a deoxidizer and graphitizer show interesting possibilities in its use. As to its powerful deoxidizing effect, iron treated with 0.20 to 0.50 per cent zirconium shows little residual zirconium in the iron; the effect of its use, however, is quite marked in graphitizing lower silicon irons and producing close-grained, tight, easily-machined iron. Crushed silicon-zirconium alloy offers the best method for the introduction of zirconium into iron in the ladle, while for cupola use, briquets of silicon-zirconium alloy are available.

In a discussion of alloys and their relationship to the iron foundry, a reference to the use of copper should not be omitted. It is now used in three or four ranges, particularly in castings of one large gray iron producer in the development of high strengths. To this organization is due tribute for its ingenuity and success in reclaiming lost markets for gray iron castings.

Must Add Alloys Correctly

To speak of the details of adding alloys may seem elementary but experience shows there are many ways in which alloys can be used incorrectly. Many foundrymen feel they know definitely which charge of iron goes into each particular ladle and with this feeling, they attempt to make one or two charges of alloyed iron in the middle of the day's run. This practice often leads to disappointing results, in poor alloy recovery, in having a grade of iron in certain types of castings for which it is totally unsuited, etc.

Likelihood of irregularity in cupola operation, and the inability of keeping charges separate as they melt, make it desirable to charge special or alloy irons either at the beginning or end of the day's run. When pouring highly alloyed iron, it is best to drain the cupola completely, build up the coke bed to the proper height, and melt the alloyed iron separately and by itself.

Troubles are reported when certain alloy contents are built up in gates and sprues. When alloy irons are produced, sprues and gates must be remelted. When recharged, full allowance for alloy content in them must be made for close and uniform control.

The moot question, too, as to whether cupola additions of alloys are better than ladle additions might be mentioned. Generally speaking, where conditions will permit the former, that is cupola additions, they are to be preferred. In this practice the alloy is introduced into the iron under the best metallurgical conditions for its reaction and absorption (at its highest temperature), and usually the uncertainty in obtaining incomplete solution or mixing of alloy is avoided. When properly designed ferroalloy additions are used in the cupola charges, uniform and exact control of composition are possible and usually obtained. When only small quantities of alloyed iron are to be made, obviously the only recourse is the use of the crushed ladle grades of ferroalloys.

In the foregoing, little mention was made of the fundamentals of cast iron melting; that is, types of charges used, cupola operations, coke and air regulation, etc. A wide diversity of ideas and practices exists in foundries and these naturally affect the proper use of ferroalloys. Specific all-purpose recommendations for use of ferroalloys thus are not attempted; while their use in no way can be said to be a panacea for all the foundrymen's ills, studies of individual problems and close co-operation between gray iron producers and ferroalloy manufacturers has been a great benefit in most cases.

Food Containers Finished Under Sanitary Conditions

(*Concluded from Page* 53)

the removable covers to the barrels were developed and patented by this company. They are fabricated from 12-gage strip steel, cut into lengths, rolled into U shape cross-sectionally, and then into hoops. Legs are welded to the ends, the handle is riveted on and the burrs ground off. These assemblies are cleaned for enameling in a mechanical gas heated washer, which consists of a sheet steel cabinet housing two tanks, a drying chamber and a looped chain conveyor. As the rings pass through, pumps force hot cleaning compound and then rinsing water on them by means of stationary sprays. The tanks are heated with gas-fired immersion type heaters.

The enamel unit consists of a double loop chain conveyor, 80 feet in length operating through a gas fired oven 40 feet long, located near the center. The rings are dipped and hung on this conveyor approximately 20 feet ahead of the oven. The discharge end of the conveyor is close to the conveyor carrying finished barrels to the shipping platform. Finished rings are either clamped to outgoing barrels or shipped to other barrel manufacturers licensed to use them on their product.

In addition to steel barrels this company also manufactures steel pails with removable covers fastened with the same type of circular clamp as on the barrel. Production lines for these pails are laid out almost exactly like those for barrels.

Welding Procedure, Design In its Fourth Edition

Procedure Handbook of Arc Welding Design and Practice, fourth edition; semiflexible simulated leather; 819 pages, 5¾ x 9 inches; 990 text illustrations; published by Lincoln Electric Co., Cleveland; supplied by STEEL, Cleveland, for $2, plus 15 cents for mailing; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

The fourth edition of this handbook contains 223 added pages and 289 new illustrations to bring it abreast of new developments of this fabricating procedure. All new data essential for the most efficient use of arc welding are included, covering varied uses. In addition to including so much new material the data in the former edition have been revised in conformity with recent developments.

It is encyclopedic in scope, concisely written and profusely illustrated, an inclusive reference guide for all interested in the art. It is written especially for the use of designers, engineers, architects, production managers, welding supervisors and operators. It contains much material for the use of draftsmen, steel fabricators and erectors, foremen, cost estimators, maintenance managers, shipbuilders, pipe and pipeline contractors and students of welding.

Eight sections cover the following: Welding methods and equipment; technique of welding; procedure, speeds and costs for welding mild steel; structure and properties of weld material; weldability of metals; designing for arc welded steel construction of machinery; designing for arc welded structures; typical applications in manufacturing, construction and maintenance.

Writing Refractories Book

"Crushing, Grinding and Pulverizing Equipment for the Refractories Industry" is the title of technical bulletin No. 64 just published by the American Refractories institute, Oliver building, Pittsburgh. The material was prepared by A. F. Greaves-Walker, professor of ceramic engineering, University of North Carolina, Raleigh, N. C., and constitutes a part of a book which Prof. Greaves-Walker is preparing for the institute. Purpose of the bulletin is to obtain comments, criticisms and additional information prior to book publication.

PROGRESS IN STEELMAKING

New Wheel Effects Saving

Locomotive wheel maintenance costs at coal mines are less with rolled steel wheels than with wheel centers and tires according to practice at a mine in West Virginia. While pressing the wheels on and off soon reduces the fit to a diameter below standard this objection has been met by the development of a "balloon"' wheel having an initial tread 4 inches thick. This type wheel affords a saving ranging from $8000 to $10,000 annually depending upon the tonnage. Many of the balloon wheels have a life of eight years and during this period may be used on different type locomotives. This is equivalent to eight services and six or seven turnings. The diameter of the tread is ⅜ to ½-inch smaller after each turning. Use of rolled steel wheels eliminate wheel center renewals and affords the maintenance of gears and pinions in alignment thus insuring uniform wear over the entire length of teeth.

♦ ♦ ♦

Offsets Formation of Smut

Use of an inhibitor in the pickling of pipe greatly assists in preventing the formation of smut and in securing a surface free from pits. Less spelter thus is required because the smoothness affords the proper drainage.

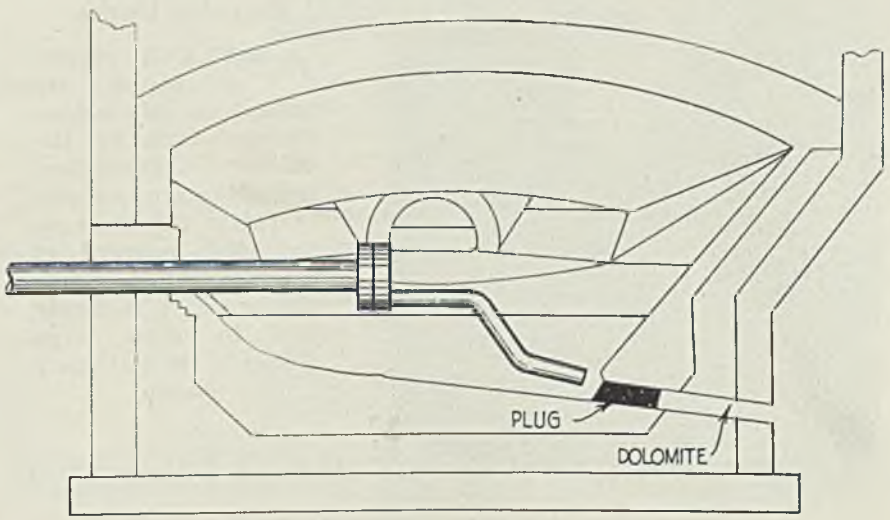
♦ ♦ ♦

Returns Heat to Furnace

Direct return of heat to open-hearth furnaces has been made possible by the development of a waste-heat boiler of practical size and construction. A metallic air preheater operates in conjunction with the boiler, thus obviating the need for expensive alloy steel in the construction. Reduction of waste-gas temperatures to safe limit before the preheater is accomplished in a short section of the boiler. The boiler may be built of such size as to serve as a precooler or it may be built large enough to provide flexibility in the production of steam and air preheat. Air temperature to the furnace is controlled by a large by-pass flue in the boiler which is equipped with a damper to permit variable quantities of hot gases to pass and mix in the preheater. A characteristic of the unit is its flexibility in directing waste heat to the point of greatest economic use. When the open hearth requires the heat, the boiler element produces the minimum quantity of steam. On the other hand, when the supply of preheat to the furnace is reduced, the production of steam will be increased. By this arrangement, therefore, all available heat in the waste gases is employed usefully. Full use of preheat during the melting down period, also affords larger tonnages and yields.

Employs Open-Hearth Charging Machine for Opening Tap Hole

WITH the ladle resting on its standards beneath the pouring spout, the tap hole dug out at the rear to the desired length, and the steel in the proper condition, all is ready to tap out the heat of open-hearth steel. The clang of a gong warns workmen that danger lurks in the pouring aisle within the vicinity of the furnace about to be tapped. The first helper and his crew push a long bar through the wicket in one of the charging doors, probe for the tap hole and poke out the refractory plug. Away flows the metal. At an open-hearth shop in Detroit a novel method is employed for opening the hole. A bar attached to the end of the charging machine ram and bent to the shape shown in the sketch is used for knocking out the plug. The bars are prepared by the blacksmith and several are kept on the charging floor as spares. By this arrangement no labor is involved in dislodging the plug and the operation is positive



Engineering Foundation Is Directing Research in Technological Fields

SCIENTIFIC laboratories of 14 universities are co-operating with the Engineering Foundation, 29 West Thirty-ninth street, New York, in an effort to solve technological and human problems in the fields of mechanical, electrical, mining and metallurgical, and civil engineering, according to a report by the Foundation.

Two government bureaus are aiding in special investigations. Working with other groups, the four founder societies, of which the Foundation is a research agency, are advancing engineering education and professional development as well as personnel research.

Long-term projects sponsored by the Foundation include alloys of iron research, comprising a review of world information on alloy steels and alloy cast irons; and welding research, embracing more than 60 fundamental studies in college and industrial laboratories and a compilation of welding literature.

World interest in earths and foundations has been aroused by a committee of the American Society of Civil Engineers, which has directed research in this sphere since 1929. A soil mechanics laboratory has been established at Harvard university. The lateral supporting power of soils to individual piles, anchors, and bulkheads is being studied at Yale university. Models of earth dams and coffer-dams are furthering extensive investigations at the University of Minnesota.

Barodynamic research, the study of weighty masses by means of special centrifuges, is going forward at the school of mines of Columbia university. Confirmation of laboratory results has been obtained from surface and underground observations of mining problems in Europe and Africa. A device for determining side pressures of loose materials, and a new type of artificial support in mines have been developed. Stress distribution in mine pillars and roofs, and the time effect in rock structures strained beyond elastic limits have been determined.

Designs for a new type of critical pressure steam boiler may grow out of a basic investigation at Purdue university by the American Society of Mechanical Engineers. Determinations of viscosity of water and steam, and reactions between steam and metal at elevated temperatures have been studied particularly. At the University of Michigan, a boiler feed water research project is concerned with methods of determining oxygen in the waters.

The nonmetallic minerals experiment station of the Bureau of mines, New Brunswick, N. J., is attacking the problem of embrittlement in boiler steel, and expects to learn its cause and means of prevention.

A specially-built machine at Massachusetts Institute of Technology is testing the strength of gear teeth. Recent operations have been devoted to experiments with surface fatigue of cast iron.

A large piece of steel known as a "test log" is being cut at the University of Michigan in the course of an investigation of the efficiency of cutting fluids, that is, the fluids used for lubricating and cooling metal cutting tools. A handbook on "Cutting of Metals" has recently been completed under direction of the American Society of Mechanical Engineers.

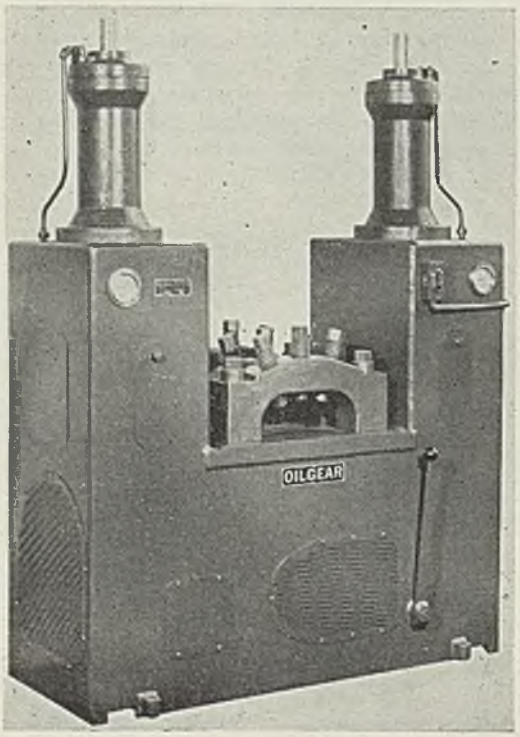
The national bureau of standards, Massachusetts Institute of Technology, Cornell university, University of California, Ohio State university and University of Oklahoma, and several industries are conducting experiments with long-radius flow nozzles, used in fluid meters, to provide more economical and convenient means for precise measurements of large quantities of liquids or gases, as in efficiency tests of steam and hydraulic power installations. In some instances steam is used, in others, water, through nozzles ranging from 3 to 16 inches in diameter, and also through 2-inch pipe orifices.

Iron Electrodes Studied

Ten years of research on pure iron electrodes, sponsored by the American Institute of Electrical Engineers at Lehigh university, was recently completed. This phase of welding research will be merged in the comprehensive program of the Foundation's welding research committee.

Information on the creep and relaxation of metals was gathered last year as part of a study of metal plasticity carried on at the University of Pittsburgh with research facilities provided by the Westinghouse Research Laboratories. Special apparatuses were designed and constructed for the work, the results of which are proving of practical value.

Nearly 500 specimens of concrete are under observation in long-time tests at the University of California to determine the various factors in the plastic behavior of concrete. Three new series of investigations have been started, comprising studies of the moisture loss accompanying plastic flow under sustained load; of the validity of the assumption of plane bending in beams under sustained load; and of the effect of compound composition and fineness of cement upon plastic flow. A series of thermal stress studies has already been completed.



Twists Airplane Propeller Blades

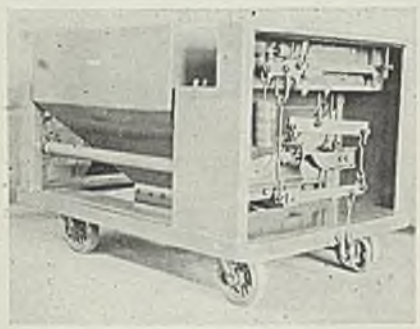
AIRPLANE propeller blades are twisted on this unique machine built by the Oilgear Co., Milwaukee. A floating arm smoothly twists the blade to the pitch required at various sections while the propeller is firmly held by three large screws in the stationary clamp

MATERIALS HANDLING

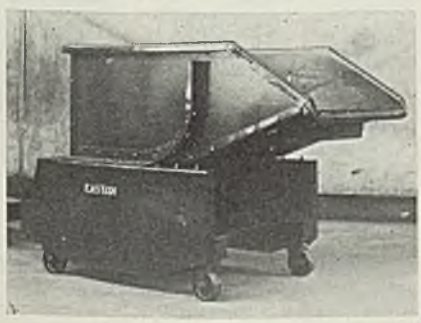
Dual Purpose Equipment Speeds Up Handling

(*Concluded from Page* 49)

companying illustration, and to portable elevators. In the former application, the dump trailers may be used in conjunction with tractors and lift trucks, or pushed or pulled around on their own wheels. Scales are now being built as integral parts of various types of equipment, particularly electric overhead cranes



TWO types of dual-purpose equipment are illustrated here. Above is a hopper-bottom hand truck of 27 cubic foot capacity equipped with a Fairbanks scale. Of welded construction, the truck is mounted on four rubber-tired swiveling wheels. Below is a 27 cubic foot dump body mounted so that it can be moved on its own wheels as a live trailer or picked up and transported by an electric lift truck. Photos courtesy Easton Car & Construction Co.



and monorail units, and recently weighing units have been added to floor and hand lift trucks, as shown in another illustration. For the past two years, there has been on the market a tailboard elevator for motor trucks which permits loading and unloading at various levels.

One more recent addition to the growing list of combinations has been placed in production recently by one manufacturer. This is a motor truck body incorporating a movable floor. Like other innovations in materials handling equipment, this unit is intended to make a transportation machine serve a dual purpose, resulting in saving of time in unloading and in less fatigue for the operator.

• • •

Trucks Have Welded Frames

Electric arc welded frames are now standard equipment in the Roadbuilder model truck built by the Hug Co., Highland, Ill. These frames are of I-beam design and the entire frame, including the integral bumper, tow hooks, spring hangers and cross members is electrically arc welded.

NEW EQUIPMENT

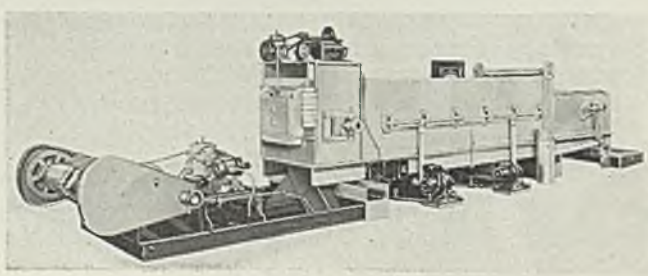
Electric Counter—

Struthers Dunn, Inc., Philadelphia, has recently made available a new line of electric counters. These counters are available with five digits in either the reset or non-reset type. Construction of the counters is such that the load and the operating mechanism is constant regardless of what number is being counted. The duty of the operating mechanism is practically the same as on a relay; each load is the same whether one or ten thousand is being counted. This eliminates any tendency for the counter to skip when only one or two wheels should be turning and miss when all the wheels should be turning. Only one number appears on the dial at a time.

