

STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

For forty-eight years—IRON TRADE REVIEW

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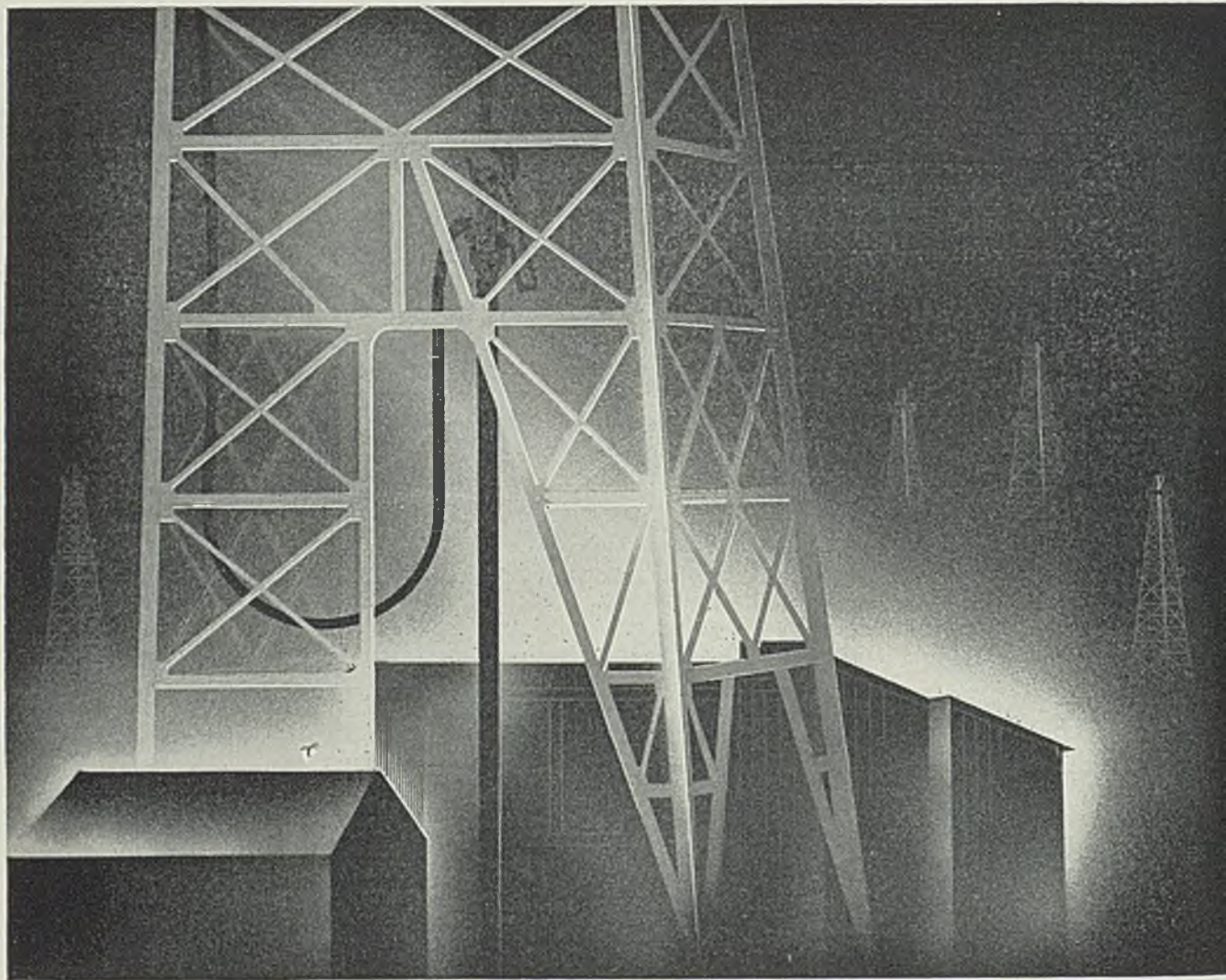
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CUTS COSTS

CREATES SALES

As the Editor Views the News

ONE important result of the recent depression and the present recovery is that individuals in places of great responsibility in business and industry are being compelled to pay more attention to trends of public opinion. Dr. Virgil Jordan touched on one aspect of this problem (p. 17) when he declared that the "political puppet show—the perennial Punch and Judy spectacle of modern party politics—is more important and absorbing to the great mass of every people than the vast drama of struggle and achievement called business through which they meet and deal with the fundamental facts of life."

• • •

Everyone knows that this is true and that the failure of the public generally to understand and appreciate the problems of the wealth-creating agencies of our economic system—industry and agriculture—is responsible for the ease with which dangerous legislation can be enacted today. Business and industrial executives are

Don't Underrate Public Opinion!

somewhat to blame for this condition, not because they oppose or are cautious about liberal ideas (p. 31), but because they underrate the value of public opinion and, with some noteworthy exceptions, have not made a serious attempt to understand the attitude of the man in the street or to help him to appreciate the true role of industry.

• • •

When steel ingot production for 1936 is totaled, it will approximate that of 1926. This fact facilitates comparisons between the character of output in two

Shift Marked in Decade

years a decade apart. Most significant (p. 14) is that whereas 30 per cent of the output of steel in 1926 was devoted to plates, shapes and bars, only 20 per cent of the production in 1936 is going into these products. Also, sheets, strips and tinplate, which accounted for 20 per cent of the total in 1926, will take about 40 per cent in 1936. This represents a significant shift, and

there has been abundant evidence recently that industry in taking cognizance of it in its planning for the future. At Birmingham last week, Chairman Taylor of U. S. Steel announced an extensive expansion program for the Tennessee subsidiary (p. 15), which provides for continuous strip and tin mill capacity.

• • •

Industry undoubtedly has enough difficulty in trying to interpret existing laws affecting business without borrowing trouble from the future. Nevertheless,

Another Patman Bill Looms

the amendment to the Clayton act which Representative Patman proposes to introduce at the next session is so drastic that no time should be lost in trying to sidetrack it effectively. The proposed amendment (p. 29) would make it unlawful for a manufacturer to ship in interstate commerce any product or material "produced by such manufacturer for sale or distribution at retail by such manufacturer or by an affiliate of such manufacturer." Obviously, the intent is to break up direct selling by manufacturers. Although the proposed bill would not take effect until three years after its enactment, it would certainly force revolutionary changes in existing methods of distribution, and probably without curbing the abuses it aims to eliminate.

• • •

STEEL'S weekly cable from abroad (p. 81) reports that steel production in Great Britain in September, amounting to 1,027,000 gross tons, established a new all-time record. Previous all-time

Steel at Record High in England

peaks had been attained in March and April of this year. This thrice-repeated achievement in seven months is an indication of the degree to which England has recovered from depression. American business men returning from visits abroad report increasing activity, which in several countries has reached the point where the pressure of domestic demand is causing manufacturers to neglect their export markets. Reverberations of this condition are beginning to be felt on this side of the Atlantic. It is almost certain that the attention of American manufacturers in the near future will be attracted more and more by opportunities in Europe.

E. L. Shaner

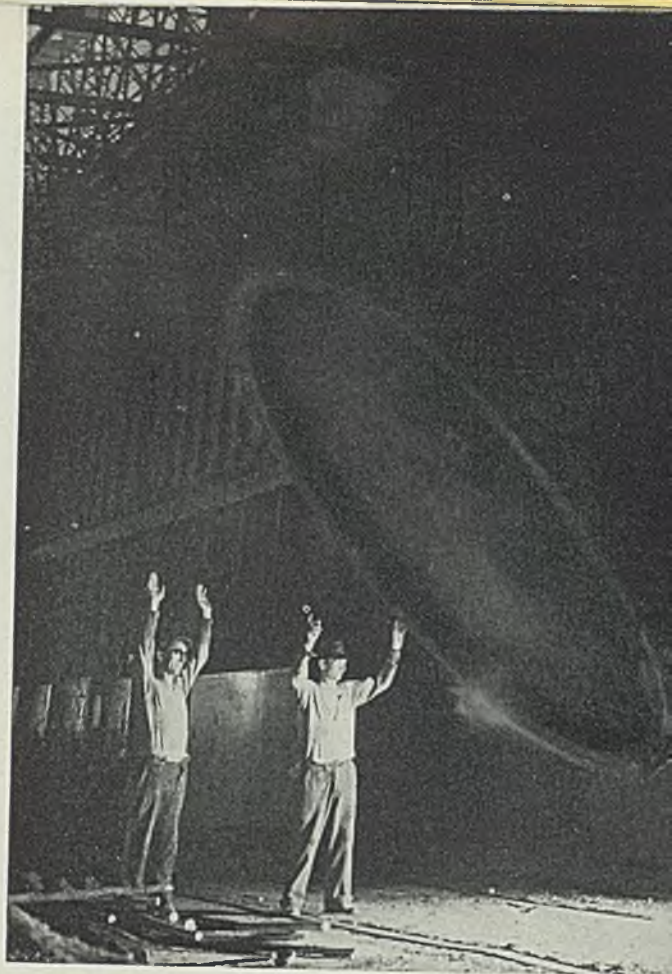
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1936 Ingot Output Level

With 1926; Finished

Steel Vastly Different

◆



STEEL production this year will closely approximate that of 1926, according to present indications. Average operations of slightly less than 76 per cent during the current quarter will place 1936 output on a par with that of ten years ago.

Some of the channels into which steel has been moving recently, however, are vastly different from those through which, in 1926, cursed the then heaviest flow on record. Time has altered the old channels and has created some new ones. It is the latter upon which hopes may be based for the attainment of a new mark in total volume during the future.

Nineteen twenty-six was a good business year. It marked a peak in production of automobiles as well as steel. For the steel industry it was the culmination of the upturn which followed the 1921 depression. Its steel output has been exceeded only by those of 1928 and 1929. United States Steel common sold at a new high of 160½, not to be topped until the 1929 bull market.

Early in the recent business recovery, 1926 conditions and values frequently were mentioned as a pattern after which to fashion—a par at which to shoot. Ten years ago the full flower of the post-war boom had not yet arrived. In various ways 1926 fell short of the unsound heights scaled in 1928 and 1929 before the top-heavy structure tumbled, and in that respect it has been considered a year of more nearly ideal conditions than those immediately preceding the crash.

Now, seven years after the collapse, steel production has dragged

the depths and returned to the highly desirable level of a decade ago.

Business conditions today, however, have not recovered universally to the 1926 level. Some industries are far more active than they were ten years ago, while others have lagged. Unemployment in 1926 was not the problem it is today, though there are some 12,000,000 more people now in the United States than at the earlier date. The seeming paradox of parity in steel production and unfavorable comparisons in some other industries may be explained in part by an examination of steel distribution figures for the two years.

More Steel for Automotive

First, consider steel consumption by the automotive industry. As in steel ingots, production of motor vehicles in 1936 should be almost a stand-off from that of the 1926 output of 4,505,661 units. To match the latter figure requires the production of about 1,160,000 cars and trucks this quarter, or only about 10 per cent more than were turned out in the fourth quarter last year.

Steel consumption will show a gain, however, because of the increase in steel in the cheaper cars. In 1935, for instance, STEEL's figures on distribution of finished steel products indicated a gain of nearly 15 per cent over 1926 in automotive steel use, despite a decrease of 9 per cent in number of units produced.

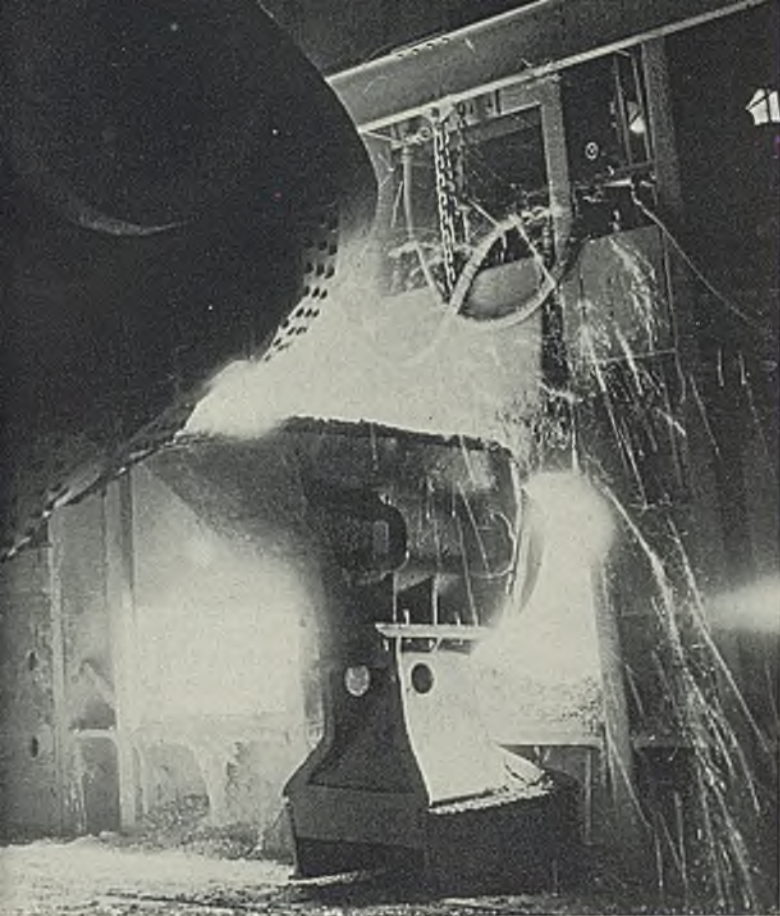
UP SHE goes! Pouring 50 tons of hot metal into an open-hearth furnace. With steelworks operations slightly above 65 per cent so far this year as much raw steel is being made as in 1926, when operations were 84 per cent

Ten years ago the motorcar industry took 14.7 per cent of total finished steel output. This year, even with comparable productions of both vehicles and steel, the percentage will be only a few points higher.

Turning to the railroads, a markedly different picture is revealed. In 1926 the carriers accounted for 22.7 per cent of all finished steel sold. Rail production was 3,217,649 tons, the highest since 1913. Freight cars ordered totaled more than 60,000.

This year, rail rollings will do well to approach one-third the 1926 figure, while car awards for the first nine months numbered only about 37,000. The railroads have increased their steel purchases sharply since a year ago, when their consumption was 7.75 per cent of total production, and may be found to have boosted their share to about 14 per cent when final figures are compiled. This, however, still is far below the 1926 proportion.

Building construction use of steel has followed a course similar to that of the railroads. Building steel rep-



U.S. Steel Launches Into Strip, Tin Plate Production in South

resented about 13 per cent of the total in 1926. Last year, building erection materials accounted for only 7 per cent of the aggregate, while in 1936 the figure is rising moderately but holding well below the 1926 level.

The compensation for the decrease in production of the heavy steel products lies in the marked rise in popularity of flat-rolled material. Tin plate output last year was larger than in 1926 and will show a further gain this year. In ten years the container industry has almost doubled the percentage its steel consumption represents of total production.

Sheets and strip are going to some consumers whose requirements were inconsequential, if not non-existent, in 1926. In certain instances flat-rolled steel has supplanted other steel products or other materials. This trend has been evident in the huge program of continuous mill installations the past several years. As a result, sheets and strip have grown to represent about 32 per cent of all finished steel production. In 1926, the percentage was almost exactly one-half the present figure. Bars have held their own, accounting for approximately the same share of the total today as they did ten years ago.

In other words, whereas in 1926 the steel industry was devoting around 30 per cent of its output to the production of plates, shapes and

rails, that slice now is less than 20 per cent. The flow of sheets, strip and tin plate, however, has grown from about 20 per cent in 1926 to 40 per cent today.

This gain in flat rolled steel use is important because in a large measure it represents the acquisition of new markets which likely will be retained. At the same time, the deficiency in use of heavy products by the railroad and building industries is only a temporary loss, and much, if not all of it, will be retrieved in time.

Demand Can Rise Easily

With more complete recovery in building construction and in railroad rehabilitation, steel demand can push ahead more easily than it could ten years ago when the industry's markets were less numerous.

Release of buying which was postponed during the depression has been a big factor in the rapidity of recovery in steel demand since the middle of 1935.

Considerable of this deficiency remains to be released, however, in those industries consuming the heavy steel products; nor does it appear that all of the deferred buying of consumer goods has been set free. This impetus, consequently, may be expected to continue to make itself felt, with the result that a further increase in total steel consumption is possible before the peak of the present movement has been passed.

LARGE expansion of properties of the Tennessee Coal, Iron & Railroad Co. in the Birmingham district will be started immediately, with completion scheduled for early in 1938. The program calls for two batteries of coke ovens, a blooming mill, a continuous 48-inch strip mill, two continuous cold-rolling mills and a tinning mill. According to reliable information the development will cost \$29,000,000.

Announcement of the new program was made by Myron C. Taylor, chairman of the United States Steel Corp., of which the Tennessee company is a subsidiary, at a luncheon last Thursday in Birmingham, attended by nearly 600 prominent citizens of Alabama and the South. William A. Irvin, Steel corporation's president also was a speaker, and supplied the practical details of the program.

He stated that the new blooming mill will furnish slabs for the continuous wide strip mill, which will provide flat steel as light as 18 gage and in widths up to 48 inches and which will have a capacity of 300,000 tons a year.

"This will be supplemented," he added, "by two continuous cold-rolling mills of latest design, capable of producing light-gage plates for all kinds of deep-drawing and highly finished sheets, such as are used for tin plates and other difficult stampings. Each mill will have a capacity of 100,000 tons per annum. A tinning department, with a capacity of 4,000,000 base boxes of tin plate, will be added to provide tin plates for the ever-growing demands of the packing industry.

"When this extensive building

program is completed, early in 1938, the Tennessee company's new mills will employ about 2500 men, in addition to the 17,000 who are at present employed—at the highest wage rates in the company's history."

"Since 1907 vast sums have been expended in this district for additional facilities and improvements. Some idea of this may be gained from the following facts:

"In 1907 annual ingot capacity was 500,000 tons. Today it is 1,784,000 tons. In 1907 the annual finished steel capacity was 400,000 tons; now it is 1,600,000 tons.

"When the United States Steel Corp. acquired the Tennessee property it produced only rails, plates and bars. Since that time, the facilities have been installed for a wide diversification of steel products, including black and galvanized sheets; splice bars, spikes, axles, forgings and sundry other steel products.

"When the United States Steel Corp. purchased control of the Ten-

Tennessee Subsidiary's Present Facilities

(Tons, Yearly Capacity)

Ingot and castings	1,802,000
Finished steel products	1,600,000
Rails	483,600
Wire and wire products.....	293,100
Black sheets	153,800
Bars	154,800
Splice bars, tie plates.....	142,100
Galvanized sheets	125,500
Plates	108,000
Wire rods	103,900
Structural shapes	84,000
Hoops, ties, baling wire.....	60,000
Bolts, nuts, rivets, etc.....	36,200
Forging blooms and billets ..	19,400
Coke	1,582,000
Pig iron and ferroalloys.....	1,604,000

To Which Will Be Added

Two batteries of coke ovens.. ..	.....
One blooming mill .....	.....
Continuous wide strip mill...	300,000
Two cold-rolling mills.....	200,000
Tinning department:	
4,000,000 base boxes tin plate.	

nessee company labor conditions in the Birmingham district were extremely bad, and the problem of retaining the services of satisfactory workers was acute. Workers were dissatisfied with conditions under which they were forced to perform their duties; there was a lack of that broad public welfare spirit which today characterizes the corporation in all its departments . . .

"The Tennessee company has never lost sight of its social responsibilities. It operated throughout the depression at a loss of \$17,000,000. In doing so it was able to provide some degree of employment for many thousands of its workers and to assist with more millions in extending relief to those who were unable to find work.

"In continuing to make very substantial investments in this district, the Corporation is giving concrete evidence of its faith in the future development of industry and prosperity in the South."

"Rhythm of Recovery Re-established," Says Taylor

PLANS such as ours are essential not only to continued success of the Corporation, but to serve the nation, to create wealth for the public who are its owners, and to secure a larger measure of employment for those who are engaged in its activities," said Myron C. Taylor, chairman, United States Steel Corp., in addressing the Birmingham group when the southern expansion plans were announced.

"A business enterprise, especially a large one like ours, cannot be successfully conducted, even if it would, for the benefit of any one group. It must seek to balance in equitable relationship the interests of the public, the owners, the workers. That is not always easy, as many unforeseen factors enter our daily lives, and the future is not always quite clear. But we must attempt to envision the future as well as the present, if we would survive in a moving competitive world.

Early Generations Credited

"These great plants and systems through which our Corporation is operated, and its products distributed, do not represent the labor and intelligence of our generation alone, nor of any one generation. This productive inheritance of the nation has its roots far back in American enterprise and American history.

"These plants, and the arts by which our products are created and distributed, are the result of the courage, tenacity and foresight of many generations of fine men—men in whom these deeply rooted American characteristics were pre-eminent.

"In no part of our history have

these attributes been more splendidly apparent than in the manner in which our people have faced the emergencies of the past seven years. I feel impelled in all seriousness to express a feeling of satisfaction and of gratitude that together we have had the courage to overcome so many of our most trying problems.

"Happily the tide has turned, the rhythm of recovery has been re-established. It has assumed sufficient volume to enable us to operate the great plants of our Corporation in this district and elsewhere for a sustained period of six months at 65 to 70 per cent of their capacity. They are now operating at more than 70 per cent . . .

"We believe that we read these signs aright at this time, and that the revival which we have seen and are witnessing in the earlier stages is the beginning of a progressive resumption of full operation of America's vast productive enterprises.

"In this long and trying period of slackness, there has accumulated what I may well describe as a tremendous need which soon will translate itself into absolute necessity for a vast amount of materials to supply these deficiencies.

"I venture to say that if the railroads of the country alone were called upon to operate in a fully normal way, necessitating that they proceed with their usual plans for improvement and development, this would produce a great volume of business and furnish much employment. The same may be said of the construction industry, the public utility industry and related enterprises. These industries too must soon break their bonds and go into action.

"And so it is that if you follow

through the whole gamut of our American life, you will find enormous unsatisfied needs which must be supplied, and as each day passes those needs become more acute and the volume becomes greater. Once we fully realize this tremendous potential opportunity for the employment of human energy, we cannot fail to push forward, as in the past, in all branches of our productive and distributive activities. When this tide reaches full flow, unemployment, which has been our greatest problem, will largely solve itself. No one can longer doubt that this improvement is actually under way and gaining impetus with the passing of each day.

"The purpose of our visit to Birmingham would be in itself sufficient evidence that we believe in the future of America; that we believe in the future of the South; that we are willing for the interests which we represent to back this belief."

Steel Corporation Lists Division of Stock Holdings

Common stock of the United States Steel Corp. outstanding Sept. 30, amounted to 8,703,252 shares while preferred stock amounted to 3,602,811 shares, the corporation announced last week.

Of the common stock 2,046,525 shares, or 23.51 per cent, were in brokers' names, representing an increase of 69,553 shares over the 1,976,972 shares, or 22.72 per cent, held by brokers on June 30, 1936. Investors common stock holdings on Sept. 30 were 6,656,727 shares, or 76.49 per cent, compared with

6,726,280 shares, or 77.87 per cent, on June 30.

Of the preferred stock outstanding 417,148 shares, or 11.58 per cent, were in brokers' names on Sept. 30, an increase of 11,644 shares over the 405,504 shares, or 11.25 per cent, so held on June 30. Investors' holdings of preferred amounted to 3,185,663 shares, or 88.42 per cent of the outstanding issue on Sept. 30, compared with 3,197,307 shares, or 88.75 per cent, held by them on June 30.

Foreign holdings of Steel common Sept. 30 amounted to 592,858 shares, or 6.81 per cent of the issue, compared with 608,570 shares, or 6.99 per cent, so held on June 30. Of the preferred stock 75,385 shares, or 2.09 per cent, were owned abroad on Sept. 30, as against 74,812 shares, or 2.08 per cent, so held June 30 last.

Steel Plant's Community Day

The Shenango works of Carnegie-Illinois Steel Corp., New Castle, Pa., was host to citizens of Lawrence county, Pennsylvania, Oct. 14, when "Community Day" was observed—the first time such an event has been held by the local plant. Carl E. Crawford, the new general superintendent of the Shenango plant, opened the division for public inspection from 10 a. m. to 6 p. m.

Greatest Issues Are Never Settled By Politics, Says Virgil Jordan

THE prosperity and security of all the people in this country comes and can come only out of the work they do; there is no other formula for prosperity and security, said Dr. Virgil Jordan, president, National Industrial Conference board, in an address at a joint meeting of the Cleveland chamber of commerce and Associated Industries in Cleveland, Oct. 14.

"We imagine our productive system is self-operating, an inexhaustible horn of plenty which can pour forth without limit or effort. This is an illusion of mass ignorance arising from the fact that an insignificant fraction has played any part in creating the marvels that make our existence possible.

World Not Fully Civilized

"Although in their everyday life they may use all the marvelous gadgets of modern civilization, the great majority of the populations of all countries remain essentially primitive with the minds of children.

"Here is an unparalleled paradox of

our time. The political puppet show, the perennial Punch and Judy spectacle of modern party politics, is more important and absorbing to the great mass of every people than the vast drama of struggle and achievement called business, through which they meet and deal with the fundamental facts of life.

"Why, then, do these vast masses of people live under the amazing and almost universal illusion that business is something separate from their lives, an incidental nuisance, a devil against which the state and its political priesthood must everlastingly struggle to protect them?

"It is no wonder, therefore, that when the delicate machinery of human co-operation in the struggle for existence, which we call business, slips somewhere and slows down for a time, the spell of the political superstition should grip the crowd and make it seek consolation or compensation from the gods of government.

"It is true that at times, as at present in this country, great questions and decisions may lie beneath

Guild Spirit Still Lives; Sons Follow Their Fathers



HERE are 28 fathers and 29 of their sons—all employed by J. Wiss & Sons Co., Newark, N. J., manufacturer of shears, scissors, snips and similar products. Each father has a son immediately behind him. Seventh from the left is J. Robert Wiss, president, with his son, Richard. J. Robert's father, F. C. J. Wiss, was president until he died three years ago; and his grandfather, Jacob Wiss,

founder of the company in 1848. On the right of Mr. Wiss is Frederick H. Rauh, general superintendent, with his son, Frederick. Mr. Rauh's father was superintendent before him.

The Wiss company has men in active service who worked for the founder nearly 60 years ago. The company employs 360, of whom 16 per cent are in this father-son group.

the surface of politics. But these issues are rarely recognized by any great number of people. Such issues are never settled by political campaigns, speeches or even directors' decrees. They are finally decided by the facts, and they are ultimately grasped only through the actualities of experience of those involved in them."

Carnegie Recognizes Centralized Council

Last week after a three-day meeting of two delegates from each plant of Carnegie-Illinois Steel Corp. was concluded, the management recognized a Pittsburgh district general council to deal on major issues.

The first action of this council was to place a formal request for an immediate increase in wages. The council then recessed until Oct. 20, for further negotiations.

The council is limited to 18 men recruited from 399 employe representatives in nine Carnegie-Illinois Steel Corp. plants.

B. F. Bennett, an employe of the Granite City Steel Co., Granite City, Ill., was elected president of the Amalgamated Association of Iron, Steel and Tin Workers for the year beginning Jan. 7. He succeeds Michael F. Tighe, retired. A member of the Amalgamated since he went to work at the age of 14, Mr. Bennett promised a "business-like-campaign to organize steel workers."

Otis Steel Denies Report Of General Wage Advance

Otis Steel Co., Cleveland, through its president, E. J. Kulas, last week denied reports from trade union sources of a general wage advance affecting 300 workers, after production had been cut by the men with the assertion "a fair day's work for the wages paid."

"This is not in keeping with the facts," said Mr. Kulas. "We have made adjustments in our method of computation of wages in our sheet mill warehouse as we frequently do in other departments in an endeavor to keep our wage costs dependent on the amount of tonnage produced."

H. A. Brassert and Oil Refinery Engineers Join

The Ralph M. Parsons Co., Chicago, refinery engineer and contractor, and H. A. Brassert & Co., Chicago and London, consultants and contractors in the steel industry, are now associated.

The Parsons company, which spe-

cializes in design and construction of Dubbs cracking units, built the \$2,500,000 Wilshire refinery recently completed at Los Angeles, and plants for the Big West Oil Co., the Home Oil & Refinery Co., and the Independent Refining Co. in Montana, as well as the Malco refinery at Artesia, N. Mex.

The Brassert company has a notable record of achievement in the design and construction of steel plants and steel plant equipment, including the new Corby plant in England, which is one of the largest in Europe. Mr. Brassert has worldwide contacts in the oil industry as well as in steel.

Each company keeps its own identity, management and organization, but they work together and their combined engineering and financial resources are at the services of refiners everywhere. Offices of both companies are at 310 South Michigan avenue, Chicago.

All-Steel Welded Ferry For Straits of Mackinac

An all-steel electric welded automobile ferry and ice breaker for use in the straits of Mackinac, from Mackinaw City to St. Ignace, Mich., is to be built by the Michigan state highway department, Lansing Mich.

Bids have been obtained by the department. The ferry is to be 372 feet long, 75 feet beam and 22 feet molded depth and will require 2500 to 3000 tons of steel, mainly plates. It will be powered by diesel motors, and will have a capacity for 150 automobiles.

This vessel will be added to the fleet now in service between upper and lower Michigan under control of the state highway department. Date of completion is set for June, 1937.

Machine Tool Orders Lower in September

A considerable recession during September reversed the upward trend in machine tool orders, for the first time in ten months. The index compiled by the National Machine Tool Builders' association, Cleveland, dropped to 118.5, down 20 per cent from the July high point of 150.

Domestic orders have been receding since April. The summer rise in the index was due to increased foreign business. In September foreign orders were about 30 per cent of the total.

"The three-months' trend line points downward," the association reports. "It is not possible to estimate the extent to which election uncertainties and anticipated tax dif-

ficulties are contributing to continued slowing down of domestic business, but that they represent distinct hurdles to be overcome is accepted beyond question."

Longest Stainless Steel Train, 12 Cars, Exhibited

The longest streamlined train in the world, the light-weight, stainless steel Denver Zephyr of the Burlington railroad, rolled out of the shops of the Edward G. Budd Mfg. Co., Philadelphia, Oct. 15, with more than 200 Philadelphia business and professional men as passengers, and left for New York where it was on exhibition.

The train, one of two Denver Zephyrs built by the Budd company for over-night service between Chicago and Denver beginning Nov. 8, consists of 12 cars, including Pullman sleepers, cocktail lounge, diner, observation-parlor car, coaches, mail and baggage car, and two giant diesel power cars with a total of 3000 horsepower. These cars are nearing completion in the plant of the Electro-Motive Corp., Chicago, the exhibition run to New York having been made with an electric locomotive.

Post Notices of Social Security Deductions

Steel plants in some districts last Friday were reported to be posting notices advising employes that under the provisions of the federal social security law the following deductions would be made from their wages:

One per cent in 1937, 1938 and 1939; 1½ per cent in 1940, 1941 and 1942; 2 per cent in 1943, 1944 and 1945; 2½ per cent in 1946, 1947 and 1948; 3 per cent annually after Dec. 31, 1948.

These employe payments can not be deducted from the employes' income tax payments, the notices said.

Republic Improving Electric Weld Pipe Mill

Republic Steel Corp. has closed its No. 3 electric weld pipe mill in Youngstown for two weeks while improvements are being made that were authorized some time ago. It is the largest of this corporation's three electric weld mills, with capacity for rolling pipe up to 16 inches in diameter. Capacity will be increased. Similar changes were made on the company's No. 2 mill some time ago.

Present and Proposed Iron, Steel Freight Rates Compared

AWAITING indications as to the railroads' next move on the proposed new freight rates, iron and steel traffic experts last week anticipated a drawn-out controversy, with most opposition coming from interior blast furnaces on the ground that the spread between transportation costs of these pig iron producers and those of lake-front producers would be widened greatly under the contemplated revisions.

While the cost of raw materials for interior and Pittsburgh-Wheeling district furnaces would be increased, lakefront producers apparently would gain a decrease, making the differential between districts the largest in many years, it is said.

How Proposal Would Work

This is because of the proposed rates on iron ore, which at present is subject to a surcharge of 8.96 cents a gross ton, with northern roads dividing the surcharge with lower lake carriers on ore to interior furnaces. Under the carriers' proposal, lake-front furnaces would pay 5 cents a net ton over the present base rate on the rail haul at the head of the lakes from mines to loading docks, but interior and Pittsburgh-Wheeling district furnaces would pay an additional 5 cents a ton on the haul from lower lake unloading dock.

There are no "average" costs of producing a ton of pig iron because of the variance in amounts of raw materials used and methods of transportation, but for purposes of illustrating the effect of the pro-

posed rates, on the basis of a Pittsburgh-Wheeling furnace obtaining all its coal by water, lake-front furnace obtaining its limestone by water, and interior furnaces using both "direct" shipments of ore and dock ore, the cost of a gross ton of pig iron would be increased 5 cents for both interior and Pittsburgh-Wheeling district furnaces, while lake-front producers would have their costs lowered 6 cents.

This is shown in the accompanying table, calculated on the basis of approximately 4000 pounds of ore, 2050 pounds of by-product coke and 900 pounds of limestone, with 70 per cent of the transportation costs chargeable to coke included in the cost of assembling raw materials. Dock storage charges and intra-plant handling charges are not included.

Under these assumptions the per ton differentials between pig iron producing districts are as follows:

	1928	1936	Proposed
Youngstown	\$6.81	\$7.07	\$7.12
Cleveland	5.67	5.92	5.86
Differential	1.14	1.15	1.26
Pittsburgh	\$6.02	\$5.24	\$6.29
Cleveland	5.67	5.92	5.86
Differential .....	.35	.32	.43
Youngstown	\$6.81	\$7.07	\$7.12
Pittsburgh	6.02	6.24	6.29
Differential .....	.79	.83	.83

Rates on coal would be just about the same for lake-front furnaces as under the present surcharge basis.

On finished and semifinished steel, commodity rates would be increased 10 per cent with the maximum of 1 cent per 100 pounds, or 20 cents per ton, net or gross as rated, while column rates would be increased 1 cent per 100 pounds. These changes would result in slight increases or decreases, the increases principally on short hauls, as shown in the accompanying table. Pig iron rates also fall under this classification.

Action on the proposed rates, which were advanced Oct. 1 by the American Association of Railroads for the purpose of replacing the present emergency surcharges which expire Dec. 31, is likely to be taken at a meeting of the executive committee of the National Industrial Traffic League in Chicago, Oct. 20. The carriers are said to desire the assent of the league so that the railroads may file tariffs with the interstate commerce commission

without first docketing the changes for public hearings.

The tariffs, if and when filed, would be subject to protest and suspension by the commission. This is the ordinary procedure, but insistence by the commission that favorable action on a petition to set aside an outstanding order be a condition precedent to the filing of tariffs, may delay any move by the carriers.

Reports from 89 class 1 railroads last week showed that in September they had estimated operating revenues of \$276,012,576, compared with \$237,116,976 in September, 1935, a gain of 16.4 per cent, indicating that the usual late fall decline in carloadings may not be sharp this year. It is estimated that final quarter shipments will be 9.7 per cent above last year.

Rates on Iron and Steel

FINISHED STEEL

(Cents Per 100 Lbs.)

	Present rate		
	Base rate	with surcharge	Carriers' proposal
Pittsburgh to:			
Detroit	26.5	28	27.5
New York	33	35	34
Philadelphia	29	31	30
Cleveland	18.5	19.5	19.5
Cincinnati	26.5	28	27.5
Boston	40	42	41
Chicago to:			
Detroit	25	26.5	26
St. Louis	22	23.5	23
Indianapolis	21	22.5	22
Twin Cities	30	32	31
Milwaukee	0.08	0.085	0.09
Flint	24	0.255	25
Cincinnati	25.5	27	26.5
Cleveland to:			
Toledo	17	18	18
Detroit	20	21	21

PIG IRON

Present rate

From	Base rate	with surcharge	Carriers' proposal
To Saginaw, Mich.			
Detroit	2.10	2.247	2.30
Cleveland	3.50	3.745	3.70
To Columbus, O.			
Hamilton	2.00	2.14	2.20
Cleveland	2.10	2.247	2.30
To Hyde Park, Pa.			
Neville Island	1.26	1.348	1.385
Cleveland	2.65	2.8355	2.85
Youngstown	1.76	1.8832	1.935
To Pittsfield, Mass.			
Buffalo	4.16	4.41	4.36
Cleveland	6.32	6.57	6.52

BILLETS

Present rate

From	Base rate	with surcharge	Carriers' proposal
To Detroit			
Chicago	3.78	4.0446	3.98
Cleveland	3.02	3.2314	3.22
Pittsburgh	4.28	4.5796	4.48
To Dayton, O.			
Chicago	3.78	4.0446	3.98
Cleveland	3.28	3.5096	3.48
Pittsburgh	3.91	4.1837	4.11
To Cleveland			
Youngstown	1.89	2.0223	2.08
Pittsburgh	2.90	3.103	3.10

Rates on Raw Material

CHARGEABLE TO ONE GROSS TON OF PIG IRON

	1928		
	Cleveland	Youngstown	Pittsburgh
Ore	\$3.23	\$4.81	\$5.39
Coke	2.24	1.78	.28
Limestone .....	.20	.22	.35
Total	5.67	6.81	6.02
1936			
Ore	3.38	4.96	5.56
Coke	2.34	1.89	.28
Limestone .....	.20	.22	.40
Total	5.92	7.07	6.24
Under Carriers' Proposal			
Ore	3.32	5.01	5.61
Coke	2.34	1.89	.28
Limestone .....	.20	.22	.40
Total	5.86	7.12	6.29

Sponsors Plan for Modernized Homes

EXPANDING outlets for metals in both cast and rolled forms are indicated with the formal introduction last week of the new Kelvin home, sponsored by Kelvinator Corp. in Detroit. The occasion was signaled by a luncheon tendered 200 leaders in real estate, business, finance and government, Wednesday at the Detroit Athletic club.

The new type of home, 50 of which are now completed or under construction throughout the country, is an electrically-equipped and air conditioned structure, designed for families of moderate means. First buildings are in the \$6500 class. This is said to be the first time that complete year-round air conditioning, electric refrigeration and electric cookery have been made available in homes in this price range, and the volume market which the development has opened up should mean much for suppliers of metal products for home equipment.

In the air conditioning duct system alone, for example, it is estimated that each home requires some 540 pounds of 26-gage galvanized steel sheets.

Assistance for Builders

It is not the intention of the Kelvinator Corp. to enter the home building field, but rather to make available to architects and builders in all localities the benefit of extensive research by Kelvinator laboratories.

Homes are based on standardized floor plans with varied exterior designs and can be adapted readily by the individual architect to local conditions and desires of the owner.

Best known for its development work on electric refrigeration, the Kelvinator Corp. is now embarking upon a new enterprise—in the words of the company's president, George W. Mason, "a scientific approach to the introduction of a new mode of living."

Committee which planned the formal celebration at Detroit included Governor Frank D. Fitzgerald of Michigan; Mayor Frank Couzens of Detroit; Charles R. Hook, president, American Rolling Mill Co.; Mrs. Nels Johnson of the Detroit Federation of Women's clubs; W. E. Levis, president, Owens-Illinois Glass Co.; Walter McLucas, president, National Bank of Detroit; Henry Sheldon, president, Sheldon Land Co.; Henry F. Vaughan, Detroit commissioner of health; T. D. Webb, vice chairman of the federal home loan board; and H. S. Wherrett, president, Pittsburgh Plate Glass Co.

District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended		Same week	
	Oct. 17	Change	1935	1934
Pittsburgh . . .	77	None	46	20
Chicago	76	+ 1	55	27
Eastern Pa. . . .	48½	— ½	38	19½
Youngstown . . .	78	— 2	53	30
Wheeling	95	+ 3	81	23
Cleveland	79½	— 2½	62	31
Buffalo	84	None	50	24
Birmingham . . .	64	None	58½	25
New England . . .	75½	+ 5½	68	40
Detroit	100	+ 5	88	59
Cincinnati	96	+ 6	†	†
Colorado	38	None	†	†
Average	75	None	51	26½

†Not reported.

Production

STEEL production was in close balance last week; slight increases in the Chicago, Wheeling, Detroit, Cincinnati and New England districts offset declines at Youngstown, eastern Pennsylvania and Cleveland, and held the rate at 75 per cent. Other districts were steady. This compares with 51 and 26½ per cent, respectively, in the comparable weeks of 1935 and 1934.

Youngstown—Down 2 points to 78 per cent last week, due to Youngstown Sheet & Tube Co. closing down an open hearth for repairs. This rate will be maintained this week.

Cleveland-Lorain—Off 2½ points last week to 79½ per cent. Corigan, McKinney division of Republic Steel Corp. operated 12 furnaces through Friday, and on Saturday put on an additional furnace. National Tube Co. at Lorain took one furnace off for repairs, scheduling 11, while Otis Steel Co. continued with all 8 active.

Colorado—Unchanged at 38 per cent last week, as six furnaces continued to melt.

Detroit—Up 5 points to 100 per

cent, as all 21 basic open-hearth furnaces were on operating schedule last week for the first time since the steelmaking capacity of the district was increased late in August.

Wheeling—Up 3 points to 95 per cent, based on production schedules in 35 of 37 open-hearth furnaces.

Pittsburgh—Unchanged at 77 per cent, based on the continuation through last week of United States Steel Corp. subsidiaries operating at 75-76 per cent, and an average for the independents at close to 80 per cent. Carnegie-Illinois has 18 of 32 on; Jones & Laughlin, all 11; National Tube, 3 of 4; Pittsburgh Steel, 2 of 2; and Pittsburgh Crucible Steel, and American Steel & Wire, each 1 of 2. Bethlehem has 5 of 7 active at Johnstown, Pa. Pittsburgh Crucible will blow in its second Midland, Pa., blast furnace about Nov. 15.

New England—Rose last week from 70 to 75½ per cent, with indications that the rate will rise to 85½ per cent this week.

Chicago—Increased 1 point to 76 per cent, the fourth consecutive weekly gain and a new high for the year. Pig iron production is being pushed but it is limited at the moment by the amount of capacity available for prompt use. Twenty-five of 38 stacks are active.

Central eastern seaboard—Off fractionally to a spread of 48 to 49 per cent. This reflects somewhat lighter buying of finished steel this month, particularly plates.

Cincinnati—Steelmaking operations were increased last week to practical capacity, with 23 of 24 open hearths active. Another open hearth, listed in computations, was reported retired permanently.

Birmingham—Maintained at 64 per cent. Preparations are being made to bring in two additional open-hearth furnaces at the turn of the month, and the rate will go to 71 per cent.

Buffalo—Continued at 84 per cent, fluctuating somewhat from day to day on account of changeovers. The range has been from 81 to 87 per cent at various times due to these changes, but the intention of producers is to maintain present output as nearly as operating conditions will permit.

STEEL CORP SHIPMENTS GAIN

Shipments of finished steel in September by the United States Steel Corp., 961,803 tons, exceeded August shipments of 923,703 tons by 38,100 tons and those of September, 1935, by 346,870 tons, a gain of 55.5 per cent. For nine months of 1936 total shipments were 7,867,707 tons, compared with 5,341,223 tons in nine months of 1935, an increase of 47.3 per cent. The September total has been exceeded only by those of April and May, 1936.

U. S. STEEL CORP. SHIPMENTS

(Inter-company shipments not included)

	(Tons)			
	1936	1935	1934	1933
Jan.	721,414	534,055	331,777	285,138
Feb.	676,315	583,137	385,500	275,929
Mar.	783,552	668,056	588,209	256,793
April	979,907	591,728	643,009	335,321
May	984,097	598,915	745,063	455,302
June	886,065	578,108	985,337	603,937
July	950,851	547,794	369,938	701,322
Aug.	923,703	624,497	378,023	668,155
Sept.	961,803	614,933	370,306	575,161
9 mo.	7,867,707	5,341,223	4,797,612	4,157,058
Oct.	686,741	686,741	343,962	572,897
Nov.	681,820	681,820	366,119	430,358
Dec.	661,515	661,515	418,630	600,630
Yearly adj.	+23,750	+23,750	+19,907	*44,283
Total	7,347,549	5,905,966	5,805,235	

*Addition. †Deduction.

Find Labor Does Not Benefit Most in Income or Security from Trade Unionism

THE prevailing theory of higher hourly wage rates and restricted working hours does not operate to produce greater income or more employment for factory labor, say two business economists, Allen W. Rucker and N. W. Pickering, in their latest study, "Does Unionism Really Benefit Labor?", published by Farrel-Birmingham Co. Inc., Ansonia, Conn.

The survey embraces 12 major nondurable goods industries accounting for almost 2,000,000 factory wage earners.

In the prosperity period, 1923-1929, the average annual income per worker in nonunionized industries increased 6.2 per cent as compared to a decline of 1.8 per cent in unionized industries. Employment opportunity increased 10.8 per cent in nonunionized industries, compared to a decline of 5.3 per cent in unionized industries; and, total purchasing power of wages rose 23.7 per cent in nonunionized industries as contrasted to a shrinkage of 2.3 per cent in the unionized group of industries.

During the depression period, 1929 to 1933, the average annual income per worker in nonunionized indus-

tries resisted shrinkage better than did incomes in industries which were unionized.

The reduction in 1933 as compared to 1929 was 24.9 per cent for nonunionized industries and 30.4 per cent for unionized industries. Employment opportunity in nonunionized industries dropped 14.7 per cent compared to 11.6 per cent for that in unionized industries; and, total purchasing power of wages paid was 14 per cent less in 1933 for nonunionized industries as compared to 17.5 per cent less in unionized industries.

The study is based upon end results reported in the United States census of manufacturers and includes wage earners only in such industries as banking, petroleum products, flour, chemicals, tires and tubes, boots and shoes, leather, cotton goods, knit goods, men's clothing.

Contrary to Assumption

"It has been widely assumed by union leaders, government officials, many economists and especially by writers in the liberal press that American labor benefits from the higher wage rates and shorter work

week enforced by organized trades unions," says the report.

"That assumption has never been proven from the end results; more repetition rather than factual evidence has served to give the theory a wide acceptance. For the industries and periods examined, the official record industrial operation fails to confirm the benefits predicted by the theory. Instead, the normal operation of the American system was definitely superior in its results to labor on all accounts—amount and increase in annual average income, security of employment opportunity and total purchasing power distributed as wages."

Financial

NATIONAL Supply Co. of Delaware, Pittsburgh, has announced a plan by which it will be enabled to pay more than \$5,800,000 accumulated dividends on its preferred stock through a new preferred issue and additional common stock. Each present shareholder owning one share of 7 per cent preferred, with \$35 back dividends as of Oct. 1, will receive one and one-fifth shares new 5½ per cent preferred and a quarter share of common stock. Another part of the plan will bring subsidiaries in 15 states all into the parent company which is now merely a holding company. Eight months' profits are approximately \$2,600,000, including company interest in Spang-Chalfant & Co. Inc., earnings.

* * *

Transue & Williams Steel Forging Corp., Alliance, O., reports net profit of \$20,133 for the third quarter, after ordinary taxes and depreciation, but before federal income taxes and provision for surtax on undistributed profits. This compares with net profit of \$41,546 in the preceding quarter and a loss of \$25,482 in the September quarter last year. For the first nine months the company reports net profit of \$95,104 against \$50,697 in 1935.

* * *

Harbison-Walker Refractories Co., Pittsburgh, reports net earnings of \$1,082,800 for the third quarter, equal to 75 cents a common share. This compares with net of \$462,000, or 30 cents a share in the third quarter of 1935. Nine months earnings this year were \$2,431,000, or \$1.66 a share, against \$1,245,700, or 80 cents a share in the like 1935 period.

* * *

National Steel Corp. has declared the regular dividend of 37½ cents per share, payable Oct. 31 to Oct. 24 record.

Pressure Tank Reported World's Largest



AT PORT ARTHUR, Texas, this steel tank of 100,000-barrels capacity was put in operation recently by the Warren Petroleum Co., and is said to be the largest pressure oil tank in the world. It is 141½ feet in diameter, 40 feet high from ground line to liquid level. The tank, a Hortonspheroid, made by the Chicago Bridge & Iron Works, Chicago, operates at a pressure of 10 pounds per square inch. Photo, courtesy National Petroleum News

Meetings

SPEAKERS ANNOUNCED FOR CONSTRUCTORS' CONVENTION

AMERICAN Institute of Steel Construction will hold its fourteenth annual convention at the Greenbrier hotel, White Sulphur Springs, W. Va., Oct. 21-23.

Wednesday morning there will be an address by the president, C. G. Conley, head of Mt. Vernon Bridge Co., Mt. Vernon, O., and a report by Secretary V. G. Iden, New York. Speakers for the afternoon session include: J. H. Van Deventer, editor, *Iron Age*, New York; W. S. Tower, executive secretary, American Iron and Steel institute, New York; Thomas S. Holden, vice president, F. W. Dodge Corp., New York; and A. P. Greensfelder, president, Fruin-Colnon Contracting Co., St. Louis.

Wednesday evening, a motion picture of the building of the San Francisco-Oakland bay bridge will be exhibited by the American Bridge Co., and C. F. Goodrich, the company's chief engineer will describe the work.

Thursday morning's program schedules the report of F. H. Frankland, institute's chief engineer; an address by J. R. Burkey, chief engineer of bridges, Ohio state department of highways, Columbus; and a symposium on building codes. There will be a golf tournament in the afternoon. At the annual banquet in the evening addresses will be made by Glenn Griswold, editor, *Business Week*, New York, and Frank Lovejoy, sales executive, Socony-Vacuum Co. Inc., New York.

Reports by T. H. Hendrix, director of statistics of the institute, and Robert T. Brooks, its executive vice president, New York, will be submitted Friday morning. Addresses will be made by W. N. Guthrie, Stevenson, Jordan & Harrison, management engineers, New York; and Dr. Ralph T. Lee, department of public relations, General Motors Corp., Detroit. Directors will be elected at the afternoon session and the annual get-together dinner will feature the evening.

1937 FOUNDRY CONVENTION AND SHOW IN MILWAUKEE

Milwaukee, one of the foremost foundry centers in the United States, has been selected for the forty-first annual convention and exposition of the American Foundrymen's association, to be held during the week of May 2, 1937. Meetings and display of equipment and supplies will be staged in the Auditorium.

In selecting Milwaukee for the 1937 gathering of the foundry industry, the board of directors gives recognition to the progressive Mil-

waukee chapter. Interest and activity of foundrymen of that section has placed Wisconsin in high rank in technical attendance and in handling the practical problems of foundry practice, apprentice training, cost, safety and hygiene. Outstanding plants, making all classes of castings, will be available for inspection.

Shaping the program and exhibition to meet present-day needs of the industry, special attention will be given to new, technical and mechanical developments. Papers on all phases of foundry practice and on management problems will be offered, with special attention on medical and legislative aspects of safety and hygiene in the foundry. In addition, papers have been scheduled on the use of safety shoes, leg-gings, goggles and respiratory protective devices and on maintenance of equipment. This part of the problem of foundry management will be supplemented by a special section in the exhibition devoted to protective equipment.

TO DISCUSS FOREIGN TRADE IN MEETING IN CLEVELAND

Under leadership of the Midwest Foreign Trade committee, Cincinnati, business men from midwestern states will confer in Cleveland, Oct. 26-27, on ways and means of enlarging their overseas markets. Theme of the conference will be "Real Recovery Is in Foreign Trade."

