

# STEEL

FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW



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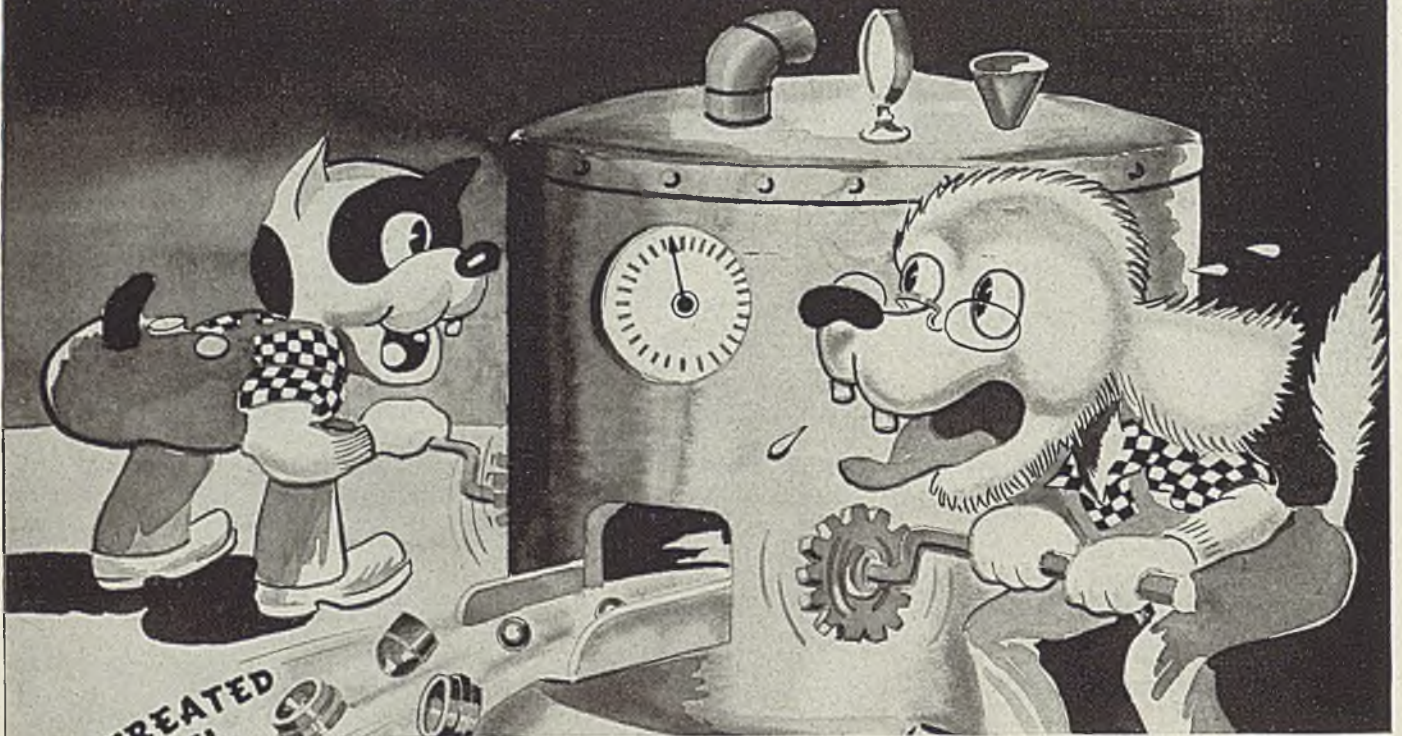
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PRODUCTION • PROCESSING • DISTRIBUTION • USE

October 18, 1937



# OLD DOGS — NEW TRICKS



*Two old timers, Monel and Nickel, will exhibit new qualities in new products at Fall Conventions*

● You've seen Monel<sup>®</sup> and Nickel at many past conventions, no doubt. You know these old timers are tough, rust proof, corrosion resistant metals. This year be sure to see them again: For Monel and Nickel will introduce to you *new products* for uses you'd never have thought possible.

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OIL WORLD EXPOSITION  
October 11th to 16th  
Petroleum Bldg., Houston, Texas

19th NATIONAL METAL EXPOSITION  
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Atlantic City Auditorium, Atlantic City, N. J.

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# STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

## As the Editor Views the News

IN ISSUING an inquiry for from 5000 to 8000 tons of ferromanganese or from 15,000 to 24,000 tons manganese ore, the United States government apparently is adopting a new policy of protection against runaway markets in an emergency. The government produces only a negligible amount of steel, and therefore the inquiry probably is for material to be used as a backlog to be made available for private producers engaged in government work in time of emergency. The specifications (p. 17) are puzzling in that they do not conform to standard grades. Industry will await an explanation of the purpose of this inquiry with interest.

• • •

Continued authorization for industrial expansion and rehabilitation should go a long way toward quieting the uneasiness of those who view the present business and security market situation with alarm. The millions appropriated in the last week or ten days for new or remodeled plants and equipment is tangible evidence that the managements of numerous companies are confident of the future. Ford Motor is launching a program (p. 19) involving \$40,000,000, which embraces a new 1000-ton blast furnace of all-welded construction. Otis Steel is spending \$3,000,000 on improvement (p. 20) and American Rolling Mill announces a \$2,000,000 program at Middletown.

• • •

Activity of this kind in the United States is matched by an unusually brisk spurt of expansion in iron and steel producing and finishing facilities throughout the world. Steelworks for utilizing low-grade iron ore (p. 15) are contemplated for Ebbw Vale in South Wales and in the Salzgitter district of North Germany. A similar plant is operating in Corby, England. A continuous sheet mill, built under American Rolling Mill patents, is operating in Germany and another is under construction at Ebbw Vale. A sheet mill

will be erected in Australia. Japan is planning to increase its steel production to 8,000,000 tons annually in a few years. In Italy, India, Manchuria, Canada and other countries similar steps to increase capacity are being taken. This activity must mean that the world recognizes the potency of steel more vividly than ever before.

• • •

In 1924 the Ferro Enamel Corp., recognizing the need for research in the then comparatively new field of porcelain enameling, established a fellowship in a midwestern university. The results have been so gratifying that the company now announces (p. 44) four new fellowships at four additional universities. Westinghouse Electric & Mfg. Co. has launched a co-operative educational enterprise with Carnegie Institute of Technology (p. 21) in a program of undergraduate engineering training. These examples of the co-operation of industrial companies with educational institutions are worthy of study by executives in many branches of the metalworking industry. Scholarships, fellowships, co-operative courses, etc. can be made to yield great values not only in the results of research but also in the training of personnel.

• • •

One of the brilliant accomplishments that can be credited to the management of industry is the steady reduction of accidents. Everyone knows that safety is the result of systematic effort, but few realize the extent to which education enters into the picture. The district manager of an independent steel company (p. 36) declares that "safety in steel consists of four-fifths education and one-fifth mechanical perfection." He describes the elaborate physical safeguards provided in a brand new mill and then says that they will prevent only 15 per cent of preventable accidents. The remaining 85 per cent can be prevented only by continuous educational work. Thorough safety work pays. Witness one company's estimate that since 1930 its safety campaign has prevented 62 fatal and 6577 lost time accidents.

*E. L. Shaner*



## How Inland Sheets Cut Parts Cast

Your source of steel is a subject that ought to be reviewed frequently. Long established habits of buying, while they may seem to save time, are also apt to allow continual wastes in production costs to grow unseen.

For example, one refrigerator manufacturer had established an *average loss* on refrigerator door panels owing to hairlining in the enamel finish at the corners. Inland engineers surprised him by practically eliminating this loss . . . with an Inland sheet specially processed to meet this condition.

The best way of checking your present costs of handling steel is to call in an Inland engineer. If he is able to improve your finished products or reduce the unit cost of their manufacture you make a worthwhile profit on his efforts . . . and without any obligation or expense on your part.

*The workability of Inland sheets is not obtained by standardized specifications and mill methods . . . Inland field men analyze the requirements of each customer. Inland is equipped and organized to meet these special requirements with remarkably uniform shipments.*

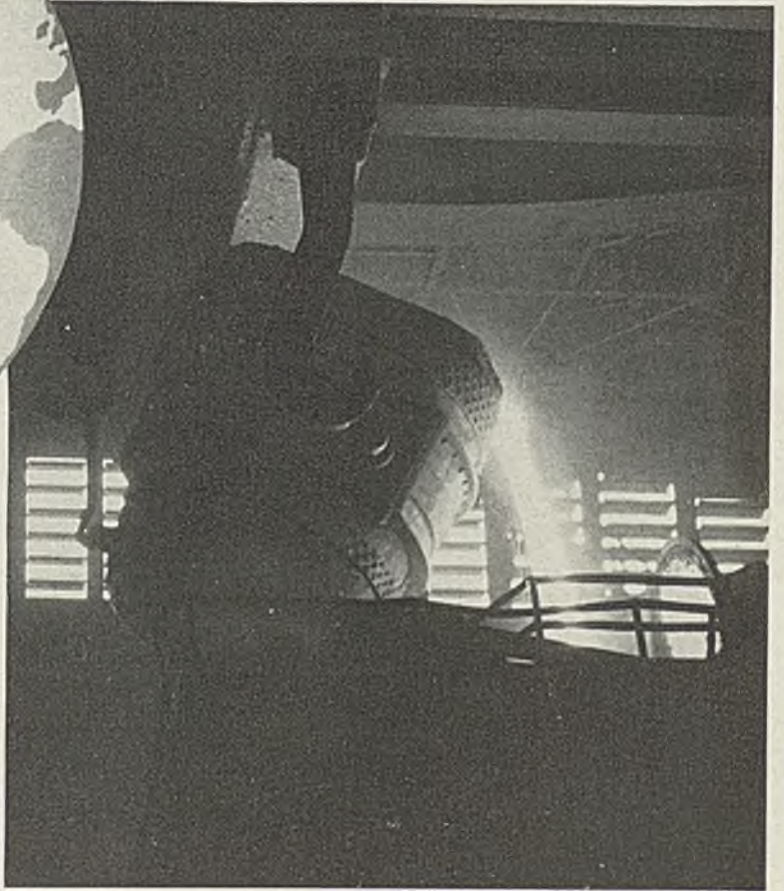


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 PLATES • FLOOR PLATES • STRUCTURALS • PILING • REINFORCING BARS

# INLAND STEEL CO.



*Currents of distribution over the world are being altered by the widening areas of steel-making activities*



## Steel Production

### Spreading in Far Countries

**T**HE world is becoming more steel conscious. As never before in peace time, practically every country, some of them remote from regular trade channels, is coming to value steel and its raw materials and to safeguard the latter, while adding to or originating means for producing the former.

At present people in practically every part of the world, except Bedouins of the desert and the Eskimo, are engaged in some measure of activity related to the production of steel or iron.

In some of the islands of the Pacific action has been taken to restrict exports of steel and iron scrap, to conserve supplies for home use. In the southern hemisphere steel plants are being enlarged and new works are being built.

Ore deposits are being opened in countries previously not producers, and plants to utilize ore are being projected or built in countries which formerly exported the raw material.

The race of the recognized steel-

making nations of Europe and America to produce in larger tonnage is familiar to all. Great Britain is straining every means at its command to increase its steel output to meet domestic needs and to protect its world export market. On the Continent steel plants are running at practical capacity to meet demand for export as well as for home needs.

No longer is the steel industry concentrated in North America and Western Europe. It has spread eastward into Asia, which in 1936 made 80 per cent more steel than in 1929, exclusive of the new steel centers in Siberia. This tendency has been encouraged by nationalistic efforts toward self-sufficiency.

In 1936 about 24 per cent of the world steel output came from countries comparatively new to this industry, compared with only 13 per cent in 1929.

Establishment of new steel centers and steel processing industries outside North America and Western

Europe during and after the World war has caused many changes in international steel trade. Machine shops and small steel mills in South Africa, Australia, Mexico, Chile, Brazil, and Argentina are able, with some tariff aid, to supply home markets with a variety of manufactured steel products, but continue to import semifinished steel and iron, machine tools and machinery.

Two factors have had an important influence in spreading the production of steel into countries formerly dependent on others for practically all their requirements. These are the increased use of scrap and development of methods for utilizing low-grade iron ores.

Scrap exists everywhere that steel is consumed and its low price on world markets has made possible establishment of steelworks in locations remote from iron ore deposits, formerly a necessary requirement for steelmaking.

Use of scrap requires far less fuel than in the smelting of iron ore and

subsequent refining of the iron into steel. The use of the electric furnace in melting steel scrap offers opportunity for steelmaking where hydroelectric power exists and coal is scarce.

Transportation by water is cheap and scrap can be moved long distances at small cost, making it available to consumers close to tide-water.

The relation of pig iron output to that of steel has been reversed in the past two decades, due entirely to this increased use of scrap. Up to about 1914 world output of pig iron was somewhat larger than that of steel, the excess being used in castings. For a number of years now the relation has been exactly opposite, production of pig iron being consistently less than steel. At present practically half the steel produced in the world comes from scrap.

As a result of the growing importance of scrap almost all countries now control exports or forbid them entirely. The United States and France are practically the only exceptions to this rule. Japan has exercised strict export control for some time, regarding it as an essential war material, but admits scrap free of duty.

Great Britain has taken measures to conserve its domestic scrap, and exports are practically absent. Italy for a long time has allowed no outward movement of scrap except under license, the law being effective Nov. 14, 1926. Germany has required an export license since Sept. 27, 1923. France since Dec. 15, 1936, has suspended export restrictions on scrap but requires authorization from the ministry of finance, and an export duty has been imposed.

Export permits are required by Belgium, Czechoslovakia, Poland, Rumania, Spain, Austria, Sweden, Finland, Norway, and Peru.

Japan's search for steelmaking scrap resulted in the movement of 97,381 tons from India in the year ended March 31, 1937, compared with 56,665 tons the preceding year. This has caused the Bengal Industries association to request the local government to impose an export duty.

#### Lower Grade Ores Used

In the Federated Malay States, shortage of scrap caused by Japanese buying has led to an order prohibiting scrap exports, except to the Straits Settlements, and then only by government authorization. Scrap is used in the Malayan foundries for casting accessories for tin mine machinery.

Better methods for utilization of low-grade iron ore, another important factor in spreading the area of steel production, are mainly the re-

sult of research by two Germans, first applied commercially by an American, H. A. Brassert, in a plant in England. Patents on this process are now being issued in many countries.

On the basis of this new process Mr. Brassert built a steelmaking plant at Corby, England, to utilize ores formerly too low in iron to be used economically. In this plant Northamptonshire ores containing about 30 per cent iron and high in sulphur, alumina and other impurities have been smelted at a profit. As a result Mr. Brassert has been commissioned to build a similar plant at Ebbw Vale, in South Wales, for Richard Thomas Co. Ltd. The same engineer has contracts for plants in Turkey and India.

#### New Plant in Germany

Germany is preparing to benefit from the process and Mr. Brassert has been authorized to build the new iron smelting and steel plants of the Herman Goering Works of the Herman Goering Reich Stock Co., recently formed under government auspices.

The plant will be located in the Salzgitter district of North Germany. It will consist at first of eight blast furnaces, coke ovens, steelworks and rolling mills. It is expected to produce 1,000,000 tons of steel ingots annually by 1940. Similar plants are planned for other locations in Germany where low-

grade ore is available for smelting.

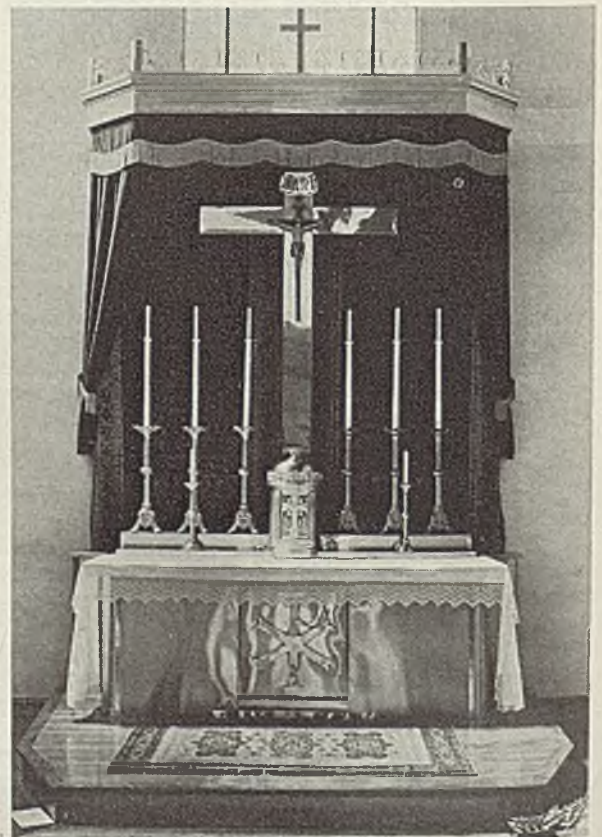
American methods are being adopted in many countries. Under patents of American Rolling Mill Co., Middletown, O., the first continuous sheet mill erected abroad has been placed in operation in Germany, and the second will be completed in England in a few months. The German plant is a 55-inch hot mill with capacity of 500,000 tons per year. The English installation is part of the plant of Richard Thomas Co. Ltd., at Ebbw Vale, South Wales, already referred to. It will be a 54-inch hot mill with two cold reduction mills, with annual capacity of 500,000 tons.

American Rolling Mill Co., as previously announced, has united with John Lysaghts Ltd. of Australia to establish works for the manufacture of special steel sheets for automobile bodies. Hitherto \$2,000,000 worth had been imported annually. The new project will require an investment of about \$5,000,000.

The steel industry in Japan has more than doubled its capacity since 1929, and plans are under way to increase production to 8,000,000 tons annually in the next few years. As Japan has practically no iron ore deposits it has been reaching out over the world for scrap. Its purchases from the United States have long been a matter of comment, and until exchange difficulties stopped the flow its scrap buying

### Stainless Steel Used in Altar

*IN PLANNING a new altar for "Our Lady of Perpetual Help" church, Tampa, Fla., the Redemptorist Fathers conceived the idea of following the design of altars used by early Christians for their secret worship in the catacombs. To carry out this design and idea, Architect Frank Frimmer, Tampa, selected Enduro stainless steel, a product of Republic Steel Corp., Cleveland, because of its close resemblance to silver. He specified the popular 18-8 type in mirror finish. Tampa Roofing & Metal Works, Tampa, was the fabricator*



was the largest of all the nations.

Perhaps Japan's most important recent acquisition is control of an iron ore deposit on Koolan island, off the coast of Australia. The West Australian government granted a concession to British interests, which has now passed to Japanese control. An American engineer has planned the development, with the latest equipment for mining, handling and docks.

In 1921 a Japanese company obtained an iron mining concession in India and in 1935 shipped 595,000 tons to Japanese plants. In 1928 the same company began operations in Malaya, a second Japanese interest starting operations in 1930. Their combined output in 1935 was 817,000 tons.

Japan shipped 650,000 tons of iron ore from the Philippine islands in 1936. Oriental Iron Co., Ltd., which has a deposit on the island of Samar, one of the Philippines, has a contract to deliver 1,000,000 tons of iron ore annually to Japan after 1938.

Japan also is reported to have obtained ore concessions in the Netherlands East Indies.

#### Canadian Expansion Seen

In Canada a movement is now under way to increase iron and steelmaking facilities. Plants from one end of that country to the other are participating in this expansion, or will soon give the word to go ahead.

A blooming mill is being rushed to completion at the Hamilton, Ont., plant of the Steel Co. of Canada. Once this work is completed the next unit to follow will be a continuous mill for rolling coiled breakdown stock for the sheet mills. Construction of this unit probably will start early next year.

At another Canadian plant work soon will start on an open-hearth modernization program. No new furnaces will be required but present steelmaking facilities in the open-hearth shop will be enlarged to tap 150-ton heats. Future plans probably will include construction of a strip mill.

Italy also is looking to its steel producing facilities, not being satisfied with its present setup. It is considering an ambitious program for new construction.

In India, Tata Iron & Steel Co. Ltd. has started a new plant for production of tubes, hoops and strip and has expanded its sheetmaking capacity by 10,000 tons annually, to about 150,000 tons. Facilities for producing medium sections and heavy bars also are being enlarged. A fifth blast furnace is planned to supply iron. Open hearth facilities

(Please turn to Page 72)

# U. S. Takes Bids on Heavy Tonnage of Ferromanganese

**T**HE UNITED STATES government last week issued an inquiry for 5000 to 8000 tons of ferromanganese, reported to be the largest government inquiry for this material on record. Bids are to be opened Oct. 29, for delivery in six months to the Philadelphia navy yard.

Specifications call for 68 to 72 per cent ferromanganese as against standard quality of 78 to 82 per cent. As an alternate price are asked on 15,000 to 24,000 tons of manganese ore of 40 per cent manganese. The relatively low content of the ore is specified, it is believed, to enable domestic producers to participate.

The material, either ferromanganese or manganese ore, it appears, is for storage in event of a national emergency.

Trade leaders see in this a new policy, designed to protect the government against a runaway market, such as might develop in case of war, and such as did develop during the World war when ferromanganese prices advanced to \$475 and higher.

As the government produces little or no steel of its own, it is thought that in case of emergency the government would ask producers for prices on steel, with and without this material being taken into account.

#### Specifications Are Puzzling

Should an offer prove advantageous, the government would then supply the ferromanganese from its own stock. It is not believed that the inquiry is the forerunner of plans by the government to go into steelmaking on a substantial scale.

Puzzling to many in the trade, however, is the manner in which specifications are presented. As noted, those for ferromanganese are for a grade under standard. At the same time specifications for the ore call for the relatively low content of 40 per cent manganese, but require that the ore be suitable for making a standard grade of ferromanganese.

These seemingly paradoxical requests are complicated by the fact, some trade leaders declare, that it is impossible to make a standard grade of ferromanganese from 40 per cent ore.

Unquestionably keen interest will be centered on this opening. One feature will be the extent to which

domestic ore producers will be able to participate. Delivery in six months might make it difficult, it is pointed out, for the producers to figure on any large portion of the tonnage, especially in view of the fact that nodulized ore will not be accepted. Nodulized ore, it is said, represents at least a fair portion of annual domestic output.

Shipments of manganese ore, 35 per cent or more manganese, from domestic mines in 1936 were 32,119 gross tons averaging 45 per cent manganese, compared with 26,428 tons averaging 44 per cent manganese in 1935.

Ferruginous manganese ore, 10 to 35 per cent manganese, from domestic mines was shipped in 1936 to the extent of 98,962 gross tons, averaging 15 per cent manganese.

Imports of manganese ore in 1936 totaled 846,648 gross tons, containing 415,749 tons of manganese, compared with 333,502 tons, containing 189,258 tons of manganese in 1935. Of the 1936 imports 34 per cent was from Soviet Russia, 29 per cent from Africa, 15 per cent from India and 13 per cent from Brazil.

## Expect 150 Executives at Greenbrier Steel Outing

About 150 executives of member companies in the American Iron and Steel institute are expected to attend the informal outing at the Greenbrier hotel, White Sulphur Springs, W. Va., Oct. 23-25. The program will be devoted entirely to sports and social activities, featured by a three-day golf tournament. Steel leaders say it is still too early to say whether this will be an annual affair, one which might take the place of the semiannual meetings of the institute which were held regularly until a few years ago.

## Germany Lowers Import Duty on Pig Iron

Germany has lowered its import duty on pig iron from 40 to 4 cents per 220 pounds, effective Oct. 18 and until Oct. 31, 1938, according to a cablegram to the commerce department from Berlin. For the first eight months this year, the United States exported 11,000 tons of pig iron to Germany.

# Review Broadening Use of Porcelain Enameled Steel

**V**ARIOUS new markets, particularly the architectural field, offer an opportunity for a further substantial growth in use of porcelain enamel, it was declared at the sales conference of the porcelain enameling industry held in connection with the seventh annual meeting of the Porcelain Enamel institute in Chicago, Oct. 11-12.

Discussing the industry's markets, George S. Blome, Baltimore Enamel & Novelty Co., Baltimore, pointed out that architectural uses of porcelain enamel are increasing more rapidly than is consumption among the older fields and that additional applications to stores, building fronts, service stations, etc., are to be expected in future years.

Other instances in which porcelain enamel can be used to advantage, and in which there are good market possibilities, include marine equipment, automobile trailers, street cars, railroad passenger cars, automobiles and electrical products, he stated.

Figures were presented by Mr. Blome showing the improvement this year in output of various products which are large users of porcelain enamel. Following data cover production in units or dollars for the first eight months of 1937 compared with all of 1936:

	1936	1937*
Electric ranges.....	202,987	284,043
Home refrigerators.....	1,995,806	1,877,975
Washers.....	1,204,227	1,245,520
Ironers.....	125,548	128,587
Architectural enamel ..	\$1,000,000	\$1,500,000
Commere'l refrigerators	\$11,856,000	\$15,200,000
Gas ranges.....	\$67,110,000	\$38,450,000
Table tops, breakfast sets	\$2,795,678	\$1,980,000
Signs.....	\$2,974,174	\$2,059,980

\*Eight months.

Activities of the educational bureau of the institute were described by Emery L. Lasier, Titanium Alloy Mfg. Co. Increasing expenditures for promotional work have been matched by steady gains in sales the past several years.

Porcelain enamel sales by institute members this year are estimated at \$22,000,000. This compares with \$17,500,000 in 1936 and with an average of \$11,334,000 for the three years 1932-1934. The 1937 increase exceeds the upturn in the index of general business over both 1936 and the three-year average. Work of the educational bureau covers market and technical research, production control, advertising and industry trade contacts.

A resume of the institute's technical research work was presented

by Richard H. Turk, Porcelain Enamel & Mfg. Co., Baltimore. Tests have been conducted at the government bureau of standards and Ohio State university under institute sponsorship. Results of tests on reflectance and on tentative acid resistance have been published and data on abrasion tests are near publication. Impact tests are under way.

Results of a patching compound developed through the institute's fellowship at Ohio State university have been encouraging, and this work is to be continued, according to Mr. Turk.

The technical research committee plans for 1938 to convert the acid resistance test to a standard test and to continue work on abrasion



F. E. Hodek Jr.

Elected president, Porcelain Enamel institute

and impact resistance tests. Publication of a booklet on architectural enamel also is planned.

A plea to the institute that it give primary consideration to the question of service as the only solid approach to its co-operative endeavor was made in the presidential address by R. G. Calton, Tennessee Enamel Mfg. Co., Nashville, Tenn.

Tracing the development of the capitalistic system, with its principle of profit and competition, Mr. Calton pointed out that it has become apparent in the last century that competition can be extremely destructive and work a great injury upon society. These views resulted in public regulation, affecting

first the railroads and other public utilities which were inherently monopolistic.

"Now we are faced with the growing belief that all businesses are 'affected with a public interest,' and that industry should be governed so that the ends of society may first be served and that profit should merely be incident thereto," he stated.

"If such is the case, that is, if we are to accept the principle that our business is 'affected with a public interest,' it then seems to me that we must revise our approach to our problems. It will require a change in our mental attitude. If we are to justify the co-operative work that we are doing through the Porcelain Enamel institute, it will be necessary for us to emphasize first and foremost a genuine desire to serve the best interests of society. There need be no change in our desire for profit. It is merely necessary that we approach our problems first from the standpoint of service and then from the standpoint of profit. There will be plenty of competition, competition with other industries, competition among ourselves to serve better."

## Enamel in Architecture

Commenting on the architectural use of porcelain enamel, R. M. King, Ohio State university, Columbus, O., indicated that while some problems still prevail in attempts to enlarge this market that applications are growing and are being extended to larger buildings. Production difficulties include color matching, wavy surfaces and chipping of panels, while the matter of distribution of material for building purposes also requires further study.

F. E. Hodek Jr., secretary, General Porcelain Enameling & Mfg. Co., Chicago, was elected president of the institute for 1937-1938. He served as vice president the past year. Other officers chosen include: vice presidents, Mr. Turk, and H. D. Chase, Chicago Vitreous Enamel Product Co., Chicago; treasurer, William Hogenson, Chicago Vitreous Enamel Products Co.; secretary, George P. MacKnight.

The new executive committee consists of the following: Mr. Blome, Mr. Calton, W. R. Greer, Porcelain Enamel & Mfg. Co., Baltimore; P. B. McBride, Porcelain Metals Corp., Louisville, Ky.; Harry V. Mercer, American Rolling Mill Co., Middletown, O.; Ernest J. Richardson, Ingram-Richardson Mfg. Co., Beaver Falls, Pa.; R. W. Staud, Benjamin Electric Mfg. Co., Des Plaines, Ill.; R. A. Weaver, Ferro Enamel Corp., Cleveland; Edgar H. Weil, Vitreous Steel Products Co., Cleveland; and W. F. Wenning, Ceramic Color & Chem. Mfg. Co., New Brighton, Pa.



# All-Welded Blast Furnace in Ford's \$40,000,000 Steel Expansion

**F**ORMAL release of details of the expansion program now under way at the Ford Motor Co.'s River Rouge plant, Detroit reveals that \$40,000,000 will be spent in 1937-38, mainly in iron and steel divisions.

Much of this new construction work has already been reported in STEEL, but it may be pertinent to summarize the program, which shapes up as follows:

1. A 1000-ton all-welded blast furnace will be built, the contract having been awarded to Arthur G. McKee Co., Cleveland. With auxiliary equipment, contracts for all of which have not yet been placed, this project will cost close to \$4,500,000. Incidentally, while this is the first blast furnace to be completely welded, all-welded blast furnace stoves have been used in England recently.

The furnace project includes a new battery of 61 by-product coke ovens, now under construction by the Koppers Co., supplementing two present batteries. Increased coke output will serve requirements of the new blast furnace, and will also increase output of fuel gas to 40,000,000 cubic feet daily.

When the new furnace is completed, iron ore requirements will be lifted to 1,500,000 tons yearly, compared with the present 850,000 tons.

2. Two large storage holders are now under construction,

work being done by the Stacey Bros. Gas Construction Co. and Bartlett-Hayward Co.

One, with capacity of 10,000,000 cubic feet, will be what is claimed the largest all-welded steel structure in the world, and will be used to store coke oven gas. The other, with capacity of 2,500,000 cubic feet, will be for blast furnace gas.

The blast furnace gas supply will be increased by 89,000 cubic feet per minute from the present 97,000 cubic feet per minute when the new stack is in service.

When the two holders are completed, and hooked into the plant gas distribution system, coke oven gas will be used to enrich blast furnace gas and the resulting mixture fed into plant mains for production use in melting, heating and heat treating furnaces.

3. Reconstruction of present open-hearth furnaces and reorganization of manufacturing methods is to be carried out on a progressive schedule to permit operation of a majority of the furnaces at all times. Pennsylvania Engineering Works, New Castle, Pa., has contract for initial open-hearth rebuilding work.

A change is contemplated in steel-making methods, plans calling for installation of bessemer converters for preliminary processing operations on heats of steel. Such duplexing will permit an appreciable

reduction in time required for processing heats, it is said. Contracts for the bessemer still are pending, and an addition to the open-hearth building will be made to house this equipment.

4. A new cast alloy steel foundry building which will cover approximately 8 acres and will increase floor area in the foundry division to 38 acres will be started shortly. The building will house equipment for melting and casting alloy steels, and will continue the present foundry structure north to connect with the motor building. In connection with this development, the present electric furnace building will be converted to supply molten steel alloys for use in casting work in the foundry.

5. New equipment will be installed in both the hot and cold strip rolling mills, United Engineering & Foundry Co., Pittsburgh, having contract for the rolling mill equipment. The hot strip mill will be widened to roll a 60-inch sheet, compared with the 48-inch limit at present.

A new finishing stand also will be added, and two new slab heating furnaces installed, the latter by Rust Engineering Co., Pittsburgh. Additional equipment in the cold finishing department includes a 78-inch continuous pickler and 12 sets of three bell-type bright annealing furnaces. Westinghouse Electric & Mfg. Co. is installing the furnaces; Wean Engineering Co., Warren, O., will build the pickler.