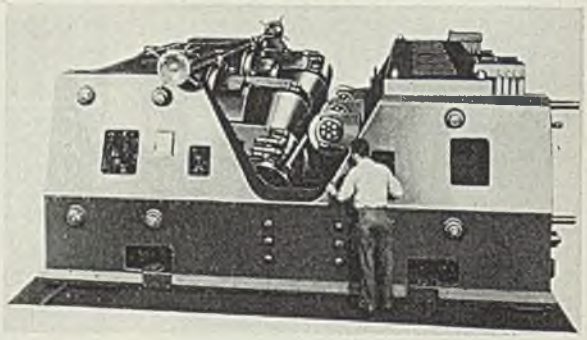
♦ ♦ ♦

Continuous Furnace—

Barkling Fuel Engineering Co., 400 North Paulina street, Chicago, is now producing continuous chain belt conveyor furnaces for heat treating. These units embody speed semimuffle indirect heating features used for accurate heat control in treating high carbon steel. Scale control is easily accomplished by means of controlled atmosphere. The chain conveyor is designed of cast links set close enough to enable the handling of small parts without using trays. Chains travel over an alloy drum equipped with sprocket teeth which insures positive drive. Work is placed on an exposed portion of the belt provided for this purpose, and material is carried through the furnace on the belt, dropping off through sealed chute into a tank. This tank is self-emptying and is supplied in either flat belt type or spiral type. Tank is equipped so that interchangeable quenching of water or oil may be provided. Variable speed controls are included in both the chain belt drive and in the quench tank for handling of various types of wood.



Continuous chain belt furnace for heat treating, equipped with automatic quencher. This unit was designed by the Barkling Fuel Engineering Co.



Sutton straightening machine will handle large and small sizes of bars, tubes and pipe

♦ ♦ ♦

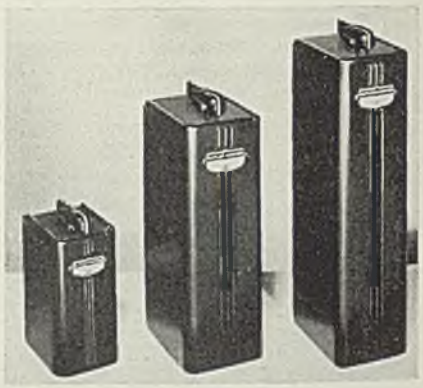
Straightening Machine—

Sutton Engineering Co., Pittsburgh, has recently introduced a new bar and tube straightening machine. Capacity of the machine is up to 8½ inches on large solid bars, either heat treated or unheat treated steel of any composition; or high tensile tubing of any wall thickness from 2½ inches to 16 inches. Straightening speeds to 500 feet or higher per minute are available. Steel construction is used throughout, and the entire machine is roller bearing equipped. This machine is a composition of two cross roll straightening machines and a gag roll. Angles of all the rolls on this machine are adjustable to maintain full line contact on all sizes, greatly increasing the life of the roll, reducing wear on the guides, giving a smooth finished pipe and accurate straightening.

♦ ♦ ♦

Drum Controller—

Cutler-Hammer Inc., 320 North Twelfth street, Milwaukee, announces a new line of fractional horsepower drum controllers. These units are designed for use with reversible alternating current squirrel cage motors and reversing or non-reversing multispeed squirrel cage motor, driving machine tools and similar machines where speed regulation is desired. An airstyled removable case encloses a compact



Fractional horsepower drum controller recently introduced in a new airstyled case by the Cutler-Hammer Co.

mechanism offering features such as an insulated cylinder to which the segments are firmly secured without screws, non-stubbing, renewable contact fingers mounted in individual bakelite moldings, and a positive action, self-indexing drum.

♦ ♦ ♦

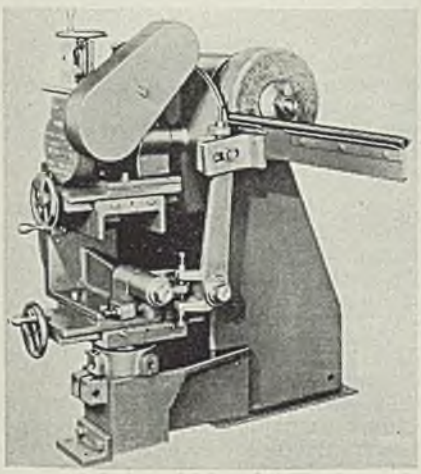
Valves—

Hancock Valve division, Consolidated Ashcroft Hancock Co., Bridgeport, Conn., announces the addition of the 1¼, 1½ and 2-inch sizes in globe and angle pattern to their new line of bronze valves. Valves are equipped with stainless steel seats and disks. This stainless steel trim is heat treated to a hardness of 500 Brinell and machined on a diamond boring machine.

♦ ♦ ♦

Tube Polishing Machine—

Acme Mfg. Co., Detroit, has recently introduced a single wheel automatic tube polishing machine for finishing tubing or pipe up to several inches in diameter. A vertical hand wheel for raising leather lined feed disk provides proper speeds from 0 to 20 feet or more per



Acme tube polishing machine for finishing tubing, bars or piping of small or large diameter

minute. A center hand wheel is provided for tube size adjustment and lower hand wheel for pressure and wheel wear. Power is provided by a ¼ horsepower, totally enclosed motor for driving the feed disk and a 5 or 7½ horsepower, totally enclosed fan-cooled motor is used for driving the polishing wheel spindle. V-belt drives are used on both motors with adjustable mountings. The machine is completely ball-bearing equipped.

♦ ♦ ♦

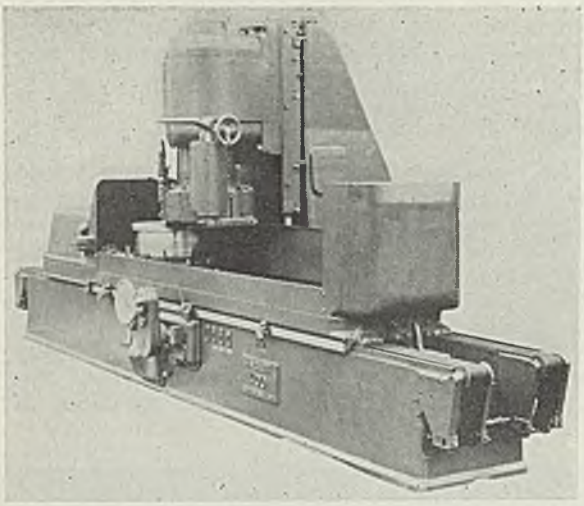
Flow Indicator—

Autocall Co., 237 Tucker avenue, Shelby, O., has recently introduced a flow indicator designed for signalling or control of operating equipment. The new unit is in three major parts; the housing with its electrical contact equipment, a flexible paddle suspended from the electrical unit and a strap to hold the housing assembly over a hole in the pipe line. The paddle is constructed of flexible material which will not retard the free flow of liquid in the pipe. Movement of liquid in the pipe line deflects the paddle and the movement serves to make or break electrical contact. If used in a sprinkler line, the device can be made to sound an alarm in case of operation; or any machine may be made to operate at any fluctuation in the flow. All pipes are protected from corrosion.

♦ ♦ ♦

Surface Grinder—

Hanchett Mfg. Co., Big Rapids, Mich., has recently placed on the market a new vertical spindle surface grinder. The motor is of built-in type, 30 horsepower, 700 revolutions per minute, with a 40 horsepower motor also available. Grinding wheel is 22 inches in diameter, either in the cylindrical or segmental type. These machines are



Hanchett vertical spindle surface grinder which provides speeds up to 90 feet per minute

built in all lengths from 50 to 132 inches. The finished T-slotted table top is 18 inches wide. It is hydraulically operated and provides speeds up to 90 feet per minute. The grinding wheel is provided with hand, power and automatic feeds. The machine is provided with a wheel-dressing device as well as a motor driven coolant system with coolant tank of more than ordinary capacity.

♦ ♦ ♦

Motor Starter—

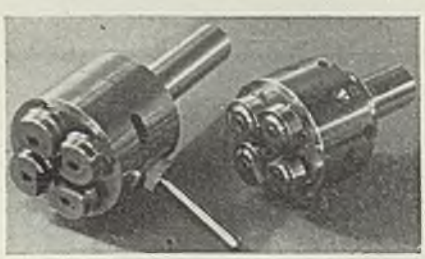
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has recently announced an inexpensive line of explosion-proof manual motor starters adapted for control and protection of single phase and polyphase squirrel cage motors where explosion-proof equipment is desired. Of the across-the-line type, the starters use the disk thermostat, toggle-type mechanism, are front operating and have long life contacts and corrosion resisting finish on all metal parts. Starters can be changed from one rating to another by changing heaters. Heater coils may be easily changed without disturbing the trip mechanism.

♦ ♦ ♦

Milling Tool—

National Acme Co., 170 East 131st street, Cleveland, announces a new hollow-end milling tool. This tool is designed to use circular cutters with the same micrometric adjustment and positive control feature as is used when holding circular shapers. By using more than one step on the cutter, it is possible to turn several diameters with one pass. After the tool has completed the cut, the cutters are automatically released and backed off, without marring the work. Adjustment for diameter is provided in the tool. Cutters may also be used for finishing or turning a radius on a shoulder, if desired. Tool may also be used as a standard shaft opening automatic die head, by simply changing from hollow-milling cutters to circular shapers. In this way, milling cutters, circular shapers or a combination of both may be used to advantage.

Diameters from 0.056-inch to 13⅜ inches may be end-turned in this manner with standard cutters.



New hollow end milling tool designed and built by National Acme Co.

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

Fire Brick—A. P. Green Fire Brick Co., Mexico, Mo. Booklet illustrates how fire brick is made in a modern fire brick plant.

Burner Equipment—Surface Combustion Corp., Toledo, O. Bulletin No. 79, ilustrating designs of its gas burner equipment.

Switchboard Styling — General Electric Co., Schenectady, N. Y. Folder No. 2253A, illustrating new developments in switchboard styling.

Riveting Aluminum — Aluminum Co. of America, Pittsburgh. Booklet No. A. D. 5, illustrating and describing methods of riveting aluminum and its alloys.

Hand Burners—D. A. Hinman & Co., Sandwich, Ill. Handbook No. 26, illustrating and describing advantages offered by its hot and cold-rolled hand benders.

Electric Motors—Bodine Electric Co., 2250 West Ohio street, Chicago. Folder Vol. 17-No. I, describing characteristics and applications of series motors.

Welding—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., booklet covering the procedure, conditions and materials for welding modern alloys; copies are available at 50 cents each.

Ground Thread Tap—Greenfield Tap & Die Corp., Greenfield, Mass. Folder No. G-648 25M, announcing a new high speed ground thread tap, claimed to eliminate the principal difficulties of correct thread assembly.

All-Steel Grandstands—Pittsburgh Des Moines Steel Co., 3421 Neville Island, Pittsburgh. Bulletin No. 401, describing its all-steel grandstands and illustrating a number of stands erected for various schools, with table of seating capacities.

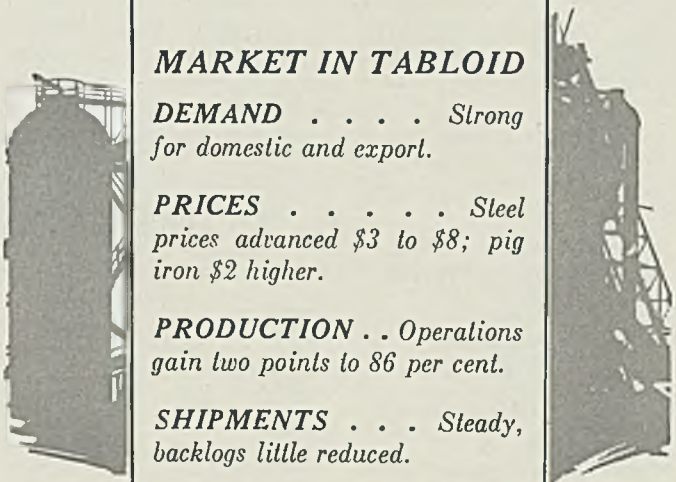
Finishes — Patterson Foundry & Machine Co., East Liverpool, O. Folder illustrating and describing the part its electrically heated kettles play in the process of converting the oil of the soy bean, and other vegetable oils, into durable finishes.

Industrial Packings—United States Rubber Products Inc., 1790 Broadway, New York. Manual to assist engineers in properly adapting the company's various packings to specific needs; special sections are devoted to recommendation charts.

Thermometers and Hydrometers—C. J. Tagliabue Mfg. Co., Park and Nostrand avenues, Brooklyn, N. Y. Catalog No. 1100A, includes in addition to the regular line of extreme precision and standard grade thermometers and hydrometers, a complete listing of the widely used A. S. T. M. thermometers with illustrations, also the A. P. I. and certified hydrometers.

Steel Prices Advance To Meet Labor Costs

Pig Iron Up $2 In Many Districts; Operating Rate 86



MARKET IN TABLOID

DEMAND . . . . *Strong for domestic and export.*

PRICES . . . . . *Steel prices advanced $3 to $8; pig iron $2 higher.*

PRODUCTION . . *Operations gain two points to 86 per cent.*

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

INCREASES of $3 to $8 per ton on steel products announced by Carnegie-Illinois Steel Corp., effective immediately and applying to June 30, are being followed by other producers.

This is the industry's hedge against the added expense entailed by the advance in wages announced early last week, adding a heavy financial burden. Inasmuch as mills are practically sold out at former prices to the end of March, and further in some products, while the wage advance goes into effect March 16, producers are not entirely recouping their added payroll expenditure.

Semifinished steels were increased $3 per ton, with skelp boosted $6 as it did not advance last fall; shapes and plates were raised $4, bars $5, sheets of various grades $5 to $8 per ton, galvanized taking the maximum on account of the heavy increase in cost of zinc.

On the heels of the steel advance pig iron producers announced a further rise of $2 per ton on all grades, effective immediately and for second quarter.

Steelmakers have added a little capacity at most centers with the result that they are engaged at 86 per cent, two points higher than a week ago, exactly equal to the rate in the second week of September, 1929. At no time since have operations been as high. Pittsburgh increased one point to 88 per cent; Chicago half a point to 81; Eastern Pennsylvania one point to 57; Youngstown 2½ points to 84; Wheeling two points to 96; Buffalo four points to 90; Detroit three points to 100. No change in rate was made at Cleveland, at 79½, Birmingham, 77, New England, 97, Cincinnati, 64, and St. Louis, 82.

Pig iron production in February was 3,020,006 gross tons, a decline of 6.2 per cent from January, on account of the short month. Daily average rate in February was 107,857 tons, the best since October, 1929, at 115,747 tons and 3.85 per cent above the rate in January. In February, 1936, the daily rate was 63,411 tons. For two months of 1937 output was 61.4 per cent greater than for the same period in 1936. Seven additional stacks were active in February.

Pittsburgh Steamship Co., Great Lakes subsidiary of the United States Steel Corp., has doubled its shipbuilding program, announced a month ago. It has decided to build four steam-electric cargo boats, which will require 24,000 tons of steel, mostly plates and bars, instead of the 12,000 tons previously suggested. These are the first lake cargo carriers to be built since 1930.

Automobile production last week reached 126,975 units, giving promise of 500,000 cars in March. This is the largest output since present models were announced. This rate is the highest attained since early 1929. Compared with the preceding week General Motors gained 10,000, Ford 4000 and Chrysler 900.

Exports of manufactured steel and iron in January fell 4.8 per cent from December, but were 56 per cent higher than a year ago. Scrap exports show a decline from 158,962 gross tons in January, 1936, to 109,026 tons in December and 72,849 tons in January, this year.

Congestion of scrap at shipping points continues and about 45,000 tons are backed up on cars in the Port Richmond, Pa., area awaiting ships. Scrap prices are meeting resistance at present high levels, but advances are being made at some consuming points. Heavy melting steel at Pittsburgh has reached $22, the highest level since May, 1923.

Responding to the general price rise STEEL'S composites advanced sharply. Finished steel composite rose $4.40 to $60.70, nearly every item having some increase. The iron and steel composite advanced $2.52 to $39.47, the highest level since December, 1925. This composite is likely to be affected again this week as the $2 a ton advance in pig iron becomes more general. In the finished steel composite record January and February, 1926, were at practically the present level.

In an effort to relieve shortage of pig iron and steel the government of Great Britain has suspended the duty on pig iron and has reduced that on steel from 20 to 10 per cent ad valorem. Greatest need continues to be in semifinished steel.

COMPOSITE MARKET AVERAGES

	Mar. 6	Feb. 27	Feb. 20	One Month Ago Feb., 1937	Three Months Ago Dec., 1936	One Year Ago Mar., 1936	Five Years Ago Mar., 1932
Iron and steel	$39.47	$36.95	$36.71	$36.74	$35.15	$33.20	$29.28
Finished Steel	60.70	56.30	55.80	55.92	53.90	52.32	47.09
Steelworks Scrap ..	20.12	19.66	19.25	19.19	16.92	14.48	7.89

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

A COMPARISON OF PRICES

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

Finished Material

	March 6, 1937	Feb. 1937	Dec. 1936	Mar. 1936
Steel bars, Pittsburgh	2.45c	2.20c	2.05c	1.85c
Steel bars, Chicago	2.50	2.25	2.10	1.90
Steel bars, Philadelphia	2.74	2.49	2.36	2.16
Iron bars, Terre Haute, Ind.	1.95	2.10	1.95	1.75
Shapes, Pittsburgh	2.25	2.05	1.90	1.80
Shapes, Philadelphia	2.45½	2.25½	2.11½	2.01½
Shapes, Chicago	2.30	2.10	1.95	1.85
Tank plates, Pittsburgh	2.25	2.05	1.90	1.80
Tank plates, Philadelphia	2.43½	2.23½	2.09	1.99
Tank plates, Chicago	2.30	2.10	1.95	1.85
Sheets, No. 10, hot rolled, Pitts.	2.40	2.15	2.10	1.85
Sheets, No. 24, hot ann., Pitts.	3.15	2.80	2.75	2.40
Sheets, No. 24, galv., Pitts.	3.80	3.40	3.35	3.10
Sheets, No. 10, hot rolled, Gary	2.50	2.25	2.25	1.95
Sheets, No. 24, hot anneal., Gary	3.25	2.90	2.90	2.50
Sheets, No. 24, galvan., Gary	3.90	3.50	3.50	3.20
Plain wire, Pittsburgh	2.90	2.60	2.60	2.30
Tin plate, per base box, Pitts.	$4.85	$4.85	$5.25	$5.25
Wire nails, Pittsburgh	2.50	2.25	2.20	2.15

Semifinished Material

Sheet bars, open-hearth, Youngs.	$37.00	$34.00	$32.50	$28.50
Sheet bars, open-hearth, Pitts.	37.00	34.00	32.50	28.50
Billets, open-hearth, Pittsburgh	37.00	34.00	32.50	28.40
Wire rods, No. 5 to ⅝-inch, Pitts.	47.00	43.00	40.75	40.00

Pig Iron

	March 6, 1937	Feb. 1937	Dec. 1936	March 1936
Bessemer, del. Pittsburgh	$23.26	22.30	21.8132	20.8132
Basic, Valley	21.50	20.50	20.00	19.00
Basic, eastern del. East Pa.	23.26	22.46	21.8132	20.8132
No. 2 fdy., del. Pittsburgh	23.21	22.21	21.3132	20.3132
No. 2 fdy., Chicago	22.00	21.00	20.50	19.50
Southern No. 2, Birmingham	18.38	17.63	16.88	15.50
Southern No. 2, del. Cincinnati	21.69	20.94	20.44	20.2007
No. 2X eastern, del. Phila.	24.135	23.385	22.6882	20.6882
Malleable, Valley	22.00	21.00	20.50	19.50
Malleable, Chicago	22.00	21.00	20.50	19.50
Lake Sup., charcoal, del. Chicago	27.54	26.54	26.2528	25.2528
Gray forge, del. Pittsburgh	22.17	21.17	20.6741	19.6741
Ferromanganese, del. Pittsburgh	84.79	84.79	82.65	80.13

Scrap

Heavy melting steel, Pittsburgh	$22.00	$19.65	$18.55	$15.75
Heavy melt. steel, No. 2, East. Pa.	18.00	17.75	14.12½	12.55
Heavy melting steel, Chicago	20.25	19.50	17.00	14.75
Rail for rolling, Chicago	21.75	20.75	17.50	15.75
Railroad steel specialties, Chicago	22.25	21.00	19.00	16.25

Coke

Connellsville furnace, ovens	$4.00	$4.00	$4.00	$3.50
Connellsville, foundry, ovens	4.25	4.25	4.40	4.10
Chicago, by-product foundry, del.	10.25	10.25	9.75	9.75

Steel, Iron, Raw Material, Fuel and Metals Prices

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

Sheet Steel

Prices Subject to Quantity Extras and Deductions (Except Galvanized)

Hot Rolled No. 10, 24-48 in.