Senator Royal S. Copeland, New

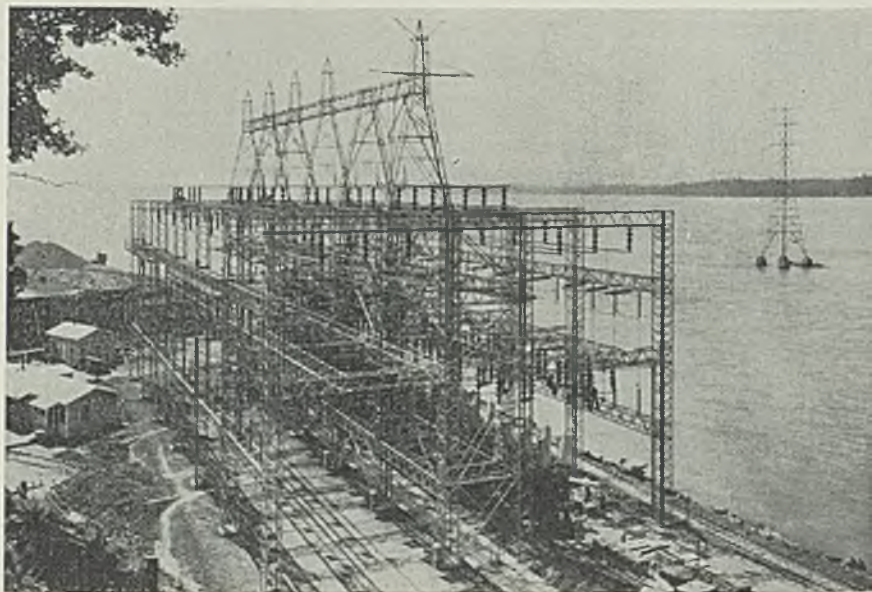
York, well informed on American merchant marine, will speak. James S. Carson, vice president, American & Foreign Power Co. Inc., New York, will lead a discussion on international American trade relations. View points on foreign markets will be furnished by Franklin Johnston, publisher of *American Exporter*, New York, and A. G. Lindsay, manager export division, Crosley Radio Corp., Cincinnati.

Finances of foreign commerce will be discussed by W. S. Swingle, director of foreign department, National Association of Credit Men, and George F. Bauer, chairman, World Trade League of the United States, will explain the workings of reciprocal trade pacts. New possibilities of trade in the Far East will be presented by C. K. Moser, chief of the department of commerce's Far Eastern division. E. J. Unruh, executive secretary, Midwest Council of International Relations, Indianapolis, will show how business stability is inseparable from world trade.

DIRECTORS OF GRAY IRON FOUNDERS SCHEDULE MEETING

Directors of the Gray Iron Founders' Society Inc. will conduct their semiannual meeting at Hotel Cleveland, Cleveland, Oct. 20. Good attendance from districts throughout the country is expected. In connection with the meeting, members will visit the National Metal Congress and exposition which is being held in Cleveland, Oct. 19-23.

Maze of Steel in TVA Switch Structure



APPROXIMATELY 185 net tons of steel is used in this 161,000-volt switching structure erected recently adjacent to Wheeler dam power house on the Tennessee river. It occupies a ground space of 84 x 192 feet. This unit of the TVA project will have an initial installation of two 36,000 kilovolt-ampere generators, ultimately ten. Photo courtesy Delta-Star Electric Co., Chicago

Men of Industry

L DOUGLAS SMITH, president, Lewis Foundry & Machine Co., Pittsburgh, and president of Groveton Land Co., both subsidiaries of the Blaw-Knox Co., Blawnox, Pa., has resigned to become general sales manager of McKeesport Tin Plate Co., McKeesport, Pa., a newly created post. Mr. Smith formerly had been vice president of the Lewis company and also of the Union Steel Castings Co., another Blaw-Knox subsidiary.

Directors of the McKeesport company have called a special meeting of stockholders for Nov. 24 to ratify a merger with the National Can Co., whose stock is 65 per cent held by the McKeesport company. Directors of the National Can Co. have set Nov. 17 for their special stockholders' meeting on the subject.

Lee M. Hogan, former manager of advertising and sales promotion of Steel & Tubes Inc., a subsidiary of Republic Steel Corp., Cleveland, has been named district sales manager of the New York district. Irving Whitehouse, former assistant manager, has been appointed manager of sales promotion. A. R. Smith, who has been superintendent of the Elyria division of Steel & Tubes, has been promoted to general manager of that division, succeeding A. E. Adams, retired.

Mr. Hogan began his career in the steel industry in 1923 with the Mohegan Tube Co., Brooklyn, N. Y., which later became a part of Republic. Mr. Whitehouse, a graduate of Yale university and Massachusetts Institute of Technology, has been associated with Republic for two years. Mr. Smith began his career in 1920 with companies which were later to become part of Re-



L. Douglas Smith

public, and rose through the sales and operating departments to become superintendent and recently general manager of this division.

P. A. Hill, formerly connected with the Superior Steel & Malleable Castings Co., is now engaged on sales for the Belle City Malleable Iron Co. and Racine Steel Castings Co., Racine, Wis.

Maj. Frank Roessing, president of the Roessing Mfg. Co., Sharpsburg, Pa., and president of the Pittsburgh Electric Galvanizing Co., has been named director of public works for the city of Pittsburgh.

W. C. Straub, formerly manager of the New York branch office of the Chicago Pneumatic Tool Co., has been appointed assistant to executive vice president. A. D. Stern has been appointed manager at New York, succeeding Mr. Straub.

Hanson T. Thomas, until recently vice president and general manager of sales of the Oliver Iron & Steel Corp., Pittsburgh, has become associated with the sales department of Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

H. H. Cleveland, after serving 24 years with the Billings & Spencer Co., Hartford, Conn., the last five years in the capacity of general sales manager, has resigned his connection with that firm to become associated with Bonney Forge & Tool Works, Allentown, Pa. He will have

charge of all tool sales in the industrial, hardware and mill supply fields.

Edward T. Causer, for the past eight years manager of the crankshaft division, Union Drawn Steel Co., Beaver Falls, Pa., has been named works manager of the Berger Mfg. Co., Canton, O., succeeding H. C. Baker, who has been given an extended leave of absence. Both companies are subsidiaries of Republic Steel Corp., Cleveland.

A. C. Belles, who has been with Union Drawn 25 years and connected with the cold drawn department, has been placed in charge of both the cold drawn and the crankshaft divisions of Union Drawn.

Joseph T. Somers, formerly vice president, has been elected president of the Wyckoff Drawn Steel Co., Pittsburgh, succeeding the late Col. A. W. Wyckoff. Mr. Somers has been active in the management of the company since its formation in 1919.

E. C. Bullard, vice president and general manager, Bullard Co., Bridgeport, Conn., sailed Oct. 1 for an extended business trip throughout Europe. He will visit Sweden, Russia, Germany, France, England and other countries. Mr. Bullard will return sometime about the middle of December.

J. Harry Christman has been named manager of the Chicago plant of the Milcor Steel Co., Milwaukee. Mr. Christman formerly was sales manager at Milwaukee and for some time has been a vice president of the company. He has been identified with Milcor since 1913.

H. B. Kraut, general manager of the Giddings & Lewis Machine Tool
(Please turn to Page 28)



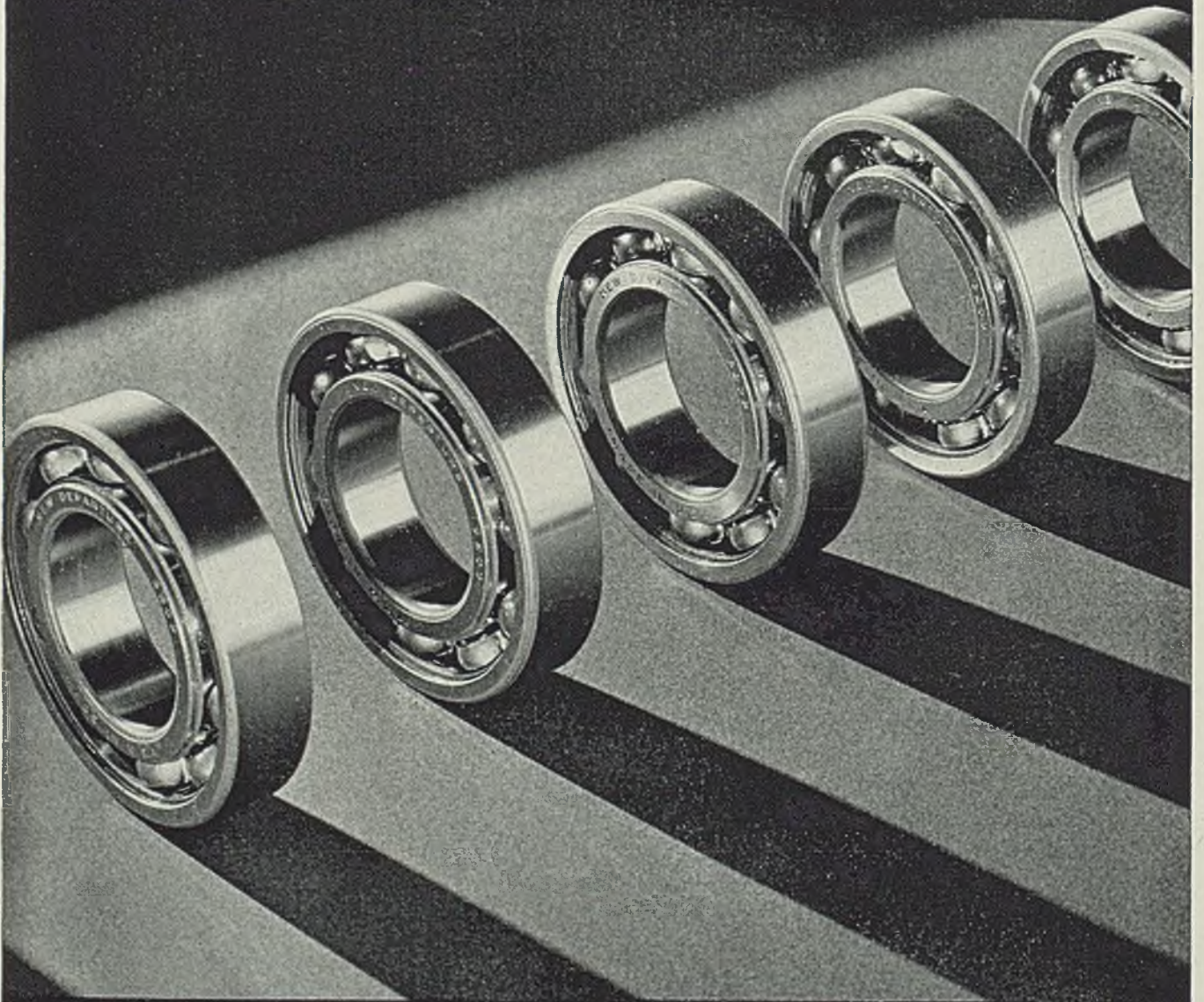
Lee M. Hogan



Irving Whitehouse

From New Departure will come
the next great development in
anti-friction bearings

It has always been so!



NEW DEPARTURE

THE FORGED STEEL BEARING



DETROIT

THE first week of November may be conspicuous for the national election, but General Motors is thinking of it primarily in terms of introduction dates on most of its cars. Pontiac comes out Nov. 4, Cadillac and LaSalle on the 6th and Chevrolet on the 7th.

Cadillac's thrust at the 1937 market centers in a new line of eights, called "series 65" that appears in a Fisher body on a 131-inch wheel base.

The "65" fits in just above the Cadillac "60" series and will come out with brother eights, twelves and sixteens formally at the same time. The twelve and sixteen, as well as the large eight line, are on a Fleetwood body, but the "60" and "65" both are Fisher bodies.

All of the Cadillac lines for next year have a new type radiator grille, resembling a checker design. Chrome-plated ribs in the grille run both vertically and horizontally, being 32 in number across and 44 deep.

The Cadillac hood, unlike some others which have taken to the lift or "alligator type," opens in the conventional manner. Pontoon-type fenders, made in two pieces, are carried over unchanged from 1936. Wheels are 16-inch.

Features of Design

Doors in the two-door model are hinged at the front and at the rear, thus opening at the center pillar. The front windshield is divided. Bodies are slightly wider, but not noticeably lower so that running boards are of conventional depth. The rear window is divided by two vertical sections. Fender wells are to be continued for spare tires.

Front-on, the new Cadillac lines are distinctive for not only the checkered-type shell but the placing of the company emblem centered down on the front bumper. Three short vertical chromium bands, placed vertically, are new and appear on each apron, or the section between the front fenders and radiator.

Front headlamps are mounted on horizontal braces. So as to make the Fisher body apparent from the Fleetwood, which latter incidentally is the only General Motors body

which has any vestige of wood left, the hood louvres on each are made distinctive.

The Fisher body has a double row of louvres, divided off by 14 vertical bands, the entire opening running the full length of the hood. The Fleetwood bodies, though, simply have four short horizontal bands set well down and back on the hood.

Inside the new Cadillacs, instrument panels follow 1936 styling closely, being marked off by three horizontal beads, clock at the extreme right, speedometer at the center, and a cluster of four dials at the extreme right. Flex steering wheels are standard.

Olds, also counting the days until an early November showing, has followed the General Motors 1937 policy of marking the cleavage between models. Its sixes and eights bear less resemblance, yet enough to mark them brothers.

Wheelbases Are Increased

The six has a radiator shell of chrome horizontal slots, the eight a honeycomb-type grille. Both have longer wheelbases from the 1936 dimension of 115 inches on the six and 121 inches for the eight. A safety feature will be the mounting of tail lights high on the sides of the body. A third tail light is centered over the rear license plate.

Both the six and the eight motor have been developed for slower idling speeds and refinements in carburetion will bear out an economy claim although, like Chevrolet, rated horsepower will be greater. The six horsepower has been 90, the eight, 100.

Conservatively, General Motors has drawn away from the earlier idea of placing automatic gear-shifting on Olds though that additional unit has been well perfected. It can be had optionally on the Olds eight, however.

Three more weeks and the New York show will be on.

As might have been expected, delays getting dies to work satisfactorily, delays in getting new tools, jigs and fixtures set up and the innumerable small delays in working out a thousand-and-one "bugs," have all been a damper.

Schedules for October have in

many cases yielded to the more immediate pressure of minor delays, but by and large, the industry is shaking off these first inevitable headaches.

Ford has been trying to get up to 5000 assemblies daily just as soon as possible, but the odds are against making that grade before October is out. Too many details on retooling have yet to be solved, though there is practically no retooling on the engine line.

Last week Ford assemblies were over 500 per day. Many of the Rouge departments had worked up to a fuller schedule, such as the Flat Rock, Mich., lamp plant which had resumed in full on Oct. 12 and many branch assembly plants such as Edgewater, N. J., were back in production.

Ford has kept details well under cover on the type of braking for the 1937 V-8. Some observers have felt Ford would be forced to divorce mechanical brakes next year in favor of hydraulics, but whether the V-8 for the coming year will have hydraulics is still pretty much of a secret. Some thought the tip-off was at hand last week that there would be no change since big brother Lincoln-Zephyr came forth with mechanicals for 1937.

Ford May Make Own Tires

Ford is still keeping warm its plans to make tires for its own use. The buying divisions there, plus top executives, are still mulling over proposals submitted on over \$10,000,000 worth of machinery that they may eventually pass on for a capital investment.

The equipment, so preliminary plans have it, would be set up to make some 24,000 casings daily, or at the rate of 5,000,000 a year. Either the old Highland Park plant or one of the present Ford forge shops at Dearborn would be used for the new division.

The latter unit, which is somewhat favored, is a four-story building having about 200,000 square feet of floor space, but it seems doubtful that such a plant would be sufficient for the large-scale manner in which Ford is going into the business.

For the present, Ford may be

dangling the tire threat over the heads of Akron to see what labor disturbances at the rubber city can thus be vanished. But, the question of getting deliveries on tire-making machinery to the aggregate of \$10,000,000 has been a stumbling block.

Those machinery suppliers that have submitted estimates are all in the position of being unable to make deliveries even in the near future. Thus, Ford is held back, even if the go-ahead were given today.

In a limited way, some tire-making capacity might be worked out by Dearborn. They already have a large number of tubing machines and vulcanizers which are used in making rubber parts such as steering wheels. Perhaps part of this could be pressed into temporary service.

Fisher Body, to make a big play out of the "Uni-Steel" body for 1937 cars, which simply means that wood has disappeared, has played up the by-word "See How Fisher Glorifies The Steel Body" in its advance publicity.

To detail, Fisher shows how steel is used for the rear-end bracing, floor, cross members, top cross bows, roof rails, rocker panels and both outer and inner door panels. Where Fisher, and of course General Motors, made a lot of "turret top" first in 1935, it begins to look as though "Uni-Steel" will be a favored adjective for Fisher bodies in the coming year.

Fisher Spends Heavily

In order to get set for the coming season, Fisher is said to have spent more than \$25,000,000. Eleven million has been earmarked for new machinery, \$10,000,000 for new dies and the balance of \$4,000,000 for plant rearrangements.

The largest single item was in \$7,000,000 for the new Grand Rapids, Mich., stamping plant, \$4,165,000 for the four divisions at Lansing, Pontiac, Flint and Detroit; \$1,300,000 at Cleveland and Norwood; \$631,000 at Buffalo and Tarrytown and \$2,262,000 in many other divisions.

The new axle plant that makes Pontiac self-sufficient on this detailed part has been completed, and thus leaves Chevrolet Gear & Axle at Detroit free to make its own axles. Formerly Pontiac production had to be worked in at Detroit and in a year as the past, Chevrolet wanted all the capacity for its own axles.

Pontiac has spent about \$3,000,000 on new machine tools and equipment for the division which was put

Automobile Production

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

	1934	1935	1936
Jan.	155,666	289,728	364,004
Feb.	230,256	332,231	287,606
Mar.	338,434	425,913	420,971
Apr.	352,975	452,936	502,775
May	330,455	361,107	460,565
June	306,477	356,340	452,955
July	264,933	332,109	440,999
Aug.	234,811	237,400	271,291
Sept.	170,007	87,540	*119,073
9 mo. ...	2,384,014	2,875,304	3,320,239
Oct.	131,991	272,043	.....
Nov.	83,482	395,059	.....
Dec.	153,624	404,528	.....
Year	2,753,111	3,946,934	.....

Estimated by Cram's Reports

Week ended:		
Sept. 19		33,615
Sept. 26		15,680
Oct. 3		22,800
Oct. 10		39,945
Oct. 17		48,195

*Estimated.

in between the heat-treating department and the assembly lines without necessity of building new buildings. Sixty-six thousand square feet of space were taken up, in which 315 new machine tools were installed.

All of the axle parts—shafts, ring gears, differential side gears, spider gears, bevel side pinions and cases for differentials and carriers—will come from the new unit, a complete setup except for axle housings which will be made on the outside.

Among the machine tools installed have been 75 Gleason gear cutters, 28 Gleason matching and lapping units and a battery of automatic gear generators. Each of the latter cost some \$14,000 apiece.

Descalce Shafts Electrically

The installation of several Bullard automatics, in addition to a number of centerless grinding machines for finishing bearing surfaces on the axle shafts have both been made. Out of the machine tool picture, but nevertheless an important equipment addition this year is a two-section 40 x 12 x 7-foot electric furnace for descaling shafts that lays claim to having near-perfect insulation.

Packard has made a switch in its production schedule, marking about 1700 assemblies this month from "115's" to "120's" due to reports from the field currently on the six. The Packard plant has been working six full days, assembling from

330 to 350 cars daily. Compared with a preponderance of sizes a few weeks ago, there's now an even split with the small eights in cars coming off the line.

General Motors Truck has placed a \$500,000 order for major stampings with Edward G. Budd Mfg. Co. . . . Buick has shaved \$20 to \$55 on its low-priced models for 1937, but upped prices on the larger series . . . Studebaker, Nash and others have been converts for 1937 to the one-piece stamping for front fenders, as Buick began a year ago. . . . Ford's Flat Rock, Mich., lamp plant went into quantity production Oct. 12. . . . Over 3000 DeSoto field men will have visited the factory here by the early part of this week. . . . Signing of a contract to provide all the glass for General Motors requirements for the next five years means an aggregate of about \$120,000,000 business for the Libbey-Owens-Ford Glass Co., which recently acquired the Columbia Plant Glass Co. plant, Blairsville, Pa., from General Motors, and it will be held as a reserve plant in case demand outruns the facilities in plants at Toledo, O., in suburban Rossford and Ottawa, Ill.

Ad Program Wins Prize

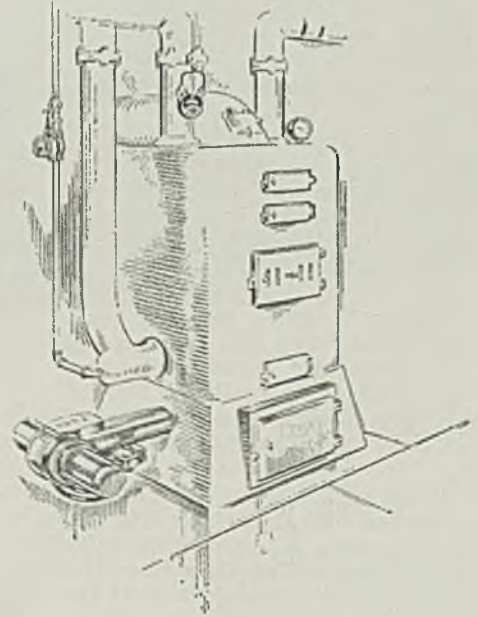
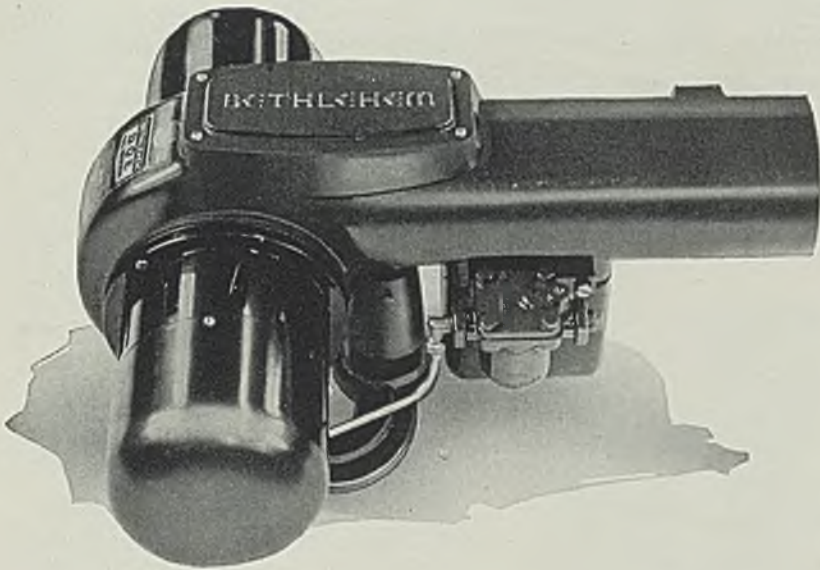
Warner & Swasey Co., Cleveland, recent recipient of an honor award recognizing its direct mail campaign, "A Challenge to American Industry," as one of three ranking leaders in the Direct Mail Advertising association's 1936 competition, was awarded third prize by the National Industrial Advertisers association at Philadelphia, Oct. 6th, in a citation covering its entire 1936 advertising program. Business and trade paper copy, recognized by the latter award, has been built around the Warner & Swasey "new industrial dictionary" and specific performance achievements of the company's new high-speed turret lathes.

Steel Spring Strike Ended

Standard Steel Spring Co. resumed normal operations in its two Coraopolis, Pa., plants in the Pittsburgh district last week for the first time since Aug. 17, when a strike for union recognition began. Employees returned to work with the understanding that an election to be supervised by Sheriff Frank I. Gollmar will be scheduled soon to name employe representatives.

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

HORSE HEAD SPECIAL (^{99.99+%} UNIFORM QUALITY) ZINC



THE BACKBONE OF THE UNIT

THE BACKBONE of this modern efficient oil burner is the main cradle—and this is a single ZINC Alloy Die Casting. This casting, on which the driving motor and oil pump are fastened, houses the entire operating mechanism.

Although the main cradle is the largest die casting in this assembly, the design engineers have specified ZINC Alloy Die Castings for most of the other metal parts. The air intake orifice, air regulator ring, fuel strainer body, several brackets and a flexible coupling—all are die cast to tolerances that permit their use without machining.

This extensive use of ZINC Alloy Die Castings in a single unit is typical of many present day assemblies. The advantages of this metal and process are being utilized in many industries to solve a variety of production problems. Our Technical Service staff will be glad to answer specific questions on the possible application of ZINC Alloy Die Castings in your products.

NATIONAL METALS EXPOSITION

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We try to keep abreast of the Die Casting industry in our publication, The Alloy Pot. We will gladly place your name on our mailing list to receive the literature on this subject if you so desire.

The New Jersey Zinc Company

160 Front Street



New York, N. Y.

Men of Industry

(Concluded from Page 23)

Co., Fond du Lac, Wis., sailed for Europe Oct. 7.

C. H. Sipe, formerly general manager of the Brighton Electric Steel Casting Co., Beaver Falls, Pa., has been elected president of the company to succeed the late D. T. Sipe.

W. J. Holtmeier has been made manager of the newly established eastern branch office of Hammond Machinery Builders Inc., Kalamazoo, Mich., with headquarters at 148 West Twenty-third street, New York.

George Torrence, formerly president of Link-Belt Co., Chicago, has been made vice president and general manager of the Rayon Machinery Corp., Cleveland, a subsidiary of the Industrial Rayon Corp.

Wilson Miles Cary Jr., formerly associated with the Jeffrey Mfg. Co., Columbus, O., is now with the Pittsburgh Screw & Bolt Corp. in a sales capacity, and will be located at the New York office, 630 Fifth avenue.

Frank N. Satter recently was appointed district manager of sales for the Cleveland and Youngstown, O., districts, with headquarters at 3030 Euclid avenue, Cleveland, for the Lawrenceville Bronze Co., Pittsburgh.

Stephen L. Feduska, a graduate of the University of Pittsburgh, and formerly associated with the Continental Roll & Steel Foundry Co., as assistant to the director of metallurgy, has been appointed metallurgist of the United Engineering & Foundry Co., Pittsburgh.

A. P. Witteman has joined the sales organization of the Leland-Gifford Co., Worcester, Mass. He is to be in charge of the Cleveland territory, with headquarters at 2024 East Eighty-sixth street. For the past ten years he had been identified with the Falk Corp., Milwaukee.

H. J. Kumer, of Montebello, Calif., has been appointed Pacific coast representative of Hiram Swank's Sons Inc., Johnstown, Pa., fire clay refractories manufacturer. He formerly was identified with the Jones & Laughlin Steel Corp., Pittsburgh, and Warman Steel Casting Co., Los Angeles.

C. A. Lord has joined the general sales organization of the Universal Form Clamp Co., Chicago. He formerly had been in the sales department of Concrete Steel Co., Chicago. He is being succeeded in that post by R. S. Brown, heretofore asso-

ciated with his father in the firm of Smith & Brown, structural engineers, Chicago.

W. P. Lotz has joined the Fellows Gear Shaper Co., Springfield, Vt., as assistant sales manager, with headquarters at 616 Fisher building, Detroit. He recently returned from the Far East, where he acted as special representative of the Pratt & Whitney Co., Jones & Lamson Machine Co., Landis Tool Co., and National Automatic Tool Co. Mr. Lotz was formerly manager of the New York office for Kearney & Trecker Corp.

E. H. Hart, J. N. Swarr, K. H. Platt and R. A. Barnes have been appointed service engineers by the



William L. Goodhue

Who, as noted in STEEL, Oct. 5, has retired as general superintendent of the Vandergrift sheet works, Vandergrift, Pa., of Carnegie-Illinois Steel Corp., after 47 years of service in the sheet and tin plate industry

Bristol Co., Waterbury, Conn. They have just completed a two months training course at the factory at Waterbury.

Mr. Hart, a graduate of Geneva college, Beaver Falls, Pa., has been assigned to the Boston office; Mr. Swarr, a graduate of Purdue university, has been assigned to the New York office, to replace G. T. Evans who has been promoted to the engineering department at Waterbury; Mr. Platt, a graduate of Queens university, Kingston, Ont., has been assigned to the Philadelphia office, while Mr. Barnes, a graduate of Purdue, has been assigned to the St. Louis office.

Raymond E. Zahniser has been appointed assistant manager of sales of tin mill products for Jones & Laughlin Steel Corp., succeeding William Miller, who was recently appointed manager of sales for the strip and sheet mill products of the firm. For the past ten years, Mr.

Zahniser has been connected with the New York district sales offices, and before that was in the general order department at Pittsburgh. He has been with the company since 1912.

Harold L. Dublin, formerly district sales manager in Cleveland for Follansbee Bros. Co., has joined the Cleveland office of Jones & Laughlin to handle the sale of sheets and strip in that territory. Mr. Dublin had been with Follansbee for 24 years.

Died:

HARRY B. Kirkland, 66, assistant to the managing director, National Electrical Manufacturers' association, New York, in that city, Oct. 10. He had been connected with the electrical industry for over 40 years.

Harry B. Newton, 52, purchasing agent, Thew Shovel Co., Lorain, O., in Elyria, O., Oct. 9.

Arthur B. Weeks, 60, veteran engineer of National Tube Co., Pittsburgh, in Lorain, O., Oct. 7.

Thomas English, 67, superintendent of the labor department, coke works, Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., in Fairfield, Ala., recently.

Harry Hutchinson, 50, branch manager, General Fireproofing Co., Cleveland, in that city, Oct. 7. He formerly was vice president of the Carey Safe Co., Buffalo.

Charles F. Henning, 55, vice president of the United States Gypsum Co., Chicago, in Highland Park, Ill., Oct. 3, as a result of an automobile accident.

Franklin Overbagh, 82, a pioneer of the electrical industry and active in the management of Overbagh & Ayres Co., Chicago, maker of electrical reflectors, which he founded in 1902, in Chicago, Oct. 6.

George L. Walters, 65, vice president and treasurer, Adams & Westlake Co., Chicago, distributor of railway supplies, in Winnetka, Ill., Oct. 1. Mr. Walters had been associated with the company since 1891.

A. W. Gifford, vice president, Canadian Refractories Ltd., Montreal, Que., in Salisbury, Conn., Sept. 24. Mr. Gifford was a member of the firm of Wilson Paterson Gifford Ltd. for many years before becoming vice president of Canadian Refractories Ltd.



WINDOWS OF WASHINGTON

WASHINGTON

ALL kinds of rumors are afloat in connection with the possibility of the wound being healed between the A. F. of L. and the CIO. However, those who know most about the labor situation seem to feel that the proposal to appoint committees to try to reach an agreement is more or less of a gesture.

President Green of the A. F. of L. delayed twice last week the appointment of such a committee from his organization. John Lewis has stated several times that he will not even discuss the matter unless the executive council of the A. F. of L. rescinds its former action throwing out the unions affiliated with his organization. There seems little likelihood that the council will do this. It remains to be seen which, if either of the organizations will recede from its stand.

John Lewis at a press conference here last week stated that his organization would probably meet early in November, after the election, to decide on its future policies.

Plans to Continue Drive

He still maintains that the attitude of his organization is unchanged regarding a possible agreement with the A. F. of L. He emphatically denies that there is any thought at this time of dissolving the CIO if continuation of the steel drive could be arranged in some other way.

"We shall go ahead to assist in organizing the mass production industries with the A. F. of L. if we can and if not, without it," he stated. Concerning the statement alleged to have been made by David Dubinsky a week or so ago Lewis said that this stand "is a proposition which we have made all the time." The proposition, as stated by Dubinsky, was to the effect that "speaking for my own organization I wish to say that we might be willing to consider a

compromise that would lead to unity in the ranks of organized labor, but only on condition that the A. F. of L. would so change its policies in regard to organizing the workers in the mass production industries that it would be possible to continue the work of organizing in steel, automobiles, rubber, cement, and other similar industries on a complete industrial basis."

Lewis stated further at his press conference that the basis on which peace is possible between the CIO and the A. F. of L. executive committee is withdrawal of the council's suspension order and an agreement on industries in which industrial organization can be permitted.

NAVY WILL REQUIRE MUCH STEEL IN 1937

Government departments are getting figures together for congressional appropriations for the fiscal year 1937, beginning July 1 next. Most departments have already submitted figures to the budget bureau, which attempts to pare them as much as possible.

The story here is that both the army and navy will ask for appropriations which will be of interest to the steel industry. This includes additional defenses on the Pacific coast. The navy will also ask for a progressive extension of the Vinson navy building program. Should these plans be authorized, and it appears entirely likely that they will in some form, a large amount of steel will be used.

Although congressional approval must be obtained, plans are now being discussed which call for some 200 acres on the San Francisco bay front on which the navy department would construct warehouses, administration buildings and power houses, etc. In this connection it is said that the department has made some preliminary negotiations with the

city of Oakland, Calif., for the construction of this proposed new naval supply base, to be on San Francisco bay and to cost \$12,000,000.

It is also indicated that the navy department will ask congress for permission to construct eight to 12 destroyers and six new submarines.

PATMAN PLANS DRASTIC CURB ON MANUFACTURER-SELLER

There has been continued talk about the Robinson-Patman law, one of the important matters of conversation among Washington representatives of trade associations and industrialists.

One of the things that has caught their notice is the proposed amendment which has been prepared by Representative Patman which would prevent manufacturers from owning retail outlets and prevent retailers from becoming manufacturers.

The proposed amendment has just become available here and it is said that Mr. Patman intends to introduce it at the coming session of congress. The bill is to further amend the Clayton act in order to "further protect interstate commerce against restraints and monopolies." It proposes to amend the present act by adding after section 3 a new section as follows:

"Section 3½. (a) It is hereby declared that the enactment of this section is necessary in order to protect commerce from restraints and monopolies which result in certain cases where persons are concerned with both the manufacturing and retailing of articles or materials.

"(b). It shall be unlawful for any manufacturer or any affiliate of such manufacturer to directly or indirectly transport or cause to be transported, in commerce, any article or material produced by such manufacturer for sale or distribution at retail by such manu-

facturer or by an affiliate of such manufacturer.

"(c). For the purpose of this section—

"(1) The term 'person' means an individual, a corporation, a partnership, an association, a joint stock company, a business trust, or an organized group of any of the foregoing, whether or not incorporated.

"(2) The term 'manufacturer' means any person, other than an individual, engaged in the producing, manufacturing, processing, packing, refining, or preparation of articles or materials for sale or consumption.

"(3) A person shall be deemed to be an affiliate of a manufacturer if such person controls or is controlled by, or is under common control with, such manufacturer.

"(4) The exhibition of a motion picture, for a charge, shall be deemed to be a sale at retail.

"(5) A person shall be deemed to control another person if having over the latter (A) actual or legal control, whether direct or indirect, or (B) any direct or indirect power or influence (whether arising through direct or indirect ownership or control of stock or other capital, evidences of indebtedness, or physical properties or equipment, through contract, lease, or agency arrangements, through interlocking directorates or officers, or through any other means of circumstances) which can be used to affect, in any substantial manner, the policies or conduct of such other person affecting competitive relationships between persons engaged in the business of selling articles or materials at retail.

"Sec. 2. This act shall take effect three years after the date of its enactment."

FTC FILES COMPLAINT ON COLLUSIVE PRICE MAKING

A complaint alleging collusive bidding and fixing and maintenance of uniform prices, in violation of section 5 of the federal trade commission act, has been issued by that commission against nine companies engaged in the manufacture and sale of turbine-generators and condensers. The Heat Exchange institute, a trade association with headquarters in New York, also is a respondent. The respondent companies are:

General Electric Co., Schenectady, N. Y., manufacturing turbine-generators; Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.; Allis-Chalmers Mfg. Co., Milwaukee; and Elliott Co., Jeannette, Pa., manufacturing both turbine-generators and condensers; Worthington Pump & Machinery Corp., Harrison, N. J.; Ingersoll-Rand Co., Jersey City, N. J.; Foster-Wheeler Corp., New York; C. H. Wheeler Mfg. Co., Philadelphia, and Ross Heater & Mfg. Co.,

Buffalo, dealing only in condensers.

The respondents, who allegedly entered into their price-fixing agreement in 1933, are said to constitute a group so powerful that they are able to control the turbine-generator and condenser business in the United States. The complaint sets out that the principal purchasers of these products are public utilities, either publicly or privately owned, and municipal, state and federal governments.

RELIEF SPENDING INCREASES

According to apparently reliable information available here federal expenditures for the first quarter of this year for direct relief, including the CCC camps, were 30 per cent more than for the same period of last year. If the CCC expenditures are excluded it is stated that the increase was 80 per cent.

The figures given show that for the first quarter of this year the federal government spent \$487,000,000 exclusive of CCC camps, or \$585,000,000 if those expenditures are included. The comparable figures for last year were \$269,000,000 and \$430,000,000.

COMPILING OBITUARY OF NRA

A final summation of the activities of that old bird, the NRA, will be handed to the President not later than Jan. 1, it was decided last week by the committee on industrial analysis, which was created by executive order for that purpose.

It will be recalled that during the closing hours of the life of NRA that its board of review published many industry reports—none being made public for the steel industry—and this proposed final report will be a summary of these reports as to the principles they brought out. The purpose of the final report, which it is expected will be referred to congress by the President, is to set down in writing the lessons of that now extinct bird.

This committee, of which Secretary of Commerce Roper is chairman and of which the secretaries of agriculture and labor are members, created a division of industrial economics, which took over about 50 of the personnel of NRA and an appropriation of \$100,000 for this work.

CAR LOADING ESTIMATE UP

The regional shippers' advisory board has made estimates of freight car requirements of the iron and steel industry for fourth quarter which total 375,922 cars compared with present actual loadings of 309,178 cars or an expected increase of 21.6 per cent.

These figures have been broken down into territories showing that in the New England territory the

actual carloadings for iron and steel have been 3374 cars and the estimated 3711, an increase of 11 per cent.

ANOTHER PROFESSOR CALLED

Another professor has entered the Washington picture. This time it is E. Pendleton Herring, professor of government at Harvard University who has been called here by Senator Byrd of Virginia, who is chairman of a senate committee charged with working out a plan for the reorganization of government departments.

It is reported that Senator Byrd hopes to get his committee together soon after the election and to have hearings on various phases of government reorganization. The committee already has a mass of material before it.

It is said that already interests have started to bring pressure against members of the committee because of those who fear the loss of jobs and those on the outside who fear that information they have been getting from the government from some source or other will be curtailed or entirely cut off. Farmers want nothing done with the department of agriculture, labor unions want nothing done with the department of labor, and commercial interests want nothing done with the department of commerce. In addition to this congressional committee the President himself has appointed a special committee of his own to look into this situation.

WALSH-HEALEY LAW NEEDS FUNDS FOR ADMINISTRATION

It seems likely administration of the new Walsh-Healey government contract law will be mighty poor for some time. Reason? The labor department has no money with which to administer it.

Congress authorized the law and then promptly adjourned without making financial provision for its administration. For a long time Secretary of Labor Perkins thought the President would give her some emergency money, especially in view of the fact that this law was really the baby of the A. F. of L. She was doomed to disappointment.

Being strictly up against it Miss Perkins has appointed three men in her department to act as a temporary board of contracts. These men all draw salaries for other work, and they have much other work to do, giving what time they can to this new law. At the moment at least things are in a chaotic condition and whether this is bettered before an appropriation is in sight is just one of those questions. Incidentally, it is understood that officials of the labor department have a goodsized headache already over this law, which was dropped in their lap.

Good Management Involves Dealing with Public Opinion

AT THE recent sixth annual meeting of the Porcelain Enamel institute in Cleveland, its president, R. G. Calton, delivered an address which dealt frankly with a problem that confronts every industrial executive in the country. He was discussing the attitude of business and industrial leaders toward social development.

The theme of his address can be summarized in a few excerpts. "The world is going through a great social revolution and back of it all has been a desire on the part of the 'have nots' to share in a greater measure with those who have. Surely if this is true, and if it is just a repetition of a struggle that has gone on at intervals since the inception of the profit and capitalistic system, it is now time for business to anticipate the desires of the great mass to the end that the problems of the mass can be solved more intelligently and with the help of the best brains available."

Mr. Calton then presented an indictment against business men for their lack of interest in, or active opposition to certain inevitable social tendencies. "In the past," he charged, "business men have furnished the greatest resistance to social trends. Although in most cases they may have deferred the change for a time, eventually through a great mass of confusion, the desires of the majority have prevailed. Business men generally opposed such acts as the workmen's compensation act, anti-trust legislation, safety laws and such other beneficial acts as are now accepted by the great majority of us."

Indicts Business and Industrial Leaders for Ignoring Trends in Desires of Public

Turning to the present situation, Mr. Calton declared that today we are confronted with legislation originated by "rabble rousers," written by politicians and "administered by social theorists whose ideas are 10 years or more in advance of practical considerations as they exist today."

"How much better it would have been," he asked, "had business men started some 10 years ago to sound out these trends and to have advanced well worked out plans for the solution of our social problems, rather than to have left it to the individuals who are attempting to force them upon us at this time?" And he added, "If business and industry generally represent the higher levels of intelligence, all of these legislative acts would

have been benefited greatly by the practical considerations that could have been advanced by business men."

The majority of astute business and industrial leaders, we believe, will agree in general with views expressed by Mr. Calton. We concur in his indictment of business men for their attitude toward social trends, but we would place the emphasis upon the blindness of executives to the potency of public opinion rather than upon their opposition to reform or to social progress.

It would be unfortunate, indeed, if all of us were to forsake our roles as conservatives or liberals, and as practical business men or social theorists. For sound progress we need the vision of the dreamers and theorists, as well as the common sense of hard-headed, practical, non-imaginative individuals. Strength in both camps makes for checks against ill-considered action. Our present alignment of liberals opposed by conservatives is a valuable guarantee of balanced judgment. To condemn sincere persons because they are conservative, practical or cautious is to discourage one of the greatest safeguards to an enlightened public opinion.

Many Executives Overlook Fact That Courting Favorable Public Opinion Is Good Business

But we share with Mr. Calton the feeling that too many industrial and business executives have been remiss in devoting the proper attention to the desires of the public at large. Today good management involves a knowledge of trends in mass public opinion and a thorough appreciation of their implications in terms of approval or opposition to the policies pursued by management.

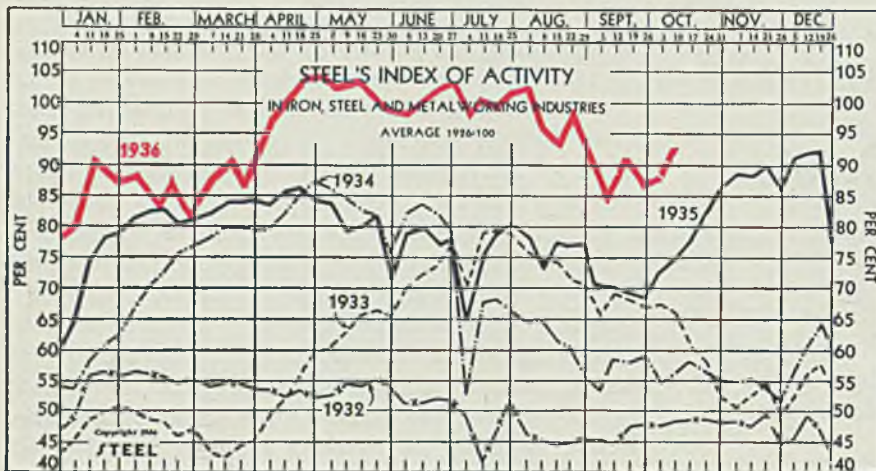
Run over the names of the first 10 industrial executives that come to mind and ask yourself how many of them really respect the power of public opinion. The chances are that you will decide that too few of them—far too few—take public opinion into serious account in their administration of company affairs. Perhaps you will concede that some of them actually subscribe to the outmoded doctrine "the public be damned."

Many prominent industrialists still are on the public's unofficial black list. This is partly because clever politicians have found it politically profitable to "smear" industry and some of the individuals in industry. In a larger measure, it is because industry has been backward in public relations.

Winning and holding public esteem is largely a matter of salesmanship. Some politicians are particularly adept at it. "Rabble rousers" are good at one-time sales but they seldom can repeat, or "hold" customers.

Industry should divert more of its selling technique to winning public esteem. To do so in connection with current problems of social development not only will benefit industry directly but will make for more practical social legislation.

THE BUSINESS TREND



STEEL'S index of activity in the iron, steel and metalworking industries gained 4.4 points to 93.4 in the week ending October 10:

Week ending	1936	1935	1934	1933
July 11.....	100.9	76.5	67.8	79.1
July 18.....	99.9	79.8	68.1	79.4
July 25.....	102.1	80.8	66.4	78.8
Aug. 1.....	102.5	78.4	64.8	75.9
Aug. 8.....	98.7	73.4	64.6	74.7
Aug. 15.....	92.6	77.5	61.4	74.2
Aug. 22.....	97.7	77.0	60.3	71.6
Aug. 29.....	94.0	77.3	55.1	70.3
Sept. 5.....	87.5	70.9	53.5	65.5
Sept. 12.....	83.1	70.1	58.7	69.1
Sept. 19.....	90.1	69.4	58.1	68.2
Sept. 26.....	86.2	68.5	59.3	66.9
Oct. 3.....	89.0†	73.3	54.7	67.4
Oct. 10.....	93.4*	74.9	56.4	66.0

†Revised. *Preliminary.

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

Resumption of Auto Production Stimulates Activity Index

WITH automobile output again expanding and other barometers of industrial activity holding steady at high levels, STEEL'S index for the week ending Oct. 10 mounted to 93.4, the highest point since the last week of August. The gain of 4.4 points helps considerably in shaping the trend line for October to the sharp incline which prevailed throughout the tenth month a year ago but at a lower level.

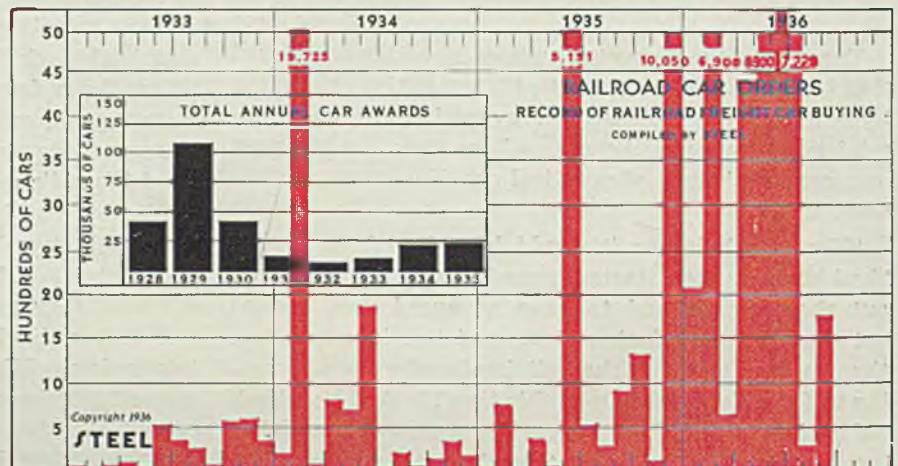
Freight car loadings continue at around 820,000 cars weekly. A year ago the highest weekly traffic in the fall season amounted to 734,300 and the 700,000 mark was exceeded only six times in 1935. Electric power output continues at a volume only slightly below the all-time high. Steelworks operations, at 75 per cent of capacity, are at the highest point in 1936. The last

time this percentage was recorded was in the week ending May 17, 1930. Automobile output mounted from 22,800 to 39,945. While this is a modest figure, it is the highest in six weeks, or since the last week of August.

For the most part, monthly figures continue to reflect an upward trend in activity. Building permits for September showed a moderate gain over August. An exception to the generally indicated tendency toward higher figures was provided by the report on machine tool orders issued by the National Machine Tool Builders' association. The index of total orders for September showed a decline, the first interruption to consecutive gains in 10 months. The three months' moving average index for September was 132.0, compared with 135.5 in August.

Is the reversal in trend of machine tool orders a subtle indication that the tax and other business-throttling factors are beginning to exert their influence upon future commitments?