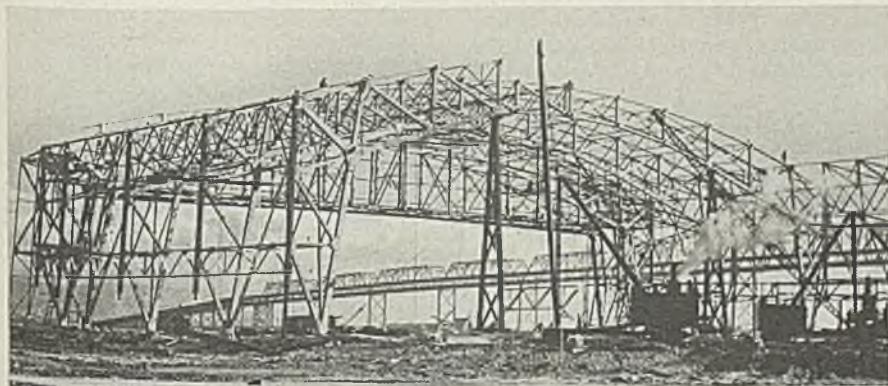
6. Capacity of the main powerhouse is being increased again by the installation of a third 110,000-kilowatt turbogenerator, supplied by General Electric Co., Schenectady, N. Y. An additional boiler also will be installed by the Combustion Engineering Co., division of Superheater Co., New York.

7. Not covered in the program announced last week but still on the active list at the Rouge plant is a new press shop and body assembly building, plans for which are now being drawn by Albert Kahn Inc., Detroit. The structure will be L-shaped, 900 x 1450 feet, and will involve an additional expenditure, reported as \$5,000,000. In connection with this building probably will be a new centralized and expanded tool and die shop.

Inquiries are now out for 45,000 tons of structural steel required for the new buildings.

The expansion program, the company states, is designed to enable it to maintain, in face of increasing production, its policy of manufacturing in its own plant a substantial share of all parts required in production of cars and trucks.

## Steel Goes Up for Golden Gate Exposition



**P**ERMANENT contributions of the 1939 Golden Gate exposition to San Francisco will be two 265 x 335-foot hangar buildings and a 380 x 630-foot terminal structure. To be used as exhibit buildings during the fair, they later will form the nucleus of a municipal airport on Treasure Island, San Francisco bay, the exposition site. Framework of the hangars was erected by crane and a stiff-legged derrick on skids. Walls were cantilevered outside the line of the lower arch pins to counterbalance weight of roof. Steel was fabricated and erected by the Judson Pacific Co.

## \$5,000,000 for Mill Improvements

MAJOR portion of \$3,000,000 authorized last February for expansion at Otis Steel Co.'s plant in Cleveland is being used for improving the large continuous hot strip mill and the large continuous cold rolling mill, E. J. Kulas, president, stated last week.

Orders for new equipment were placed early in the spring. All preliminary work is nearly completed and will be ready when the machinery arrives later this fall.

Included in the project are additional 4-high stands on the large continuous hot mill, with increased width throughout the mill to permit the production of sheets of the width in greatest demand.

Heating facilities, as well as modern auxiliary equipment for shearing and preparing the product for consumer are being installed.

Finishing capacity will be increased by the addition of a new 4-high stand to the 4-high continuous cold mill with motors and auxiliary equipment, making it one of the most efficient and modern units in the country. The cold mill also is being widened and will finish the widest product produced on the enlarged hot mill.

The motor room building attached to the hot mills is being enlarged for new and more powerful motors and generators. Back of the continuous mill, new soaking pits are being added to increase capacity.

### \$2,000,000 At Middletown

Calvin Verity, executive vice president, American Rolling Mill Co., announced that \$2,000,000 has been appropriated for the Middletown, O., plant.

Open-hearth furnaces will be improved, including new furnace controls and other equipment.

An additional soaking pit is already under construction and the soaking pit building is being enlarged. The blooming mill will be motorized. Additional annealing capacity will be provided which will necessitate extension of existing buildings.

## Steel Corp. Shipments 39% Over Last Year

Shipments of finished steel products by subsidiaries of the United States Steel Corp. in September were 1,047,962 tons, which is 59,896 tons smaller than August shipments but exceeds September, 1936, by 86,159 tons. This is the highest September record since 1929, when the

total was 1,145,244 tons. For nine months of 1937 shipments were 10,956,846 tons, an increase of 3,089,139 tons, or 39 per cent over the comparable period of 1936.

## Tool Steel Scrap Prices Doubled

WHILE the edge appears to be off the tungsten ore market, there is still much interest in discarded tool steel which contains a substantial portion of tungsten. Various prices are reported on this scrap, but a spread of 36 to 40 cents, shipping point, based on 18 per cent tungsten tool steel, appears fairly representative.

This is an increase of approximately 100 per cent since early in the year when the market was about 20 cents. For a number of weeks prices showed a steady advance, then with the suspension of shipments of Chinese tungsten ore, as a result of Sino-Japanese war, they rose sharply. This movement appears to have been checked, at least temporarily due to a somewhat easier trend in tungsten ore.

Interest on the part of American consumers of ore has lagged recently, as they consider prices too high, and are fairly well stocked. The world market for ore, as reflected by London quotations, is still about the equivalent of \$35 to \$36, duty paid, per short ton unit. American consumers do not appear disposed to pay more than \$30 to \$31, and there are some indications that this might be done on domestic scheelite, if not at present, possibly a little later.

Despite this situation, producers of tool steel are active in buying back scrap from the customers to whom they sell tool steel. The average scrap dealer is wary in handling this grade of material because of the costly analysis necessary.

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

	(Tons)			
	1937	1936	1935	1934
Jan.	1,149,918	721,414	534,055	331,777
Feb.	1,133,724	676,315	583,137	385,500
Mar.	1,414,399	783,552	668,056	588,209
April	1,343,644	979,907	591,728	643,009
May	1,304,039	984,097	598,915	745,063
June	1,268,550	886,065	578,108	985,337
July	1,186,752	950,851	547,794	369,938
Aug.	1,107,858	923,703	624,497	378,023
Sept.	1,047,962	961,803	614,933	370,306
Oct.	.....	1,007,417	686,741	343,962
Nov.	.....	882,643	681,820	366,119
Dec.	.....	1,067,365	661,515	418,630
Y'ly adj	.....	+40,859	+23,750	+19,907
Total	.....	10,784,273	7,347,549	5,905,966

\*Deduction.

## Financial

### SPANG, CHALFANT-NATIONAL SUPPLY MERGER APPROVED

STOCKHOLDERS of both Spang, Chalfant & Co. and of the National Supply Co. at separate meetings last week approved the plan of recapitalization whereby National Supply will merge with Spang, Chalfant into a new Pennsylvania corporation to be known as National Supply Co.

Under the plan stock will be issued to stockholders of the parent company and its affiliate, Spang Chalfant.

One share of National preferred will receive one share of 5½ per cent prior preferred and one share of \$2 ten-year preferred stock of the new company. One share of National common will receive one common share of the new company.

One share of Spang, Chalfant preferred will receive one share of 5½ per cent prior preferred of the new company. One share of Spang, Chalfant common not owned by National will receive 1½ shares of common.

The 5½ per cent series prior preferred of the new company will be convertible for ten years into the common stock on the basis of 2½ shares for the first two years, 2¼ shares for the next four years, and two shares for the last four years.

The new \$2 ten-year preferred stock of \$40 par value will rank after the prior preferred and will be convertible share-for-share into common stock. It automatically becomes common stock on Oct. 1, 1947.

National reported consolidated net profit, including Spang, Chalfant, for the first half of \$4,768,139 after all charges, compared with \$1,834,531 last year. The company declared a dividend of \$1.75 on preferred stock payable Oct. 1 to record Sept. 20.

Spang, Chalfant's second quarter net profit was \$1,018,262, equal to \$1.10 a share of common, against \$590,991, or 53 cents a share on the common, in the period last year. The company declared a dividend of \$1.50 on its preferred stock, payable Oct. 1 to record of Sept. 20.

### EARNINGS STATEMENTS

Bridgeport Machine Co., Wichita, Kans., reports net profits of \$586,492 for the nine months ending Sept. 30 compared with \$349,581 in the period a year ago.

Monarch Machine Tool Co., Sidney, O., reports third quarter net profit of \$150,272, equal to \$1 a share on 150,079 common shares outstanding. For the nine months ending Sept. 30 net profits totaled \$334,173.

equal to \$2.23 per common share.

Rustless Iron & Steel Corp., Baltimore, has net profits of \$19,076 for the third quarter, compared with \$17,643 net in the June quarter. Net income for the nine months ending Sept. 30 was \$54,364 against \$28,028 in the period a year ago.

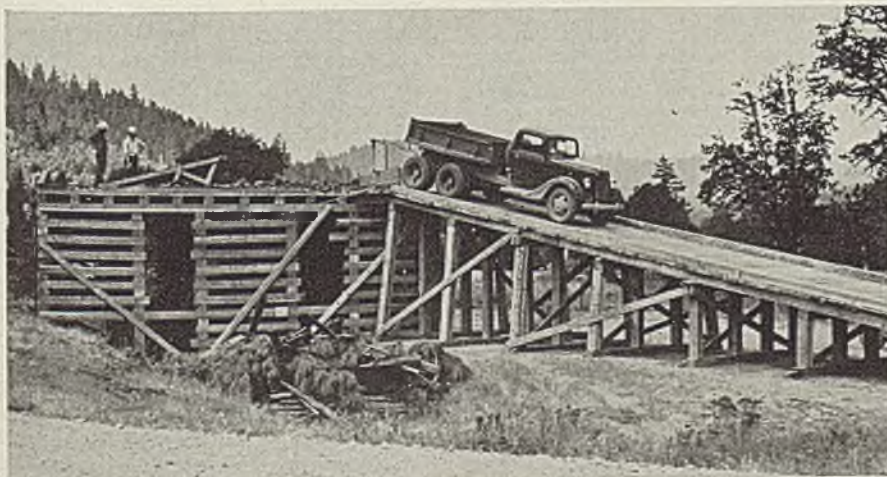
Woodward Iron Co., Woodward, Ala., for the nine months ending Sept. 30, reports net income of \$954,627, more than \$300,000 over the entire year of 1936. The company earned \$602,836 in the first six months, leaving an estimated net profit of \$351,791 for the third quarter. These figures exclude undistributed profits tax.

Harbison-Walker Refractories Co., Pittsburgh, reports estimated consolidated net income for the three months ending Sept. 30 at \$782,100, compared with \$1,082,800 in the corresponding period of 1936. For the first nine months of this year the company estimated its net income at \$2,795,300 compared with \$2,431,600 in the corresponding 1936 period, and for the 12 months ended Sept. 30 at \$3,826,100.

## To Launch Carrier Nov. 10

The WILLIAM A. IRVIN, first of the four 600-foot ore vessels being constructed for the Pittsburgh Steamship Co., will be launched Nov. 10. The carrier, named for the president of the United States Steel Corp., is being built at Lorain, O., by the American Shipbuilding Co., which also is building a sister ship, the GOVERNOR MILLER. At Ecorse, Mich., Great Lakes Engineering Co. is building two other freighters.

## Mining Chrome Ore in California



CHROME ore is mined near O'Brien, Calif., and hauled in Ford trucks over 66 miles of tortuous mountain trails to the nearest railroad at Wilderville, Oreg., where it is loaded into cars for shipment to the Rustless Iron & Steel Corp., Baltimore. The truck makes two round trips daily, hauling 10 tons in each load, or a daily total reported as four tons above the minimum required to make the operation profitable

## Meetings

### FABRICATORS MEETING WILL DISCUSS STEEL IN HOUSES

FORUM discussion of progress made in building residences with steel will be a special feature of the fifteenth annual meeting of the American Institute of Steel Construction in White Sulphur Springs, W. Va., Oct. 23-26, Fred T. Llewellyn, consulting engineer, United States Steel Corp., New York, has prepared a report on use of light-gage, flat-rolled steel in housing.

The building outlook, progress of research within the industry, and related problems are other subjects to be considered. Some 300 representatives of companies fabricating structural steel will attend.

Among speakers will be Edward L. Ryerson Jr., vice president, Inland Steel Co., Chicago; F. E. Schmitt, editor, *Engineering News-Record*, New York; E. J. Russell, architect, St. Louis; Henry M. Stevens, vice president, J. Walter Thompson Co., New York; H. D. Hussey, American Bridge Co., New York; and C. Oliver Wellington, McKinsey, Wellington & Co., New York.

Thomas H. Beck, president, Crowell Publishing Co., and Harold B. Wells, judge of the court of errors and appeals of New Jersey, will speak at the banquet Oct. 28.

### RETAIL HARDWARE DEALERS ESTABLISH NATIONAL WEEK

National Retail Hardware association, Indianapolis, has announced establishment of National Hardware

Week, May 9-14, 1938. The action was taken after plans were passed upon by secretaries of state retail hardware associations affiliated with the National association, at a conference in Indianapolis last month.

Manufacturers and wholesalers distributing through retail hardware channels will be asked to cooperate with the 14,000 association members. Plans have been laid for a complete advertising and sales promotional campaign.

The program is in charge of Rivers Peterson, editor, *Hardware Retailer*, and Richard Harding, head of the association's promotion department. Henry P. Sheets, Indianapolis, is managing director of the association.

### CONVENTIONS OF MACHINERY ASSOCIATIONS IN PITTSBURGH

American Supply and Machinery Manufacturers' association, National Supply and Machinery Distributors' association and Southern Supply and Machinery Distributors' association have selected Pittsburgh for their 1938 triple convention. The date is May 9-11. Headquarters will be at the William Penn hotel.

## Westinghouse, Carnegie Tech in Educational Plan

A co-operative educational enterprise which will link the Westinghouse Electric & Mfg. Co., East Pittsburgh, and Carnegie Institute of Technology, Pittsburgh, in a new program of undergraduate engineering training was announced last week by Robert E. Doherty, institute president.

The Westinghouse company has appropriated \$200,000 to the institute, which will make it possible for a number of students with superior qualifications to take the usual technical courses for a degree and, during the same period, to obtain shop and engineering experience in the Westinghouse plant.

Of the group of students who will be selected to follow the co-operative course, a number, perhaps ten each year, will receive George Westinghouse scholarships. A George Westinghouse professorship of engineering will also be established, and one of the duties of the holder of this position will be the supervision of the co-operative program.

The program has been formulated by Dr. E. B. Roberts of Westinghouse and President Doherty. It is the second co-operative educational enterprise which Westinghouse has entered into in Pittsburgh, an agreement being in effect between the company and University of Pittsburgh providing for a co-operative program of graduate work.

# Need 69% Rate to Equal 1929 Record

STEEL ingot production must average about 69 per cent of capacity over the remainder of the year if the total for 1937 is to equal that of 1929. Currently the rate is 63 per cent.

Output of open-hearth and bessemer ingots in the first nine months this year amounted to 42,498,769 gross tons. To overtake the record for the full year 1929—54,312,279 tons—the industry must make 11,813,510 tons in the final quarter this year. Total annual capacity for open-hearth and bessemer ingots is 68,290,862, and for the quarter, approximately 17,072,715 tons.

With an average rate of 83.12 per cent in the nine months this year total production was 2 per cent under that for the comparable period in 1929. In view of the recent decline in steelworks operations there is some question now as to whether a new record for a year's output will be established.

September total, as reported briefly in STEEL'S Oct. 4 issue, was 4,301,869 tons, 12 per cent less than in August. This compares with 4,151,388 tons in September, 1936,

## District Steel Rate

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended Oct. 16	Change	Same week 1936	1935
Pittsburgh ..	60	-2	77	46
Chicago .....	57	-8	76	55
Eastern Pa....	51	-4.5	48.5	38
Youngstown..	58	-2	78	58
Wheeling .....	74	None	95	81
Cleveland ....	68	+5	79.5	62
Buffalo .....	67.5	-2.5	84	50
Birmingham..	70	-7	64	58.5
New England ..	70	+5	75.5	68
Detroit .....	92	None	100	88
Cincinnati ...	70	None	96	†
St. Louis ....	60	None	†	†
Average ...	63	-3	75	51

†Not reported.

and 4,527,887 tons in September, 1929.

Capacity engaged in September, according to the American Iron and Steel institute, was 76.52 per cent. Average for STEEL'S weekly estimates in September was 77 per cent.

## Production

BECAUSE of a reduction in steelworks operations at Chicago, Pittsburgh and other leading steel

centers the national rate eased 3 points last week to 63 per cent. Small increases were noted at Cleveland and in New England.

**Youngstown, O.**—Down 2 points to 58 per cent, with 51 open hearths operating and three bessemer on reduced schedules. Youngstown Sheet & Tube Co. last week unexpectedly added an open hearth at Campbell, O. Schedules this week are expected to be the same.

**Cleveland**—Up 5 points to 68 per cent through lighting of additional open-hearth capacity by Otis Steel Co. and Republic Steel Corp. Schedule for this week is expected to remain the same.

**Detroit**—Unchanged at 92 per cent of capacity.

**St. Louis**—Unchanged at 60 per cent for second week.

**Birmingham, Ala.**—Down 7 points to 70 per cent, in adjustment to lighter steel demand.

**Cincinnati**—Unchanged at 70 per cent with schedule this week calling for an additional open hearth in service.

**Central eastern seaboard**—Down 4½ points to 51 per cent, with further decline of less sharpness scheduled for this week.

**Buffalo**—Down 2½ points to 67½ per cent as Bethlehem dropped one open hearth.

**Pittsburgh**—Down 2 points to 60 per cent. Forty-two blast furnaces are active, compared to 48 at this time last month.

**Wheeling**—Operations in this district are unchanged at 74 per cent.

**New England**—Up 5 points to 70 per cent of capacity. This will be increased several points this week.

**Chicago**—Declined 8 points to 57 per cent, a drop of 26 points since a month ago and the lowest rate since January, 1936. A further recession is in prospect since new business recently has been insufficient to support a rate of better than 50 per cent. Five more blast furnaces have been shut down, giving the district 24 active stacks out of 39.

## Steel Ingot Statistics

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

	—Open Hearth—		—Bessemer—		— Total —		Weekly production, all of companies, gross tons	Number of weeks in month
	Gross tons	Per cent of capacity	Gross tons	Per cent of capacity	Gross tons	Per cent of capacity		
1937								
Jan.....	4,433,145	84.20	291,794	54.30	4,724,939	81.43	1,066,578	4.43
Feb.....	4,082,163	85.87	331,669	68.35	4,413,832	84.25	1,103,458	4.00
March....	4,812,879	91.42	403,787	75.14	5,216,666	89.91	1,177,577	4.43
April.....	4,681,677	91.83	390,198	74.98	5,071,875	90.27	1,182,255	4.29
May.....	4,767,269	90.55	386,290	71.88	5,153,559	88.82	1,163,332	4.43
June.....	3,899,190	76.48	284,572	54.68	4,183,762	74.46	975,236	4.29
July.....	4,220,561	80.09	336,035	62.67	4,556,596	78.49	1,030,904	4.42
Aug.....	4,502,243	85.25	373,428	69.49	4,875,671	83.79	1,100,603	4.43
Sept.....	4,029,921	78.98	271,948	52.38	4,301,869	76.52	1,005,110	4.28
9 mos....	39,429,048	84.98	3,069,721	64.89	42,498,769	83.12	1,089,712	39.00
1936								
Jan.....	2,843,415	54.76	196,389	32.21	3,039,804	52.39	686,186	4.43
Feb.....	2,754,446	56.76	202,445	35.55	2,956,891	54.53	714,225	4.14
March....	3,148,813	60.64	185,040	30.33	3,333,853	57.46	752,563	4.43
April.....	3,627,830	72.14	304,775	51.62	3,932,605	69.99	914,593	4.29
May.....	3,735,283	71.93	302,092	49.55	4,037,375	69.58	911,371	4.43
June.....	3,640,672	72.40	334,897	56.72	3,975,569	70.75	926,706	4.29
July.....	3,587,764	69.25	326,606	53.69	3,914,370	67.61	885,604	4.42
Aug.....	3,833,727	73.83	350,560	57.50	4,184,287	72.11	944,534	4.43
Sept....	3,848,340	76.71	303,048	51.45	4,151,388	74.05	969,950	4.28
9 mos....	31,020,290	67.61	2,505,852	46.52	33,526,142	65.40	856,570	39.14
Oct.....	4,216,536	81.20	317,710	52.11	4,534,246	78.15	1,023,532	4.43
Nov.....	3,993,472	79.42	329,553	55.82	4,323,025	76.94	1,007,698	4.29
Dec.....	4,119,025	79.50	305,342	50.20	4,424,367	76.42	1,000,988	4.42
Total...	43,349,323	70.74	3,458,457	48.07	46,807,780	68.36	895,329	52.28

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

## New Scrap Rule Opposed

Southwestern freight bureau has issued a proposal to change rules applicable to shipments of scrap iron and steel in its territory. The proposed rule would require filing affidavits within 12 months of shipment certifying that the scrap had actually been remelted, before the scrap iron freight rates would be made effective.

At a hearing Oct. 13 at St. Louis this rule was protested by the St. Louis and Gulf coast chapters of the Institute of Scrap Iron and Steel Inc. and the national office of the institute.

# Steel Imports Less But Value Higher

IMPORTS of iron and steel products in August, except scrap, totaled 38,379 gross tons, compared with 41,388 tons in July and 48,170 tons in August, 1936, showing decline of 6.8 per cent and 20.3 per cent respectively, according to the bureau of foreign and domestic commerce. Despite the lower volume there was a rise of 22 and 21.5 per cent in value, respectively. A heavy increase in steel pipe imports contributed to this rise in value.

Steel pipe imports led in tonnage

## FOREIGN TRADE OF UNITED STATES IN IRON AND STEEL

	Gross Tons		Gross Tons	
	1937	1936	1937	1936
	Imports	Exports	Imports	Exports
Jan....	43,063	201,692	50,489	241,564
Feb....	41,628	290,987	43,358	213,802
March...	51,805	570,584	56,720	264,337
April...	68,197	683,674	49,277	301,987
May....	49,050	969,222	59,391	314,950
June....	44,771	826,534	59,910	294,951
July....	47,012	889,438	47,490	296,738
Aug....	61,489	836,319	60,697	295,341
8 mos....	407,015	5,318,524	427,773	2,217,884
Sept....			59,993	235,571
Oct....			64,509	261,882
Nov....			61,970	203,297
Dec....			52,584	244,156
Total...			666,838	3,162,694

with 11,185 tons, compared with 2205 tons in July, and 4003 tons in August last year. Germany contributed 10,296 tons of this product. Pig iron was second in tonnage with 7952 tons, compared with 8310 tons in July and 12,524 tons in August last year, 5167 tons coming from

## ORIGIN OF AUGUST IMPORTS

	Gross Tons			
	Iron ore	Pig iron	Manganese ore	Ferromanganese
Norway.....	14,459	200		491
Sweden.....	21,471			
Mexico.....	745			
Canada.....	1,200	383	53	120
Cuba.....	60,000		2,122	
Chile.....	99,450			
Newfoundland	9,000			
Iran.....	500			
Netherlands		2,202		
British India		5,167	3,834	
Soviet Russia			24,547	
Brazil.....			9,274	
Gold Coast...			9,110	
France.....				156
Japan.....				45
Total.....	206,825	7,952	48,940	812
Sheets, structural steel				
Skelp and sawplate				
Unif. Kingdom	11		18	
Belgium.....	104	3,325	1,278	1,386
Sweden.....	2		646	3
Australia.....	3			
Germany.....		19	304	73
France.....		803	632	322
Canada.....			1	
Austria.....			2	
Czechoslovakia			13	
Total.....	120	4,147	2,894	1,784

British India and 2202 tons from the Netherlands. Structural shapes were third with 4150 tons, compared with 7486 tons in July and 7264 tons in August, 1936. These came principally from Belgium and France.

Germany led in the total of imports with 14,368 tons, chiefly pipe; Belgium was second with 6696 tons, mainly structural shapes, bars and hoops and bands. British India was third with 5167 tons, all pig iron.

For eight months cumulative imports total 345,324 tons, valued at \$17,628,175, compared with 339,566 tons valued at \$13,942,263 in the same period of 1936, an increase of 1.7 per cent in quantity and 26.4 per cent in value.

Scrap imports in August were 23,110 tons, valued at \$321,428, in comparison with 5824 tons valued at \$83,785 in July, an increase of 297 per cent in volume and 284 per cent in value. Total scrap imports for eight months were 61,691 tons, valued at \$845,045, compared with 88,207 tons, valued at \$829,579, in the corresponding months of 1936, a decline of 30 per cent in quantity and an increase of 1.9 per cent in value. Canada supplied most of the scrap in both periods.

## UNITED STATES IMPORTS FOR CONSUMPTION OF IRON AND STEEL PRODUCTS—BY PRODUCTS

Articles	(In Gross Tons)		
	Aug. 1937	July 1937	January thru Aug., '37
Pig iron.....	7,952	8,310	76,127
Sponge iron.....	52		2,180
Ferromanganese (1)....	812	2,598	20,662
Spiegelisen.....	1,442	3,440	13,894
Ferrochrome (2).....	7	17	240
Ferrosilicon (3).....	376	219	1,880
Other ferroalloys (4)....			52
Steel, ingots, blooms....			124
Billets.....	146	150	1,385
Concrete reinf. bars....	58	95	3,603
Hollow bar drill steel...	238	146	1,759
Bars, solid or hollow...	2,894	4,823	36,276
Iron slabs.....			1
Iron bars.....	111	71	1,341
Wire rods.....	1,475	1,045	10,839
Boiler, other plate....	5		204
Sheets, skelp, saw plate	120	350	8,325
Die blocks or blanks....	14	4	91
Tin plate, taggers' tin and terneplate.....	10		162
Structural shapes.....	4,150	7,486	62,015
Sashes, frames (5)....			
Sheet piling.....	399		2,161
Ralls, fastenings.....	136	1,032	6,539
Cast iron pipe, fittings.	181	272	1,958
Malleable iron pipe fgs.	33	12	287
Welded pipe.....	1,105	343	7,107
Other pipe.....	9,866	1,578	25,990
Cotton ties.....		105	454
Other hoops and bands..	1,784	3,584	20,995
Barbed wire.....	1,781	1,767	10,638
Iron and steel wire....	493	239	3,478
Teleg. and tele. wire..	4	2	16
Flat wire and strips....	307	281	2,443
Wire rope and strand..	237	404	2,498
Other wire.....	79	380	2,840
Nails, tacks, staples..	1,368	1,827	12,716
Bolts, nuts, rivets....	109	94	467
Horse and mule shoes..	94	26	277
Castings and forgings..	541	488	3,300
Total, gross tons.....	38,379	41,188	345,324
Iron and steel scrap....	23,110	5,824	61,691

GRAND TOTAL..... 61,489 47,012 407,015  
(1) Manganese contents; (2) chrome content; (3) silicon content; (4) alloy content; (5) formerly included with "Structural shapes."

Comparative statistics follow which show imports of iron and steel products from the standpoint of value:

# Activities of Steel Users and Makers

ORDERS booked by General Electric Co., Schenectady, N. Y., during the first nine months this year amounted to \$305,276,556, an increase of 44 per cent over the \$211,891,038 received during the same period last year. Orders received during the third quarter totaled \$88,010,937, compared with \$74,922,441 during the corresponding period last year, an increase of 17 per cent. The third quarter and first nine months this year were the largest of any corresponding periods since 1929.

International Harvester Co., Chicago, is moving its general offices to the Harvester building, 180 North Michigan avenue, from the old Harvester building, 606 South Michigan avenue, which it has occupied since 1907.

Westinghouse Electric Elevator Co. has purchased the assets, business and good will of the A. B. See Elevator Co. Inc. at Jersey City, N. J., and is moving its headquarters from Chicago to Jersey City. Plans are underway for increasing the manufacturing aisle space at the plant by approximately 50 per cent and for doubling office space. The company, however, will continue operations at Chicago.

Consolidated Metals Corp., Detroit, producer of babbitt, solder, tinning, metal, bronzes and other nonferrous cast materials, is now casting standard S.A.E. analyses of bearing bronzes in permanent molds. Cored and solid bars are poured in diameters from 1-inch outside diameter up to 12 inches, and in varying lengths. Previously sand cast, bars made by the new method are claimed to provide a denser structure, leading to longer wearing qualities.

Auto-Diesel Piston Ring Co., Cleveland, has increased its production facilities and is producing a wider range of types and sizes. Rings for large bore combustion and steam engines, as well as for air and hydraulic cylinders, can be furnished up to and including 33-inch diameter. Included are conventional types of step cut, angle cut and butt joint snap rings, in compression and oil control styles, as well as 2 and 3-piece combination rings for high pressure service, also sectional packing rings. The company is placing special emphasis on the use of high grade alloyed irons and low friction bronzes to assure long piston ring life and preserve cylinder walls.

# Men of Industry

**C**HARLES P. BETZ has been appointed superintendent of the new coke plant now being erected by the Hanna Furnace division of Great Lakes Steel Corp., Detroit. A graduate of Case School of Applied Science, Cleveland, he was associated with the Central Furnaces division of American Steel & Wire Co., Cleveland, until 1916 when he became active with the coke oven department of Youngstown Sheet & Tube Co., Youngstown, O., continuing there until 1926 when he was named superintendent of coke plant for the Central Alloy plant of Republic Iron & Steel Co., Massillon, O., later the Central Alloy division of Republic Steel Corp. The Great Lakes coke plant will be placed in operation about Jan. 1.

M. F. May, since 1930 associated with Young Radiator Co., Racine, Wis., manufacturing heat transfer products for cooling and heating in the air conditioning industry, has been elected a vice president. He will remain in charge of sales of the catalog products division.

Elmer F. Weiss has been appointed manager of the Detroit office of Cutler-Hammer Inc., Milwaukee. He succeeds A. R. Johnson, who has recently been named manager of the company's merchandising sales division. He began his career with Cutler-Hammer after graduating from Carnegie Institute of Technology in 1922.

F. J. Woldrich, who joined the Cutler-Hammer sales staff in 1933,



Charles P. Betz

has been placed in charge of the newly opened branch sales office in Portland, Oreg.

E. T. Rees has been named manager of the Indianapolis office of Cutler-Hammer. Mr. Rees has served in the electrical engineering sales field for 25 years, the past five being in the employ of Cutler-Hammer.

R. E. Zimmerman, vice president, United States Steel Corp., New York, and named by the American Iron and Steel institute as its nominee for membership on the American Standards association board of directors, has been elected to membership by the board.

B. E. Pheneger, for the past two years superintendent of Central furnaces and docks, American Steel & Wire Co., Cleveland, has been appointed general superintendent of both Central furnaces and the Cleveland coke works. H. F. Dobscha has been made superintendent of Central furnaces, while W. R. Pendry continues as superintendent of the coke works.

M. W. Reed, vice president, Amer-

ican Steel & Wire Co., Cleveland, under whose department the metallurgical division operates, announces the following personnel changes in that division: J. R. Thompson has been appointed assistant manager of the metallurgical department at Cleveland; L. H. Dunham has been made district metallurgist, Chicago district; R. H. Barnes takes a similar post in Cleveland, and R. R. Leo has been appointed assistant division metallurgist at Cleveland.

Bonnell W. Clark, vice president and general manager, Westinghouse Electric Supply Co., New York, has recently been elected president. Mr. Clark has been continuously associated with the electrical wholesaling business since 1906, except for a period from 1916 to 1920 when he served the Gould Storage Battery Co. as sales manager. He joined the Westinghouse organization in 1925 as special representative; in 1929 was made general manager and in 1932 became vice president and a director.

William J. Kelly, Chicago industrial executive and civic leader, has been elected president of the Machinery and Allied Products institute, national organization of machinery manufacturers. He is president of Arthur J. O'Leary & Son Co., Chicago, manufacturers of iron and steel products, and will continue in that position. He is also president of the Economic Club of Chicago. Mr. Kelly, as president of the institute, succeeds John W. O'Leary, chairman of the executive committee, Chamber of Commerce of the United States. Mr. O'Leary will remain a member and chairman of the institute's executive committee.

Other officers of the institute are: Vice president, Robert M. Gaylord, Rockford, Ill.; treasurer, Paul C. DeWolf, Providence, R. I.; secretary, Alexander Konkle, Chicago. Members of the executive committee are Harry C. Beaver and William C. Dickerman, New York; Charles E. Brinley and George H. Houston, Philadelphia; Maurice F. Dunne and John W. O'Leary, Chicago; Robert E. Friend and L. W. Grothaus, Milwaukee; Phillips Dennett, South Walpole, Mass.; Frederick V. Geier, Cincinnati; Robert W. Gillispie, Columbus, O.; W. B. McSkinnon, Athol, Mass.; Philip M. Morgan, Worcester, Mass.; W. S. Shipley, York, Pa., and Guy A. Wainwright, Indianapolis.