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, del.	2.60c
New York, del.	2.73c
Philadelphia, del.	2.69c
Birmingham	2.55c
St. Louis, del.	2.735c
Pacific ports, f.o.b. cars, dock	2.95c

Hot Rolled Annealed No. 24

Pittsburgh	3.15c
Gary	3.25c
Chicago, delivered	3.28c
Detroit, delivered	3.35c
New York, del.	3.48c
Philadelphia, del.	3.44c
Birmingham	3.30c
St. Louis, del.	3.485c
Pacific ports, f.o.b. cars, dock	3.80c

Galvanized No. 24

Pittsburgh	3.80c
Gary	3.90c
Chicago, delivered	3.93c
Philadelphia, del.	4.09c
New York, delivered	4.13c
Birmingham	3.95c
St. Louis, del.	4.135c
Pacific ports, f.o.b. cars, dock	4.40c

Tin Mill Black No. 28

Pittsburgh	3.30c
Gary	3.40c
St. Louis, delivered	3.635c

Cold Rolled No. 10

Pittsburgh	3.10c
Gary	3.20c
Detroit, delivered	3.30c
Philadelphia, del.	3.39c
New York, del.	3.43c
Pacific ports, f.o.b. cars, dock	3.70c
St. Louis	3.485c

Cold Rolled No. 20

Pittsburgh	3.55c
Gary	3.65c
Detroit, delivered	3.75c
Philadelphia, Pa.	3.84c
New York, del.	3.88c
St. Louis	3.885c

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	3.235c
St. Louis, No. 20	3.835c

Tin and Terne Plate

Gary base, 10 cents higher.

Tin plate, coke base (box) Pittsburgh	$4.85
Do., waste-waste	2.75c
Do., strips	2.50c
Long ternes, No. 24 unassorted, Pitts.	4.10c
Do., Gary	4.23c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

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

Straight Chromes

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

Steel Plate

Pittsburgh	2.25c
New York, del.	2.53c
Philadelphia, del.	2.43½c
Boston, delivered	2.65c
Buffalo, delivered	2.50c
Chicago or Gary	2.30c
Cleveland, del.	2.44½c
Birmingham	2.40c
Coatesville, base	2.35c
Sparrows Pt., base	2.35c
Pacific ports, f.o.b. cars, dock	2.80c
St. Louis, delivered	2.53c

Structural Shapes

Pittsburgh	2.25c
Philadelphia, del.	2.45½c
New York, del.	2.50¼c
Boston, delivered	2.63½c
Bethlehem	2.35c
Chicago	2.30c
Cleveland, del.	2.45c
Buffalo	2.35c
Gulf Ports	2.65c
Birmingham	2.40c
Pacific ports, f.o.b. cars, dock	2.80c

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	3.00c
Philadelphia, del.	2.74c
Boston, delivered	2.85c
New York, del.	2.78c
Pitts., forg. qual.	2.80c

Rail Steel
To Manufacturing Trade

Pittsburgh	2.30c
Chicago or Gary	2.35c
Moline, Ill.	2.35c
Cleveland	2.35c
Buffalo	2.20c

Iron

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

Reinforcing

New billet, straight lengths, quoted by distributors

Pittsburgh	2.60c
Chicago, Gary, Buffalo Cleve., Birm., Young...	2.30c
Gulf ports	2.65c
Pacific coast ports f.o.b. car docks	2.70c
Philadelphia, del.	2.54c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	2.40c
Chicago, Buffalo, Cleveland, Birm., Young....	2.45c
Gulf ports	2.80c

Wire Products

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

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	$2.75
Cement coated nails	$2.75

(Per pound)

Polished staples	3.45c
Galv. fence staples	3.70c
Barbed wire, galv.	3.40c
Annealed fence wire	3.20c
Galv. fence wire	3.60c
Woven wire fencing (base column, c. l.)	$67.00
Single loop bale ties, base column	58.00

To Manufacturing Trade

Plain wire, 6-9 ga.	2.90c

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

Spring wire, Pitts. or Cleveland	3.50c
Do., Chicago up $1, Worc. $2.	

Cold-Finished Carbon Bars and Shafting

Base, Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,000 lbs.	2.85c
20,000 to 59,999 lbs.	2.80c
60,000 to 99,999 lbs.	2.75c
100,000 to 299,999 lbs.	2.72½c
300,000 lbs. and over	2.70c

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

Alloy Steel Bars (Hot)

(*Base, 3 to 25 tons*)

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

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

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

Piling

Pittsburgh	2.60c
Chicago, Buffalo	2.50c

Strip and Hoops

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

Hot strip to 23⅞-in. Pittsburgh	2.40c
Chicago or Gary	2.50c
Birmingham base	2.55c
Detroit, del.	2.60c
Philadelphia, del.	2.69c
New York, del.	2.73c
Cooperage hoop, Pittsburgh	2.40c
Chicago	2.50c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland	3.20c
Detroit, del.	3.40c
Worcester, Mass.	3.40c

Carbon	Cleve. Pitts.	Worcester, Mass.
0.26—0.50	3.20c	3.40c
0.51—0.75	3.30c	3.50c
0.76—1.00	6.05c	6.25c
Over 1.00	8.10c	8.30c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$42.50
Relay rails, Pittsburgh, 20—100 lbs.	25.50-28.00
Light rails, billet qual., Pittsburgh, Chicago	$38.00
Do., rerolling quality	37.00
Angle bars, billet, Gary, Pittsburgh, So. Chicago	2.80c
Do., axle steel	3.35c
Spikes, R. R. base	2.90c
Track bolts, base	4.00c
Tie plates, base	$46.00

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

Bolts and Nuts

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

Carriage and Machine

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

Plow Bolts

All sizes	65-10-10 off

Stove Bolts

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

Step bolts	60 off
Elevator bolts	60 off

Nuts

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

Hexagon Cap Screws

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

Square Head Set Screws

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

Rivets, Wrought Washers

Structural, Pittsburgh, Cleveland	3.25c
Structural, Chicago	3.35c
⅛-inch and smaller, Pitts., Chi., Cleve.	70-5 off
Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs.	$6 off

Cut Nails

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

Pipe and Tubing

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

Welded Iron, Steel Pipe

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

Butt Weld

In.	Blk.	Galv.
Steel		
¼ and ⅜	55	38½
½	59½	49½
¾	62½	53
1—3	64½	55½
Iron		
½	27	10½
¾	32	16
1—1¼	35	21
2	38½	23

Lap Weld

Steel		
2	57	47½
2½—3	60	50½
3½—6	62	52½
7 and 8	61	50½
9 and 10	60½	50½
Iron		
2	32½	18
2½—3½	33½	20½
4—8	35½	24

Line Pipe

Steel		
⅛, butt weld	51	
¼ and ⅜, butt weld	54	
½, butt weld	58½	
¾, butt weld	61½	
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	
Iron		

⅛—1½ inch, black and galv. take 4 pts. over; 2½—6-inch 2 pts. over discounts for same sizes, standard pipe lists, 8—12-inch, no extra.

Boiler Tubes

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

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

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

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

Seamless Boiler Tubes

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

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

Seamless Tubing

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

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

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

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

Class A pipe $3 over Class B

Stnd. fitgs., Birm. base	$100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., Buffalo and Young.	$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 ⅝-inch incl.	47.00
Do., over ⅝ to 11/16-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.	$3.90- 4.10
Connellsville, fdry.	4.50- 4.75
Connell. prem. fdry.	5.50
New River fdry.	6.00
Wise county fdry.	4.45- 5.00
Wise county fur.	4.00- 4.50

By-Product Foundry

Newark, N. J., del.	10.17-10.60
Chi., ov., outside del.	9.50
Chicago, del.	10.25
New England, del.	12.00
St. Louis, del.	10.50-11.00
Birmingham, ovens	6.50
Indianapolis, del.	9.65
Cincinnati, del.	9.75
Cleveland, del.	10.30
Buffalo, del.	10.50
Detroit, del.	10.70
Philadelphia, del.	9.85

Coke By-Products

Spot. gal. Producers' Plants

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

Per lb. f.o.b. Frankford

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

Eastern Plants, per lb.

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

Per 100-lbs. Atlantic seaboard

Sulphate of ammonia	$1.35

†Western prices, ½-cent up.

Pig Iron

Late Friday pig iron prices were advanced $2 per ton at Buffalo, Eastern Pennsylvania, Detroit, Everett, Mass., Standish, N. Y., and Pittsburgh which must be added to prices quoted below for these points.

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

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$23.00	$23.50	$22.50	$24.00
Birdsboro, Pa.	23.00	23.50	22.50	24.00
Birmingham, Ala.‡	18.38	.....	17.38	22.50
Buffalo	22.00	22.50	21.00	23.00
Chicago	22.00	22.00	21.50	22.50
Cleveland	22.00	22.00	21.50	22.50
Detroit	22.00	22.00	21.50	22.50
Duluth	22.50	22.50	.....	23.00
Erie, Pa.	22.00	22.50	21.50	23.00
Everett, Mass.	23.75	24.25	23.25	24.75
Hamilton, O.	22.00	22.00	21.50	.....
Jackson, O.	22.00	22.00	.....	.....
Neville Island, Pa.	22.00	22.00	21.50	22.50
Provo, Utah	21.00	.....	.....	.....
Sharpsville, Pa.	22.00	22.00	21.50	22.50
Sparrows Point, Md.	23.00	.....	22.50	.....
Swedeland, Pa.	23.00	23.50	22.50	24.00
Toledo, O.	22.00	22.00	21.50	22.50
Youngstown, O.	22.00	22.00	21.50	22.50

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

Delivered from Basing Points:				
Akron, O., from Cleveland	23.26	23.26	22.76	23.76
Baltimore from Birmingham	23.58	.....	22.46	.....
Boston from Birmingham	24.37	.....	23.87	.....
Boston from Everett, Mass.	24.25	24.75	23.75	25.25
Boston from Buffalo	24.25	24.75	23.75	25.25
Brooklyn, N. Y., from Bethlehem	25.27	25.77	.....	.....
Brooklyn, N. Y., from Bmghm.	25.05	.....	.....	.....
Canton, O., from Cleveland	23.26	23.26	23.76	23.76
Chicago from Birmingham	22.22	.....	22.10	.....
Cincinnati from Hamilton, O.	22.07	23.01	22.51	.....
Cincinnati from Birmingham	21.69	.....	20.69	.....
Cleveland from Birmingham	22.12	.....	21.62	.....
Mansfield, O., from Toledo, O.	23.76	23.76	23.26	23.26
Milwaukee from Chicago	23.00	23.00	22.50	23.00
Muskegon, Mich., from Chicago, Toledo or Detroit	24.90	24.90	24.40	25.40
Newark, N. J., from Birmingham	24.01	.....	.....	.....
Newark, N. J, from Bethlehem	24.39	24.89	.....	.....

Delivered from Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Philadelphia from Birmingham	23.38	...	23.26	.....
Philadelphia from Swedeland, Pa.	23.76	24.26	23.26	.....
Pittsburgh district from Neville Island	Neville, base plus 63c, 76c, and $1.13 switch'g charges			
Saginaw, Mich., from Detroit	24.25	24.25	23.75	23.75
St. Louis, northern	22.50	22.50	22.00	.....
St. Louis from Birmingham	†22.12	.....	21.82	.....
St. Paul from Duluth	23.94	23.94	.....	24.44

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $26.50, Phila. base, standard and copper bearing, $27.63.

Gray Forge		Charcoal	
Valley furnace	$21.50	Lake Superior fur.	$24.50
Pitts. dist. fur.	21.50	do., del. Chicago	27.54
		Lyles, Tenn.	24.50

Silvery†

Jackson county, O., base: 6-6.50 per cent $26.50; 6.51-7—$27.00; 7-7.50—$27.50; 7.51-8—$28.00; 8-8.50—$28.50; 8.51-9—$29.00; 9-9.50—$29.50; Buffalo $1.25 higher.

Refractories

Per 1000 f.o.b. Works

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

Fluorspar, 85-5

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

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	80.00
Do., Baltimore, base	80.00
Do., del. Pittsburgh	84.79
Spiegeleisen, 19-20% dom. Palmerston, Pa., spot	†26.00
Do., New Orleans	26.00
Ferrosilicon, 50% freight allowed, c. l.	69.50
Do., less carload	77.00
Do., 75 per cent	126-136.00
Spot, $5 a ton higher.	
Silicoman., 2½ carbon	89.00
2% carbon, 94.00; 1%,	104.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del.	10.00
Ferrotungsten, stand., lb. con. del.	1.30-1.40
Ferrovanadium, 35 to 40% lb., cont.	2.70-2.90
Ferrotitanium, c. l., prod. plant, frt. all., net ton	137.50
Spot, 1 ton, frt. allow., lb.	7.00
Do., under 1 ton, lb.	7.75-8.25
Ferrophosphorus, per ton, c. l., 17-19% Rockdale, Tenn., basis, 18%, $3 unitage	58.50
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $3 unitage	75.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80
†Carloads. Quan. diff. apply	

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin: New York Spot	Straits Tin: New York Futures	Lead: New York	Lead: East St. L.	Zinc: St. L.	Aluminum 99%	Antimony: Chinese Spot, N. Y.	Nickel: Cathodes
Feb. 27	15.00	15.12½	15.75	54.25	54.10	7.00	6.85	6.80	*19.00	16.50	35.00
Mar. 1	15.00	15.12½	15.75	54.10	53.80	7.00	6.85	6.80	*20.00	16.75	35.00
Mar. 2	15.00	15.12½	15.75	55.12½	54.90	7.00	6.85	7.00	*20.00	16.75	35.00
Mar. 3	15.00	15.12½	15.75	56.87½	56.67½	7.00	6.85	7.00	*20.00	16.75	35.00
Mar. 4	15.00	15.12½	15.75	57.00	56.75	7.00	6.85	7.00	*20.00	16.75	35.00
Mar. 5	15.00	15.12½	15.75	58.00	57.75	7.00	6.85	7.00	*20.00	16.75	35.00

*Nominal range 20.00 to 21.00.

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 15.00. Conn. copper

Sheets	
Yellow brass (high)	20.12½
Copper, hot rolled	22.62½
Lead, cut to jobbers	10.50
Zinc, 100-lb. base	11.50-12.00
Tubes	
High yellow brass	22.87½
Seamless copper	23.37½
Rods	
High yellow brass	16.50
Copper, hot rolled	19.37½
Anodes	
Copper, untrimmed	19.87½
Wire	
Yellow brass (high)	20.37½

OLD METALS

Deal. buying prices, cents lb.

No. 1 Composition Red Brass	
*New York	11.25-11.37½
Cleveland	12.00-12.25
*Chicago	11.25-11.50
St. Louis	10.50-11.00
Heavy Copper and Wire	
*New York, No. 1	13.00-13.12½
*Chicago, No. 1	13.25-13.50
Cleveland, No. 1	12.75-13.00
St. Louis, No. 1	12.50-13.00
Composition Brass Borings	
New York	10.25-10.37½
Light Copper	
*New York	11.50-11.62½
*Chicago	11.25-11.50
Cleveland	10.75-11.00
St. Louis	10.50-11.00
Light Brass	
*Chicago	7.75- 8.00
Cleveland	6.75- 7.00
St. Louis	6.75- 7.25
Lead	
*New York	6.00- 6.12½
Cleveland	5.75- 6.00
*Chicago	5.62½-5.87½
St. Louis	5.25- 5.50
Zinc	
New York	3.75- 4.00
St. Louis	4.00- 4.50
Cleveland	3.75- 4.00
Aluminum	
Borings, Cleveland	9.75-10.00
Mixed, cast, Cleve.	13.25-13.50
Mixed, cast, St. L.	13.50-14.00
Clips, soft, Cleve.	15.00-15.25

SECONDARY METALS

Brass, ingot 85-5-5-5,1cl, 16.50
*Stand. No. 12 alum. 17.75-18.25

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS

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

IRON BARS

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

REINFORCING BARS

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

SHAPES

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

PLATES

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

NO. 10 BLUE

Baltimore	3.45c
Boston (g)	3.70c
Buffalo	3.72c
Chattanooga	3.66c
Chicago	3.60c
Cincinnati	3.50c
Cleveland	3.46c
Det. 8-10 ga.	3.43½c
Houston	3.45c
Los Angeles	4.15c
Milwaukee	3.71c
New Orleans	3.85c
New York‡ (d)	3.82c
Portland	3.95c
Philadelphia*	3.45c
Pittsburgh (h)	3.50c
San Francisco	3.95c
Seattle	4.10c
St. Louis	3.84c
St. Paul	3.60c
Tulsa	3.80c

NO. 24 BLACK

Baltimore*†	4.10c
Boston (g)	4.30c
Buffalo	3.35c
Chattanooga*	3.56c
Chicago	4.10c-4.75c
Cincinnati	4.05c
Cleveland	4.31c
Detroit	4.33½c
Los Angeles	4.35c
Milwaukee	4.36c
New York‡ (d)	4.47c
Philadelphia*†	4.15c
Pitts.** (h)	4.40c
Portland	4.65c
Seattle	4.85c
San Francisco	4.65c
St. Louis	4.49c
St. Paul	4.50c
Tulsa	4.85c

NO. 24 GALV. SHEETS

Baltimore*†	4.20c
Buffalo	4.10c
Boston (g)	4.85c
Chattanooga*	4.16c
Chicago (h)	4.70c-5.35c
Cincinnati	4.65c
Cleveland	4.91c
Detroit	5.00c
Houston	4.50c
Los Angeles	4.60c
Milwaukee	4.96c
New Orleans*	4.09c
New York‡ (d)	5.07c
Philadelphia*†	4.80c
Pitts.** (h)	5.00c
Portland	5.35c
San Francisco	5.25c
Seattle	5.35c
St. Louis	5.05c
St. Paul	5.10c
Tulsa	5.20c

BANDS

Baltimore	3.50c
Boston††	3.70c
Buffalo	3.52c
Chattanooga	3.91c
Cincinnati	3.75c
Cleveland	3.66c
Chicago	3.60c
Detroit, ⅛-in. and lighter	3.68½c
Houston	3.35c
Los Angeles	4.30c
Milwaukee	3.71c
New Orleans	4.25c
New York‡ (d)	3.82c
Philadelphia*	3.55c
Pittsburgh (h)	3.50c
Portland	4.60c
San Francisco	4.45c
Seattle	4.60c
St. Louis	3.84c
St. Paul	3.85c
Tulsa	3.55c

HOOPS

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

COLD FIN. STEEL

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

COLD ROLLED STRIP

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

TOOL STEELS

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

	Base
High speed	62c
High carbon, high chrome	41c
Oil hardening	24c
Special tool	22c
Extra tool	18½c
Regular tool	15c

Uniform extras apply.