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



Finished Steel Shipments Up Sharply in September

	Gross Tons		
	1936	1935	1934
Jan.	721,414	534,055	331,777
Feb.	676,315	583,137	385,500
March	783,552	668,056	588,209
April	979,907	591,728	643,009
May	984,097	598,915	745,063
June	886,065	578,108	985,337
July	950,851	547,794	331,777
Aug.	923,703	624,497	378,023
Sept.	961,803	614,933	370,306
Oct. ....	.....	686,741	343,962
Nov. ....	.....	681,820	566,119
Dec. ....	.....	661,515	418,630

Daily Ingot Rate Shows Slight Drop in September

	Gross Tons		
	1936	1935	1934
Jan.	112,813	106,302	73,968
Feb.	118,577	115,595	92,164
March	128,576	110,204	103,646
April	151,625	101,562	117,443
May	155,625	97,543	125,907
June	153,263	90,347	117,672
July	150,874	87,224	59,578
Aug.	161,351	107,997	51,161
Sept.	160,043	113,000	50,759
Oct. ....	.....	116,398	54,885
Nov. ....	.....	121,170	61,947
Dec. ....	.....	122,936	78,570

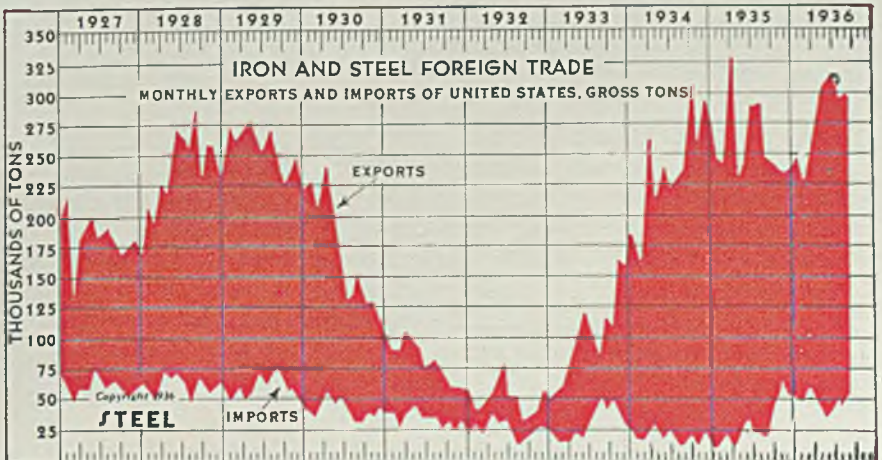
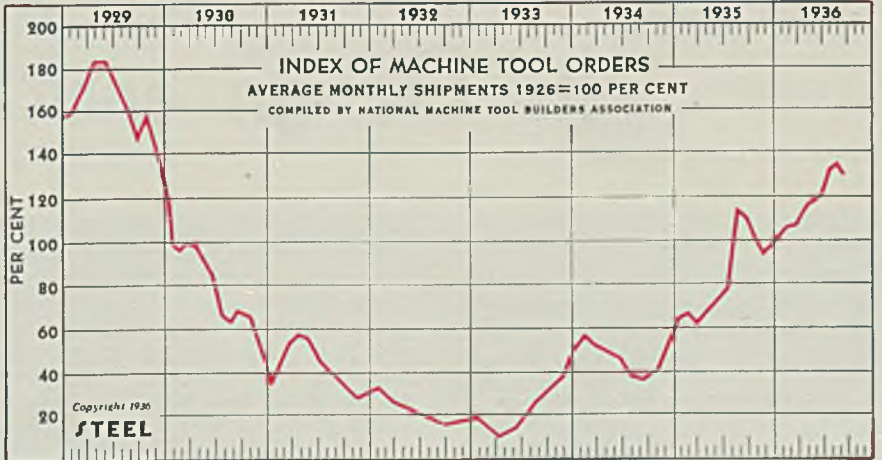
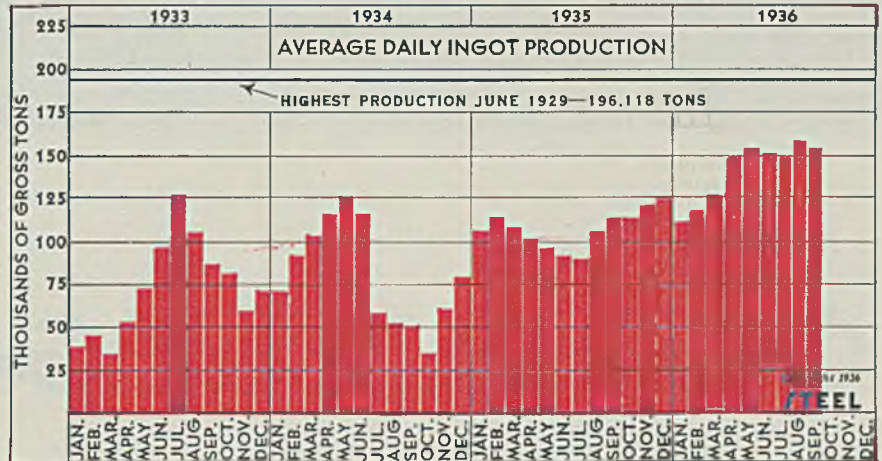
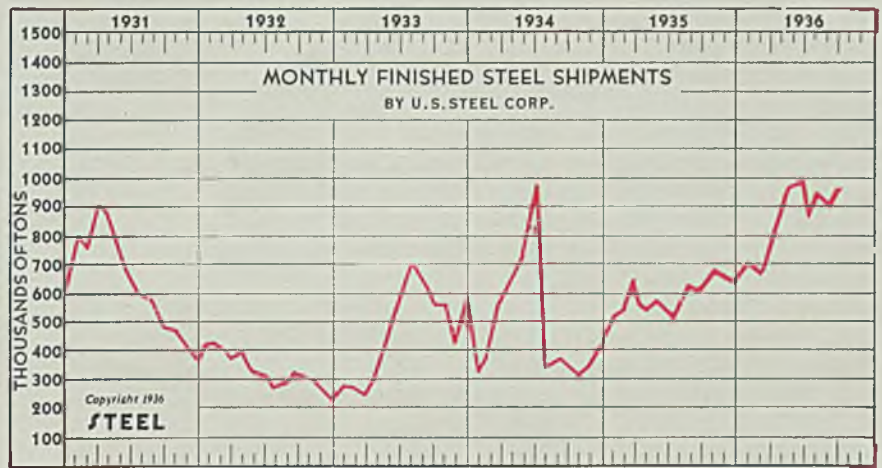
Index of Machine Tool Declines in September

Three Months Average

	Three Months Average			
	1936	1935	1934	1933
Jan.	102.6	61.3	56.5	18.3
Feb.	107.1	61.5	58.2	15.2
March	109.4	60.3	50.9	11.1
April	114.4	60.3	48.5	8.3
May	116.6	67.1	46.8	10.6
June	124.5	76.7	42.6	15.5
July	132.6	94.7	38.6	22.4
Aug.	135.5	112.2	37.1	27.9
Sept.	132.0	108.5	37.4	30.9
Oct. ....	.....	102.9	40.5	33.3
Nov. ....	.....	93.8	44.2	38.0
Dec. ....	.....	99.9	54.1	51.0

Iron and Steel Exports Off As Imports Gain in August

	1936		1935	
	Imports	Exports	Imports	Exports
Jan.	50,489	241,564	22,784	262,740
Feb.	43,358	213,802	28,905	228,537
Mar.	56,720	264,337	21,409	323,035
Apr.	49,621	301,987	28,866	205,336
May	59,391	314,950	47,719	286,598
June	59,910	294,951	33,208	286,333
July	47,940	296,738	31,894	296,782
Aug.	60,697	295,341	32,312	247,312
Sept. ....	.....	.....	53,158	244,419
Oct. ....	.....	.....	59,569	238,358
Nov. ....	.....	.....	56,637	205,242
Dec. ....	.....	.....	53,678	239,268



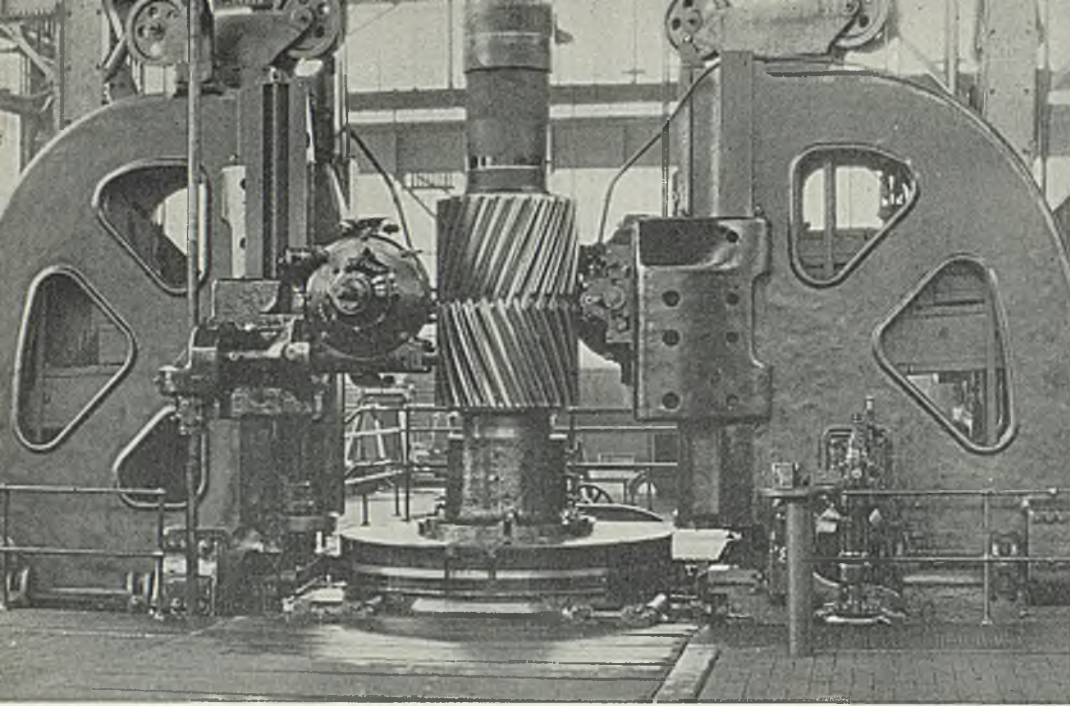


FIG. 1—Cutting a heavy steel mill pinion. This gear hobber is used when heavy cuts must be taken and the machine is subjected to considerable strain

Quiet High-Speed Gearing— Its Design and Manufacture

Part I

INTRIGUING problems involved in the design and production of quiet, high-speed gearing are exacting the attention of engineers. This may be explained in part by insistence of the operators and general public for relatively silent machinery. It is only natural then that quantitative technical analysis of gear noise is given secondary consideration, while the qualitative values concerned with human comfort are drawing primary attention. Unfortunately, it is not always possible to anticipate the character of noise to which exception will be taken, to say nothing of the lack of instruments suitable for identifying or measuring it.

It is exceedingly difficult to eliminate or suppress noise in existing gears. Absorbing means in the form of case liners have been tried with but little success, because of the large amount of material required to absorb even a small quantity of sound energy. Isolation is effective

only where the driving and driven equipment as well as the gear may be mounted so that they can vibrate independently of their supports. The object in such cases is to prevent sound transmission and drumming in the substructure but it has no effect on the air borne disturbances.

Energy of sound is very small, proof of which is found in the fact that the efficiency of a noisy gear shows no measurable difference from that of a quiet one. Sound waves in the air are the result of a transfer of motion from the walls of the gear case. Once vibration has started, the energy required to sustain it is small due to extremely low internal

friction of metal. To arrest this motion, on the other hand, would require the application of very large forces.

The best thing to do with a noisy gear is to abandon it. Disturbances which are the cause of noise must be eliminated at their source. This is possible only when dimension and form is held to such limits as will insure the presence of no motion other than the prescribed one.

Noise in gearing is to a large degree the result of recurrent separation of the contacting teeth. It is only possible for such separation to exist when any instantaneous value of relative angular velocity differs from the *mean* values established by the prescribed velocity ratio of the set.

Faulty gear operation may result from the presence of one or more of the following:

A. Disturbance over which designer has considerable influence.

1. Those caused by the transient nature of tooth loading especially as

BY W. P. SCHMITTER
Falk Corp., Milwaukee

regards its movement across the face.

2. Those due to critical speeds. Only certain types of drives are apt to run into criticals. When experience shows that they are likely to be encountered, necessary calculations should be made. Because of the uncertainty of such computations, shafts should be increased so that the expected criticals will be at least 25 per cent out of the operating range.

Critical vibrations are of two kinds, torsional and linear; the latter being encountered only at extremely high speeds. Torsional vibration is a swinging motion of the gear relative to a stationary axis but since the gear is revolving, it appears as a variation of angular velocity. Linear vibration corresponds to the oscillation of a tightly stretched string.

B. Disturbance over which designer has limited influence.

1. Those due to change from rolling to sliding on the tooth profiles and changes in direction of sliding as engagement moves in and out from the pitch circle. These disturbances are small and are dependent upon smoothness of profiles, efficiency of lubrication and design of tooth. Their importance is sometimes exaggerated in the treatment of speed increasers.

2. Angular accelerations arising from torsional deflection in shafts and pinion teeth. The drive generally comes in on one side of the pinion with power take-off on opposite side of the gear. When pinion and gear are of nearly equal diameter, torsional deflections compensate. When pinion diameter is small as compared with the gear, loading of teeth on incoming side of pinion is greatest.

3. Those due to bending of pin-

NOISE in high-speed gearing is dependent upon so many factors that service performance seems virtually unpredictable. Certain requirements of design and manufacture, unless satisfied, lead to trouble, yet their apparent complete fulfillment is not a complete guarantee of quietness. Engineers engaged in the production of gearing are at present giving this subject intensive study. Last April at the twentieth annual meeting of the American Gear Manufacturers' association in Philadelphia, W. E. Sykes, consulting engineer, Farrel-Birmingham Co. Inc., Buffalo, presented a paper, "Gear Noise," which received wide acclaim. Major portions of this paper were presented in the May 18 issue of STEEL. The accompanying article, the first of two, constitutes portions of another valuable paper, "Quiet High-Speed Gearing," read before the nineteenth semi-annual meeting of the same association held Sept. 8-10 on board the S.S. SEEANDBEE cruising the Great Lakes. This paper, which also received much commendation, will be concluded in an early issue of STEEL. The author, W. P. Schmitter, is assistant chief engineer, the Falk Corp., Milwaukee

ion or shafts. The result is a reversal of stresses in shafts and unequal loading across the face. The recurrent storage and emission of potential energy manifests itself as vibration and noise.

4. Impacting and splashing of the lubricant.

C. Disturbances over which the gear shop has chief control.

1. Those due to errors in tooth spacing. These result in variations of angular velocity of the rotating masses. Errors of this kind give much trouble at high speed, particularly noise and excessive loading.

2. Those due to deviations from the perfect involute. With limited contact ratio the effect is similar to that stated above.

3. Those due to "runout" of the apex of herringbone gears. This is especially noticeable in the case of heavy pinions and is often present in low-ratio gear sets. As a result the pinion mass must reciprocate at high speed with a variation in the stress intensity of the respective helices together with noise and vibration.

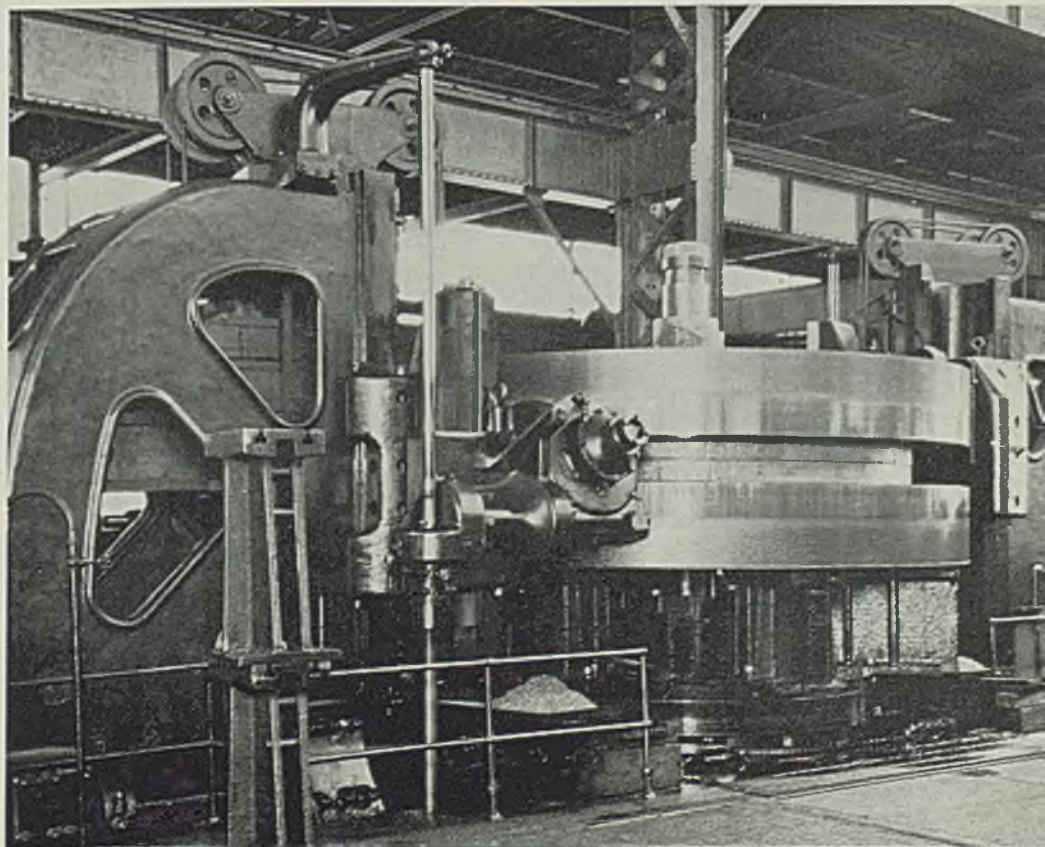
4. Those due to the presence of flats, burrs, roughness of teeth, and incomplete surface refinement.

5. Those arising from misalignment of the axes.

6. Those due to unbalance in the rotating masses, also couples due to rotating masses.

D. Disturbances over which the

FIG. 2—Although this gear hobber appears to be identical with the one in Fig. 1, it is used exclusively for high-speed gear cutting. Several thousand dollars were spent recently to improve the divisional accuracy of this unit



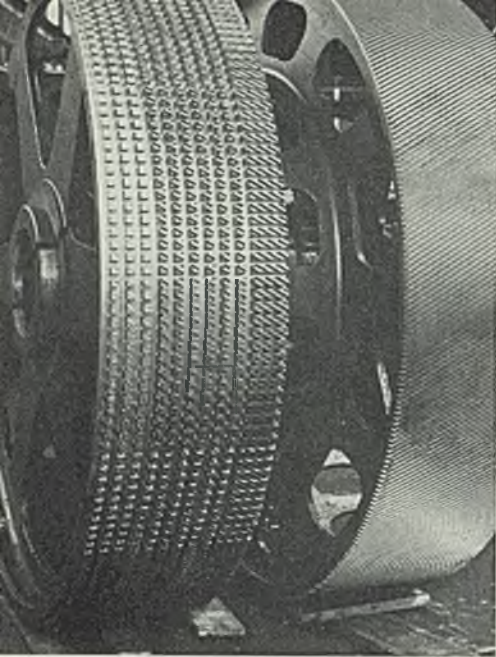


FIG. 3—This large cast-steel gear was machined to expose alternate 1-inch squares; absence of defects was a tribute to foundry practice

gear designer has little or no control.

1. Torque fluctuations due to imbalances in the driving means.
2. Torque fluctuations of the driven machinery; such variations, for example, as exist in pumps, blowers, etc.
3. Couples due to gyroscopic effect of rotating masses. This phenomenon is uncommon and is experienced only when the gear axis is moved as in airplanes, ships and motor cars, and sometimes in planetary gear shafts.

The causes for tooth separation are frequently but not necessarily due to imperfections in the gears themselves. They may be due to outside conditions which have little or nothing to do with accuracy of gear cutting or design.

No Single Cause of Noise

A pair of gears is essentially a loosely coupled device. The running clearance between the teeth is necessary to provide room for expansion with increase of temperature and to permit proper lubrication. It is largely because of this clearance that adverse external conditions sometimes interfere with the proper performance of an inherently good gear set.

There is no single specific for gear noise and there are little in the way of criteria upon which to forecast performance. There are, however, certain requirements which, if not satisfied, will certainly lead to disappointment, and yet their apparent complete fulfillment is not altogether a guarantee of a quiet gear. Manufacture of high-speed

gearing is today as much of an art as an exact science despite fruitful gains of the last few years.

From an analysis of the disturbances responsible for gear noise, we may prescribe the following as essential to a quiet operating pair of herringbone gears.

1. Division of the teeth permanently accurate.
2. Shafts true, concentric with the teeth, round, and spaced to allow for a proper running clearance.
3. Revolving parts in correct running balance.
4. Shafts parallel to each other under all conditions.
5. Spiral angles correct and matched.
6. Tooth profiles of correct form to transmit uniform velocity despite deflections that may occur under load.
7. Tooth surfaces finished smoothly.
8. Helical design such that there is sufficient overlap and the axial contact migration under load not excessive.
9. Teeth properly lubricated.
10. No functional interference arising from elastic distortions of pinion shafts or supports.

These are the primary requirements and some are naturally of greater consequence than others. In the past, however, a few have been overemphasized until they assumed importance entirely out of harmony with their real significance.

Division of Teeth Most Important

The actual step by step division of the gear teeth is of greatest importance and is established primarily in the cutting process. Suffice it to say that axial index depends not so much upon the particular cutting process used as upon its state of perfection. It is not enough to speak of a hobber or a shaper because all hobbers are not alike and there are similar basic differences in shapers.

We have production hobbers, pre-

cision hobbers, those using the Creep system, those using compensated division, single cutting hobbers, dual hobbers, horizontal hobbers, vertical hobbers, etc. There are tooth by tooth rack shapers, progressive rack shapers and continuous pinion shapers. Even machines of a given type will produce gears with varying degrees of accuracy depending upon inherent accuracy of the machine itself, its state of repair or disrepair, accuracy of the hobs or cutters, their sharpening, mounting and other variables.

Improved Hobs Are Help

The method used by the Falk Corp. for high-speed gearing is exclusively that of hobbing of the compensated division type but not all of these machines are best adapted for high-speed work. Figs. 1 and 2 illustrate two apparently identical gear hobbers. The one in Fig. 2, however, is used entirely for high-speed gear cutting, and the one in Fig. 1 where heavy cuts must be taken and the machine subjected to considerable strain. Only recently several thousand dollars were expended in improving the divisional accuracy of the precision hobber to gain a few ten-thousandths inch.

Improvements in hobs have aided materially in attaining a closer approach to theoretical perfection. In recent years methods of grinding hob threads have been perfected to a degree that tooth to tooth lead errors are now commonly held to 0.0002-inch. As a result, gear tooth spacing limits are reduced considerably from what was at one time considered acceptable practice.

While the accuracy of division depends mainly upon the cutting and refining methods used, practically all of the preliminary processes affect it in some degree. Turning and boring must be held to a high order of accuracy and precautions taken not to build up residual stresses which, upon release, mar the character of the finished product. To guard against such con-

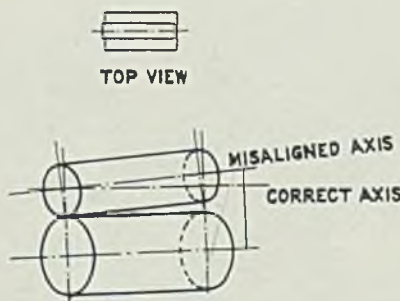


FIG. 4A
MISALIGNMENT IN PLANE OF CENTERS
(INTERSECTING AXES)

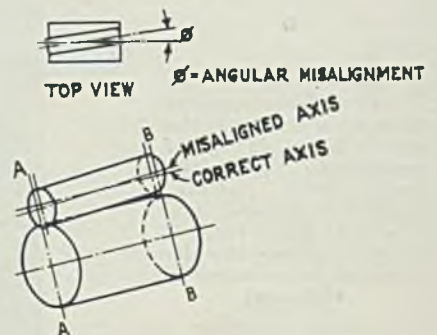


FIG. 4B
MISALIGNMENT NORMAL
TO PLANE OF CENTERS
(CROSSED AXES)

tingencies, gear blanks are heat treated three times during their manufacture, to insure this steel being in its most stable metallurgical condition. Any of the ordinary hardening processes making use of a quench, therefore, are inadvisable, except where proportions are small.

Pinions are forged from alloy steel. Care must be taken in the forging process so that the amount of hammer work in one section is not unduly greater than that in another. With variation in material density cutter resistance is not uniform, thereby directly affecting the windup in the cutter drive. The relative speed of the cutter to blank is intermittently disturbed causing spacing errors which lead to noise.

In their normalized condition alloy steels have a higher yield point than straight carbon steels and their self-hardening properties make it possible in many cases to avoid a quenching operation. Where greater hardnesses are necessary, higher drawing temperatures of alloy steels release a greater portion of the quenching stresses. This leaves the steel in a more stable condition than possible with straight-carbon steels.

Types of High-Speed Gears

Three general types of construction are in use for high-speed gears. The oldest makes use of a rolled steel ring shrunk upon a cast-iron spider. It is open to the objection that high hoop stresses in the ring are relied upon to keep it in intimate contact with the supporting structure. These, together with the compressive stresses between the two members are a potential source of difficulty since they cannot be controlled accurately. Tooth rings have been known to come loose in service and some have even opened up after years of operation. Unless the shrinking operation is carefully carried out, stresses will not be uniform. The surfaces first coming in contact with the spider cool faster and friction is too high to permit

Concentration Resulting from Errors in Mounting

Transverse pressure angle, degrees	Concentration in Per Cent of Error for Spur or Single Helical Error through centers, per cent	
	Error normal to centers, per cent	Error normal to centers, per cent
14½	25	97
17	29	96
20	34	94
22½	38	92
25	42	90
27½	46	89

For herringbone gears concentration is 50 per cent of above values.

the ring to adjust itself after the initial set. Another construction sometimes used consists of a rolled or cast-steel ring welded to a built-up plate structure. For the welds to be reliable, carbon content of the ring should be kept low, as alloying elements are especially undesirable due to air hardening.

Castings Are Sound

A third method makes use of integral steel castings. Contrary to popular belief, a high-grade gear casting is sounder than a forging. To produce a forging or plate, a billet must first be cast and this is subject to blow holes and secondary shrinks. In the subsequent processes of rolling and forging each small air pocket will be spread out until it covers an area much greater than that of the original fault. This is known as a seam, which is really a misnomer since it has practically no strength due to the fact that the rolling and forging temperatures are below those required for welding. A defect of this character is much more serious than a blow hole because it is not readily detected in the usual inspection procedure. As it is not of a localized character, it generally affects several teeth and leads to early failure.

Gears must be of a form and pro-

portion well adapted to casting. Fig. 3 shows a large cast-steel gear machined to expose alternate 1-inch squares; absence of defects bears tribute to the present high state of foundry technique. The Falk Corp. has developed a special alloy steel which is well suited for cast gears.

A journal flat will cause cyclic variations in gear centers. A difference in journal diameters produces converging axes. The shaft journals and seats are accordingly ground to close limits. It is obvious that the path of the tooth is established not by the geometrical center of the gear but by its position relative to the journal; high-speed gears, therefore, are always turned and cut after mounting on the shaft.

Balance Is Essential

Shaft centers must be such as to allow for adequate backlash. Ordinarily, there is considerable latitude here but there are occasional applications such as already cited where clearance must be held to a minimum. In one such instance a set of gears mounted on anti-friction bearings began to squeal during the course of a short test run. They were found to rotate freely at one point in their revolution and then half a dozen turns later binding took place. The gears were carefully checked and found to be true, but it was discovered that the eccentricities of the bearings in conjunction with thermal expansion caused cramping when the high points on each were brought into line. For very high-speed work, the sleeve bearing still has the field to itself; the oil film is particularly beneficial in permitting some self-correction because of viscosity changes accompanying temperature changes.

High-speed gears must be properly balanced or they will not run without noise and vibration. A set of gears may rattle when running for no other reason than because the large gear is out of balance and overruns the pinion during part of each revolution with consequent separation of contact during that part of the rotation. If the gear is properly cut and mounted, the noise

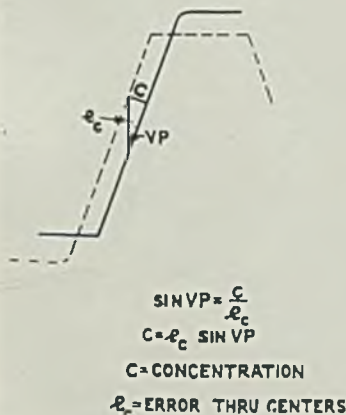


FIG. 5A

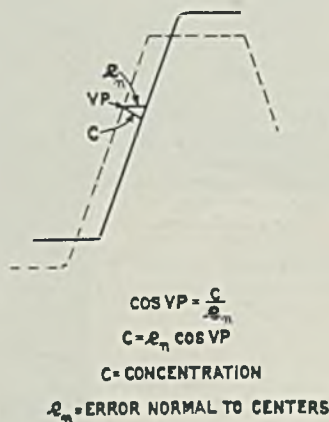


FIG. 5B

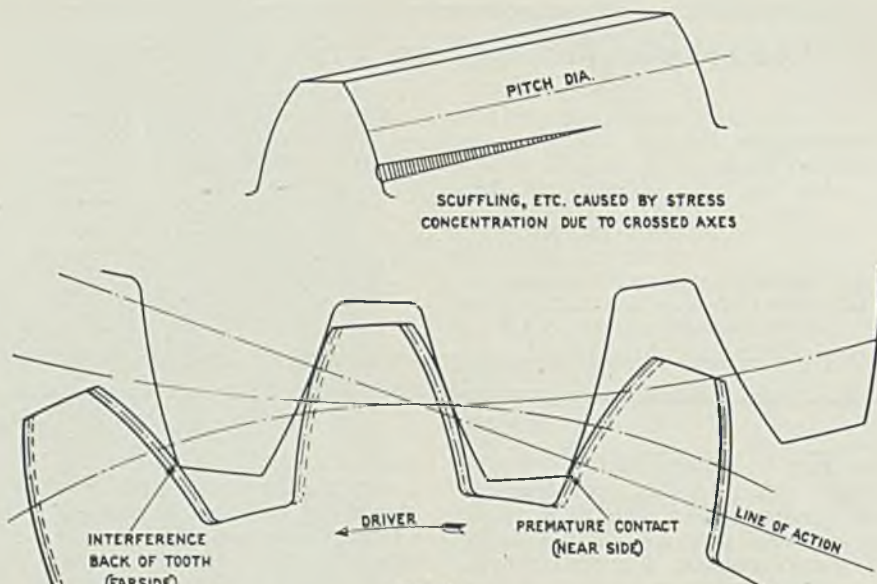


FIG. 6
VARIATIONS OF TOOTH CONTACT DUE TO MOUNTING ERROR (CROSSED AXES)

will usually disappear when the gear is run under load.

Importance of perfect running balance in high-speed gearing is illustrated by the following example. A gear unit was furnished for a drive between a steam turbine and centrifugal pump, about 1000 horsepower, 4000 to 1200 revolutions per minute. Notwithstanding that the gear was carefully tested before shipment, it was excessively noisy when put to work. Nothing could be done to cure the trouble, and a new unit was built and shipped. Exactly the same trouble developed in the second unit although every precaution had been taken to prevent it. Finally it was discovered that a short piece of surplus key was left projecting behind the pinion coupling. The unbalanced weight of this key was sufficient to throw the high-speed pinion out of balance and this was the cause of the trouble.

Balanced Electrically

Dynamic balancing machines in which the low spot in the wheel is located by an electrical method are used for high-speed gears. The gear is mounted on a swinging arm which is temporarily locked by means of jack screws. In operating the balancing machine, the wheel is brought up to speed and the screws backed off, permitting the unbalanced weight to register a pressure against a stabilizing spring. One end of the revolving shaft carries a segmental switch with 24 stations connected to an equal number of small neon lamps. When the gear swings to the heavy side, contact is made with the pivoted arm at the center of the shaft axis, and the neon light corresponding to that particular position flashes. After

the high side of the gear is disclosed in the first run, trial weights are bolted in place and the balancing operation repeated until the lights flash rapidly in sequence, showing the gear to be in perfect balance. A similar machine is used for pinions and small gears.

If the high-speed herringbone gear is to operate quietly, it must not only be extraordinarily accurate as such, but needs also to be supported in a frame of equal precision and capable of maintaining the correct relationship of pinion and wheel under load. In gears on this type, wide face widths are employed to hold the linear velocities as low as practical and this results in case proportions which require careful attention to detail. Parallelism in both planes is

essential but especially so in the plane normal to the shaft centers. An alignment error in the plane of centers is present when the spacing between pinion and gear shaft bearings is greater on one side than the other. See Fig. 4A.

As a result of such a condition the load at the extremity of the face on the short side will be heavier than the designed average. For unidirectional toothed gears the concentration will be equal to approximately the difference between maximum and mean centers multiplied by the sine of the pressure angle, and lighter than the average by the same amount on the opposite side. See Fig. 5A. When the error is appreciable, the difference in loading is high because the elastic deflections of the teeth are of a low order.

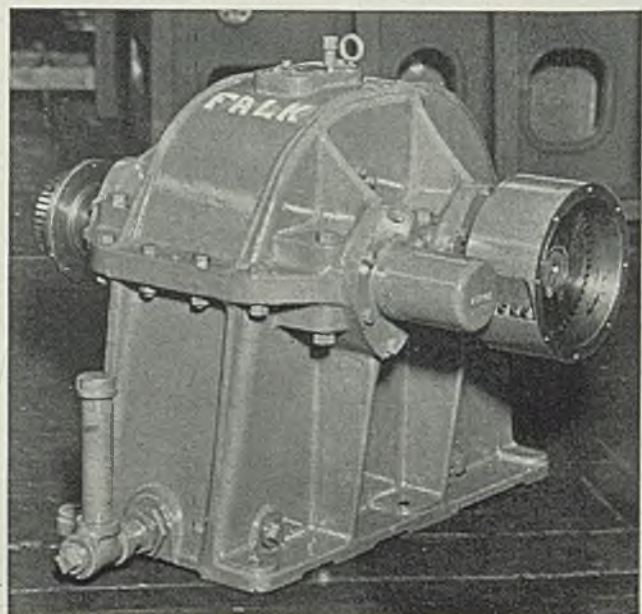
Figuring Concentration

It is apparent that the relative horizontal slopes of the shaft axes are determined by the extremes of bearing positions relative to their average and that the degree of concentration is a function of the face width. Herringbone gears operate as two individual gears in dividing the load between the right and left-hand helices (if pinion is not restrained axially), thus for a given face and slope the concentration will be only one-half that of a single helical gear of the same proportions. This sometimes influences the design treatment, particularly as regards the choice of centers and face width.

Mounting errors of this type produce less concentration for low pressure angles than for the higher ones, although the difference is small, as is illustrated in the table on page 37. It may be worthy of consideration in the case of very large

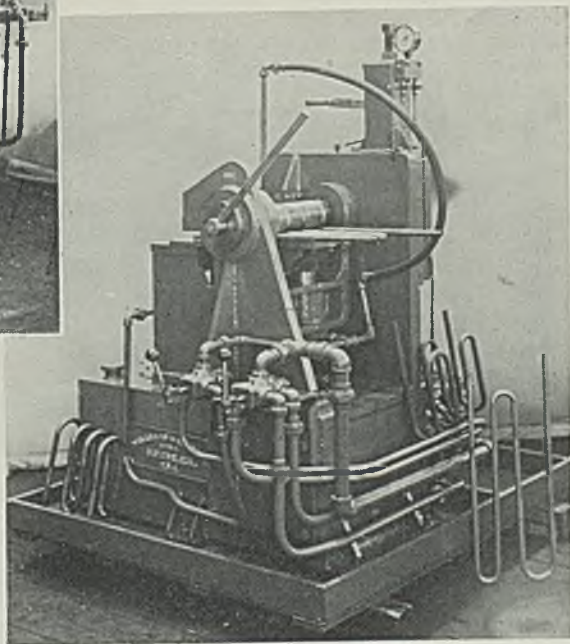
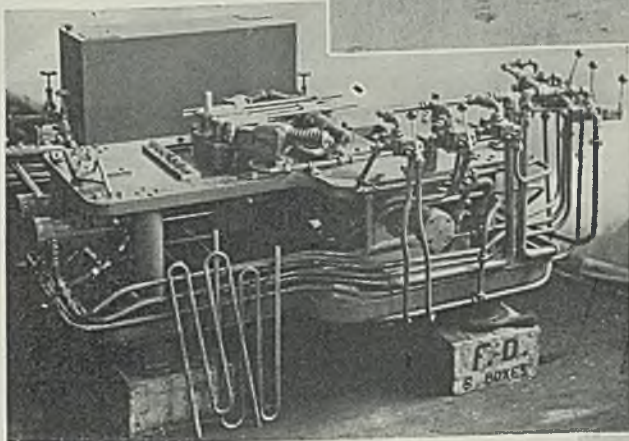
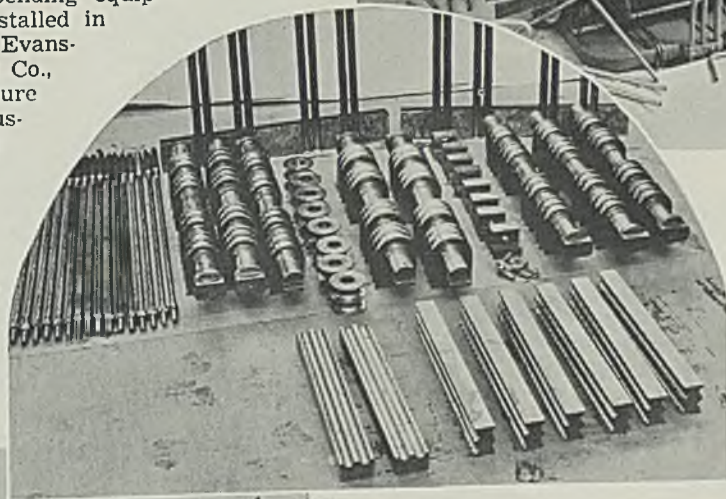
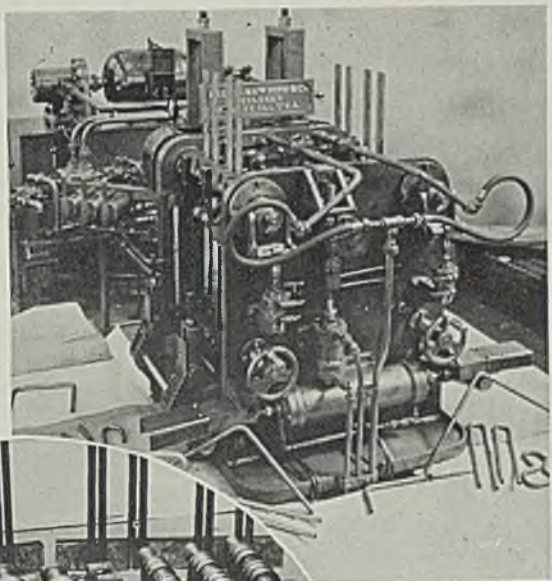
(Please turn to Page 56)

FIG. 7—This new standardized high-speed reduction gear unit has a housing of the rigid type



Steel Tubing Is Formed On Production Basis

NEW high-production tube bending equipment recently has been installed in the plant of Servel Corp., Evansville, Ind., by Williams, White & Co., Moline, Ill., for use in manufacture of Electrolux refrigerators. Illustrations on this page show some of this equipment. At the upper right is a hydraulic tube bender in which eight cold-drawn steel tubes are inserted in the front dies and eight in the rear dies. Power is applied and the 16 tubes are bent up to and including 180 degrees, with adjustable stops provided



for any desired angle of bend. Some of the formed tubes are shown in the foreground. Hydraulic pressure of 800 pounds is required in the clamp cylinders, about 300 pounds in the large cylinder to do the bending and 400 pounds pressure to hold the ironing dies against the work.

After the tubes are bent, the die clutches are released by air and the bending units returned. An air operated ejector is provided to raise the bent tubes 4 to 6 inches. When the tubes are removed the bending dies are returned by an air impelled rack. One operator is required for the front of the machine, and a helper for the rear. The two throttle valves are interlocked so that both the helper and the operator must work together.

Specially designed arbors are used

inside the steel tubes while they are being bent, to prevent flattening or wrinkling. Adjustable gages are provided for tubes of various lengths. With accurate tubes it is possible to fill, bend and unload the machine in approximately 30 seconds, making about 1920 bends per hour.

Arbors used in the tubes are of

the hinged ball type. The tube is drawn over the end of the solid arbor, into which is inserted the ball on a hinge which conforms to the radius of the tube. The ball is about 1 inch past the bending point and after the bend is made, while the tube is still clamped in the machine, the arbor is pulled down about 2 inches, which irons out the flatness

between the end of the arbor and the ball at the finish. With these arbors set exactly in position, no wrinkles or flattening will occur.

Next illustration shows some of the die equipment required for these machines. With the dies on the machine just described, it is possible to bend 16 one-inch steel tubes, 16-gage, to 4-inch radius or less.

Third illustration, at the left on the page, shows another type of hydraulic bender designed to make continuous flat coils in one piece, such as shown at the front of the machine. These flat coils are subsequently transferred to the machine shown at the lower right

where they are finished to the shape shown in the left foreground. The flat coil is placed on the die table below the main shaft which itself is a die. The table swings around in a counter clockwise direction making a 180-degree bend in the coil, one side of which is clamped rigidly during the operation.

Soluble oil is used as a lubricant on the cast steel dies and in the arbors. This eliminates any oil being in the pipes when finished and also prevents rust. The tubes are all sandblasted inside and outside before installation, to prevent any foreign material being in the refrigerant solution.

features, in which event any individual case would be referred to the state industrial board for disposition. Or, he may elect not to operate under the act. In such an instance an employe alleging disability from an occupational disease may then sue for damages in an ordinary court of law. As in any other civil suit, in order for the plaintiff to recover damages he must show negligence on the part of the employer.

So far as cases involving the use of contaminated wiping cloths are concerned, it is regarded as patent that a jury would impute negligence to an employer who knowingly furnished a worker with unsanitary wiping cloths or who did not take ordinary precautions in the purchase of such materials.

Care in Purchasing

The answer as to how an employer can avoid the risk of being named defendant in such an action is comparatively simple. It involves merely the use of ordinary prudence in the purchase of wiping cloths as well as all other supplies which involve a health or accident hazard. Wiping cloths, by analogy, are classed in the same category as common tools. In the use of common tools, the employe assumes the risk of any danger rising from a latent defect, unless the employer has a better means of knowing of the existence of that defect than has the employe. Consequently, proof that the employer has purchased a tool from a reliable source and in accordance with standard specifications, in many cases, has relieved him from liability in the event of injury when other circumstances failed to show negligence on the part of the employer.

The standard specification for sterilization of wiping cloths which is now generally accepted throughout the industry is that established by the Sanitary Institute of America, the national trade association of sterilized wiping cloth manufacturers. These specifications prescribe that no wiping cloth shall be sold as sanitary or sterilized unless it has been thoroughly washed and boiled in a solution containing pure soap—76 per cent caustic and/or chloride of lime—and dried in a temperature of more than 212 degrees Fahr.

Products conforming to this standard carry the distinguishing seal and label of the Sanitary Institute of America. It would appear reasonably certain that any employer named a defendant to a suit under a workmen's occupational disease act, charging negligence in the furnishing or contaminated wiping cloths, would make out a good prima facie defense by showing that the cloths in question carried this label.

Sterilized Wiping Cloths Serve To Check Spread of Occupational Disease

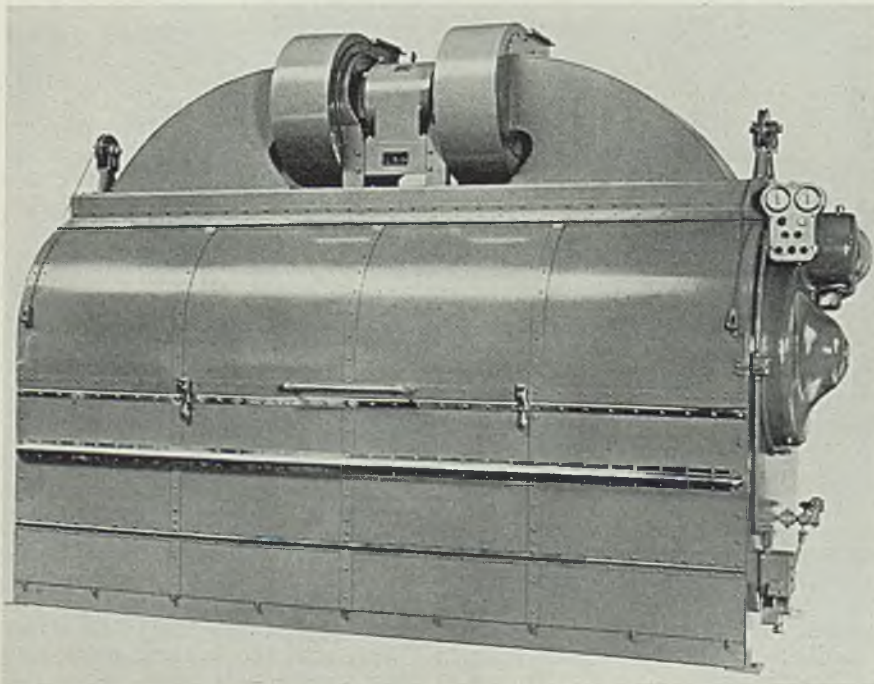
ALTHOUGH both employer and employe have long been aware of such a disease as oil dermatitis and have taken preventive measures in the form of disinfectants, much less attention, until recently, has been given to the danger of infection spread by the unsanitary wiping cloth.

Better informed groups, such as safety engineers, of course, have consistently opposed the use of unsterilized materials. More recently, others than safety men have acquired the belief that regardless of all other factors, the one indispens-

able specification to be insisted on in the requisitioning of wiping cloths is sterilization.

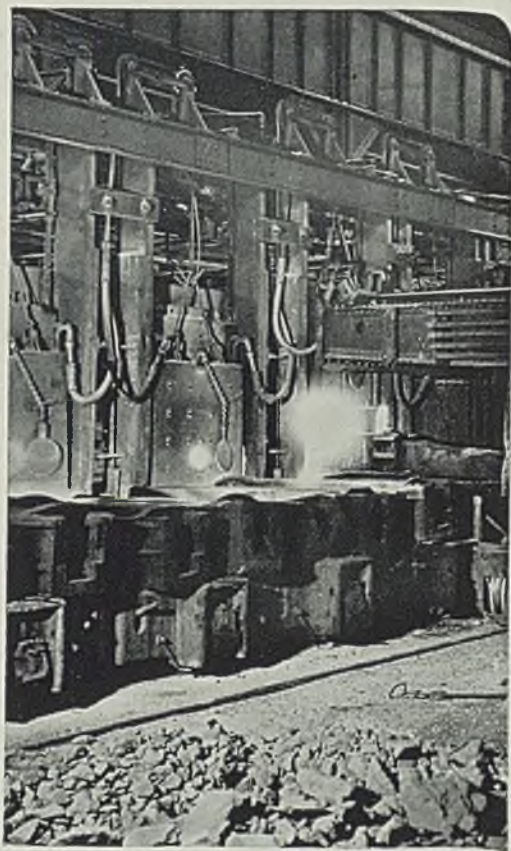
This conclusion has been strengthened by the increasing tendency for legislative and regulative authorities to hold the employer responsible for the health of employes through workmen's industrial disease acts.

Industrial disease acts already are in effect in various states. Illinois has passed such an act, which goes into effect Oct. 1. Illinois' measure provides that its operation shall be elective. The employer may choose to be bound by its compensation



Drying machine in which wiping cloths are sterilized at 212 degrees Fahr. following washing

BOOK OF FACTS



Heat is a natural enemy of rubber. Hose used in steel industry operations is constantly subjected to high temperatures. Therefore, U. S. Rubber Hose is specially compounded to combat the destructive effect of heat over long periods. Also, U. S. Rubber Hose is extra tough—extra flexible—has greater strength built into cover and carcass.

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Multiple Drills Speed

BY FRED B. JACOBS

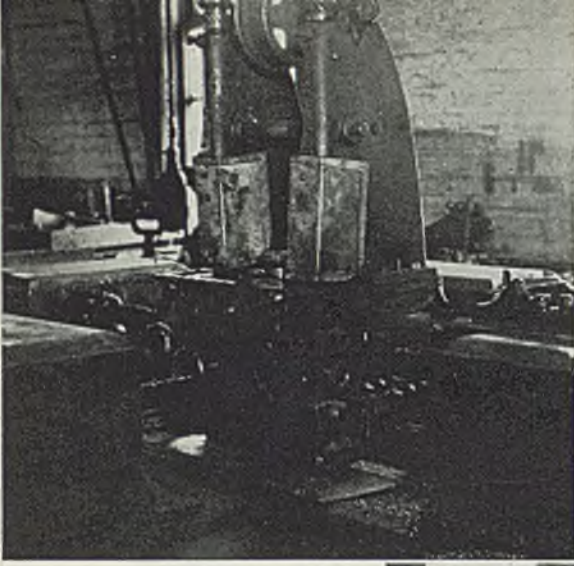


FIG. 1—(above) This combination of drills and jigs makes 14 holes at one time in a sewing machine bed

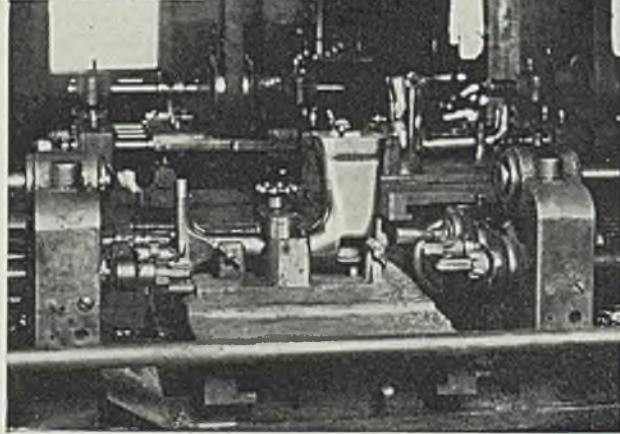
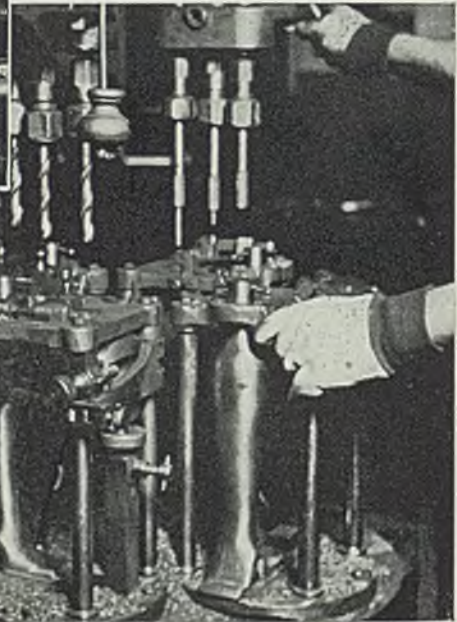


FIG. 2—(above) Boring holes for the upper shaft in a rotary sewing machine. Fig. 3—(right) Three-station operation for drilling, reaming and counterboring



WHERE long production runs are made, multiple drilling offers a ready means of reducing production costs as anywhere from three to a dozen or more holes can be drilled in practically the same time necessary to finish one. Multiple drilling of course calls for the installation of special expensive equipment the nature of which will vary with the character of the work. This article illustrates and describes a few of the multiple drilling operations, performed daily at the plant of the White Sewing Machine Co., Cleveland. This company has been manufacturing household sewing machines for over a half century and thus the production methods used today are a gradual development dating from the time when the output was only a few machines daily.

Drill From Four Directions

The operation shown in Fig. 1 consists of the simultaneous drilling of 14 holes in a sewing machine bed. As the illustration shows the work is located in a special jig while the drills operated from the front, both sides and the top. This machine was built by National Automatic Machine Tool Co., Richmond, Ind., from the White company's specifications and it is an excellent example of a spe-

cial purpose tool. The 14 holes range in size from $\frac{1}{8}$ to $\frac{1}{2}$ -inch. In this operation the work is set and clamped in the jig then the jig is set in place in the machine, being positioned by means of stops provided for the purpose. Drills feed in from four sides automatically.

In Fig. 2 is shown the operation of boring holes for the upper shaft in a rotary type sewing machine head. As the illustration shows, the work is clamped securely in a special fixture while the boring machine is a special unit designed and constructed for this work at the White company. At each side of the machine are three boring tools. The

tool for the first operation is a core drill which is centered between the other two. The second operation consists of rough reaming done with the tool back of the core drill. The third operation is finish reaming, performed with the tool in front of the core drill. The work locating fixture is located accurately for each operation by means of stops. Thus the sequence of operations is performed at the front and back of the work simultaneously. The work starts with the center tool, then moves back to bring the tool in the foreground in position, then it is moved forward to position for the tool in the background. Finished in

Production Economically in Sewing

Machine Parts Manufacture

this manner the holes are exactly in line which condition is necessary to facilitate assembly without unnecessary line reaming to bring the holes in correct relation.

The holes thus bored are used as locating points for drilling, counter-boring and reaming three holes as shown in Fig. 3. In this operation four jigs are mounted on a turntable. The first station is for loading. At the second station three 35/64-inch holes are drilled. At the third station a 17/64-inch hole is drilled and one of the previously drilled holes counterbored. At the third station two holes are counterbored and one reamed. This sequence of operations is carried out under a Natco multiple drilling machine.

One Setting Drills Eight Holes

An unusual operation is shown in Fig. 4 where special equipment is used for drilling eight holes at one setting. The five holes at the right range in size from No. 19 to 3/8-inch, while the three holes at the left are for 12 x 24 screws which are used to fasten the head permanently to the bed. The work is clamped in a special fixture taking advantage of previously milled surfaces for locating points. Then the fixture carrying the work is moved to the left, then to the right. Thus the operation is practically automatic and the eight holes are finished in the same time that would be consumed in finishing one if the holes were drilled one at a time.

In Fig. 5 is shown a production line arranged in the shape of a U for drilling 21 holes and tapping three holes. Two men operate the line while six box jigs hold the pieces while 21 holes are drilled and three are

tapped. In the extreme foreground are shown several heads and one of the jigs. The equipment for drilling consists of five Natco multiple drilling machines. This is a good example of multiple drilling where two men can operate a production line embodying five machines. One man loads the work and carries it successively to two machines one after another. The other man operated the other three machines. The machine tables are fitted with stops which position the work accurately so that no time is

lost in locating the work correctly under the drills. Holes drilled in this operation range in size from 1/8 to 1/2-inch.