A. C. Merritt, vice president, Allis-Chalmers Mfg. Co., West Allis, Wis., was elected president of the Farm Equipment institute at the annual



Elmer F. Weiss



F. J. Woldrich



E. T. Rees

convention held in Chicago, Oct. 6 and 7. Other officers elected include: Executive committee chairman, Charles T. Ray, Avery Farm Machinery Co., Peoria, Ill.; first vice president, F. H. Clausen, Van Brunt Mfg. Co., Horicon, Wis. C. Gordon Cockshutt, Cockshutt Plow Co. Ltd., Brantsford, Ont., was elected a vice president and ten other vice presidents were re-elected.

H. C. Angster, secretary-director, National Association of Domestic and Farm Equipment, and Cal Sivright, Oliver Farm Equipment Co., Chicago, were elected members of the executive committee. G. W. Crampton, Deere & Co., Moline, Ill., and S. E. Barlow, Huber Mfg. Co., Marion, Ind., were elected honorary members.

R. O. Griffis, formerly research engineer for Bethlehem Steel Co., is now in England where he will serve



R. O. Griffis

as chief metallurgist at the strip mill Richard Thomas & Co. Ltd. is building in Ebbw Vale, Wales.

Ralph L. Wilson, previously metallurgical engineer, Timken Steel & Tube division of Timken Roller Bearing Co., Canton, O., has become associated with Climax Molybdenum Co., New York, as metallurgical engineer in its development field. He will make his headquarters in the Canton office. A graduate of Lehigh university in 1921, Mr. Wilson served on the metallurgical staff of United Alloy Steel Corp. and its successor from 1921 to 1928. He then was appointed assistant metallurgical engineer of the Timken organization, becoming metallurgical engineer in 1933. He is author and co-author of numerous articles and technical papers dealing with the metallurgy of steel for high temperature applications.

Frank J. Miller has been elected



F. J. Miller

by New Departure, division of General Motors Corp., Bristol, Conn., as manager of its Chicago sales and engineering office at 230 North Michigan avenue, succeeding G. W. Fowler, deceased. Mr. Miller has been associated with New Departure's sales activities in the Chicago territory for over 18 years.

H. Sidney Smith, consulting engineer for Union Carbide Co., has been awarded the Samuel Wylie-Miller medal by the American Welding society for meritorious contributions to the science and art of welding. For many years Mr. Smith was associated with the founder of the medal, in the development of welding methods. He has served as president of the British Acetylene association and the International Acetylene association. He came to this country from his native England in 1911, and in 1918 was made consulting engineer for the Union Carbide Co., after serving the Prestolite Co. Inc., Indianapolis as works manager.



G. R. Munschauer

Who, as noted in STEEL, Sept. 27, page 21, was honored with a testimonial ceremony and presentation Sept. 14 on the occasion of his fortieth anniversary with the Niagara Machine & Tool Works, Buffalo

## Died:

WILLIAM L. RICKARD, head of Rickard & Co. Inc., New York, advertising agency, in White Plains, N. Y., Oct. 5. Mr. Rickard began his business career 35 years ago in the sales department of Otis Elevator Co. In 1912, with Clifford Sloan, Mr. Rickard formed the advertising agency of Rickard & Sloan Inc., and when Mr. Sloan retired two years ago the firm became Rickard & Co.

Raymond Ross Jardine, 48, Pittsburgh district sales manager for National Tube Co., in Pittsburgh, Oct. 6.

James G. Hogan, 52, district sales representative in Cleveland for Republic Steel Corp., Cleveland, in that city, Oct. 4.

Edward L. Stevens, 43, for the past year manager of sales of commercial wire rope, Union Wire Rope Corp., Kansas City, Mo., in that city, Sept. 21.

George Finley Richmond, 48, manager of the Toronto branch, Canadian Car & Foundry Co. Ltd. since 1917, Sept. 29. He was a native of Buffalo and a graduate of Yale.

Andrew W. Bell, 60, partner in Bell Bros., metal dealers, Pittsburgh, in that city, Oct. 7. He had been in business 40 years with his brother, Albert Joseph Bell.

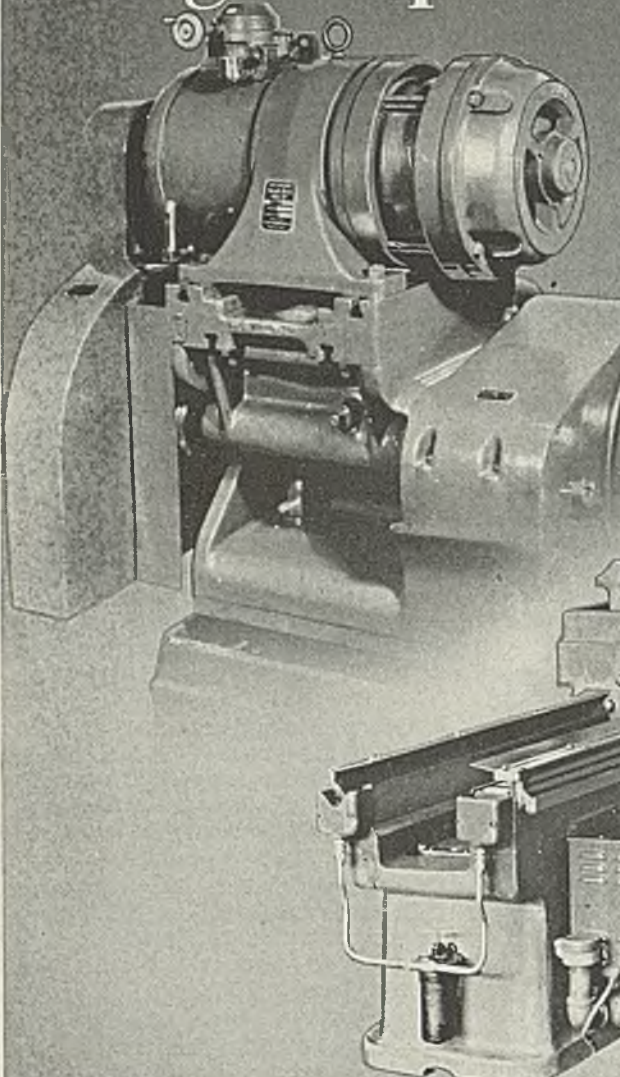
Ferdinand H. Kronjaeger, 49, night superintendent at the Beech Bottom plant of Wheeling Steel Corp., Oct. 6 in Ohio Valley General hospital. He had been associated with Wheeling since he was 14.

Ernest J. Seiber, 65, assistant manager, Pittsburgh works of Standard Sanitary Mfg. Co., Oct. 4 at his home in Pittsburgh. He had been associated with the company for more than 30 years.

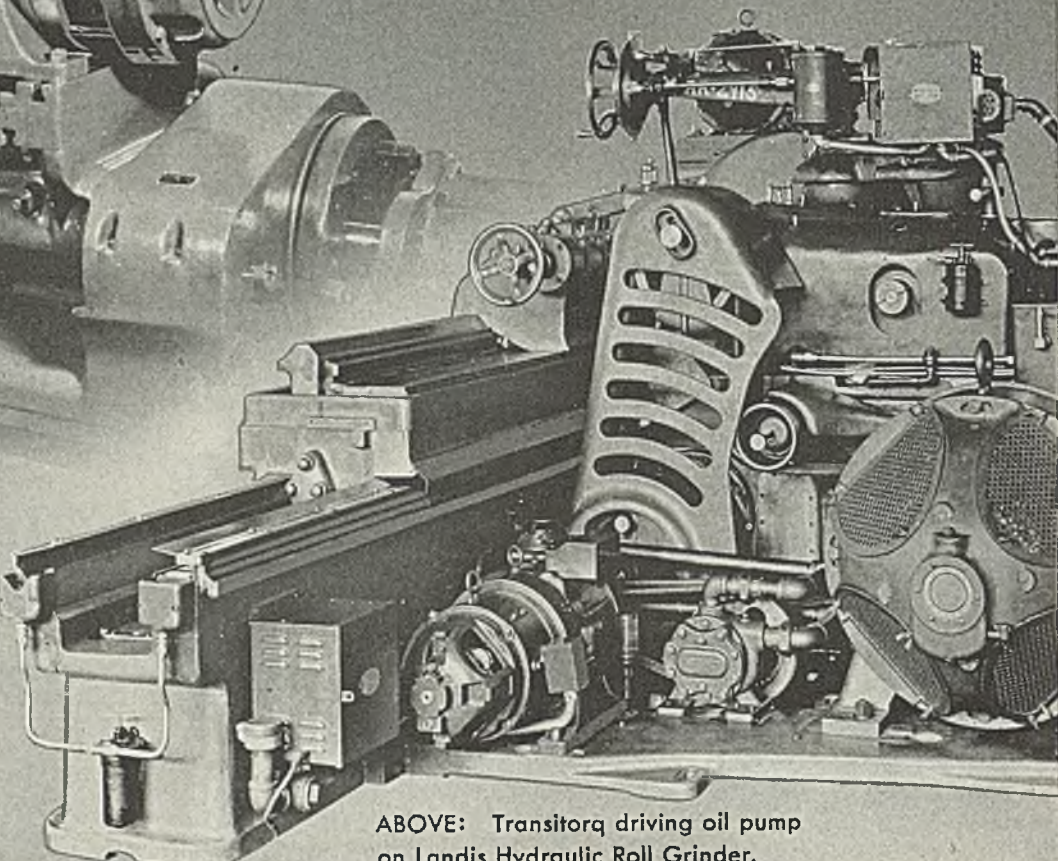
John E. Gilson, 59, president, J. E. Gilson Co., Port Washington, Wis., manufacturer of grey iron castings, Sept. 30. Before founding the Gilson company in 1916, he was associated with his father in the Gilson Mfg. Co., Port Washington.

Frank R. Thompson, commercial manager of the Gulf Steel division, Republic Steel Corp., Oct. 10 at his home in Gadsden, Ala. He went to the Gadsden works from Ensley in 1909. He was a civic leader in Gadsden, being a member of the chamber of commerce and other organizations.

# Right Speeds to Grind Right



LEFT: Transitorq driving the work on a Landis Roll Grinder.



ABOVE: Transitorq driving oil pump on Landis Hydraulic Roll Grinder.

• No matter what the diameter of the work or nature of the material to be ground, Transitorq makes it possible to select exactly the *right* speed for the *best* finish. With this Landis Hydraulic Roll Grinder there is no such thing as approximation:—there are no *steps* in speed, because Transitorq is *infinitely adjustable*, either while stationary or

grinding. At the touch of a finger the operator obtains the speed he wants. He is complete master of the job. Our engineers will be glad to show what Transitorq can do for your machines.

New Departure, Division General Motors Corporation, Bristol, Connecticut. Branch Offices at Chicago, Detroit and San Francisco.

**NEW DEPARTURE**  
*Variable Speed*  
**TRANSITORQ**





# MIRRORS OF MOTORDOM

DETROIT

**D**ESPITE the fact most of the new cars have power plants which practically duplicate those used in last year's designs, with some minor improvements, there are a number of new engines which will appear shortly; some already are in production, others still in process of being tested.

One interesting design is the new V-16 engine which will be offered in the large Cadillac. It is a 185-horsepower unit which features a 135-degree angle between opposing cylinder blocks. Compared with last year's 16-cylinder engine, it is 250 pounds lighter, having 41 cubic inches displacement per 100 pounds compared with 35 cubic inches in the old design. Bore and stroke are the same, 3 1/4 inches. By flattening out the V-type engine, it has been possible to effect a reduction in wheelbase of 13 inches without sacrificing driver comfort. Height of the engine, excluding accessories which are mounted in the cradle between the cylinders, is only 16 inches, compared with 29 inches on the former design. The motor is cast *en bloc*, with long water jackets, side valves and a nine-bearing crankcase—a real tribute to the skill of Cadillac foundrymen.

## Cadillac To Show Five Lines

Cadillac will have five lines on display at the show in New York next week—the La Salle with 125-horsepower 90-degree V-8 engine; a radically restyled Cadillac 60 with complete new body, no running boards and a 135-horsepower 90-degree V-8 engine; the standard Cadillac V-8 with about the same engine as the 60 model; the Cadillac Fleetwood model with 140-horsepower 90-degree V-8 engine; and the new V-16 Cadillac with the engine described above.

Experiments are reported being pushed at the Chrysler engineering laboratory on a new type of V-8 engine of about 100-horsepower rating. What car this power plant will appear in is not known definitely as

BY A. H. ALLEN

Detroit Editor, STEEL.

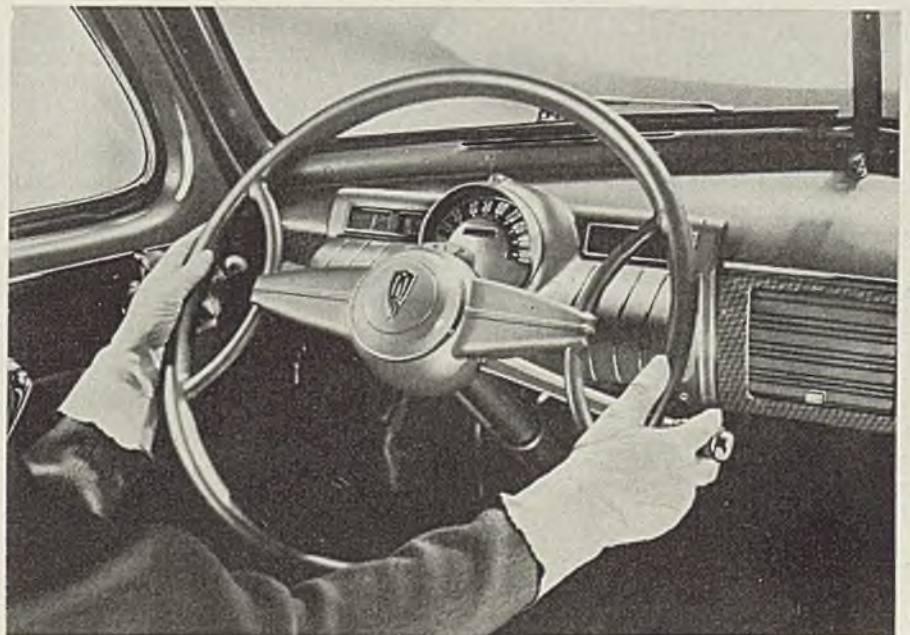
yet. One possibility might be its use in a rebirth of Chrysler airflow models which have been discontinued for 1938. Several former Ford engineers are now at work in the Chrysler laboratories perfecting details of the new engine.

More and more it appears Ford shortly will be in the field with a new and larger power plant. Reports on the new engine indicate it is still of the V-8 type but with bore increased to 3 3/16 inches from the present 3 1/16 inches. Presumably the new engine would be installed

in a third and larger Ford model to be introduced in a higher-priced class than the two present Ford lines. This new model apparently will not be ready for display at the same time as the other 1938 models. Delivery of some materials has been set for Nov. 1.

Details of the extensive Ford expansion program, which have been reported from time to time in this department, made big news here last week following release of the information to newspapers. A summary of developments in process at the Rouge plant is presented elsewhere in this issue. Not included in the details of the \$40,000,000 program was any reference to the new press building and body shop which architects currently are figuring, or

## Olds Steering Wheel and Instrument Panel Assembly



**M**OST unusual design which has yet appeared on 1938 models is the Olds steering wheel and instrument panel assembly. Note how the wheel gives clear vision of the instrument unit which is set out from the dash in a composition casting. Also shown is the control lever for automatic transmission now optional equipment available on all Olds models



# MIRRORS OF MOTORDOM

to the new tool and die shop being equipped at the moment.

Production of Ford V-8s was scheduled to start last week, but a number of difficulties were encountered, chiefly in regard to sheet metal work for fenders and tops, which delayed the return to volume assemblies. Such nightmares over dies and press operation are not unusual when a new model is started, and it is expected they will be short lived.

Steel releases from Ford continue slow, but are picking up from other producers, although the tendency continues to be toward buying for only a short period ahead. Buick recently placed steel for 30-45 days of production, with assemblies currently running close to 1200 daily.

**F**OUR developments are being stressed by Buick for 1938—the new “turbulator” dome-shaped aluminum alloy piston which is claimed to permit controlled burning of fuel mixtures and a higher compression ratio without detonation; the new coil spring rear suspension system which in combination with airplane-type shock absorbers improves ride and steering qualities; a new method of body mounting by which body bolts are located in “quiet” zones, or zones of least vibration in the frame; and an automatic transmission, optional at extra cost on the smallest or 40 series. The latter is the same device as that available on Olds models.

Use of coil springs on the rear by Buick has eliminated eight points requiring lubrication, since lubrication of the rear suspension is now unnecessary. The coil spring system used on front wheels has been improved with the addition of threaded steel bushings in the lower control arms better to resist wear and retain lubricants. Lubrication of the steering linkage also has been simplified by a new type of direct cross steering on the 40 and 60 series. Elimination of more than a dozen parts and assemblies has been effected by the new hookup.

Welding is used throughout the new Buick frames to make them rigid, single units. Side rails are of channel section with maximum depth of 7½ inches on the two smaller models and 9 inches on the two larger models, an increase of ¾-inch and 1¾ inches respectively. A tubular cross member has been added between the side rails at the top of the “kick-up” in the rear. Batteries on the new

## Automobile Production

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

	1935	1936	1937
Jan.	300,335	377,244	399,634
Feb.	350,346	300,810	383,698
March	447,894	438,943	519,177
April	477,059	527,625	553,415
May	381,809	480,518	540,357
June	372,085	469,368	521,139
July	345,297	451,206	456,909
Aug.	245,075	275,934	405,064
8 mos.	2,919,900	3,321,648	3,779,393
Sept.	92,728	139,820	*192,400
Oct.	280,316	230,049	.....
Nov.	408,550	405,799	.....
Dec.	418,317	518,958	.....
Year	4,119,811	4,616,274	.....

Estimated by *Ward's Automotive Reports*

Week ended:		
Sept. 18	.....	30,150
Sept. 25	.....	28,030
Oct. 2	.....	†44,330
Oct. 9	.....	†71,958
Oct. 16	.....	89,680
	Week ending	
	Oct. 16	Oct. 9
General Motors	43,600	†31,875
Ford	300	† 213
Chrysler	27,250	†22,450
All others	18,530	†17,420

\*Estimated. †Revised.

Buicks, as in several other new models, are installed under the hood. Speaking of electrical equipment, improvements have been made in generators of practically every new car, capacity being increased, air cooling added in some cases and automatic voltage control being installed. The more general use of radios, heaters, cigarette lighters, twin horns, defroster fans, auxiliary lights and other accessories requiring electrical current has imposed new demands upon batteries, which are being met with larger generators.

**F**ORTY-SEVEN progressive improvements affecting appearance, comfort and performance” declares Dodge in speaking of its new models, but outwardly it is difficult to see where this many changes have been made. New, but in most cases only slightly altered from 1937 lines, are radiator grille, hood louvres, fenders, windshield, instrument panel, headlamps, door and luggage compartments, brake drums, engine impulse neutralizer, muffler, clutch facings, clutch baffle and release bear-

ings, generator and interior treatment.

Considerable attention has been paid to silencing of bodies, one innovation being the use of chassis outriggers equipped with rubber spools by which chassis and body are kept from making actual metal-to-metal contact. Ride has been improved by a number of minor changes, and semi-elliptic rear springs are longer and of thinned-down leaves of Chrysler's amola steel. Cast iron brake drums have been increased in diameter from 10 to 11 inches and are of ribbed design for rapid cooling.

Engineers, by the way, are paying particular attention to brake drums this year, especially since field reports of cars of as late a vintage as 1937 showing brake drums badly out of round as a result of heat warpage.

**M**ORE light is thrown on the industrial expansion in the Mound road-Eight-Mile road vicinity with the news last week that Carboly Co. Inc. has purchased a 40-acre tract of land in that area adjoining the west side of the Grand Trunk railway. While plans for a new plant on this property have not been prepared as yet, it is the company's intention to erect a building there in the near future for the manufacture of cemented carbide cutting tools, dies and grinding wheel dressers, involving expenditure of a reported \$750,000. The company now has plants in Detroit, Stamford, Conn., and Cleveland.

A 12-acre site has been acquired in the same vicinity by the Divco Twin Trunk Co., now occupying quarters jointly with Continental Motors Inc. on East Jefferson avenue. Officials of the Divco company report they have no building plans as yet for the new location. Two other industrial companies are said to be eyeing property in this same area for future expansion, while several automobile companies are making quiet surveys of nearby land.

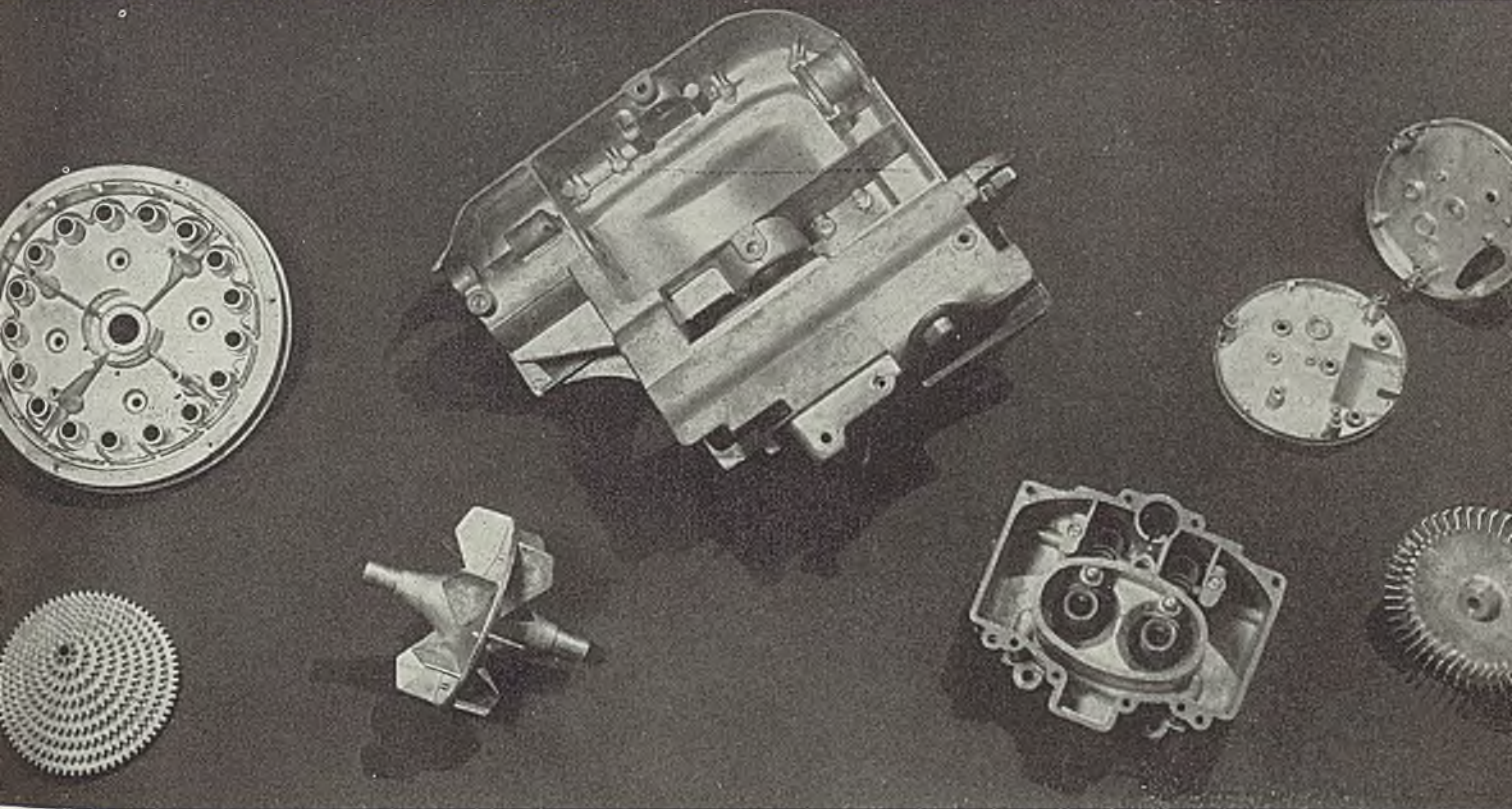
Equipment interests are experiencing a quiet season, but expect to start activity on new programs about Nov. 1—at least they are hoping the present letdown in business will not discourage new tooling in automotive plants. In general, equipment buying this year has been almost entirely for plant expansion programs, with a minimum of replacement buying. Next year the outlook is for active replacement of obsolete tools, as well as for the installation of a considerable volume of new machinery which combines several operations on one machine. Since it is practically impossible now to persuade a machine operator to handle more than one machine, the natural outgrowth is to combine operations into a single machine to effect production economies.

THE NEW JERSEY ZINC CO  
ZINC ALLOYS FOR DIE CASTING

OBILES

ELECTRICAL APPLIANCES

BUSINE



# FRANKLY, WE'RE AMAZED!

Unless you are intimately associated with the die casting industry, it will be difficult for you to fully appreciate the spectacular progress of this modern branch of engineering. Since the development of the new alloys, based on Horse Head Special Zinc, the widespread utility of die castings has been inevitable. As metallurgists, we had every confidence in the ability of the metal, but it remained for the die casting engineer, with an amazing skill and ingenuity, to create die castings typified by those shown on this page.

Each year, for the past eight years, the commercial die casters of the country have sent us their outstanding ZINC Alloy Die Casting applications for exhibit at the Annual Metal Expositions. Each year this collection has served as a visual report of progress. Now, in our ninth consecutive display, we present an array of die castings that cannot fail to impress the alert engineer or production man.

Visit us in booths F-32 and F-36, Atlantic City Auditorium, October 18-22, and be convinced of the engineering acceptance of this amazing metal and method.



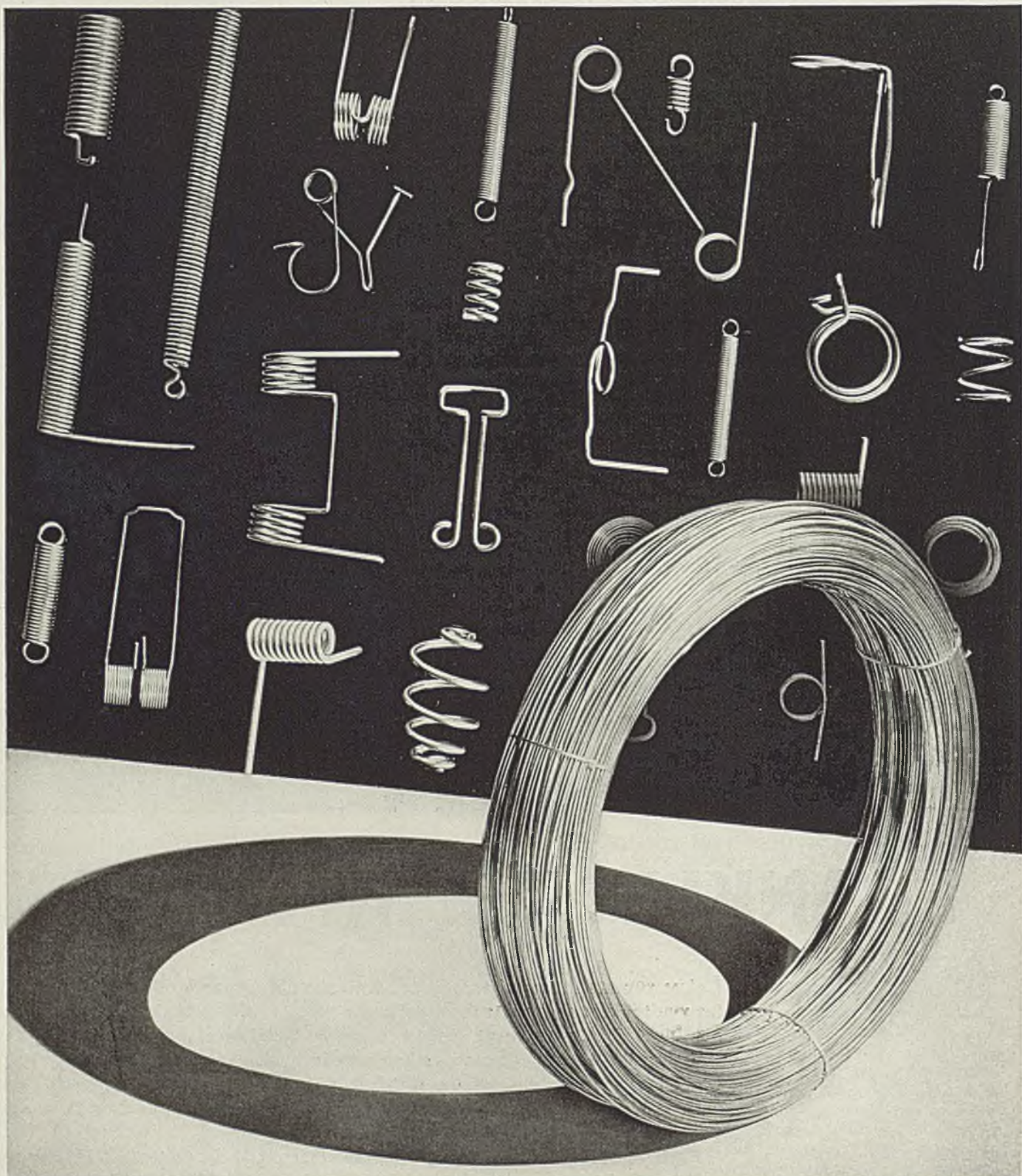
## THE NEW JERSEY ZINC COMPANY

160 FRONT STREET

NEW YORK, N. Y.

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

HORSE HEAD SPECIAL ( 99.99+% ) ZINC



Increase the dependability of your springs with the uniform quality and precision standards of EAGLE Music Wire... Famous for half a century

**WASHBURN WIRE CO., Inc.**, 550 East 118th St., New York City



# WINDOWS OF WASHINGTON

WASHINGTON

CONGRESS will reconvene Nov. 15, in accordance with a proclamation issued by the President last week.

The President had been committed for a long time to a special session, but congressional leaders urged against it. However, as usual, Mr. Roosevelt won. Congressional members, overwhelmingly opposed to this extra session, will come back for work with no good feeling toward the Chief Executive, many observers believe. However, that does not seem to worry him.

Many things of special interest to the steel industry will be on the books as the session convenes. Not the least of these will be scrap control legislation. This may be held over until the January session, but it is quite possible the hearings start during the extra session.

Many pending bills were detailed in this column in the issue of Aug. 30. Status of the legislation will be just what it was when congress adjourned.

Other legislation affecting the steel, and every other industry will be hours and wages, tax revision and other similar matters.

Immediately following his announcement of a special session last week the President made another fireside chat to the country in which he said it is not a bad thing for the tranquility of the country to have congress in session.

He pointed out the high cost of living is a deterrent to business and industry—not mentioning the fact that for several years he has preached the doctrine of higher prices.

Mr. Roosevelt said monopolies must be ended and stated the present antitrust laws are not adequate to break up alleged monopolies.

## UNEMPLOYMENT CENSUS TO BE WIDELY PUBLICIZED

John D. Biggers, glass manufacturer and administrator of the unemployment census, told a group of news writers he had accepted the

BY L. M. LAMM  
*Washington Editor, STEEL*

work as a dollar-a-year man because "I am a slightly idealistic guy."

Asked if he intended to use a lot of ballyhoo to put over the job, Mr. Biggers said he did not like the word "ballyhoo," but that about expresses it. He has gone out of his way to create a co-operative attitude among the newspaper men, realizing that if the papers are not with him, the job will not be a success.

The program is going to be dramatized highly and in addition to using newspapers and radio, he will use all other publicity mediums possible.

One point Mr. Biggers wants to get over to the unemployed is that they have nothing to gain and nothing to lose by filling out the blanks which will be sent to every home in the country. Efforts will be made to reach even transient workers where possible.

Interest in the census, he said, is evidenced by many blanks filled out through questionnaires already printed in newspapers. In surprisingly many cases, he said, the information is correctly supplied. The blanks as finally approved, will not be distributed before Nov. 16.