BOLTS AND NUTS

(100 pounds or over)

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

(a) Under 100 lbs., 60 off.

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

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

‡Domestic steel; *Plus quantity extras; **One to 9 bundles; *†50 or more bundles; †New extras apply; ††Base 8000 lbs., extras on less.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, March 4

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	$19.23 3 18 6*	$22.31	2 15 0
Basic bessemer	19.23 3 18 6*	14.23	1 15 0
Hematite, Phos. .03-.05	21.48 4 7 6	.....	.....
SEMIFINISHED STEEL			
Billets	$30.69 6 5 0	$24.40	3 0 0
Wire rods, No. 5 gage	47.16 9 12 6	41.68	5 2 6
FINISHED STEEL			
Standard rails	$41.65 8 10 0	$44.74	5 10 0
Merchant bars	2.19c 9 10 0	1.63c	4 7 6
Structural shapes	2.00c 9 2 6	1.52c to 1.63c	4 2 6 to 4 7 6
Plates, †¼ in. or 5 mm.	2.23c 10 3 9	2.00c to 2.05c	5 9 6 to 5 12 0
Sheets, black, 24 gage or 0.5 mm	2.85c 13 0 0	2.86c	7 15 0††
Sheets, gal., 24 gage, corr.	3.45c 15 15 0	3.41c	9 5 0
Bands and strips	2.20c 10 0 0	1.75c to 1.89c	4 15 0 to 5 2 6
Plain wire, base	2.31c 10 10 0	2.49c	6 15 0
Galvanized wire, base	2.75c 12 10 0	2.94c	7 17 6
Wire nails, base	2.64c 12 0 0	2.39c	6 10 0
Tin plate, box 108 lbs.	$ 4.85 0 19 9	.....	.....

British ferromanganese $80 delivered Atlantic seaboard, duty-paid.

Domestic Prices at Works or Furnace—Last Reported

		£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$19.89	4 1 0(a)	$17.61	378	$22.24	660	$25.36	63
Basic bessemer pig iron	20.25	4 2 6(a)	12.84	275	14.66	435	29.97 (b)	69.50
Furnace coke	5.62	1 3 0	5.93	127	5.73	170	7.65	19
Billets	30.69	6 5 0	27.55	590	21.57	640	38.84	96.50
Standard rails	1.82c	8 5 0	1.64c	780	1.73c	1,150	2.38c	132
Merchant bars	2.19c	9 10 0	1.68c	800	1.16c	775	1.98c	110
Structural shapes	2.01c	9 3 0	1.64c	780	1.16c	775	1.93c	107
Plates, †¼-in. or 5 mm.	2.16c	9 16 9	2.12c	1,010	1.43c	950	2.29c	127
Sheets, black	2.64c	12 0 0§	2.84c	1,350‡	1.83c	1,220‡	2.59c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	3.08c	14 0 0	4.41c	2,100	2.85c	1,900	6.66c	370
Plain wire	2.52c	11 10 0	2.77c	1,320	2.02c	1,350	3.11c	173
Bands and strips	2.26c	10 5 0	1.92c	915	1.43c	950	2.29c	127

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

**Gold pound sterling carries a premium of 67 per cent over paper sterling.

Iron and Steel Scrap Prices

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

HEAVY MELTING STEEL

Birmingham†	12.50-13.50
Bos. dock, No. 1, exp.	16.50-17.00
N. Eng. del. No. 1	16.50-17.00
Buffalo, No. 1	19.00-20.00
Buffalo, No. 2	17.50-18.50
Chicago, No. 1	20.00-20.50
Cleveland, No. 1	17.50-18.00
Cleveland, No. 2	16.50-17.00
Detroit, No. 1	16.00-16.50
Eastern Pa., No. 1	19.00
Eastern Pa., No. 2	18.00
Federal, Ill.	15.25-15.75
Granite City, R. R.	17.50-18.00
Granite City, No. 2	15.25-15.75
New York, No. 1	15.00-15.50
N.Y. dock, No. 1 exp.	15.50-16.00
Pitts., No. 1 (R. R.)	22.50-23.00
Pitts., No. 1 (dlr.)	21.75-22.25
Pittsburgh, No. 2	19.00-19.50
St. Louis, R. R.	17.50-18.00
St. Louis, No. 2	15.25-15.75
Toronto, dlrs. No. 1	9.75-10.50
Toronto, No. 2	8.75- 9.50
Valleys, No. 1	19.00-19.50

COMPRESSED SHEETS

Buffalo, dealers	17.50-18.50
Chicago, factory	19.00-19.50
Chicago, dealer	18.00-18.50
Cleveland	17.50-18.00
Detroit	16.00-16.50
E. Pa., new mat.	19.00
E. Pa., old mat.	16.50
Pittsburgh	21.00-21.50
St. Louis	16.00-16.50
Valleys	19.00-19.25

BUNDLED SHEETS

Buffalo	14.50-15.00
Cincinnati, del.	14.00-14.50
Cleveland	14.00-14.50
Pittsburgh	18.50-19.00
St. Louis	12.00-12.50
Toronto, dealers	6.00

SHEET CLIPPINGS, LOOSE

Chicago	14.00-14.50
Cincinnati	13.00-13.50
Detroit	12.25-12.75
St. Louis	13.00-13.50

STEEL RAILS, SHORT

Birmingham	16.00-16.50
Buffalo	22.50-23.50
Chicago (3 ft.)	22.00-22.50
Chicago (2 ft.)	23.50-24.00
Cincinnati, del.	21.50-22.00
Detroit	19.00-19.50
Pitts., open-hearth, 3 ft. and less	25.00-25.50
St. Louis, 2 ft. & less	19.50-20.00

STEEL RAILS, SCRAP

Boston district	†15.00-15.25
Buffalo	19.50-20.50
Chicago	20.00-20.50
Pittsburgh	21.50-22.00
St. Louis	18.25-18.75
Toronto, dealers	9.00

STOVE PLATE

Birmingham	9.00- 9.50
Boston district	†10.25-10.50
Buffalo	14.00-14.50
Chicago	12.00-12.50
Cincinnati, dealers	11.75-12.25
Detroit, net	10.50-11.00
Eastern Pa.	15.00
New York, fdry.	11.50-11.75
St. Louis	11.75-12.25
Toronto, deal'rs, net	7.50- 8.00

SPRINGS

Buffalo	22.50-23.50
Chicago, leaf	22.00-22.50
Chicago, coil	24.00-24.50
Eastern Pa.	25.00
Pittsburgh	26.00-26.50
St. Louis	20.00-20.50

ANGLE BARS—STEEL

Chicago	21.50-22.00
St. Louis	18.00-18.50
Buffalo	14.50-15.00

RAILROAD SPECIALTIES

Chicago	22.00-22.50

LOW PHOSPHORUS

Buffalo, billet and bloom crops	22.50-23.50
Cleveland, billet, bloom crops	22.00-22.50
Eastern Pa., crops	24.50-25.00
Pittsburgh, billet, bloom crops	26.00-26.50
Pittsburgh, sheet bar crops	25.50-26.00

FROGS, SWITCHES

Chicago	20.00-20.50
St. Louis, cut	18.00-18.50

SHOVELING STEEL

Chicago	20.00-20.50
Federal, Ill.	15.25-15.75
Granite City, Ill.	15.25-15.75
Toronto, dealers	7.50

RAILROAD WROUGHT

Birmingham	9.00-10.00
Boston district	†10.00-10.25
Buffalo, No. 1	17.50-18.50
Buffalo, No. 2	19.00-20.00
Chicago, No. 1, net	18.50-19.00
Chicago, No. 2	20.00-20.50
Cincinnati, No. 2	17.25-17.75
Eastern Pa.	19.00
St. Louis, No. 1	15.00-15.50
St. Louis, No. 2	17.50-18.00
Toronto, No. 1 dlr.	8.00

SPECIFICATION PIPE

Eastern Pa.	17.00-17.50
New York	12.50-13.00

BUSHELING

Buffalo, No. 1	17.50-18.50
Chicago, No. 1	18.50-19.00
Cincin., No. 1, deal.	12.25-12.75
Cincinnati, No. 2	9.00- 9.50
Cleveland, No. 2	13.00-13.50
Detroit, No. 1, new	15.50-16.00
Valleys, new, No. 1	18.50-19.00
Toronto, dealers	7.00

MACHINE TURNINGS

Birmingham	6.00- 6.50
Buffalo	12.00-12.50
Chicago	10.50-11.00
Cincinnati, dealers	11.50-12.00
Cleveland	12.00-12.50
Detroit	11.00-11.50
Eastern Pa.	13.00-13.50
New York	†8.50- 9.00
Pittsburgh	15.50-16.00
St. Louis	9.50-10.00
Toronto, dealers	6.25- 7.00
Valleys	14.25-14.75

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	†8.25- 8.50
Buffalo	12.25-12.75
Cincinnati, dealers	10.50-11.00
Cleveland	13.00-13.50
Detroit	11.00-11.50
Eastern Pa.	11.50-12.00
New York	†7.00- 7.50
Pittsburgh	14.50-15.00
Toronto, dealers	6.25

CAST IRON BORINGS

Birmingham	6.00- 6.50
Boston dist. chem.	†9.50- 9.75
Boston dist. for mills	†8.25- 8.50
Buffalo	12.50-13.00
Chicago, dealers	11.00-11.50
Cincinnati, dealers	10.50-11.00
Cleveland	13.00-13.50
Detroit	11.00-11.50
E. Pa., chemical	13.00-13.50
New York	†8.00- 8.50
St. Louis	8.00- 8.50
Toronto, dealers	6.75

PIPE AND FLUES

Cincinnati, dealers	11.00-11.50
Chicago, net	14.00-14.50

RAILROAD GRATE BARS

Buffalo	15.00-15.50
Chicago, net	13.50-14.00
Cincinnati	11.50-12.00
Eastern Pa.	15.00
New York	†11.00-11.50
St. Louis	12.50-13.00

FORGE FLASHINGS

Boston district	†12.25-12.75
Buffalo	17.50-18.50
Cleveland	17.00-17.50
Detroit	15.00-15.50
Pittsburgh	18.00-18.50

FORGE SCRAP

Boston district	†6.50- 7.00
Chicago, heavy	22.50-23.00
Eastern Pa.	16.50-17.00

ARCH BARS, TRANSOMS

St. Louis	18.00-18.50

AXLE TURNINGS

Boston district	†10.00-10.50
Buffalo	16.00-16.50
Chicago, elec. fur.	19.00-19.50
Eastern Pa.	17.50-18.00
St. Louis	11.50-12.00
Toronto	6.25

STEEL CAR AXLES

Birmingham	17.00-18.00
Buffalo	20.50-21.50
Boston district	†20.00-21.00
Chicago, net	23.50-24.00
Eastern Pa.	27.00
St. Louis	22.00-22.50

SHAFTING

Boston district	†18.50-18.75
Eastern Pa.	23.50
New York	†19.00-19.50
St. Louis	15.00-15.50

CAR WHEELS

Birmingham	16.00-17.00
Boston dist. iron	†13.00-13.50
Buffalo, iron	18.50-19.00
Buffalo, steel	21.50-22.50
Chicago, iron	20.00-20.50
Chicago, rolled steel	22.00-22.50
Cincinnati, iron	17.50-18.00
Eastern Pa., iron	19.00
Eastern Pa., steel	25.00
Pittsburgh, iron	19.00-19.50
Pittsburgh, steel	26.00-26.50
St. Louis, iron	17.00-17.50
St. Louis, steel	19.00-19.50

NO. 1 CAST SCRAP

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

HEAVY CAST

Boston dist. break.	†13.00-13.25
New England, del.	†15.50-15.75
Buffalo, break.	14.50-15.00
Cleveland, break.	14.50-15.00
Detroit, No. 1 mach. net	13.50-14.00
Detroit, break.	12.50-13.00
Detroit, auto net	14.25-14.75
Eastern Pa.	18.50-19.00
New York, break.	†14.00-14.50
Pittsburgh	16.50-17.00

MALLEABLE

Birmingham, R. R.	15.00-15.50
New England, del.	18.75
Buffalo	19.00-20.00
Chicago, R. R.	22.00-22.50
Cinci., agri. del.	16.00-16.50
Cleveland, rail.	20.00-20.50
Detroit, auto, net	16.00-16.50
Eastern Pa., R. R.	18.50-19.00
Pittsburgh, rail	20.50-21.00
St. Louis, R. R.	18.00-18.50

RAILS FOR ROLLING

5 feet and over

Birmingham	16.00-16.50
Boston	†15.75-16.25
Buffalo	19.50-20.50
Chicago	21.50-22.00
Eastern Pa.	19.00-20.00
New York	†17.00-17.50
St. Louis	18.50-19.00

LOCOMOTIVE TIRES

Chicago (cut)	22.00-22.50
St. Louis, No. 1	19.00-19.50

LOW PHOS. PUNCHINGS

Buffalo	20.50-21.50
Chicago	22.50-23.00
Eastern Pa.	24.00-25.00
Pittsburgh (heavy)	24.75-25.25
Pittsburgh (light)	23.00-23.50

Iron Ore

Lake Superior Ore

Gross ton, 51½ %

Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess.	4.65

Eastern Local Ore

Cents, unit. del. E. Pa.

Foundry and basic 56.63% con.	9.00-10.00
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, f.a.s. Atlantic ports

Foreign manganiferous ore, 45.55% iron, 6-10% man.	*16.00
No. Afr. low phos.	*16.00
Swedish low phos.	nominal
Spanish No. Africa basic, 50 to 60%	*15.50
Tungsten, spot sh. ton unit, duty pd.	$15.85-16.00
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	22.00-22.50

*Nominal asking price.

Manganese Ore

(Nominal)

Prices not including duty, cents per unit cargo lots.

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

Bars

Bar Prices, Page 72

Pittsburgh—Effective last Friday on new business, hot-rolled carbon bars were advanced $5 a ton, and are currently quoted 2.45c, Pittsburgh. Realization that new prices were imminent served to strengthen specifications in some measure. Producers continue under heavy pressure for deliveries which extend from four to six weeks. Consumers showed an increasing disposition to be satisfied to place orders for delivery during second quarter on the basis of whatever price prevails at time of shipment. Demand from the automotive industry has been increasingly heavy. Producers see no change in the high rate of operations in the immediate future, barring unforeseen disruptions. Hot-rolled alloy steel bars have been advanced $5 a ton and are quoted 3.00c, Pittsburgh.

Cleveland — Specifications for commercial and alloy steel bars were particularly active last week, despite the fact that mills were definitely out of the market for first quarter deliveries on all grades and that second quarter prices had not been announced. Considerable tonnage was taken at price prevailing at time of shipment, to be delivered at mill convenience. Even under these conditions producers booked only regular customers and limited them to average needs.

Chicago—New bar prices are effective immediately and on second quarter business. Producers are sold for this quarter and heavy shipments will be continued through the balance of this month. Automotive, farm implement and tractor interests are taking heavier shipments, with operations of the latter two groups near the best rate in history. On new business for identified projects price protection will be extended only until the end of the month following that in which the quotation was made, with specifications to be received within three months. The market on bars now is 2.50c, base.

Boston—Advance coverage on alloy, forging and commercial steel bars has been limited to a smaller volume than usual previous to a price increase. Consumers who attempted to get on rolling schedules in some instances were forced to turn to jobbers, who appear to get best delivery.

New York—Commercial steel bars are up $5 per ton, with an indicated increase of $7 on alloy bars, though the latter is not definitely confirmed. Common iron bars are up $5.

Philadelphia — Most commercial bar mills are now booked for six to seven weeks, although in some instances where particular conditions apply, some tonnage can still be had around four to five weeks. Cold-drawn bar deliveries, to say nothing of alloy bars, are also being further extended.

Semifinished

Semifinished Prices, Page 73

Pittsburgh—Sheet bars, billets, blooms and slabs are up $3 a ton, and are now quoted $37, Pittsburgh. Forging billets are up $3 a ton to $43. Skelp has been advanced from 1.80c, Pittsburgh, to 2.10c, an increase of $6 per ton. Even though the price situation commanded great interest during the past week, it was secondary to the heavy demand which confronts producers upon all sides. Sheet bars especially are scarce. Indicative of world scarcity Great Britain last week joined Japan and other nations in easing its import duty to facilitate obtaining whatever material it is able to find.

Plates

Plate Prices, Page 72

Philadelphia — A heavy tonnage of plate business has been booked by mills able to make deliveries this quarter, buyers endeavoring to get under cover before the new prices became announced. Such mills are now practically out of the market. Award is expected to be announced momentarily of 1800 tons of plates out of a total of 3000 tons of hull steel for two coastwise freighters for the Philadelphia & Norfolk Steamship line, just awarded to Pusey & Jones, Wilmington, Del.

District mills are also figuring on miscellaneous supplies for the navy on which bids will be opened March 16. Including all the various products approximately 10,000 tons of steel will be purchased.