While the foregoing are only a few of the drilling operations performed at the White Sewing Machine Co., they reflect up-to-date practice and are excellent examples of multiple drilling which can be adapted to practically any production work where it is necessary to drill and ream a number of holes in long production runs on a group of similar parts.

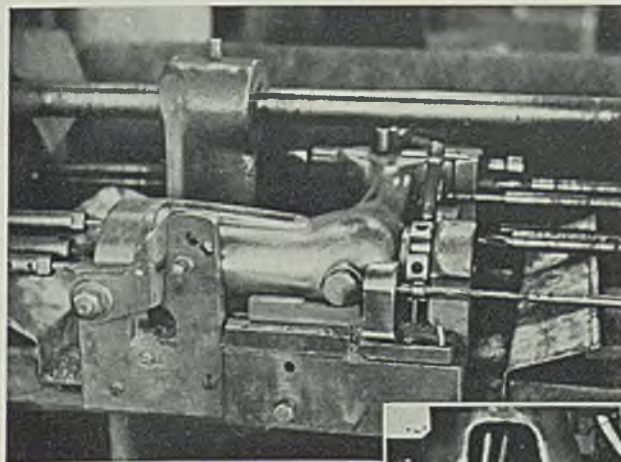
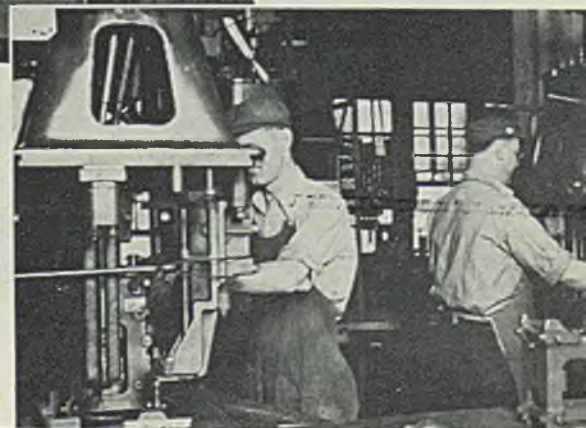


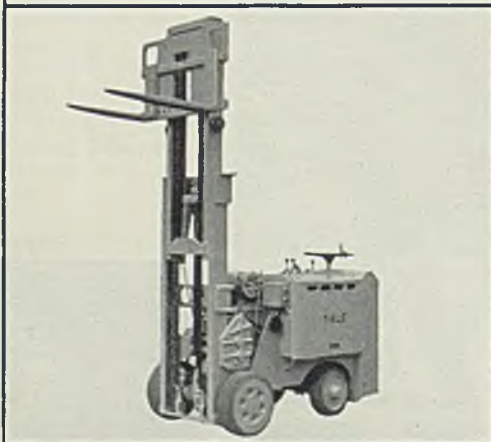
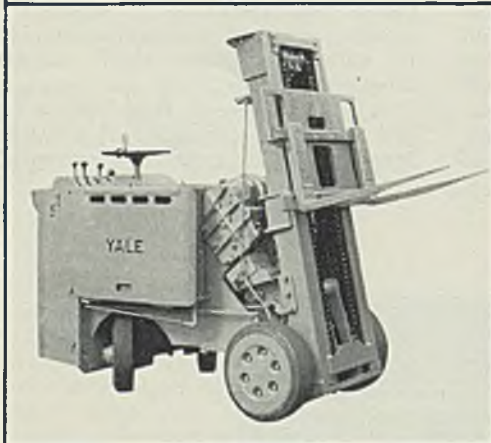
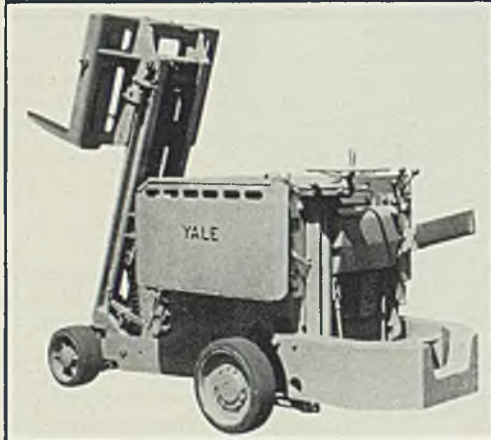
FIG. 4—(above) Heads are clamped in the fixture shown and eight holes are drilled in them simultaneously by this arrangement. Fig. 5—(right) Two men operate the U-shaped production line shown here. Six box jigs hold the pieces while 21 holes are drilled and three are tapped



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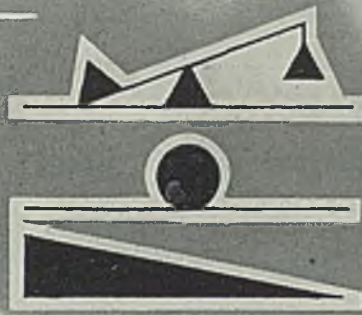
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New Handling Equipment in Buick Plant Includes Several Innovations

ONE of the reasons why the automobile manufacturers of this country have been pointed to with pride by all students of materials handling is that they have never been content to let the old equipment and the old methods do the job whenever they have found that the task to be accomplished can be done better by more modern means.

Obsolescence has long ago been discovered as an enemy in this industry. As a result, the automotive plants are always out in front in applying more economical methods. Just because a conveyor line, a hoist or a truck has been in operation only a comparatively brief time, it is not allowed to stand in the way of progress. That is the reason that so many of the units in the great automobile manufacturing centers are still in the foreground today as examples of how best to handle materials and finished products.

A recent example of what is being done is found in the plant of the Buick Motor Co. in Flint, Mich. According to F. Elwell, works engi-

neer, the recent expansion program which was undertaken by Buick included the purchase of several items of materials handling equipment and changes in methods of utilization of some of the older equipment.

One of the most interesting of these innovations is noted in the fact that in several instances recently Buick has arranged for processing of parts along the conveyor line. A notable case is to be found near the starting end of the motor assembly conveyor in Factory No. 11, where the bell housing is milled after it has been bolted on

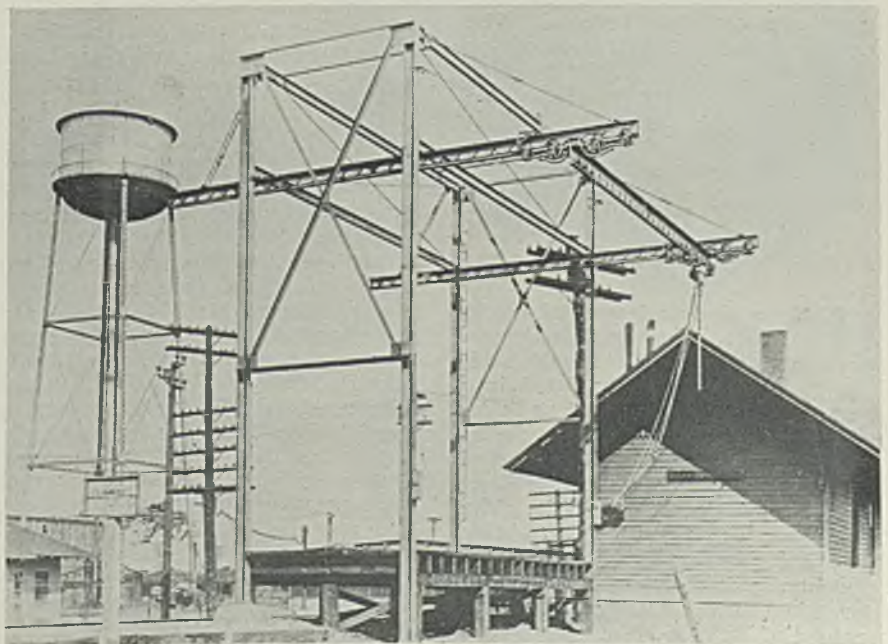
the motor and started along the assembly line.

Included also in the program has been the purchase of several special electric industrial trucks. Some of these are used for high tiering, others for handling and tiering extremely heavy loads of sheet steel bundles.

Several special-duty tractors have been installed for operation with trailer trains. Many of the latter now consist of special containers, or racks, on which production parts are stacked or stored in larger quantities than were possible under older methods.

According to Mr. Elwell, some of the conveyors have become so long and travel is over such a tortuous route that it has been necessary to install dual drives. The latter are so arranged and located that each pulls approximately one-half the

HERE is an unusual installation of tram rail, unusual in that it is the property of a railroad and used for heavy handling at a small freight station. It is understood that considerable salesmanship was involved. As a matter of fact, it all came about because one of the sales executives in a factory served by this outlying station saw a group of his men struggling with some heavy incoming materials, and decided that such methods were decidedly primitive



MATERIALS HANDLING

load. These drives are controlled from a central location with indicating apparatus so arranged that the load on each drive can be adjusted as the occasion requires.

Another of the recent acquisitions at Buick's plant has been a gasoline-driven industrial locomotive. This is used for handling bulk materials which arrive in carload quantities.

• • •

Locomotive Crane Activity

OHIO Locomotive Crane Co., Bucyrus, O., reports through J. E. Robertson, sales manager, locomotive crane division, that the organization is enjoying a substantial business in cranes for scrap iron, railroad and slag plant handling operations. This is another indication of the reliance of industry on modern materials handling equipment in meeting unusual delivery requirements incidental to the present business upturn.

• • •

Handy Inspection Unit

A MANUFACTURER of welded pressure vessels now uses a specially designed electric industrial truck, on which is permanently mounted X-ray apparatus, which is moved directly to the vessel to be tested. The usual method is to move the work to the testing department; here is a complete reversal. The testing equipment, exclusive of the truck, weighs 6¼ tons. In order to prevent any disturbance of the delicate apparatus, the entire unit is transported from job to job by overhead traveling crane.

• • •

Additional Uses for Trucks

HOW an electric industrial truck, originally purchased for transporting finished products to the loading platform, gradually fitted into additional handling operations is described in an interesting article in a recent issue of *Exide-Ironclad Topics* issued by the Electric Storage Battery Co., Philadelphia. The truck was purchased by the Tri-Lok Co., Pittsburgh, to handle metal flooring. After it had been in use for some time, it was found that instead of leaving 20-foot lengths of steel outdoors until they were ready

for use, by utilizing the electric truck in conjunction with a dolly and using the overhead crane for loading the steel from the freight cars directly to the truck and dolly, the steel could be carried into the building to inside storage space near the shearing machine.

This change has effected savings. After the steel is sheared, it is placed on skids and the latter are moved by the truck to the punches and thence to the assembling tables. The next operation into which this truck was fitted is the transportation of the formed flooring from the assembling tables to the 1600-ton press. The truck also carried the flooring to painting or galvanizing departments.

• • •

Full-Enclosed Hoist Motors

RECENTLY announced line of motors is designed particularly for use on cranes and hoists of smaller sizes, such as are used in foundries, machine shops, coal and coke plants and similar locations where considerable quantities of dust and dirt are present. High starting torque and low starting current are embodied. Among the features are a special insulating varnish with high resistance to oil, most solvents, moisture and unusual temperatures; an extra-large, diagonally split conduit box for making easy connections; end frames of tough, ductile, malleable iron, with complete support for end shields and solid feet cast integral with the frame; and rotor bars copper-brazed to the end rings.

• • •

Novel Sheet Handling Truck

THE ability of the industrial truck manufacturers to find a solution of difficult problems is indicated in many directions. In a large radio manufacturing plant in the East, the handling of unusually long sheets of steel constituted a difficult problem. Today this problem is no longer existent. The solution was a special sheet handling truck, which enters the box cars at the company's siding and unloads the bundles, transporting them to storage and thence to the first operation.

The truck is really a combination of electric industrial unit with a gantry and hoist attachment. A motorized beam, which can be extend-

ed from the end of the truck, permits picking up the steel with a special cradle device. An electric hoist, which is built into the beam, does the lifting. When the load is raised to the proper height, the beam is retracted into the main frame and the cradle lowered into position.

• • •

Raising Individual Output

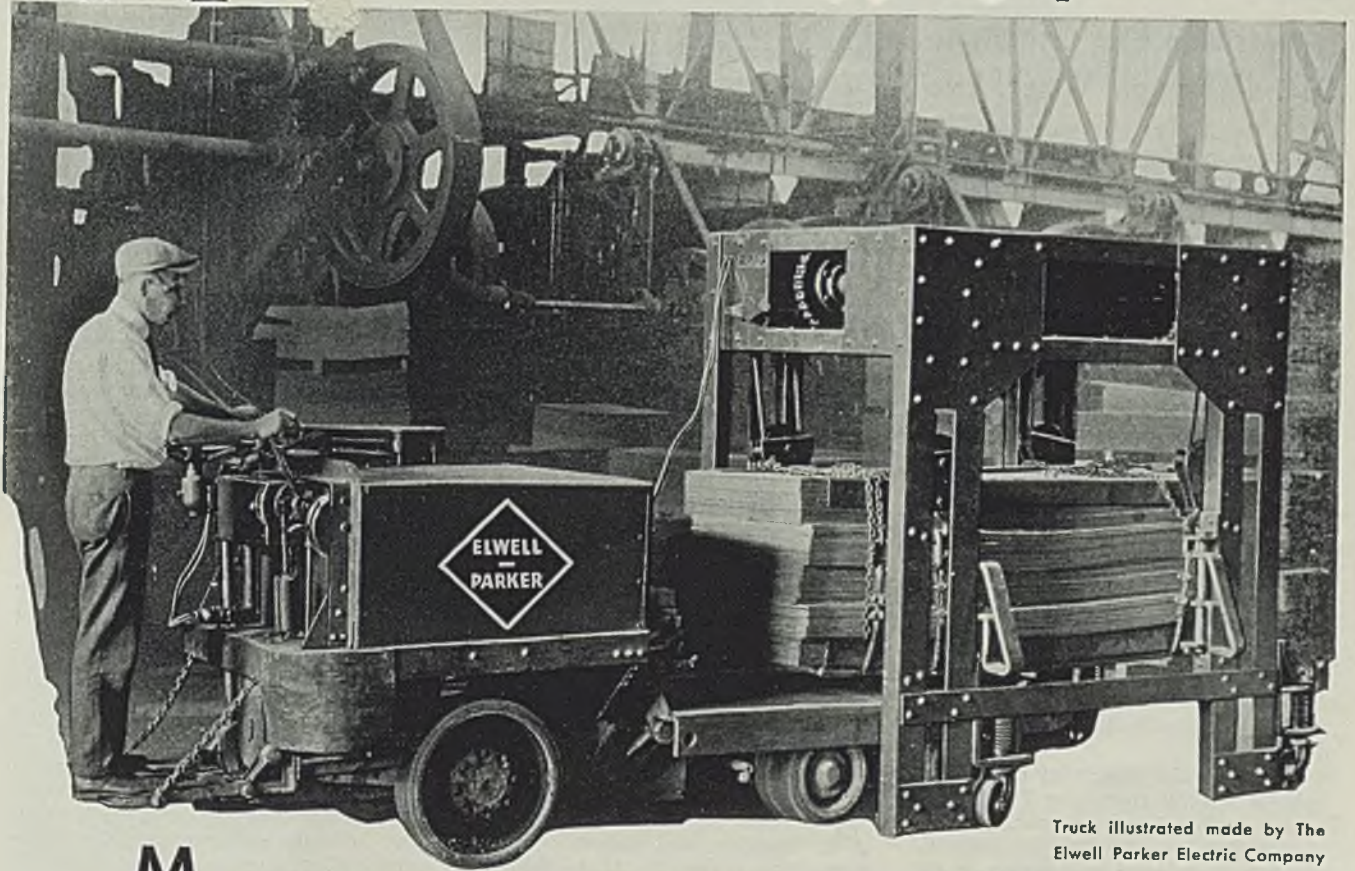
APROMINENT materials handling engineer in a letter to the editor of this section states: "In my humble opinion, I think the materials handling industry has shown considerable progress in its potential position, as well as in the sale of its equipment. I think, as never before, industry is becoming materials handling minded, which is not strange, in view of the political and social situations. The only economical way to higher wages and shorter hours is to increase the production of the individual in order that he can earn the higher wage in the shorter time at the same time reducing the cost of the article to increase distribution or sales. I do not know of anything which plays a more important part in this than materials handling."

• • •

Costs of Handling

IN A RECENT issue of *Storage Battery Power* is contained a description of a materials handling system in which a fleet of eleven industrial trucks plays a leading part. Some interesting cost figures are included, and while it is explained that the cost per ton of moving the material is difficult to determine due to the variation in distances between storage areas and various parts of the manufacturing departments, it is pointed out that the average load carried per truck is 2½ tons and the trucks average 12 hours daily for 26 days per month. The age of the trucks varies from 3½ years to more than 16. It is claimed that repair-parts costs for 2½ years amounted to only \$6.30 per truck-month. The total operating cost per truck day is given as \$9.40. The present cost of loading outgoing cars with the powered equipment is estimated at 24 cents per ton, which compares with a previous cost of 49 cents per ton.

Exide-Ironclads can cut the time between receiving and shipping platform



Truck illustrated made by The Elwell Parker Electric Company

MODERN handling methods make possible a far more efficient flow of materials throughout a plant. The electric industrial truck, with its almost infinite adaptability, can perform a multitude of handling operations that quicken production, save space and materially cut costs.

As their sole source of energy, the batteries selected to power these units have an important bearing on performance and economy alike. Exide-Ironclads have proved their enormous value in this service by providing a great reserve of power, dependable and uninterrupted performance throughout each working shift, ease and low cost of maintenance, as well as long, trouble-free life.

In fact, the Exide-Ironclad Battery is daily demonstrating that it has the four essential characteristics for improved material handling service—high power ability, high electrical efficiency, extreme ruggedness, and long life. Write for free booklet, "The Efficient, Economical Method of Handling Material."

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POWER DRIVES

Maintaining Best Grinding Speed Through Wheel Life

FOR EVERY type of work there is always a best speed which gives the best quality and greatest quantity of product. In grinding, as the diameter of the wheel decreases from wear and dressing, it must be speeded up to maintain the proper peripheral speed. Variable-speed motors, changing pulleys and variable-speed transmission units are a few of the more common methods of obtaining this constant grinding speed. Dust from grinding and dressing often causes increased commutator trouble with variable-speed motors. Changing pulleys requires time.

On the gear grinding unit, shown in the accompanying illustration, wheel speeds between 5000 and 5500 feet per minute obtain the best cutting action, maintain the shape and produce the best finish. Grinding wheels on this machine are used from 14 inches in diameter down to 8 inches.

To obtain the necessary change in spindle speeds from the 7½ horsepower squirrel-cage motor, operating at 1750 revolutions per minute, the V-belt sheaves are varied in diameter. The 4-groove motor sheave has possible diameter variations from 5.8 inches to 7 inches; the spindle sheave, from 4.8 inches to 6 inches. This permits obtaining any

spindle speed between 2480 and 1640 revolutions per minute.

Sheave diameters are varied by a special wrench while the drive is stationary. To compensate for changes in belt length during adjustment and to maintain tension the motor is mounted on a Rockwood pivoted motor base. Guards are removed to show the drive.

The gear grinder is built to grind gears with 11 to 144 teeth inclusive, from 2½ to 24 inches in diameter and any face width up to 24 inches.

The wheel carriage and index head are both hydraulic operated. The lower 3 horsepower motor drives the hydraulic pump at constant speeds. Variable oil demand is controlled by a relief valve.

The drives and variable-pitch sheaves are made by Allis-Chalmers Mfg. Co., Milwaukee, Wis.; the pivoted motor base by Rockwood Mfg. Co., Indianapolis, Ind.; the gear grinder is a product of Gear Grinding Machine Co., Detroit.

♦ ♦ ♦

An Inventory of Needs

AS THE end of the year approaches and industrial plant managers make up their budgets for the coming year the plant engineer may profitably plan ahead on what his department needs. Requests for estimates on next year's requirements often come unex-

pectedly and marked "rush." As a result urgent needs, which may not be obvious at the time, may be overlooked.

Some of the first things to list are drives which are obsolete; where excessive maintenance would be reduced by changes, such as special motors or different types of control; and modernization of layout and arrangement of equipment with planned drives. With the probability that selling prices of plant products will be more nearly fixed than in the past, reductions in operating and maintenance expenses, as well as manufacturing or processing costs, will offer the best opportunities for increasing profits.

Maintenance cost of troublesome drives, bearings or units of control equipment should be analyzed to show how much they are costing and probable savings by changing to different equipment or methods. With definite costs and estimates submitted, the plant engineer has a better opportunity to gain his point.

Requests for additional testing and repair facilities and equipment, if accompanied by a statement of the advantages or savings and examples of previous disadvantages because such were not available, are always impressive.

♦ ♦ ♦

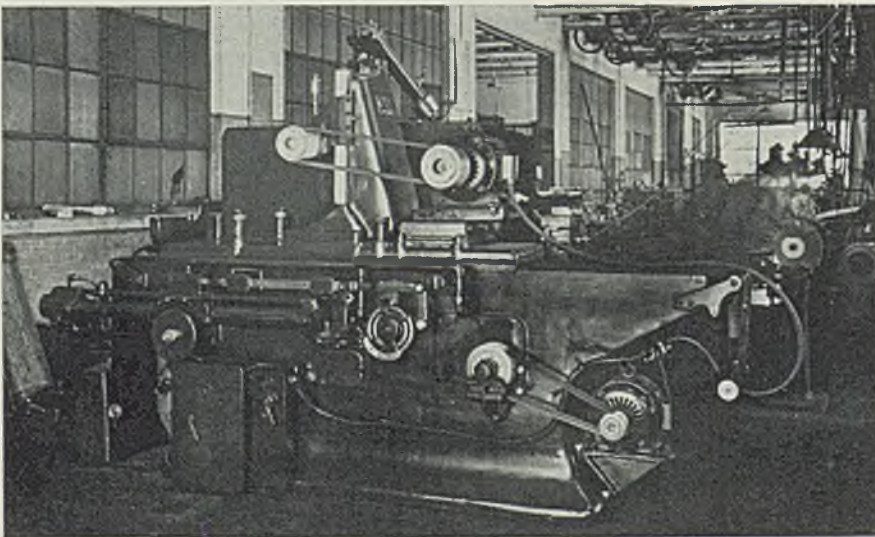
Loose or bent fuse clips which do not provide proper contact to carry the current without overheating may be responsible for fuse interruptions. If the fuse blows repeatedly for no apparent cause, check to see if the clips are unduly hot. Sometimes this source of trouble is overlooked in an attempt to find the source of a supposed overload.

♦ ♦ ♦

A flexible coupling is neither intended nor designed to serve as a universal joint. The coupling is installed to compensate for minor accidental or unintentional misalignment within comparatively narrow limits. This alignment should be checked periodically and corrected, if in error.

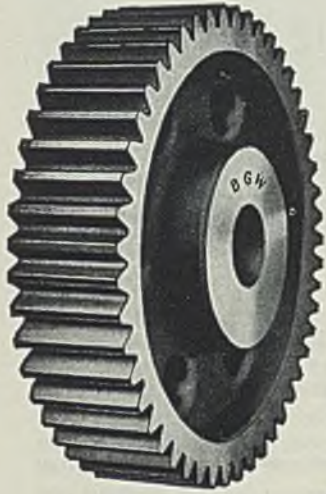
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With split pulleys, sheaves, gears or chain sprockets be sure all nuts are tight before starting. After running a month it is well to check to see that none have loosened and recheck at the end of a year.



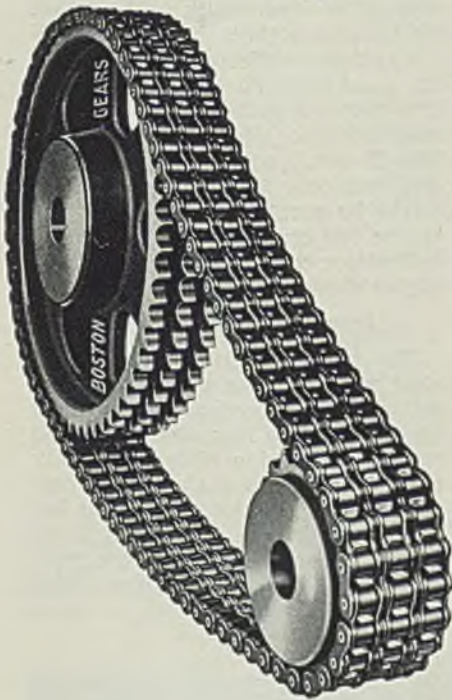
Varying diameters of variable pitch V-belt sheaves on both motor and grinding spindle permits obtaining any spindle speed between 1640 and 2480 revolutions per minute on this grinder

**CUTTING
THE COST OF
POWER
TRANSMISSION**

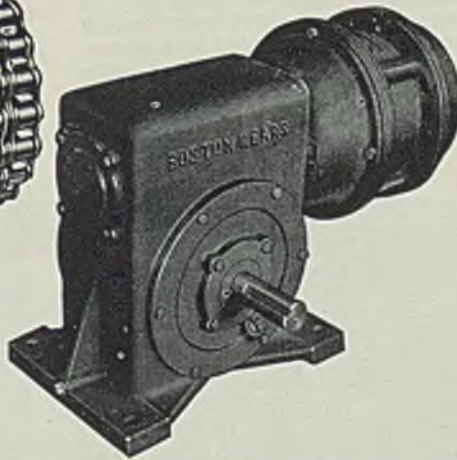


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Current Practices in Wire Galvanizing as They Affect Ductility and Other Properties

METHODS used in the galvanizing of wire have a direct bearing on the physical properties of the zinc coating. In the first installment of this discussion, which appeared in *STEEL* for Oct. 12, Mr. Meyers described the electrogalvanizing processes and illustrated the defects which resulted from improper practice. He also discussed the effect of the chemical composition of the steel upon the quality of the coating. The vital necessity of proper cleaning was emphasized.

Standard Fluxes Used

After the wire is cleaned it must be fluxed. The function of the flux is to protect the cleaned wire and aid in the correct alloying action taking place between the zinc and the steel wire. Several standard fluxes of well known composition are used in commercial practice. These fluxes are usually of a zinc-ammonium chloride base and are used in the neutral or acid state as practice dictates.

The molten zinc bath itself must be carefully controlled so that the temperature and time of immersion are correct, and dross or iron-zinc alloy content not excessive. The purity of the zinc used has a direct

BY C. W. MEYERS
Development Engineer, American
Steel & Wire Co., Chicago

bearing on the quality of the galvanized product.

After galvanizing the wire may be "wiped" (passed through asbestos plugs) or "unwiped," (passed vertically through a bed of charcoal depending on the quality of zinc desired. Some processes utilize a heating step after galvanizing which is supposed to have beneficial results.

The net result of a properly regulated practice should be such that the bare wire is covered by a continuous, dense, adherent coat of protective zinc which is found to consist of several layers of iron-zinc

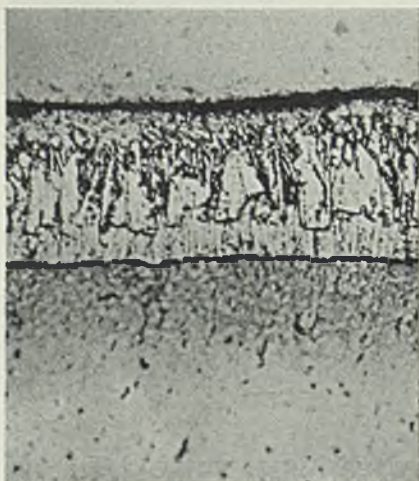
alloy topped by a layer of pure zinc. The alloy layers vary from high iron, iron-zinc alloys at the surface of the wire to high zinc, iron-zinc alloys near the pure zinc coating.

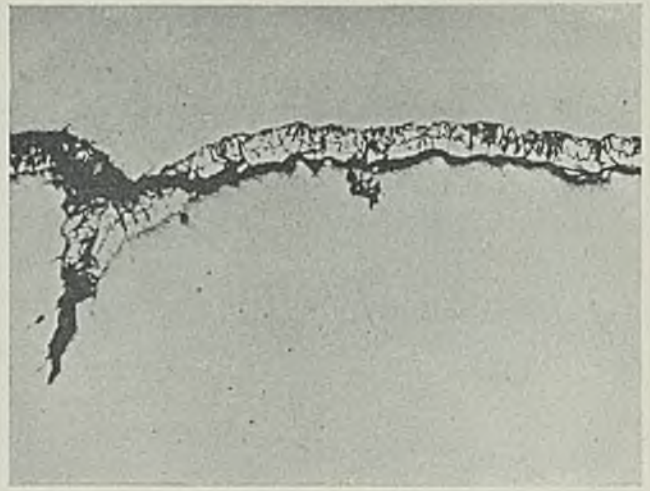
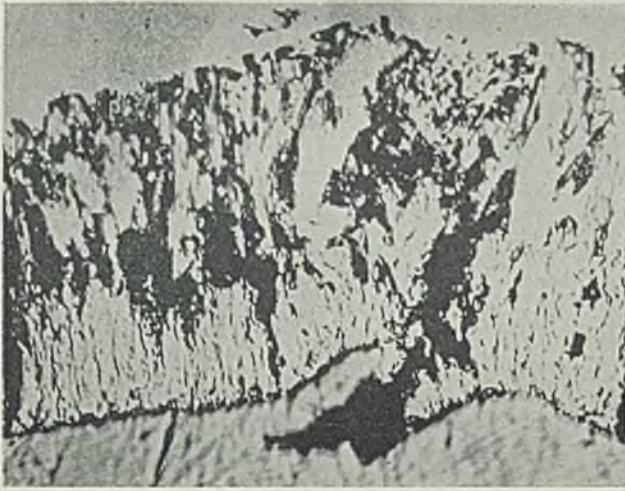
A characteristic section of a good galvanized coating is illustrated in Fig. 1 at 500 diameters, which shows a weight of 1.1 ounces per square foot of coating and a 5 to 6 minute immersion test. This illustration shows the various alloy layers and also indicates the nature of the bond between the zinc and the base metal. Fig. 2 at 1500 diameters also shows a tightly adherent coat. This is a "wiped" coating however, and tests only 3 to 4 immersions. It might be mentioned here that the button test on both these specimens indicates a coating free from sugaring as shown in Figs. 10 and 11.

Iron-Zinc Alloy Formed

The alloying action between the steel wire and the zinc coating results from the tendency for iron to go into solution in molten zinc. The resulting iron-zinc alloy is slightly more resistant to the action of copper sulphate solution used in the immersion or Preece test. Recognition of this phenomenon led to the process of heating the galvanized wire

FIG. 1 (left)—Characteristic section of extra galvanized high-tensile strand unwiped coating. Note distinct alloy layers. X500. Fig. 2 (center)—Hot galvanized tightly wiped coating illustrated here shows characteristic dense, pore-free coating. X1500. Fig. 3 (right)—Example of improper heat treatment after galvanizing. Note porous condition of coating. X1500





after coating in an attempt to increase the extent of alloy layer, also to close up pores in the coating; thereby increasing the number of minutes the wire would stand the immersion test. The effect of this treatment appears to be illustrated by Figs. 3 and 4 at 1500 diameters, and Fig. 5 at 150 diameters. While these wires have only 0.63-ounce per square foot of coating, they show an immersion of 4½ minutes. This high immersion is accomplished by the thicker iron-zinc layers obtained by heating subsequent to galvanizing. The rough, uneven parting line between zinc and steel is plainly shown. It is also apparent that the application of heat has not resulted in a marked elimination of pores, but has only closed over the surface.

These pores or holes may break out during any slight bend and present a potential source for failure. Fig. 5 also shows the result of poor cleaning practice. The seam

Fig. 6—Photomicrograph of button test made on wire which has been heated after hot galvanizing. The brittle character and poor adherence of the coating are clearly shown here

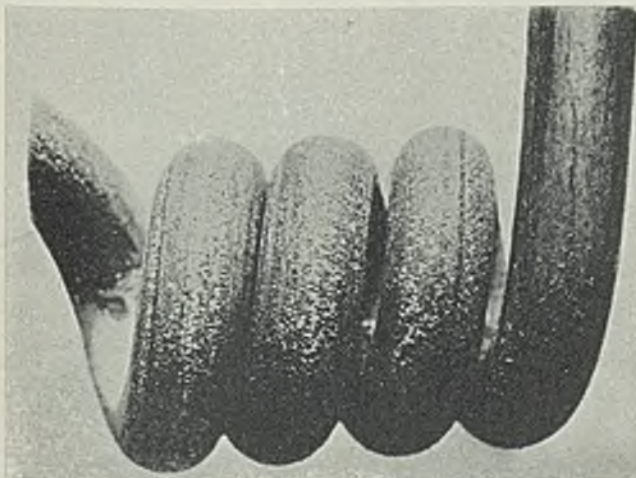


FIG. 4 (left)—Galvanized coating in which pin holes were sealed by heating after galvanizing. Concealed porous nature of the coating is revealed here. Effect of a defective steel surface is also illustrated. X1500. Fig. 5 (right)—Another example of wire heat treated after galvanizing. Irregularity of the coating is illustrated. Note zinc does not fill to bottom of seam in steel surface at left and coating has cracked and parted from steel base. X150

has not been properly cleaned and zinc has not succeeded in bridging the gap.

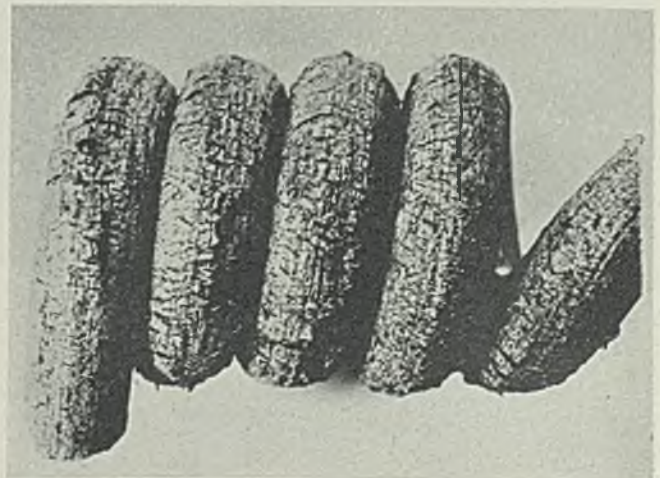
The photomicrographs appear to indicate that the advantages of the post-application of heat and the attendant heavier iron-zinc alloy layer have not been adequately proved. The American Society for Testing Materials recognizes these difficulties and uses the immersion test only as a measure of uniformity of coating. The Society is primarily interested in the weight of coating and its appearance after the button test as a more accurate measure of galvanizing quality.

It is interesting to examine samples of wire made by the "post-heat treatment" method and see

what happens when the surface of the zinc has been exposed to high temperatures. Figs. 6 to 9 show what happens when such wire is formed into "buttons." All figures are at five diameters. Whether as obviously apparent as those figure show or not, incipient cracks are present in the coatings so heat treated; thus it is evident that serious consideration should be given this fact when choosing galvanized products. Even under such mild bending conditions as shown in Fig. 9 it is immediately apparent that coating failure has definitely occurred. There are two common methods by which a coating fails after bending. These are: Starting of cracks in the brittle iron-zinc alloy base, and, embrittlement of surface of zinc by chemical reaction with outside influences. The above mentioned cases indicate the deleterious effects of both conditions.

On the other hand, Figs. 10 and 11 show the effect of a normal,

Fig. 7—Badly flaked and sugared condition of this wrap is due to brittle alloys formed at junction of steel and coating when wire was heated to a rather high temperature after galvanizing



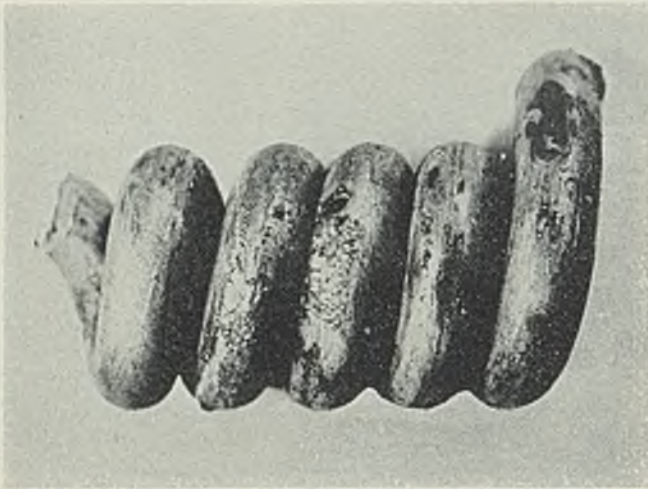


Fig. 8—Illustrating another form of failure of hot galvanized wire which was prepared under improper conditions

carefully controlled galvanizing process. The wire shown in these illustrations was drawn with particular regard to surface conditions. It was cleaned in hot dilute hydrochloric acid, washed, and passed through a flux bath of zinc-ammonium chloride. The flux residue was dried on the wire before the immersion in the molten zinc took place. The speed of the wire and the length of the immersion in the zinc were determined accurately so that the iron-zinc alloy layer in the coating would be of a thickness which would not develop intergranular cracks on bending, and thus cause local points of failure in the coating. The smoothness of the bends indicates a sufficient balance between pure zinc and iron-zinc alloy to afford best resistance to bending influences. The weight of coating on this wire is 0.64-ounce per square foot and it tests four 1-minute immersions.

Fig. 10—Illustrating the tightly adhering coating after the button test on a well made, tightly wiped hot galvanized fence wire

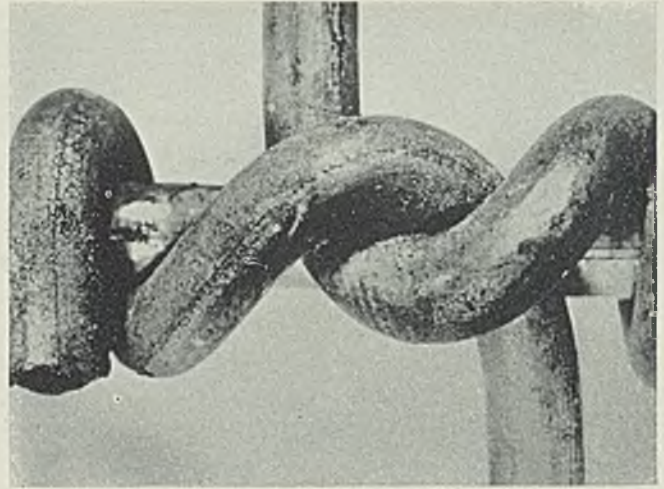
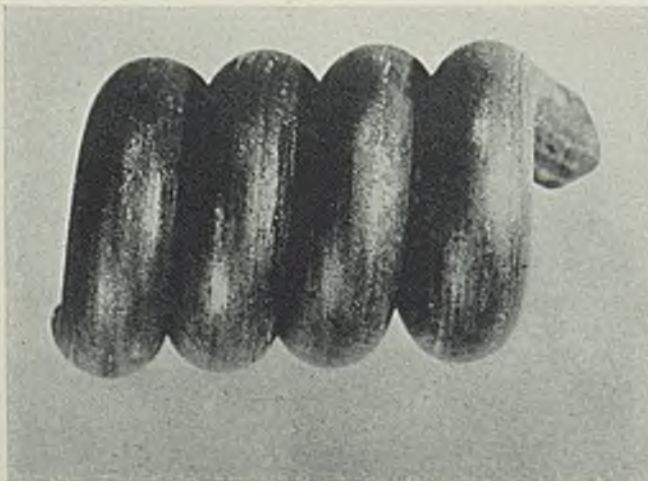


Fig. 9—Cracked condition of this wire is due to a high-temperature heat treatment after galvanizing

There is no excessive development of brittle alloy layer on this wire.

The purpose of this discussion has been to present a clear picture of the commercial side of the galvanizing problem and compare the various methods in use today for the application of zinc to steel wire. Samples used for photomicrographs and photomacrographs were purchased from dealer stocks and thus do not represent specially prepared exhibits.

Use of Cyanide in Surface Cleaning Covered in Manual

A manual giving in detail methods for the application of sodium cyanide solutions in the preparation of metal surfaces is announced by The R. & H. Chemicals department, E. I. du Pont de Nemours & Co. Inc., Wilmington, Del. The manual gives a general outline for the various methods used in treating metal surfaces with specific information regarding the use and handling of sodium cyanide in that field.

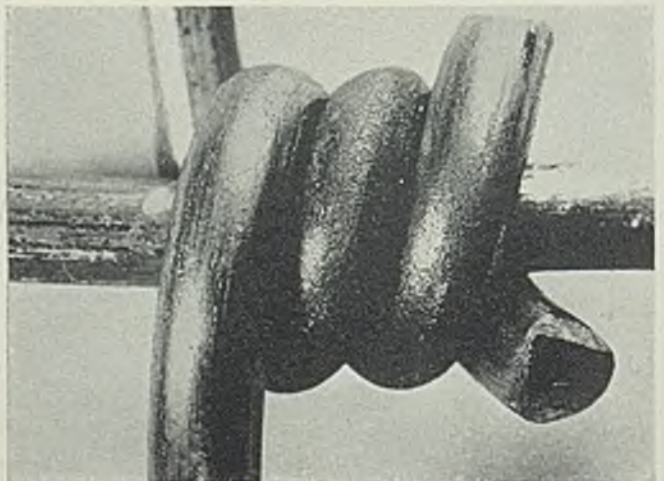
The preparation of metal surfaces

is discussed under the following general headings: steel finishes, metal surfaces, direct application of sodium cyanide, cleaning ferrous metal surfaces, preparation of hot rolled steel surfaces, cleaning non-ferrous metal surfaces, preparation of steel surfaces for enameling, preparing metal surfaces, and safe handling of sodium cyanide.

DARK COLORS AFFECT SALES

A manufacturer of kitchen utensils recently revived the use of porcelain enamel on frying pans. Retailers report that housewives are a little slow in accepting this product due to the dark color of the enamel. This results from the cobalt base coat enamels which are used because of their heat resisting and heat absorbing qualities.

Fig. 11—This galvanized coating was sufficiently ductile and adherent to withstand the abrasion and formation of the knot in a fencing machine



WELDING, etc.—by Robert E. Kinkead

Renew Your Faith in the Sanity of All Mankind

AS THIS is written, men of many nations are on their way to Cleveland for the National Metal congress and exposition, in which welding demonstrations play an important part. From Japan, India, Italy, France, Germany, U. S. S. R. and the British Empire, men who are interested in welding are on their way to this great industrial show.

The future hopes of civilization, of peace, of plenty for the peoples of the world lie in just such manifestations of common interest. Being what they are, men can differ to a murderous degree on capitalism, communism, fascism, imperialism, the new deal or any other political or economic creed; but you cannot get two men angry with each other when they are both trying to solve the problems of residual stresses in welds.

Not a few of the grievous troubles of the world are the result of over-emphasis of our differences. This metal show is based on the proposition that the welfare of the human race depends upon the industry and intelligence with which individual men use the gifts that nature has placed at their disposal. It is an American show, of course, because it is held in America, but in practically every metal, alloy and machine, the ideas of men of other nations are embodied. Technology knows no national boundaries.

To visit a show of such magnificent proportions as this one, to see in tangible form the results of industrial progress is to renew one's faith in the sanity of the human race. Every technical meeting, and there will be scores of interesting ones, every exhibit, every entertainment will be founded on the very antithesis of war, hatred, bigotry and destruction. This show will represent co-operative human effort at its best.

Welded Steel Machinery

RECENT inquiry by a large Eastern foundry and machine shop for a line of heavy machinery to manufacture brings up the question of what to do about welded steel construction. The trend toward converting machinery built of castings to welded steel con-

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.

struction is evident wherever machinery is built. In the heavy electrical machinery field the conversion is probably 90 per cent complete. In road building machinery 80 per cent of the tonnages involved have been converted to welded steel.

Welded steel construction for machinery is not a fad or a scheme of electrical manufacturers to sell welding machines. Each month and year developments are made which make the practice applicable to more kinds of machinery and more parts of the same machine. In many cases the cost of manufacture is reduced; in other cases the

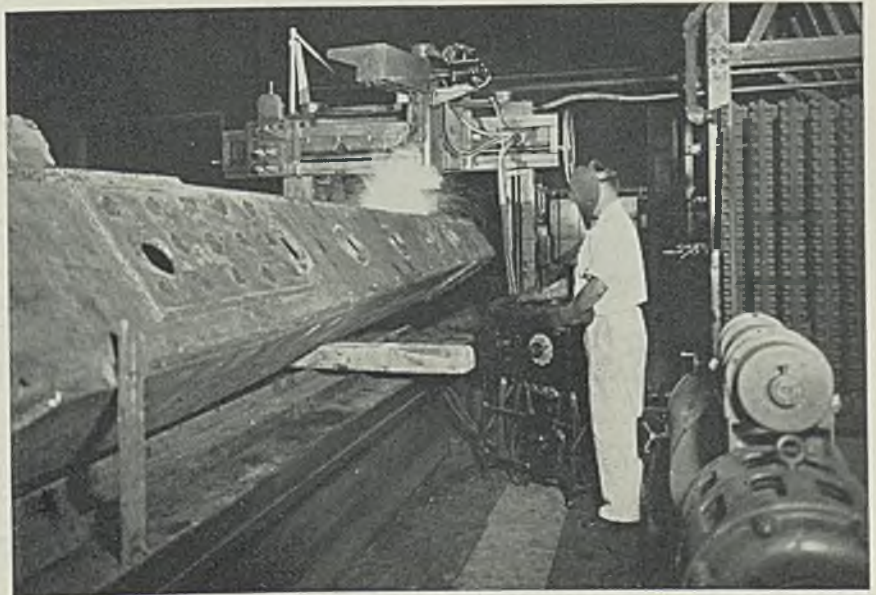
cost of manufacture is increased but the cost of use is decreased.

Anyone who would take over the manufacture of a line of machinery without considering the latest information about the use of welded construction is asking for trouble. A line of machinery is not the stable thing it used to be, lines often changing from month to month. Welded steel construction makes such rapid changes possible without severe penalties in manufacturing cost. Unreasonable demands for short delivery are more readily met where such universally available and reliable materials as steel plate and shapes are used.

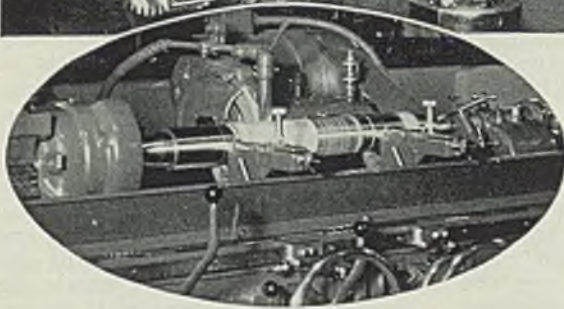
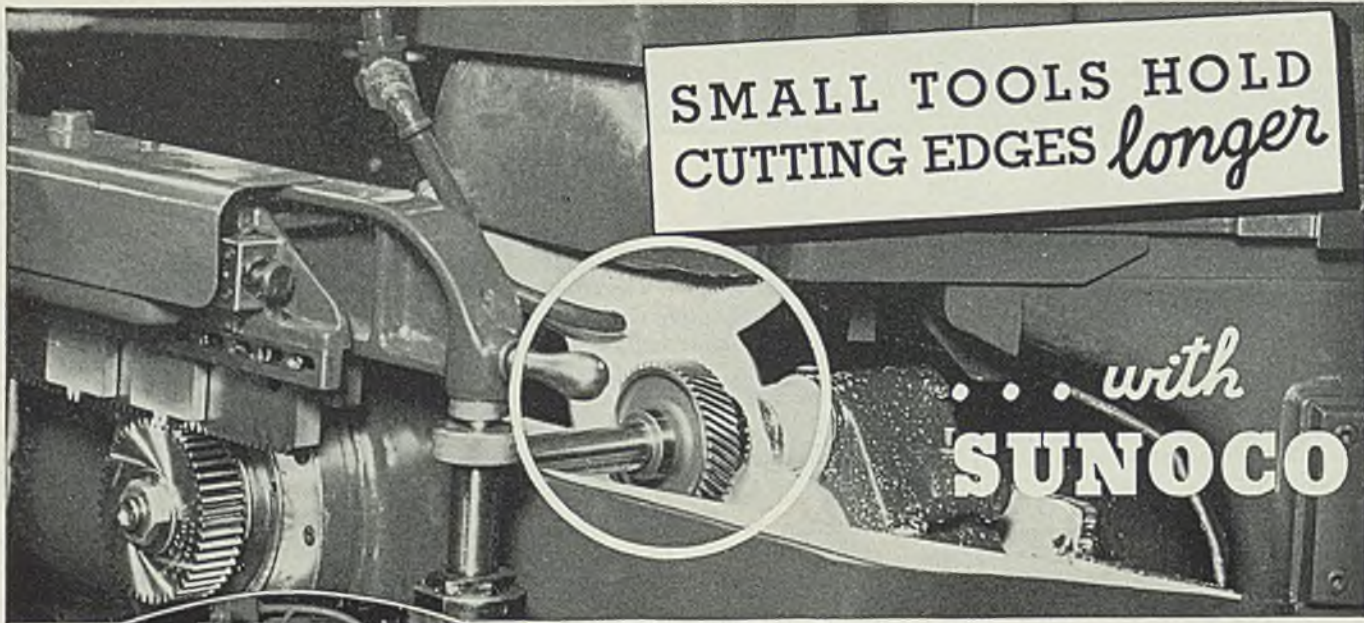
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The new Lockheed 12 airplane was the result of 1200 pages of engineering calculations. Weld any twelve pieces of steel together and it would take 12,000 pages of calculations to locate and evaluate the residual stresses involved if no mechanical or heat stress relieving were used.

Automatic Arc Welder

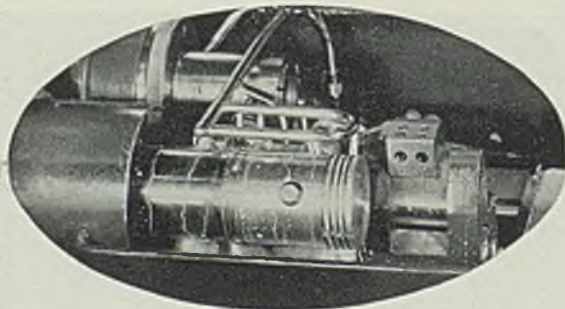


FIFTY coated welding electrodes are loaded into the magazine of this new automatic welding head and fed into welding position as they are required. The machine has been developed and perfected by the Harnischfeger Corp., Milwaukee. It may be used on flat work of any length, on circular pieces, and, by means of a pantagraph attachment, on any shape. As one electrode is consumed, the remaining butt is ejected and a new, full-length rod is fed into place. During this feeding operation, the work table stops and then starts again automatically as the new electrode makes contact. Higher currents used by the machine result in considerably higher welding heats, and thereby speed up production



Operation: Finish Grind Wheel Spindle
Material: Steel Forging S. A. E. 3145
Spindle Speed: 1700 R.P.M.
Coolant: 1 part Sunoco to 40 parts water

Courtesy of Cincinnati Grinders, Inc., Cincinnati, Ohio



Operation: Finish Turning Outside Dia.
of Lynite Piston
Spindle Speed: 1100 R.P.M.
Feed Per Rev.: .0015 Inch
Cutting Lubricant: 1 part Sunoco to 30
parts water

Courtesy of Ex-Cell-O Aircraft Tool Corp., Detroit, Mich.

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PROGRESS IN STEELMAKING

Salt Coating on Ingot Molds Tends To Prevent Stickers and Scale

RECENTLY there has been developed a novel method of preventing the formation of scale on ingot molds or blasting it off in case any should form. It is the simplest method yet devised and apparently works better than other practice. It consists merely in dipping the hot mold into a tank of salt brine. In one large steelworks the stripping crane carries the hot mold over to the brine tank. At another large shop the hot molds are set onto a car, taken to another part of the building and dipped into salt brine.