Mr. Biggers declared there was a demand for the census from all parts of the country and "there is good reason for its undertaking."

The writer tried to pin him down to answer the question "so what?" after the census results are known. He refused to even make a guess on the assumption his job only is to take the census and someone's else to say what shall be done with data obtained.

One reason for taking the census seems to be to satisfy curiosity as to who was right in estimating the unemployed. Another benefit may be to show congress how much money to appropriate for relief.

Certain inconsistencies are noted in the blank as are several ques-

tions over which Mr. Biggers has no control. Congress provided certain questions should be included. Experienced census collectors know how loath folks are to answer anything about their income and so that question has been put last. This was done, it is explained, because it has been the experience of census experts a person will answer down a card or questionnaire until they come to some question they do not want to answer—then they stop and answer no further. In this case, it is last, and no great harm will be done.

The fourteen questions are as simple as possible. Mr. Biggers believes results will be tabulated by Jan. 1.

## SECRETARY ROPER CONFIDENT BUSINESS WILL BE GOOD

A rosy picture of industry in future was painted last week by Uncle Dan Roper at his press conference. He issued a detailed statement made up by commerce department experts which, at least to his mind, seemed to indicate there was plenty to back his expectation of good business for the coming months.

"With regard to machinery sales at this time," he said, "all available indicators show they continue well above the level of last year.

"Machine tool orders during the first eight months of this year were 45 per cent higher than the monthly average during 1936; foundry equipment sales were higher by the same margin; air conditioning equipment has gained 78 per cent over last year, and most other types of machinery about which current sales statistics are available are maintaining an average substantially higher than during 1936.

"Even more improvement is marked in export trade. Foreign sales of industrial machinery in the first eight months of this year amounted to \$162,000,000 which is 46 per cent above the foreign shipments for the whole of last year. In agricultural machinery we exported over \$50,000,000 worth up to the end of August, compared with approxi-

mately \$44,000,000 for the entire year 1936."

Mr. Roper said he expected pauses in business from time to time, but considers these result from natural and normal factors and "may easily be tokens of sound adjustment."

#### **BUSINESS ADVISORY COUNCIL HOLDS FIRST FALL MEETING**

Edward R. Stettinius, chairman of the finance committee of the United States Steel Corp., was here last week attending the first fall meeting of Secretary Roper's business advisory council. He was substituting for Myron C. Taylor, a member of this body for several years but who has not attended recently.

The council this year has been more chary than usual of giving any information as to what it is doing or discussing. The organization has been "razzed" so much in the past for its reports being thrown into the waste basket by the President that its members evidently hesitate to talk.

Well-informed circles say the members were getting restive under the alleged treatment of the Chief Executive which was called to his attention. He is said to have replied the council's report generally reached him after he had already decided what he wanted to do. He suggested the reports be sent to him earlier. It is apparent the business men intend to do just this.

Since the President has become so interested in John D. Biggers, it is probable he will come to think more of the business council. Mr. Biggers is a member of the council and that is how he came to the attention of Mr. Roosevelt. Anyhow, the membership of the Roper committee is starting the year with great hopes of being able to do something for the administration and in that way leading the President to think in a little more kindly terms toward business and industry.

#### **PUBLIC CONTRACTS BOARD IS BEING REVAMPED**

The public contracts board established under the Walsh-Healey government contract law is being revamped and revised by the labor department, under which it operates. A new board has been appointed and succeeds the temporary unit which was named a year ago and which consisted of department of labor employes, because no appropriation was made for the board.

Up to this time the new board has not decided when or if hearings will be held on wages set under the law for the steel industry. While members of the new board are unprepared to say so at this time, it is fair to assume the setting of wages in the steel industry probably will be among the last undertaken, owing

to the fact wages in that industry are higher than in most others.

The three new members of the board include Thomas Holland, chairman, Oscar R. Strackbein and Robert N. Campbell. Their duties are to hold hearings and make findings on questions arising under the Walsh-Healey act, which, it will be recalled, requires manufacturers and dealers who make contracts in excess of \$10,000 with the government to comply with certain minimum wage, maximum hour and other conditions in the performance of the contract.

#### **CHAMBER OF COMMERCE PLANS BUILDING CONFERENCE**

Late in november or early in December the United States chamber of commerce will call a conference here to study causes for the slowing down of residential building and to suggest means for stimulating activity.

George H. Davis, president of the national organization, said "plans for the meeting are being developed by the chamber in co-operation with representatives of building material and equipment manufacturers, real estate interests, building supply dealers, and other interested parties."

In announcing the conference the chamber points out at the beginning of this year it was the general opinion there would be an increase over the 1936 volume of between 50 and 60 per cent. "In the past few months, however, the rate of increase has materially slackened so that it now appears that the increase will scarcely be more than half of that predicted."

It is stated that before the decision to hold the building conference a survey was made of steel manufacturers and of all interested in building to determine in what ways the national organization could be helpful in stimulating residential building. It was said "there was unanimity of opinion that a conference on private building this fall under the national chamber's auspices would be helpful, provided it developed practical ideas and suggestions which local chambers of commerce could put to work in their respective communities.

#### **ALUMINUM CO. WINS REVIEW OF DISSOLUTION**

The United States Supreme Court last week decided it would grant a review in the case of the government against the Aluminum Co. of America and hear argument to determine whether the justice department may continue its antitrust action to dissolve the company for alleged monopolistic practices.

The appeal was made by the company in an effort to prevent the government from further proceed-

ings in New York. The court took under review an opinion by a Philadelphia circuit court that the justice department may proceed with the suit aimed at the dissolving of the company.

The government charged the concern and 62 other defendants with monopoly and conspiracy to monopolize trade in the aluminum and related articles. A Pittsburgh federal district court had contended further action should be brought in Pittsburgh where an earlier suit had been filed in 1912.

The Supreme Court set hearings in the case for Nov. 8 and announced Chief Justice Hughes and Mr. Justice Stone took no part in consideration of the petition. No reason was assigned for their withdrawal.

#### **NAVY TO RECEIVE BIDS FOR MANGANESE ORE**

The navy department has specifications out announcing bids will be received on Oct. 29 for between 40,000 and 50,000 tons of manganese ore containing in excess of 40 per cent manganese.

It is announced here this will mean almost all of the domestic manganese producers will not be able to bid. Much criticism has arisen and there is a chance the navy may have to redraw its specification. This tonnage is reported to be for the surplus pile which the government wants to build up and for which the last congress appropriated some \$3,500,000 for manganese and other ores for the purpose of accumulation.

#### **Foreign Machine Tool Orders Rise Sharply**

Index of new machine tool orders compiled by the National Machine Tool Builders association, Cleveland, moved upward in September for the second successive month. This was the result of a sharp increase in foreign orders, more than sufficient to offset a decline in domestic.

September's combined index was 210.7, compared with 179.8 in August and 118.5 in September, 1936. Foreign orders increased from 50.3 in August to 91.7 in September. Domestic business declined from 129.5 to 119. Foreign orders accounted for 42 per cent of September's total, against 28 per cent in August, and 30 per cent in September, 1936.

Power-driven metalworking machinery was exported in August to the value of \$4,190,386, compared with \$2,234,789 in August, 1936, according to department of commerce. Sharpest gain was in boring mills and chucking machines. Other metalworking machinery exports totaled \$384,366, compared with \$205,425 in August of last year, a gain of 87 per cent.

## Industry Gradually Is Edging Out of Direct Line of Fire

IT IS extremely fortunate for industry that continued persecution at the hands of governmental and other agencies during the past several years has made its leaders callous, if not immune, to fresh attacks upon its interests. If this were not so, industrial executives would have had cause for deep concern over the statements made by certain government and labor union officials during the past week. For instance, President Roosevelt, in his so-called "fireside chat" last Tuesday evening, indicated his intention to press forward with policies which can only have the effect of retarding the march of recovery. His determination to call congress into session in November for the purpose of considering wage-and-hour and agricultural control legislation certainly runs counter to the opinion held in industrial circles, namely, that such arbitrary meddling with the economic system simply stores up future headaches for everybody.

Wage-and-hour and AAA controls during the past four years have not worked well enough to justify continuing them in the manner desired by the President. We do not need super-keen memories to recall that right after March 4, 1933, industry enjoyed a sharp upturn which extended into July. That spurt was followed by a prolonged sidewise movement, which in retrospect appears to have been an automatic economic adjustment—forced by the fact that wages, prices, etc. had advanced too rapidly in that brief boom period.

### False Premise Behind Governmental Policy Brings Period of Adjustment To Restore Balance

Today industry again is in a sidewise movement, and we have excellent evidence that the inevitable law of supply and demand has injected itself into our economic system in order to right the unbalanced condition of demand, supply and price. Moreover, we can well believe that the unbalanced condition was caused by the undue pressure of government to hike wages, shorten work periods, and otherwise to increase the cost of production more rapidly than the increased burden could be borne by the national income.

In all of this, the government seems to be guided

by the thought that higher wages, shorter working periods and a wider distribution of employment creates additional or increased purchasing power and that this increment in buying capacity is readily translated into increased consumption and thereby increased production. Unfortunately this conception overlooks the element of price. If higher wages are forced—as they have been in recent months—to the point where payrolls are increased without a parallel increase in production, then the cost of production goes up and the apparent increase in purchasing power disappears.

That is what has happened since last April and May. Right now buyers are engaging in a mild strike. We are witnessing the effect of the automatic brake which economic law imposes when our system gets out of balance.

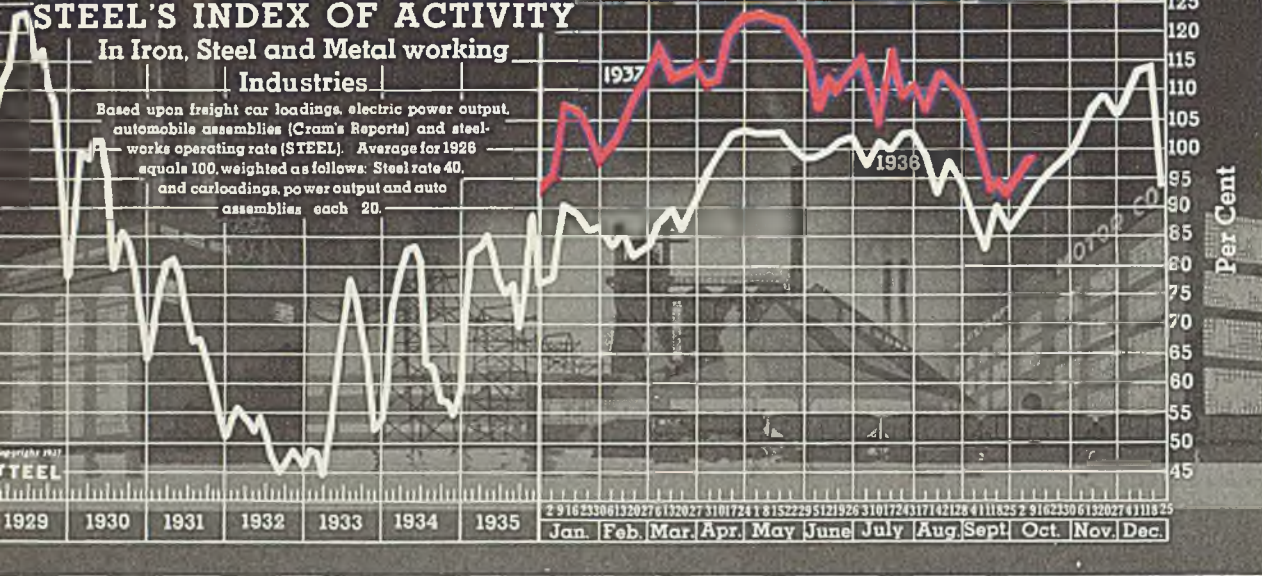
In view of this experience it is difficult to understand just why our government should rush headlong into legislation that will further complicate an already difficult situation.

### Labor's Internal Struggle Weakens Its Prestige; Industry Will Profit in Long Run By Moderation

In Denver and Atlantic City the chief executives of A. F. of L. and CIO are holding conventions, the principal purpose of which seems to be to determine which camp excels in mud-slinging. The feud between the two already has cost the nation millions of dollars in wages, destruction of property, loss of life and curtailed production and profit due to jurisdictional disputes, entirely aside from losses caused by disagreements between employers and employes. This fight is hurting the prestige of the legitimate labor movement in this country, yet the leaders, like the President of the United States, persist in pushing on relentlessly in the wrong direction.

In one respect, these mistakes on the part of the federal administration and of union labor leaders present a slight degree of encouragement to industry. The bloom is off the peach in respect to the one-time popular sport of making industry the scapegoat for the nation's troubles. In his radio chat, the President indulged in less invective against industry than in any previous address involving business problems since he assumed office. Likewise labor union chieftains at Denver and Atlantic City thus far have been directing their fire at one-another rather than at employers.

Industry is husbanding its strength, while some of its self-designated opponents are dissipating theirs.



STEEL'S index of activity gained 2.2 points to 98.8 in the week ending Oct. 9:

Week ending	1937	1936	1935	1934	1933	1932	1931	1930
July 31	109.1	102.6	78.4	64.6	75.8	46.1	68.9	79.2
Aug. 7	107.3	98.7	64.6	73.4	74.7	45.1	67.0	85.6
Aug. 14	113.8	92.6	71.5	61.4	74.2	44.6	67.4	86.2
Aug. 21	110.3	97.9	77.0	60.3	71.6	44.9	67.3	88.5
Aug. 28	108.5	94.0	77.3	55.1	70.3	45.2	66.5	87.4
Sept. 4	104.8	87.5	70.9	53.5	65.5	45.4	65.3	79.0
Sept. 11	94.3	83.1	70.1	58.7	69.1	44.9	60.9	85.9
Sept. 18	95.0	90.1	69.4	58.1	68.2	47.8	65.6	86.2
Sept. 25	93.0	86.2	68.5	59.3	66.9	48.0	65.2	83.8
Oct. 2	96.6†	89.0	73.3	54.7	67.4	47.7	62.4	81.0
Oct. 9	98.8*	93.4	74.9	56.4	66.0	48.4	61.5	79.4

†Revised. \*Preliminary.

## Gains in Power and Auto Output Buoy Activity Index

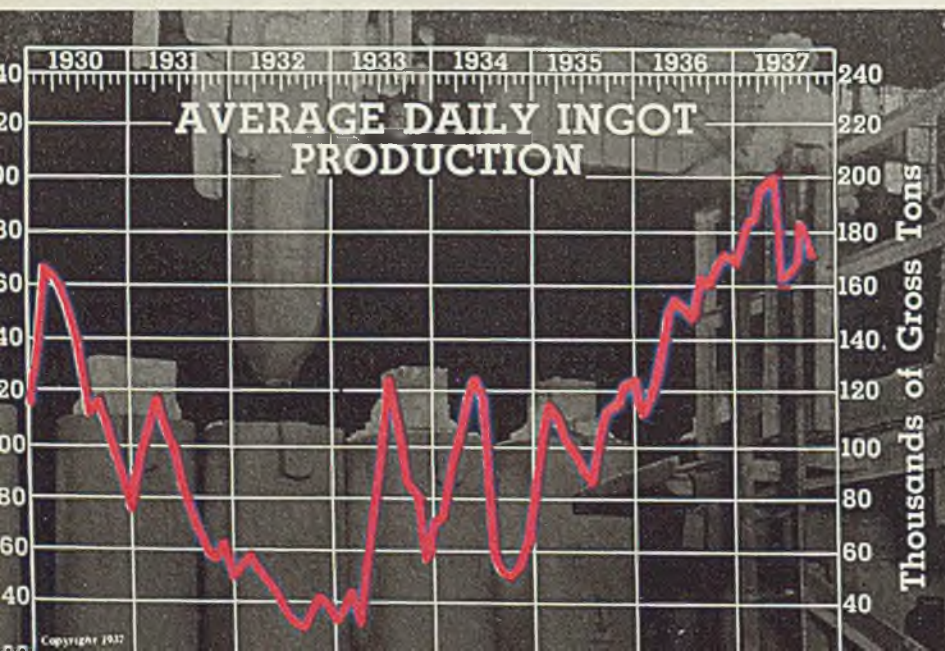
IN SPITE of contraseasonal weakness in revenue freight car loadings and a continued downward trend in the rate of steelworks operations, STEEL'S index of activity in the week ending Oct. 9 recorded a modest gain. The increase from 96.6 to 98.8 can be attributed to a slight upturn in electric power output and to a sharp spurt in automobile production which more than offset the recessions in the two other barometers.

While activity unquestionably is in a sidewise move-

ment—which probably constitutes an automatic economic adjustment of the unbalanced condition of supply, demand and prices—there are indications that this indefinite trend will be of short duration.

Last year car loadings eased off in the second week of October only to touch the year's high in the fourth week. Also, the rate of steelworks operations faltered in mid-October and then started upon an upward march which continued into May of the present year. Automobile production this year in the week ending Oct. 9 is about on a par with the figures for the week ending Nov. 7 in 1936.

If new business materializes in time to prevent the steel rate from sinking below the level of the lower sixties, industry's activity curve may still trace a pattern similar to that of the fourth quarter of 1936.



	Gross Tons		
	1937	1936	1935
Jan.	182,181	112,813	106,302
Feb.	184,361	118,577	115,595
March	193,209	128,576	110,204
April	195,072	151,625	101,562
May	198,213	155,625	97,543
June	160,914	153,263	90,347
July	168,763	150,874	87,224
Aug.	186,992	161,351	1079,97
Sept.	172,075	160,043	113,000
Oct.	.....	168,333	116,398
Nov.	.....	173,496	121,170
Dec.	.....	170,448	122,936



# BUSINESS

## TREND

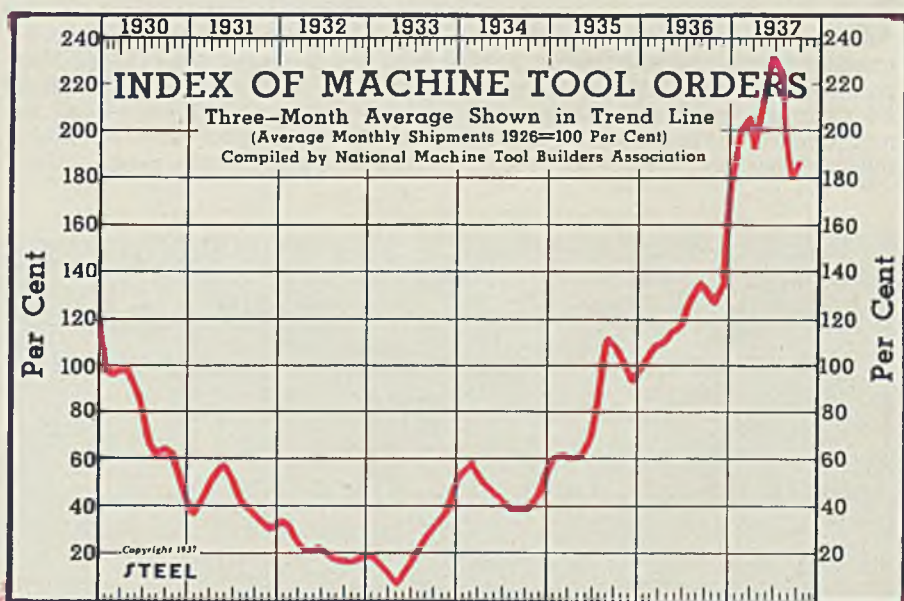
### Steel Shipments Decline Moderately in September

	Gross Tons		
	1937	1936	1935
Jan.....	1,149,918	721,414	534,055
Feb.....	1,133,724	676,315	583,137
March.....	1,414,399	783,552	668,056
April.....	1,343,644	979,907	591,728
May.....	1,304,039	984,087	598,915
June.....	1,268,550	886,065	578,108
July.....	1,186,752	950,851	547,794
Aug.....	1,107,858	923,703	624,497
Sept.....	1,047,962	961,803	614,933
Oct.....	.....	1,007,417	686,741
Nov.....	.....	882,643	681,820
Dec.....	.....	1,067,365	661,365



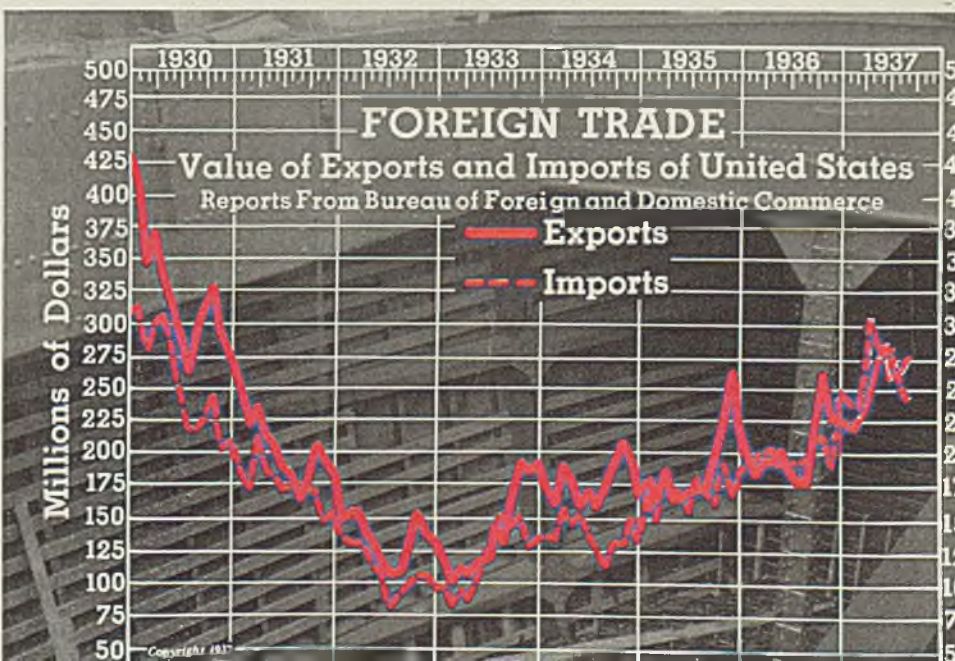
### Machine Tool Index Up Slightly in September

	1937	1936	1935	1934
Jan.....	201.7	102.6	61.3	56.5
Feb.....	207.7	107.1	61.5	58.2
March.....	192.4	109.4	60.3	50.9
April.....	219.8	114.4	60.3	48.5
May.....	234.2	116.6	67.1	46.8
June.....	227.6	124.5	76.7	42.6
July.....	190.5	132.6	94.7	38.6
Aug.....	180.9	135.5	112.2	37.1
Sept.....	187.2	132.0	108.5	37.4
Oct.....	.....	127.5	102.9	40.5
Nov.....	.....	134.0	93.8	44.2
Dec.....	.....	180.4	89.9	54.1



### Favorable Trade Balance Continues Through August

	Dollars (000 omitted)			
	1937		1936	
	Exports	Imports	Exports	Imports
Jan.	221,550	240,396	198,654	187,482
Feb.	232,504	277,805	182,024	192,774
March	256,390	306,699	194,790	198,686
April	269,171	287,252	192,795	202,779
May	288,924	285,038	201,042	191,110
June	265,341	285,925	185,188	192,233
July	267,185	265,349	178,324	193,409
Aug.	277,695	245,707	178,249	195,016
Sept.	.....	.....	219,976	215,525
Oct.	.....	.....	264,708	212,001
Nov.	.....	.....	225,766	196,423
Dec.	.....	.....	229,739	244,321



# PRACTICING

# SAFETY in

BY F. E. FLYNN

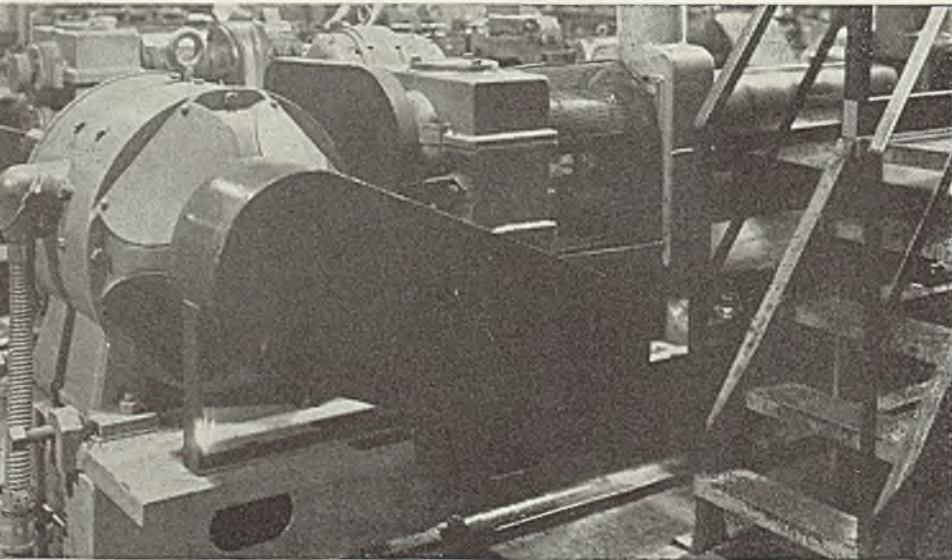
District Manager, Republic Steel Corp.  
Warren, Ohio

**S**AFETY in steelworks is an old problem. Basically it consists of about four-fifths education and one-fifth mechanical perfection. It is possible to make the mechanical fifth nearly perfect—to eliminate many causes of accidents as far as moving machinery and hot metal

are involved. The stage can be set so that safety rests squarely on the efforts of the individual workmen, and this has been done in the Niles tin plate mill of the Republic Steel Corp. A thoroughgoing job has been done in providing all known safety devices as precautionary

measures. The large portion of the safety problem is covered in a constant educational program through which each employe takes part in a safety conference at least once each month.

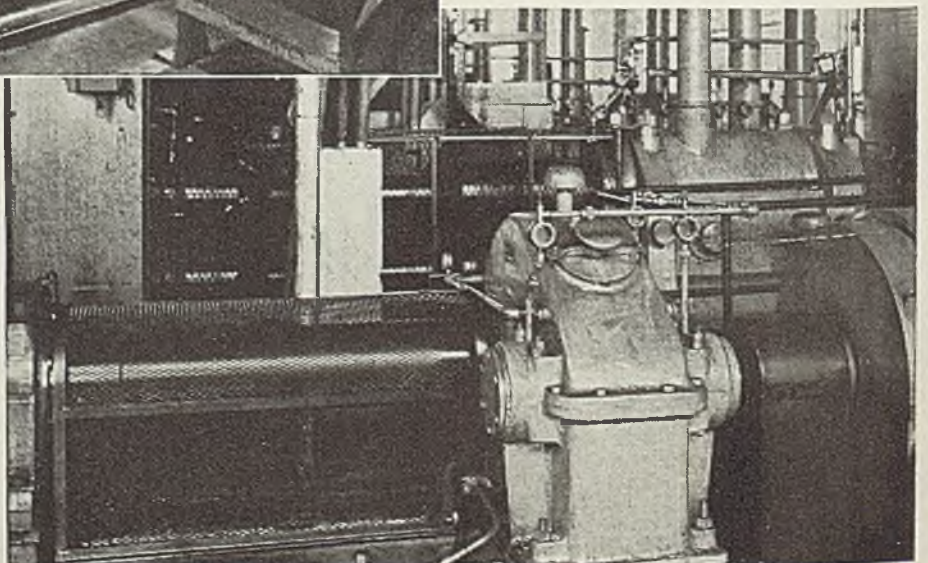
Few of the safeguards provided at the new Niles plant are strictly new. Rather, the safeguards there are notable because of the thoroughness of their conception and application. For example, the floors throughout the plant all were planned not only from an operating standpoint but also from that of safety. Five types of flooring are used; woodblock, concrete, brick, composite rubber and rolled steel floor plate with raised antiskid pattern. Floors throughout are level, with few breaks or raises to cause tripping. By far the major portion of the floor is concrete. Composite rubber is laid in the assorting room so as to favor the feet of sorters who have to be in the standing position during their working hours. Rolled



At the cleaners are guards for pinch roll and slitter



In the department housing the 4-high tandem mill are guards over the coupling and drive shaft to the reel, and over mill spindles and couplings. A safety walk goes over mill spindles



# the Steelworks

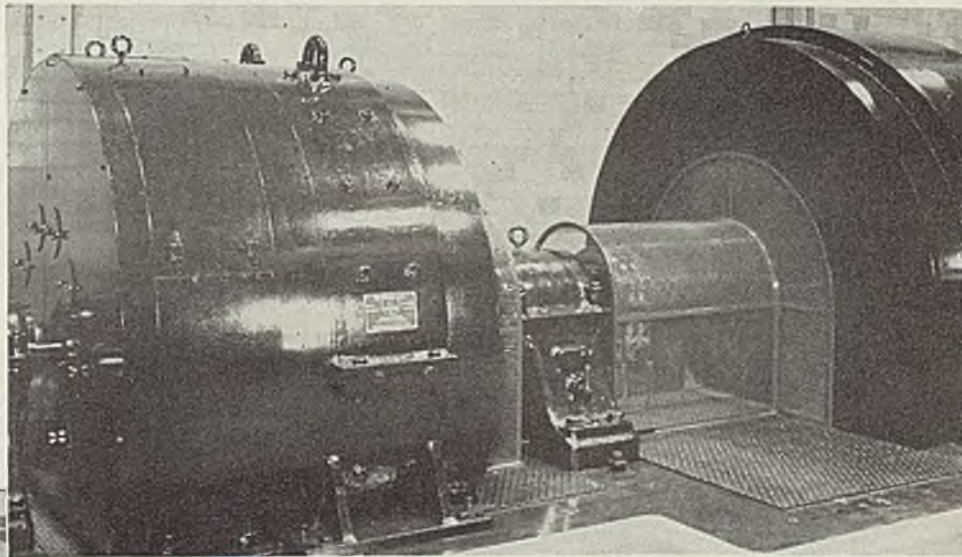


steel plate with raised pattern is used to cover floor openings. Woodblock floors are used around tanks and mills where acid and oil are present.

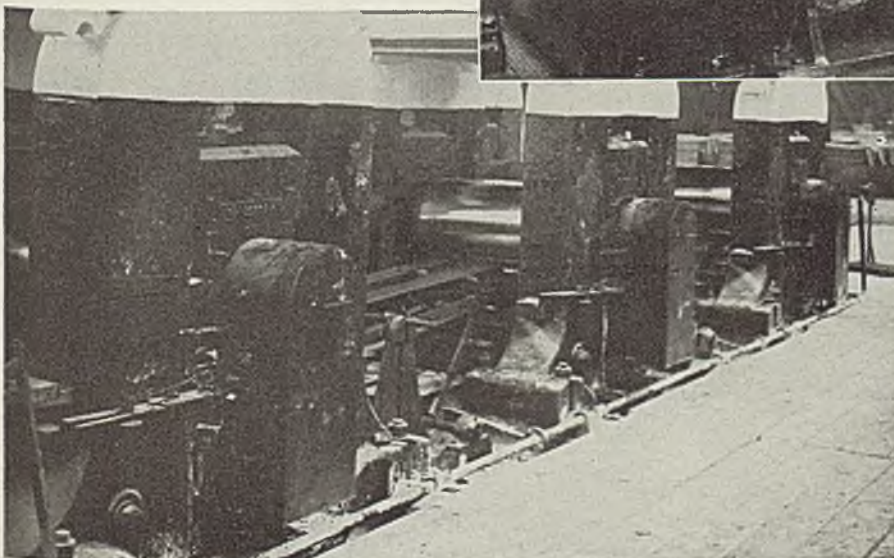
Of particular interest is the floor selected for the department housing the new 4-high, tandem, cold rolling mill. Because the rolled strip is coated with palm oil prior to cold rolling and because water is sprayed on the steel during the cold rolling operation, it is difficult in such a department to provide a floor that does not become slippery. The floor in use in this case is woodblock and steel plates covered with paper mill felt, a fabric resembling heavy canvas. With this type of floor, combined with regular cleaning by hot water and caustic soda, the difficult hazard of slipperiness has been eliminated largely. Two complete floor coverings of paper mill felt are used, one being cleaned while the other is in use to make sure of oil-free footing at all times.