Much speculation here prevails with respect to the cost of the new liner for the United States Lines, on which bids are to be opened April 1. As noted in previous issues this liner will require 15,000 or 16,000 tons, depending upon the type finally decided upon. In view of recently announced increases in labor rates and reduction in working hours, which is being reflected in steel prices and various other commodities, it is estimated in some quarters that the construction of this liner will cost around $20,000,000, as compared with around $14,500,000 for one type and $16,500,000 for another type bid a few months ago and $11,500,000 bid on one type many months ago when the boat first came up for figuring.

Pittsburgh—On new sales, effective immediately upon announcement last Friday, the leading interest advanced plates $4 per ton. The quotation is now 2.25c, Pittsburgh. Barge work holds promise of improvement here. United States engineers, St. Louis, will take bids March 30 on five to eight all-welded oil barges, involving a total of 750 to 1200 tons. Inland Waterways Corp., New Orleans, will open bids March 17 on a derrick hull containing 140 tons of plates.

Cleveland — Most plate mills are definitely out of the market for second quarter, some reporting backlogs of over eight weeks. Railroad car fabricating shops are particularly active as most roads are anxious to get as quick delivery as possible on cars placed earlier this year.

Pittsburgh Steamship Co., Cleveland, subsidiary of United States Steel Corp., awarded contracts for four bulk freighters, to American Shipbuilding Co., Cleveland, and Great Lakes Engineering Works, Detroit. Two will be built at Lorain, O., and the other two at Ecorse, Mich. It is estimated that 24,000 tons of plates, shapes and other steel products will be required.

Chicago—Mills are unable to accept additional business for March delivery and new prices are applicable on future orders. Price protection on identified projects now is being extended only until the end of the month following the date of quotation. Specifications must be received within three months. Shipments continue heavy, with railroads and freight car builders taking largest tonnages, and active demand continues for lighter gages as well as the heavier sizes.

New York — Eastern platemakers have announced an advance of $4 per ton on universal and floor plates, effective at once. All producers are sold through March. Skelp, not included in the advance late last year, has been advanced $6.

Boston—Canadian consumers have placed some substantial tonnage with a district sales office of an eastern mill promising delivery in two

weeks. The same mill has picked up considerable spot tonnage on a delivery basis. This appears to be a lone exception, however, as the average is four to five weeks on plain material and longer on dished, flanged and semi-fabricated work.

Seattle—Fabricators report improved demand for boilers and tank work, and shipyard activity is increased. Inquiry is practically all from private industry. Seattle Boiler Works reports more than 100 tons involved in three boilers for an Oregon lumber firm and miscellaneous work. Plates required for the seven storage tanks for the Seattle marine terminal of Shell Oil Co. total 1200 tons instead of 650 previously reported awarded to Western Pipe & Steel Co., San Francisco.

Contracts Placed

600 tons, three digesters for Soundview Pulp Co., Everett, Wash., to Puget Sound Machinery Depot, Seattle.

550 tons additional, seven storage tanks for Shell Oil Co., Seattle, to Western Pipe & Steel Co., San Francisco.

195 tons, 50-ton derrick barge, United States engineer, Vicksburg, Miss., to St. Louis Shipbuilding & Steel Co., St. Louis; bids Feb. 23.

125 tons, elevated water tank, Oostburg, Wis., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

100 tons or more, three welded steel barges, United States engineer, Savannah, Ga., to Ingalls Iron Works, Birmingham, Ala., $22,573.

Unstated tonnage, 200,000 gallon tank, water works, Norfolk, N. Y., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

Contracts Pending

750 to 1200 tons, five to eight all-welded oil barges, for United States engineers, St. Louis; bids March 30.

140 tons, derrick hull, Inland Waterways Corp., New Orleans; bids March 17.

Unstated tonnage, five to eight steel oil barges, United States engineer, St. Louis, Cir. 151, bids March 30.

Sheets

Sheet Prices, Page 72

Pittsburgh—Under the price advances last Friday, No. 10 gage hot-rolled sheets are quoted 2.40c, Pittsburgh, an increase of $5 per ton; hot rolled annealed No. 24 are quoted 3.15c, Pittsburgh; galvanized No. 24, 3.80c, Pittsburgh. Tin mill black has been advanced to 3.30c. Cold-rolled No. 10 is now 3.10c, and No. 20, 3.55c. Large tonnages were entered in mill books last week for delivery far into the future as buyers awaited the announcement on prices and anticipated advances in view of the wage increases which the steel industry had just announced. Deliveries range to as far as 20 weeks, with all gages in good demand and some extremely hard to obtain. The sold-out condition of mills has been troublesome to many consumers who find producers show an increasing disposition to go slow on promises and to exercise care in acceptance of tonnage. In some quarters of the steel industry it is expected that the situation in regard to sheets will grow even more acute in the near future. Enameling sheets No. 10 are now 2.90c, Pittsburgh, and No. 20, 3.50c, Pittsburgh.

Cleveland — Most sheet mills are sold well into second quarter, particularly on hot-rolled annealed and to a less degree on galvanized and other grades. For some time producers have been forced to limit customers' orders to average requirements. Miscellaneous requirements from stove, refrigerator and air-conditioning unit manufacturers, have been exceptionally active.

Chicago—Price advances of $5 to $8 a ton have become effective immediately. Mills are unable to promise delivery in most instances until well into second quarter. While this is unusual, consumers had anticipated deferred deliveries and higher prices by heavy orders

during previous weeks and in a number of cases are protected over a large portion of the next 60 days. At the same time, consumption among most leading users is heavy, with increases noted in the automotive and farm implement industries.

Philadelphia — While a general steel strike this spring now appears to have been forestalled by recent wage advances and reductions in base working schedules, jobbers and consumers who have bought heavily stand to profit materially by virtue of sharp increases in prices for second quarter. Indicative of the strong upward trend in sheet prices was a mill sale in this district before the formal opening of books of several hundred tons of ordinary blue annealed sheets at $6 a ton above the first quarter market, for delivery in eight weeks.

Bids will be asked March 16 by the navy on a substantial tonnage of galvanized sheets, included in approximately 10,000 tons of various iron and steel items for delivery to several yards.

Boston—Sales offices are submitting all orders to mills before acceptance and delivery on some grades is extended to June. As a result second quarter prices will apply sooner than usual. Regardless of price, consumers are striving to get on rolling schedules. Demand for heavier gages is strong.

New York — Hot-rolled No. 10 sheets have been advanced $7 per ton, galvanized $3 and cold-rolled $6. Revision of extras on cold-rolled sheets, 23 gage and lighter, is reported to make for a total advance in these gages of more than $10.

Cincinnati—Backlogs of sheet producers are steadily growing. Automotive demand has been stepped up abruptly with approach of the spring selling season.

St. Louis—Little doubt exists that there will be higher quotations, color to this view being given by the recent advance in certain grades of sheets by warehouses. Meanwhile purchasing continues on a large scale and backlogs have not been lowered to any extent.

Behind the Scenes with STEEL

Like Hot Cakes

REPRINTS of editorial articles, as well as advertising pages, appearing in STEEL are constantly in demand, so much so that a special department keeps in a medium dither handling this work. For instance, last year STEEL supplied a total of 165,900 editorial and advertising reprint pages, while for all Penton Publications this total was 292,075, well over a quarter of a million.

Our Vice President in Charge of Reprints says he may be quoted as saying that we are in a position to supply reprints of any article in any quantity, promptly and at nominal cost. Well, he ought to know.

* * *

New and Different

HAVE you noticed the new headings appearing over our various departments of the *Power Drives, Mirrors of Motordom,* etc., ilk? Combination of the open italic lettering with the contrasting scratchboard circle effect, to our way of thinking, produces a clear, forceful and different type of identification. Work was done by Manning Studios in Cleveland who are masters at that sort of thing.

Neat but not Goudy, we'd say.

* * *

Telling the World

SPEAKING of fitting the name to the job, we think you will agree that W. E. Holler, general sales manager of Chevrolet, makes a nice combination, although it would be even better if he were manager of a radio station.

* * *

Prop

WE ARE told of a certain reader of STEEL who resides in an apartment equipped with an in-a-door bed. Due to some local disarrangement the bed does not rest firmly on the floor, but the gentleman finds that by placing STEEL'S Yearbook issue and a regular weekly issue under one leg of the bed, he is able to sleep soundly, free from rocking and bouncing.

Thus does STEEL ably serve one of its 60,000 readers, even to the point of insuring him a night's rest.

* * *

Mercury Clipped

NEW YORK CENTRAL'S streamlined flyer, The Mercury, which averages 60 miles an hour between Cleveland and Detroit, and is the last word in class and service, limped into Cleveland the other night one hour and 35 minutes late because of a *flat wheel* on one car which necessitated removal of the car from the train.

Three dozen red caps massed on the station platform to give the engineer the bird as he came in. Yahhhhhhhh, N.Y.C.!

* * *

Tiny Temblor

A MILD earthquake jostled this and surrounding territory last Tuesday but all hands came through unscathed. Two local scriveners on an associated Penton publication vied with each other in reporting the event to newspaper city rooms, and it said one of these gentlemen was even approached by a local scientist to relate details of the tremor.

By and large, however, the seismographic manifestation passed unnoticed. It may have been just the reverberations from a nearby sit-down strike.

* * *

Nut Dispensers Bolt

LATEST news on the sit-down situation, as we hear it, is that employes in the Goody Nuts Shoppe in Detroit have returned to work following a short sitting. "We want more pay, less work," demanded the employes. "Nuts," said the management.

* * *

Sew What?

HEADLINE OF THE WEEK: "Good Queen Bess Sent for Needles"—Acme Steel Co. in the March 1 issue. You have to stop and read to get the point.

—SHRDLU

Pipe

Pipe Prices, Page 73

Pittsburgh—The long anticipated advance in pipe prices was announced Friday when a leading interest revealed that it would raise standard pipe 5 points on black and 6 points on galvanized. Oil country goods are increased approximately $5 per ton. Other classes of goods, including seamless mechanical and boiler tubes, will be raised. Although the new prices are for second quarter, tubular capacity is reported sold to March 31. Advance in buttweld is first since April, 1934, but since that time two reductions went into effect, totaling $7.40. Thus, producers had to regain $7.40 a ton on buttweld in order even to reach the 1936 level. Sellers point out that increased wages, higher skelp prices and other factors influenced current advance. Requirements for industrial expansion and repair work, railroad equipment and the oil industry continue heavy.

Cleveland — Jobbers' pipe requirements declined last month in comparison with January and December. However, this was anticipated and the decline was not so severe as expected. Cast pipe demand is confined to small lots. This condition should change within the next month as it is believed considerable WPA work is pending.

Chicago—While cast pipe lacks activity occasioned a year ago by availability of federal funds for municipal extensions and improvements, inquiries are slightly more numerous. Orders still are small but gradual pickup is anticipated with approach

of spring. Closing on 2355 tons for Chicago is expected within next few weeks.

Boston — Utilities attempting to cover on close to 2000 tons of steel pipe before second quarter price announcements, were unsuccessful. Meanwhile steel pipe buying is in fair volume with resale market firm.

New York — Poirier & McLane Corp. is low on general contract for foundations, west side elevated highway, Spring to Cedar streets, New York, requiring 4220 tons of steel pipe for piling, mostly 18-inch. Cast iron pipe inquiry is mounting slowly, although current buying has been light. Early increase in cast pipe prices is forecast, due to rising raw material costs.

Birmingham, Ala. — Cast iron pipe demands are less active. Some stock is going into warehouses and other preparations are being made for anticipated business when weather conditions improve.

San Francisco—Third largest inquiry for cast iron pipe this year has just come out for figures and bids for 1000 tons of 4 to 12-inch pipe will be opened March 10 for East Bay municipal utility district, Oakland, Calif. Awards aggregated 427 tons, bringing the total to date to 3147 tons, compared with 6513 tons for corresponding period in 1936.

Seattle—Demand for cast iron pipe has not gained momentum and new projects are developing slowly, many dependent on federal allotments. Several Pacific Northwest awards are pending. Portland has purchased a supply of copper tubing for the water department and Wapato, Wash., has distributed an award of 2, 4 and 8-inch cast iron pipe among three suppliers.

Steel Pipe Placed

300 tons, 4 to 12-inch, Shell Oil Co. marine terminals, Seattle, to Seattle Steel Co., Seattle.

Steel Pipe Pending

4420 tons, 12 and 18-inch steel pipe, mostly latter size, for piling, foundation, west side elevated highway, Spring to Cedar streets, New York, Poirier & McLane Corp., New York, low on general contract, bids March 2. Work also takes 250 tons, cast pipe, 250 tons structural steel, and 100 tons reinforcing bars.

Cast Pipe Placed

190 tons, procurement division, treasury department, delivery Meriden, Conn., 130 tons to Warren Foundry & Pipe Corp., Phillipsburg, N. J., and 60 tons to R. D. Wood & Co., Florence, N. J.; approximately 285 tons more 6 and 16-inch is being bid for same delivery point.

190 tons, 4 to 12-inch, South Gate, Calif., to United States Pipe & Foundry Co., Burlington, N. J.

150 tons, McNeil Island, Wash., to American Cast Iron Pipe Co., Birmingham, Ala.

100 tons, 4-inch in 6-foot lengths, Boston, to United States Pipe & Foundry Co., Burlington, N. J., at $67.50 ton, delivered.

100 tons, 4 to 8-inch, Anaheim, Calif., to National Cast Iron Pipe Co., Birmingham, Ala.

Cast Pipe Pending

3700 tons, 20 and 24-inch, Mamaroneck, N. Y., bids March 15.

1925 tons, various sizes, Milwaukee; bids closed March 4.

1000 tons, 4 to 12-inch, East Bay municipal utility district, Oakland, Calif.; bids March 10.

220 tons, 4 to 12-inch, Cicero, N. Y., bids in.

170 tons, 6 and 8-inch, treasury department, procurement division, Washington, delivery Dailey, W. Va.; Req. RA-2657-W, bids March 10.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 73

Bolt, nut and rivet specifications continue heavy and March shipments are expected to exceed those of February. Consumption among farm implement and tractor manu-

facturers and automotive parts manufacturers have expanded. Second quarter prices on bolts, nuts and rivets have not been announced.

Transportation

Track Material Prices, Page 73

Output of rails and track accessories has been increased, while rail schedules of some mills are around 90 per cent of capacity. Actual output is still limited by the additional time necessary for heat treatment. Shipments of bars, plates and shapes for equipment building and repairs continue heavy and while the market for new cars is quiet as regards orders, a relatively large volume of buying is under consideration.

Standard rails over 60 pounds per lineal yard are up $3.50 per gross ton to $42.50, shipping mill; angle splice bars are up $2 per ton and are quoted 2.80c. Tie plates are up $4 per net ton to $46.50. Forged steel axles for cars and locomotives are now quoted 3.35c, base, Pittsburgh.

Atchison, Topeka & Santa Fe railway has ordered from Budd Mfg. Co. 52 streamlined stainless steel passenger cars. The carrier also ordered a new streamlined diesel locomotive now being built by Electro Motive Corp., La Grange, Ill.

Locomotives Placed

Atchison, Topeka & Santa Fe, one streamlined diesel locomotive, to Electro Motive Corp., La Grange, Ill.

Canadian Pacific, which recently placed 3 locomotives with Montreal Locomotive Works, Ltd., has closed on 20 additional locomotives to Canadian Locomotive Co. Ltd.

Northern Pacific, eight passenger locomotives to Baldwin Locomotive Works, Philadelphia.

Pickands, Mather & Co., one switch engine, to American Locomotive Co., New York.

St. Louis-South Western, five locomotives, to own shops at Pine Bluff, Arkansas.

Car Orders Placed

Atchison, Topeka & Santa Fe, 52 streamlined stainless steel passenger cars, to the Edward G. Budd Mfg. Co., Philadelphia.

Michigan Limestone & Chemical Co., 30 30-cubic yard ore cars, divided equally between the Austin-Western Road Machinery Co., Aurora, Ill. and the Differential Steel Car Co., Findlay, O.

Norfolk & Western, 1000 hopper cars, to the Virginia Bridge & Iron Works, Roanoke, in addition to 1000 previously noted; this is also in addition to 2000 hopper cars placed with the Bethlehem Steel Co., Bethlehem, Pa., a few weeks ago.

Northern Pacific, 2000 cars; 750 gondolas to Pressed Steel Car Co., Pittsburgh; 500 flat cars to Bethlehem Steel Co., Bethlehem, Pa.; 500 box cars to Pacific Car & Foundry Co., Seattle; 250 gondolas to American Car & Foundry Co., New York.

Car Orders Pending

Missouri-Kansas-Texas, 50 seventy-ton hopper cars, bids asked.

Strip

Strip Prices, Page 73

Pittsburgh—Hot-rolled strip, Pittssories has been increased, while rail 2.15c to 2.40c, an increase of $5 per ton, effective last Friday, on all new orders. High rate of activity continues and producers have been unable to reduce backlogs, which average five weeks. Jobbers have been taking good sized tonnages recently.

Cleveland — Stocks of many consumers are light as shown by their efforts to get early deliveries. Most mills have been forced to limit orders to usual requirements, to prevent speculative purchases. The question of price means little to buyers compared with deliveries. Requirements of auto partsmakers, small farm tools and electric equipment manufacturers are particularly active.

One Ohio mill advanced prices last Wednesday, effective immediately and for second quarter, as follows: Cold-rolled strip $8 a ton to 3.25c; commodity strip No. 14 gage, base sizes, $7 to 3.45c; commodity strip No. 20 gage, base sizes, $7 to 3.85c; No. 20 gage, lamp stock, $7 to 3.95c; No. 3 finishing extra changed from 25 cents to 75 cents and now includes paper between the sheets. All prices are base Cleveland or Pittsburgh. Another company advanced cold-rolled strip $7 a ton, no other variation was noted on other grades.

Chicago—Strip producers are well booked for 60 days and are making immediate application of higher prices. Additional business can not be accepted for March delivery and on cold-rolled strip, shipments run well into second quarter. Consumption among leading users continues high and is at best rate so far this year among automotive interests. Hot rolled strip now is 2.50c, Chicago.

Boston—Cold strip demand continues unabated. Pressed for delivery, mills have booked substantial tonnage for second quarter at

open prices. Cold rolling mills are operating at capacity in most cases. Hot strip shipments are heavy.

Wire

Wire Prices, Page 73

Pittsburgh—In many quarters last week further price developments were expected in wire products following adjustments of Feb. 24. Some producers showed an inclination to go easy on promises and not overload books. Demand continued at a high rate and pressure for shipments was strong. Producers asserted that the Feb. 24 adjustments would be inadequate in view of wage increases and rising costs of materials.