Scale Is Blasted Loose

When the hot mold strikes the brine it begins to sizzle. The hot brine boils up through the interior of the mold which creates a regular geyser effect out of the top of the mold. The hot steaming brine gets under the scale and blasts it off the inside, the outside and top of the mold. The mold is left in the brine only a moment and when removed, the salt crystallizes immediately. Any scale that the boiling action does not remove is blasted off when the salt crystallizes. The mold is left completely covered with white salt.

The scale, which drops to the bottom of the brine tank, is removed periodically with shovels or with an electromagnet.

The salt-coated molds now are ready to receive the molten steel from the ladle. The salt coating helps to prevent the steel from sticking to the sides of the mold. As the mold is filled, the salt first melts and turns to vapor which drives out any air remaining in the mold, thus protecting the surface of the steel from air oxidation. This tends to prevent scale formation. The salt mixes with the foreign material on the surface of the ingot forming a liquid slag which gradually is carried to the top of the mold.

Proportion Most Effective

At one plant the brine tank contains a saturated solution. Another company reports best results by using brine between 11 and 16 per cent or between about 40 and 60 de-

grees salometer. It apparently doesn't make much difference whether or not saturated brine is used. The coating, however, is much thicker and more nearly covers the inside of the mold when saturated brine is employed.

Considerable liquid is lost by evaporation and much salt is taken out of the brine by the hot mold. For this reason the brine has to be renewed frequently and the tank cleaned periodically. By using a lixate dissolver, however, new brine can be made with the least possible effort.

Cracks in ingots practically have been eliminated at a plant in the Wheeling district by the use of the salt water dip. Pouring practice must be clean in order to avoid scabs or laps on the ingots. At this plant a tub, 10 feet diameter and 8 feet high, is filled with water to a height of 7 feet and then 1200 pounds of salt added. The bath now is ready to receive a drag of forty-five 22 x 24-inch molds. Following the dip about 100 pounds of salt is added to the bath to compensate for that taken out by the molds.

Assures Better Coating

The molds dip better and take a better coating when dipped at about 500 degrees Fahr. according to an open-hearth superintendent.

Plant foremen seem more than satisfied with the economy of using salt rather than tar and point out the large saving over the old method in that they can practically do away with the labor required to remove the scale from the molds. This always is a tedious time consuming process when tar is used but with salt this scaling almost entirely is eliminated.

Adds Life to Rail Guides

Hard facing rail mill guides with wear-resisting material shows a performance 50 times better than some guide materials tested by a rail-maker. Following the hard facing operation the guide faces are ground accurately to shape inasmuch as correctly contoured and smoothly

ground surfaces prevent scratching the steel going through the mill. The expense involved in a carefully executed job of surfacing is warranted because of the added life of the guides and the freedom from shutdowns necessitated by guide changes.

Protects Interior of Pipe

Metal pipe for handling corrosive liquids can be protected effectively with an inner-core of vinyl resin, which is formed to shape within the pipe in two operations. First the vinyl resin composition is made up into a hollow preform. The latter then is placed within the pipe, which acts as a matrix, and given its final conforming shape by means of heat and fluid pressure. Finally, the vinyl resin composition is rendered thermally stable by a heat treatment which is supplemental to the shaping operations.

Removes Rust Effectively

Cleaning rust from steel is accomplished effectively by a recently devised method. The rusted steel is immersed in an agitated solution composed of 100 parts of concentrated hydrochloric acid, 2 parts of antimony oxide, and 5 parts of stannous chloride crystals. The proportion of antimony oxide and stannous chlorides permits of fairly wide variations without detriment. The solution dissolves the rust rapidly and leaves the surface clean. The steel then is washed in water and dried.

New Machine Handles Plates

Plates in the shearing department of a broad strip mill in the Great Lakes district are handled by a new type charger. The new device is built with six pairs of magnets which pick up plate too heavy for men to handle conveniently, but too light to warrant the use of the overhead crane. The machine handles plates up to $\frac{1}{2}$ -inch thick and up to 2250 pounds in weight. Long plates in storage are picked up and moved by powerful magnets suspended from traveling cranes.

Constant-Speed Power Source Operates Through Automatic Gear Shifting Unit

PROBLEM of changing gears automatically to suit load conditions has been constantly before engineers for many years. Many devices have been tried, such as sliding gears and frictions, but all have proved impractical. Automatic Gear Corp., Standard building, Cleveland, has developed a system of spur gearing, balanced as to torque and rotation, which engineers claim has solved the problem. Under this system, the load itself changes the gear ratio. All gears are constantly in mesh but are so constructed that when coupled to a light load, the entire gear train revolves as a unit, bringing no reduction into play.

Gears are held in position by delicately balanced brakes, so arranged that as the load increases, it overbalances the brake tension and permits the reduction gears to go into play. Thus the gears do not operate except in starting or at the point of overloading in relationship to the fixed power input. As a result of this system, constant speed power sources may be used, and need for speed control is eliminated under variable load operation.

Gears are all hardened and ground and may be operated up to

may be inserted in the train. As the load increases, an increasing number of these gears will be utilized, increasing the ratio.

Quiet High-Speed Gearing-Design and Manufacture

(Concluded from Page 38)

drives where the proportions make it difficult to obtain exact centers or where the frame may be subjected to greater expansion on one side than the other. On small units it is never of any consequence.

Fig. 4B shows a gear set with mounting error such that the axes do not lie in a common plane. This type of misalignment is more objectionable than the one just described. Referring to Fig. 5B and the table, it should be noted that the concentration in this case is almost equal to the error whereas for the other it is from one-fourth to one-half its magnitude. Pressure angle has but little influence on the extent of the concentration for the crossed axes condition.

Not only is the unit concentration considerably greater for a given

alignment error of the latter form, but of even greater evil is the resulting interference with correct tooth action. The zone of action through a transverse plane at one side of the gear A-A, Fig. 4B, is distorted with reference to that on the opposite side B-B, producing premature engagement on the leading side. Most of the load will be carried here with heavy concentration at the root of the pinion and tip of gear teeth during approach action. Under such conditions scuffing is generally experienced together with vibration and noise. At the opposite end, action is delayed and in severe cases no contact is present on the driving side, and there may be interference at the clearance side of the teeth. Fig. 6 illustrates this condition graphically.

Small high-speed gear frames are generally quite rigid. The height from floor to parting line is somewhat greater than that of slow speed frames due to the necessity of carrying a rather liberal quantity of lubricant below the gears without the inconvenience of outside reservoirs. The wall sections are quite generous so as to avoid drumming. These two circumstances insure the gears against misalignment arising from case distortions.

In the smaller sizes the housings are first bored accurately and then fitted with bronze-back babbitted bearings, manufactured to close tolerances, and arranged to receive the pilot of a line reamer. This tool is constructed so that the pilot bar is entirely within the unit before the reaming operation commences and therefore the original parallelism of the case is maintained. Sometimes the case is bored, the cover removed, the bearing shells placed in position, and the babbitt linings then bored with the original setting. Fig. 7 shows a small high-speed gear housing of the rigid type.

(To be Concluded)

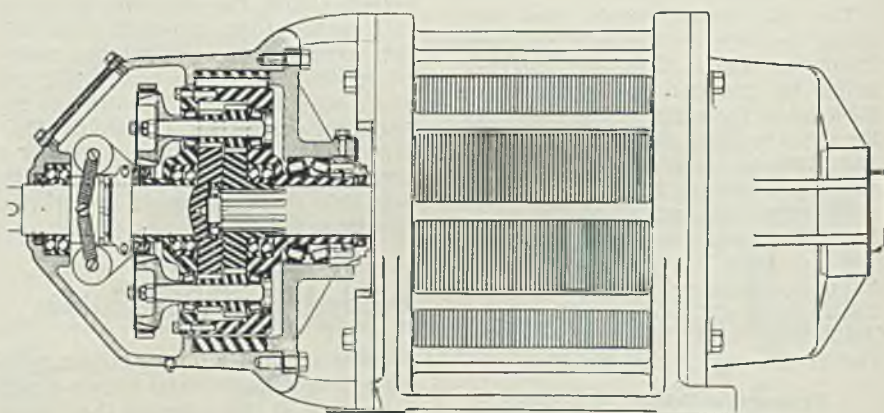


Dissembled parts of the automatic gear change unit, showing simplicity of construction. If required, more gears may be added to increase the ratio

10,000 feet per minute running in oil. The device requires no attention, according to the company, and can be built for any horsepower. It may be used in connection with automobiles, trucks, buses, tanks, railcars, diesel and electric locomotives and has a wide application in the industrial field.

One suggested application is to synchronous motors driving varying loads, as on rolling mills. The automatic gear selector takes up the load change with no strain on the power source. As a result, it is not necessary to convert to direct current, but the motor may operate direct from the alternating current line.

Number of speed changes available on the device is practically limitless, as any number of gears



Cross section of the gear unit attached to an alternating current motor. As the load increases, gears go into play, allowing the motor to operate under a continuous load without strain. As a result, it is unnecessary to shift to direct current to operate the motor

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NEW EQUIPMENT

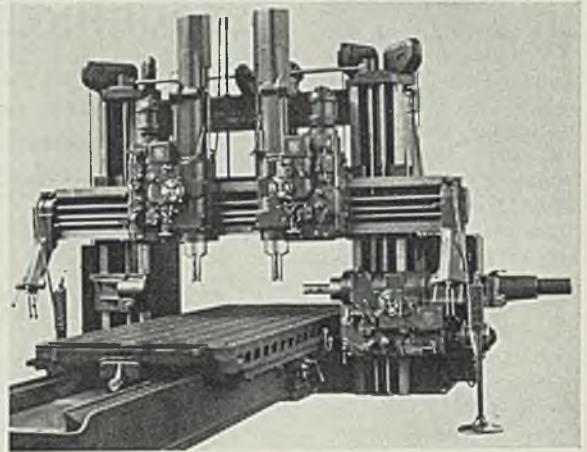
Horizontal Boring, Drilling and Milling Machine—

Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., has added a larger unit to its line of high power precision horizontal boring, drilling and milling machines. Headstocks are of the quill type, which include a bore spindle with hand and power feeds. Diameters of the quill and spindle are 11½ and 4½ inches, respectively. Maximum adjustment of the quill is 9 inches. Quills and spindles on the vertical headstocks are hydraulically counterbalanced. The machine provides a large working range, measuring 104 inches between columns and 100 inches between the face of the horizontal head and the end support bearing block. From the top of the table to the face of the vertical headstocks the clearance ranges from a minimum of 12 inches to a maximum of 72 inches. The table is 84 x 255 inches, with the table cross feed 216 inches. Total length of the bed is 470 inches.

Tool Grinder—

Brown & Sharpe Mfg. Co., Providence, R. I., has recently announced a new cutter and tool grinding machine. Accommodating all the usual types and sizes of cutters, the machine requires only one grinding position. Machine centers swing 10 inches diameter and take 20 inches in length. Maximum longitudinal table travel is 18 inches and a 4-inch reciprocation by hand lever is avail-

Giddings & Lewis high-power precision horizontal boring, drilling and milling machine



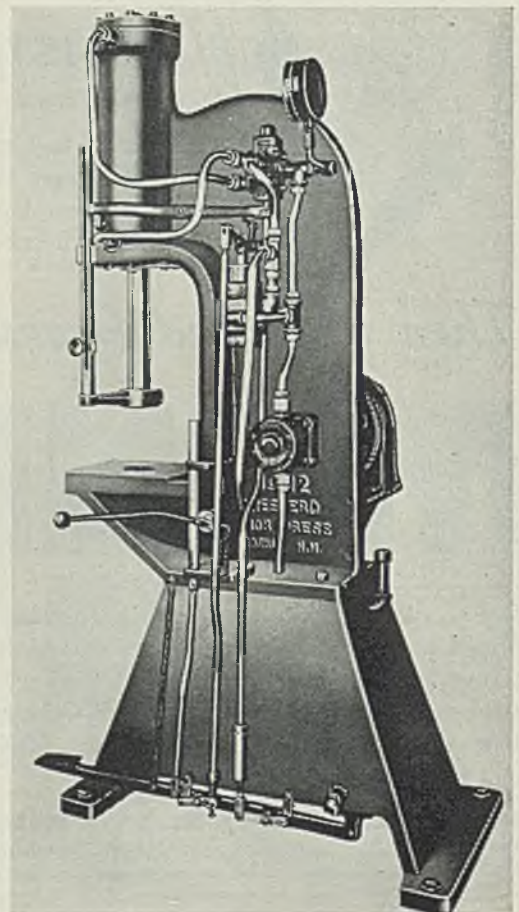
able anywhere in the 18-inch travel. Largest diameter that can be ground on centers is 6 inches. Heavy single base casting supports the sliding table and wheel spindle column. The sliding table mounts the swivel table, on which are clamped the centerhead and footstock. The centerhead is equipped with a clearance setting gage. The wheel spindle column has a transverse movement of 7 inches, controlled by a handwheel graduated to read to 0.001-inch. A constant speed dustproof motor drives the cartridge type spindle by V-belt. Spring shoes automatically maintain adjustment of the wheel spindle boxes. Two wheel speeds are provided, 3760

and 4380 revolutions per minute. A complete group of accessories is furnished, including universal head, cutter bars, tooth rests, wheel sleeves and the like.

Hydraulic Press—

Edwin E. Bartlett Co., Nashua, N.

Right—Greenerd arbor press of 15-ton capacity designed especially for assembling ball bearings and for straightening work



Left—Brown & Sharpe cutter and tool grinding machine which requires only one operating position

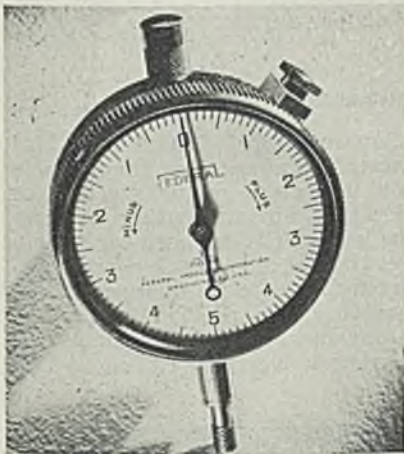


H., has recently completed the new No. 60 BB 15-ton Greenerd hydraulic press especially designed for assembling ball bearings. It is also adaptable for straightening work when equipped with a special straightening table. The press is operated by a foot pedal, amount of pressure exerted on the pedal determining the ram pressure. The pressure may be locked by means of a hand lever if desired. When the pressure is locked it will remain indefinitely and evenly until the hand lever is tripped which will automatically return the ram to any predetermined power stop. When the ram is at top position, the pump bypasses, relieving all pressure. Any desired pressure from ½ to 15 tons may be obtained. The press is a self contained unit having the tank in the base and a 3-horsepower motor mounted on the side of the frame. Work up to 18 inches in diameter is handled.

• • •

Dial Indicator—

Federal Products Corp., Providence, R. I., has recently announced a new dial indicator for gaging tolerances, out-of-round measurements



Federal low friction dial gage has full jeweled movement

and similar industrial services. Movement is full jeweled, and as a result of light weight construction and freedom from friction, internal resistance has been kept at a minimum. According to company claims, the lightweight construction of the instrument aids in its durability because of the lessened shock to the mechanism. Quicker reading is possible because of the elimination of lag between the point follower and the pointer on the dial.

• • •

Dust Counter—

Bausch & Lomb Optical Co., Rochester, N. Y., announces a dust counter designed to provide an ac-

curate means of measuring the dust concentration in industrial plants. Developed in collaboration with a large insurance company, the dust counter provides a basis for work on dust control by providing a check on actual operating conditions. Air sampling mechanism consists of a moistening chamber through which the air is drawn, and an impinging device which deposits the dust particles suspended in the air on a circular glass plate within the instrument. The dust deposit is in the form of a ribbon. The viewing and counting apparatus consists of a built in microscope with a dark field illuminating system. The special

eyepiece contains a micrometer disk ruled in 30 micron squares. These areas are used for dust counting, and are so calibrated that by adding five zeros to the number of particles visible in these squares, dust count per cubic foot is obtained.

• • •

Dewatering Tanks—

Claude B. Schneible Co., Chicago, announces a new line of dewatering tanks for use with wet dust collector units. This new equipment is known as the Multi-Louver and is a specially designed unit for dewatering the accumulated sludge in the

INSUROK

Cuts Power Requirements

28%

THIS INSUROK CG Bearing lasted twelve times longer than the bronze bearing previously used in its place. Operating on a rod mill roughing stand, this INSUROK bearing reduced the power requirements 28 per cent, at the same time eliminating the hazard of oil or grease.



The result . . . Reduced bearing cost per ton; additional rolling time; costly delays eliminated; increased bearing life; greater safety of operation; and a tremendous saving in power costs.

Our Design, Research and Engineering Departments are available without cost or obligation.

The RICHARDSON COMPANY

Melrose Park, (Chicago) Ill. Founded 1858 Lockland, (Cincinnati) Ohio
 New Brunswick, N. J. Indianapolis, Ind.
 Detroit Office: 4-252 G. M. Building, Phone Madison 9386
 New York Office: 75 West Street, Phone Whitehall 4-4487

settling cone of Multi-Wash dust collectors built by this company. Water containing solids enters the de-watering tank at the top through a baffled section, preventing undue disturbance in the tank. A constant level is maintained at all times, the excess water being recirculated through the dust collection system. Solids are precipitated to the bottom of the tank, and when a sufficient amount of solid matter has accumulated, the flow is switched to the alternate tank and the water is drained off, leaving solid matter with a maximum of 20 per cent water. The multi-louver cone through which the water passes off is so constructed that solid material will not

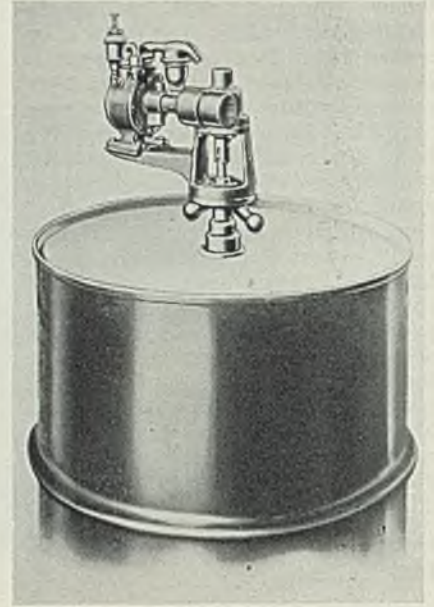
pass with the water. After the sludge is drained, lower gates are opened and the remaining sediment fills into a truck or other suitable receptacle.

♦ ♦ ♦

Pneumatic Paint Mixer—

Binks Mfg. Co., 3114 Carroll avenue, Chicago, is offering a new power agitating paint mixer designed for adapting to any standard lacquer or paint barrel or drum equipped with hand mixing facilities. The new unit can be furnished with male or female thread according to needs of the buyer. Agitators are operated by an air motor with a control valve to regulate speed.

Mechanical construction is simple, the motor having but three moving parts of hardened and ground steel.



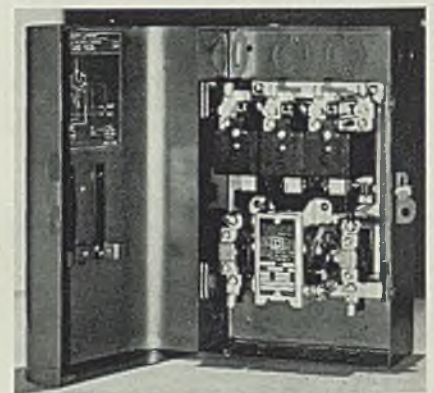
Binks air motor agitating unit for mixing paint in the drum or barrel

Air consumption is 2 to 3 cubic feet of air per minute.

♦ ♦ ♦

Automatic Motor Starter—

Square D Co., 710 South Third street, Milwaukee, has announced a new automatic motor starter for operation on alternating current. The new unit is designed for remote operation of alternating current motors from 7½ to 25 horsepower. Accessibility for periodic inspection, arrangement of parts for quick replacement, vertical closing action

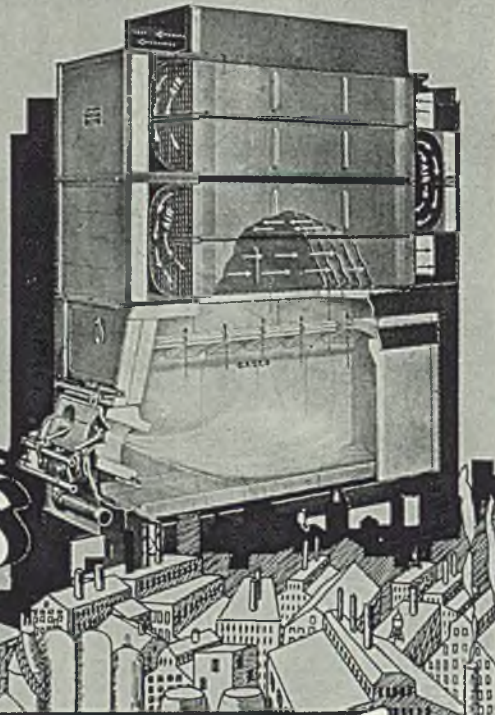


Square D automatic alternating current motor starter for remote operation of motors

and compactness are the four major features in the design of this new starter. Two or more push button stations, limit switches or other

THE STEEL INDUSTRY'S SOURCE OF HIGH TEMPERATURE AIR

ROSS AIR HEATERS



Direct or Indirect Type—Oil or Gas Fired—Supply Constant Controlled Temperatures from 100 to 1000° F. Most economical source of High Temperature Air for Metal Finishing operations. Write for Bulletin 122.

J. O. ROSS ENGINEERING CORP.

Main Office—350 Madison Ave.—New York

201 North Wells St.
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2860 N. W. Front Ave.
Portland, Ore.



12953 Greeley Ave.
Detroit

408 Empire Bldg.
Pittsburgh, Pa.

"Pioneer Builders of Air Heaters"

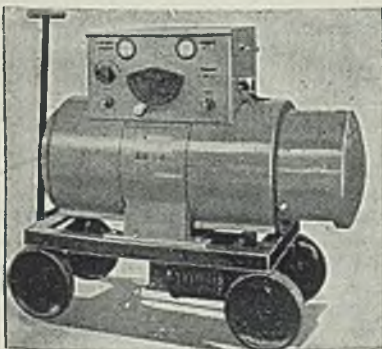
mechanisms can be used with one unit and motor. Two or more units can be interlocked electrically for sequence operation. Liquid level, pressure or heat regulating devices can be applied with the starter in automatic motor control. Sizes in the present line include units for polyphase motors from 7½ horsepower at 110 volts to 25 horsepower at 440 volts, 550 volts and 600 volts; units for single phase motors from 3 horsepower at 110 volts to 7½ horsepower at 220 volts.

◆ ◆ ◆
Stainless Containers—

Stevens Metal Products Co., Niles, O., has recently placed on the market a series of steel shipping containers lined with 18-8 stainless steel to offer non-corrosive properties for shippers. Drums are made of IngAclad, which has a 20 per cent layer of stainless steel bonded to soft steel, and are available in capacities ranging from 10 to 110 gallons. Both solid and removable heads are furnished with either I-bar or pressed out rolling hoops, and bilge barrels with locking removable head are also available. Drums are made in thicknesses from 18 gage to 12 gage. These containers answer the need for stainless drums without the high cost of stainless steel, it is claimed.

◆ ◆ ◆
Welders—

Ideal Electric & Mfg. Co., Mansfield, O., has developed a new arc welder of all steel construction. Dual control systems with individual current and voltage meters are provided. Controls are mounted on top of the machine for easy accessibility. Ball bearings are used exclusively in the welder and roller bearings in the wheels of the truck on which it is mounted for portability. A permanent cover of heavy rolled steel is welded over the ribs near the center of the welder, all other covers being removable. Main frame consists of rolled steel bars welded between steel rings forming



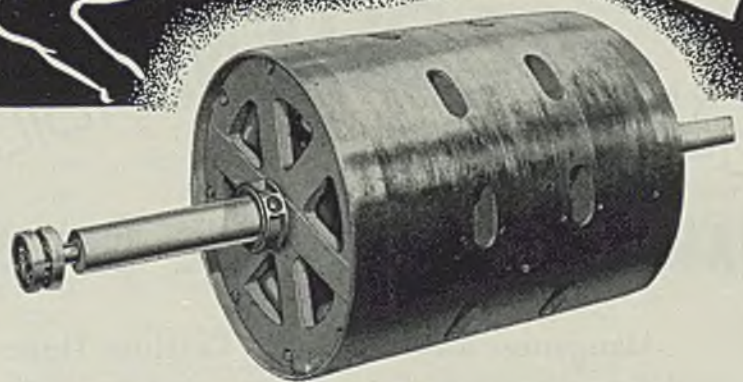
Noel Speedarc welder which has unity power factor at full load, a product of the Ideal Electric & Mfg. Co.

a case which holds the stator laminations. Large diameter shafts are of high carbon steel, and core laminations of 26 gage electric sheet steel punchings are assembled directly on the shaft. Brushes are electrographitic type and are provided with imbedded pigtail connections. Models are available in 125, 200, 300 and 400-ampere capacities.

◆ ◆ ◆
Pillow Block—

Fafnir Bearing Co., New Britain, Conn., has recently placed on the market a new pillow block in which

the one piece housing is made entirely of molded rubber. This block supports a standard steel radial ball bearing of the double shielded type, which is pressed into the housing, followed by a shielding plate, a rubber insulating washer and a thrust collar which clamps the bearing securely in place. The sealed bearing is prelubricated, and the exterior of the rubber housing is treated with a protective lacquer designed to prevent deterioration in service. The block is mounted on the shaft with a light press fit, and sizes are available to fit shafts from 11/16-inch to 1 7/16 inches.



BECAUSE IT HAS STEARNS FORCED VENTILATION AND RADIATION

More pull — 50% greater magnetic pulling power—is inherent in Stearns' Magnetic Pulleys because of the Stearns' principle of forced ventilation and magnetic radiation. This principle includes the famous Stearns one-piece, horse-shoe magnet body member and the

high cooling efficiency of forced ventilation through air ducts.

The greater magnetic strength of Stearns' magnetic pulleys has been known and utilized by users for more than twenty years . . . Stearns' pulleys are preferred as the outstanding value in their field. Write for full information.

HIGH
STEARNS
—DUFFY—
MAGNETIC EQUIPMENT

STEARNS MAGNETIC MFG. CO.
 FORMERLY MAGNETIC MFG. CO.
 650 S. 28 St. Milwaukee, Wis.

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.

Vacuum Cleaning Systems — Spencer Turbine Co., Hartford, Conn. Folder on central and portable vacuum cleaning systems.

Roller Bearings—SKF Industries Inc., Philadelphia. Catalog No. 228-

3S, covering general roll mill data for calculation and design.

Air Operated Controller—Brown Instrument Co., Wayne and Roberts avenues, Philadelphia. Catalog No. 8901, on controllers, ex-

plaining their operations; includes diagrams illustrating construction and ease with which control units may be interchanged.

High Speed and Tool Steels—Firth-Sterling Steel Co., McKeesport, Pa. Price list of high speed and tool steels, Sterling stainless and Nirosta steels.

Absorption Refrigerating Machines—Carbondale Machine Corp., Harrison, N. J. Bulletin No. 1104, explaining the absorption method of refrigerating; the three types of absorption machines, "Atmospheric, Double-Pipe, and Tubular", are illustrated by line drawings showing details of construction.

Heat Transfer Products—Young Radiator Co., Racine, Wis. Catalog No. 536, on radiators, cooling equipment, heaters, heat exchange units for truck, coach, rail car, locomotive service with gasoline or diesel engines. Catalog No. 636, on heat transfer surfaces for air conditioning and special applications.

Flow Meters—Cochrane Corp., Seventeenth street and Allegheny avenue, Philadelphia. Folder on flow meter recorders, electric or mechanical; meters are guaranteed to within $\frac{1}{2}$ of 1 per cent of accuracy on continuous full load; mechanical meter has exceptionally high operating torque because of the tilting U-tube manometer within the meter; electric meter utilizes the galvanometer Null principle.

Induction Motors—General Electric Co., Schenectady, New York. Folder No. 2345, illustrating a new design of riveted-frame squirrel-cage polyphase induction motors, in frame sizes of from one to 15 horsepower at 1800 revolutions per minute. Folder No. 1619B, on splashproof induction motors to meet requirements where equipment is subjected to splashing or dripping liquids, or is regularly washed down by hose. Folder No. 1538A, on type K totally enclosed induction motors under conditions of abrasive dust or excessive moisture. Folder No. 1341C, on explosion proof totally enclosed, fan-cooled induction motors, for class 1, group D, hazardous locations (as defined in article 32 of the National Electrical Code). Folder No. 1366A, on type KR totally enclosed hoist motors. Folder No. 1362B, on totally enclosed, fan-cooled induction motors, available in a wide variety of speed, horsepower, and power-supply combinations to cover every practical power requirement in their field.

Service!

1906  1936

QUALITY · DEPENDABILITY

DAMASCUS MANGANESE CASTINGS

Manganese and Alloy Steel Castings One Half to One Thousand Pounds Produced in our modernly equipped foundry from electric furnace steel and heat-treated in automatically controlled gas-fired furnaces.

The **DAMASCUS STEEL CASTING CO.**

New Brighton, Pa.

(Pittsburgh District)

DAMASCUS STEEL CASTINGS
(Manganese and Alloy)

Backlogs Cushion Slight Decline in Orders

Rate Holds at 75;

Rail Awards Heavy;

Auto Assemblies Gain

OPERATIONS holding at 75 per cent of capacity; rail awards heavy; automobile production making another increase; the heavy flow of orders showing a tendency toward slackening temporarily in some districts—these are the highlights of the iron and steel market.

A slight decline in new specifications is not unexpected in view of the extensive buying recently, and producers point out that backlogs are more than ample to cushion the drop. One company's unfilled orders are more than 100,000 tons greater than they were on Sept. 15.

Last week's automobile production, 48,195 units, represented an increase of 8250 from the preceding week. The industry is emerging from its usual period of delays and interruptions attendant to the initial production of new models. Ford, aiming at assembling 5000 units a day as soon as possible, was passing the 500-per-day mark last week.

Deliveries Retarded

SHEET deliveries to the automotive industry are being retarded at present because of these delays in assembling the new models, but the mills have large backlogs assuring satisfactory rolling for four to six weeks.

The rail awards totaled 86,237 tons, including 23,000 tons for Southern railway, 55,162 tons for Southern Pacific, 6075 tons for the Nashville, Chattanooga and St. Louis, and 2000 tons for the Missouri Pacific. Southern Pacific also will spend an estimated \$1,500,000 for track accessories.

In view of possible shortages of certain types of freight cars during the winter months, extensive car repair programs now are under way. Baltimore & Ohio is repairing more than 1000 box cars and 100 locomotives. Inquiries for 60 new locomotives appeared last week, in addition to the 50 pending for the New York Central.

Contracts for 30,000 tons of steel line pipe were awarded by Gulf Oil Corp., Pittsburgh, requiring approximately 287 miles of 10-inch seamless tubing. Fifteen hundred tons will be required for a 48-inch steel pipeline for Everett and Chelsea, Mass.

Shape awards totaled 10,435 tons, a decrease of 10,000. Pending awards include 4300 tons for another section of the Sixth avenue subway in New York, 2650 tons for a Cincinnati viaduct and several 1000-ton proj-

MARKET IN TABLOID

DEMAND *Temporary slackening noted in some lines.*

PRICES *Steady.*

PRODUCTION . . . *National rate unchanged at 75 per cent.*

SHIPMENTS *Good.*

ects. Reinforcing bar awards totaled 3002 tons, compared to 6722.

Coke producers, who have been operating at an unusually high rate for the last two months, now are beginning to encounter increasing domestic demand. Nearly all of the midwest by-product ovens are operating and National Tube Co., Pittsburgh, is preparing to operate the last of its four by-product oven batteries at its Lorain, O., works.

In pig iron, stocks of both consumers and producers are light. It is likely additional blast furnaces will be blown in during the next 60 days. Royal Dutch pig iron prices have been advanced \$1 a ton.

Scrap prices are steady and the market is comparatively quiet. STEEL'S scrap index remains at \$16.54, the iron and steel composite is unchanged at \$34.60 and the finished index holds at \$53.90.

Chicago Gains a Point

OPERATIONS in the Chicago district were up 1 point to 76 per cent; Wheeling 3 to 95; Detroit 5 to 100; New England 5½ to 75½, and Cincinnati 6 to 96. Youngstown was down 2 points to 78; eastern Pennsylvania ½ to 48½ and Cleveland 2½ to 79½. The others were unchanged. Last year in the same week the national rate was 51 per cent; two years ago it was 26½.

The industry is watching Great Britain's activity with increasing interest, for steelmakers there are setting all-time records but still are unable to meet demand. In September, production of ingots and castings totaled 1,027,000 tons, exceeding the million-ton mark for the first time in history. STEEL'S London correspondent cables that demand is very strong, pig iron supplies are being rationed to consumers, and billet mills are completely sold out for the rest of this year. Imports from the Continent are heavy in an effort to relieve the situation.

COMPOSITE MARKET AVERAGES

	Oct. 17	Oct. 10	Oct. 3	One Month Ago Sept., 1936	Three Months Ago July, 1936	One Year Ago Oct., 1935	Five Years Ago Oct., 1931
Iron and Steel	\$34.60	\$34.60	\$34.62	\$34.15	\$33.49	\$32.84	\$30.30
Finished Steel	53.90	53.90	53.90	53.10	53.40	53.70	48.22
Steelworks Scrap . . .	16.54	16.54	16.54	16.18	12.89	12.72	8.50

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

	Oct. 17, 1936	Sept. 1936	July 1936	Oct. 1935		Oct. 17 1936	Sept. 1936	July 1936	Oct. 1935
Finished Material					Pig Iron				
Steel bars, Pittsburgh	2.05c	1.95c	1.95c	1.85c	Bessemer, del. Pittsburgh	\$20.8132	20.8132	20.8132	19.81
Steel bars, Chicago	2.10	2.00	2.00	1.90	Basic, Valley	19.00	19.00	19.00	18.00
Steel bars, Philadelphia	2.36	2.26	2.26	2.16	Basic, eastern del. East. Pa.	20.8132	20.8132	20.8132	19.81
Iron bars, Terre Haute, Ind.	1.95	1.85	1.85	1.75	No. 2 fdy., del. Pittsburgh	20.3132	20.3132	20.3132	19.31
Shapes, Pittsburgh	1.90	1.90	1.90	1.80	No. 2 fry., Chicago	19.50	19.50	19.50	18.75
Shapes, Philadelphia	2.11 1/2	2.11 1/4	2.11 1/4	2.01 1/2	Southern No. 2, Birmingham	15.50	15.50	15.50	14.50
Shapes, Chicago	1.95	1.95	1.95	1.85	Southern No. 2, del. Cincinnati	19.44	19.44	20.2007	19.38
Tank plates, Pittsburgh	1.90	1.90	1.90	1.80	No. 1 2X eastern, del. Phila.	21.6882	21.6882	21.6882	20.68
Tank plates, Philadelphia	2.09	2.09	2.09	1.99	Malleable, Valley	19.50	19.50	19.50	18.50
Tank plates, Chicago	1.95	1.95	1.95	1.85	Malleable, Chicago	19.50	19.50	19.50	18.75
Sheets, No. 10, hot rolled, Pitts.	1.95	1.95	1.95	1.85	Lake Sup., charcoal, del. Chicago	25.7528	25.2528	25.2528	24.90
Sheets, No. 24, hot ann., Pitts.	2.60	2.50	2.50	2.40	Ferromanganese, del. Pitts.	80.13	80.13	80.13	90.13
Sheets, No. 24, galv., Pitts.	3.20	3.20	3.20	3.10	Gray forge, del. Pittsburgh	19.6741	19.6741	19.6741	18.67
Sheets, No. 10, hot rolled, Gary	2.05	2.05	2.05	1.95	Scrap				
Sheets, No. 24, hot anneal., Gary	2.70	2.60	2.60	2.50	Heavy melting steel, Pittsburgh	\$18.25	17.75	14.15	13.65
Sheets, No. 24, galvan., Gary	3.30	3.30	3.30	3.20	Heavy melt. steel, No. 2, east. Pa.	14.25	14.00	11.50	11.00
Plain wire, Pittsburgh	2.50	2.40	2.40	2.30	Heavy melting steel, Chicago	16.25	16.15	13.25	12.50
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.25	Rail for rolling, Chicago	16.75	16.75	14.00	14.00
Wire nails, Pittsburgh	2.05	1.95	2.10	2.40	Railroad steel specialties, Chicago	17.75	17.65	14.75	13.50
Semifinished Material					Coke				
Sheet bars, open-hearth, Youngs	\$32.00	30.00	30.00	28.00	Connellsville, furnace, ovens	\$4.00	3.90	3.45	3.55
Sheet bars, open-hearth, Pitts.	32.00	30.00	30.00	28.00	Connellsville, foundry, ovens	4.25	4.25	4.25	4.35
Billets, open-hearth, Pittsburgh	32.00	30.00	30.00	27.00	Chicago, by-product foundry, del.	9.75	9.75	9.75	9.75
Wire rods, No. 5 to 1 1/2-inch, Pitts.	40.00	38.00	38.00	38.00					

Steel, Iron, Raw Material, Fuel and Metals Prices

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

Sheet Steel	Tin Mill Black No. 28	Corrosion and Heat-Resistant Alloys	Structural Shapes
Prices Subject to Quantity Extras and Deductions (Except Galvanized)	Pittsburgh 2.75c Gary 2.85c St. Louis, delivered 3.08c	Pittsburgh base, cents per lb.	Pittsburgh 1.90c Philadelphia, del. 2.11 1/2 c New York, del. 2.16 1/2 c Boston, delivered 2.30 1/2 c Bethlehem 2.00c Chicago 1.95c Cleveland, del. 2.10c Buffalo 2.00c Gulf Ports 2.30c Birmingham 2.05c Pacific ports, f.o.b. cars, dock 2.45c
Hot Rolled No. 10, 24-48 in.	Cold Rolled No. 10	Chrome-Nickel	Bars
Pittsburgh 1.95c Gary 2.05c Chicago, delivered 2.08c Detroit, del. 2.15c New York, del. 2.30c Philadelphia, del. 2.26c Birmingham 2.10c St. Louis, del. 2.28c Pacific ports, f.o.b. cars, dock 2.50c	Pittsburgh 2.60c Gary 2.70c Detroit, delivered 2.80c Philadelphia, del. 2.91c New York, del. 2.95c Pacific ports, f.o.b. cars, dock 3.20c	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	Soft Steel (Base, 3 to 25 tons) Pittsburgh 2.05c Chicago or Gary 2.10c Duluth 2.20c Birmingham 2.20c Cleveland 2.10c Buffalo 2.15c Detroit, delivered 2.20c Pacific ports, f.o.b. cars, dock 2.60c Philadelphia, del. 2.36c Boston, delivered 2.47c New York, del. 2.40c Pitts., forg. qual. 2.40c
Hot Rolled Annealed No. 24	Cold Rolled No. 20	Straight Chromes	Steel Plate
Pittsburgh 2.60c Gary 2.70c Chicago, delivered 2.73c Detroit, delivered 2.80c New York, del. 2.95c Philadelphia, del. 2.91c Birmingham 2.75c St. Louis, del. 2.935c Pacific ports, f.o.b. cars, dock 3.25c	Pittsburgh 3.05c Gary 3.15c Detroit, delivered 3.25c Philadelphia, del. 3.36c New York, del. 3.40c	No. No. No. No. 410 430 442 446 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	Pittsburgh 1.90c New York, del. 2.19c Philadelphia, del. 2.09c Boston, delivered 2.32c Buffalo, delivered 2.15c Chicago or Gary 1.95c Cleveland, del. 2.09 1/2 c Birmingham 2.05c Coatesville, base 2.00c Sparrows Pt., base 2.00c Pacific ports, f.o.b. cars, dock 2.45c St. Louis, delivered 2.18c
Galvanized No. 24	Enameling Sheets	Steel Plate	Steel Plate
Pittsburgh 3.20c Gary 3.30c Chicago, delivered 3.33c Philadelphia, del. 3.51c New York, del. 3.55c Birmingham 3.35c St. Louis, del. 3.53 1/2 c Pacific ports, f.o.b. cars, dock 3.80c	Pittsburgh, No. 10 2.45c Pittsburgh, No. 20 3.05c Gary, No. 10 2.55c Gary, No. 20 3.15c	Pittsburgh 1.90c New York, del. 2.19c Philadelphia, del. 2.09c Boston, delivered 2.32c Buffalo, delivered 2.15c Chicago or Gary 1.95c Cleveland, del. 2.09 1/2 c Birmingham 2.05c Coatesville, base 2.00c Sparrows Pt., base 2.00c Pacific ports, f.o.b. cars, dock 2.45c St. Louis, delivered 2.18c	Pittsburgh 1.90c New York, del. 2.19c Philadelphia, del. 2.09c Boston, delivered 2.32c Buffalo, delivered 2.15c Chicago or Gary 1.95c Cleveland, del. 2.09 1/2 c Birmingham 2.05c Coatesville, base 2.00c Sparrows Pt., base 2.00c Pacific ports, f.o.b. cars, dock 2.45c St. Louis, delivered 2.18c
	Tin and Terne Plate		
	Gary base, 10 cents higher. Tin plate, coke base (box) Pittsburgh \$5.25 Do., waste-waste 2.75c Do., strips 2.50c Long ternes, No. 24 unassorted, Pitts. 3.50c Do., Gary 3.60c		

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

Reinforcing	
New billet, straight lengths, quoted by distributors.	
Pittsburgh	2.05c
Chicago, Gary, Buffalo, Cleve., Birm., Young.	2.10c
Gulf ports	2.45c
Pacific coast ports f.o.b. car docks	2.45c
Philadelphia, del.	2.26c-2.36c
Rail steel, straight lengths, quoted by distributors	
Pittsburgh	1.90c
Chicago, Buffalo, Cleve- land, Birm., Young.	1.95c
Gulf ports	2.30c

Wire Products

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

Base Pitts.-Cleve. 100 lb. keg. Standard wire nails.....	\$2.05
Cement coated nails.....	\$2.05
Galv. nails, 15 gage and finer	\$3.05
do. finer than 15 ga.....	\$4.55
(Per pound)	
Polished staples	2.75c
Galv. fence staples	3.00c
Barbed wire, galv.	2.55c
Annealed fence wire.....	2.80c
Galv. fence wire	3.15c

Woven wire fencing
(base column, c. 1.)...\$60.00

To Manufacturing Trade

Plain wire, 6-9 ga.	2.50c
Anderson, Ind. (merchant products only) and Chicago up \$1; Duluth up \$2; Birming- ham up \$3.	
Spring wire, Pitts.	3.05c
* or Cleveland	3.05c
Do., Chicago up \$1, Worc. \$2.	

Cold-Finished Carbon Bars and Shafting

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

10,000 to 19,999 lbs.	2.35c
20,000 to 59,999 lbs.	2.30c
60,000 to 99,999 lbs.	2.25c
100,000 to 299,999 lbs.	2.22 1/2 c
*300,000 lbs. and over	2.20c

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, Chi- cago, Massillon, Can- ton, Bethlehem	2.55c
--	-------

Alloy		Alloy	
S.A.E. Diff.	S.A.E. Diff.	S.A.E. Diff.	S.A.E. Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20
4100 0.15 to 0.25 Mo.	0.50		
4600 0.20 to 0.30 Mo.	1.25-		
1.75 Ni.	1.05		
5100 0.80-1.10 Cr.	0.45		
5100 Cr. spring	base		
6100 bars	1.20		
6100 spring	0.70		
Cr., Ni., Van.	1.50		
Carbon Van.	0.95		
9200 spring flats	base		
9200 spring rounds, squares	0.25		

Piling

Pittsburgh	2.25c
Chicago, Buffalo	2.35c

Strip and Hoops

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

Hot strip to 23 1/2-in.	
Pittsburgh	1.95c
Chicago or Gary	2.05c
Birmingham base	2.10c
Detroit, del.	2.15c
Philadelphia, del.	2.26c
New York, del.	2.30c
Cooperage hoop,	
Pittsburgh	2.05c
Chicago	2.15c
Cold strip, 0.25 carbon and under,	
Pitts., Cleveland.	2.60c
Detroit, del.	2.81c
Worcester, Mass.	2.80c
Cleve- Worces-	
ter, Mass.	

Carbon	Pitts.	Worces-
0.26-0.50... ..	2.60c	2.80c
0.51-0.75... ..	3.70c	3.90c
0.76-1.00... ..	5.45c	5.65c
Over 1.00... ..	7.50c	7.70c

Rails, Track Material

(Gross Tons)

Standard rails, mill	\$36.37 1/2
Relay rails, Pitts.	
20-100 lbs.	25.50-28.00
Light rails, billet qual. Pitts., Chi.	\$35.00
Do., reroll. qual.	34.00
Angle bars, billet, Gary, Ind., So. Chi.	2.55c
Do., axle steel.	2.10c
Spikes, R. R. base.	2.75c
Track bolts, base.	3.75c
Tie plates, base.	2.00c
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, Bir-
mingham, Chicago. Discounts
to legitimate trade as per Dec.
1, 1932, lists:

Carriage and Machine

1/2 x 6 and smaller.	70-10 off
Do. larger	70-5 off
Tire bolts	50 off

Plow Bolts

All sizes	70-5 off
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Steve Bolts

In packages with nuts at-
tached 75 off; in packages
with nuts separate 75-5 off;
in bulk 82 1/2 off on 15,000 of
3-inch and shorter, or 5000
over 3-inch.

Step bolts	65 off
Elevator bolts	65 off

Nuts

S. A. E. semifinished hex.:

1/2 to 7/8-inch	60-20-15 off
Do., 1/2 to 1-inch.	60-20-15 off
Do., over 1-inch.	60-20-15 off

Hexagon Cap Screws

Milled	80-10-10 off
Upset, 1-in., smaller	60 off

Square Head Set Screws

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

Rivets, Wrought Washers

Struc., c. l., Pitts- burgh, Cleveland	3.05c
Struc., c. l., Chicago	3.15c
3/4-in. and smaller, Pitts., Chi., Cleve.	70-5 off
Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs.	\$6.00 off

Cut Nails

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

Pipe and Tubing

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

Welded Iron, Steel Pipe

Base discounts on steel pipe,
Pitts., Lorain, O., to consum-
ers in carloads. Gary, Ind., 2
points less. Chicago, del. 2 1/2
less. Wrought pipe, Pittsburgh.

Butt Weld			
Steel			
In.	Blk.	Galv.	
1/4 and 1/2	60	44 1/2	
3/4	64 1/2	55	
1	67 1/2	59	
1-3	69 1/2	61 1/2	
Iron			
1/4	31 1/2	15	
1/2	36 1/2	20 1/2	
1-1 1/4	39 1/2	25 1/2	
2	41 1/2	26	
Lap Weld			
Steel			
2	62	53 1/2	
2 1/2-3	65	56 1/2	
3 1/2-6	67	58 1/2	
7 and 8	66	56 1/2	
9 and 10	65 1/2	56	
Iron			
2	37	22 1/2	
2 1/2-3 1/2	38	25	
4-8	40	28 1/2	

Line Pipe			
Steel			
1/4, butt weld	56		
1/4 and 1/2, butt weld.	59		
1/2, butt weld	63 1/2		
3/4, butt weld	66 1/2		
1 to 3, butt weld	68 1/2		
2, lap weld	61		
2 1/2 to 3, lap weld.	64		
3 1/2 to 6, lap weld.	66		
7 and 8, lap weld.	65		
Iron			
1/4-1 1/4 inch, black and galv. take 4 pts. over; 2 1/2-6 inch 2 pts. over discounts for same sizes, standard pipe lists, 8- 12-inch, no extra.			

Boiler Tubes			
<i>C. L. Discounts, f.o.b. Pitts.</i>			
Lap Weld	Charcoal		
Steel	Iron		
2-2 1/4	1 1/4	8	
2 1/4-2 1/2	2-2 1/4	13	
3	2 1/2-2 3/4	16	
3 1/4-3 1/2	3	17	
4	3 1/4-3 1/2	18	
4 1/4-5	4	20	
	4 1/4	21	

In lots of a carload or more,
above discounts subject to
preferential: of two 5% and
one 7 1/2 % discount on steel and
10% on charcoal iron.

Lapwelded steel: 200 to 9999
pounds, ten points under base,
one 5% and one 7 1/2 %. Under
2000 pounds 15 points under
base, one 5% and one 7 1/2 %.

Charcoal iron: 10,000 pounds
to carloads, base less 5%; un-
der 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 quot-
ed for 55 cold-drawn boiler
tube sizes ranging from 1/4 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 di-
ameter, inclusive, and embrace
47 size classifications in 22
decimal wall thicknesses rang-
ing 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. \$39.00-40.00	
4-in., Birmingham.	42.00-43.00
4-in., Chicago	50.40-51.40
6 to 24-in. Chicago.	47.40-48.40
6-in. & over, east. fdy.	43.00
Do. 4-in.	46.00

Class A pipe \$3 over Class B
Std. htgs., Birm. base \$100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton

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

Forging Billets

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

Pitts., Chi., Buff.	39.00
Forging, Duluth	41.00

Sheet Bars

Pitts., Cleve., Young., Chi., Buff., Can- ton, Sparrows Pt.	32.00
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Slabs

Pitts., Chi., Cleve., Young.	32.00
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Wire Rods

Pitts., Cleve., No. 5 to 3 1/2-inch incl.	40.00
Do., over 3 1/2 to 3 1/2-inch incl.	42.00
Chicago up \$1; Worcester up \$2	

Skeps

Pitts., Chi., Young., Buff., Coatesville, Sparrows Point.	1.80c
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Coke

Price Per Net Ton

Beehive Ovens	
Connellsville, fur.	\$3.75- 4.00
Connellsville, fdry.	4.25- 4.50
Connell prem. fdry.	5.50
New River fdry.	6.00
Wise county fdry.	4.45- 5.00
Wise county fur.	4.00- 4.50

By-Product Foundry

Newark, N. J., del.	10.20-10.65
Chi., ov., outside del.	9.80
Chicago, del.	9.75
New England, del.	11.50-12.00
St. Louis, del.	10.00-10.50
Birmingham, ovens	6.50
Indianapolis, del.	9.40
Cincinnati, del.	9.50
Cleveland, del.	9.75
Buffalo, ovens	9.75
Detroit, ov., out. del.	9.00
Philadel, del.	9.88

Coke By-Products

Spot gal. Producers' Plants

Pure and 90% benzol.	16.00c
Toluol	30.00c
Solvent naphtha	30.00c
Industrial xylol	30.00c
Per lb. f.o.b. Frankford, Phenol (200 lb. drums).	15.50c
Do. (450 lbs.)	14.50c
Eastern Plants, per lb. Naphthalene flakes and balls, in bbls., to job- bers	7.25c
Per 100 lbs. Atlantic seaboard Sulphate of ammonia.	\$1.275
†Western prices, 1/4-cent up	

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry ls 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.

Table with columns: Basing Points, No. 2 Fdry., Malleable, Basic, Bessemer. Lists various locations like Bethlehem, Pa., Birdsboro, Pa., Birmingham, Ala., etc.

Table with columns: Delivered from Basing Points, Akron, O., Baltimore, etc. Lists various locations and their respective prices.

Table with columns: Delivered from Basing Points, St. Louis, St. Paul, etc. Lists prices for specific basing points.

Table with columns: Basing Points, Birdsboro, Steelton, Standish, N. Y., etc. Lists prices for various basing points and charcoal.