Elimination of hazards features all parts of the new plant. Operations start with the receipt of coils in carloads. The coil storage, 48 feet wide and several hundred feet long, is commanded by a 10-ton electric traveling crane which transfers the coils from the cars to the stor-

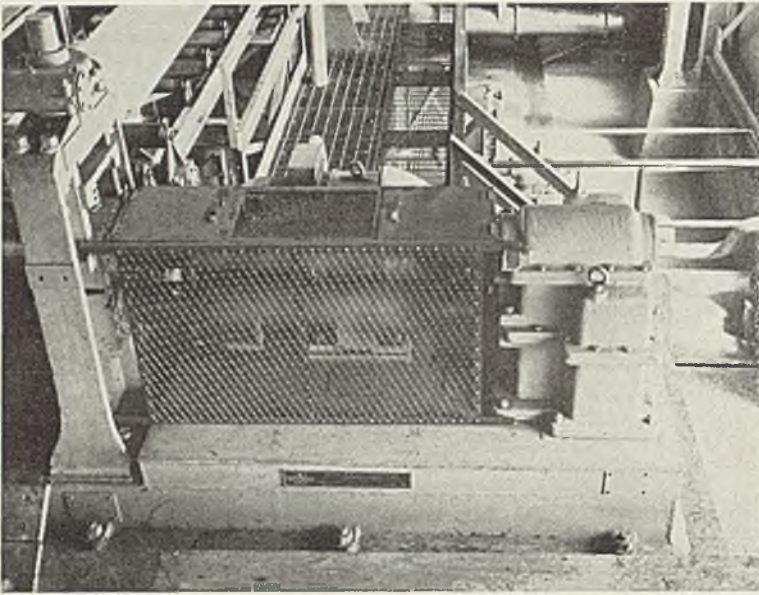
age platform. In this operation coils frequently are bumped against the brick sidewall. To prevent chipping and eventual weakening of this wall, it is protected by strips of heavy gage steel, each 12 inches wide and running the entire length of the wall. They are spaced ver-



Guards on motor generators eliminate the necessity for railings



On the cold roll lines are guards over the outside ends of the rolls



Here a guard is shown over the continuous pickler pinch roll pinion

tically at 3-foot intervals from the floor to a level just below the crane runway.

#### Safeguards Built in Pickler

From the storage the coils are transferred by a gravity conveyor to the continuous pickler. Floor openings alongside the pickler, 6 to 8 inches wide, are covered as far as possible by rolled steel floor plate and where this is not possible the openings are railed in. In the continuous pickler most of the safeguards are built in. From intake reel to the recoiling end all motors, couplings, drives, rollnecks and other moving parts are covered. Pits or openings are protected by handrails. On both sides of the continuous pickler is a safe walkway made

of subway grating and adequately protected by handrails and toe boards. Electric control panel platforms are provided with safe stairways, all adequately handrailed.

Because of the generation of free hydrogen and the presence of sulphur in the bath fire hazard protection in the continuous pickler is important. In addition to the usual fire extinguishers, the continuous pickler is provided with a pipeline for extinguishing fires with live steam. No smoking is permitted in this building and operations such as welding or flame cutting may be conducted only under conditions approved by the safety inspector.

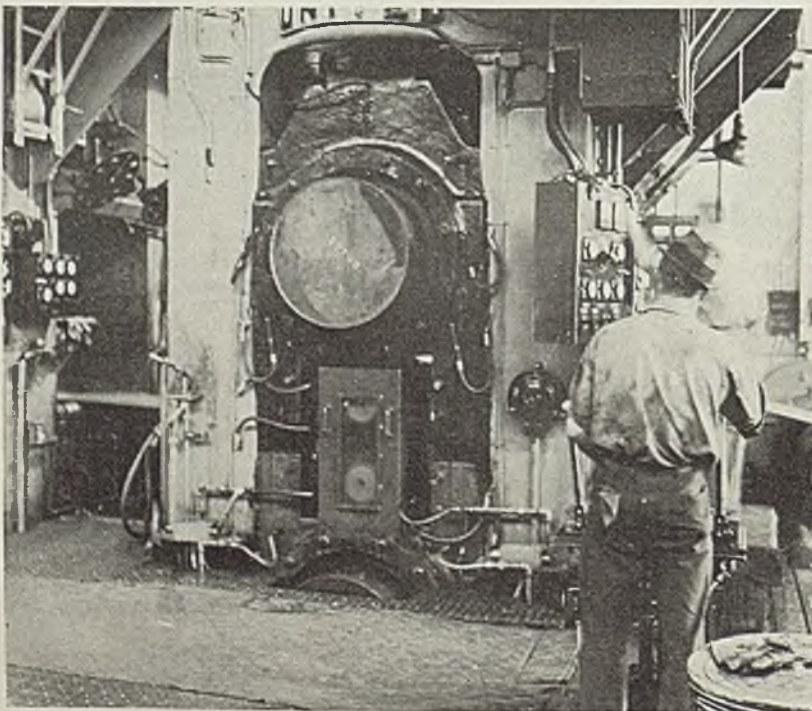
Control panels, motor generator sets and motors which drive the 4-high, tandem mill are located in a

separate room which has two doors to permit free entry and exit under all conditions. The familiar hand-rail guards are not used in this room. Instead, all moving parts, including driveshafts and couplings, reduction gears and wabblers couplings are enclosed. Fire extinguishers in this department are of the carbon dioxide and carbon tetrachloride types. The motor room basement also is provided with two doors. Located in the basement is a set of wet cell batteries to furnish current for emergency lighting and the like. Because these cells generate a certain amount of free hydrogen they are recognized as having a fire hazard and consequently are kept in a separate room adequately vented.

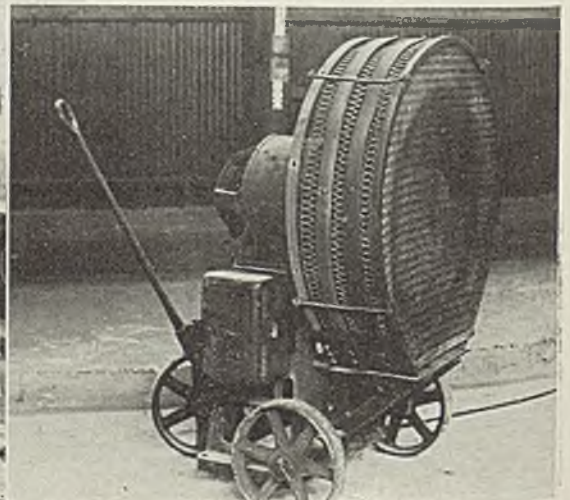
#### Roll Ends Are Covered

Oils are stored in a concrete chamber located underground which is ventilated to prevent oil vapors from saturating the air. Motor drives for pumps are covered both for accident and fire prevention. Electric switches are located outside of the room. Electric lamps are provided with heavy vapor proof glass shields to prevent breakage and resulting fire hazards. In addition to being equipped with fire extinguishers of the carbon dioxide and foam types, this room has a 4-inch steam line operated from outside.

In the design of the new tandem mill every effort was made to build safety features right into the mill. Ends of backing rolls are covered permanently by steel castings. Ends of workrolls are covered with wire reinforced glass housed in strong steel frames; such shields give adequate protection and at the same time enable the operator to observe the rolls at work. The top of the



End of backing-up roll is encased with metal, while ends of working rolls are covered by a removable plate with safety glass inset. Below is shown portable man cooler well guarded for safety



mill has a steel platform with a good stairway approach. All moving parts such as motors, couplings, shafts and screwdown drives are enclosed. The accumulator is enclosed. Built-in safety features of the mill are too numerous to mention. In general, moving parts are covered wherever this is possible. This is notably the case with the rewind end of the mill. A roll grinder adjacent to the mill also has all moving parts covered, while the pit in which it is located is railed off. Coils from the tandem mill are transferred to the electrolytic pickler by electric lift trucks rubber tired for quiet operation and to prevent wearing of hazardous ruts in the floor. The floor opening at the base of the reel stands at the entrance to the electrolytic pickler is covered by an ingenious, sliding floor plate which prevents injuries to the feet of the workers. From the reel stands the strip passes to the roller levellers through bell mouth guards which effectively prevent hands of workmen from being drawn into the rolls. All moving parts such as motors, couplings and shafts are covered.

#### Cold Mill Well Protected

The hazard in operating the balling machine at the trimming station largely has been eliminated. When trimming, ribbons from the edges of the strip drop into a pit from which they are pulled out by a rod and passed into the balling machine. This machine has been provided with a switch which must be held in contact by the operator's foot. The control is located far enough away from the entry to prevent entanglement.

An impressive safety job has been done on the mill that cold rolls the tin plate following the annealing operation. Rollnecks, wabblers, roll trains and other moving parts are completely enclosed. Shields over the rollnecks are so designed that the rollnecks may be greased only

Parking lot, where all but officials must park, is entirely enclosed and opens only at hospital gate



from the rear, making it impossible for a man to get his head caught between the rolls. Walkways between the mill housings are entirely enclosed and safe passage over the roll trains is afforded by railed bridges. A platform of generous dimensions has been placed on top of each mill housing.

In the tinning machines every possible safeguard has been applied. Moving gears and drive parts are covered. Natural gas is the fuel in these machines; to prevent damage due to improper ignition or explosions they are provided with doors that automatically permit of pressure relief. All water connections are strong and so designed as to prevent water from getting into the tin pots.

There are many general safety features. All stairways are of the safe type, with good treads and adequately provided with handrails. Stairways have been provided as the approaches to cranes. All non-current carrying parts are grounded. The high steel fence surrounding the outdoor substation is grounded. All electrical equipment throughout the plant may be locked out on switchboards so that a repair man can go about his work with safety lock keys in his pocket and secure in the knowledge that nobody can start up a machine by accident. Girl's locker rooms have only one entrance but are provided with additional "panic" doors through which quick exit may be had in emergencies. Adequate locker rooms for men have also been provided.

#### Educational Program Emphasized

In order to prevent automobile accidents within the plant gates, as well as prevent confusion and entry of unauthorized persons, a large parking lot has been established in an enclosure whose entrance is beside the main gate. Cars coming to the plant are stopped by the gatekeeper and shunted into the enclosure, making it necessary for everyone to walk into the grounds. Also housed in the gate house is a well-

equipped dispensary with nurses in attendance at all times. Serious cases are taken to a nearby hospital, which is regularly inspected by the safety department of Republic.

Despite the thoroughgoing safety features which have been built in at Niles, it is estimated that these physical safeguards will prevent only about 15 per cent of preventable accidents. The remaining 85 per cent can be prevented only by continuous and unrelenting educational work throughout the operating organization. Safety is recognized as a function of the operating department and the organization of the perpetual safety campaign is the same at Niles as at other Republic plants. The primary objective of the plan is to tie each individual in the plant into the safety campaign.

Once each month the general superintendent holds a safety meeting with all department heads. Once a month each department head has a safety conference with his foremen. Each foreman, in turn, is charged with the responsibility for seeing that each man under him understands unsafe practices and performs his work correctly. Under this procedure all safety hazards are discussed, unsafe practices are eliminated and safety rules laid down. To keep the safety idea constantly alive, large posters are placed on the bulletin boards and signs such as "Don't Get Hurt" are displayed in prominent places.

That industrial accidents can be prevented is demonstrated positively by Republic's experience over many years. Based on actual records, the company estimates that its safety work since 1930 has prevented 62 fatal and 6577 lost time accidents.

## Vibration Maintained by Antivibration Devices

Vibro-insulators, produced by B. F. Goodrich Co., Akron, O., have been adopted as standard equipment on the line of vibratory equipment manufactured by Syntron Co., Homer City, Pa.

Included are hammers, saws, drills, vibrators, vibra-flow feeder conveyors, feeder machines, weigh feeder machines, vibratory packers and tie tampers. The vibro-insulators are utilized in the bases of these machines so that the vibrating efficiency will not be dissipated through the base. In effect, the insulator permits the machine to vibrate and do its work efficiently with very little of the vibration being transmitted to the floor.

Tests conducted by the Goodrich company disclose that the use of vibro-insulators reduces industrial fatigue and therefore increases workers' efficiency.

# Review Foundry Practice in First Missouri Conference

**T**HE first regional foundry conference, held Oct. 8 and 9 at the Missouri School of Mines and Metallurgy, Rolla, Mo., by the St. Louis chapter of the American Foundrymen's association in co-operation with the school, was featured by an interesting program and a large attendance.

Four papers were presented at the refractories session under the chairmanship of George W. Mitsch, American Car & Foundry Co., St. Louis. The first, "Linings for Reservoirs and Ladles Suitable for Soda Ash Treatment," by J. J. Offutt, A. P. Green Fire Brick Co., Mexico, Mo., was confined entirely to a discussion of mixing ladles. The speaker outlined a series of tests conducted on a 60 per cent alumina brick, a first quality stiff mud brick and a special fired refractory. The alumina brick showed no signs of shrinkage or vitrification but in some instances, due to the high porosity of the refractory material, the slag penetrated entirely through the brick. The stiff mud brick developed some signs of vitrification. The slag did not penetrate to a very great depth, but rather the refractory seemed to be eroded and absorbed by the slag. This indicated that the temperatures had been high enough to soften the brick and lower the resistance to slag attack.

## Special Refractory Stands Up

A special refractory developed no signs of overfiring or vitrification, and the erosion was noticeably less. However, on a 5-hour run the slag cup had been cut in at the base about  $\frac{1}{8}$  to  $\frac{3}{16}$ -inch. The best results in laying the bricks were secured with a dry clay base mortar which contained no sodium silicate and therefore was not air setting. A number of examples were presented to show the results secured with this refractory.

L. C. Hewitt, Laclede-Christy Clay Products Co., St. Louis, presented a paper on "Refractory

Bonds and Grouting Material," in which he outlined the various materials used. The speaker stated that in general practice in lining and coating ladles in the average ferrous foundry, fire clay of the same type as is used in the manufacture of lining material itself, either alone or with the addition of some fine ground silica sand or fire clay grog, is employed. In holding ladles such as a bull ladle, experience indicates it is better practice to use one of the special high temperature cements. The speaker pointed out that special cements also are used in cementing stopper rods, particularly if the ladles are large and the metal is in the ladle for a considerable length of time.

Mr. Hewitt stated that in using a refractory mortar or plastic material, reasonable care is necessary in the preparation of the particular material, including mixing, soaking and the like. Water content should be kept at a minimum necessary for the particular application. The higher the water content the longer the period required for drying out. Also, sufficient time for drying should be allowed before high temperatures are applied. Steam rapidly forming in the plastic lining will cause the material to loosen or fall.

A paper "Refractories for Miscellaneous Foundry Furnaces" by G. D. Cobaugh, Harbison-Walker Refractories Co., St. Louis, included a discussion of refractory materials for annealing ovens, core ovens, heat treating furnaces, car wheel annealing pits, rotary and air furnaces, electric furnaces, and nonferrous melting furnaces. The speaker also referred to the attention now paid to heat conservation through diminishing heat losses and increasing the amount of heat transferred to the charge. He stated that insulating materials most frequently used on the outside of furnace walls are diatomaceous earth types of brick, both natural and calcined; compo-

sitions containing asbestos together with diatomaceous earth; expanded mica; monohydrated bauxite; rock wool; slag wool; granulated slag; granulated crushed fire brick. According to the speaker, calcined diatomaceous earth brick are available for temperatures up to 2000 degrees Fahr. It was mentioned that the limiting factors for insulating refractories, when directly exposed to furnace conditions, are inability to withstand abrasion, erosion or corrosive slag action due to open, porous texture. Therefore, the use necessarily is confined to parts not directly exposed to the action of coal ash and slags.

## Explains Cupola Requirements

In the final paper of the session, C. W. Berry, Walsh Refractories Corp., St. Louis, spoke on "Cupola Linings." The speaker discussed the various zones in the cupola and pointed to the conditions which must be encountered by the refractories. Above the charging door conditions are not severe and a good grade of brick will give satisfactory results and long life. Between the charging door and the top of the melting zone, temperatures are not exceptionally high and the slag action is not severe if a flux is added properly. However, that section is subjected to severe abrasion if the material is charged carelessly. In the top of the melting zone, higher temperatures are experienced in addition to abrasion of the moving charge. Also slag and molten iron are blown against the lining. In the melting zone the lining is subjected to high temperatures and for that reason must be highly refractory. Slag action is most violent and the lining must be dense and well laid with as few and as narrow joints as possible, according to Mr. Berry. Failure starts at these joints and it is important to use a high grade of fire clay in laying the blocks.

The nature of the charge has con-

siderable bearing on the life of the cupola. A high percentage of steel scrap, with its higher melting temperature, decreases the life of the brick in the melting zone, according to the speaker. Steel scrap should be used in small pieces so that it will not divert the blast against the lining. Fluxing materials should be kept at least 6 inches away from the lining. Excessive blast is one of the causes of greatest trouble with brick linings in the cupola.

A simultaneous session on foundry sands was in charge of T. C. Hamlin, U. S. Radiator Corp., Edwardsville, Ill. In the first paper by Harry W. Dietert, Harry W. Dietert Co., Detroit, on "Sand Control Program in the Foundry," the author stressed particularly the composition of molding sand; the factors, including permeability, fineness, green strength, dry strength, deformation and moisture which must be taken into consideration in proper sand control; mold control; considerations in choosing a new sand. The speaker considered carefully the defects which may result through improper sand. These include defects caused by sand grains, clay bond, moisture, mold hardness and flask equipment. In the latter instance Mr. Dietert pointed out that the venting of a mold may be handicapped greatly by using flasks not vented on the side, or by using solid top and bottom boards. The depth of a flask also has its influence on mold hardness. A shallow squeeze flask will cause very high mold hardness on raised pattern portions of the mold. On a jolt ram flask, the raised pattern portion in the shallow flask is low in mold hardness. Method of ramming, flask equipment, pattern equipment and mold hardness should receive more careful study.

#### Fines Lower Permeability

Lester B. Knight Jr., National Engineering Co., Chicago, discussed the preparation of sand in a paper "Sand Reclamation, Sand Conditioning and Sand Control." Mr. Knight illustrated the application of sand preparing equipment both for jobbing and production foundries. He stressed the desirability of the control and removal of fines as an aid to controlling permeability. He pointed out that tests show the removal of from 2 to 3 per cent of fines from a given sand will result in a remarkable increase in permeability.

Mr. Knight concluded the discussion with the statement that successful sand control, conditioning and reclamation may be had by intelligent use of equipment to clean and screen the sand properly, controlling the amount of fines, mulling the sand correctly and aerating

the sand after conditioning. He illustrated the savings possible through proper sand control.

A practical discussion of sand problems was presented by C. F. Bunting, Southern Malleable Iron Co., East St. Louis, Ill., in a paper "Relation Between Molding Sands and Casting Defects." In stressing the need for moisture control, Mr. Bunting pointed out that a wet sand is likely to produce a rough finish due to the sand grains sticking to the pattern. While a slight excess of moisture is advantageous in increasing flowability and decreasing the sand burn on the casting, these can be controlled better by using a more refractory sand or by the addition of sea coal. Sand with excess water is likely to produce blow holes. Therefore, it is of greatest importance to test for moisture and reduce it to a point where the best results can be obtained. Foundrymen should remember in making the test that sand will lose a slight amount of moisture if some time elapses between preparation and use.

#### Sea Coal Improves Finish

Mr. Bunting also discussed green and dry permeability. He pointed out that in general if a smooth finish is desired the permeability must be kept low, at least below 30, while for castings where finish is not so important it is better to run a little higher with due respect to moisture and strength. A permeability of 40 generally will give satisfactory finish, while at about 60 the finish may be on the rough side. Mold hardness or amount of ramming also has its effect on finish. The speaker stated that probably no other property of sand varies so much from shop to shop and even floor to floor in the same foundry as mold hardness. He also stated that sea coal added to sand is one of the most effective means of improving the finish. Sea coal affects all the properties of molding sand, tends to reduce permeability, particularly when added in excess, reduces contraction and expansion and requires more moisture to bring the sand to the same temper. When the metal is poured, the sea coal burns and deposits a film of carbon on the mold surface, thus producing less sand burn on the castings.

Prof. C. Y. Clayton, head of the metallurgy department, Missouri School of Mines, presided at the session on metallography. Dr. S. R. B. Cooke, Missouri School of Mines, presented a paper on "Metallography of Cast Iron" in which he reviewed the methods used in polishing samples. He then described a method developed at the school for preparing polished specimens of cast iron whereby the graphite con-

tained in the specimen is polished with the matrix and is not torn out.

A very fine abrasive, consisting of alumina, two microns or finer in diameter is used. A soft but not yielding lap is employed, made from pitch or vegetable rosin softened by addition of turpentine and beeswax. Prior to polishing, the samples are reduced with lead laps or emery paper of 0 to 0000 grade. Dr. Cooke illustrated his talk with slides and a sample of the pitch lap.

#### Specimens Polished Together

The lap is driven in the machine at 60 revolutions per minute. The spindle which drives the holder, containing from 1 to 6 specimens, revolves at plus or minus 100 revolutions per minute. Dr. Cooke stated that it takes anywhere from 30 minutes to an hour to complete the polishing operation. However, since a number of specimens are polished at one time, the time per specimen is cut materially.

The second paper was entitled "Metallography, Its Technique and Application," and was presented by S. C. Massari, Association of Manufacturers of Chilled Car Wheels, Chicago. The speaker pointed out that a knowledge of the structure of metals is far more important than the chemical composition, for it generally is realized that metal may have the same chemical analysis and yet be widely different in physical properties. The physical structure of metals is closely associated with properties, whereas chemical composition may have practically no association. Mr. Massari stated that in the chilled car wheel industry, through extensive work in the metallographic laboratory, a thorough understanding of the crystalline structure of the metal has been acquired. This has resulted in a material reduction in many of the different kinds of service failures and the establishing of newer methods of manufacture which have improved further the quality of the product. The speaker outlined recent developments of metallographic technique and through the use of a number of slides showed application of metallography to gray and chilled iron.

The third paper was entitled "Some Notes on Microstructure of Cast Irons" and was presented by J. J. Picco, Sorbo-Mat Process Engineers, St. Louis. Mr. Picco first summarized the general impression concerning graphite in its relation to the physical properties of cast iron as well as to the service record. He then followed with a discussion of the desirability of the various graphite formations.

The speaker illustrated his discussion with a piece of soft iron which

exhibited an inverse chill. He described the manner in which one formation developed into another and supplemented this with slides showing graphite as it existed in a number of test bars and castings. He concluded by emphasizing his belief that fine flake types of graphite uniformly dispersed and without a definite pattern are the best form for engineering castings.

In the discussion, V. A. Crosby, Climax Molybdenum Corp., Detroit, pointed out that in cellular graphite formation, the casting has a lower deflection, a lower impact, a lower transverse, a lower resistance to wear and a higher modulus of elasticity. With the flake graphite, the reverse is true, and a high resistance to wear is secured.

#### Criticizes Nonferrous Procedure

The simultaneous session on nonferrous metals and alloys was presided over by Francis T. O'Hare, Central Brass & Aluminum Foundry, St. Louis. A. Fritschle, Federated Metals division, American Smelting & Refining Co., St. Louis, presented a paper on "Nonferrous Metals and Alloys" in which he criticized the methods followed in many foundries in preheating a part of the charge. He pointed out that the metal never should come in direct contact with the furnace flame for any period of time, because metal allowed to soak directly in the fire becomes badly contaminated with harmful gases and the chemical reactions ruin the mix. By simply placing the pieces of metal on top of the furnace far enough away from the opening in the lid, so that the flame does not touch the metal, this difficulty is eliminated.

Because of the many variables in furnace and foundry practice, it is well for the foundrymen to check closely on melting practice and to train the furnace tender in the best method of handling the work. It was recommended that every heat of red brass and tin bronze be deoxidized before tapping out any metal or pulling the crucible from the furnace. Phosphor copper is the usual medium employed for the purpose, according to Mr. Fritschle. The phosphor copper should be plunged immediately to the bottom of the molten metal and then stirred vigorously for a few seconds. The speaker pointed out that the use of gates or sprues as coolers frequently results in faulty castings, the defects having the appearance of cold shuts.

In the second paper of the nonferrous session, P. J. Myall, Fisher Furnace Co., Chicago, discussed the types, operation and maintenance of nonferrous melting furnaces. Mr. Myall presented a nontechnical dis-

cussion of electric, open hearth and crucible melting furnaces. He discussed the application of a specific furnace most suitable to the various requirements found in the nonferrous foundry. Slides were used to illustrate the features of oil and gas-fired crucible furnaces. Particular reference was made to furnace linings of silicon carbide. The speaker also presented a comparison of melting costs on various types of furnaces, as well as the capital investment required in various instances.

Final paper of the nonferrous session was presented by C. C. Morgan, Bronzoid Corp., Dallas, Tex., and was entitled "Use of Plastic Bronze in Modern Bearing Applications." The speaker pointed out that bronze containing about 70 per cent copper, 6 per cent tin and 24 per cent lead perfectly distributed combines the best features of bronze and babbitt. He stated that the copper matrix provides ample strength to resist shock, the lead and tin give the necessary lubricant and plasticity requirements. With a perfect copper matrix, it was stated the principal danger from the tendency of lead, the least stable element present, to feed out too fast under service conditions and leave the copper matrix without protection. For that reason it has been found worthwhile to purchase lead which has been specially treated to retard crystal growth. Bronze bearings now are in production with hardnesses in the neighborhood of 35 to 40 brinell and with a compressive strength above 10,000 pounds per square inch. The speaker stated that microscopic examination of one of these bearings after severe service shows a thin film of lead-tin composition wherever metal to metal contact has occurred.

#### Reviews Steelmaking Practice

L. E. Everett, Key Co., East St. Louis, Ill., presided at the steel session. In a paper entitled "Current Basic Open Hearth Practices at the Granite City Works of the American Steel Foundries," John W. Porter described in detail the procedure employed in his firm's furnaces from the time the new lining is installed to tapping a heat of steel, and repairing the bottom for the next heat. He discussed such phases as preparation of the furnace bottom, building up the bottom, charging the heat, refining the heat, finishing the heat, tapping, repairing the bottom.

He concluded that by use of a uniform charge from heat to heat and by control of refining operations, it is possible to produce consistently the highest grade of steel to meet requirements on composition, and physical and other properties. Pig

iron, scrap, slag forming materials, and fuel should be analyzed, and each charge made in a standard manner relative to quantity and composition. Thus, the heat melts uniformly, and the tapping time can be forecast accurately.

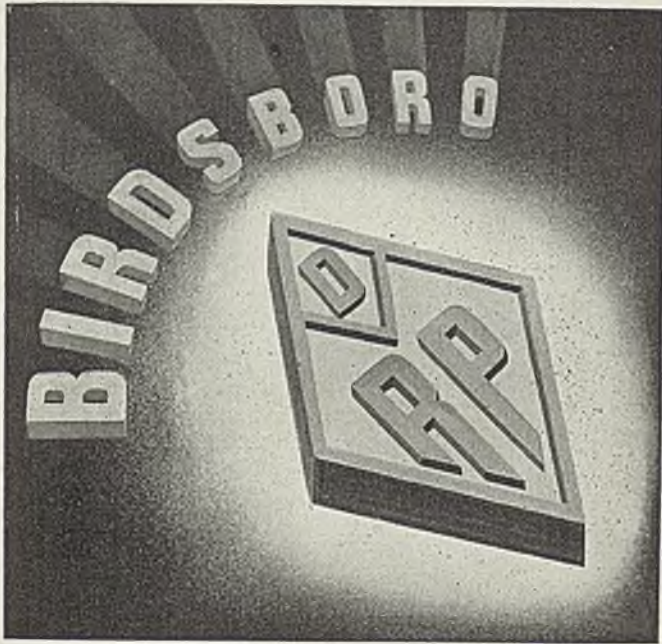
L. K. Bartholic, St. Louis Steel Casting Co., St. Louis, presented a paper on "The Electric Furnace in the Steel Foundry Industry," in which he pointed out that during the past 25 years electric steel foundries have increased production steadily until at present about one-third of the total steel produced for castings is melted electrically. He stated that nearly all furnaces for casting purposes are acid lined due to the availability of raw materials suitable for acid melting. Successful operation of the electric furnace demands skilled labor, and one of the greatest factors in advancement of the electric furnace steel foundries is due to the intelligent and skillful handling of high temperature metal.

#### Speaks on Alloy Castings

Methods used in the production of low alloy steel castings parallel so closely the methods used in producing high grade carbon steel castings that it is difficult to differentiate between production of the two types, according to T. N. Armstrong, International Nickel Co., New York, who discussed "Some Factors in the Production of Alloy Steel Castings." Differences in the properties are due primarily to the alloys. Mr. Armstrong pointed out that many of the defects occurring in steel castings may be traced back to improper deoxidation practice, and care must be exercised to obtain the best results. After the steel has been poured into molds there is little difference between the behavior of carbon steels and alloy steels. Alloys affect the green casting in much the same manner as increase in carbon, although there is considerable difference in the hardening power with different alloys. For example, a composition containing 0.20 per cent carbon and 2 per cent manganese should be handled similarly to a carbon steel containing 0.45 per cent carbon, and a 0.20 per cent carbon, 2 per cent nickel steel similarly to a plain 0.30 per cent carbon steel.

"Importance of Maintenance of Foundry Operations," was the topic of a paper by Carter Bliss, Scullin Steel Co., St. Louis, in which the author pointed out the value of having available the necessary spare parts, etc., to effect repairs within the shortest possible time. He also recommended study of the parts which wear out rapidly to see if they can be replaced with something more permanent. Frequent





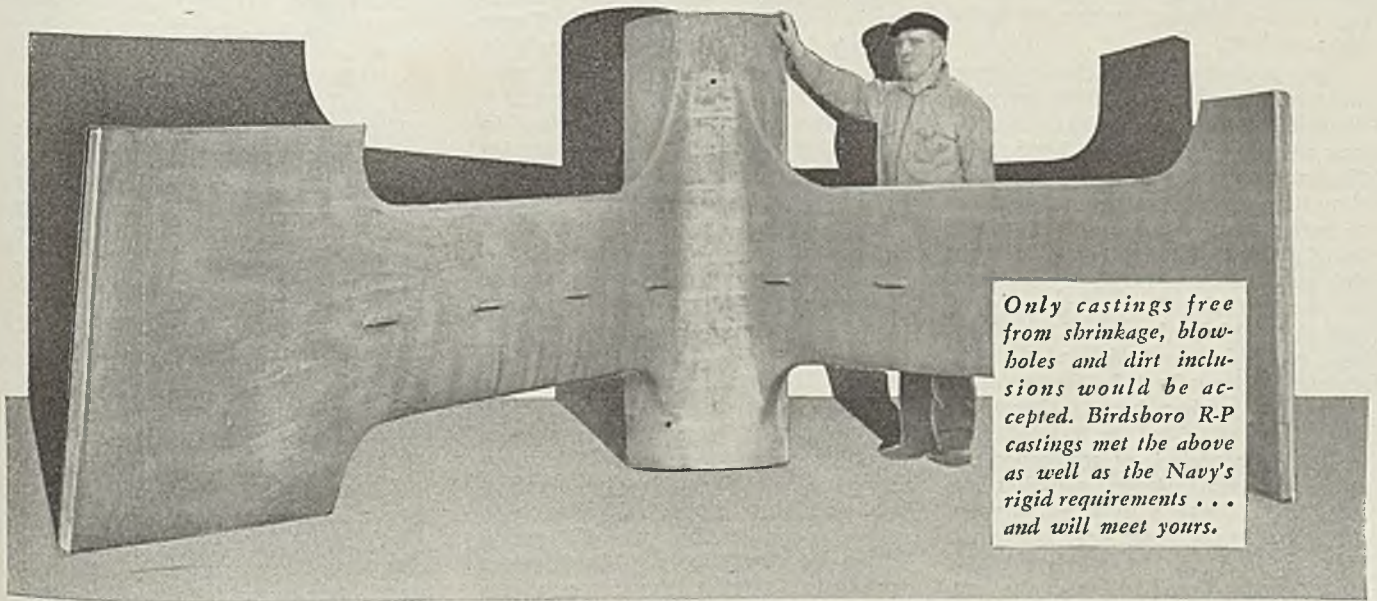
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inspections should be made to detect wear which may cause trouble later on. Catching a breakdown before it comes pays big dividends.