Cleveland — While most mills are still able to make deliveries on certain grades this quarter, some are out of the market and are accepting tonnage for second quarter delivery only, at the price prevailing at time of shipment. New business received under these conditions has been fairly heavy and assures active operations well into second quarter. Demand for manufacturing wire, fencing material and other agricultural requirements is particularly strong.

Chicago—A general advance of $5 per ton has been made on wire and wire products, following close on the recent adjustment upward to bring it in line with other steel products. The new level, effective at once and through second quarter, puts standard wire nails at $2.75 per keg and plain wire at 2.90c per pound. Wire producers are booked heavily for 60 days. Consumption of manufacturers' wire has increased, due partly to automotive requirements.

Boston—Steel wire mills, operating at full capacity in most departments, are striving to complete first quarter volume before April 1. Buying holds to the recent high rate for plain, spring and specialty wires.

Buffalo—Demand for wire products has grown to such an extent that ingot output has been continued at the increased rates started late in 1936. It had been expected one of two open hearths at the Wickwire plant in River road would be withdrawn early this year and that operation of its blast furnace would be discontinued. Neither unit is to be withdrawn now it is understood.

Pine-Ihrig Machine Co., Oshkosh, Wis., is preparing to place in volume production a new rotary vane free of gears, springs and valves. It is the result of development work over the past two years.

Shapes

Structural Shape Prices, Page 72

Pittsburgh — Structural shapes have been advanced $4 per ton and now are quoted 2.25c, Pittsburgh. Awards during the week included 1000 tons for the McGregor bridge, Manchester, N. H., placed with American Bridge Co., Pittsburgh. Inquiries included 3000 tons for a tire plant for Ford Motor Co., Dearborn, Mich., 1500 tons for the Aluminum Co. of America at Alcoa, Tenn. Fabricators continue operating at a high rate and expect considerable improvement later this spring.

Cleveland — Structural awards are in lots under 100 tons, and do not total high. However, a number of larger jobs are expected to be placed during the month. At present fabricators are well booked, but are making rapid headway on deliveries. Considerable tonnage involved in state grade crossings is expected to come out for bids soon.

Chicago — Fabricated structural steel is quiet and few large projects have appeared for bids lately. Bridge work predominates, with about 6000 tons pending for structures in various western states. In connection with new prices announced for prompt and second quarter business producers have made a change in the arrangement for price protection on identified projects. Quotations now will hold good until the end of the month following that in which prices were named. Specifications must be received within three months. For example, bids made in March will hold until the end of April, with specifications to be received by the end of June.

Boston—Structural steel buying lags behind most other hot-rolled products. However, inquiry is several thousand tons heavier, led by a six-span bridge, Gill-Montague, Mass., over the Connecticut river, closing March 16, and several veterans' hospital buildings, White River Junction, Vt., April 6. Most fabricating shops in this district are active, but with lighter backlogs.

New York — While structural awards in this district are sluggish, new inquiry is coming out in slightly heavier volume. Bids on 6000 tons, for International bridges, near Wells Island, New York, were postponed from March 2 to 10. Approximately 1200 tons have been bid for New Jersey state bridges. The 1937 New York state highway bridge program inquiry, requiring a substantial tonnage is expected to start in about one month.

Philadelphia—An increasing volume of work is noted, although outstanding orders in this district continue limited. Possibly the largest project actively pending is the 2300-ton power house for the Philadelphia Electric Co., with the 2000-ton high school at Sixty-seventh street and Elmwood, this city, next. A central high school in North Philadelphia requiring 4000 to 5000 tons, is expected to be up for bids May 1.

San Francisco—Interest centers around the expectant award of a large shop building for the government air depot at Sacramento, Calif. The largest award went to Bethlehem Fabricators Inc., Los Angeles, calling for 495 tons for the Alameda street bridge, for the United States Engineer office, Los Angeles. So far this year 33,828 tons have been booked, compared with 20,241 tons for the same period a year ago

Seattle — Shops are reasonably busy, many having old contracts under construction delayed during the maritime strike. New business is not developing in volume and the immediate future appears rather uncertain.

Shape Contracts Placed

4000 tons, building, Sheffield Farms, West Fifty-sixth street, New York, to Post & McCord, New York, through White Construction Co., New York.

1300 tons, superstructure, Pickwick Landing Power House, Tennessee Valley Authority, Knoxville, Tenn., to Milwaukee Bridge Co., Milwaukee.

1000 tons, MacGregor, bridge Contract 4, Manchester, N. H., to American Bridge Co., Pittsburgh.

835 tons, power transmission towers, Tennessee Valley Authority, Knoxville, Tenn., to American Bridge Co., Pittsburgh.

830 tons, transmission towers, Pickwick-Memphis line, Berclair, Tenn., for Tennessee Valley Authority, to American Bridge Co., Pittsburgh.

620 tons, tainter gates, etc., Beverly, Tex., for Lower Colorado River Authority, to Lakeside Bridge & Steel Co., Milwaukee.

600 tons, transmission towers, for Northern Indiana Public Service Co., Hammond, Ind., to Bethlehem Steel Corp., Bethlehem, Pa.

600 tons, postoffice, Peoria, Ill., to Bethlehem Steel Corp., Bethlehem, Pa.

495 tons, Alameda Street bridge, United

Shape Awards Compared

	Tons
Week ended March 6	17,597
Week ended Feb. 27	22,708
Week ended Feb. 20	18,291
This week, 1936	8,738
Weekly average, 1936	16,332
Weekly average, 1937	26,459
Weekly average, February	22,141
Total to date, 1936	222,800
Total to date, 1937	264,590

States Engineer Office, Los Angeles, to Bethlehem Fabricators, Inc., Bethlehem, Pa.

475 tons, state highway bridges, Sidney-Unadilla highway, Otsego county, New York and Bainbridge, N. Y., to Harris Structural Steel Co., New York; through Lane Construction Corp., Meriden, Conn.

475 tons, bridge, Connecticut river, Lyme, N. H.—Thetford, Vt., to American Bridge Co., Pittsburgh.

450 tons, viaduct, West side elevated highway, West 177-180 streets, New York, to Lehigh Structural Steel Co., New York, through Duffy Construction Corp., New York.

425 tons, infirmary building, Yaphank, N. Y., to Weatherly Steel Co., New York, through Jonwal Construction Co., New York.

395 tons, building addition, Klug & Smith, Milwaukee, to Worden-Allen Co., Milwaukee.

300 tons, Hospital building, Raybrook, N. Y., to Bethlehem Steel Corp., Bethlehem, Pa., through Amsterdam Building Co., Inc., New York.

295 tons, bridge project, 789-B, Like Oak County, Texas, to Austin Bros., Dallas, Texas.

275 tons, building 28, Packard Motor Co., Detroit, to Whitehead and Kales, Detroit.

270 tons, bridge number 1438, Morgan county, West Virginia, to Roanoke Iron & Bridge Co., Roanoke, Va.

250 tons, state bridge, Intramural drive separation, Queens, N. Y., to American Bridge Co., Pittsburgh, Pa.; F. T. Westcott, North Attleboro, Mass., general contractor.

250 tons, state highway bridge, AW-2002, Palisade, Colo., to Midwest Steel & Iron Works Co., Denver.

250 tons, tainter gate hoist bridges, dam No. 1, Beverly, Tex., for Lower Colorado River authority, to Austin Bros., Dallas, Tex.

250 tons, bridge over railroad, Jefferson Springs road, Rutherford county, Tennessee, to Lebanon Bridge Co., Nashville, Tenn.

250 tons, plant addition, Lebanon Paper Box Co., Lebanon, Pa., to Lehigh Structural Steel Co., Allentown, Pa.

250 tons, coast guard station F. Bennett airport, New York, to Harris Structural Steel Co., New York; Groves & Quinn Co., New York, general contractor.

250 tons, shop addition, Heil Co., Milwaukee, to Worden-Allen Co., Milwaukee.

240 tons, state bridge PWSI, Ittawamba county, Mississippi, to Vincennes Steel Corp., Vincennes, Ind.

210 tons, Holy Family hospital, Brooklyn, N. Y., to Harris Structural Steel Co., New York; Chapman Kruge Engineering Co., New York, general contractor.

190 tons, Navaio General hospital, Fort Defiance, Ariz., to Capitol Steel Co., Oklahoma City, Okla.; R. F. Ball Construction Co., Fort Worth, Texas, general contractor.

165 tons, plant addition, P-K Construction Co., Pittsburgh, to Keystone Engineering Co., Pittsburgh, Pa.

165 tons, bridge, FAP-145-G, Comanche county, Oklahoma, to Capitol Steel Co., Oklahoma City.

162 tons, state highway bridge, Leominster, Mass., to Truscon Steel Co., Youngstown, O., through G. Bonazolli & Sons, Hudson, Mass.

155 tons, post office and custom house, St. Albans, Vt., to Bethlehem Steel Corp., Bethlehem, Pa., Smith Construction Co., Inc., Derby, Conn., general contractor.

130 tons, warehouse, Firestone Rubber Co., Brooklyn, N. Y. to Ingalls Iron Works, Birmingham.

125 tons, state highway project, NRS-2, Lumpkin county, Georgia, to Virginia Bridge Co., Roanoke, Va.

125 tons highway bridge, Two Harbors, Minn., to Illinois Steel Bridge Co., Jacksonville, Ill.
125 tons, building, Seven-Up Bottling Co., St. Louis, to La Salle Iron Works, St. Louis.
110 tons, addition, Alice Deal Jr. high school, Washington, D. C., to Barber & Ross, Washington, D. C.; Bethlehem Steel Corp., Bethlehem, Pa., awarded 48 tons reinforcing bars; Lacchi Construction Co., Baltimore, Md., general contractor.
105 tons, post office, New Rochelle, N. Y., to Bethlehem Steel Corp., Bethlehem, Pa.; A. J. Paretta Contracting Co., Long Island City, N. Y., general contractor.
100 tons, state hospital alterations, Harrisburg, Pa., to Richard de Cou, Philadelphia.
100 tons, radio tower for Station KGW, Portland, to Truscon Steel Co., Youngstown, O.
100 tons, bridge, Jersey City, N. J., to Harris Structural Steel Co., New York.

Shape Contracts Pending

6000 tons, highway bridge, St. Lawrence river, near Wells Island, New York; bids postponed March 2 to 10, Thousand Islands Bridge authority, Watertown, N. Y. Requirements are for American and Canadian crossings, also International Rift crossings. Two of the bridges to be of the suspension type; Robinson & Steinman, New York, consulting engineers. Work also includes 580 tons of wire cable strand and 177 tons, reinforcing bars.
5500 tons, 516 galvanized towers, for Skagit Transmission Line, Seattle, running for 116 miles between Neuhalem and Seattle; bids April 1.
4000 to 5000 tons, Central high school, North Philadelphia, specifications expected out soon with bids to close around May 1; a substantial tonnage of reinforcing bars for foundation work also will be required.
3700 tons, subway section No. 6, route 101, sixth avenue from West Ninth street to West Eighteenth street, New York; bids March 26, to oard of Transportation, New York.
3500 tons, federal building addition, Vesey street, New York; Millimet Construction Co., Union City, N. J. low, Otis Elevator Co. low on elevators, bids Feb. 26.
3500 tons, state bridge, six spans, over Connecticut river, Gill to Montague, Mass.; bids March 16.
3000 tons, tire plant, for Ford Motor Co., Dearborn, Mich.
2300 tons, power house, Philadelphia Electric Co., Philadelphia; bids pending.
1825 tons, state bridges, Texas.
1800 tons, incinerator plant, Stickney Ill., for Chicago sanitary district; bids March 11.
1500 tons, building additions, Navy Yard, Norfolk, Va., bids in.
1500 tons, pot shells and frames, for Aluminum Co. of America, Alcoa, Tenn.
1500 tons, Washington Irving high school, New York; bids in.
1500 tons, bridge, Dearborn, Mich.
1238 tons, state bridges, Tennessee.
1200 tons, mill building, for The Wayne Works, Richmond, Ind.
1100 tons, building alterations and additions, Passaic, N. J.
1000 tons, depot supply building, government air depot, Sacramento, Calif.; bids March 27.
1000 tons, hangar, Sandpoint, Wash.; Wisconsin Bridge & Iron Co., Milwaukee low.
900 tons, public school, 152 street, Queens, N. Y.; bids in.
750 tons, pot shells and frames, Aluminum Co. of America, Massena, N. Y.
600 tons, Mississippi river bridge and approaches, Clinton, Iowa.
600 tons, state bridges, Colorado.
540 tons, bridge, Colonia, N. J.; Centaur Construction Co. Inc., New York, general contractor.
500 tons, viaduct, Westside Elevated highway, between 186 and 191 streets, New York; bids March 11.
500 tons, warehouse, for Kimberly-Clark Corp., Neenah, Wis.
400 tons, state highway bridge, Route 739, Avonmore, Pa.
330 tons, state bridge, Middlesex county, New Jersey, bids March 8.
300 tons, miscellaneous material for power house, for Rocky Mountain Power Corp., Polson, Mont.
270 tons, state bridge, Atlantic county, New Jersey; bids March 8.
250 tons, building, for Western Printing & Lithographing Co., Poughkeepsie, N. Y.
250 tons, bridge over Matanuska river, for Alaska railroad, United States department of interior.
250 tons, Esquire theater, Chicago.
200 tons, ordnance building, coast guard, Curtis Bay, Baltimore, for United States treasury department.

Reinforcing

Reinforcing Bar Prices, Page 73

Pittsburgh—Concrete reinforcing bars are up $6 per ton as a result of last Friday's price announcement, and are quoted 2.55c, base, Pittsburgh. During the past week the anticipated price advance was a subject of great discussion in the concrete reinforcing bar market. Mills are fairly active and a stronger situation is expected in the immediate future. Large inquiries are not frequent, but the volume of small tonnages is well maintained.

Cleveland — Awards continue to be limited to small tonnages and little change is seen in the near future. Mills are operating at a fairly high rate. Considerable work is pending in state grade crossings, but bids are not expected to come out this month. Total estimated tonnage of reinforcing bars for February in northern Ohio was only 168 tons, joists almost equaled that of bars with 163 tons.

Chicago—Reinforcing bar shipments are fairly heavy though producers in most instances are not interested in materially heavier sales in view of the need for raw steel supplies in other departments. A substantial amount of prospective work is accumulating, however, and an upturn in awards is looked for with the approach of spring. A sizable tonnage of bars will be required for state bridges while some additional material will be involved in sanitary district work. Prices have been advanced $6 a ton with billet steel bars 2.60c base.

Boston—Active inquiry for concrete reinforcing bars is gradually mounting for bridges and public works. Buying continues light with a fair number of small awards made.

New York—New inquiry is again sustaining pending requirements in this district with about 1500 tons of new volume out for bids. Awards have slumped and are generally confined to small individual lots. Largest individual new projects include hospital buildings, Welfare Island and several structures at the West Point Military Academy. Prices on recent lettings have been weak.

Reinforcing steel bars have been advanced $6 a ton, effective imme-

diately, thus making billet bars 2.88c deld. New York or 2.98 deld. job.

Philadelphia—Pending definite establishment of prices for second quarter, reinforcing bar sellers are moving cautiously. Some to all practical intents and purposes have had no tonnage to offer over the past week. School work is outstanding. McCloskey & Co., general contractors, this city, have decided to withdraw their bids on a large portion of the electrification program of Pennsylvania between Paoli, Pa., and Harrisburg, Pa. An announcement was made that they would likely share, along with two or three other general fabricators in this program.

San Francisco—Interest centers around the announcement of the Columbia Steel Co., subsidiary of the United States Steel Corp., that effective March 16 an increase of 10 cents per hour on the minimum rate in all districts will be paid, that a 40-hour week will prevail and that time and one-half pay will apply on all overtime. Bethlehem Steel Co., Judson Steel Corp. and other coast producers, it is stated, will meet the increase. Outstanding award involved 6000 tons for the Federal building, Los Angeles, placed with Los Angeles interests. No important new inquiries developed during the week. Awards totaled 7149 tons and brought the aggregate for the year to 14,846 tons, compared with 54,107 tons for the same period last year.

Seattle—February failed to develop new business of importance but legislatures in Oregon, Washington and Idaho will shortly allocate highway improvement funds which will finance construction requiring reinforcing. Unfavorable weather has retarded building operations.

Reinforcing Steel Awards

6000 tons, Federal Building, Los Angeles, to Consolidated Steel Corp., Los Angeles.
422 tons, bureau of reclamation, Potholes, Calif., to Colorado Fuel & Iron Co., Pueblo, Colo.
318 tons, 2 bridges over Big Tujunga Wash, Los Angeles county, California, to unnamed interest.
300 tons, buildings for state hospital, Patton, Calif., to unnamed interest.
250 tons, plant improvement Soundview Pulp Co., Everett, Wash., to Bethlehem Steel Corp., Seattle.
107 tons, highway work in Lincoln and Clark counties, Nevada, to unnamed interest.
100 tons, state bridge, Intramural drive separation, Queens, N. Y., to Igoe Bros., Newark, N. J.; F. T. Westcott, N. Attleboro, Mass., general contractor.

Concrete Awards Compared

	Tons
Week ended March 6	7,947
Week ended Feb. 27	6,993
Week ended Feb. 20	2,968
This week, 1936	12,168
Weekly average, 1936	6,005
Weekly average, 1937	3,806
Weekly average, February	3,877
Total to date, 1936	93,350
Total to date, 1937	38,060

Reinforcing Steel Pending

420 tons, subway section No. 6, route 101, sixth avenue from West Ninth street to West Eighteenth street, New York; bids March 26, to Board of Transportation, New York.
175 tons, bridge, Main street-Central Parkway, Flushing, New York.
116 tons, city structure No. 7, New York, Poirier & McLane Corp., New York, low.

Pig Iron

Pig Iron Prices, Page 74

New York — All grades of pig iron, including low phosphorus, have been advanced $2 per ton, effective immediately and for second quarter delivery. This increase follows close on the former rise of $1.

Some small tonnage of pig iron is still available for shipment in March, but only in carloads, no large tonnages being possible.

Pittsburgh — Recently advanced price of pig iron already has been tested in this district in the past week. Some producers have been accepting tonnage only for March, but in other instances specifications for second quarter have been taken. Producers' stocks are well depleted. It is anticipated that heavy demand will show no cessation for some time.

Cleveland — Pig iron producers report considerable tonnage placed in the last week for delivery during March. Most sellers are scrutinizing orders closely to eliminate the obviously speculative. Foundries are generally forced to be less critical in specifications, if prompt delivery is required. All grades of silvery iron were advanced Monday. Second quarter prices have not yet been announced.