Table with columns: Silvery†, Jackson county, O., base; 6-6.50 per cent, etc. Lists prices for silvery iron.

Bessemer Ferrosilicon†
Jackson county, O., base: Prices are the same as for silveries, plus \$1 a ton.
†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Refractories

Table with columns: Per 1000 f.o.b. Works, Fire Clay Brick, Super Quality, First Quality, Second Quality, etc. Lists prices for various refractory products.

Table with columns: Chester, Pa., and Baltimore bases (bags), Domestic dead - burned grains, net ton f.o.b., etc. Lists prices for various brick and base products.

Fluorspar, 85-5

Table with columns: Washed gravel, duty paid, tide, net ton, etc. Lists prices for fluorspar and gravel.

Ferroalloys

Table with columns: Dollars, except Ferrochrome, Ferromanganese, 78-82%, etc. Lists prices for various ferroalloys.

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

Table with columns: Copper, Electro, Lake, Casting, Straits Tin, Lead, East, Zinc, Alum, Antimony, Nickel, etc. Lists prices for various nonferrous metals.

*Nominal range 19.00 to 21.00c.

MILL PRODUCTS

Table with columns: F.o.b. mill base, cents per lb., except as specified, Copper brass products, etc. Lists prices for mill products.

OLD METALS

Table with columns: Deal. buying prices, cents lb., No. 1 Composition Red Brass, etc. Lists prices for old metals.

Light Brass

Table with columns: Chicago, Cleveland, St. Louis, New York, etc. Lists prices for light brass.

Lead

Table with columns: New York, Cleveland, Chicago, St. Louis, etc. Lists prices for lead.

Zinc

Table with columns: *New York, St. Louis, Cleveland, etc. Lists prices for zinc.

Aluminum

Table with columns: Borings, Cleveland, Mixed, cast, Cleve., etc. Lists prices for aluminum.

SECONDARY METALS

Table with columns: Brass ingot, 85-5-5, Stand. No. 12 alum., etc. Lists prices for secondary metals.

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† 11.00-12.50 Bos. d'ck, No. 1, exp. †12.25 N. Eng. del. No. 1... 12.75 Buffalo, No. 1... 15.50-16.50 Buffalo, No. 2... 14.50-15.00 Chicago, No. 1... 16.00-16.50 Cleveland, No. 1... 15.50-16.00 Cleveland, No. 2... 15.00-15.50 Detroit, No. 1... 14.50-15.00 Eastern Pa., No. 1... 15.50-16.00 Eastern Pa., No. 2... 14.00-14.50 Federal, Ill. ... 12.75-13.25 Granite City, R. R. 14.25-14.75 Granite City, No. 2... 12.75-13.25 New York, No. 1... †11.75-12.25 N. Y. d'ck, No. 1, exp. †12.00-12.25 Pitts., No. 1 (R. R.) 18.25-18.75 Pitts., No. 1 (dlr.) 18.00-18.50 Pittsburgh, No. 2... 16.00-16.50 St. Louis, R. R. ... 14.25-14.75 St. Louis, No. 2... 14.50-15.00 Toronto, dlrs. No. 1 10.50-11.00 Toronto, No. 2... 9.50-10.00 Valleys, No. 1... 16.75-17.25	COUPLERS, SPRINGS Buffalo... 17.00-17.50 Chicago, springs... 18.25-18.75 Eastern Pa. ... 19.00-19.50 Pittsburgh... 20.50-21.00 St. Louis... 15.50-16.00 ANGLE BARS—STEEL Chicago... 18.00-18.50 St. Louis... 15.50-16.00 Buffalo... 14.50-15.00 RAILROAD SPECIALTIES Chicago... 18.00-18.50 LOW PHOSPHORUS Buffalo, billet and bloom crops... 17.50-18.00 Cleveland, billet, bloom crops... 19.00-19.50 Eastern Pa., crops... 18.50-19.00 Pittsburgh, billet, bloom crops... 20.50-21.00 Pittsburgh, sheet bar crops... 19.50-20.00 FROGS, SWITCHES Chicago... 16.00-16.50 St. Louis, cut... 15.00-15.50 SHOVELING STEEL Chicago... 16.00-16.50 Federal, Ill. ... 13.00-13.50 Granite City, Ill. 12.75-13.25 Toronto, dealers... 6.50 RAILROAD WROUGHT Birmingham... 8.00-9.00 Boston, district... †8.00-8.25 Buffalo, No. 1... 14.50-15.00 Buffalo, No. 2... 15.50-16.50 Chicago, No. 1, net... 14.00-14.50 Chicago, No. 2... 16.00-16.50 Cincinnati, No. 2... 14.00-14.50 Eastern Pa. ... 16.00 St. Louis, No. 1... 13.00-13.50 St. Louis, No. 2... 14.50-15.00 Toronto, No. 1 dlr... 7.00 SPECIFICATION PIPE Eastern Pa. ... 14.00-14.50 New York... †10.00-10.50 BUSHELING Buffalo, No. 1... 14.50-15.00 Chicago, No. 1... 14.75-15.25 Cincln., No. 1, deal... 11.00-11.50 Cincinnati, No. 2... 6.50-7.00 Cleveland, No. 2... 10.50-11.00 Detroit, No. 1, new... 14.00-14.50 Valleys, new, No. 1... 16.50-16.75 Toronto, dealers... 6.00 MACHINE TURNINGS Birmingham... 6.00-6.50 Buffalo... 9.00-9.50 Chicago... 8.50-9.00 Cincinnati, dealers... 7.50-8.00 Cleveland... 10.00-10.50 Detroit... 9.00-9.50 Eastern Pa. ... 10.50 New York... †6.00-6.50 Pittsburgh... 12.50-13.00 St. Louis... 6.00-6.50 Toronto, dealers... 4.00-4.50 Valleys... 10.75-11.25 BORINGS AND TURNINGS <i>For Blast Furnace Use</i> Boston district... †5.25-5.50	Buffalo... 9.50-10.00 Cincinnati, dealers... 6.50-7.00 Cleveland... 10.50-11.00 Detroit... 9.50-10.00 Eastern Pa. ... 9.00 New York... †4.75-5.00 Pittsburgh... 11.50-12.00 Toronto, dealers... 4.00 CAST IRON BORINGS Birmingham... 6.00-6.50 Boston dist. chem... †6.25-6.75 Boston dist. for mills... †6.00-6.25 Buffalo... 9.50-10.00 Chicago, dealers... 9.25-9.75 Cincinnati, dealers... 6.50-7.00 Cleveland... 10.50-11.00 Detroit... 9.50-10.00 E. Pa., chemical... 10.00-13.00 New York... †6.00-6.50 St. Louis... 5.50-6.00 Toronto, dealers... 4.50-5.00 PIPE AND FLUES Cincinnati, dealers... 9.00-9.50 Chicago, net... 8.00-8.50 RAILROAD GRATE BARS Buffalo... 11.00-11.50 Chicago, net... 10.00-10.50 Cincinnati... 9.00-9.50 Eastern Pa. ... 12.50 New York... †8.00-8.50 St. Louis... 10.50-11.00 FORGE FLASHINGS Boston district... †9.75-10.00 Buffalo... 14.50-15.00 Cleveland... 14.50-15.00 Detroit... 13.00-13.50 Pittsburgh... 16.00-16.50 FORGE SCRAP Boston district... †6.50-7.00 Chicago, heavy... 18.00-18.50 Eastern Pa. ... 14.00-14.50 ARCH BARS, TRANSOMS St. Louis... 16.50-17.00 AXLE TURNINGS Boston district... †7.25-7.50 Buffalo... 12.50-13.00 Chicago, elec. fur... 16.00-16.50 Eastern Pa. ... 13.00-14.00 St. Louis... 10.50-11.00 Toronto... 4.50 STEEL CAR AXLES Birmingham... 13.00-14.00 Boston district... †14.50-15.00 Buffalo... 17.00-17.50 Chicago, net... 18.00-18.50 Eastern Pa. ... 21.50 St. Louis... 16.50-17.00 Toronto... 8.50 SHAFTING Boston district... †16.00-16.25 Eastern Pa. ... 21.00-21.50 New York... †16.50-17.00 St. Louis... 15.00-15.50 CAR WHEELS Birmingham... 12.50-13.50 Boston dist. iron... †11.00-11.50 Buffalo, iron... 15.00-15.50 Buffalo, steel... 17.50-18.00 Chicago, iron... 16.50-17.00 Chicago, rolled steel... 18.00-18.50	Cincinnati, iron... 13.00-13.50 Eastern Pa., iron... 17.00 Eastern Pa., steel... 19.00-19.50 Pittsburgh, iron... 18.00-18.50 Pittsburgh, steel... 20.50-21.00 St. Louis, iron... 14.00-14.50 St. Louis, steel... 16.00-16.50 Toronto, net... 8.50 NO. 1 CAST SCRAP Birmingham... 11.50-12.50 Bos. dis. No. 1 mch. †10.75-11.00 N. Eng., del. No. 2... 19.00-9.25 N. Eng., del. textile... 12.00-12.50 Buffalo, cupola... 14.00-14.50 Buffalo, mach... 15.00-15.50 Chicago, agri. net... 12.00-12.50 Chicago, auto... 12.50-13.00 Chicago, mach. net... 14.00-14.50 Chicago, rall'd net... 13.00-13.50 Cincl., mach. cup... 13.50-14.00 Cleveland, mach... 16.25-16.75 Eastern Pa., cupola... 16.50-17.00 E. Pa., mixed yard... 14.00-14.50 Pittsburgh, cupola... 17.00-17.50 San Francisco, del... 13.50-14.00 Seattle... 10.00-11.00 St. Louis, No. 1... 12.50-13.00 St. L. No. 1, mach... 13.00-13.50 Toronto, No. 1, mach., net... 9.50-10.00 HEAVY CAST Boston dist. break... 10.25-10.50 New England del... 11.00-11.50 Buffalo, break... 13.00-13.50 Cleveland, break... 13.00-13.50 Detroit, No. 1 mach. net... 13.50-14.00 Detroit, break... 11.50-12.00 Detroit, auto net... 13.50-14.00 Eastern Pa. ... 15.50 New York breakable... †11.25-11.75 Pittsburgh... 15.00-15.50 MALLEABLE Birmingham, R. R. ... 12.00-13.00 New England, del... †16.25-17.50 Buffalo... 16.50-17.50 Chicago, R. R. ... 18.50-19.00 Cincl., agri. del... 14.00-14.50 Cleveland, rail... 17.50-18.00 Detroit, auto, net... 14.50-15.00 Eastern Pa., R. R. ... 17.50 Pittsburgh, rail... 17.50-18.00 St. Louis, R. R. ... 15.50-16.00 Toronto, net... 7.00 RAILS FOR ROLLING <i>5 feet and over</i> Birmingham... 13.00-14.00 Birmingham... †11.00-11.50 Buffalo... 16.00-16.50 Chicago... 16.50-17.00 Eastern Pa. ... 16.00 New York... †12.00-12.50 St. Louis... 16.00-16.50 LOCOMOTIVE TIRES Chicago (cut)... 17.50-18.00 St. Louis, No. 1... 13.50-14.00 LOW PHOS. PUNCHINGS Buffalo... 17.50-18.00 Chicago... 18.50-19.00 Eastern Pa. ... 18.00-18.50 Pittsburgh (heavy) 19.50-20.00 Pittsburgh (light) 18.50-19.00
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Iron Ore

Lake Superior Ore Gross ton, 51½% Lower Lake Ports Old range bessemer... \$4.80 Mesabi nonbess... 4.50 High phosphorus... 4.40 Mesabi bessemer... 4.65 Old range nonbess... 4.65	Eastern Local Ore Cents, unit, del. E. Pa. Foundry and basic 56-63% con. (nom.) 8.50-9.00 Cop.-free low phos. 58-60% (nom.)... 10.00-10.50 Foreign Ore Cents per unit, f.a.s. Atlantic ports (nominal) Foreign manganiferous ore, 45.55%
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iron, 6-10% man. 11.00 No. Afr. low phos. 11.00 Swedish basic, 65% 9.50 Swedish low phos... 10.50 Spanish No. Africa basic, 50 to 60%... nom. Tungsten, spot sh. ton unit, duty pd. \$15.85-16.00 N. F. fdy., 55%... 7.00 Chrome ore, 48% gross ton, c.i.f. ... 19.50-19.75

Manganese Ore

(Nominal) Prices not including duty, cents per unit cargo lots. Caucasian, 50-52%... 27.00 So. African, 50-52%... 27.00 Indian, 50-52%... 26.00
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Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS	
Baltimore*	3.20c
Boston††	3.30c
Buffalo	3.10c
Chattanooga	3.56c
Chicago (j)	3.20c
Cincinnati	3.42c
Cleveland	3.10c
Detroit	3.29c
Houston	3.10c
Los Angeles	3.60c
Milwaukee	3.31c-3.46c
New Orleans	3.55c
New York† (d)	3.51c
Pitts. (h)	3.15c-3.30c
Philadelphia*	3.25c
Portland	3.70c
San Francisco	3.25c
Seattle	3.90c
St. Louis	3.45c
St. Paul	3.45c-3.60c
Tulsa	3.35c
IRON BARS	
Portland	3.50c
Chattanooga	3.56c
Baltimore*	3.10c
Chicago	2.85c
Cincinnati	3.42c
New York† (d)	3.15c
Philadelphia*	3.25c
St. Louis	3.45c
Tulsa	3.35c
REINFORCING BARS	
Buffalo	2.60c
Chattanooga	3.56c
Chicago	2.10c-2.60c
Cleveland (c)	2.10c

Cincinnati	3.25c
Houston	3.25c
Los Angl., cl.	2.45c
New Orleans	3.50c
Pitts., plain (h)	3.05c
Pitts., twisted squares (h)	3.175c
San Francisco	2.45c
Seattle	3.50c
St. Louis	3.35c
Tulsa	3.25c
Young	2.30c-2.60c
SHAPES	
Baltimore*	3.10c
Boston††	3.29c
Buffalo	3.35c
Chattanooga	3.66c
Chicago	3.30c
Cincinnati	3.52c
Cleveland	3.41c
Detroit	3.52c
Houston	3.10c
Los Angeles	3.60c
Milwaukee	3.41c
New Orleans	3.65c
New York† (d)	3.47c
Philadelphia*	3.10c
Pittsburgh (h)	3.25c
Portland (l)	3.70c
San Francisco	3.25c
Seattle (l)	3.75c
St. Louis	3.45c
St. Paul	3.55c
Tulsa	3.60c
PLATES	
Baltimore*	3.10c
Boston††	3.31c

Buffalo	3.47c
Chattanooga	3.66c
Chicago	3.30c
Cincinnati	3.52c
Cleveland, ½-in. and over	3.41c
Detroit	3.52c
Detroit, ¾-in.	3.85c
Houston	3.10c
Los Angeles	3.60c
Milwaukee	3.41c
New Orleans	3.65c
New York† (d)	3.50c
Philadelphia*	3.10c
Phla. floor	4.95c
Pittsburgh (h)	3.25c
Portland	3.70c
San Francisco	3.25c
Seattle	3.75c
St. Louis	3.55c
St. Paul	3.55c
Tulsa	3.60c
NO. 10 BLUE	
Baltimore*	3.10c
Boston (g)	3.40c
Buffalo	3.72c
Chattanooga	3.46c
Chicago	3.15c
Cincinnati	3.32c
Cleveland	3.21c
Det. 8-10 ga.	3.24c
Houston	3.45c
Los Angeles	3.70c
Milwaukee	3.26c
New Orleans	3.65c
New York† (d)	3.41c
Portland	3.85c
Philadelphia*	3.20c

Pittsburgh (h)	3.05c
San Francisco	3.60c
Seattle	3.85c
St. Louis	3.40c
St. Paul	3.40c
Tulsa	3.80c
NO. 24 BLACK	
Baltimore*†	3.90c
Boston (g)	4.05c
Buffalo	3.35c
Chattanooga*	3.51c
Chicago	3.55c-4.55c
Cincinnati	4.22c
Cleveland	4.01c
Detroit	4.14c
Los Angeles	4.35c
Milwaukee	4.16c
New Orleans	4.50c
New York† (d)	4.10c
Phla.*†	3.85c
Pitts.** (h)	3.65c-4.95c
Portland	4.30c
Seattle	4.60c
San Francisco	4.20c
St. Louis	4.20c
St. Paul	4.10c
Tulsa	4.85c
NO. 24 GALV. SHEETS	
Baltimore*†	3.90c
Buffalo	4.10c
Boston (g)	4.00c
Chattanooga*	3.96c
Chicago (h)	4.15c-5.15c
Cincinnati	4.82c
Cleveland	4.61c
Detroit	4.82c
Houston	4.50c
Los Angeles	4.40c
Milwaukee	4.76c
New Orleans	4.95c
New York† (d)	4.50c
Philadelphia*†	4.50c
Pitts.** (h)	4.30c-5.55c
Portland	4.60c
San Francisco	5.00c
Seattle	5.10c
St. Louis	4.90c
St. Paul	4.60c
Tulsa	5.20c
BANDS	
Baltimore*	3.30c
Boston††	3.40c
Buffalo	3.52c
Chattanooga	3.71c
Chicago	3.40c
Cincinnati	3.57c
Cleveland	3.46c
Detroit, ½-in. and lighter	3.49c
Houston	3.35c
Los Angeles	4.20c
Milwaukee	3.51c
New Orleans	4.05c
New York† (d)	3.66c
Philadelphia*	3.30c
Pittsburgh (h)	3.30c
Portland	4.35c
San Francisco	4.20c
Seattle	4.35c
St. Louis	3.65c
St. Paul	3.65c
Tulsa	3.55c
HOOPS	
Baltimore	2.30c
Boston††	4.40c
Buffalo	3.52c
Chicago	3.40c
Cincinnati	3.57c
Det., No. 14 and lighter	3.49c
Los Angeles	5.95c
Milwaukee	3.51c
New York† (d)	3.66c
Philadelphia*	3.55c
Pittsburgh (h)	3.80c
Portland	5.70c
San Francisco	6.25c
Seattle	5.70c
St. Louis	3.65c
St. Paul	3.65c

COLD FIN. STEEL	
Baltimore (c)	3.98c
Boston*	4.15c
Buffalo (h)	3.70c
Chattanooga*	4.38c
Chicago (h)	3.75c
Cincinnati	3.97c
Cleveland (h)	3.75c
Detroit	3.84c
Los Ang. (f) (d)	5.85c
Milwaukee	3.86c
New Orleans	4.55c
New York† (d)	3.96c
Philadelphia*	4.01c
Pittsburgh	3.60c
Portland (f) (d)	6.30c
San Fran.(f) (d)	5.90c
Seattle (f) (d)	6.25c
St. Louis	4.00c
St. Paul	4.27c
Tulsa	4.80c
COLD ROLLED STRIP	
Boston	3.245c
Buffalo	3.39c
Chicago	3.27c
Cincinnati (b)	3.22c
Cleveland (b)	3.00c
Detroit	3.18c
New York† (d)	3.36c
St. Louis	3.41c
TOOL STEELS	
(Applying on or east of Mississippi river; west of Mississippi 1c up)	
Base	
High Speed	59 ½c
High carbon, high chrome	39c
Oil hardening	23c
Special tool	21c
Extra tool	17 ¼c
Regular tool	14 ¼c
Uniform extras apply.	

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Oct. 15

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

	British gross tons U. K. ports	Channel or North Sea ports, metric tons		Continental Quoted in gold pounds sterling
		Quoted in dollars at current value		
	£ s d		£ s d	
PIG IRON				
Foundry, 2.50-3.00 Silicon	\$15.31	3 2 6*	\$14.23	1 15 0
Basic bessemer	15.31	3 2 6*	11.79	1 9 0
Hematite, Phos. .03-.05	18.38	3 15 0		
SEMIFINISHED STEEL				
Billets	\$28.79	5 17 6	\$19.10	2 7 0
Wire rods, No. 5 gage	43.86	8 19 0	36.61	4 10 0
FINISHED STEEL				
Standard rails	\$40.43	8 5 0	\$44.74	5 10 0
Merchant bars	1.86c	8 10 0	1.20c	5 5 0
Structural shapes	1.81c	8 5 0	1.14c	5 1 6
Plates, ½ in. or 5 mm.	1.89c	8 12 6	1.57c	4 5 0
Sheets, black, 24 gage or 0.5 mm.	2.24c	10 5 0	2.39c	6 10 0††
Sheets, galv., 24 gage, corr.	2.57c	11 15 0	2.57c	7 0 0
Bands and strips	2.03c	9 5 0	1.48c	4 0 0
Plain wire, base	2.14c	9 15 0	1.94c	5 5 0
Galvanized wire, base	2.52c	11 10 0	2.15c	5 17 6
Wire nails, base	2.63c	12 0 0	1.75c	4 15 0
Tin plate, box 108 lbs.	\$ 4.59	0 18 9		

British ferromanganese \$75 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d (\$43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d	French Francs	Belgian Francs	Reich Marks
Fdy. pig iron, Si. 2.5	\$18.38	3 15 0(a)	\$13.54	290
Basic bessemer pig iron	18.38	3 15 0(a)	8.87	190
Furnace coke	5.27	1 6	4.86	104
Billets	30.01	6 2 6	21.34	457
Standard rails				
Merchant bars	1.81c	8 5 0	1.41c	671
Structural shapes	2.04c	9 7 0	1.32c	630
Plates, ½ in. or 5 mm.	2.05c	9 7 6	1.30c	620
Sheets, black	2.12c	9 13 9	1.66c	790
Sheets, galv., corr., 24 ga. or 0.5 mm.	2.63c	12 0 0	1.79c	850†
Plain wire	3.07c	14 0 0	2.84c	1,350
Bands and strips	2.19c	10 0 0	2.31c	1,100
	2.21c	10 2 0	1.54c	735

*Basic. †British ship-plates. Continental, bridge plates. ‡24 ga. †† 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 67.15 per cent over paper sterling.

Discount

Chicago (a)	65
Cleveland	70
Detroit	70
Milwaukee	70
Pittsburgh	65-5

(a) Under 100 lbs., 60 off.
 (b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Quantity base; (e) New mill classif. (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less; (i) Under 3 in.; (j) Shapes other than rounds, flats, fillet angles, 3.35c.
 Prices on heavier lines are subject to new quantity differentials: 399 lbs. and less, up 50 cts.; 400 to 3999 lbs., base; 4000 to 7999 lbs., 15 cts., under; 8000 to 14,999 lbs., 25 cts., under; 15,000 to 39,999 lbs., 35 cts., under; 40,000 lbs. and over, 50 cts., under; (except Boston).
 †Domestic steel;
 **Plus quan. extras;
 **Under 25 bundles;
 †50 or more bundles;
 †New extras apply;
 ††Base 40,000 lbs., extras on less.

Bars

Bar Prices, Page 64

Pittsburgh—Following the first heavy buying movement which occupied most of September and the first week of October, automotive specifications for both carbon and alloy bars have eased. Bar tonnage due these accounts, however, is the largest aggregate in several years and as shipping directions are issued will represent requirements for 30 to 45 days. Small-lot buying of bars, mainly for rush shipment, have been taking the advanced price of 2.05c. f.o.b. Pittsburgh, for the hot-rolled grade, although buyers who got in under the Oct. 1 deadline are still being invoiced at 1.95c, base, Pittsburgh. Alloy quality bars are firm at 2.45c and purchases by small manufacturers of dies, tractors and oil refinery equipment lead.

Cleveland—New bar business has receded slightly since the first of the month, in contrast to the heavy specifications placed the last two weeks of September. Buyers now coming into the market are unable to get deliveries inside of six to eight weeks. Because of this the new prices have had little opposition from consumers. Alloy bars and forge shops are more active, in view of increased demands from the automotive industry.

Chicago—Higher prices have failed to disturb new business in steel bars and sales and specifications are close to the rates of previous weeks. Demand from the automotive industry is gaining, though at a somewhat slower rate than had been anticipated. Requirements for farm implement and tractor manufacturers are increasing in some directions, and continue in better volume than during the corresponding period of several years.

Boston—Although sales of steel bars during the first two weeks of October do not aggregate the volume booked previous to the fourth quarter price advance, some buyers have placed considerable business at the new prices. This new buying is occasioned by the current requirements of manufacturers, and to some extent a desire to protect themselves on deliveries.

Philadelphia—Due to the substantial volume placed before the \$2 advance Oct. 1, commercial steel bar tonnage continues to decline, with a result that deliveries are steadily improving. This is also reflected in somewhat lesser degree in cold-drawn bars, on which there have recently been some minor revisions in quantity extras.

New York—Bar business has

shown some let-up since the first of the month, when the \$2 advance went into effect on commercial and cold-drawn carbon bars. This trend is regarded as natural in view of the protective covering last month.

Youngstown, O.—Mill managers are directing energies toward shaping deliveries of steel bars to satisfy impatient customers in instances. These largely are automotive part-makers who use forging bars, cold-drawn bars, etc. Consumers of alloy steel bars also are pressing for deliveries. Concrete reinforcing bar users are winding up the highway and building construction season and are taking everything in the way of bars that the mills can furnish.

Plates

Plate Prices, Page 64

Pittsburgh—The market is enlivened by numerous inquiries for standpipes, railroad car repair programs and to a certain extent, marine work. Producers of heavy plates have still before them backlogs of three to four weeks. Decision of the Baltimore & Ohio railroad to rebuild about 1000 box cars and 1000 locomotives at its various shops, most of which are close to the Pittsburgh district, will call for a tonnage of plates. For alterations to the Emsworth, Pa., lock and dam about 138 tons of wrought iron plates will be required, on which bids were opened Oct. 14, with American Bridge Co., Pittsburgh, low. Dravo Contracting Co. on Oct. 14 launched the 1200-ton government dredge JEWETT from its marineways at Pittsburgh. The plate market at 1.90c, f.o.b. Pittsburgh, holds unchanged.

Cleveland—While prices for plates remain firm and unchanged, an increase of \$3 a ton is expected by some, to be announced for first quarter. In view of the shortage of cars of some types, a considerable improvement in railroad buying is expected over the remainder of this year. Fabricators report backlogs ranging from three to four weeks, mainly due to difficulty in getting steel.

Chicago—Plates continue to move in heaviest tonnages to tank and structural fabricators and to railroad shops and freight car builders. New business recently for tank work has totaled several thousand tons and there is a fair amount of business in small lots for miscellaneous use. Bids have been taken on an all-steel, welded automobile ferry and ice breaker for the state of Michigan, involving 3000 tons of

plates and shapes. Some business has been placed for recent freight car orders, with additional tonnages for this purpose in prospect. Plate deliveries are improving, with shipments now ranging from two to four weeks.

Boston—Plate sales continue strong. Delivery has improved somewhat, especially on tank steel, but demand for the better grades of plates, notably the fire box grade, is keeping delivery time still three to four weeks. The first sale of plates to the textile industry for some time involved approximately 100 tons for reels for a mill at Attleboro, Mass.

Philadelphia—Plate demand continues sluggish, although prospects are somewhat improved by virtue of additional railroad equipment business, including five locomotives just placed with the Baldwin Locomotive Works by the Boston & Maine which also bought five from the Lima Locomotive Works at Lima, O. Moreover, the Baltimore & Ohio has a much larger list of equipment repairs under contemplation than recently indicated, for in addition to repairs to 100 locomotives work has been begun on a new car repair program. Steel has been placed for repairs to more than 300 and this is said to be only the beginning of a car repair schedule, which will include 10,000 cars. Steel for the Reading car building and repair program is still pending. The Pennsylvania railroad has postponed until Oct. 19 the opening of bids on one to three car floats previously noted as pending for delivery at Hoboken, N. J. Approximately 600 tons of hull steel will be required for each float.

Birmingham, Ala.—Orders for plate, though not in large tonnages, maintain steady production at high level. Some mills have been maintaining three shifts. Tanks, barges and other contracts recently received by fabricating shops here will call for much plate in the near future with some of the business to extend over into next year.

San Francisco—While over 34,000 tons of plates are pending, awards included only two projects in excess of 100 tons each. Western Pipe & Steel Co. secured 250 tons for a 42,000-bbl. tank for Vernon, Calif. The treasury department, San Francisco, has opened bids on 200 tons for a 36-inch welded steel pipe line to be delivered at Oakland, Calif.

Contracts Placed

400 tons, pontoons, United States engineer, Memphis, Tenn., to St. Louis Structural Steel Co., St. Louis.

250 tons, 42,000-bbl. tank for Vernon, Calif., to Western Pipe & Steel Co., San Francisco.

100 tons, textile mill reels, Attleboro, Mass., to unnamed interest.

Contracts Pending

2500 to 3000 tons steel, mostly plates and floor plates, for automobile ferry and ice breaker for Michigan state highway department for Straits of Mackinac; all-steel and all-welded; bids taken.

1500 tons, 10,200 feet, 48-inch steel pipe for Everett and Chelsea, Mass.; by Metropolitan district water supply commission, Boston; V. J. Grande, Roslindale, Mass., general contractor.

1000 tons, three car floats for Pennsylvania railroad, for delivery to Hoboken, N. J., bids postponed Oct. 13, to Oct. 19; in addition about 800 tons of shapes and bars; there is a possibility

that no more than one car float will be purchased at this time, in which event about 335 tons of plates and 265 tons of shapes and bars will be required.

200 tons, 36-inch welded steel pipe, treasury department, San Francisco, for delivery in Oakland, Calif.; bids opened.

138 tons, wrought iron plates, alterations to Emsworth, Pa., lock and dam; American Bridge Co. low bidder on Oct. 14 opening.

J. G. Kyle Co. has removed its concrete pipe manufacturing business from Cincinnati to Atlanta, Ga.

Sheets

Sheet Prices, Page 64

Pittsburgh — Even though new specifications for sheets so far in October have been less than in the same September period, sheet mills have such large backlogs that they are assured of satisfactory rolling schedules for at least six weeks. Shipments are gradually being completed on black sheets which were taken at the third quarter 2.50c, f.o.b. Pittsburgh market, and on which since the market has been advanced to 2.60c.

Cleveland—Miscellaneous demand for sheets has declined only slightly since the first of the month. This has been more noticeable in hot-rolled annealed, on which prices were advanced. In view of this the delivery situation has been eased somewhat, but backlogs still remain considerably extended. Some mills are filled up for the remainder of the year. Demand for galvanized sheets is most active, however, requirements for either enameling, stainless or electrical grades continue strong. Fabricators of alcohol drums have come into the market for sizable lots. Prices remain firm.

Chicago—Sheet deliveries to the automotive industry are retarded by delays of the volume producers to increase assemblies of new models. Shipments elsewhere are heavy and an increase in the total movement is anticipated shortly as automotive schedules increase. Mill backlogs continue heavy and extended deliveries still are required for most grades.

Boston—Sheet sales have slackened during the initial weeks of fourth quarter. Although at best sheet sales in this area are not heavy, relatively speaking, present demand is considered satisfactory.

New York—While sheet tonnage has held up far better than expected this month it is beginning to taper. Jobbers are specifying less freely and there is less pressure for sheets from the building trades. However, mill deliveries have shown little improvement.

Philadelphia — While a shade easier, sheet demand continues brisk, with consumers endeavoring to get on mill books in view of extended rolling schedules. The Pennsylvania state highway department will open bids Oct. 20 on 300 tons of automobile license tag stock. Edward G. Budd Mfg. Co. has purchased most of the several thousand tons of steel required for an order which it had booked several weeks ago for the General Motors Truck Corp. for major stampings for truck cabs. The steel is of light gage



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D E T R O I T

sheets, principally 20 gage stock.

Buffalo—Sheet mills here are operating practically at capacity and are heavily booked for the remainder of the quarter. There is excellent demand for both hot and cold-rolled strip and consumers are pressing for deliveries in many instances.

Youngstown, O.—Mills rolling sheets exclusively are so filled with specifications, with new business pressing also that schedules are falling further behind. Deliveries are being made under pressure in some instances that promise to become heavier toward November's opening. Mills that also roll tin mill black are under even heavier pressure for shipments since the average tin plate mills are consuming practically all their black plate product themselves, and can release little tonnage outside. Sheet mill backlogs now are becoming impressive.

Cincinnati—Buying of sheets continues to exceed capacity, lengthening delivery dates. Some interests announce six weeks are required for cold-rolled, four to five weeks on other grades. Specifications from automobile manufacturers are gradually becoming heavier.

St. Louis—Buying of sheets continues in substantial volume, with stove, household appliance, refrigerator and steel furniture interests relatively the largest buying groups. As has been the case for a considerable while, deliveries are the vital factor. Certain large consumers fearing a scarcity later on are placing orders for the requirements well into December.

Birmingham, Ala.—Fairly good demand is still met and sheet mills are keeping up a steady output. There has been no accumulation at mills.

Transportation

Track Material Prices, Page 65

Imminent need for increased equipment is bringing railroads into the market for rails, cars, locomotives and material for repairs to rolling stock. In the past week 86,237 tons of rails have been placed and indications are that several heavy tonnages are under consideration for fall ordering. Southern Pacific has bought 55,162 tons, the Southern railroad 23,000, Missouri Pacific 2000 and the Nashville, Chattanooga & St. Louis 6075 tons.

Subject to further approval the New York, New Haven & Hartford will probably inquire shortly for a few thousand tons of rail.

In addition to the 50 locomotives for which inquiry was made ten days ago by the New York Central the Wheeling & Lake Erie is inquir-

ing for ten, the Union Pacific for 20 and the Chicago, Milwaukee & St. Paul for 30. The Boston & Maine has placed ten locomotives with two builders.

Baltimore & Ohio, noted in a recent issue as planning to make repairs to 100 locomotives in four of its shops, has also started on an extensive car repair program, which, it is understood, will involve 10,000 cars. Steel has been recently purchased for 300 freight cars. Kennecott Copper Co. is inquiring for 240 ore cars.

The New York board of transportation contemplates the purchase of between 110 and 250 subway cars for the independent subway system, which is municipally operated. The board will hold a hearing Oct. 23 on terms of a purchase contract and once the terms have been decided upon a date will be set to receive bids. Later the board of estimate will be asked to authorize the purchase and the sinking fund commission to approve the issuance of the necessary bond.

Railmakers have extended the de-



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livery deadline from Dec. 31 to March 31 but no action apparently has been taken in extending the Oct. 31 deadline for orders at current prices.

Rail Orders Placed

Missouri Pacific, 2000 tons, 112-pound rails, to Carnegie-Illinois Steel Corp., Chicago.

Nashville, Chattanooga & St. Louis, 6075 tons 90 and 110-pound rails, to Tennessee Coal, Iron & Railroad Co.; accessories to same supplier.

Southern Pacific, 55,162 tons 112 and 131-pound rails; 29,123 tons to Columbia Steel Co., 16,348 tons to Bethlehem

Steel Co., 9691 tons to Colorado Fuel & Iron Co.; 11,000 tons tie plates to Columbia Steel Co., 1800 tons track spikes and bolts to Bethlehem Steel Co.

Southern, 23,000 tons 131-pound rails for first quarter delivery, to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.; accessories to same supplier.

Car Orders Placed

Seaboard Air Line, 10 de luxe coaches to Pullman-Standard Car Mfg. Co., Chicago; cost about \$500,000.

St. Louis Southwestern, 50 flat cars to American Car & Foundry Co., New York.

Locomotives Placed

Boston & Maine, 10, five passenger engines to the Baldwin Locomotive Works, Eddystone, Pa., and five freight locomotives to Lima Locomotive Works, Lima, O.

Car Orders Pending

Kennecott Copper Co., 240 ore cars, bids asked.

Western Pacific, 100 ballast, 50 freight cars; bids Nov. 2 at San Francisco.

Locomotives Pending

Chicago, Milwaukee, St. Paul & Pacific, 30 types 4-8-4-freight locomotives.

Union Pacific, 20 Passenger locomotives; bids asked.

Wheeling & Lake Erie, 10 freight locomotives; bids asked.

Pipe

Pipe Prices, Page 65

Pittsburgh—An order for 30,330 tons of 10-inch seamless line pipe has been placed by the Gulf Oil Corp., Pittsburgh, with National Tube Co. and Jones & Laughlin Steel Corp., both of Pittsburgh. National received approximately two-thirds of the order. The pipe, weighing about 40 pounds to the foot, will be used for the construction of 13 loops to the main oil line from Jenks, Okla., to Dublin, Ind., and aggregates 287 miles in length.

Cleveland—Demand for wrought pipe for industrial extension and repair work continues fairly active here. Jobbers stocks are normal, with little change in rate of turnover. Prices on standard pipe remain unchanged, however, an advance of 5 per cent went into effect Oct. 15 on cast iron fittings. Republic Steel Corp., Cleveland, recently received an order from Michigan-Toledo Pipe Line Co. for 550 tons of 6-inch pipe for shipment to Mt. Pleasant, Mich.

Chicago—Cast pipe shipments are fairly heavy and October deliveries are expected to be the largest in several months. Orders are fairly numerous, mainly for small lots. Prices are steady.

New York—The only activity, aside from small orders, in the cast pipe market last week came from the treasury department procurement division, New York city, which took bids Oct. 15 on 500 tons of 6, 8 and 12-inch sizes for various city projects.

The resale pipe market remains highly unsettled, although it is having little or no influence on the primary market. Commercial pipe tonnage while not as active as a month ago is coming out in fair volume. Little line pipe inquiry is noted.

Boston—Most of the cast pipe



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business is in carload lots, and no large projects are pending. The outstanding steel pipe project involves 1500 tons of 48-inch for the metropolitan district water supply commission, Boston, for which V. J. Grande, Roslindale, Mass., is general contractor.

Youngstown, O.—Steady inflow of moderate sized orders and releases on both butt weld and lap weld pipe continues to keep district well occupied. Seamless mills also are busy, largely on the smaller sizes; but no single large line pipe orders have been placed recently. Oil country goods demand continues satisfactory.

Birmingham, Ala.—While lettings are not so frequent, cast pipe shops are still keeping up a fairly steady pace in production, averaging three to five days per week. No large contracts are pending.

San Francisco—Improvement in demand for cast pipe is noted and a number of new projects are pending. Oakland Calif., will take bids Oct. 21 for 965 tons of 6 to 10-inch. Walnut Creek, Calif., has taken bids on 383 tons of 6 and 8-inch pipe.

Seattle—Demand for cast pipe shows no improvement. Few specifications are out and delays are numerous in plans for proposed projects. Willapa Valley, Wash., water district plans a \$69,000 water system. Nashua, Mont., has voted a \$50,000 bond issue for a sewer and water system involving cast pipe.

Cast Pipe Placed

- 540 tons, 4 to 6-inch, Garland, Utah, to unnamed interest.
- 255 tons, 6-inch, Ignacio, Colo., to unnamed interest.
- 255 tons, 6-inch, Indian service department, Albuquerque, N. Mex., to unnamed interest.

Steel Pipe Placed

- 30,300 tons, 10-inch seamless, Gulf Oil Corp., Pittsburgh, divided between Jones & Laughlin Steel Corp. and National Tube Co., both of Pittsburgh.
- 550 tons, 6-inch for Michigan-Toledo Pipe Line Co., to Republic Steel Corp., Cleveland.

Cast Pipe Pending

- 965 tons, 6 to 10-inch, East Bay municipal utility district, Oakland, Calif.; bids Oct. 21.
- 500 tons, treasury department, procurement division, New York; bids taken Oct. 15.
- 383 tons, 6 and 8-inch, Walnut Creek, Calif.; bids opened.
- 300 tons, Point Defiance improvement, Tacoma, Wash.; bids by state procurement officer, Seattle, soon.
- 150 tons, fittings, Chicago sanitary district; Hanley & Co., Chicago, low for general contract.
- 120 tons, 4 to 8-inch, Wild Cat Canyon project, Berkeley, Calif., for treasury department; bids opened.

Strip

Strip Prices, Page 65

Pittsburgh—Orders for strip steel in aggregate volume tended to level off somewhat last week after three to four weeks of progressive improvement previously. Many mills are still faced with problems of deliveries and backlogs awaiting rolling and are still probably at the heaviest point in six years. The market is quoted firmly at 1.95c, f.o.b. Pittsburgh, for hot-rolled strip and 2.60c, Pittsburgh or Cleveland,

base on strip coming off cold mills.

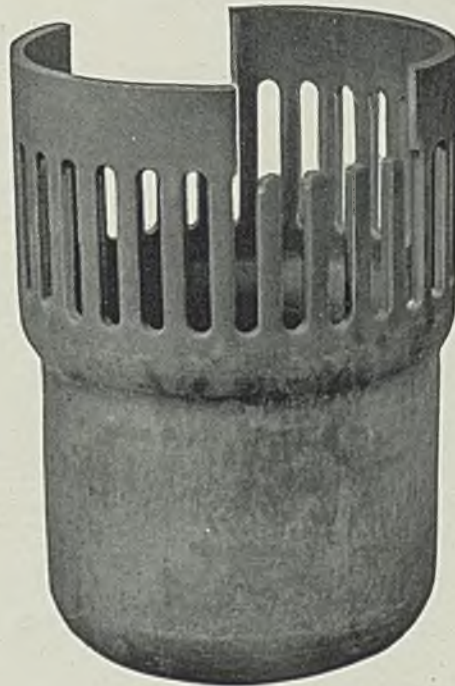
Cleveland—Strip producers report heavy backlogs. One mill is completely sold out for remainder of the year, on both hot and cold-rolled. New business continues active, except for high carbon cold-rolled, on which considerable speculative buying was reported before the advance. No large orders have been placed recently, but miscellaneous demand, particularly from electrical equipment manufacturers, has been encouraging.

Chicago—Strip demand is gaining gradually, partly as a result of

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increasing automotive needs. Shipments to motor car plants are increasing less rapidly than had been anticipated, but better schedules are in sight. Specifications from miscellaneous users show occasional gains. Producers are able to give delivery of about three weeks on hot-rolled strip, with shipments on cold-rolled material more extended in some instances.

Boston—Demand for strip has been maintained at a relatively high level. Buyers are desirous now of getting orders on books as protection against further delay

in shipment. Many manufacturers are in need of material for current requirements. Delivery generally ranges from a month upward.

New York—Narrow strip tonnage is in fair demand with deliveries of hot-rolled available in two weeks. Automobile accessory manufacturers are the main support of the market.

Philadelphia—Of all the leading flat-rolled products, narrow hot strip appears to be available for quickest shipment. Two weeks and even better, are being offered by some leading mills. Demand in the local

district remains spotty, but with prices unchanged at 1.95c, Pittsburgh, or 2.26c, Philadelphia. Cold strip is available at 2.60c, Pittsburgh, or 2.91c, Philadelphia.

Youngstown, O. — Automotive strip needs, both wide and narrow, continue to grow. Mills are under heavier pressure for deliveries and some complaints are being heard from customers that desired deliveries are falling behind.

Wire

Wire Prices, Page 65

Pittsburgh—New merchant price lists now state that joint or pool cars (minimum of 40,000 pounds) may be made up of orders from two or more purchasers to make a mixed carload for shipment to one destination and that each purchaser will stand the expense of delivering his material from the car at destination to his store. Formerly, joint and pool carloads had been differentiated to the extent that the former took a 10-cent extra over straight or mixed carloads and that pool cars were figured on a less-carload basing point price plus carload freight and stop-over charge. Apparently little test has developed since Oct. 1 on the new price of \$2.05, f.o.b. Pittsburgh or Cleveland, for standard wire nails, in view of the fact that shipments are still on the \$1.90 market which was in effect in September.

Cleveland—Delivery on some wire products have been extended eight to ten weeks. This is particularly true of nails on which there was a \$3 ton advance the first of the month; and on wire rods mainly because the wire mills themselves have been absorbing output of the rod mills. While most consumers have been estimating their needs further ahead, some buyers who have insisted in waiting to the last minute, now find themselves with the serious problem of getting deliveries soon enough to satisfy their requirements.

Boston—The volume of new business has fallen off considerably as buyers are taking delivery on the heavy tonnage booked before the price advance.

Chicago—Steel wire demand is increasing despite the higher prices which became effective Oct. 1. While some buying was stimulated last month consumers are interested in obtaining supplies as promptly as possible, due to continued active consumption. Jobbers accumulated little additional stock during the temporary period of lower prices, and inventories are not regarded as ex-

Behind the Scenes with STEEL

Forward, America!

RECOVERY is here and prosperity pauses on tiptoe before starting to swing it. Of this we are sure, from recent observations in Detroit. One of the most important yet little recognized indices of prosperity is the size and tenor of a crowd of excavation-watchers. This profession in late years has suffered severe blows, principally due to lack of excavations, but the turn has come. At extensive diggings for the new Greyhound bus terminal in Detroit the other day, the crowd of noon-day onlookers was both dense and enthusiastic. Their "ohs" and "ahs" spurred steam shovel operators to new heights (or should we say depths?) of dexterity.

From casual observation we would say the hole was most workmanlike, and we venture the opinion that the future building will be quite a thing.

Snapped Up

A READER in Indiana who renews his subscription cautions us to send copies to his home, because the "boys" down at his plant grab up the issues to read before our subscriber has a chance to get at them. He says he is going to try to take up a collection from the boys for another subscription, and that will eliminate the difficulty.

Data on Halfshell

HOT off the Penton presses is a new file of data sheets which give at a quick glance the complete picture of STEEL, from editorial, circulation and advertising angles. These sheets are the answer to prayers of advertising agency men and others who want to know a whole lot in a hurry about a publication. They represent the most recent *tour de force* of our sales promotion staff, and their efforts have been met with a chorus of "Yeah, man" from a broad and representative group of business paper students.

It is impossible to reproduce all comments but here are a few excerpts which may indicate the general tone: "Valuable for reference purposes. . . . Compliment you highly on the method. . . . Saves a lot of time. . . . Presentation ap-

peals to us. . . . Effective and efficient. . . . Concise and complete tabular data. . . . Well prepared and very useful. . . . Adequate and convincing. . . . Compliment you on the neatness and compactness. . . . The method of presenting basic information. . . . Very understandable and readable. . . . Will be used constantly for reference."

If you are not convinced, let us know and we will be glad to mail you a set of these data sheets which present volumes of specific information about STEEL in a few pages.

• • • •

Current Events Dept.

ONE hears plenty these days about taxes but, just as in Mark Twain's reference to the weather situation, nobody does anything about them. For example, a Chicago statistician, after many weeks of wrestling with pencils, calculators and statute books, reports the average American family pays 2700 hidden taxes daily. As Mr. Brisbane might say, that's a lot of taxes.

Everywhere, the tax collector is pictured as a giant ogre, intent on devouring the citizenry. Actually he is probably some harmless sort of fellow like Caspar Milquetoast who is merely obeying orders.

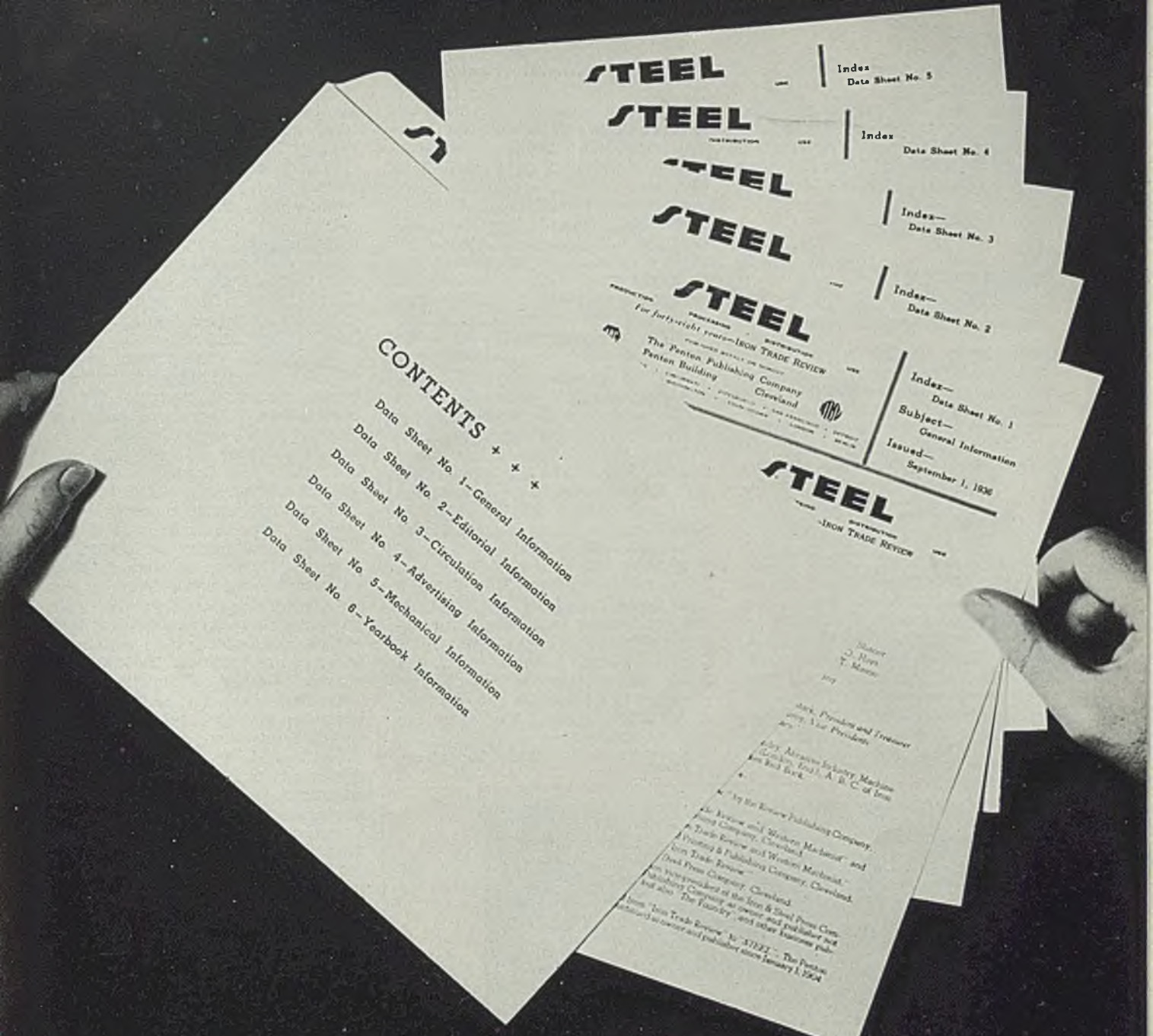
Human nature and party politics being what they are, we believe it's going to be a long while before any sensible attitude toward taxation will develop in this country. Meanwhile we will go on paying through the nose and complaining in private. But there we go philosophizing again.

As an interesting commentary on taxation, Louisiana recently commemorated the birthday of the late Kingfish Long. On the occasion every single government office closed its doors for the day, with one exception—the department of tax collection. Why, they reasoned, make poor Huey rest uneasily in his grave?

Harlem Touch

HEADLINE of the week: "Ah kin do some Truckin' wit dis heah MonoTractor!" — American Monorail Co. in STEEL for Oct. 5.

—SHADLI



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Data Sheet No. 1

Subject—
General Information

Issued—
September 1, 1936

STEEL
—IRON TRADE REVIEW

Editor
J. Ryan
T. Moore

President and Treasurer
J. Ryan

Editor, Abrasive Industry Machine
(London, Eng.), A. B. C. of Iron

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also "The Laundry" and other business pub-
lications.

Iron Trade Review No. 37222 - The Review
started to cover and published since January 1, 1924

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STEEL

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cessive. Manufacturers' wire demand has been aided by expanding automotive schedules. The market generally is steady at 2.55c, Chicago, for plain wire and \$2.10 for wire nails.