In his talk, Mr. Bliss mentioned numerous problems which have occurred in his plant and how they have been overcome. He said that with a sand elevator, the best quality belt money can buy pays for itself in the long run and that with an inclined belt it is advisable to use troughing rolls rather than a flat belt with aprons. One essential in proper maintenance is an efficient master mechanic, who never gets excited, knows what to do when a breakdown occurs, always has a new part ready to replace the broken one and seems to have the faculty of knowing where to look for trouble.

#### Must Know Service Requirements

The session on gray irons and alloys, under the chairmanship of Webb L. Kammerer, Midvale Mining & Mfg. Co., St. Louis, attracted considerable interest. The first paper, entitled "Requirements of a Good Base Iron for Alloying," was presented by David B. Reeder, Electro Metallurgical Sales Corp., Chicago. Mr. Reeder emphasized that in considering the metallurgical requirements for a suitable base iron for alloying it is essential that the service requirements of the casting be known definitely. Machinability, high strength, abrasion resistance, freedom from growth, retardation of attack by various chemicals, increased resistance to oxidation, are perhaps the major considerations and have a bearing on the choice of a base iron.

The speaker outlined the improvements in properties which may be secured through the addition of various alloys to a proper base iron. Chromium is added to stabilize the structure and promote uniformity of cross section. Nickel is added to harden the matrix slightly through refinement of pearlite and to prevent the formation of free carbides. Molybdenum also refines the pearlitic and increases the strength, the effect being greatest in the low carbon irons. Generally chromium is added in combination with either nickel or molybdenum, as this simultaneous addition results in definite strength increase, slightly higher hardness, but with little or no loss in machinability. Mr. Reeder then outlined the numerous applications for alloyed gray irons.

V. A. Crosby, Climax-Molybdenum Corp., Detroit, presented a practical discussion entitled "Melting Requirements." Mr. Crosby pointed out that it would be just as hard to produce a low strength iron consistently as to produce a

high strength iron time after time. His experience in visiting many foundries has illustrated the fact that it is difficult to get foundrymen to agree on the many details of cupola practice. Uniformity is the goal in producing any type of iron, and the question involved, according to the speaker, is getting set up to do the same thing each day. Unless uniformity of practice is followed, uniformity of iron cannot result.

Mr. Crosby outlined a number of points which require attention, both in producing special irons for castings such as piston rings, and for regular types of castings. He pointed out that in a short heat it is not necessary to pay particular attention to the slag hole. At the same time, in producing hard iron, it is necessary to have a larger tap hole so that it will not freeze up. Another point he stressed was the temperature of the iron. Mr. Crosby stated that if cupola iron is too hot, something can be done with it, but if it is too cold, it cannot be used. He also stated that the size and amount of graphite in the material charged has a pronounced effect on the size and shape of graphite that comes through in the finished casting.

#### Using Alloys in Iron

Final paper of the session was entitled "Some Practical Uses of Alloys in Cast Iron," and was presented by Carl Morken, Carondelet Foundry Co., St. Louis. Mr. Morken stated that the alloys used in cast iron may be divided conveniently into three groups: (1) Those metals and metalloids inherently present in cast iron and which may be said to be natural constituents; (2) those metals which are added to cast iron to create a change in its properties, and which largely remain in the metal as constituents; (3) those metals which are added to cast iron to change its properties, and which largely disappear during commercial reaction and are not residual in appreciable quantities.

Mr. Morken then discussed the addition of such elements as nickel, chromium, molybdenum, vanadium, titanium, and the results which may be obtained through the application of the alloys. The speaker also discussed the use of several types of deoxidizers. Mr. Morken pointed out that the more vigorously acting an alloy becomes when added to iron, the more care is necessary in its use. The use of alloys, according to the speaker, must be guided by common sense.

G. S. Daley, Century Foundry, St. Louis, presided at a luncheon at which William R. Chedsey, director of the Missouri School of Mines

and Metallurgy, welcomed visitors to the campus. At a dinner to conference visitors, presided over by George W. Mitsch, American Car & Foundry Co., St. Louis, Dan M. Avey, secretary-treasurer, American Foundrymen's association, spoke on the association's activities.

## Establishes New Porcelain Enameling Fellowships

Recognizing the need for experiment and research in its comparatively new industry, Ferro Enamel Corp., Cleveland, in 1924 established the Cushman fellowship at Western Reserve university. So gratifying were results of the work that the company has established four new fellowships to begin this fall at four additional universities.

R. R. Schauss has been given a fellowship at Case School of Applied Science to devote his time to "Study of Factors Relating to Suitable Cast Iron for Leadless Enameling." He will work under direction of Dr. A. C. Coffinberry and Dr. H. A. Schwartz.

At the University of Illinois, Thomas L. Hurst, graduate of the University of North Carolina and University of Washington, will make a "Physical and Chemical Study of Soluble Salts Present in Mill Liquors, Including Their Relation to Total Solubility and Selective Crystallization on Drying," working under direction of Dr. A. I. Andrews.

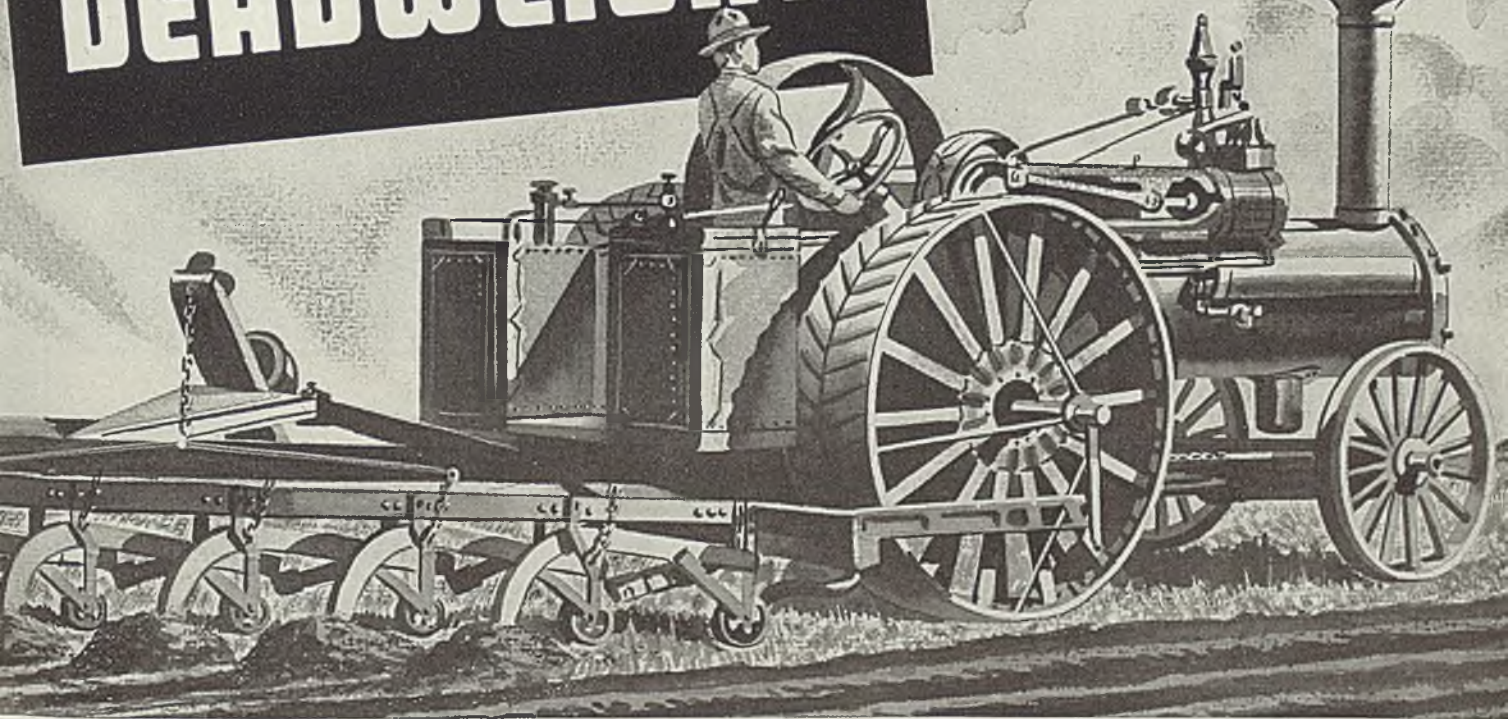
Warren B. Felter, graduate of Alfred university, has been awarded a fellowship at Ohio State university for research work on "Sagging; Causes of and Methods of Elimination." He will work under direction of R. M. King.

The fourth new fellowship was established at Alfred university and was given to Wilfred Paquin for "Studies of Domestic Clays and Clay Blends; Methods of Improving Clays for Porcelain Enamel." Dr. C. R. Amberg is director of this fellowship.

This year the Cushman fellowship at Western Reserve has been granted to Nelson P. Niles, graduate of California Institute of Technology, who will work under direction of Dr. H. S. Booth and continue study of the fundamental reactions involved in porcelain enamel frits.

In addition to these five fellowships, the Ferro Enamel Co. is a contributor to the fellowship which is being carried on under direction of the Porcelain Enamel institute. Dr. George T. Rankin holds this assignment. The company also carries on an extensive research program in its own laboratories, a large share of the laboratory time being devoted to problems other than those involved in current manufacturing operations.

*Of Course It's*  
**OBSOLETE.. So is**  
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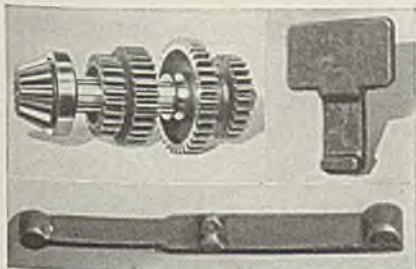
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**L**ESS THAN THIRTY YEARS AGO, the tractor illustrated, was used for farming. No farmer would run it today. It's too costly to operate. So is deadweight in modern equipment. "The lightest farm tractor in the world," says one manufacturer . . . and that's good salesmanship. The more it weighs the more it costs to operate is the way equipment buyers are figuring these days.

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Parts' improvement is the major factor in product improvement. Avail yourself of the conspicuous advantages of forgings.



**Information for Technical Men and Engineers**

It requires a minimum of 50,000 lbs. (25 tons) to break the test specimen of steel used for the drop forged lower transmission shaft of the RD8 "Caterpillar" tractor. This test is equivalent to a tensile strength of 250,000 lbs. per sq. inch. To test it for shock and impact resistance, a test specimen of the forged shaft steel is given a notched type test in a special machine designed to measure the foot pounds necessary to break the specimen with a single blow from a pendulum type hammer.



"Drop Forging Topics" is issued several times yearly. It is sent free upon request. Send your name and address if you are not now receiving it, and copies will be regularly sent you.



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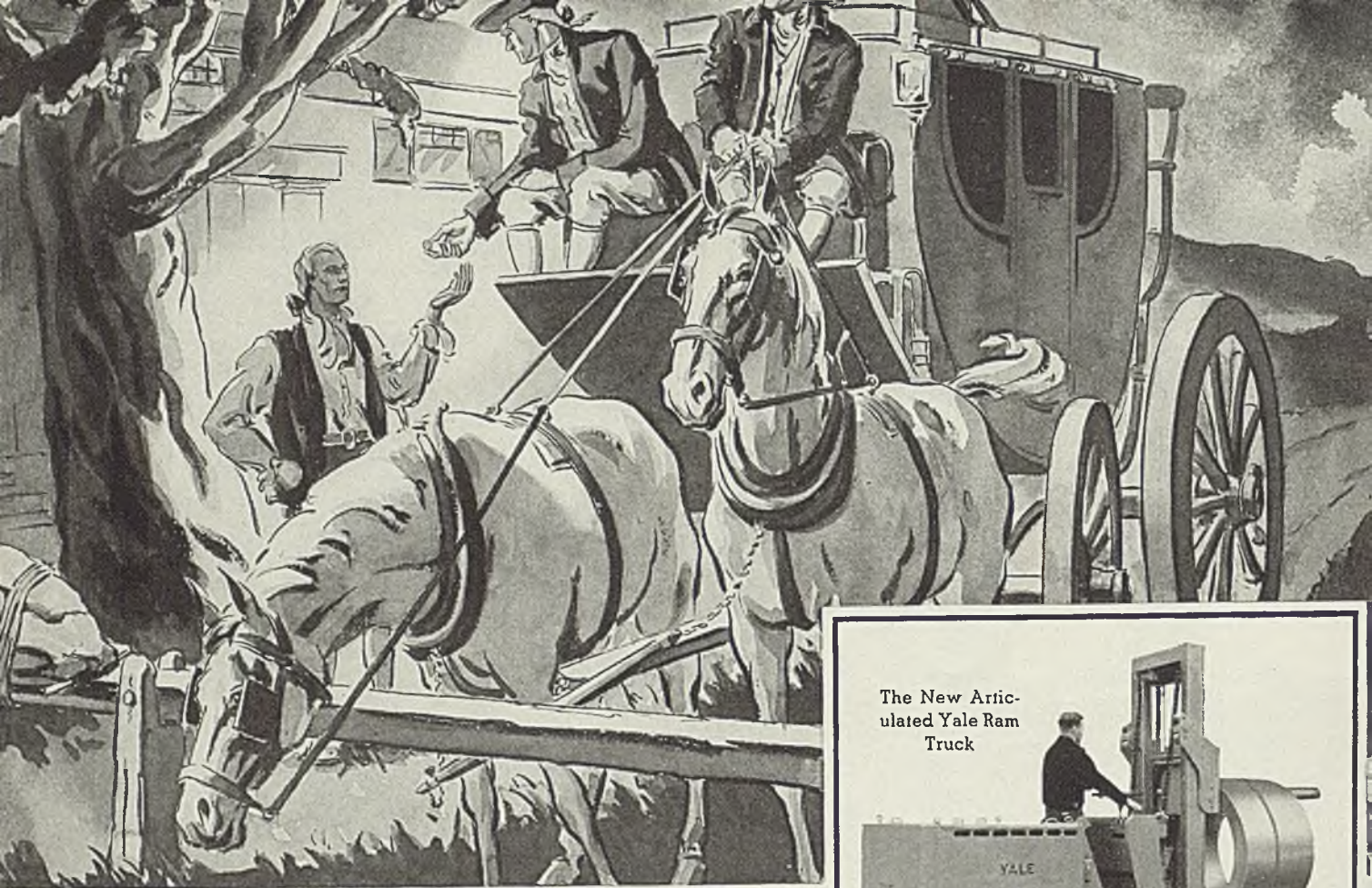
*This identifies members of the Association*

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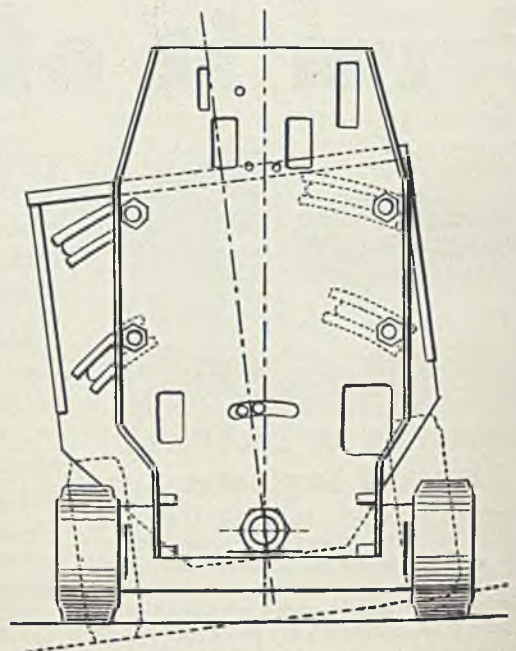
It's not so long ago that lumbering stagecoaches clattered over the highways, paying tribute at every toll gate. The most efficient mode of travel then known—*NOW* relics of a picturesque past... Because time works changes that make the efficiency of yesterday ineffectual today.

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# MATERIALS HANDLING



## Uninterrupted Materials Flow Permits Continuous Operation in Wire Mill

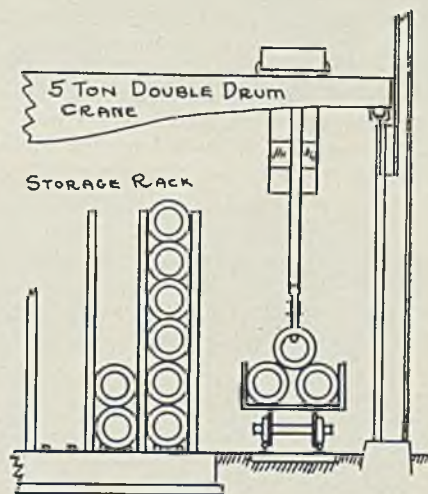
**W**IRE drawing is largely a handling problem. Without planned flow of the work and the use of mechanical and electrical equipment to eliminate rehandling in so far as possible, the entire process would be a continuous pick up and lay down.

Where rehandling is necessary this may be performed more economically by handling mechanically, automatically if possible, in large units or quantities at a time, thus decreasing the number and cost of rehandlings.

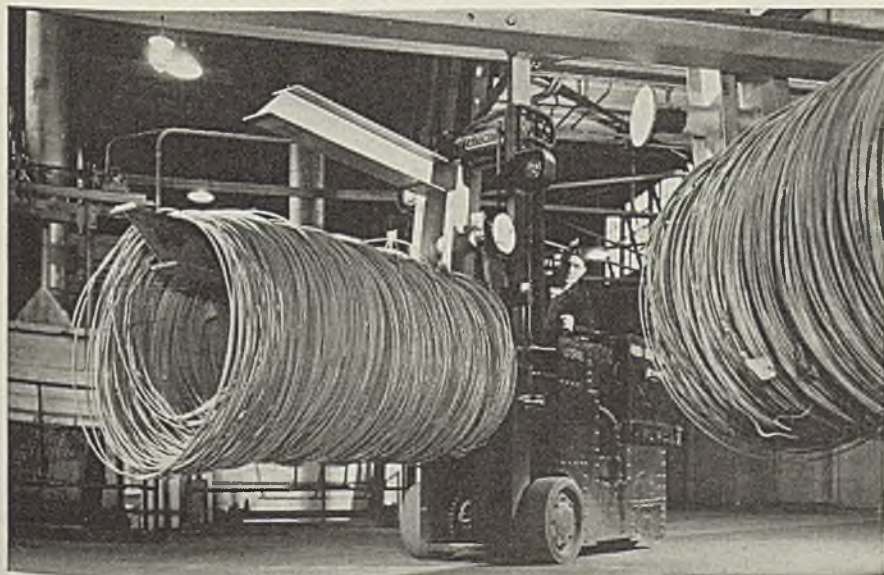
The layout of processes and the use of equipment at the new South Chicago wire mill of Republic Steel Corp. (STEEL, pp. 42-45, May 3, 1937)

is carefully planned to permit economical handling of materials. Chief features of this installation are a carefully planned layout of equipment to permit a continuous flow of rod coils from cars through storage and cleaning without turning coils; handling in large units, also with a planned flow; provision for a continuous supply of rods or wire at machines; backing-up facilities for removal of finished products, especially at bottlenecks; and practically automatic electrical control of movements wherever possible, so that the operator can handle and control operations from his cab or the floor.

Ultimate plans of this wire mill



■ Section view shows coils being unloaded from gondolas to 2800-ton yard storage racks



provide for considerable increase in capacity. This addition was taken into consideration in planning the layout and handling. When this addition is necessary the plant can be increased in size and capacity by adding to buildings and equipment without changing the existing arrangement. Another interesting and well-planned feature is the provision for rearrangement of handling facilities wherever failure of a

■ Electric tier-lift truck with special demountable ram takes rods from bakers to ram rack at wire-drawing machine

# MATERIALS HANDLING



single unit might create a stoppage in the flow of materials or interfere with continuous, uninterrupted operation.

Coils of rod are received in gondolas from the near-by rod mill, although the ultimate plans provide for a continuous flow of rods direct from the rod mill by means of a conveyor. The coils are loaded in the gondola by overhead crane and set on edge across the car for ease in unloading by crane into storage and remain in that position until drawn into wire.

Entire layout of flow is planned so the coils of rods are not turned in handling at the rod mill or in storage and cleaning operations. The gondola load of rods is placed alongside the rod storage racks which are served by a 5-ton overhead, high-speed, traveling crane on a 96-foot span. The crane is provided with a double-tilting hook, controlled by the crane operator, which hooks into a load of coils, lifts and moves the load sideways to the storage racks.

These steel storage racks have individual lanes to permit storage of coils of rod six high on edge to facilitate handling and classification. The storage racks permit storage of 2800 tons of rod by heats, according to grade classifications. Usually in supplying coils to the cleaning house the crane operator starts at the top of a storage lane and goes to the bottom, thus keeping each heat or other classification separate.

## Craneman Controls Operations

The storage yard crane operator, from his cab, can see and control all operations from gondola to storage and from storage to conveyor without assistance. These coils, as removed from the storage racks for the cleaning operations, are set on edge on an intermittently-operated apron conveyor extending along the end of the rack, which transfers them into the cleaning house. Movement of this conveyor, which will hold 13 loads of crane lifts of 3000

to 3500 pounds each of coils of rod, is controlled by the cleaning house craneman.

Cleaning house crane, which straddles the row of cleaning tanks, is of the semistiff-leg type, thus eliminating side-sway and permitting faster operation. A detachable, aluminum-bronze, acid-resisting, hairpin hook is used for handling coils through the cleaning tanks. The craneman picks up a load of coils on the hook from his conveyor and, as he carries it to the first tank, pushes a button which moves the conveyor up until the next load of coils is in position. An automatic stop then halts the conveyor. Thus the next load is ready for him and vacant space is available at the storage rack end of the conveyor for refilling by the yard craneman.

The cleaning house craneman deposits the lift of 7 or 8 coils, each weighing approximately 450 pounds, in the first tank. The hook is so constructed that the coils loop on the lower acid-resisting arm of the hairpin and are submerged in the cleaning or lime solutions while the upper arm rests on the edges of the tank. The coils remain on the lower hook throughout the cleaning operations.

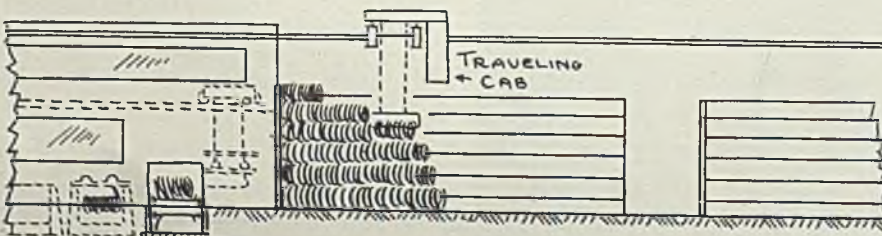
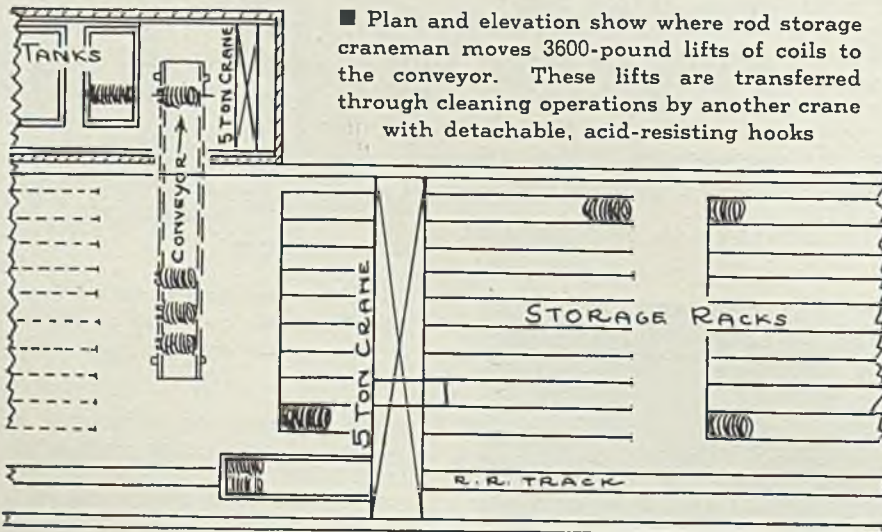
## Moving Coils Through Tank

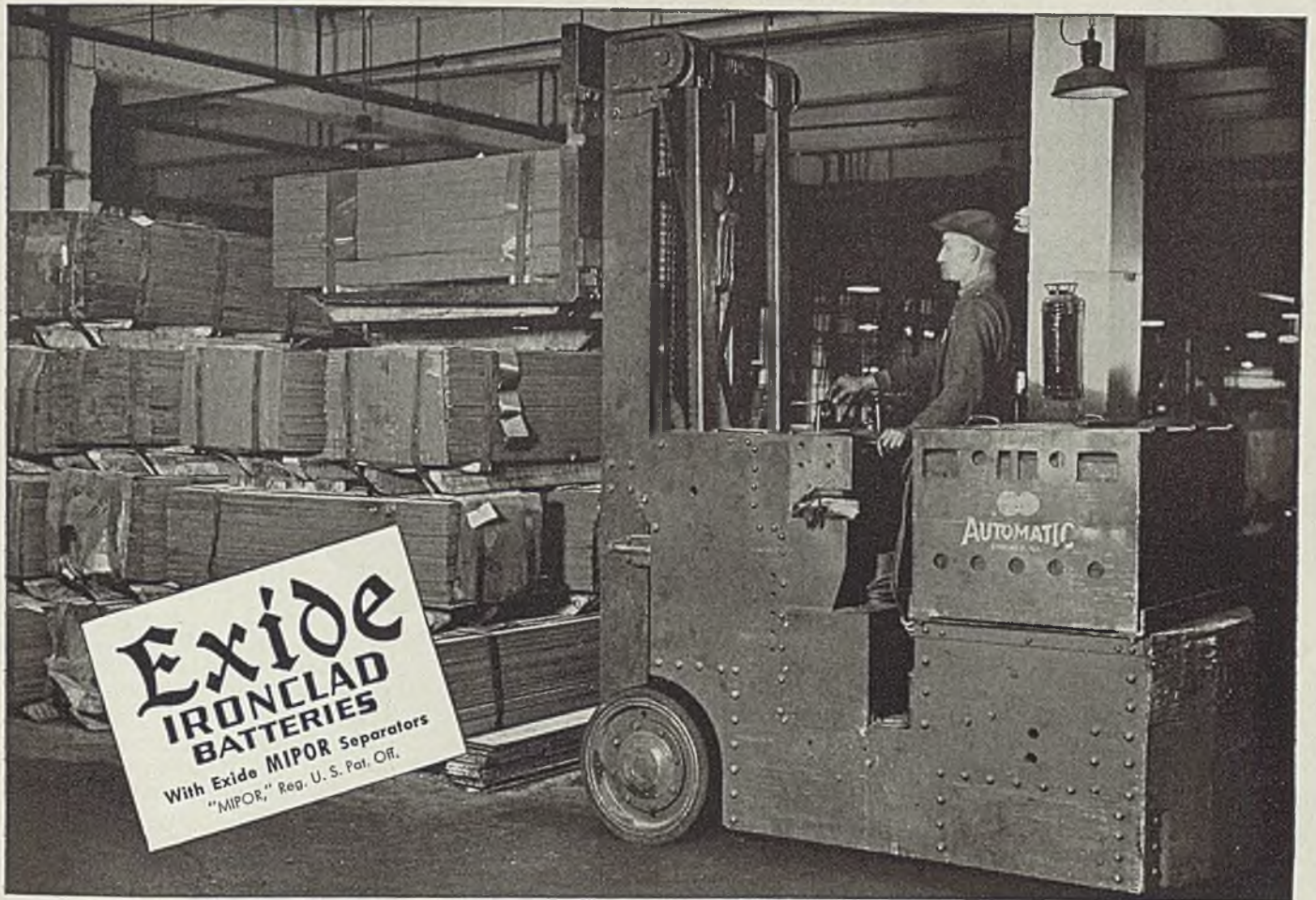
After the craneman deposits a load of coils in the first tank he then lifts the load which has been there longest and moves it on to the next tank, repeating the operation at each tank, on through the last tank. The load of cleaned coils of rods from this last tank is then deposited on one of two conveyors traveling through the baker, which is set at the end of and at a right angle to the row of tanks.

Pushing a button opens the vertical doors at the both ends of the baker, on one of the two conveyor lanes in the baker, and moves the conveyor up one step, thus carrying one lift of coils into the baker and another lift out at the opposite end. This movement is carried out automatically through relays and automatic interlocking control. In the meantime the operator returns to the other end of the tanks with an empty hairpin hook to get another lift of coils and repeat the operation.

The baker is constructed with two separate, individually heated and controlled lanes, because this operation is a critical point where failure with a single unit would soon shut down all succeeding operations. Space is provided to install a third baking lane when necessary.

This two-lane baker, which is indirect gas fired, in connection with the automatic operation and electrical control provide a total production equal to ten of the old type





Truck illustrated made by Automatic Transportation Co., Inc.

## "You can't realize what an electric industrial truck is capable of until you use an Exide-Ironclad Battery"

**T**ODAY'S production conditions demand material handling on a larger scale than ever before. For this purpose electric industrial trucks of far greater capacity and wider versatility have been developed, placing in the hands of the steel industry a newly efficient tool for speeding up production and cutting costs.

Already users have found that these giant new trucks can deliver an entirely new order of performance when equipped with Exide-Ironclad Batteries. For Exide-Ironclads have almost unlimited reserve power ready at an instant's notice to perform phenomenal tasks. They maintain a consistently high voltage, which assures good vehicle speeds at all times. They are rugged, trouble-free and long-lived.



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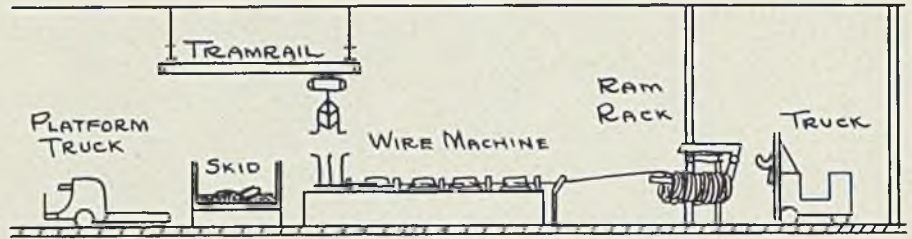
push-in and pull-out baking ovens.

Coils of rods are removed from the discharge ends of the baker conveyors by an electric tiering truck with a special demountable ram. The rod baker lanes are staggered or set back at the ends so the ram truck has access to the discharge end of each conveyor to insert the lower arm of the ram into the lift of rods.

### Overloading Prevented

In case the truck operator has not removed the lift of rods when the cleaning house craneman deposits another lift of cleaned rods and pushes the baker conveyor operating button, the conveyor does not operate but sounds a warning bell. When the trucker removes the waiting baked coils he then pushes a special interlocking button at the discharge end of the conveyor, which opens the oven doors and advances the conveyor. Thus the cleaning house craneman does not have to wait, nor the truck operator go around the bakers to operate the conveyor. Also, at the end of the cleaning house shift the trucker empties the conveyor by operating his button. At present cleaning and baking operations are carried out only on the day shift.

The ram load of coils is placed by the trucker on a special rack consisting of a double row of I-beams held up on columns. This rack extends along the entire row of continuous wire drawing machines. The truck operator sets the upper yoke of the demountable ram on top of the I-beam rack, thus suspending the coils below the rack with the



■ Elevation shows where cleaned coils of rod are placed at wire-drawing machines by truck, and ends welded for continuous drawing

open end of the ram toward the wire drawing units.

Each wire drawing machine is provided with space for two demountable rams so that each machine always has from 3000 to 7000 pounds of rods available. The ram is demounted from the truck, an empty ram picked up, and the truck is ready for the next load from the rod baker. Surplus cleaned rods for the night shift are placed in temporary floor storage on edge for ease in recovery.

### Coils Handled in Units

In this way, throughout the entire cleaning and baking operations 7 to 8 coils of rods weighing about 450 pounds each, or 3000 to 3500 pounds at a lift, are handled as a unit. The coil ends are welded together on the storage rack and the butt end of one lift welded to the front end of the next lift so that wire drawing operations are continuous.