Chicago—Pig iron producers have little iron for sale this month due to limited stocks and absorption of furnace output by orders already at hand. Consumption remains heavy in all directions with automotive, farm implement and tractor and railroad needs predominating. Some

foundries have fairly heavy stocks though these are commensurate with good outlook for operations. Market is firm at $22, furnace, for No. 2 foundry and malleable on spot sales. Second quarter business accepted recently has been subject to prices prevailing at time of shipment since books for next period had not been opened.

Boston — Pig iron buying since the $1 advance has been light. Another increase is expected for second quarter. Some have attempted to cover for next quarter, but sellers are not anxious to protect heavily even at open prices. The Everett, Mass., furnace will go into blast about April 1 after being down several months. About 800 tons of Indian iron arrived last week.

Mystic Iron Works, Everett, Mass., has advanced all grades of pig iron $2 per ton, effective immediately. This brings No. 2 foundry to $25.75, furnace.

Buffalo—Increase in pig iron prices has caused considerable sales resistance on the part of some consumers and decreased buying is the result. This is not causing any great concern among sellers as many are booked solidly for this month, which is the only period for which orders will be accepted. Shipments have been heavy during the past week but were generally on orders taken before the latest advance of $1 a ton.

Philadelphia—Pig iron consumers continue to buy actively. Main difficulty in many cases is to obtain delivery at present prices before the end of this month. Strong upward surge in costs is causing some leading pig iron sellers to predict $30 iron by fall.

Cincinnati—Second quarter books are not yet open on pig iron, the delay lending weight to belief another price increase is pending. Meanwhile furnace interests advise they are sold for the remainder of this quarter and are refusing orders for spot shipments at the $1 increase recently adopted.

St. Louis — Since the advance of $1 per ton in pig iron, buying has dwindled to small proportions and is almost entirely on a necessity basis. Meanwhile the melt held at its recent high levels, with the showing by basic being particularly impressive. Steel foundries are operating at the highest rate in a number of years. February shipments slightly bettered the January total, despite its being a shorter month. The present daily average rate is about on a parity with that of February.

Birmingham, Ala. — Pig iron shipments, with much tonnage going north of the Ohio river, continue steady and the market is firm. Reports are still current of export business being offered. Production is being maintained at high level but surplus stock is not being built up.

San Francisco—Columbia Steel Co., with furnace at Provo, Utah, has advanced its price on No. 2 foundry pig iron $2.50 per ton, effective March 1, to $21, furnace. This producer did not follow others in the former advance.

Coke By-Products

Coke By-Product Prices, Page 73

New York—Naphthalene is more active, distributors to the household trade taking heavier shipments. Current production of phenol is being well absorbed. Supplies of some distillates are short, with little spot material available. Shipments against contracts are heavy, the lacquer, chemical, industrial and rubber outlets consuming substantial quantities. Prices are firm and unchanged.

Scrap

Scrap Prices Page 76

Philadelphia—The upward trend in scrap continues strong. No. 1 and No. 2 steels are now holding respectively at $19 and $18, delivered, consuming plant, with indications of still higher levels being done. Dealer offerings for export are also being marked up, with as high as $19, dock, being reliably reported, for No. 1 steel and $18 for No. 2.

This upward trend continues in the face of an export embargo by the railroads in effect here for the past several days, and the opinion is that this embargo in one degree or another will continue for some time, despite the fact that at least one boat was scheduled to come into Port Richmond over the past week end and that there will likely be a movement of at least two boats per week over the remainder of this month.

It is now estimated that more than 1400 cars, or approximately 45,000 tons of scrap, are now on sidings at Port Richmond. It is believed, however, that the embargo situation with respect to No. 1 steel for export will be relieved somewhat over the next two weeks as much of this grade is expected to be moved out. Domestic prices on certain leading grades of cast scrap and railroad specialties have been further increased.

Edward G. Budd Mfg. Co., this city, has disposed of its monthly accumulation of 5000 tons of new compressed sheets at $18.75, Budd plant, with two or three consumers particupating. A month ago this tonnage went at around $18.35.

Pittsburgh—Scrap has skyrocketed to new high levels here within the past few days, sales of No. 1 heavy melting material having been made at $22, and one railroad list having gone at around $23. The quotable range on heavy melting is now the highest since May, 1923. The swift advance, attributed to demand for heavy material from mills and increasing difficulty of obtaining scrap for this district because of the strong export situation, has made dealers wary, since they are now facing a situation which they have not encountered in many years. The normal spread between No. 1 heavy melting and No. 2 has been out of line for some time. Railroad specialties are in exceptionally good demand.

Chicago—Scrap is marking time as regards price. Heavy melting steel sold up to $21 recently but under the influence of an increase in available supplies the market has leveled off for the moment at a top of $20.50, at which figure some mill buying has been done. Dealers and brokers have lowered their bids and the market remains quotable at $20 to $20.50. The heavier inflow of scrap is reflected in the regulation of shipments by some consumers. Prices on other grades continue strong, with higher levels effective in some instances.

Boston—Scrap prices for export, notably No. 1 heavy melting steel and No. 2 cast, continue to rise. Shippers pay $17, dock, for the former with $15 reported for the latter. Embargoes are gradually being lifted by railroads as delayed boats arrive for loading. Most scrap tonnage available in the eastern part of the district is moving for export.

New York—Heavy melting steel for export is up 50 cents with sharp advances also on No. 2 cast and compressed sheets for dock delivery. Cast scrap for domestic delivery is stronger, with an increase of nearly $2 on No. 2 cast. Higher prices are being paid on cast grades, grate bars, compressed sheets and other grades. Export demand is heavy, with ship-

ments against domestic contracts active. Higher prices are bringing scrap out in better volume.

Buffalo—Dealers are creating a feverish market for scrap in anticipation of heavy buying. Practically every leading dealer in this market says No. 1 heavy melting steel is worth $20 a ton and that No. 2 cannot be bought in tonnage for less than $20. Shipments on orders taken at $18.75 are nearing completion and at the present rate of melt consumers cannot stay out of the market much longer. There is little chance of boat scrap coming this way for some months as export demand is taking all scrap available in eastern markets. Dealers will not sell before they have material on hand and claim the limited tonnage available is holding down operations. Mixed scrap is being worked and sold at large profits but brokerage tonnage is scarce.

Cincinnati—Dealers have advanced buying prices on sheet clippings and machine shop turnings $1 a ton, as the entire list took strength from general market factors. Foundry demand is at a peak for recent years.

St. Louis — After ascending to the highest levels in more than ten years, scrap iron and steel prices have apparently reached the apex of the present upward movement. Heavy melting steel and other steel grades are off about 25 cents from the top, though there have been few specific alterations. The easier tone is due to freer offerings caused by high prices of recent weeks.

Birmingham, Ala.—Heavy melting steel, cast and stove plate are in best demand, with supplies sufficient. Prices are unchanged.

Seattle—Japanese buyers are placing orders for scrap at the higher c.i.f. prices. Local mills are still buying steadily, No. 1 melting having risen to $12.50, the highest level since the depression. Tidewater stocks are not large but current prices will attract shipments from the interior as quickly as weather conditions permit.

Warehouse

Warehouse Prices, Page 75

Pittsburgh — Warehouses report demand steadily improving as an increasing number of buyers seek material which mills are unable to supply speedily. Despite a $5 per ton advance in sheets last week, orders showed no cessation.

Cleveland — Jobbers look forward to an active month, particularly in lighter gage products on which mill deliveries are so far extended. Structural requirements are noticeably slack and little change is anticipated. Stock conditions have become noticeably acute among distributors here. February shipments exceeded January, the third consecutive advance.

Chicago—Sales are steady at a relatively high rate and continue well ahead of activity a year ago. Demand for flat rolled material has been intensified by the sold-up condition of mills.

Boston — Substantial advances in warehouse steel prices are expected shortly, but to date only No. 24 gage galvanized sheets have been marked up, this material now being 4.85c, base. Buying is heavy and includes a broad range of products.

New York — Warehouse steel prices will advance in line with mill increases shortly. Since March 1 all grades of sheets have been 25 cents per 100 pounds higher. Demand is brisk and includes most warehouse items. Lighter structural sections are more active and heavy volume is moving in plates, sheets, alloy and specialty lines. Extended mill deliveries have thrown some jobbers' stocks out of balance and attempts to fill orders by purchasing from competitive warehouses are frequent.

Cincinnati—Jobbers have advanced prices on sheets, effective at once. No. 24 black is 4.25c, No. 24 galvanized 4.85c, both on base of 3500 pounds or more, new differentials applying. No. 10 blue is advanced from 3.50c to 3.75c. Demand tends steadily upward, chiefly for industrial users.

St. Louis — The long spell of mild, clear weather has stimulated demand for building materials from store, sales during the past two weeks being the best in a number of months. The advance in certain items has apparently had no effect on buying. February business exceeded expectations, and was the best for that month since 1930, according to three leading interests.

Seattle—Volume of sales is increasing with orders well diversified. Prices are firm and generally maintained. Portland houses have advanced bars 15c to meet the Seattle level of 4.10c and are trying to raise plates and shapes 10c to the scale adopted by Washington jobbers.

Tin Plate

Tin Plate Prices, Page 72

Pittsburgh—Mills were operating at close to 100 per cent again last week, but even at this high rate deliveries in tin plate became slightly more extended. Demand from all sources continues heavy. Canmakers, especially, have been specifying freely to assure adequate stocks in the face of uncertainties later. Inquiries from abroad are strong. Producers report that premiums can now be obtained from foreign interests.

Ferroalloys

Ferroalloy Prices, Page 74

New York—Ferroalloy consumers, expecting an advance in second quarter, are making special efforts to

get shipments in by the end of March. Precisely what may be expected in the way of increases has not been indicated, but it is believed that there will be general advances and that another week will likely tell the story. Meanwhile, ferromanganese is holding at $80, duty paid, Atlantic and Gulf ports. Domestic spiegeleisen, 19 to 21 per cent, is holding for the moment at $26, Palmerton, Pa.

Iron Ore

Iron Ore Prices, Page 76

Cleveland—While iron ore prices have not been definitely announced for the 1937 season, an advance is looked for. Due to the 315,000 ton inquiry of Ford Motor Co. and other smaller inquiries already out, an early sale is expected. Increase in mining costs, state and local taxes and probable increase in vessel rates, force some observers to feel that an advance of 75 cents or $1 is probable. This will be the first adjustment in eight years.

Steel producers and bituminous coal shipping interests are keenly interested in the possibility of an early opening of the lake season. This seems highly probable at present, due to the relatively mild weather in the upper Lake Superior regions.

Cold Finished

Cold Finished Prices, Page 73

Pittsburgh—Producers have been receiving increasingly heavy commitments from the automotive industry and with miscellaneous consumers specifying steadily, unfilled tonnage averages better than six weeks at present. Probable price developments have been uppermost in the market during the past week, and pressure for shipments was slightly increased. In view of the activity of hot mills, some sellers have encountered difficulty satisfying all the demands made upon them.

Metallurgical Coke

Coke Prices, Page 73

Demand for coke continues unusually high and producers are hard pressed to meet all requirements which confront them. Coal and coke operators in the Connellsville region have been keeping a close watch on labor negotiations in the East. Idle for six weeks, operations have been resumed at the Alicia plant of United States Fuel & Iron Co. An agreement signed by the company and the United Mine Workers of America ended the controversy.

The contract market for by-product foundry coke at Chicago has been extended through March at $9.50, ovens, for outside delivery and $10.25 delivered Chicago.

Watson-Stillman Co., Roselle, N. J., hydraulic machinery builder, has opened a sales office at 83 South High street, Columbus, O. John C. Grindlay will be in charge and will cover the Kentucky, southern Ohio, and southern Indiana territory.

Nonferrous Metals

Nonferrous Metal Prices, Page 74

New York—Sentiment in nonferrous metal markets was bullish last week. Tin and zinc soared to the highest levels since 1927 while antimony advanced ¼ to ¾-cent to

equal the highest levels since 1926. Lead and copper held unchanged in strong markets. Strength in domestic markets was attributed to the improved labor conditions in this country and the general advance in metal prices to new highs in London.

Copper — Although export copper sold as high as 16.60c, c.i.f. European ports, domestic producers resisted strongly any further rise in electrolytic beyond the 15-cent level. Business was transacted on a restricted basis with some sellers not quoting while others limited sales to regular customers and independents.

Lead — Demand continued heavy throughout the week with sellers allocating sales and building up waiting lists for subsequent booking. Prices were firm at 6.85c, East St. Louis, and 7.00c, New York. St. Joseph Lead Co. continued to ask $1 premium on certain of its brands in the New York market.

Zinc—Prime western advanced $4 per ton on Monday to 7.00c, East St. Louis, while brass special advanced $5 to 7.10c. Supplies remained extremely tight with those of brass special scarce. Inquiry remained light.

Tin—Removal of the threat of a labor strike in the steel industry stimulated demand. Consumers who had bought lightly earlier in the year rushed into the market to cover requirements and forced Straits spot prices to a peak of 57.87½c on Friday. The market was also supported by a strong uptrend in prices on the London Metal Exchange.

Antimony—Chinese spot advanced to 16.75c, duty paid New York, while American spot rose to 16.50c, New York. The rise reflected an advance in prices in London. Buying was dull here at the higher levels.

Steel Imports Are Light

Philadelphia — Importations here during the week ended Feb. 27 included 6396 tons of chrome ore from Cuba. Iron and steel arrivals comprised 332 tons of structural shapes, 100 tons of steel bars, 31 tons of steel bands, 18 tons of steel sheet and nine tons of diamond plates, all from Belgium; 50 tons of pig iron and 10 tons of drill steel, all from Norway; and five tons of steel forgings from Sweden.

Also included were 69 tons of steel bands, 71 tons of steel bars and 28 tons of structural shapes from France. Importations also show 4 tons of manganese ore shipped from German mines.

England Frees Iron, Cuts Steel Duty

Foreign Steel Prices, Page 75

London—(*By Cable*)—In an effort to relieve shortage of iron and steel the British treasury March 3 lifted the duty on pig iron and reduced the import duty on other iron and steel products from 20 to 10 per cent.

Although output continues to increase as additional plants are made active demand outgrows production, especially in semifinished steel. Some export trade is being maintained, however. A further rise in steel prices is expected.

The Continent reports production unable to meet continued demand although all producing countries are working at capacity. Belgium is reported to have booked a large railroad car contract for South American delivery.

Canadian Steel Output Gains; Imports Higher

Output of steel ingots and castings in Canada for January was 115,237 tons, compared to 103,952 tons in December, and 100,225 tons in January, 1936. Pig iron production was 66,400 tons in January, a decrease of 3 per cent from the December total of 68,499 tons, but an 8 per cent increase over output of 61,336 tons of January, 1936.

Sharp gains in Canada's steel imports were registered in January with total volume of $13,345,000, compared with $9,088,000 for January, 1936. Value of imports from the United States rose from $7,968,000 to $11,637,000.

Scrap Institute Adds 21

Institute of Scrap Iron and Steel Inc., New York, enrolled 21 new members during January. The new members are: Harry Alter & Sons, Davenport, Ia.; Malo Brothers, Marion, O.; Monroe Scrap Material Company, Monroe, Mich.; Teller Iron Co., Hammond, Ind.; Levie, Heller Co., Canton, O.; Glick Iron & Metal Co. Inc., Jackson, Mich.; Solomon Iron & Metal Co., Fostoria, O.; Atlantic City Waste Materials Co. Inc., Atlantic City, N. J.; Maxton Metals, Inc., Buffalo; M. Varkle Iron & Metal Co., Detroit; Maumee River Steel Inc., Toledo, O.; William F. McGrath, Brooklyn: Apex Iron & Metal Co., Chicago; Wallace Scrap Iron & Metal Co., Ithaca, N. Y.; John S. Haskard & Sons, Inc., Plainfield, N. J.; Herman Golanty Co., Detroit; Buffalo Sash Weight & Foundry Co., Buffalo; S. Allen & Sons, Pontiac, Mich.; A. Levy Sons, Brooklyn; Henry Pollock, Pottstown, Pa.; Triboro Scrap Iron & Metal Co., Brooklyn.

Equipment

New York — Brisk inquiry, sustained buying and further extended delivery, have added to heavy backlogs of machine tool builders. Another advance in prices for several types is being considered. Demand is well spread with tools designed for one-purpose high-production uses leading. Some eastern plants are booking new orders faster than current high production. Eastern railroads generally are lagging behind western carriers in machinery buying.

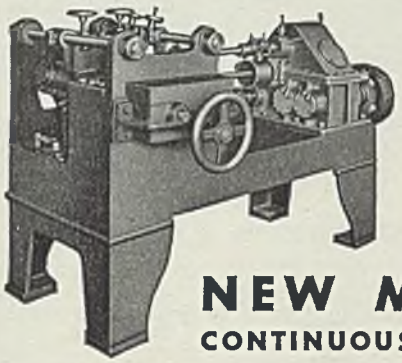
Boston — Machine tool builders, with large backlogs, are assured of near capacity operations beyond first half. Buying continues active, especially for special one-purpose machines. A large volume of new business is being figured. Inquiry is brisk, covering a wide range. Textile machinery plants are busy. From the Worcester district shipments of steel and wire fabricating machinery to Russia have been heavy. Deliveries of most current orders are further extended.

Cleveland — Machine tool and equipment inquiries and sales are in fair volume with most business done in single machines. Lathes, screw machines and presses are in best demand. White Motor Co. will spend $500,000 for machinery and tools in an 18-month expansion program.

Chicago — While sales of machine tools and other plant equipment are less than a month ago, demand remains relatively heavy. Machine tool inquiries from railroads are confined to only a few roads but are in fair volume. Deliveries on most types remain slow. Market for used machinery has been combed carefully for better types of tools as consequence of inability to obtain early shipment.

Seattle — Electrical equipment shows most active demand, although highway machinery and lumber industry requirements are increasing. Mining and cannery interests are anticipating seasonal needs. Westinghouse offered low bid, $160,000 f.o.b. factory, for furnishing ten oil circuit breakers and accessories for Benneville, Wash., powerhouse. Seattle light department is considering bids for south station equipment. Same utility will ask bids soon for approximately $385,000 worth of electrical equipment.