Shapes

Structural Shape Prices, Page 64

Pittsburgh—Leading among structural shape inquiries are 4300 tons for section 11 to the Sixth avenue subway, New York, 2650 tons for a municipal viaduct, Cincinnati, and 1000 tons for an apartment house in New York. Bids on the 2500-ton job for alterations to the Emsworth, Pa., lock and dam opened last week at Pittsburgh, finding American Bridge Co. low at \$715,800. Plain structural shapes are quoted firmly at 1.90c, f.o.b. Pittsburgh.

Cleveland—Structural fabricators are having considerable difficulty in meeting consumers requirements, due to the delivery situation in most mills. Orders requiring small tonnages continue active. The only large job let last week went to Fort Pitt Bridge Works, Pittsburgh, requiring 280 tons, for a sewage dis-

posal project, contract 91, that city. bids are due soon on both the Crawford and Huron county state highway bridges, totaling a little over 600 tons.

Chicago—Private construction is better represented in new structural inquiries, though practically all of these involve individual lots of less than 100 tons. Cranes pending for various users will take 2700 tons of structurals. Operations of fabricators are off moderately, but shipments of plain material generally are steady.

Boston—After a period in which public work was the only outlet for large individual tonnages, two new building projects have come to the fore. Albert Kahn Inc., New Center building, Detroit, is architect for the addition to the assembly plant for the Ford Motor Co. at Somerville, Mass. It is expected that bids will be called for soon. Plans for the Liberty Mutual building, Boston, said to call for 1200 tons of shapes, may be out for figuring within the next few weeks. Depending upon action of WPA and PWA officials, several large bridge projects, in addition to many smaller ones, may materialize before the first of the year.

New York—Demand for struc-

tural shapes, and new inquiries, have shown a noticeable decline during the past several weeks, a condition which became more pronounced last week. Lettings totaled slightly more than 600 tons. While public work continues to dominate both inquiries and lettings, fabricators find encouragement in the fact that a little more business is coming from private sources. The Triboro authority is preparing plans for a bridge at Whitestone.

Philadelphia—The placing of 1000 tons for the du Pont plant in Baton Rouge, La., and inquiries for approximately 1400 tons of additional Pennsylvania state bridge work, are outstanding in structural market here. This bridge work is in addition to more than 2000 tons for Pennsylvania state, on which bids recently opened, and to the contemplated toll bridge at Easton, requiring 4600 tons of shapes. Considerable school work is under contemplation for later in the year, including the proposed Central high school here, which, it is estimated, will require close to 5000 tons of shapes. Shapes are unchanged at 2.00c, Bethlehem, Pa., or 2.115c, Philadelphia; fabricated material prices continue unsettled.

San Francisco—Little or no improvement is noted in demand for structural steel shapes and awards aggregated less than 2000 tons, bringing the total for the year to 142,201 tons as compared with 96,237 tons for the corresponding period in 1935.

Seattle—There were no large awards this week but shops are generally busy and have numerous jobs in estimators' hands. At least one local plant is preparing to bid on the proposed navy floating drydock for Pearl Harbor, T. H.

Shape Contracts Placed

1500 tons, state bridge, Lewiston, Me., to Phoenix Bridge Co., Phoenixville, Pa.
 1200 tons, state highway bridge, Manhattan county, Kansas, to Kansas City Structural Steel Co., Kansas City, Mo.
 1000 tons, distillates plant for E. I. du Pont de Nemours & Co. Inc., Wilmington, Del., for construction at Baton Rouge, La., to the Virginia Bridge &

Shape Awards Compared

	Tons
Week ended Oct. 16.....	10,435
Week ended Oct. 9.....	20,455
Week ended Oct. 2.....	19,345
This week, 1935.....	16,100
Weekly average, 1935.....	17,081
Weekly average, 1936.....	22,304
Weekly average, September	19,999
Total to date, 1935.....	695,425
*Total to date, 1936.....	936,769

*Revised.



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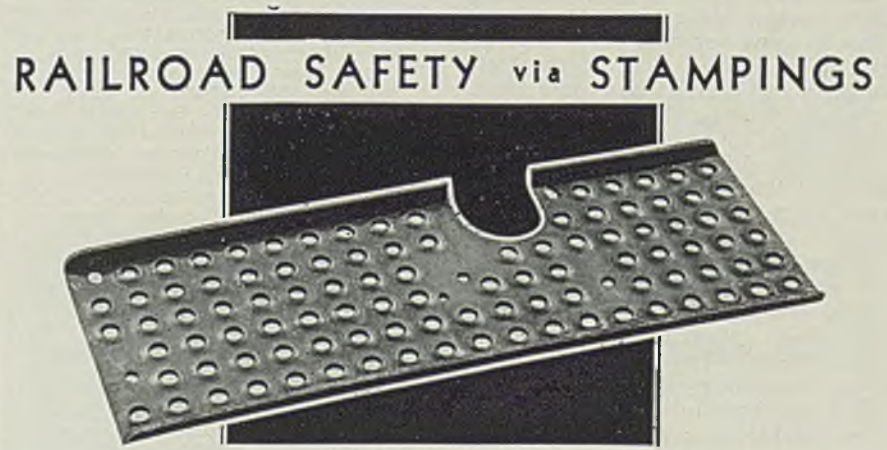
Iron Works, Roanoke, Va.
 550 tons, bridge, for Pennsylvania and Riverton railroads, South Amboy, N. J., to Bethlehem Steel Co., Bethlehem, Pa.
 530 tons, state highway bridge WPGM-10-C, North Platte, Nebr., to Omaha Steel Works, Omaha, Nebr.
 450 tons, Barbers Crossing and Neponset street bridges, Worcester, Mass., to Phoenix Bridge Co., Phoenixville, Pa.
 450 tons, state highway bridge, WPGM-2, Nebraska City, Nebr., to Omaha Steel Works, Omaha, Nebr.
 400 tons, 3-story factory, Continental Can Co. Inc. at Malden, Mass., to Joseph T. Ryerson & Son Inc., Chicago, through Austin Co., Cleveland.
 375 tons, overhead crossing, Thornton, W. Va., to American Bridge Co., Pittsburgh.
 325 tons, new police court building, Washington, for District of Columbia, to Fort Pitt Bridge Works, Pittsburgh.
 320 tons, temporary bridge, Westchester avenue, New York, to Bethlehem Steel Co., Bethlehem, Pa.
 310 tons, building for McKeesport Daily News, McKeesport, Pa., to Ingersoll Iron Works Co., Birmingham, Ala.
 310 tons, bridge No. 160-D, Stone county, Mississippi, to Nashville Bridge Co., Nashville, Tenn.
 280 tons, mill building, for Youngstown Sheet & Tube Co., Youngstown, O., to Fort Pitt Bridge Works, Pittsburgh.
 280 tons, sewage disposal, contract 91, Cleveland, to Fort Pitt Bridge Works, Pittsburgh.
 250 tons, high school, Dover, N. J., to Breen Iron Works, Newark, N. J.
 240 tons, railroad bridge WPGM-139-B, Coahoma county, Mississippi, to Bethlehem Steel Co., Bethlehem, Pa.
 235 tons, state highway bridge, Pulaski county, Missouri, to Stupp Bros. Bridge & Iron Works, St. Louis.
 225 tons, bridge over Baltimore & Ohio railroad and Raccoon creek, Newburg, W. Va., to Fort Pitt Bridge Works, Pittsburgh.
 220 tons, state highway garage and cottage, Cleveland, to Ingalls Iron Works Co., Birmingham, Ala.
 190 tons, N. Y. C. grade crossing elimination, Crittenden, N. Y., to Lackawanna Steel Construction Corp., Buffalo.
 180 tons, bridge for bureau of reclamation, specification 822-D, Yuma, Ariz., to unnamed interest.
 165 tons, boiler house, RCA-Victor Corp., Camden, N. J., to Belmont Iron Works Co., Eddystone, Pa.
 140 tons, paper mill, Sonoca Products Co., Garwood, N. J., to David Averill, Newark, N. J.
 110 tons, market house, Philadelphia, through S. H. Levin, to Morris Wheeler & Co., Philadelphia.
 100 tons, Great Falls, Mont., post office, to Isaacson Iron Works, Seattle; A. D. Belanger, Seattle, general contractor.
 100 tons, Pennsylvania state bridge in Lackawanna county, to Bethlehem Steel Co., Bethlehem, Pa.

1100 tons, steel piling, department of public works, Horace Harding boulevard bridge, Queens, N. Y.; Arthur A. Johnson Inc., New York, general contractor.
 1000 tons, apartment house, Riverside drive, New York.
 715 tons, state bridge, Chesterfield, N. H.; bids Oct. 22.
 700 tons, bridge, Deer Island, Me.; bids to be taken in November. Robinson & Steinman, consulting engineer.
 500 tons, arch bridge, Hurricane, Utah.
 500 tons, bridge, Warner-Sutton, N. H.; bids Oct. 22, Concord, N. H.
 500 tons, Connecticut river bridge, West Lebanon, N. H.—Hartford, Vt.; bids Oct. 22 at Concord, N. H.
 480 tons, bridge, Washington county, Utah, for state; bids Oct. 22.
 475 tons, bridge over Central Vermont tracks, Monson, Mass.; V. A. Gardetta, Ashley Falls, Mass., general contractor.
 450 tons, state highway bridge, Crawford county, Ohio; bids Oct. 20.
 448 tons, through truss bridge, Center-Clearfield counties, Pennsylvania; Rice & Weidman, Lancaster, Pa., low at \$107,690 in the Oct. 9 state letting. Included, 52 tons of plain steel bars.
 430 tons, railroad bridge over highway, Braintree, Mass.; bids soon.
 400 tons, store, Garden City, Long Island, N. Y., for Frederick Loeser & Co., Brooklyn, N. Y.; bids Oct. 19.
 400 tons, bridge over Pigeon creek, Crescent, Iowa, for Chicago & Northwestern railway.
 350 tons, state bridge No. 5365, East Grand Forks, Minn.
 350 tons, Fresno dam, Milk river project, Montana; bids to bureau of reclamation, Malta, Mont., Oct. 30.
 339 tons, two pony truss bridges, Indiana

county, Pennsylvania; Farris Engineering Co., Pittsburgh, low at \$98,919 in Oct. 9 state letting. Included, 57 tons of plain steel bars.
 328 tons, state bridge, Nashua river, Clinton, Mass.; Antonio Pendiscio, Fitchburg, Mass., general contractor.
 300 tons, hangar, Hartford, Conn., for Treasury department, procurement division; bids taken Oct. 21 at New Haven, Conn.
 293 tons, bridge, Durham—Lisbon, Me.; bids Oct. 21.
 288 tons, including piling, state project, Kittitas county, Washington; general contract to West Coast Construction Co., Seattle.
 250 tons, warehouse and storage buildings, A. C. Spark Plug Co., Flint, Mich.
 249 tons, steel sheet piling, repairs to bridge foundations, Bradford county, Pennsylvania; John H. Wickersham, Lancaster, Pa., low at \$38,935 in Oct. 9 state letting.
 220 tons, 2-story office building, Jersey City, N. J., for Wilmor Realty Co.
 220 tons, grade crossing elimination, Bellevue, O.; Freeman & Jones Inc., Cleveland, general contractor.
 200 tons, operating bridge for Tennessee Valley authority, Sheffield, Ala.
 194 tons, pony truss bridge, Cambria county, Pennsylvania; Altoona Construction Co., Bellwood, Pa., low at \$58,159 in Oct. 9 state letting. Included, 33 tons of plain steel bars.
 180 tons, bridge, Crookston, Minn.
 150 tons, apartment, Bronx, N. Y., for Joseph Sager syndicate; J. M. Felson, New York, architect.
 112 tons, Millbury-Sutton bridge, Mass.; New Haven Road Construction Co., New Haven, Conn., general contractor.

Shape Contracts Pending

4300 tons, section 11, Sixth avenue subway, New York.
 3000 tons, automobile ferry, including shapes and plates, state of Michigan; bids in.
 2650 tons, viaduct, Cincinnati.
 2500 tons, alterations to the Emsworth, Pa., lock and dam on Oh'io river: American Bridge Co., Pittsburgh, low on Oct. 14 bids to Pittsburgh federal engineers at \$815,800. Contract also includes 225 tons of steel castings, 200 tons of wrought iron plates and 33 tons of aluminum.
 1199 tons, crossing at Denver, for city; bids Oct. 20.



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100 tons, store, Sears Roebuck & Co., Lansing, Mich.
 100 tons, Fairgrounds bridge, Springfield, Vt.; O. W. Miller, Springfield, Mass., general contractor.
 100 tons, Shrewsbury bridge, Grafton, Mass.; bids Oct. 20 at Boston.
 100 tons, standpipe, Avington, Mass.; bids Oct. 22.
 100 tons, Pacific Electric Railroad Covina line bridge, United States engineer office, Los Angeles; bids Oct. 21.
 100 tons, three bridges, Routt county, Colorado, for state; bids Oct. 20.
 Unstated tonnage, carline station bridge, Charleston, R. I.; bids Oct. 22 at Providence, R. I.
 Unstated tonnage, addition to assembly plant, Ford Motor Co. at Somerville, Mass.; bids soon. Albert Kahn Inc., Detroit, architect.

Reinforcing

Reinforcing Bar Prices, Page 65

New York—With the exception of smaller bookings which are largely for bridges in New Jersey, the market was relatively quiet. The price situation was still somewhat easy, although no test on particularly large tonnages has been reported. New inquiries are fewer in number and total awards also are down.

Cleveland—Mills are operating close to 70 per cent, in an effort to cut down heavy backlogs. Little reinforcing tonnage for road repair work has been reported the last two weeks, but some believe this should show some improvement in the near future. Most of the tonnage in this district has come from miscellaneous sources. Prices remain firm.

Chicago—While new business has declined lately, bar distributors are in a position to continue heavy shipments for at least another 30 days. In some cases sellers have been forced to decline business because of inability to give early shipment. Deliveries generally are three to four weeks. Inquiries show but little slackening, though relatively small lots usually are involved. Orders for highway work in this and nearby states continue light. While prices are not rigidly held, the sold-out condition of some interests tends to stabilize quotations.

Boston—A grade crossing elimination award at Ashburnham, Mass., featured the market. A little more than 600 tons have come on the active pending list. Generally the demand has slackened and smaller jobs form the greater number of inquiries. The easy situation which prevailed on prices recently apparently has disappeared.

Philadelphia—Bar sellers report a sharp drop in government financed work, with the result that demand appears to be as slow as at any time this year. No awards of 100 tons or over have been reported

here during the past week. Prices are fairly steady in the absence of any test.

San Francisco—The reinforcing bar market is active and 3328 tons were placed. To date this year 204,028 tons have been booked, compared with 188,478 tons for the same period a year ago. The bureau of reclamation has awarded eleven projects located in California, Oregon, Washington, Arizona and Colorado involving 1234 tons.

Seattle—Demand for reinforcing materials continues active, the week's awards totaling 600 tons, taken by the Bethlehem Steel Co., Seattle. The local mill is also shipping heavy tonnages to the Bonneville dam under a contract awarded last year, totaling over 15,000 tons.

Reinforcing Steel Awards

645 tons, substructure, pier No. 19, San Francisco, to Soule Steel Co., San Francisco.
 450 tons, Bellingham, Wash., high school, to Bethlehem Steel Co., Seattle; Hendrickson-Alstrom Co., Seattle, general contractors.
 400 tons, warehouse and office for Coffin, Redington Co., San Francisco, to Truscon Steel Co., San Francisco.
 220 tons, grade crossing elimination, Ashburnham, Mass., to Concrete Steel Co., New York, through G. Rossie & Son, Leominster, Mass.
 196 tons, bureau of reclamation, invitation A-42,094-A, Laguna, Colo., to Colorado Fuel & Iron Co., Pueblo, Colo.
 178 tons, bureau of reclamation, invitation A-42,090-A, Laguna, Colo., to Carnegie-Illinois Steel Corp., Chicago.
 173 tons, bureau of reclamation, invitation A-42,088-A, Potholes, Calif., to Colorado Fuel & Iron Co., Pueblo, Colo.
 148 tons, bureau of reclamation, invitation A-42,084-A, Potholes, Calif., to Gulf States Steel Co., Birmingham, Ala.
 148 tons, bureau of reclamation, invitation A-42,089-A, Potholes, Calif., to Colorado Fuel & Iron Co., Pueblo, Colo.
 131 tons, bureau of reclamation, invitation A-42,086-A, Potholes, Calif., to unnamed interest.
 125 tons, addition to plant of Washington Co-Operative Egg association, Seattle, to Bethlehem Steel Co., Seattle; P. P. Gjarde, Seattle, general contractor.
 113 tons, highway work in Kittitas and Clallam counties, Washington, for state, to unnamed interests.
 100 tons, plant for American Celanese Corp., Cumberland, Md., to Bethlehem Steel Co., Bethlehem, Pa.

Concrete Awards Compared

	Tons
Week ended Oct. 16	3,002
Week ended Oct. 9	6,722
Week ended Oct. 2	3,258
This week, 1935	10,246
Weekly average, 1935	6,862
Weekly average, 1936	6,615
Weekly average, September	6,987
Total to date, 1935	291,922
Total to date, 1936	277,826

100 tons, bridges in Linn and in Wallowa counties, Oregon, for state, to unnamed interests.

Reinforcing Steel Pending

1750 tons, lining and roof for University Mound reservoir, San Francisco; bids advanced to Oct. 29.
 1370 tons, three Pennsylvania state highway bridges; bids to be opened Oct. 23. One bridge requiring 770 tons will be built in Butler county, and another involving 200 tons in Tioga county.
 865 tons, Fresno dam, Milk river project, Montana; bids by bureau of reclamation, Malta, Mont., Oct. 30.
 615 tons, substructure, pier No. 9, San Francisco; general contract to A. W. Kitchen, San Francisco.
 499 tons, crossing at Denver; bids Oct. 20.
 280 tons, Rockaway Beach boulevard, Queens, New York, for marine parkway authority; bids Oct. 30.
 266 tons, highway work in San Juan county, New Mexico; bids Oct. 21.
 230 tons, Boise project, Idaho, bids by bureau of reclamation, Ontario, Ore., Oct. 23.
 190 tons, oil storage tank, Chelsea, Mass., for Metropolitan Coal Co., Boston.
 169 tons, two bridges, Malden-Revere, Mass.; C. J. Maney Bros., Boston, general contractor.
 163 tons, bridge, Warrick, R. I.; bids taken Oct. 14.
 158 tons, highway work in San Diego county, California, for state; bids Oct. 29.
 129 tons, bridge, Delta county, Colorado, for state; bids Oct. 23.
 125 tons, for housing project at Evansville, Ind.; Ring Construction Co., Minneapolis, Iowa.
 120 tons, Washington state highway work, Kittitas county; F. G. Redmon, Yakima, Wash., general contractor.
 100 tons, state overpass, Boston & Albany railroad, Grafton, Mass.; bids Oct. 20.
 100 tons, crossing, Mountain Home county, Idaho, for state; bids Oct. 23.
 100 tons, highway work, Torrance county, New Mexico, for state; bids Oct. 21.

Cold Finished

Cold Finished Prices, Page 65

Pittsburgh—The recent drastic reductions of size extras on the smaller dimensions of cold-finished carbon steel rounds have affected only a minor percentage of tonnage. In turn, there have been no changes in extras on the more popular sizes of rounds, or in flats, squares or hexagons. However, it is felt that the establishment of the new quantity deduction bracket at 150 tons and over for single shipment of a single size is an inducement to larger buyers and also permits the cold-finished bar producers to set up steadier producing schedules. The present market of 2.35c, f.o.b. Pittsburgh, base for 10,000 to 19,999 pounds is meeting a test on present sales, which are, however, not up to the comparable September volume.

Pig Iron

Pig Iron Prices, Page 66

Pittsburgh—Water shipments of pig iron are increasing, due to the desire of some nonintegrated mills to build up inventories before the riverways are frozen over. A number of local repair jobs scheduled by the federal engineers for late this month and November may prove an early hindrance to water shipments.

Cleveland—The increasing possibility of a car shortage, has caused much concern among pig iron producers and consumers. Buyers continue to order well ahead because of the possible advance in prices for first quarter. Shipments during September were considerably more than in the similar period preceding third quarter. One large producer feels that shipments during October will exceed September by a comfortable margin. Majority of auto foundries have now resumed full operations.

Chicago—While pig iron sellers already have booked sufficient fourth quarter business to assure them of the heaviest shipments for any quarter this year, additional orders are in prospect. Some foundries underestimated requirements, while in a few cases additional buying is being done as a result of rumors of higher prices. Stocks of both consumers and producers are only moderate and the blowing in of additional blast furnaces during the next 60 days is not unlikely. Foundry schedules are increasing, due to heavier automotive demand, though jobbing plants also are busier. Prices are firm.

Boston—Although sales of pig iron during the first half of October have declined somewhat over the latter part of September, some foundries are buying larger stocks than previously in anticipation of an increase. Sellers generally are of the opinion that current purchases are not for price protection.

Philadelphia—Rumors of an increase of at least 50 cents a ton in domestic iron in the near future persist, with a result that consumers are ordering more freely. The possibility of an increase is strengthened by further increases in Royal Dutch pig iron within the past week, ranging from 50 cents to \$1 a ton and are in addition to the flat increase of \$1 a ton announced two weeks ago.

New York—An increase in domestic pig iron prices shortly is considered probable, with a shortage of iron likely this winter. Strengthening belief in likelihood of a domestic increase is the further advance within the past week in Royal Dutch

pig iron. Malleable has been increased \$1 and foundry grades 50 cents a ton. This is the first change since Holland devaluated her currency earlier in the month, the other increase, a flat advance of \$1 a ton on all grades, coming a day or so before the devaluation was made. Domestic sales over the past week appeared more lively, due in part to prospects of higher prices.

Buffalo—Buffalo furnaces are making large shipments of iron by barge canal and lake this month, estimating their movement for the period at 25,000 to 30,000 tons. Yard stocks at merchant establishments are being held at a minimum, as producers endeavor to move as much tonnage as possible by water before navigation ends. October shipments are likely to be the best of the year. Eleven blast furnaces are active, and another is being made ready.

Cincinnati—A buying movement has appeared in the pig iron market, based on the continued talk of a possible price advance this quarter. Many melters are covering for the remainder of the year, and some are entering contracts which include a carryover into 1937. Shipments are moderately heavier than last month.

St. Louis—Continued heavy consumption, talk of price advance and prospective heavy requirements for the late fall and winter have stimulated purchasing of pig iron. Purchasing so far this month has been at a higher rate than in September and sales are well diversified. Numerous small users who had covered for all 1936 requirements,

have ordered additional tonnages.

Birmingham, Ala.—A little tonnage of pig iron for delivery this quarter has been booked. Spot orders, however, continue the rule. Tennessee Coal, Iron & Railroad Co. blew in two Ensley furnaces making six active.

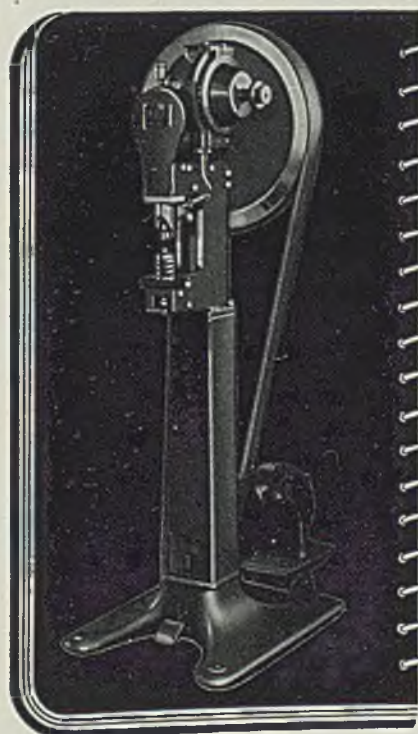
Toronto, Ont.—Demand for merchant pig iron continues to improve. Sales last week exceeded 1000 tons. Local blast furnace representatives state that orders for last quarter delivery have increased over earlier quarters this year, and inquiries are appearing for better tonnage than formerly. Prices are firm.

Scrap

Scrap Prices, Page 67

Pittsburgh—By contrast with a month ago, the local market through the past week has displayed a quiet tone as far as consumer interest is concerned. The fact, however, that mills are melting close to 13,000 tons of open-hearth scrap daily seems to present a strong case for continuation of strength. Although brokers show willingness to sell No. 1 steel into consumption at \$18, melters are not interested. The Pennsylvania railroad's recent list is understood to have brought around \$18.30 to \$18.40 on No. 1 steel, delivered.

Cleveland—Buying of No. 1 heavy steel scrap has become somewhat more difficult at prevailing quotations, but the inflow of materials continues steady. In adjoining dis-



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tricts there is some restriction on shipments to check demurrage. In the valley district there is considerable scrap on cars on plant side-tracks since mill storage yards are well filled. Meanwhile, scrap keeps on flowing into the Cleveland-Lorain district from upper lake ports via lake.

While trade sentiment at the moment is somewhat easier, quotations remain unchanged both in Cleveland and Youngstown markets.

Chicago—Scrap prices are steady, with the tone of the market generally continuing firm. The recent period of easiness has failed to weaken prices, and dealers are paying moderately higher figures in covering orders than a short time ago. Scrap is coming out in no more than sufficient volume to cover orders. Railroad offerings are light, few lists having appeared. Heavy melting steel nominally continues \$16.00 to \$16.50.

Boston—Demand from mills is easing, although supplies are not too plentiful. Demand is strongest for No. 2 steel. Two price changes, upward 25 cents a ton to \$7.00 flat for cast borings for chemical use, and the other downward 25 cents on stove plate to \$7.00 to \$7.25, were effective last week.

New York—The scrap market was comparatively quiet last week, with prices unchanged and demand showing no increase. The devaluation of the lira apparently has caused Italian buyers to postpone placing of new contracts.

Philadelphia—Steel scrap prices again are unchanged with the gen-

eral tone of the market easier. This is attributable chiefly to reduced requirements by some larger integrated mills, due to expanding use of hot metal and to sharp falling off of export demand. With respect to the former reason, it is said that the requirements of outside scrap at two large consuming units have in recent weeks declined fully 50 per cent, without any decline in the amount of steel ingots produced.

Buffalo—Strong demand for scrap is coming from dealers who have large contracts still to be filled in spite of lack of buying for several weeks. Minor reactions in other markets have placed local bids for material more nearly in line in outside producing centers and scrap is moving here in larger volume, especially by rail. It is claimed local steel works have bid \$16.50 or possibly a little more for railroad material, but have made no such offer to dealers. Low phosphorus grades, short steel rails and numerous other specialties continue to soar as dealers make purchases for shipment on orders. Melt continues heavy and early buying of many grades is anticipated.

Detroit—Heavy demand for water shipment of cast iron borings and mixed borings and turnings for Cleveland has caused brokers to advance their buying prices for local dock delivery and in frequent cases \$9.75 and \$10 have been paid. For local consumption, however, the last tonnage purchase was at \$9.50. In other grades, including heavy melting, hydraulic compressed and No. 2 steel, continued evidences of

strength are gathering ground and No. 1 steel and hydraulic compressed at \$14.50 to \$15 seem firmer than two weeks ago.

Cincinnati—Scrap prices are firmer with dealers holding materials tightly in anticipation of more active buying. Some business was done last week in neighboring centers, adding strength. A list of the Louisville & Nashville railroad included 6000 tons with a large proportion of No. 1 rails, sold for rerolling. Other bids confirmed quotations. Rejections are more frequent on No. 2 steel. Shipment of material by barge to up-river mills continues in fair volume.

St. Louis—Aside from the purchase of a fair-sized tonnage of heavy melting steel by a local mill buying of iron and steel scrap is negligible. The tonnage taken was for delivery over the next 60 days at current quotations, but slightly above the last previous purchase by this interest.

Seattle—Japanese buyers are again showing interest, some business having been placed. Exporters find that Oriental purchasers hesitate to meet c.i.f. prices, which have been raised, due to higher freight rates. Dealers are buying all available tonnages but because of continued mill and foundry buying on a considerable scale tidewater stocks are low. Prices are unchanged.

Toronto, Ont.—Iron and steel scrap dealers have revised buying prices. Local dealers state that the demand for scrap is active with most lines showing better volume.

Warehouse

Warehouse Prices, Page 68

New York—Contrary to conditions that have prevailed in previous years, sales of warehouse products have declined during the first two weeks of October, and sellers are of the opinion that the market does not display as much strength as it did about 60 days ago. Manufacturers of toys are ordering larger amounts of strip for stampings.

Cleveland—General warehouse requirements continue at the active pace set through September. Little variation in sales has been noticed, except in those items which mills have abnormally heavy backlogs. Jobbers' stocks are in much better condition than majority of consumers. Recent price advances, corresponding to mill increases, have met with little opposition.

Chicago—Warehouse sales have recovered in those sections where a moderate slump accompanied the application of higher prices Oct. 1. Total volume approximates that of



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September, with some additional improvement anticipated soon.

Boston—A steady volume of sales is noted with conditions more or less unchanged during the past three months, despite the recent price advance. Increased demand from machine shops has caused cold-finished steels to lead sales and structural shapes have also shown a slight improvement.

Philadelphia—October is proving one of the best months this year for local iron and steel distributors. The situation is unchanged with respect to base prices but is featured by revision in quantity differentials on bars to correspond with the mill revisions recently announced.

Detroit—Jobbers of finished steel products are finding business as good as during September and August.

Cincinnati—Sales from warehouse are being stimulated by slower mill deliveries. Needs of regular customers are expanding. Prices are firm and unchanged.

St. Louis—Iron and steel warehouse business so far this month has maintained the same average daily rate as in September. Demand is well diversified. A slight recession in demand for building materials, including shapes, is noted, but this has been more than offset by requirements of the general manufacturing trade, railroad and machine shops and the coal mining and oil industries.

Seattle—Warehouse business continues active, practically on a level with a month ago, and showing gains over last year. Heavy plates for shipyard work and boiler repairs are moving in good volume, and bars and sheets lead other out-of-stock items. Increased demand from private buyers is noticeable. Prices generally are steady.

Semifinished

Semifinished Prices, Page 65

Specifications appearing in the market for semifinished steels in the form of rerolling billets, sheet bars, blooms and slabs recorded a decrease last week. Total tonnage on specifications is still at a high level and gives evidence of little decline. In fact, unfilled bookings of sheet and tin plate producers are such that these finishing mills will be active takers of sheet bars for at least the balance of fourth quarter. Shipments against the former \$30 per ton, f.o.b. Pittsburgh, market on sheet bars, billets and slabs have about been completed and the next few weeks will see a test on the higher fourth-quarter market of \$32, Pittsburgh. In order to accommodate the former West Leechburg

Steel Co.'s demands for billets, Allegheny Steel Co. has placed in operation two open-hearth furnaces with a combined capacity of 7000 tons monthly that were part of the West Penn Steel Co. property acquired in 1929 and which had not been used in the interim.

Steel in Europe

Foreign Steel Prices, Page 68

London—(By Cable)—Steelworks in Great Britain in September made a new all-time record by producing 1,027,000 gross tons of steel ingots and castings. This compares with 872,700 tons in August. Setting new all-time steel production records started in March when 980,100 tons were turned out and in April a further peak was reached with 984,200 tons.

In spite of this high mark demand continues greater than domestic makers can meet and billet mills are sold to the end of the year. Increased imports of steel from the Continent are relieving the situation to some degree. Several domestic producers are out of the market and all steel-producing departments are operating at the fullest rate possible.

Pig iron production for September totals 650,800 gross tons, from 111 stacks, compared with 635,800 tons in August, from 109 stacks. This is not a record as several previous months have shown production of more than 660,000 tons. Pig iron supplies are being rationed to consumers and imports from Russia,

India and the Continent are easing the situation. Domestic contracts are being accepted at current prices to the end of March.

The Continent finds export trade is increasing. The French domestic market is reviving.

Both imports and exports of steel and iron products in Great Britain in September showed decided increase over those of August. Exports gained 17,123 tons, from 165,900 tons in August to 183,023 tons in September. Imports were 141,800 tons in August and 165,337 tons in September, a growth of 23,537 tons.

Iron Ore

Iron Ore Prices, Page 67

New York—Reflecting strong demand on the other side, as well as in this country, and increasing the ocean freight rates, chrome ore has been advanced. Turkish chrome ore, 52 per cent concentrates is now \$22.50 to \$23.00, c.i.f. gross ton; 48 to 49 per cent concentrates, \$19.50 to \$20; 48 to 49 per cent lump ore \$19.50 to \$20; and 45 per cent lump ore \$17.25 to \$17.75; and 44 per cent lump ore, \$16 to \$16.25.

Indian refractory chrome ore, 44 to 47 per cent has been increased to \$16.50 to \$17.50 and Transvaal, 45 per cent to \$17.50.

Ore prices in general are strong with further increases in iron ore expected to be announced shortly. An acute shortage developed on the other side, as a result of heavy consumption and the stoppage of sup-

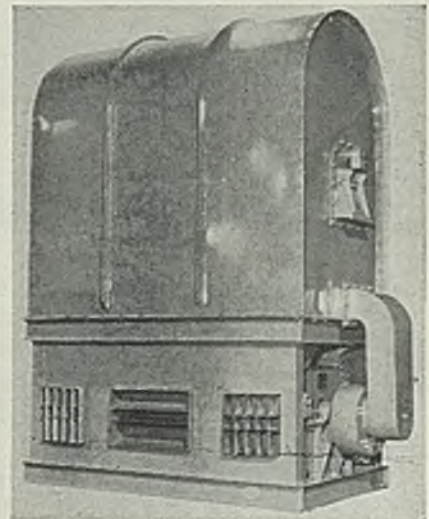
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plies from Spanish mines due to civil war in Spain.

Cleveland—Lake Superior Iron Ore association reports dock balances as of Oct. 1. amounting to 4,422,187 tons, compared with 4,956,828 on the same date last year. Receipts for the season to Oct. 1, at lower lake ports, were 22,909,888 tons, against 15,255,751 for the same period in 1935. Shipments to interior furnaces to Oct. 1, were 17,948,763 against 11,029,224 tons last year.

With the acquisition of the steamer G. G. BARNUM from the Tomlinson line, Cleveland-Cliffs fleet now stands at 23 ships.

John Geistman of Duluth recently acquired two more barges, the Geo. H. CORLISS and the MARTHA, from the Pittsburgh Steamship Co. This deal makes the second within a week Geistman has closed with the Pittsburgh company for the transfer of barges.

Tin Plate

Tin Plate Prices, Page 64

Pittsburgh—Tin plate orders for immediate consumption by canmakers have shown some decline in volume, but in their place has been the appearance of some sizable 1937 requirements from one or two leading canmakers. The latter type of business, which can be rolled at mills' late fall convenience, has therefore not added to immediate backlogs. The result has been that the delivery situation on tin plate for immediate consumption has been less acute. The market at \$5.25 per

base box, f.o.b. Pittsburgh, is quotably unchanged and no announcement has been made yet on the 1937 price.

New York — Anticipating still heavier demand some smaller independent canmakers are considering laying in stocks of tin plate for next year to avoid delivery complications. Such a development might tend to support sales during the normally lean winter season.

Bolts, Nuts and Rivets

Bolt, Nut, Rivet Prices, Page 65

Bolt and nut demand continues active with small gains in consumption. Requirements of farm implement manufacturers are broadening in some directions, while increased activity at railroad repair shops also is reflected in specifications. Needs of freight car builders are steady. Rivet demand from structural fabricators is slightly less active, but continues heavier than a year ago. Some irregularity still is noted in prices.

Metallurgical Coke

Coke Prices, Page 65

National Tube Co., Pittsburgh, is preparing to operate the last of its four by-product coke oven batteries at its Lorain, O., works. Each of the batteries is composed of 52 ovens and the fourth unit, which will likely be placed in operation in about a month, has not been used for a number of years. There are now few by-product ovens owned by steel producers in the mid-west which are

not operating, due to the fact that the heavy call for metallurgical coke continues, and that the domestic season on coke is now gaining headway. While a number of beehive coke oven units are being made ready for production, which will take place within the next few weeks, shipments of standard furnace grade are still exceptionally heavy. The beehive coke market of \$3.75 to \$4 a ton for standard furnace grade seems firm.

Foundry coke shipments at Chicago are increasing as additional plants increase operations. Gains are noted among jobbing foundries as well as producers of automotive castings. There are no surplus supplies of foundry coke.

Demand for domestic coke is increasing and production and shipments at all centers are being held practically at capacity to meet requirements. Prices are steady and firm.

Ferroalloys

Ferroalloy Prices, Page 66

New York—A heavy tonnage of ferromanganese continues to move into consumption. Some sellers report that shipments this month may be the largest so far this year. With further heavy steel production expected, ferromanganese sellers look for little falling off before December. Prices are strong at \$75, duty paid, Atlantic and Gulf ports. Domestic spiegeleisen, 19 to 21 per cent, is also moving actively at unchanged price of \$26, Palmerton, Pa., on quantities up to 50 tons and \$24 on lots of 50 tons and over.

Quicksilver

New York—The domestic quicksilver market is quiet and prices are unchanged with small lots of 15 to 25 flasks quoted nominally \$91 to \$92 per 76-pound flask. Sellers state lots of 15 to 25 flasks are not obtainable and report smaller lots of around five flasks are commanding as high as \$95 per flask. Supplies are none too large. Unconfirmed reports from abroad state that recent negotiations in Paris have resulted in a decision to end the quicksilver cartel, of which Italy and Spain were members.

Many Steel Types Imported

Arrival at Philadelphia of 249 tons of pig iron from British India and 142 tons of steel tubes from Sweden were included in iron and steel importations during the week ended Oct. 10. Other arrivals included 40 tons of ferromanganese



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and 10 tons of ferrochrome from Japan; 47 tons of structural shapes and 31 tons of diamond plates from Belgium; and 27 tons of cold-drawn steel wire, 24 tons of steel forgings, 29 tons of steel bars and eight tons of steel billets, all from Sweden.

Nonferrous Metals

Nonferrous Metal Prices, Page 66

New York — Last week brought the first rise in lead since the first weeks of the year, the leading seller quoting a \$1 a ton advance, but all interests did not immediately follow suit. This, together with gathering strength in foreign copper, prepared a bullish setting for September copper statistics, which showed a marked reduction in stocks. Buoyant sentiment followed and all the major metal markets except tin closed the week in an atmosphere of strength.

Copper — Buying continued at a steady pace and release of highly favorable September statistics failed to stampede consumers into hedging against an early price rise. Quotations were strong but opposing price policies of leading sellers obviated an advance. Prices abroad hit new highs for the past five years.

Lead — Active consumer interest continued to feature the market even after the \$1 a ton boost by the leading seller. All sellers booked heavy tonnages and a move upward on the part of those interests which did not immediately follow the lead in raising prices was regarded as imminent.

Zinc — Little fresh buying appeared for zinc and all prices held unchanged. Consumers generally are well covered on their immediate and early needs. Sellers still have considerable unfilled orders on their books.

Tin — Primarily reflecting continued delays in negotiations on re-

newal of tin output restrictions by the International Tin committee had a depressing effect on the tin market and Straits spot metal closed the week nearly a full cent lower than a week ago.

Equipment

Seattle — Dealers report demand well maintained despite the late season and inquiry indicates further buying. Public projects call for many items, especially motors and pumping units. Star Machinery Co., Seattle, will build a steel warehouse involving a crane and craneway.

Chicago—Requests for prices on machine tools are appearing from railroads in increasing number. While this information is being sought for budget-making purposes, the increased interest is taken to indicate the likelihood of an upturn in equipment buying by the carriers over coming months. Railroad shops have been more active this year than in any of the preceding several years and while machinery purchases have shown some improvement, additional buying will be necessary to permit a continuation of present operations. Machine tool inquiries elsewhere are well maintained, while orders are steady. Purchases are made up principally of small individual lots, with few large lists appearing. October sales are expected to approximate those of September. Allis-Chalmers Mfg. Co. has closed on several items for its Pittsburgh plant, with some tools still pending for the new Springfield, Ill., works. Small tool buying continues active.

American Steel Foundries, Chicago, has acquired Eastern Steel Castings Inc., Newark, N. J. The latter's plant which formerly was owned by the American Brake Shoe & Foundry Co., will continue to be operated.

McDowell, Chester-Twelfth building, Cleveland.

LIMA, O.—City plans improvements on waterworks to the extent of about \$3600. E. A. Smith is waterworks superintendent.

MARION, O.—Defiance Pressed Steel Co. has completed negotiations with the chamber of commerce for moving its factory to Marion.

MILLERSBURG, O. — Village plans to construct sewage disposal and treatment plant. Bond issue of \$34,000 will be submitted to voters at November election. Arnold, Rosch & Hartline, New Philadelphia, O., are consulting engineers.

NELSONVILLE, O. — City has completed plans for improving light plant and water works, including replacement

Construction and Enterprise

Ohio

BEDFORD, O. — City is having plans drawn for sewage disposal plant to cost \$247,000. PWA grant has been allocated. Consulting engineer is R. F. McDowell, Chester-Twelfth building, Cleveland.

COLDWATER, O. — Village plans to build sanitary sewer system. Bond issue of \$15,000 will be submitted to voters at November election. Burgess & Niple, 568 East Broad street, Columbus, O., are consulting engineers.

COLUMBUS, O.—City is taking bids

on installation of gas holder in sewage treatment works at an estimated cost of \$50,000. Bids are due at noon, Nov. 20.

HAMILTON, O. — City will remodel light plant at a cost of about \$50,000. Russell P. Price is city manager. Plans are now being prepared, will be ready for bids in about six weeks.

LAKEWOOD, O.—City plans to improve its sewage plant by construction involving digestion tanks, gas collecting equipment, dritter and chlorinating apparatus. Cost is estimated at about \$150,000. Consulting engineer is R. F.

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of boiler and addition of engine and generator unit. Cost of work will be \$80,000. B. M. Coakley, Nelsonville, is consulting engineer.

NEWTON FALLS, O.—Village plans new electric power plant and distribution system. Will advertise for bids Oct. 16. Dana M. Bailey Jr. is mayor. Cost will be about \$165,000.

NORWALK, O.—City plans extension to municipal light plant, including installation of 2500-kilowatt turbine, surface condenser, condensing pumps and other accessory equipment, total to cost \$100,000.

OSBORN, O.—Village voters approved bond issue of \$48,500 at special election Sept. 22, to be used as part of cost of construction of \$140,000 sewage disposal plant, rest of cost coming from PWA. A. M. Jones is mayor, F. J. Cellarius Engineering Co. engineer, 36 East First street, Dayton, O.

PAINESVILLE, O.—Ohio Rubber Co., in Willoughby, has started work on two new buildings to cost \$20,000.

PAINESVILLE, O.—City will expand municipal power plant by spending close to \$100,000 on new boiler, stoker, and auxiliary equipment.

PAINESVILLE, O.—Industrial Rayon Corp., West Ninety-eighth and Walford streets, Cleveland, has purchased a site for a \$7,500,000 manufacturing plant, to manufacture rayon yarn. Work will be started as soon as possible. H. B. Kline is vice-president in charge of plant operations.

PARKMAN, O.—City will build water supply and sewage disposal system. Miss LaVerna Hopkins is clerk in charge.

PORT CLINTON, O.—Village will take a referendum at November election on issuing \$219,000 in bonds for power plant and constructing or purchasing distribution system. Fred Slauterbeck is mayor.

SMITHVILLE, O.—Village plans construction of new waterworks plant to cost \$16,000, and voters will pass on the proposal at the November election. Mayor is H. M. Yoder.

TOLEDO, O.—City will improve water works at a cost of \$686,794.

Michigan

ALBION, MICH.—Malleable Iron Co. plant damaged by fire to the extent of \$1000.

BRECKENRIDGE, MICH.—Village has completed plans for \$40,000 waterworks system.

DETROIT — Buffalo Steel Corp., 7338 Woodward avenue, has been incorporated by Sol Edelman, 2250 South LaSalle Gardens, to buy and sell steel.

DETROIT — Guardian Sheet Steel Corp. has been incorporated by Carl Fidler, 3737 Boston boulevard, to wholesale sheet steel.

DETROIT — General Welding Co., 2030 West First street, has been incorporated by John S. Hakalow, 13725 LaSalle boulevard, to weld automobile parts.

GRAND HAVEN, MICH.—City has approved a proposed extension to the municipal power plant, including diesel-generator unit, at a cost of about \$175,000.

HIGHLAND PARK, MICH.—Herb Miller Inc., 12535 Woodward avenue, Highland Park, has been incorporated by Herbert R. Miller, Palmetto Hotel, Detroit, to engage in manufacturing.

PECK, MICH.—Plans for construction of \$30,000 village water system, have been completed by Francis Engineering Co., Saginaw, Mich.

PORT HURON, MICH. — Port Huron Brass Foundry Co., 326 Griswold street, has been incorporated by Irving Weiss, 1430 Nineteenth street, to conduct a general foundry.

SOUTH LYON, MICH.—City to start work on construction of sewer system and disposal plant before November 15. Cost is estimated at \$56,830.

Indiana

INDIANAPOLIS—P. R. Mallory & Co. Inc., makers of tungsten products, to

build plant addition at 3029 East Washington street at a cost of \$80,000.

PORTLAND, IND.—City has let general contract for power and light project to Yost Brothers, Decatur, Ill., on a bid of \$33,615.80.

Massachusetts

SPRINGFIELD, MASS.—Van Norman Machine Tool Co. will spend \$40,000 in equipping its new plant.

New York

GREECE, N. Y. — City will construct a disposal plant and sanitary sewer system at an estimated cost of \$1,110,000, for which a grant of \$499,500 has been made by WPA.

LOCKPORT, N. Y.—Simonds Saw & Steel Co., Ohio street, will ask bids soon for construction of a foundry costing \$37,500.

NEW YORK—Loyal Textile Presses Inc., 116 Nassau street, has been organized to conduct a machine shop.

NEW YORK—Metal Reduction Corp. has been organized, with Herman & Ernst, 122 East Forty-second street, correspondent.

OLEAN, N. Y.—Voters have approved proposed construction of sewage disposal plant to cost \$175,000. Engineer is Nussbaumer & Clarke Inc., 327 Franklin street, Buffalo.

POUGHKEEPSIE, N. Y.—Federal Bearing Co. plans to spend \$250,000 in expanding its plant. This will include considerable investment in new machinery. Herman A. Schatz is president.

WARSAW, N. Y.—Village rejected bids Sept. 18 for construction of \$32,000 filtration plant at waterworks. Engineer is S. E. Preble, care of Industrial Planning Corp., Delaware avenue, Buffalo, N. Y.

TONAWANDA, N. Y. — Linde Air Products Co., 30 East Forty-second street, New York, maker of scientific chemical products, has started work on its new \$1,000,000 factory building. John W. Cowper Inc., is contractor; F. Lee Rodgers, 28 Beard avenue, is local manager.

New Jersey

BAYONNE, N. J.—Tide Water Oil Co. 17 Battery place, New York, will let contracts soon for construction of a propane-butane rectification plant at Bayonne. Liquefied gas will be produced. Cost is estimated at \$45,000.

CAMDEN, N. J.—City board of freeholders plans extension in power plant at county institutions at Lakeland, N. J. The work will include a new boiler, stokers, and auxiliary equipment. Cost is estimated at about \$276,000.

CLIFTON, N. J. — Joseph P. Hamill Inc. is considering rebuilding silk mill which was recently destroyed by fire.

KEARNY, N. J.—Du Pont Viscoloid Co., subsidiary of E. I. du Pont de Nemours, 1007 Market street, Wilmington, Del., will alter a large section of its Forest street plant in Kearny for the production of Pontalite, a new plastic.

NEWARK, N. J.—Faitoute Iron & Metal Co., 182 Frelinghuysen avenue, N. W. Faitoute president, plans erection of additional buildings at foot of Clifton street.

SAYREVILLE, N. J.—City has asked for bids on \$178,727 sewage disposal

(Please turn to Page 86)

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(Continued from Page 84)

plant to be submitted by Oct. 21. L. P. Booz, 263 Madison street, Perth Amboy, N. J., is engineer.

TRENTON, N. J. — City plans construction of new waterworks to cost \$175,596. City engineer is M. Banks, City hall.

Pennsylvania

CONSHOHOCKEN, PA. — Borough will build a sewage system and disposal plant estimated to cost \$647,900. Remington & Goff, 509 Cooper street, Camden, N. J., are engineers.

JACKSON CENTER, PA. — Domestic Fuel Co., Sharon, plans rebuilding coal tiple and plant at Jackson Center. Fire recently destroyed the previous tiple. A power plant and engine house will be constructed in connection with the new unit, and new transmission and conveying equipment will be installed. Cost will be \$50,000.

PHILADELPHIA — E. I. du Pont de Nemours & Co., Thirty-fifth street and Grays Ferry road, plans installation of motors and controls, conveyors, and other handling equipment in new multi-story addition to local Harrison works. Cost will be close to \$200,000.

READING, PA.—Willson Products Inc., care of C. B. Smart & Co., 80 Broad street, New York, plans improving and equipping plant at a cost of \$40,000.

TITUSVILLE, PA.—Rainey-Petler Co., A. E. Rainey general manager, H & B building, plans building plant addition to cost \$37,000.

TITUSVILLE, PA. — Cyclops Steel Co. will start immediately to construct two new buildings, one to house annealing furnaces and the other to contain grinding machines. Dr. Charles G. Evans is president.

Alabama

BIRMINGHAM, ALA. — Republic Steel Corp., Cleveland, will improve the ventilating system in its Sayreton coal mine, located near Birmingham, to the extent

of \$100,000. W. H. Oldham is district manager.

Delaware

WILMINGTON, DEL.—E. I. duPont de Nemours & Co. will build a power house for its Niagara Falls, N. Y., chemical works.

Maryland

BALTIMORE, MD.—Owens-Illinois Can Co. has let contract for a building at 2901 Boston street to Lee Paschall, 122 North Elghth street, Richmond, Va. Francisco & Jacobus, 511 Fifth avenue, New York, are engineers. Cost is estimated at \$300,000.

District of Columbia

WASHINGTON — Bureau of supplies and accounts, navy department, will receive bids until Oct. 23 for two electric arc welding sets, gasoline engine driven, schedule 9016, for delivery Key West, Fla.; miscellaneous electrically operated valves, schedule 9024, for delivery Philadelphia; miscellaneous corrosion-resisting steel sheets, plates, strips, bars and angles, schedule 9031, for delivery Brooklyn, N. Y., and Philadelphia; nine motor-driven, bench type lathes, for delivery Sewall's Point, Va., schedule 9030; four motor driven, geared drills, schedule 9041, for delivery Portsmouth, Va.; one motor driven, water cooled, five roll mill machine, schedule 9048, for delivery Mare Island, Calif.; one tenoner, motor driven, schedule 9051, for delivery Portsmouth, Va. The bureau will take bids until Oct. 27 for one electric core oven, schedule 9049 for delivery San Diego, Calif.; one heavy duty, motor driven engine lathe, schedule 9050, for delivery Portsmouth, N. H.; miscellaneous turbine driven pumps and spare parts, schedule 9054, for delivery various east and west coast points; and one water tube type boiler, schedule 9056, for delivery Sewall's Point, Va.

Florida

LAKELAND, FLA. — City receives bids

Oct. 26 for construction of extensions for water and electric system; \$38,000 available. Charles Larsen is city manager.

TAMPA, FLA.—American Can Co., New York Central building, New York, will conduct steel loading platform as addition to its plant at Twenty-second street and First avenue.

Georgia

BREMEN, GA.—City, board of commissioners, will soon call for bids on \$40,000 water works project. Wiedeman & Singleton, Candler building, Atlanta, Ga., are engineers.