This special truck is also a vital point in the operation. Instead of having a duplicate truck for any possible breakdown, which would be

usable only at this work, another similar electric tiering truck, provided with a fork and normally used for carrying and tiering purposes, is so constructed that the fork can be removed and a demountable ram attachment added in 15 to 20 minutes. This fork truck is used for moving skid loads of drawn wire and piling barbed wire and nails. However, more than one truck is used for piling, or the work can wait if necessary, so that this dual-purpose truck may be withdrawn in case of a breakdown of the special rod handling ram truck.

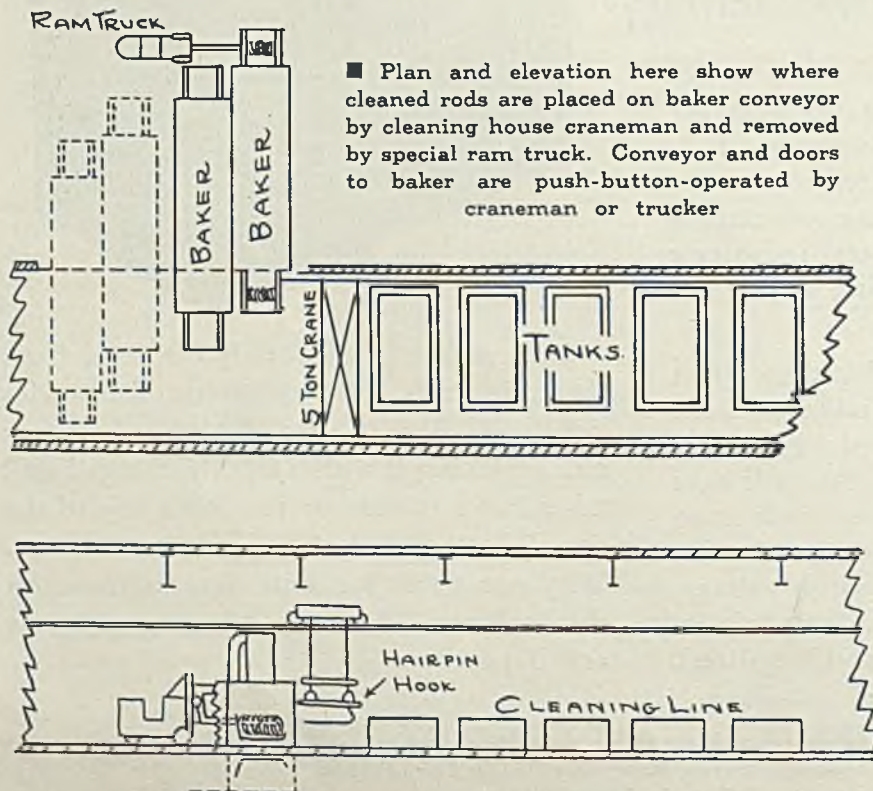
Seven 1-ton electric hoists on 16-foot span, I-beam tramrails, all with floor-operated, rigid-arm, push-button control and having a lifting speed of 35 feet per minute, serve the eleven wire drawing machines. These hoists are equipped with collapsible spiders for stripping the wire drawing blocks. The 400-pound coils of drawn wire are deposited on corrugated-steel rack skids having a capacity of 6000 pounds of coils. Two of these skids are always available at each position. Thus the wire drawing operator has space available for two supplies of rods and two outlets for finished material and is never held up for incoming material or disposal of finished product.

### Handling to Storage

Coils of drawn wire are removed to the finishing operations or to temporary storage on skids by a gas-powered, low-lift truck or by the previously mentioned electric truck with demountable forks, which may be changed over in an emergency to a ram truck for handling lifts of coils from the baker. Thus this one truck provides dual service in handling rod to, and wire from, the drawing machines at a minimum of expense. The skid loads of drawn wire are stored by gage and grade classification. The storage space for each gage carries an identifying gage mark on the wall.

A second gas-powered truck is provided with forks and tier-lifting mechanism. This is also used for handling skid platforms or for piling pallets.

Drawn wire for the 500-foot continuous electro-galvanizing unit is  
(Please turn to Page 73)



■ Plan and elevation here show where cleaned rods are placed on baker conveyor by cleaning house craneman and removed by special ram truck. Conveyor and doors to baker are push-button-operated by craneman or trucker



# JEFFREY CHAINS



## IN THE STEEL MILL



## ON COOLING BEDS

Have you ever watched a fellow "roll his own" in one hand . . . with straight fingering and equalized bearing from end to end? He rolls a good cigarette. But if his fingers slip, something goes wrong. *BALANCE* is the trick.

It's exactly like that on a cooling bed in the steel mill. Comparable accuracy of "touch" is required of attachments to the conveying chains. Unless the

pushers remain in constant alignment, pipes and tubes will not come off commercially straight.

Jeffrey cooling-bed chains are trued up to this exacting service . . . malleable roller chain for general service . . . steel thimble roller chain for more demanding, heavy-duty service. Write—The Jeffrey Manufacturing Co., 889-99 N. 4th St., Columbus, Ohio.

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**FOUNDRY EQUIPMENT**



# PROGRESS IN STEELMAKING

## Casting Machine of New Design Increases Output and Cuts Cost

**L**AST August a pig casting machine of new design was installed by Steel Industries Engineering Corp., Pittsburgh, at Steubenville, O., to serve the two blast furnaces of Wheeling Steel

Corp. at that point. Of the double strand type, the new machine replaced two double strand pig machines of conventional design. Experience to date has revealed great economies with the new machine.

It has shown capacity to produce in excess of 2000 tons of 100-pound pigs a day, or considerably more than the two machines which it replaced. On the new machine at maximum capacity a cost of 9 to 10 cents a ton can be accomplished, which compares with about 45 cents on the old machines. Designed to operate with a minimum amount of wear on moving parts, no repairs have been necessary since the machine was placed in operation and a recent check revealed that none would be needed over an indefinite period ahead. Another advantage with the new machine is the production of an unusually low scrap loss. In one typical day recently, when 1457 tons of good pigs were poured, the scrap loss was a little less than four tons.

**G**ENERAL view of new pig casting machine with pouring end in foreground. To eliminate pits, the ladle track is about 3½ feet higher than the ground line

Like the conventional pig casting machine the new machine is of the long conveyor type. In the older machine the wheels, mounted on steel rails, travel with the chain with resulting wear between the wheels and the pins on which they are mounted. In the new machine the wheels are stationary and the chain travels over the tops of the wheels. In the older design it was impossible to maintain regular lubrication of the wheels and pins. In the new machine the wheels do not heat as much as in the older machines. For this reason, and because

they are stationary, the wheels are mounted on roller bearings with adequate provision for regular lubrication. The wheels are so designed that the bearings are located a maximum distance from the hot molds. Too, the wheels are of larger diameter, permitting fewer revolutions as well as a larger heat radiating surface.

The new machine has a length of 145 feet between centers of the sprocket wheels at each end. Each strand has two chains, 328 feet long. The strand sections have a slope of  $1\frac{1}{2}$  inches per foot so as to have an adequate height at the discharge end. Water cooling sprays are located along 70 feet of section over each strand. Links are 2 feet long, or twice the length of the conventional machine, thus cutting the number of moving parts in the chain in half. These links are of rugged design and are heat treated manganese molybdenum alloy steel castings. The bushings, cast from 12 to 14 per cent work hardening manganese steel, are keyed into the male ends of the links in such a manner that there is no wear between the bushings and links. Pins, also high manganese steel castings, have square heads which key against a lug at the female ends of the links so they cannot turn. Wear thus is confined entirely to pins and bushings and both may be replaced easily.

Actually, wear of pins and bushings is inappreciable, as revealed in a recent inspection. This is the result of a number of reasons. There is no motion of the pins in the bushings on the straight run of the chains, such motion occurring only when going over the head and tail sprockets. In going around the sprocket wheels, the link angle is 18 degrees. This 18-degree angle is formed four times in each cycle,



**T**HIS partial broadside view of the upper half of the machine and the head house shows the solid concrete deck which separates the forward and return strands

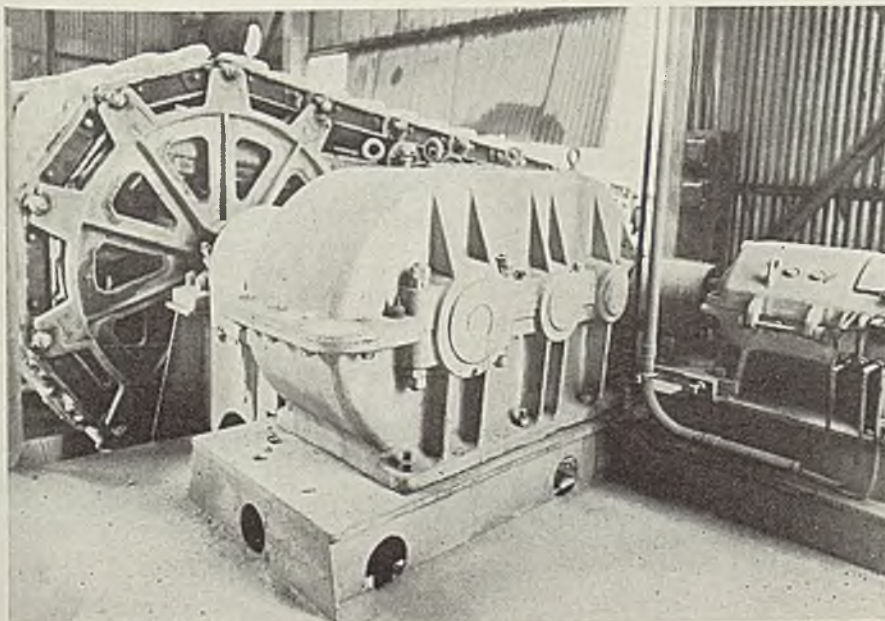
making a total rotation of 72 degrees in each cycle, or at the rate of a complete turn of 360 degrees in each five cycles. In the old machines the wheels made a complete revolution at the rate of once in every 22 inches, necessitating frequent replacements of links, wheels and pins.

Wheels are mounted in individual cast iron strands, with one end of the roller bearing shaft so locked in place as to prevent both rotation and longitudinal movement. The shaft is provided with two grease outlets on opposite sides. The practice is to lubricate the bearings with

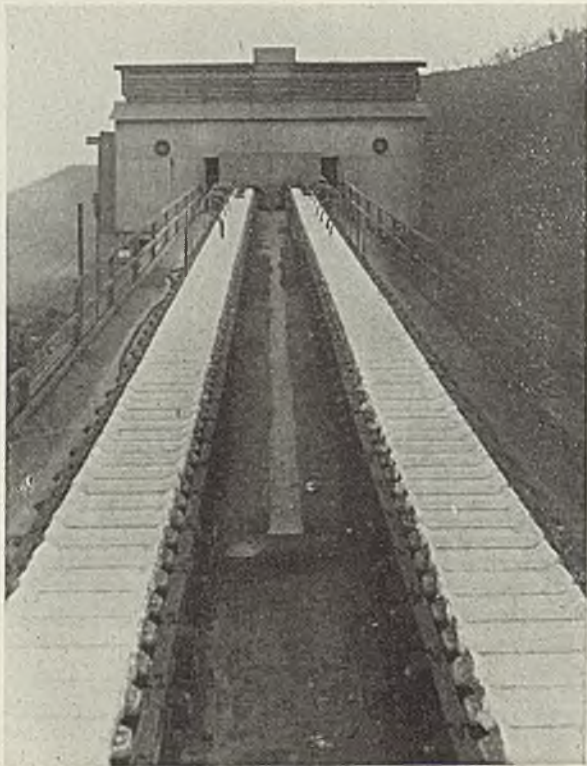
a grease gun, an operation that is performed once a week and requires about an hour for the entire machine.

Head and tail sprocket wheels are of cast steel and are  $6\frac{1}{2}$  feet in diameter. They are of the double tooth type. In this design the sprockets engage the link connecting pins, the links being carried in the space between each pair of teeth. This design prevents any deflection in the direction of the chains as they travel over the sprocket wheels. Chains also are kept in correct alignment by spacer rods which pass through the link pins at each link. The sprocket wheels are mounted in extra large pillow blocks and heavy shafting is used. The drive, located at the discharge end, is through a reduction gear unit by a 20 horsepower, shunt wound, direct current, mill type motor. There is a separate drive for each strand. Variable speed controls permit moving the strands at any speed from 10 to 54 feet per minute. Heavy take-ups are located at the tail sprockets. These have 2 feet travel so that a link may be removed or inserted in each chain when necessary.

Tapping at this plant is in ladles of the short-pour type which take about 65 tons of iron. The ladles are hauled to the pouring building where they are engaged by a ladle



**D**RIVING gear unit, at head sprockets, is a fully enclosed, triple reduction, roller bearing, helical gear reducer with reduction ratio of 700 to 1, driven by a 20-horsepower, mill type, shunt wound, direct current motor. Between gear unit and head sprockets is a shear coupling. There are two drives, one for each strand



**A** FEATURE of the new machine is the perfect alignment of the strands. Water cooling sprays are located along a 70-foot section of the approach to the head house

tilting equipment which pours the hot metal continuously into a pouring box. The stream of metal is divided by runners which feed into the molds on both strands. Operating at full capacity, i.e., both strands at the rate of 50 feet per minute, the average pouring time for 65 tons would be 13 minutes, 20 seconds. The operator's station is so located that he has a full view of the ladle, the pouring spouts, the strands up to the head house and the railroad cars which receive the pigs as they come off the machine. But three men are required to operate this machine—one in the capacity of foreman, looking after the operation in general, one who actually operates the machine and the other looking after the coating

of the molds and shifting of cars.

Mold supports are manganese, molybdenum steel castings set in keystone shaped recessed in each link so as to keep them from turning. The supports are held by one bolt which is protected from splash or short so that it may be removed with ease. When the machine was built, both cast iron and cast steel molds were installed. Experience has shown that cast steel molds have three to five times the life of the cast iron molds so that use of the former now is standard. A solid concrete floor on the top deck protects the return strands from water, splash, shot and dirt. Molds are heated on the return side by means of coke oven gas. The practice is to preheat when starting the ma-

chine and then continue heating sufficiently to dry the mold coating thoroughly. The coating employed is of the customary burnt dolomite.

## Announces Heat-Treated Oil Country Tubing

Production of a new oil country tubular product, Republic Heat-Treated Casing, is announced by Republic Steel Corp., Cleveland. For some time there has been an insistent demand in the industry for an oil well casing which could be set to greater depths without increasing weight or changing the factors of safety. Republic heat-treated casing, making use of a heat-treating process heretofore not adapted to ferrous products on a large commercial scale, insures greater setting depths for lighter weights, maintaining present safety factors, according to the announcement.

The heat-treatment of the new alloy steel casing is a process developed after several years' research by Republic's technical staff. It is not heat-treatment of the ordinary type, designed to relieve strains. To accomplish large scale production, a special furnace was designed and built in the Republic tube mill at Youngstown, Ohio.

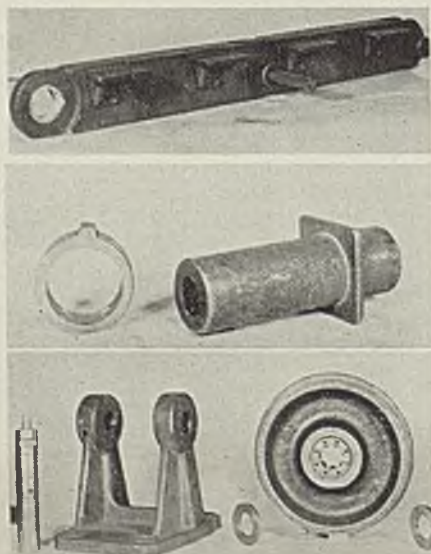
The important changes undergone by the casing during the process are partly the result of a controlled balance between the chemical elements of the steel. In addition to this factor, the controlled degree and duration of heat treatment bring about a phenomenon known as precipitation-hardening. This heat-treatment results in high ductility to resist shock and in high compressive yield point to resist collapse.

Actual collapse tests on random-picked open end and closed end specimens of the casing, certified by the Pittsburgh Testing Laboratory, are the basis for new setting depths for heat-treated casing recently published by Republic Steel Corp.

## Metal Molding Used With New Wallboard

A new wallboard product in the form of a prefinished, colored board with an enameled surface, for use as a wall lining for kitchens, bath rooms or others, has been placed on the market by Upson Co., Lockport, N. Y.

Known as Artwal, it is tiled or smooth and furnished in five colors: springtime green, pastel blue, old ivory, black and white. Used extensively with this new product are wood base moldings with metal covers, each designed to the company's specifications. They are finished in colors or in chromium plate.



**T**OP—Links which form the strands are two feet long and so designed that only the pins and bushings are subjected to wear. This view shows also the mold supports and the method of placing spacer rods to insure alignment of the chains in each strand. Center—Pins and bushings are so designed that they will not turn in the links, thus preventing wear in the latter. Bottom—Details of the stationary, roller bearing wheel and wheel mounting used in the new pig casting machine are shown in this view. Two holes in the surface of the roller bearing shaft permit continuous lubrication of the bearing

# NOW ... GET BOTH

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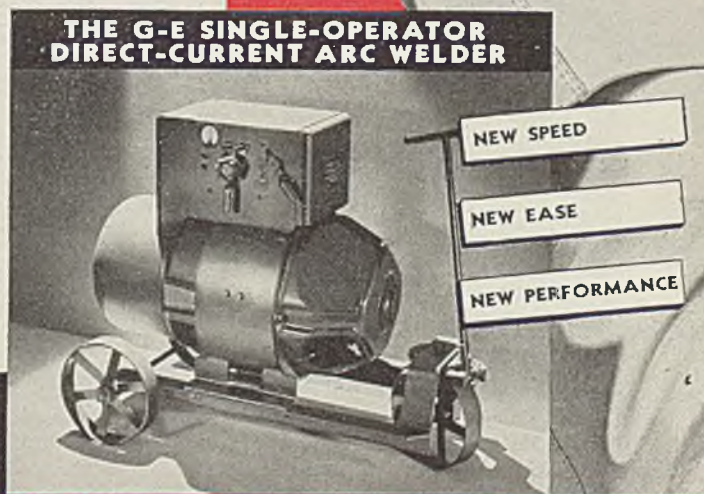
**A**N arc welder meets modern needs for profitable fabrication and repair work only when it provides a faultless output of current for light-gauge welding as well as for heavier work.

Both a wide welding range and faultless output at all points in that range are provided exclusively by the modern G-E single-operator arc welder, with its new, improved features of design and performance. You can turn the current on full tilt, cut it down to a trickle, or set it anywhere in between—you get a "peppy," stable arc at all points in the entire range. It meets Navy specifications on every adjustment.

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To give you the right equipment, General Electric builds the largest and most complete line of arc welders in the world.

**THE G-E SINGLE-OPERATOR  
DIRECT-CURRENT ARC WELDER**



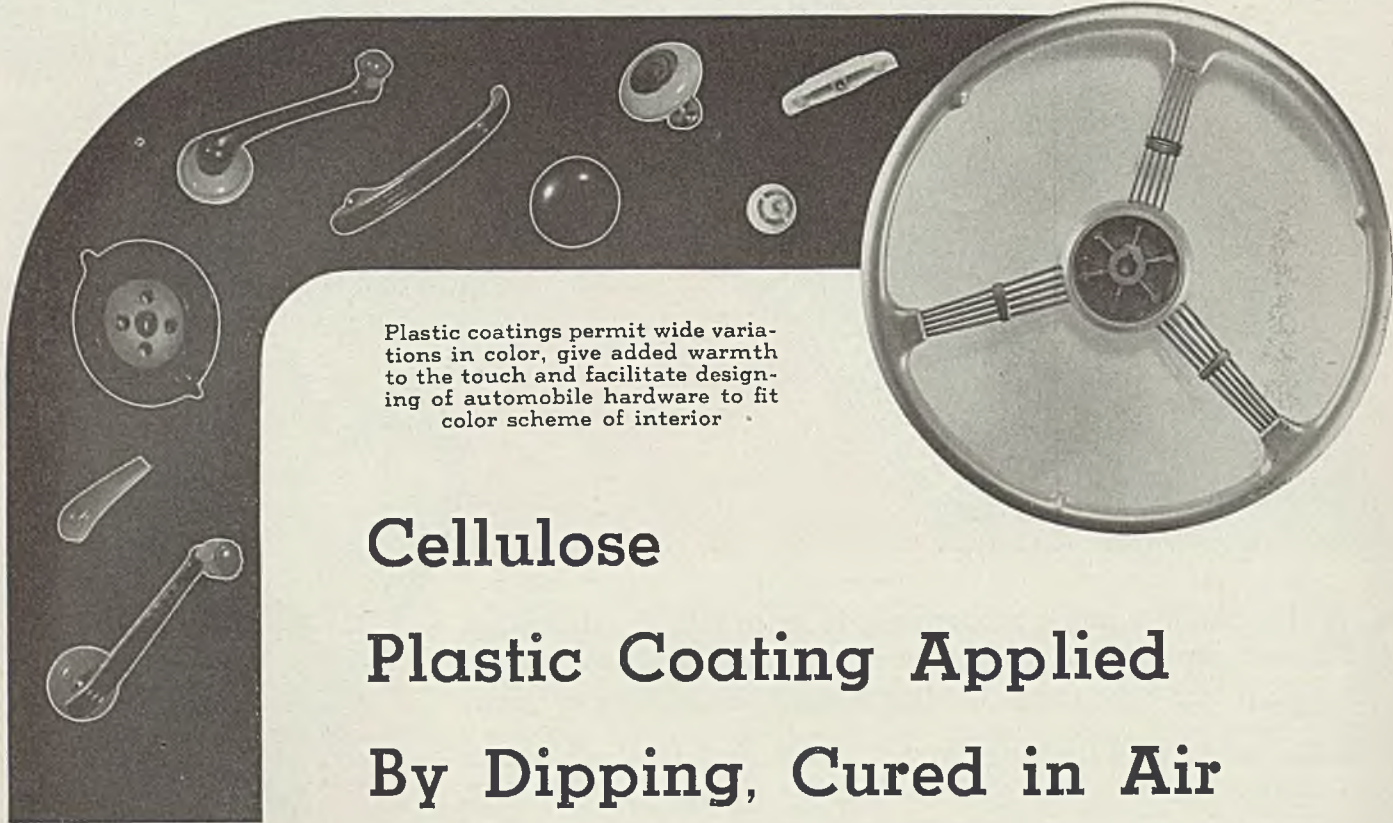
# GENERAL ELECTRIC

Filing No. 8748

140-70



# *SURFACE TREATMENT AND FINISHING OF METALS*



Plastic coatings permit wide variations in color, give added warmth to the touch and facilitate designing of automobile hardware to fit color scheme of interior

## **Cellulose Plastic Coating Applied By Dipping, Cured in Air**

**A** NEW type of cellulose plastic coating, which can be applied either by dipping or spraying on metal, wood and rubber, has been developed by the Detroit Macoid Corp., 12340 Cloverdale avenue, Detroit. The process is now being used on various products, chiefly automobile hardware. Macoid is the name of the coating used for dipping; Cellucraft, the material used with a spray gun. The two types of coatings, when cured (by drying at room temperature) are identical in properties.

The coatings may be applied to practically all types of metal surfaces, initial treatment of the surface being optional, depending upon the degree of adhesion sought. Bulk of present work involves zinc-base die castings going into such automobile hardware as window regulators, door handles, control knobs

and the like. The plastic coating permits a wide variation in appearance of the finish as far as color is concerned, gives added warmth to the touch, and facilitates designing the hardware into the overall color scheme of an interior.

Various shades are obtained by pigmenting the coating material to any desired degree, providing bright colors, delicate pastel shades, "metaltones" and other effects. Certain pigments impart an actual transparency to the finish, which has been found to set off automobile hardware strikingly. It is possible to use a clear coating which shows the finish of the base material where it is desired to protect a bright metal finish.

Where opaque coatings are to be used on die castings, no treatment of the casting is necessary other than polishing off the fins and part-

ing line. Where a transparent effect is desired the casting is buffed after polishing. Polishing and buffing are carried out by hand on double spindle high-speed polishing machines.

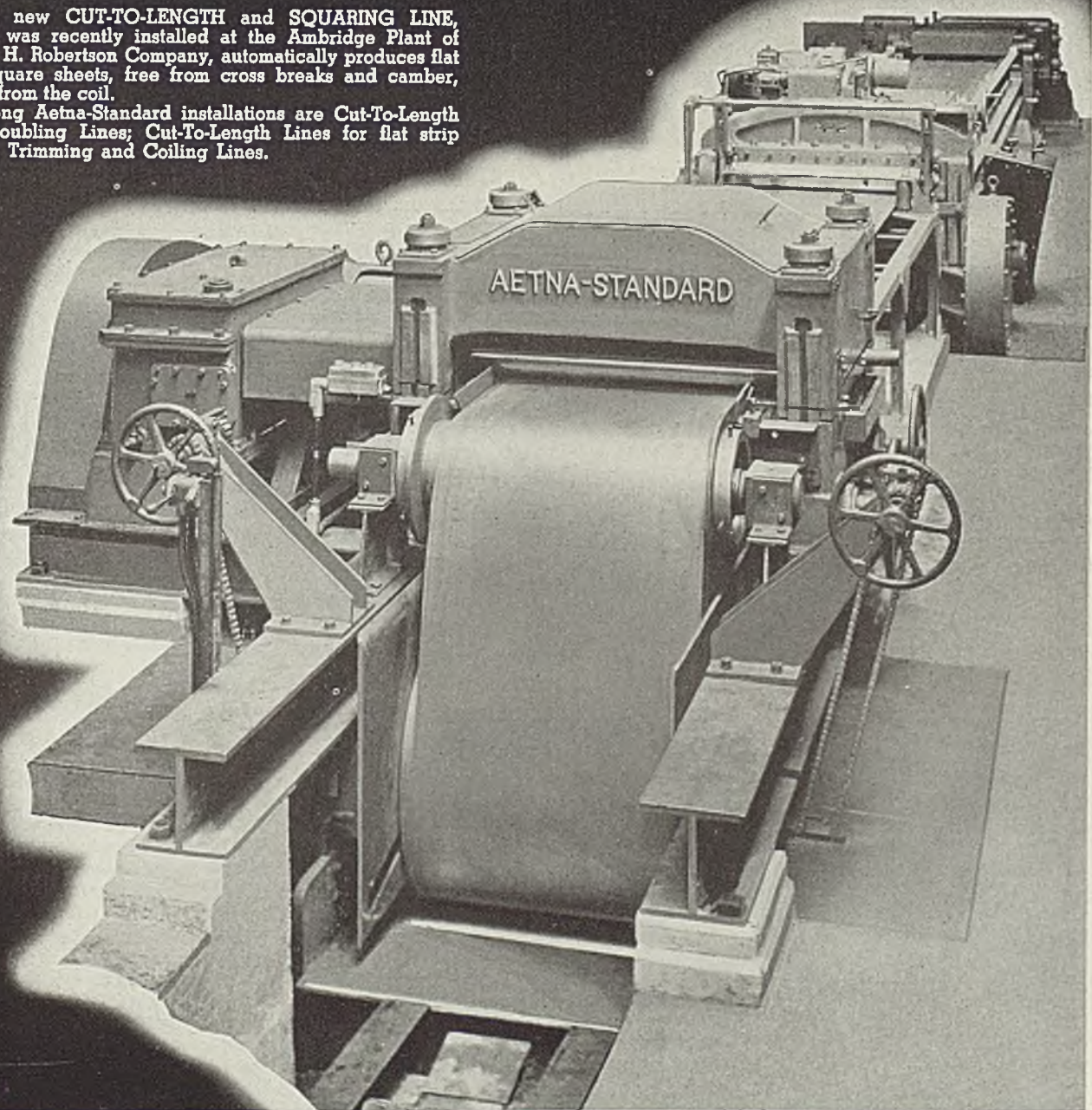
The plastic coating, when cured, is flexible and shrinks tenaciously about the surface to which it is applied. This means that pretreatment of the surface is not essential. But if more certain adhesion is wanted, the die casting can be treated with any one of several rust-proofing processes, such as the recently developed Parker Rust Proof Co. process for zinc surfaces, the American Chemical Paint Co.'s lithoform process, or in the case of steel parts may be bonderized before coating. However, engineers of Detroit Macoid do not believe such treatment is necessary where the part has an unbroken periphery to

★   ★   ★   ★   ★   ★

# A NEW AETNA-STANDARD CUT-TO-LENGTH AND SQUARING LINE

This new CUT-TO-LENGTH and SQUARING LINE, which was recently installed at the Ambridge Plant of the H. H. Robertson Company, automatically produces flat and square sheets, free from cross breaks and camber, direct from the coil.

Among Aetna-Standard installations are Cut-To-Length and Doubling Lines; Cut-To-Length Lines for flat strip sheets; Trimming and Coiling Lines.



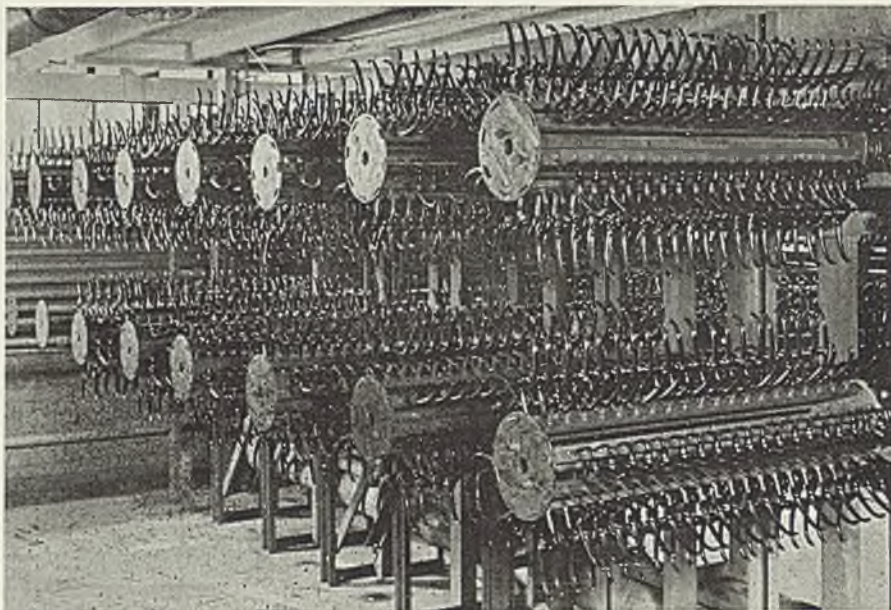
**THE AETNA-STANDARD** ENGINEERING COMPANY  
 CONSULTANTS   DESIGNERS   BUILDERS  
 STEEL AND NONFERROUS INDUSTRIES  
 YOUNGSTOWN   " OHIO "   U. S. A.

be plastic coated, such as a window regulator handle; pretreatment is recommended for large flat surfaces on which the surface tension of the plastic does not have a chance to react as favorably as on a cylindrical piece. Naturally, good application requires that all sharp corners be removed from the part, a radius of 0.010-inch being recommended, slight enough to avoid detracting from the design.

Parts are dipped, sprayed and cured at ordinary room temperatures, the average piece requiring about 30 minutes to air dry. Choice of the dipping or spraying method depends solely upon the thickness of coating desired. In dipping, by varying the viscosity of the coating and the speed at which the part is moved through the material a range of film thickness from 0.003 to 0.020-inch is possible with one dip. Spray guns are used for the thinner coats, each sprayed coat averaging 0.0015-inch. Three coats usually are recommended, to build up a film of 0.004 to 0.005-inch, sufficient for a high quality finish.

In a typical spray set-up, parts are placed on vertical fixtures attached to a chain conveyor which moves them slowly past the spray gun operator and then through a tunnel of sufficient length so that when they emerge they can be removed and unfinished pieces charged.