4 NEW ADVANTAGES



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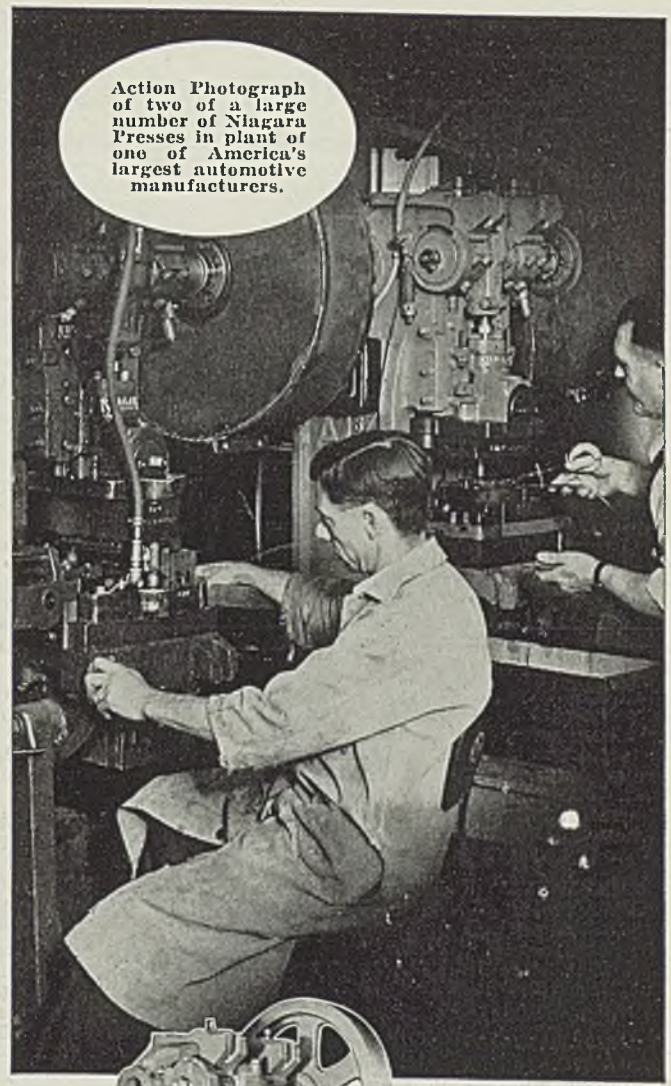
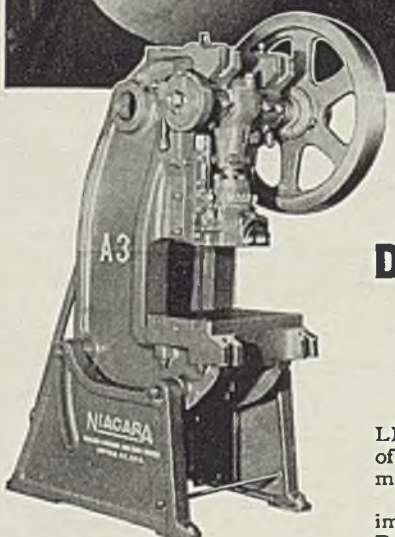


Action Photograph of two of a large number of Niagara Presses in plant of one of America's largest automotive manufacturers.



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Construction and Enterprise

Ohio

BELLVILLE, O. — Village plans construction of a sewage disposal plant costing about $22,000, to be raised from bond issue. Edgar R. Stahl is mayor, and F. G. Jackson is clerk.

BELLEFONTAINE, O. — City plans purchase of water, light and gas plant equipment. Five gas generating benches will be rebuilt, and coal handling and storage equipment installed, with necessary appurtenances. Total cost will be around $28,000. T. C. Vanica is service director, and F. M. Baxley is utilities engineer.

CINCINNATI — City plans construction of waterworks pumping station to cost $3,100,000, and maturity is dependent on PWA approval. C. A. Dykstra is city manager, and Albert S. Hibbs is waterworks superintendent.

CINCINNATI — Harry F. Wagner, city purchasing agent, 162 City Hall, has been authorized to purchase a 115-horsepower diesel stationary engine directly connected to a 75-kilowatt, 25-volt, 700-revolutions per minute electric generator, for installation at the city waterworks. Cost will be about $7000. C. A. Dykstra is city manager.

CIRCLEVILLE, O.—City has applied to PWA for aid in constructing proposed $136,363 sewage disposal plant, of which city's share would be $75,000. William J. Braham is mayor, city engineer David Courtright, and consulting engineer Floyd Browne, Marion, O.

CLEVELAND—White Motor Co., 842 East Seventy-ninth street, plans a large expansion program for 1937. More than $2,000,000 will be spent for new machinery and tools, property repairs and building construction. A new 14,000-square foot plant will be built for manufacturing heavy-duty coach bodies. Robert F. Black is president.

COLUMBUS, O. — City is taking bids due noon March 11 for a 30-million-gallon low lift electric centrifugal pump. O. J. Swisher is secretary of board of purchase, 90 West Broad street.

COSHOCTON, O. — Muskingum Valley Farm Bureau Electrification Co-operative association, E. C. Darling, manager, care of Ohio Farm Bureau, 620 East Broad street, Columbus, plans to erect rural lines in Coshocton county, and an REA loan of $144,000 has been secured. Carl Frye is engineer, same address.

FINDLAY, O. — North Central Rural Electric Co-operative Inc., L. B. Keller, Tiffin, O., president, care of Ohio Farm Bureau, 620 East Broad street, Columbus, plans erection of rural lines. An REA loan of $270,000 has been granted. Carl Frye is engineer, same address.

LORAIN, O. — Ohio Public Service Co., E. J. Burger, local manager, Broadway and Eighth street, is considering installation of a 50,000-kilowatt hour turbine plant, and construction of buildings to house it. Cost would be approximately $5,000,000. Toledo and Warren, O., are also being considered as sites.

OHIO CITY, O. — City is taking bids due noon March 12 for two 150-horsepower and one 75-horsepower diesel engines and auxiliaries. M. L. Skinner is mayor and engineer is Carl J. Simon, Van Wert, O.

PAINESVILLE, O. — City has completed survey of proposed light plant improvements, and installation of a 550-horsepower boiler, a steam turbine, and other equipment costing about $80,000 has been recommended. First contracts will be awarded around April 15. Engineer is F. O. Wallene, 17114 Ernadale avenue, and care of the department of public utilities, City Hall, Cleveland.

SIDNEY, O. — City is completing plans for additions to waterworks plant, and will be ready for bids about March 15. A 500,000-gallon elevated steel tank will be erected and a diesel engine driven generator set and appurtenances installed. Rolla Loughlin is mayor and Albert I. Guerry is service director. Engineer is Floyd E. Browne, Marion building, Marion, O.

SPRINGFIELD, O.—Crowell Publishing Co. plans to build a 6-story, $500,000 printing plant for which engineers and architects are Hillsmith & Co., 108 East Third street, Dayton. Bids will be asked soon.

ST. CLAIRSVILLE, O. — Village is taking bids due March 16 for construction of a sewage treatment plant and distribution system. D. D. Bradfield is mayor and Jennings-Lawrence, 12 North Third street, Columbus, O., engineer.

WARREN, O. — City will ask bids soon for construction of a water softening plant and for improvements at present waterworks. Cost will be around $100,000. Dan B. Gutelius is service director, and Hoover & Montgomery, 8 East Long street, Columbus, are engineers.

YOUNGSTOWN, O.—McKay Machine Co., West Rayen street, will ask bids in about 30 days for construction of 1-story, 44 x 150-foot factory estimated to cost $100,000. Another smaller manufacturing unit will be built later in the spring.

Connecticut

GROTTON, CONN.—Board of utility commissioners, borough department of water and electricity, plans construction of a new water filtration plant costing over $25,000. PWA aid will be sought.

MONTVILLE, CONN. — Connecticut Power & Light Co., 36 Pearl street, Hartford, plans to build a 25,000-kilowatt turbogenerating plant in Montville. Cost will be $1,528,000. This work is part of the total planned for 1937, which is estimated to cost $5,029,099.

NEW HAVEN, CONN.—Schiavone & Sons Inc., South Front street, plans to build a 2-story, 35 x 114-foot machine shop costing $40,000. Architect is L. F. Caproni, 1221 Chapel street.

New York

BRIGHTON, N. Y.—H. H. Clapp Inc., 1328 University avenue, Rochester, plans construction of a factory on Highland avenue. Cost is estimated at over $100,000.

CORNING, N. Y.—Corning Glass Works, Walnut street, plans to build a 3-story, 60 x 100-foot plant addition on Tioga street. A. Valksdall is chief engineer of the company.

DUNKIRK, N. Y. — Dunkirk Radiator Co. is starting construction of a large addition to its foundry.

ELMIRA, N. Y.—City plans construction of a sewage treatment plant estimated to cost $90,000.

NIAGARA FALLS, N. Y. — Hooker Electrochemical Co. will build an addition costing $50,000 to its factory. Laur & Mack, Niagara Falls, have general contract.

SYRACUSE, N. Y.—Syracuse Stamping Co., South Clinton street, plans to build a factory addition costing $50,000. Architect is B. Dawson, Union building.

Pennsylvania

CHAMBERSBURG, PA.—Muth, McGee & Geary Foundry Co. plans to rebuild its foundry which was badly damaged by fire recently. Estimated cost is $50,000.

NEWCASTLE, PA.—Pennsylvania Power Co., 19 East Washington street, and Youngstown, O., will take bids probably next month for a steam-operated electric generating plant on a site recently acquired in Lawrence county. T. L. Paden, same address, is company engineer in charge. Total cost will be about $2,800,000. (Noted STEEL, March 1.)

NEW KENSINGTON, PA. — American Shim Steel Co. has been incorporated by Thomas, Charles and Bessie Best.

Michigan

GRAND BLANC, MICH.—City is taking bids due 8 p.m. March 16 for waterworks construction, to include pumphouse, installation of pumping equipment, water supply system and erection of 100,000-gallon elevated steel tank. Arnold E. Nelson is city clerk, and Ora F. Gould, 736 Evergreen street, Flint, is engineer.

PONTIAC, MICH. — City is making preliminary plans for new sewage treatment system. H. P. Jones & Co., 2012 Second National Bank building, Toledo, O., is engineer. W. P. Edmundson is city manager.

STURGIS, MICH. — Harter Co., manufacturer of tubular steel office furniture, will expand its factory, and general contract has been awarded. E. C. Harter is president.

Illinois

BREESE, ILL.—City will hold a special election in April to vote on construction of water purification plant and erection of elevated steel storage tank. Cost will be around $47,000, and PWA aid will be sought.

SPRINGFIELD, ILL. — Hummer Mfg. Co. plants were damaged by fire recently, and machinery and the assembly plant gutted. Company is a division of Montgomery Ward & Co., Chicago.

Indiana

SOUTH BEND, IND.—Board of public works, T. Freymermuth, chairman, will ask bids soon for construction of a sewage disposal plant costing $2,298,000. Burns & McDonnell Engineering Co., 107 Linwood avenue, Kansas City, is engineer.

Alabama

BIRMINGHAM, ALA.—Southern Steel Works Co., post office box 283, is looking for a gate shear, ½ to ¾-inch capacity, 8 to 12-inch gap.

Georgia

ALBANY, GA.—Cudahy Packing Co.,

(*Please turn to Page* 96)

(Concluded from Page 94)

F. E. Wilhelm, first vice president, 221 North LaSalle street, Chicago, plans expansion of its local plant.

ATLANTA, GA.—City plans construction of a filtration plant costing $695,000, and W. Zode Smith, City Hall, is engineer.

JACKSON, GA. — REA has allotted $202,000 for rural power lines serving Butts, Jasper, Henry, Monroe, Lamar and Spalding counties.

MACON, GA. — Bibb Mfg. Co. plans to build a 3-story addition, 50 x 200-feet, costing over $100,000, to its local mill. Two other 3-story mill extensions will be built, one at Columbus, Ga., 75 x 200 feet, and one at Porterdale, Ga., 50 x 200 feet, each to cost about $100,000. Q. R. Nolen, 221 Buford place, Macon, is engineer for all three plants.

ROME, GA.—City plans to make waterworks system improvements estimated to cost around $240,000. A new filtration plant will be built. Wiedeman & Singleton, Candler building. Atlanta, are engineers.

THOMASVILLE, GA.—City will take bids soon for improvements to waterworks and sewerage system. Estimated cost is $94,000, and engineers are Wiedeman & Singleton, Candler building, Atlanta.

New Hampshire

LACONIA, N. H.—City plans to build a sewage disposal plant estimated to cost $200,000. Engineers are Metcalf & Eddy, 1300 Statler building, Boston.

Kentucky

ASHLAND, KY. — City plans expansions and improvements to its waterworks system, and pumping equipment will be installed. Cost will be around $685,000. A. T. V. Somerville is city engineer.

Louisiana

BATON ROUGE, LA. — Standard Oil Co. of Louisiana, M. J. Rathbone, president, Louisiana National Bank building, will start work within three months on a $2,750,000 lubricating plant addition to its refinery.

NEW IBERIA, LA. — George M. Germany, P. A. Landry, and Jack S. Landry plan to construct a co-operative sugar mill near New Iberia, at a cost of $700,000, and will ask bids soon.

NEW ORLEANS—Equitable Equipment Co., dealer, 410 Camp street, is in the market for a 30-ton locomotive crane, 8-wheel, standard gage, diesel powered, with a 40-foot beam.

Mississippi

OXFORD, MISS. — Board of aldermen will receive bids March 22 for a 750-horsepower diesel engine complete with auxiliary equipment. W. T. Chandler is city clerk, City Hall.

North Carolina

GASTONIA, N. C. — Ragan Spinning Co. will build a $150,000, 135 x 200-foot addition to its mill on the Gastonia-Bessemer road, and H. V. Biberstein, Charlotte, is architect.

CHARLOTTE, N. C.—City will hold special election March 16 to vote on extensions to waterworks, estimated to cost $1,365,000. J. B. Marshall is city manager.

GULF, N. C. — Deep River Coal Co. is in the market for a 10-mesh hammer mill and for a 75-horsepower electric generator.

PLYMOUTH, N. C.—Kieckhefer Container Corp., Delair, N. J., is starting work on its new paper and pulp mill. James Stewart & Co., New York Central building, 230 Park avenue, New York, has general contract. H. R. Gullin is purchasing agent for the Kieckhefer company.

Oklahoma

BLACKWELL, OKLA. — City has voted $50,000 bonds for installation of boiler at city power plant. E. E. Tierney is superintendent of public utilities, City Hall.

KINGFISHER, OKLA. — Consumers Electric Co. has been allotted $300,000 by REA for erection of rural lines.

RANDOLPH, OKLA.—Oklahoma Gas & Electric Co., 321 North Harvey street, has preliminary plans for construction of a steam turbine generating plant on the Washita river. Estimated cost is $1,000,000, and engineer is Byllesby Engineering Co., 231 South LaSalle street, Chicago.

TULSA, OKLA. — Sunray Oil Co. will build a second cracking unit and Arthur G. McKee & Co., 2422 Euclid avenue, Cleveland, has general contract.

Texas

BARTLESVILLE, TEX. — Phillips Petroleum Co. will let subcontracts in about four weeks for first work in connection with construction of a combination gasoline plant and polymerization unit to be built in Cass county at a cost of approximately $1,250,000.

HOUSTON, TEX. — Shell Petroleum Co. will build an absorption unit for refinery gases at its plant on Houston Ship Channel at Deer Park, and general contract has been given to American Locomotive Works, New York.

HOUSTON, TEX. — Champion Paper & Fibre Co., Rubian B. Robertson, executive vice president, Hamilton, O., is considering construction of a paper mill, and decision will be made within 90 days. W. O. Crute is plant manager of present pulp mill at Houston.

MT. PLEASANT, TEX. — Talco Asphalt & Refining Co., care of Capt. J. F. Lucey and Ralph E. Fair, Continental building, Dallas, Tex., plans to construct a refinery, including cracking and reforming units, Dubbs design power generating units, boiler house, machine shop, and other buildings, at an estimated cost of $600,000.

PALESTINE, TEX. — Fred M. Allison, Corsicana, Tex., and associates plan construction of gasoline casinghead plant on 44 acres in Henderson county.

Wisconsin

CHIPPEWA FALLS, WIS.—Board of education will take bids in the near future for wood and metal working machinery for new $200,000 vocational institute. John J. Nibble is secretary of board.

NEENAH, WIS.—Kimberly-Clark Corp., paper manufacturer, plans to construct a new machine room, 133 x 183 feet, and a 4-story warehouse, 80 x 254 feet, estimated to cost $500,000 with equipment. C. B. Clark is secretary.

WAUSAU, WIS.—City council has applied for PWA grant of $602,879 for proposed garbage and sewage disposal plant estimated to cost $1,339,731. Jerry Donohue Engineering Co., Sheboygan, Wis., is engineer, and J. L. Brown is city clerk.

Kansas

HIAWATHA, KANS.—City plans to make improvements to waterworks system costing about $38,000. Mayor is N. Reynolds, City Hall, and engineers are Black & Veatch, 4706 Broadway.

PAOLA, KANS. — City plans to construct a new municipal light plant and distribution system and remodel and expand its waterworks system at a cost of $225,000. Engineer is W. B. Rollins & Co., 339 Railway Exchange building, Kansas City, Mo.

PARSONS, KANS. — City is considering construction of a water supply system to cost about $340,000, Engineers are Black & Veatch, 4706 Broadway, Kansas City, Mo.

Iowa

ACKLEY, IOWA — City is taking bids due March 22 for power plant equipment, including a 375-horsepower diesel engine with a 250-kilowatt generator, exciter, and various auxiliary equipment. Cost will be about $34,500. Ralph W. Gearheart, Cedar Rapids, Iowa, is engineer.

ALBION, IOWA—Butler County Rural Electric Co-operative has been allotted $105,000 by REA for erection of rural lines in Butler, Franklin, and Bremer counties.

IOWA FALLS, IOWA — Federated Co-operative Power association has been allotted $225,000 by REA for construction of a generating plant.

IOWA FALLS, IOWA — Hardin County Rural Electric Co-operative has been allotted $100,000 by REA for erection of rural lines in Hardin and Franklin counties.

POCAHONTAS, IOWA — Central Electric Federated Co-operative association will build a generating plant and has been allotted $185,000 by REA.

Nebraska

IMPERIAL, NEBR. — City has rejected all bids for construction of a sewage disposal plant and will probably advertise again soon. Estimated cost is $25,175, and Black & Veatch, 4706 Broadway, Kansas City, Mo., are engineers.

Pacific Coast

SEATTLE — Puget Sound Machinery Depot, plate fabricator, is building three pipe-coating shop buildings at 3451 First avenue South.

SEATTLE — Boeing Aircraft Co. is reported considering building another assembly plant to match the $300,000 one recently completed. C. L. Egtvedt is president.

SEATTLE — City plans purchase of various equipment for light plant, including a 50-ton electric bridge crane and an addition to the bank of transformers. The Taylor street electric substation will be extended at a cost of $350,000.

Canada

FORT WILLIAM, ONT.—Syndicate, care of C. W. Cox, Fort William, plans to build a bleached pulp mill costing $3,000,000. Engineer care of owner.

ST. CATHERINES, ONT.—McKinnon Industries Ltd., Ontario street, plans construction of a foundry costing $40,000, and bids will be asked soon. A. E. Nicholson, 46 Queen street, is engineer.