SAVANNAH, GA.—Southern Cotton Oil Co. plans erection of 120-foot addition to car repair plant, and storage tank of 10,000-barrel capacity.

SAVANNAH, GA.—Steel Products Co., maker of trailers and tank cars, proposes to erect additions to shops on Lathrop avenue.

Kentucky

BRADFORDSVILLE, KY.—City has loan to build waterworks.

LOUISVILLE, KY.—Louisville Gas & Electric Co. to spend \$1,800,000 for new steam and electrical equipment at Canal station.

LOUISVILLE, KY.—American Air Filter Co., 215 Central avenue, will construct a one-story building, 90 x 117 feet, of steel and glass, at a cost of \$30,000. Austin Co., Cleveland, is general contractor.

OWENTON, KY.—Town is planning municipal power plant to cost about \$75,000. Work will begin soon.

Louisiana

ABITA SPRINGS, LA. — Town is having specifications prepared for sewer system and water works. For this project, \$50,000 bonds were voted and application made to PWA for supplemental funds. James M. Fourmy, Hammond, La., is engineer.

BATON ROUGE, LA. — City plans to make additions to water works with the aid of PWA loan and grant of \$362,000.

BERWICK, LA. — Town has applied for loan and grant for water works. T. F. Kramer, Franklin, La., is engineer.

JACKSON, LA. — City will soon begin work on the water works; \$41,000 is available.

NEW ORLEANS—City plans electric-operated auxiliary pumping plant. A fund of \$200,000 has been made available through Federal aid.

RINGGOLD, LA. — City will construct water works; \$39,000 available.

ST. JOSEPH, LA. — City will soon begin construction of water works with \$6700 funds available.

Mississippi

COLUMBIA, MISS.—City, chamber of commerce, Andy Evans, chairman special committee, will arrange for erecting addition to Reliance Manufacturing Co. garment plant at a cost of \$50,000.

CORINTH, MISS.—City to construct \$45,000 sewage treatment plant, including pumping station.

PASS CHRISTIAN, MISS.—City to take bids for motor-driven pumping machinery and 500,000-gallon tank with tower. Fund of \$60,000 arranged.

(Please turn to Page 88)

★
★

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Its 600 guest rooms, all newly furnished and decorated outside rooms with private bath and circulating ice water, are famous for their comfort and economy. Room rates begin at \$2.50.

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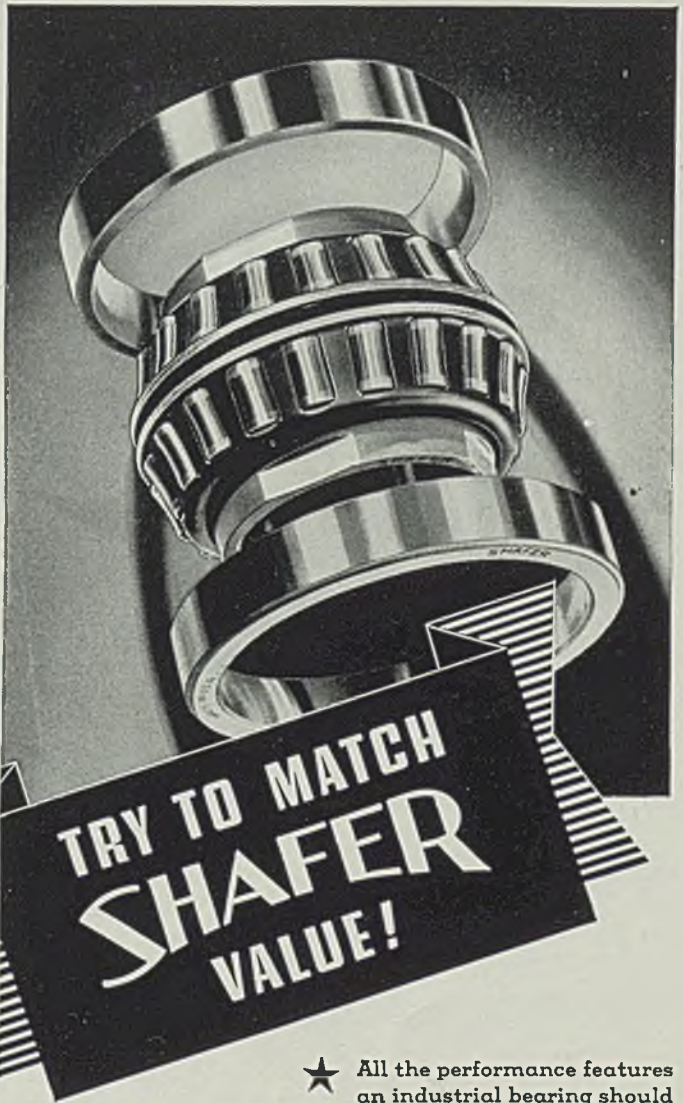
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(Concluded from Page 66)

North Carolina

CORNELIUS, N. C.—Town to construct \$38,181 waterworks system.

HIGH POINT, N. C.—City's Smith mountain project grant requests approved by PWA. This grant will supply 45 per cent of the \$6,000,000 needed.

South Carolina

GREENWOOD, S. C.—City to erect 300,000-gallon water tank at a cost of \$26,363.

Tennessee

CLARKSVILLE, TENN. — City voted \$250,000 bonds to buy or build municipal distribution system to handle either TVA or other power.

MEMPHIS, TENN. — City is planning to construct a municipal electric power distribution system. A public works grant of \$3,092,000 has been approved.

Missouri

KANSAS CITY, MO. — Jackson county water district No. 1 will make improvements in water distribution system including erection of booster pumping station at Kansas City limits, and installation of 250,000-gallon elevated tank in south central part of the district.

ST. LOUIS — St. Louis Independent Packing Co. is receiving revised bids for packing plant alterations at a cost of \$500,000.

ST. LOUIS—Geo. Flori Machine Co., Thirteenth and Linden streets, to build machine shop at 1601 Delmar. Baervelt & Honig Construction Co., 624 Wainwright building, is contractor; Albert Meyer, 4108A Fairgrounds place, is architect.

Arkansas

MAMMOTH SPRINGS, ARK. — City has PWA loan of \$20,000 and grant of \$16,364 for construction of water works.

Texas

BAY CITY, TEX. — City plans to build diesel generating station consisting of three engines, direct connected to three generators. Project will cost \$225,000.

Wisconsin

FOND DU LAC, WIS.—City will take bids soon on a pumping plant and sewage system at Grove and Seymour streets. Page Johnson is city engineer.

MILWAUKEE—Grob Bros., makers of filing machinery, will move into a plant near Grafton, Wis., where it will install new machinery.

Minnesota

HOPKINS, MINN.—Minneapolis-Moline Power Equipment Co. has work under way on new boiler plant at branch works here, which will include installation of three boiler units, stokers, and feed water heaters. Cost will be about \$125,000.

JORDAN, MINN.—Minnesota Utilities Co. will make extensions in its power plant, including new steam turbine-generator unit and auxiliary equipment.

Iowa

FORT DODGE, IOWA — City will build

a disposal plant estimated to cost \$420,000. A grant of \$189,000 has been made by WPA for this project.

Nebraska

BEEMER, NEBR.—City plans construction of 401 miles of transmission lines. REA to supply \$426,213. O. R. Toman, Lincoln, Nebr., is consulting engineer.

HASTINGS, NEBR.—City to construct 853 miles of transmission lines at an approximate cost of \$1,045,452. O. R. Toman, Lincoln, Nebr., is consulting engineer.

McCOOK, NEBR.—City will build \$60,000 sewage disposal plant with aid of PWA allotment. H. A. Davis, Crete, Nebr., is consulting engineer.

NORFOLK, NEBR.—Knox county commissioners, John D. Forsyth, Niobrara, chairman, are planning an irrigation and power project on the Niobrara river. The cost will be about \$1,400,000.

RED CLOUD, NEBR.—City plans construction of three power plants at three proposed reservoirs at an approximate cost of \$1,499,000. C. E. Mickey, Lincoln, Nebr., is consulting engineer.

WAYNE, NEBR.—Graham Ice Cream Co., H. B. Graham head, plans to construct a one-story addition to its refrigerating plant at a cost of \$35,000.

WOLBACH, NEBR.—City to construct sewage disposal plant costing approximately \$32,727. H. A. Davis, Crete, Nebr., is consulting engineer.

Colorado

BOULDER, COLO.—University of Colorado, board of trustees, is planning an electrically operated water system at a cost of \$57,000.

Montana

MALTA, MONT. — Reclamation bureau has called for bids Oct. 30, for Fresno dam, Milk river project, involving placement of 865 tons reinforcing, 5800 feet C. M. pipe, 3½ tons sheet piling, 57½ tons tunnel liner plates, 286 tons metal work, metal conduits, sealing strips, etc. Materials will be furnished by the government.

NASHUA, MONT. — Voters have approved \$50,000 bond issue for proposed sewer and water system. Plans are by J. W. Hall, Great Falls, Mont.

Nevada

LAS VEGAS, NEV.—City to build a municipal power system at a projected cost of \$250,000. PWA has approved a \$112,000 grant.

WINNEMUCA, NEV.—City common council is maturing plans for constructing a municipal power plant at a proposed cost of \$120,000.

Utah

GARFIELD, UTAH—American Smelting and Refining Co., 120 Broadway, New York, plans to enlarge and equip its power house here at a cost of about \$300,000.

Pacific Coast

LOS ANGELES—Timken-Detroit Axle Co., Detroit, is negotiating for a site for a manufacturing plant.

LOS ANGELES—Texas Oil Co. to build 16 storage tanks at berths 216 and 217 in the harbor, at a cost of \$43,000.

LOS ANGELES—Gay Engineering Co.,

2650 Santa Fe avenue, has begun work on a factory building at Eleventh and Soto streets, at a scheduled cost of \$50,000. Engineer is W. E. Chadwick, 321 Union League building.

LOS ANGELES—Bendix Aviation Corp., 108 West Adams street, Chicago, to build automotive and airplane products factory, according to a recent announcement by Vincent Bendix, president.

LOS ANGELES — Flintkote Co., 100 East Forty-second street, New York, manufacturer of asphalt shingles and roofing products will spend \$1,000,000 for erection of a felt and box board mill. I. J. Harvey is president.

MONROVIA, CALIF.—Day & Night Water Heater Co. is planning an addition to its factory building at Duarte street and Shamrock avenue. Plans prepared by Herbert A. Hamm, 579 North Holliston avenue, at estimated cost of \$18,000.

OAKLAND, CALIF.—Ferro Enamelling Co., 1100 Fifty-seventh avenue, plans to construct a one-story factory building at a cost of \$6500. F. A. Muller, 1416 Jefferson street, Oakland, is contractor.

OAKLAND, CALIF.—Fisher Body Corp. will build a steel addition to its factory at 7201 Hillside street, costing \$20,000. Dinwiddie Construction Co., 210 Crocker building, San Francisco, is contractor.

SAN FRANCISCO—Federated Metals Corp., 201 First street, is planning alterations in its metal plant at a cost of approximately \$10,000 and is securing preliminary estimates. Victor B. Seidel, 500 Howard street, is engineer.

SAN FRANCISCO—General Brewing Corp., 2601 Newhall street, will build a plant costing \$60,000. Cahill Bros., 206 Sansome street, is contractor; Fred H. Meyer, Kohl building, is architect; C. H. Snyder, 251 Kearny street, is engineer.

SPOKANE—City is proposing \$300,000 South Side project which will include construction of three water pumping plants and connecting pipe lines. In two of these plants will be three 900-horsepower vertical pumping units each; in the third, two 600-horsepower units. PWA assistance will be applied for.

SPOKANE — Polaris Mining Co., plans construction of \$100,000 plant on its Coeur D'Alene properties; also a \$300,000 ore treatment plant on its Star mine property. Plans are by W. L. Ziegler, Spokane.

EVERETT, WASH.—Everett Pulp Mill, Leo S. Burdon manager, plans additions costing \$2,000,000. Austin Co., Dexter Horton building, Seattle, is contractor.

OLYMPIA, WASH. — Washington Vencer Co. is building a new power house, replacing equipment.

SEATTLE — Blghorn Trailer Co. Inc., 220 Aurora, has been formed by W. E. DeMille to build automobile trailers.

SEATTLE — Acme Boiler & Tank Co. has opened a plant at 1124 Elliott avenue.

SEATTLE—Boeing Airplane Co. will complete expansion of its plant soon by spending \$1,000,000 for new buildings and equipment.

SEATTLE — General Petroleum Co., Seattle, plans to build a \$120,000 storage tank and warehouse on Harbor Island.

SEATTLE — Star Machinery Co. will build a steel frame warehouse, 170 x 85 feet, equipped with ten-ton crane and craneway, at First avenue South, and Hinds street.

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Pinch-Hitter of the Shop

THERE are lots of jobs calling for a tool steel that stands up under the most relentless battering—that resists the repeated shocks and impacts of use in pneumatic hammers, chisels, rivet sets, rivet busters and similar tools. Bethlehem Omega Tool Steel is supreme in this field of service.

The stamina and shock-resistance of Bethlehem Omega are tremendous. Through heat treatment, Omega can develop the unusually high tensile strength of 340,000 pounds per square inch with an unnotched-charpy value of 121 foot pounds. A slightly higher drawing

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In heat treatment, Bethlehem Omega Tool Steel responds to a wider temperature range than carbon tool steels, making it unusually well adapted to field use. No expensive heat-treatment equipment is needed. Omega forges readily between 1850 and 1950 deg. F.

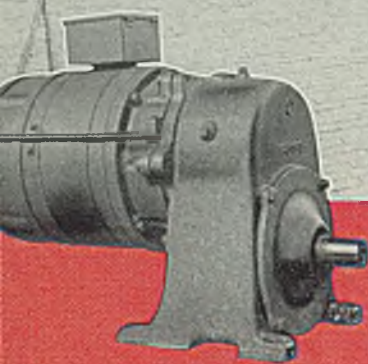
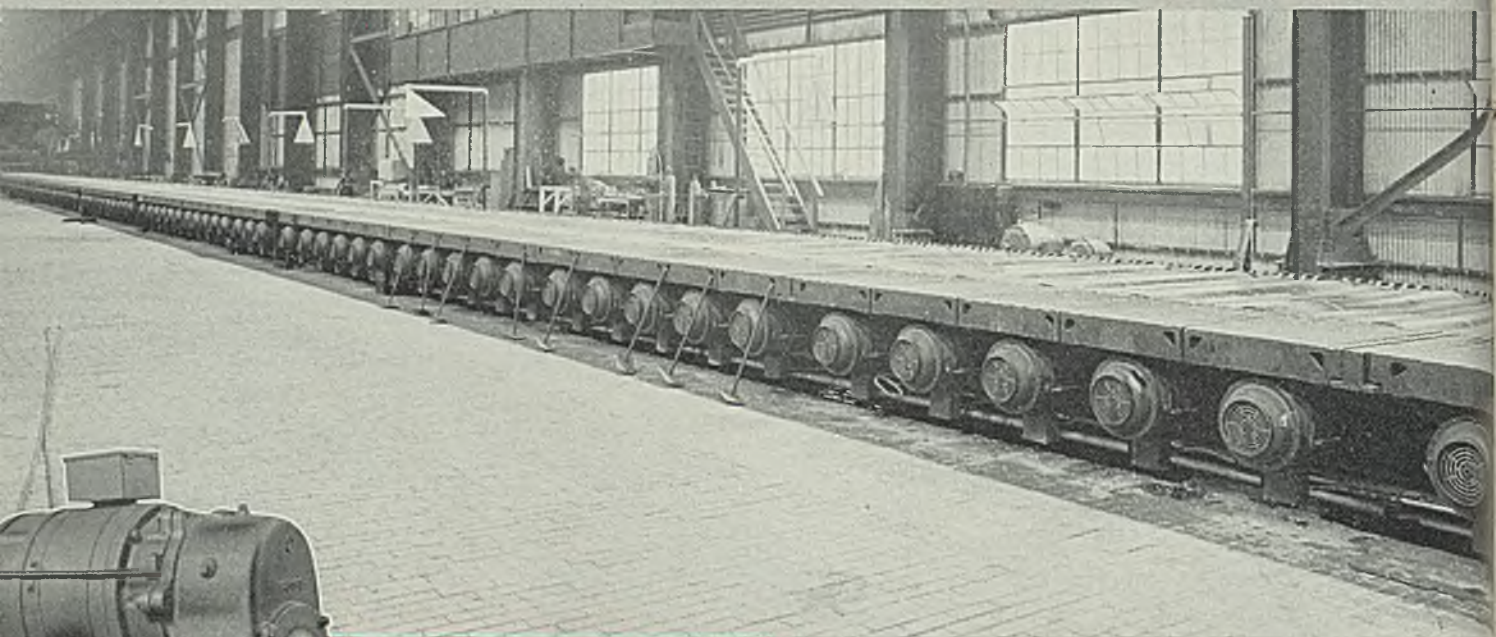
Other shop tasks are handled with equal efficiency by other Bethlehem Tool Steels, each of which is unsurpassed in its particular field of service.

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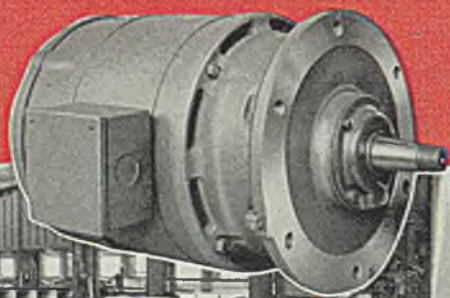


RELIANCE MOTORS



Reliance Gearmotor for inverted mounting to run-out table rollers. Squirrel-cage, enclosed fan-cooled motor unit. To stand the severity of the service these gearmotors are constructed with cast-steel gear cases, heat-treated gears with unusually wide faces, special alloy steel shafts.

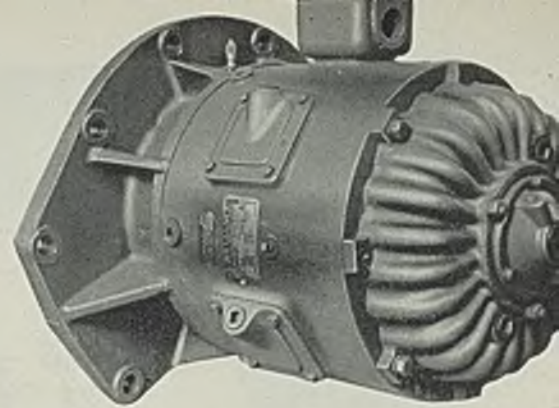
Run-out tables for conveying strip from the mill to the coilers. Rollers are individually driven by enclosed, fan-cooled Reliance Gearmotors with a 3:33:1 ratio. These gearmotors operate on an adjustable frequency and voltage to provide table speeds over a 2:1 range. Quick stopping is obtained by direct-current braking.



AFTER strip leaves the last finishing stand of the continuous mill, there is still important work to be done—hard work requiring rugged power units instantly responsive to changing needs. On run-out tables and coilers in the Great Lakes Steel Corporation Mill, Reliance Motors are doing these hard jobs. Reliance Engineers have made it their business to find out how these units can be designed, built, applied and controlled to best fit in with the ideas of the mill builders and the men who are responsible for producing the finished strip. It's a cooperative job and we have a background of experience which has prepared us for performing our part effectively. Why not write us?



Run-out table between coilers and gate shear. The squirrel-cage, enclosed fan-cooled Type "AA" Motors have special torque characteristics and are flange mounted. Each motor drives two rollers. When strip is moving, drive the rollers as indicated.



Water-cooled Squirrel-cage Motor specially designed for direct connection to coiler rolls.

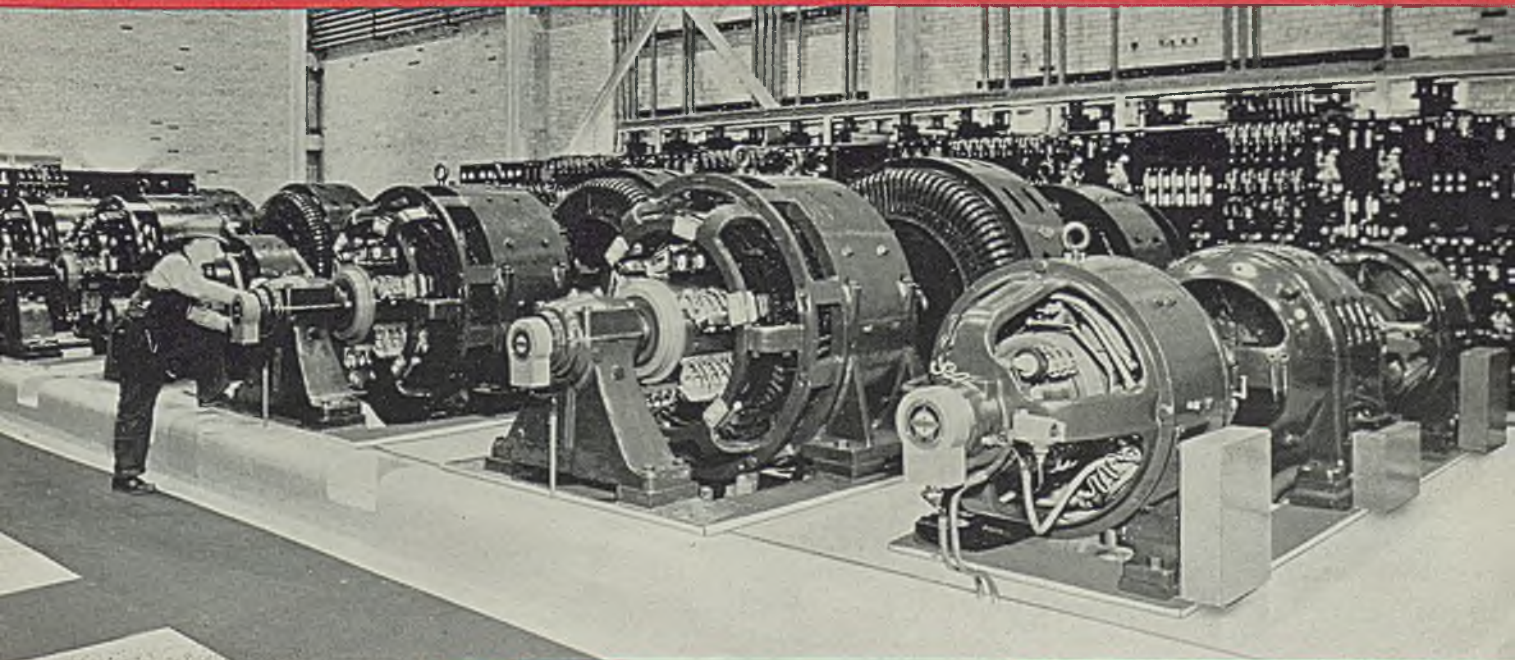
BELOW—Four 800 k.v.a. Reliance Motor-alternator Sets each driven by two 400 hp. 400-1200 r.p.m. d-c. motors. These sets supply current for operating run-out table motors at frequencies of 26/80 cycles. One 120 k.v.a. set with two 60 hp. adjustable-speed d-c. motors supplying power at 26/80 cycles for a

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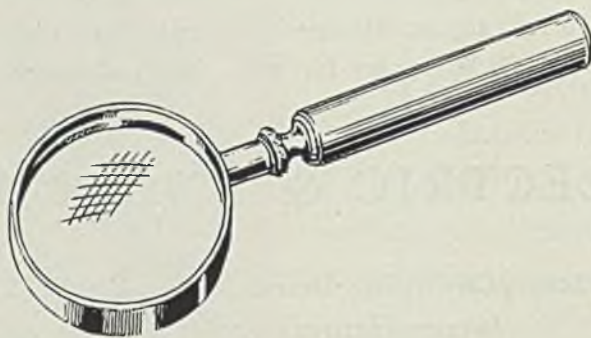
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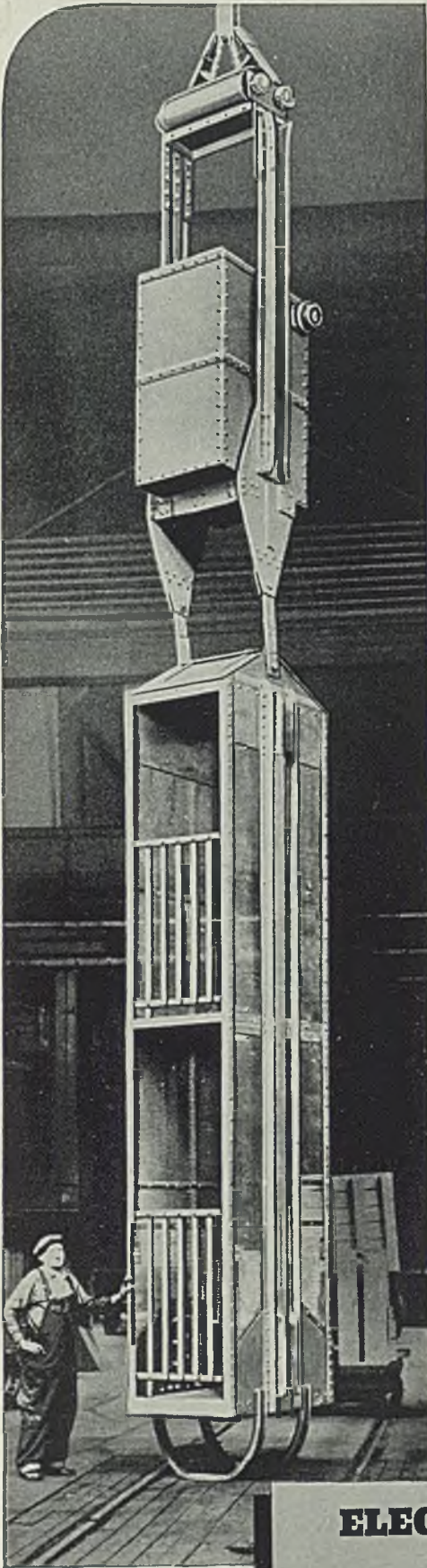
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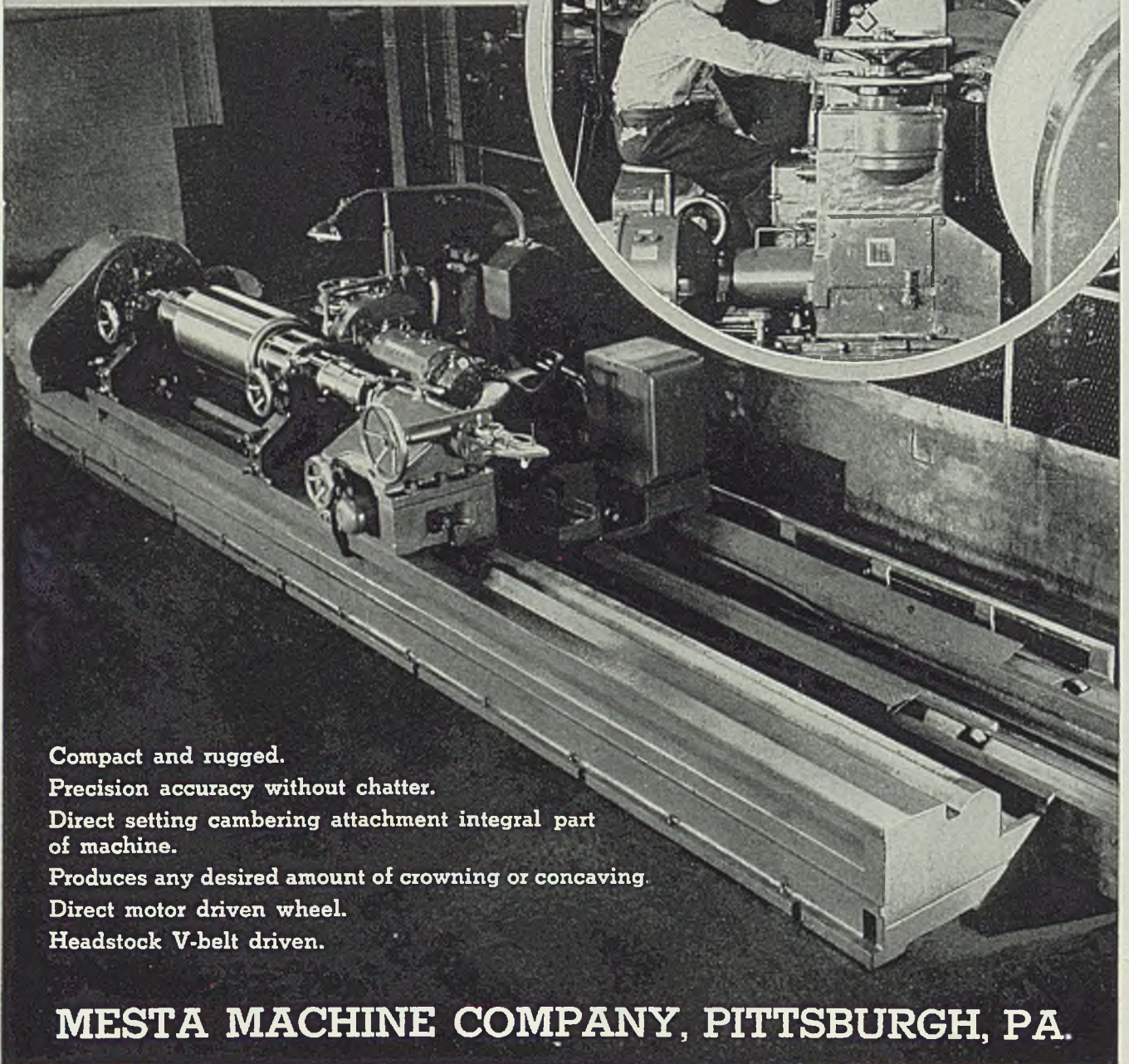
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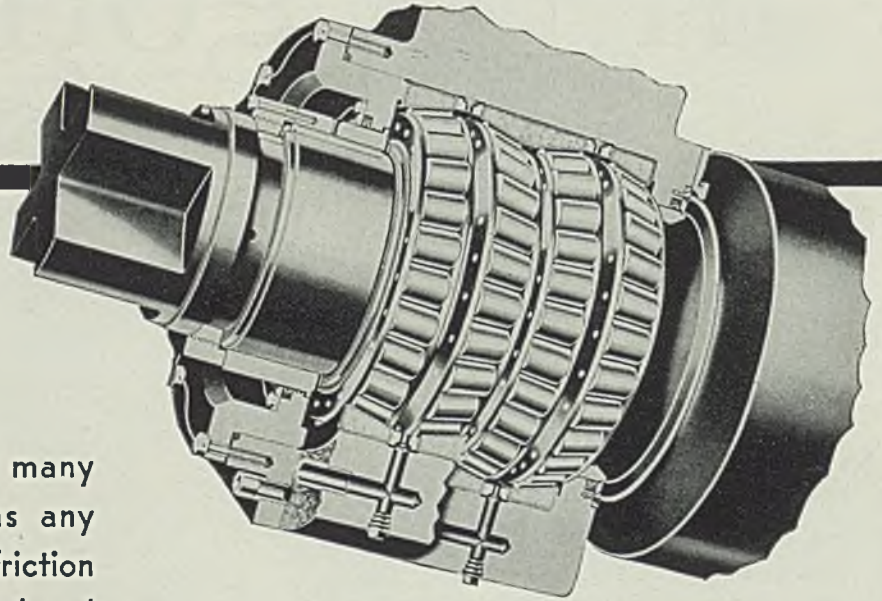
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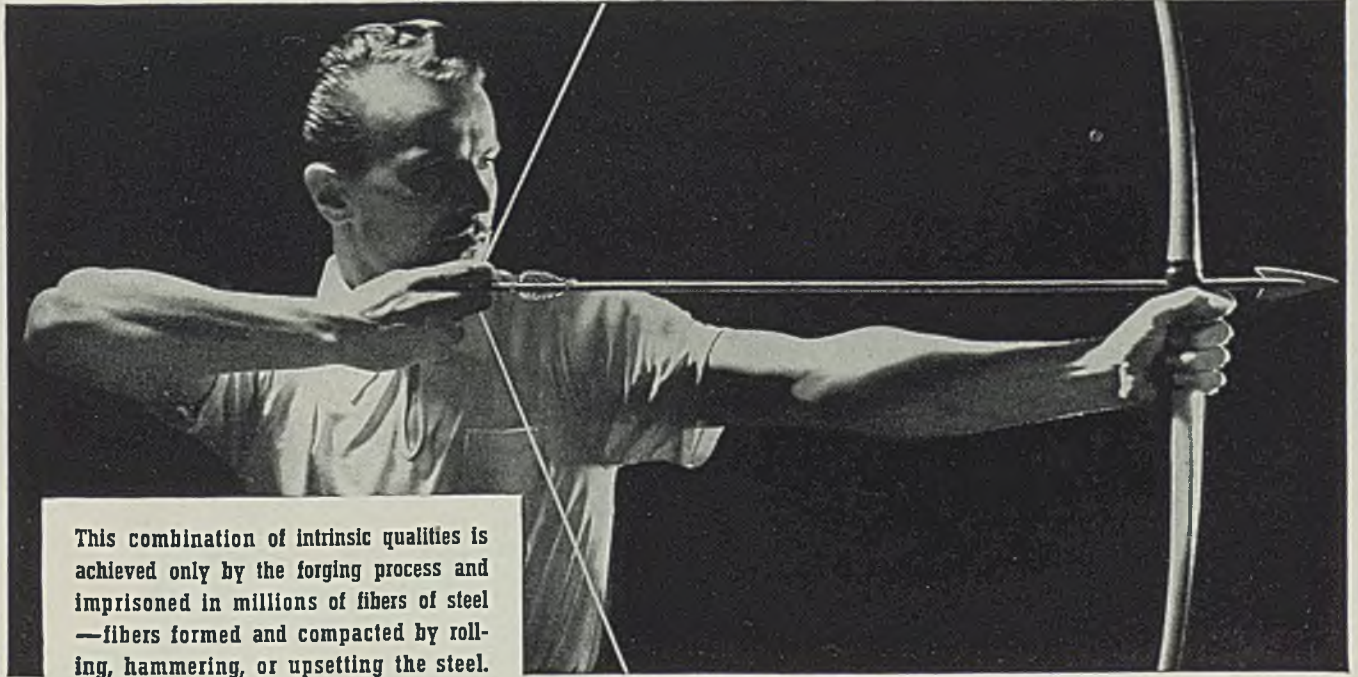
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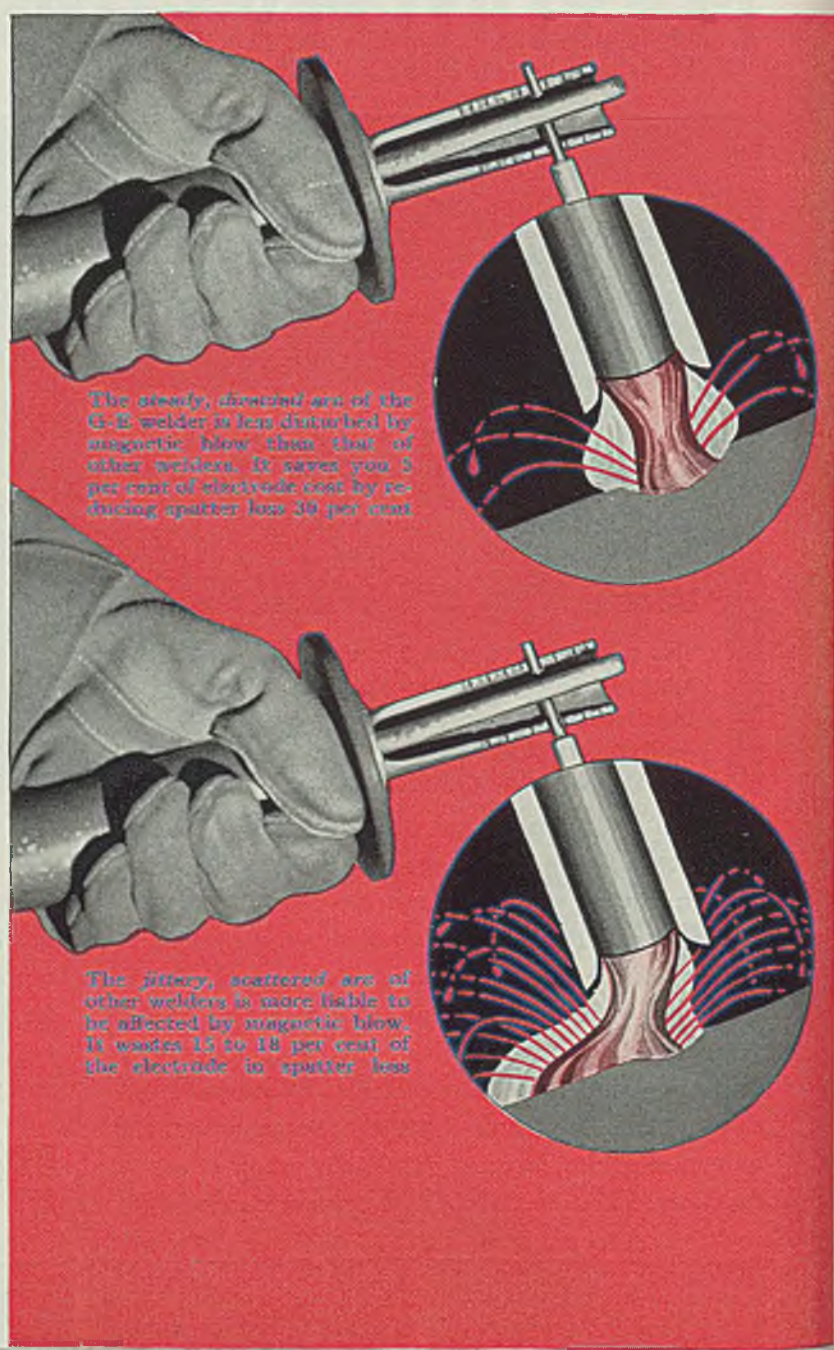
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3 Armature coils are carefully insulated with high-grade cotton tape thoroughly impregnated with Glyptal* and with asphalt varnish by several dips and bakes. All insulation is oil-, moisture-, acid- and age-resistant to provide continuous, reliable service.

4 This strong, sturdy end shield houses fan, firmly supports motor stator, and holds bearing in correct alignment. It is bolted to frame to simplify disassembly.

5 Cast-aluminum cooling fan forces ample volume of air through ducts to provide maximum cooling, keeping all parts well below safe temperature limit. Adequate heat transfer makes possible most efficient use of materials.

6 Cast-aluminum rotor of a-c motor is of fan-type construction to provide positive and correctly apportioned cooling. Overhang design obviates additional supports and makes possible better-balanced, more compact set, reducing weight and space and simplifying disassembly.

*Glyptal is the registered trademark for alkyl resin manufactured and sold by General Electric Company. These have been specially developed by General Electric for its machines, to give a tough, hard, oil-proof compound which ensures superior insulation.



GENERAL ELECTRIC, THE WORLD'S MOST EXTENSIVE USER OF ARC WELDING

CHECK VALVES ARE FOR *Protection*

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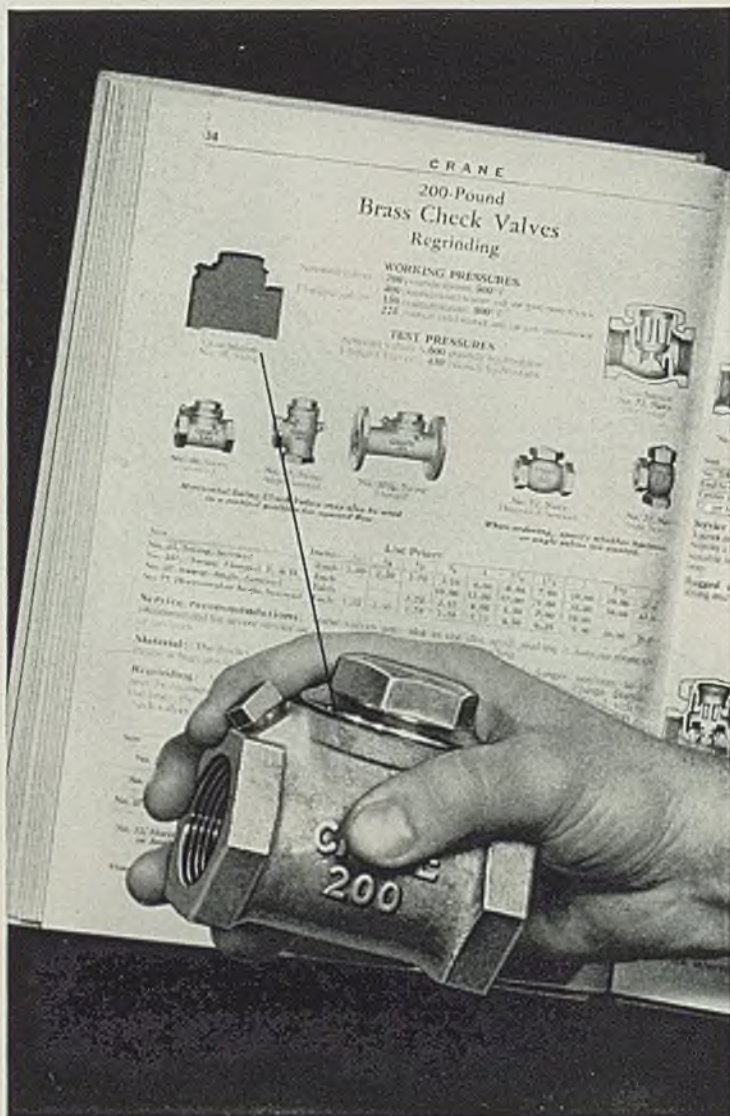
The function of a check valve is too important, when turbines, pumps, or compressors are shut down accidentally or deliberately, to take chances on its closing immediately and tightly upon loss of pressure.

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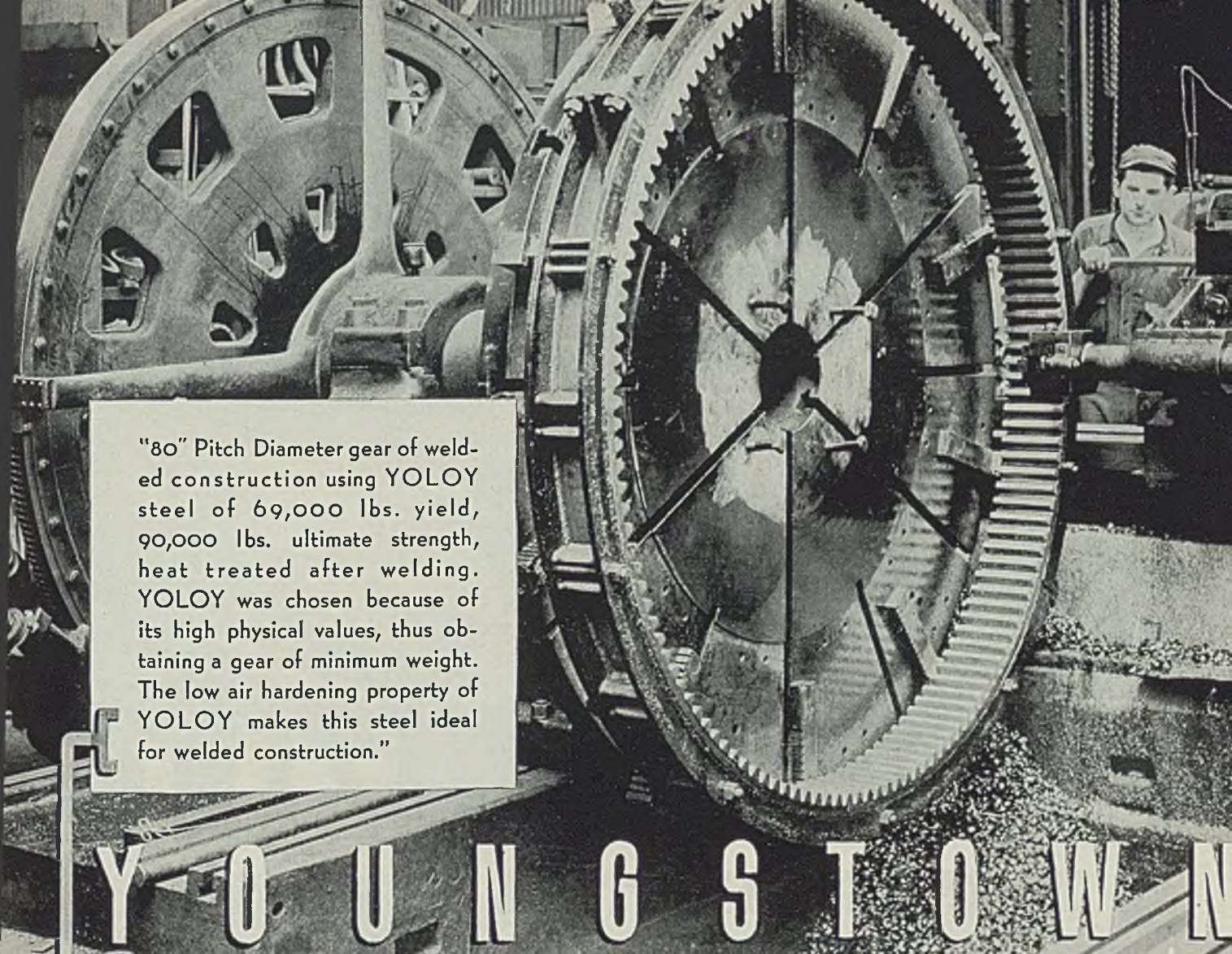
The new Crane No. 52 Catalog is a most convenient and complete purchasing guide. Use it to save time and effort when ordering valves and fittings. Complete information on the 35 Brass Swing Check Valve on page 34.

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IF IT CARRIES THIS SEAL IT'S A JOB WELL DONE

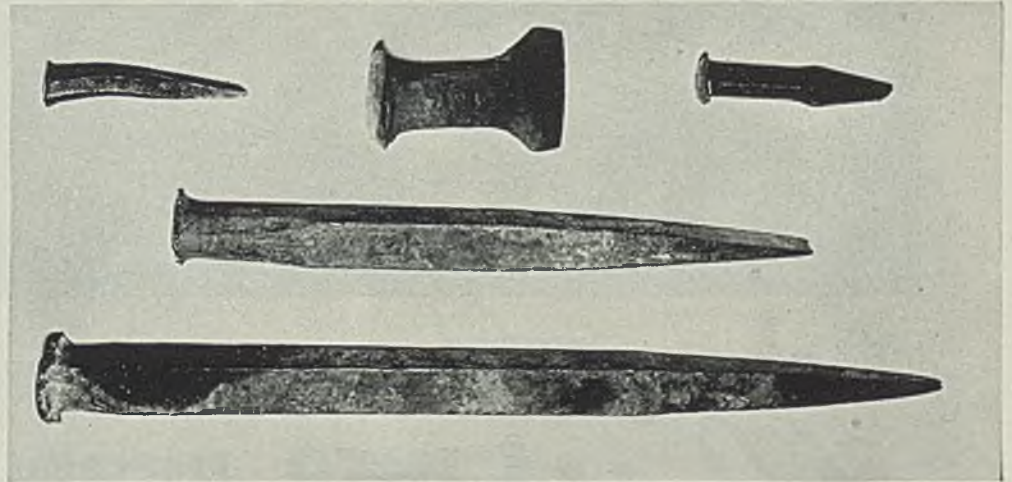


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Cutting through concrete, granite and other hard surfaces, these Chromium-Vanadium Steel chisels show a minimum of wear and distortion.

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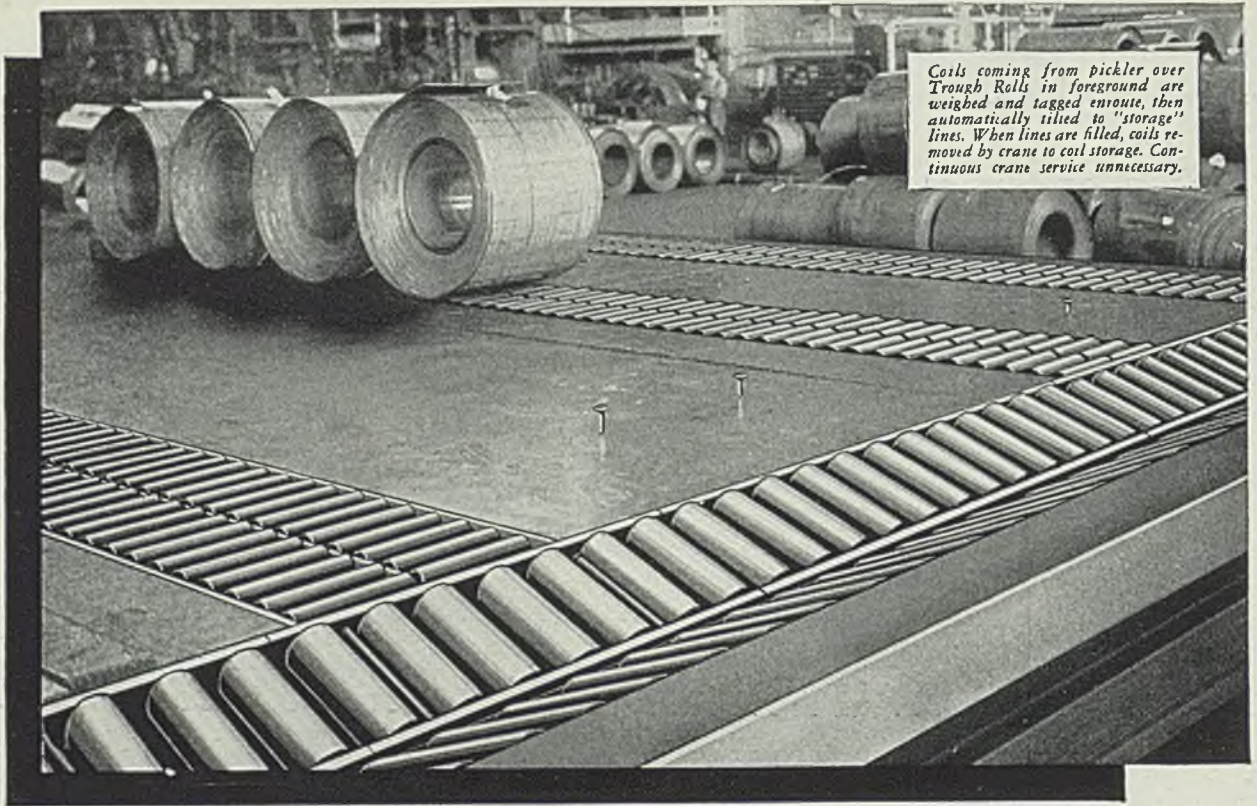
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and titanium, produced by the
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are used by steel makers in the
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FOR STRENGTH • TOUGHNESS • DURABILITY



Coils coming from pickler over Trough Rolls in foreground are weighed and tagged enroute, then automatically tilted to "storage" lines. When lines are filled, coils removed by crane to coil storage. Continuous crane service unnecessary.

CONNECTING LINKS THAT PUT

flow

INTO PRODUCTION

★ Making steel is not a one-operation business. A mill's efficiency therefore is measured largely by the manner in which the various operations are tied-in together, or coordinated.

Are there "breaks" in the production flow or does it move steadily and profitably on? Do skilled men and expensive machines frequently stop and wait for material or is there always a ready supply? Is there waste motion due to the *method* of handling material between operations, or is the most logical and practical type of handling equipment being used?

Logan Conveyors have definite functions in the handling set-up of virtually every type of mill. Where this equipment *fits in* to form important connecting links is described in detail in Logan Bulletin No. 10. Write on your letterhead for one today.



View of Trough Rolls coming from pickler with scale section and tilting sections inserted in the line of conveyor.

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THE WORK

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