Mechanization of the dipping process has been developed to the degree that practically no hand work is required other than charging uncoated parts onto racks and unloading them for shipment. Accompanying illustrations show, for example, how automobile door han-



Dipped parts are placed on drying drums which rotate until solvent has evaporated and plastic sets to a smooth, hard finish. No subsequent polishing or buffing operations are required

dles are placed on racks and the latter attached to drums which rotate slowly, carrying the pieces through the coating solution. After emerging from the plastic, the rack of parts is removed from the drum and placed in another drum in the drying section. Here, as an illustration shows, are double rows of drums connected through chain drives to a motor and geared so that they rotate slowly. When the solvent evaporates from the plastic, the latter

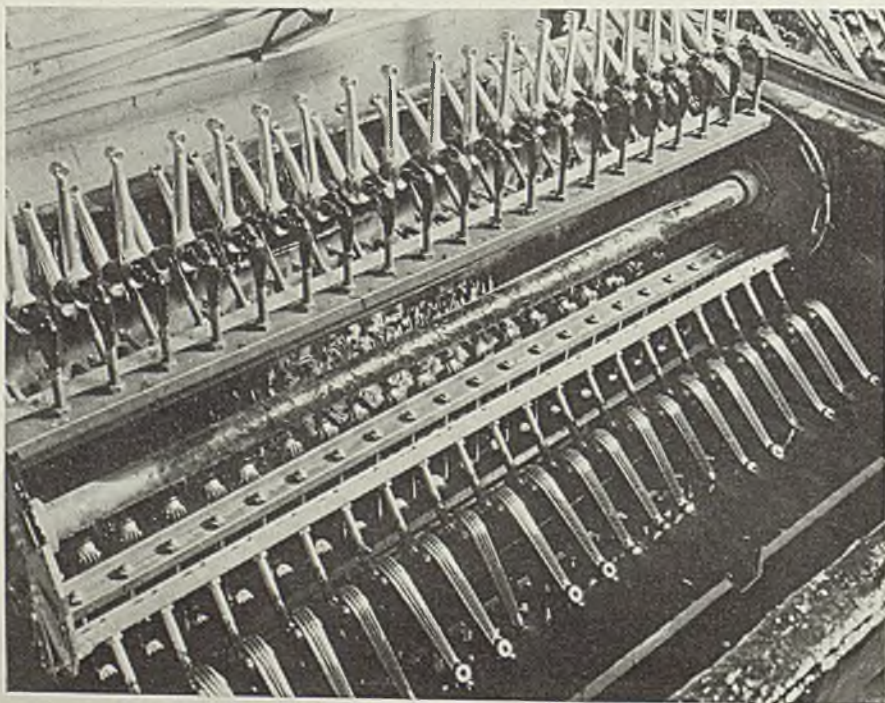
Plastic coatings are applied to metal base by dipping as illustrated here. Thickness of coating is determined by number of revolutions of dripping drum. Various shades can be obtained by pigmenting the liquid material

sets into a smooth, hard finish showing good mechanical strength, resistance to abrasion and wear, weathering and chemical attack. The finishes are claimed impervious to gasoline, naphtha, oils and greases, have high dielectric strength and insulating properties. The coatings also have passed successfully salt spray tests and tests for wearing, rubbing, aging and temperature changes.

One advantage of plastic coatings for metals is that they may be combined with separate molded plastic parts with pleasing effect. In fact, Detroit Macoid produces a number of the latter, by the injection molding method, which are combined with plastic-coated die castings for automotive hardware assemblies.

Another innovation is the application of the plastic coating to molded rubber balls for gear-shift levers. It might be thought that the resiliency of the rubber would lead to cracking of the plastic coating, but the latter has sufficient flexibility to avoid this.

The coating also has been applied over molded rubber steering wheels, a combination of dipping and spraying being required for this job. The wheel has a steel spider or core, over which a rubber hand rim and hub section have been molded. The rim is then dipped in plastic of any desired color to match the car interior, and the hub sprayed. When dry, the wheel resembles the solid molded plastic type, but has added flexibility. About the only effect which cannot be obtained in dipped coatings is the mottled design.





# POWER DRIVES



## Graphic Records Disclose Power Losses and Delays

**P**OWER losses and many other expensive wastes in industry are permitted to continue only because they aren't known to exist.

Current consumed by a motor or process or wasted by carelessness is unseen unless pictured in some way, such as by graphic records. Monthly totals are of little value in determining these losses — at least no more so than the money left in your pocket at the end of the month shows where needless expenditures have been made.

Most common uses of graphic records are to detect maximum and minimum loads and their durations, varying power demand through a cycle of operation including no-load periods, inefficiency, mechanical or electrical defects in motors or driven equipment, unnoticed wastes of power from operating motors or lights when they are not needed, and many other similar applications. A few examples of the results of such tests indicate the possibilities.

For example, a test on a drive indicated that it ran idle about 43 per cent of the time. Investigation showed the control was so inconveniently located that the operators permitted the drive to continue rather than make the trip to shut it off. The test also indicated the drive was underloaded as operated, and all machines on the drive could be operated instead of only a few, as had been the practice because of a "belief" that the drive would be overloaded. In another instance two lineshafts were belted together, as both motors were found to operate considerably below normal loading of either motor.

Adjusting operation of groups of machines to reduce peaks, as shown by graphic records and resulting from simultaneous starting or feeding, reduces maximum demand. This may be accomplished by stag-

gering the starting or feeding operations. Sometimes tests indicate that the maximum load occurs in the evening when the lighting load builds up. By changing the time of operation of certain equipment or transferring it to a night load, this peak may be decreased. Since maximum demand usually is a factor in determining energy costs, any reduction results in corresponding savings in the power bill.

### Indicate Greater Losses

Frequently, however, unexpected disclosures from graphic records indicate losses greater than the waste of power. In one plant a routine test of the power consumption of the machining department indicated a slow build-up of power demand in the morning and a gradual

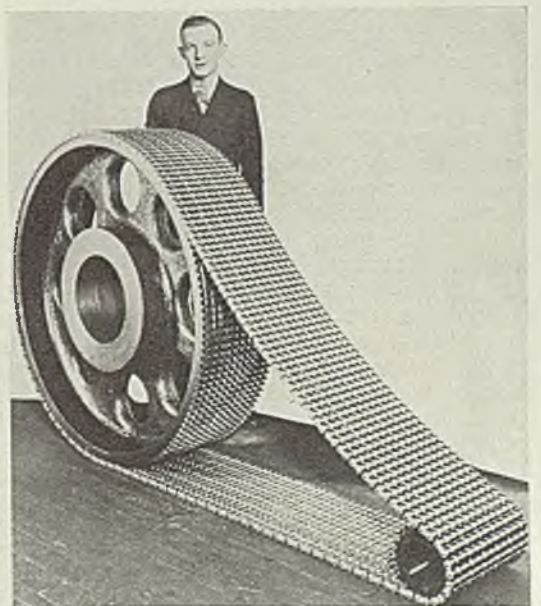
slowing down afternoon and night. These periods totaled up to about 91 minutes per day. In addition during the day, when the plant was supposed to be busiest, frequent short drops in power consumption occurred.

The graphic record of power consumption in metalworking plants is almost directly proportional to the amount of work done, after allowing for the amount of power required for operating idle. Thus, even though machines are permitted to run idle, the chart shows when they are put to work. Therefore a continuous graphic record will indicate variation in production.

Contrary to the first supposition—that the workers were slow getting into production — investigations showed that lack of material, a management responsibility, was the cause of practically all loss. Many machines didn't have a supply of material in the morning or ran out before noon. Irregular flow of work, because of incorrect balancing of operations, caused the drops in

## Duodecuple Drive for South America

**T**HIS duodecuple (12 strand), 1-inch pitch, roller chain drive is destined for the central part of South America where it is to be mounted on a 250-horsepower steam engine rated at 150 revolutions per minute. The chain is 14 inches wide, weighs 20 pounds to the foot, has an average tensile strength of 134,400 pounds and operates at a lineal speed of 1835 feet per minute. The 146-tooth, cast-iron driver connects to a 22-tooth, heat-treated machine-steel follower on 59½-inch centers. Photo courtesy Diamond Chain & Mfg. Co., Indianapolis, Ind.



power demand during the supposed busy hours.

Complete replanning of the work, scheduling of machines, handling of materials to machines, and balancing of flow of work between machines cut the morning slack from 40 minutes to 4 minutes, at noon stop from 10 to 4 minutes, noon starting from 14 to 1 minute, and evening slowing down from 27 to 5 minutes. In this way the slack was reduced from 91 minutes to 14 minutes per working day in a single department.

Similar improvements in operation throughout the plant resulted, by reduced idleness, in an annual saving in wages alone amounting to considerably over six figures. In many plants such wastes aren't considered any of the plant engineering department's business. Where this policy is in effect, the plant engineer must use considerable diplomacy in getting the charts before an executive who can initiate corrective measures. However, if he can find some excuse for presenting the charts to this executive, either in a report on power consumption or in connection with a proposed change in power utilization, the executive will note the slow build-up of power demand and investigate on his own responsibility.

In some plants where the executive realizes the importance of records of operation, daily charts are sent to him. In other plants the executive has in his office an instrument that can be connected to any group, or in some cases any unit, so he can obtain spot checks at any time.

## Safety in Maintenance

**M**AINTENANCE workers are exposed to many and varied hazards, not only those of their own carelessness and of the work they are doing but also those created by the actions of others.

Electrical shocks, ladders, scaffolds, falling objects, pinching from loosened parts, all present hazards to the maintenance men. Premature starting of equipment under repair offers a serious hazard from the action of others.

As in all industrial safety work, the maintenance man himself is either his greatest hazard or his best safeguard. Carelessness will thwart any safeguard; carefulness requires few safety devices. Maintenance men, like other workers, lapse into careless moments and so must be provided with safeguards like other workers.

### Feel False Security

Since maintenance men work on almost every type of equipment, they often have a false feeling of security, due to familiarity and con-

fidence, which frequently results in a serious accident. For example, many electricians feel a wire to see if it is "hot." This practice has resulted fatally in numerous cases. Testing of operating equipment after repairing, but before replacing guards, requires extreme caution and should be discouraged.

One of the most serious hazards to electricians and mechanical repairmen comes from premature starting of equipment on which they are working. "Man Working" signs alone are inadequate because, if the man is not in sight, the operator may think the work finished and the sign forgotten. Providing the maintenance men with padlocks and facilities for locking out switches or compensators is the only safe method and is used extensively in plants.

Repairing and adjusting machines frequently requires working in close proximity to moving shafts, gears or other rotating parts. Loose clothing, sleeves or neckties may catch and seriously injure a man. Foremen should watch clothing of maintenance workers and insist they dress properly.

### Shafting Is Dangerous

Painters and others who may be working overhead in close proximity to shafting also require guarding where shafting ordinarily is beyond possible contact. Hanging of a board between themselves and the shaft provides an easily installed temporary guard. The same protection is necessary when installing countershafts wherever the worker is within reach of or possible contact with a rotating shaft. A guard rail on platforms prevents accidentally stepping off while at work. Several companies have developed special, knockdown, portable platforms with guard rails, and toeboards that prevent tools from working off and also indicate to the worker the edge of the platform.

All tools, including ladders, chains, ropes, hammers, and chisels, require frequent inspection and repair or rejection at any signs of danger. This inspection is best made by someone designated for this work instead of relying solely on the safety instincts of the users.

Special emphasis must be placed on guarding floor openings, pits or partially dismantled equipment and on leaving tools, or parts such as bolts or nuts, overhead because of the danger to others. It is never safe to permit maintenance to be carried on overhead while men are working or passing underneath. Carrying tools or material up a ladder is unsafe; tossing them up is also dangerous.

Since the maintenance men operate in all parts of the plant, their example has a good or bad effect upon the shop employees. Therefore edu-

cational work should be directed toward making them safety-conscious, not only for the example set and their own safety, but also to train them to watch for unsafe machines and practices and suggest better safeguarding.

One good plan is to rotate members of the maintenance department on the safety committee. Usually a part of maintenance work is to install and maintain safeguards. Educational work in safety cannot be slackened in this department, or in any other, because the best safeguard is a careful man.

Where careless or low-grade labor must be used to start motors push-button starting is usually recommended.

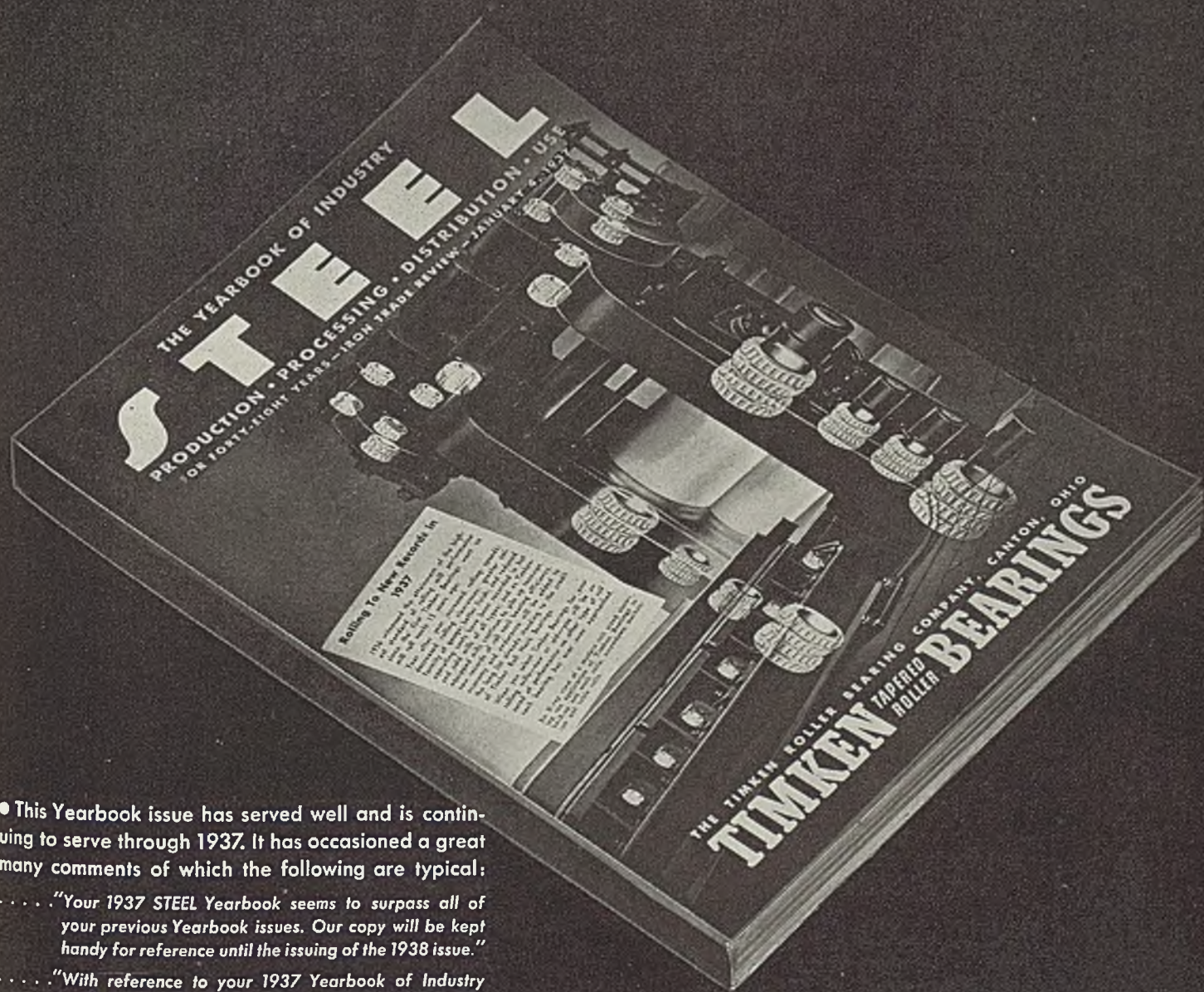
Across-the-line starting may not be used where the sudden shock of starting may damage a delicate machine or break or damage the work or tool. Also, such starting of high-inertia machines causes excessive strains on the machine and drive. Be sure they can stand it.

Experimenting with an oil "just as good, but cheaper" may be very expensive in the long run. Experimental work to determine the best oil for any particular application requires laboratory procedure or long periods of service, preferably under observation. Few industrial men are able to give the equipment and lubricant this attention. Generally it is better to purchase lubricants from a reliable source and on the recommendation of the manufacturer's engineers.

Electrical power costs more than the kilowatt-hour price. To this must be added annual power distribution costs and other overhead, maintenance, engineering charges and often power factor penalties.

One of the advantages of at least one belt in a machine drive is that its elasticity absorbs shocks. Also, a belt, which will slip when overloaded, acts as a safety link in case of sudden stoppage, thus giving time for the overload relays to shut off the current.

One plant engineer standardizes all general purpose motor speeds as follows:  $\frac{3}{4}$  to 5 horsepower, 1200 revolutions per minute; 5 to 50 horsepower, 900 revolutions per minute; 50 to 100 horsepower, 600 revolutions per minute. In this way a spare motor, even if it is necessary to use one of slightly larger rating in an emergency, can replace any other motor and still provide the same base speed.



● This Yearbook issue has served well and is continuing to serve through 1937. It has occasioned a great many comments of which the following are typical:

- ..... "Your 1937 STEEL Yearbook seems to surpass all of your previous Yearbook issues. Our copy will be kept handy for reference until the issuing of the 1938 issue."
- ..... "With reference to your 1937 Yearbook of Industry issue, I am particularly glad to see that you have continued the same general format from last year, which I feel is highly successful. Getting so much information between two covers without having it somewhat jumbled and difficult to locate is rare. Last year's setup arranged the material admirably and you were wise to continue it."
- ..... "I expect to keep this 1937 Yearbook of Industry issue of STEEL on my desk until it is replaced by the 1938 issue."

STEEL'S 1938 Yearbook issue will soon be a fact. Arrange now for adequate representation.

# Using High-Strength Low-Alloy Steel

Procedure to be followed in welding and fabricating high yield strength steel is presented in this article

BY H. L. MILLER and T. R. LICHTENWALTER

Metallurgical Department, Republic Steel Corp., Massillon, Ohio

**H**IGH yield strength steel is being used increasingly in applications where less deadweight and where greater resistance to corrosion are desired. Railroads are the most important consumers of such steel, using it in whole or in part in building large numbers of new cars. Such steel rapidly is coming into more extensive use in industrial trailer frames, contractors' service trucks, dump trucks, tanks for gasoline trucks and in other automotive applications. It is being used to reduce the weight, without lowering the capacity, of such units as clamshell buckets, dragline buckets, shovels and dirt haulers.

In view of the fact that the field of application seems to have been barely scratched it should be of interest to many steel consumers not yet familiar with this material that the procedure followed in fabricating and welding it has been well worked out. With a few exceptions, the procedure set up is much like that followed in fabricating and welding plain carbon steel. In fact, the methods are so simple as to encourage the extensive use of such steel in the manufacture of machine parts and other steel products in which a combination of light weight with strength and corrosion resistance is desired.

The methods herewith described apply to the high yield strength, low alloy steel known as Republic Double Strength. A low alloy steel, it contains 0.50 to 1.50 copper and 0.50 to 1.00 nickel, with molybdenum at 0.10 per cent minimum. This analysis permits a reduction of weight from 25 to as high as 40 per cent and raises the allowable working fiber stress to 24,000 pounds per square inch which compares with the normal 16,000 pounds ob-

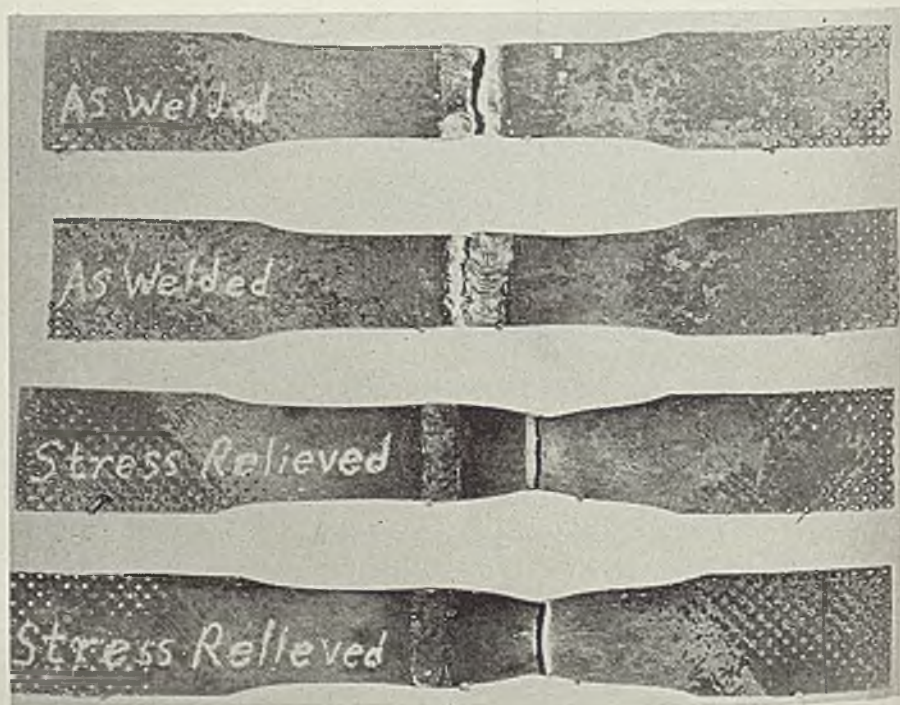
tainable with ordinary steel. The new steel shows an average yield point of 55,000 to 65,000 pounds per square inch and average tensile strength of 70,000 to 85,000 pounds. Ductility, as measured by elongation of 25 per cent minimum in 2 inches, is sufficiently high to give good cold forming properties.

It forms readily in dies and brakes hot or cold. However, the new steel has greater springiness than ordinary steel. Hence, in bending for angles, channels, zees and other

shapes it is necessary to make proper allowances. In bending 90 degrees the die must have radius equivalent to one or two times the gage of the metal, depending on the thickness. For 14-gage to  $\frac{1}{8}$ -inch material the radius must equal the gage of the metal. For  $\frac{1}{8}$ -inch and thicker material, the radius must be twice that of the thickness of the section. That is, when the radius equals the gage, approximately 3 degrees are allowed for springback while when the radius is twice the thickness 5 degrees are allowed.

With this steel it is advisable to normalize everything lighter than  $\frac{1}{8}$ -inch so as to get flat sheets for truck tanks and other applications in which flat stock is needed. It is

**R**ESULTS of bend tests showing ductility of weld metal. Top specimen is in as welded condition, bottom stress relieved in  $\frac{3}{8}$ -inch plate with weld metal ground flush



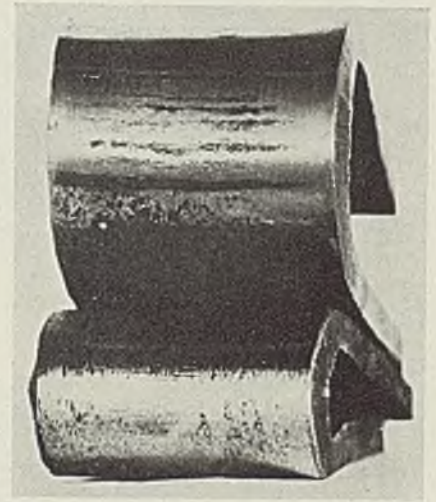
customary to use in the hot rolled condition without normalizing  $\frac{3}{8}$ -inch and heavier plates used for such purposes as car frames.

Sometimes the change in form to be obtained in drawing over a die in a brake or press is too great to be obtained cold, or a sharper radius is required. In such cases hot forming is necessary. In hot forming this steel it is essential to heat above the critical but press below the critical. The steel should be heated above the critical temperature, 1600 degrees Fahr., in a reducing or neutral atmosphere. The heating should be at a normal rate of speed with care exercised to make sure that the temperature is uniform throughout the work. Under no circumstances should the temperature be allowed to exceed 1800 degrees. The actual pressing should be done after the

the market flux coated electrodes that will yield welds of adequate strength with very little undercutting. When properly made, butt welds in this steel take a full 180-degree bend over a radius equal to gage thickness on  $\frac{3}{8}$ -inch and under and  $1\frac{1}{2}$  to 2 times the gage thickness on  $\frac{3}{8}$ -inch and over. Fillet welds are characterized by good ductility.

Because Republic Double Strength is an alloy steel, puddling should be avoided; it coarsens the grain structure and produces weak welds. Design of welded parts should be so made that the welds can be finished. In other words, there should be no opening at the end of the seam. It is inadvisable to build up the bead excessively; the reinforcement should not be in excess of 20 per cent.

In most cases electric welding is



**S**PECIMENS used in compiling tensile data on arc welded pieces shown in the accompanying table

## Results of Arc Welding on High Strength Steel

Speciment	Yield p.s.i.	Tensile p.s.i.	Location		
			Elong. 2"	Elong. 4"	Free Bend
As welded	62,300	78,300	23.0%	19.0%	In Weld 180 deg.
As welded	60,000	75,200	17.0%	14.0%	In Weld 180 deg.
1250 deg. stress relieved	51,200	65,000	37.0%	26.0%	1 $\frac{3}{8}$ " from Weld 180 deg.
1250 deg. stress relieved	52,000	65,500	37.0%	26.0%	1 $\frac{1}{2}$ " from Weld 180 deg.

Electrodes giving tensile of approximately 75,000 pounds per square inch were used plate thickness,  $\frac{3}{8}$ -inch.

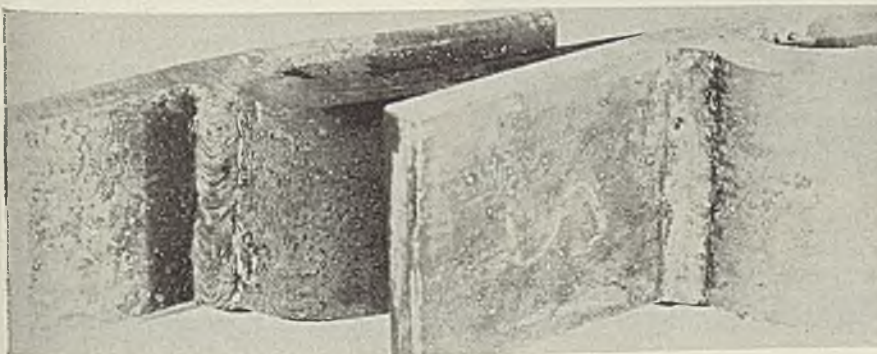
piece has cooled to between 1300 and 1400 degrees. This practice results in less warpage and shrinkage and holds the piece closer to size. Heating, if done in the above mentioned range, in no way alters the properties of this steel since it is not of an air hardening type.

In welding, the job is laid out about the same as for ordinary steel, scarfing everything heavier than  $\frac{1}{8}$ -inch. The job should be set up in fixtures wherever possible to prevent buckling, but this is not essential where the welder is familiar with the expansion and contraction of ordinary steel. Like most copper bearing steels, this new steel is subject to undercutting. Since the full strength of the steel is required by the design of the part, it is essential that such undercutting be prevented. Several manufacturers now have on

employed although the steel can be gas welded if desired. When spot welding it is advisable to use approximately the same amount of heat as with ordinary steel. The new steel, however, has a slightly higher heat conductivity, making it necessary to hold the heat just a little longer. When using a series spot welder, no attempt should be made to weld scale covered material to material free from scale. In such an operation, scaly material should be welded to scaly material or material free from scale should be welded to material free from scale. That is, both plates should be either pickled or unpickled.

The new steel may be flame cut to shape the same as ordinary steel.

**B**END test specimens on half-inch fillet welds. Note ductility



It is recommended, however, that about  $1/32$  to  $1/16$ -inch from the flame cut edge be ground off prior to welding.

Made in two grades, grade No. 1 has 0.12 carbon maximum while grade No. 1A ranges from 0.20 to 0.30 in carbon with an average of 0.23. It always is advisable, after welding, to stress relieve grade No. 1A when  $\frac{3}{8}$ -inch and heavier plates are used. It is necessary to employ temperatures ranging from 1200 to 1250 degrees Fahr. and care should be exercised that the temperature is uniform throughout the work. If the heat is below this range ductility may be impaired. In cases when stress relieving is deemed necessary in connection with grade No. 1 or with grade No. 1A in gages below  $\frac{3}{8}$ -inch the same practice should be followed.

This steel has been successfully applied in various parts to about 2000 freight cars including box cars, gondolas and coal hopper cars. A large number of gasoline truck tanks in service up to  $2\frac{1}{2}$  years are giving excellent service with 6 to 7 per cent increase in payload. Dump bodies for coal delivery have also proven very satisfactory in service up to three years. Light weight passenger cars are using increasing amounts of this steel in roofs, framing and sides.

When a plain bearing drips oil, either it has been overfilled or the proper lubricant is not used. Improper grooving also may be responsible.

Sometimes a low-speed motor may be more economical than a standard high-speed unit because a more simple speed reduction is possible. In any case, total cost by several different methods and combinations should be figured before making a decision.



# WELDING, ETC.

BY ROBERT E. KINKEAD

## Design of Welded Steel Machinery

IN THE October issue of *Mechanical Engineering*, A. P. Wood of General Electric brings out a point in connection with welded steel design that has quite often been overlooked.

He states that in some cases, parts are changed from castings to welded steel design of simpler contours only to be changed back to castings because the foundry can quote lower prices on the simplified structure. Others who operate both welding shops and steel foundries have had the same experience. Welded construction usually has to be of great simplicity to be economical.

Simplicity of design is a virtue in machinery and industrial equipment. The museums have lathes and planers built fifty to seventy-five years ago that have all manner of curlicues, and even brass ornaments, which have no function in the operation of the machines.

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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.

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Such design would be unsalable today.

Only such metal should be used as is required in the function of the machine; appearance will take care of itself and in most cases the design will be economical.

Recent design of machine tool equipment of welded structural shapes and plate, and enclosed by streamlined covers to keep the dust out of the mechanism, represents perfectly sound and logical design. Every metal part performs a legitimate function and good appearance is a result.

The subject of working stresses in machinery parts is not one which arrived with welded steel construction. The same principles have been used for many years in cast

construction. But it is a fact that a much heavier penalty is paid in welded construction for using material that is too thick and stresses that are too low.

Most designers will use higher stresses in rolled steel than in cast steel as a matter of course, but the important point is that the full value of the metal should be used to get economical design. Success in working out economical designs of welded steel machinery depends more on the designer's willingness to break with tradition than the acquisition of new knowledge.

## Welded Cars and Ships

DEVELOPMENT of the all-welded freight car and the almost completely welded tank ship forecasts great development in these two fields. At the same time, these two welding applications will provide a liberal education in economics for those who are interested in the subject.

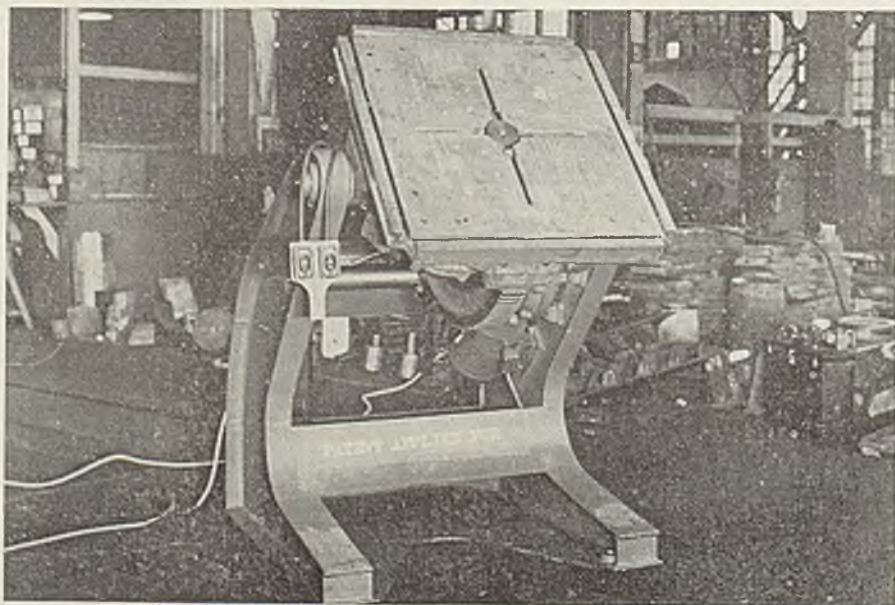
The welded freight car will have to be built at a lower cost than a riveted car. No matter how much the car builder might want to pay—his men five dollars per hour, the steel company \$300 per ton for the steel, and the welding company \$5000 for a welding machine—these things are impossible because the railroad cannot afford to pay more for its cars.

If the ICC raises the railroads' tariffs so that they can pay more for cars, more people will ship by truck or not ship at all, so there will be less need for cars. These are the conditions which business men must face, and enlightened labor leaders know it.

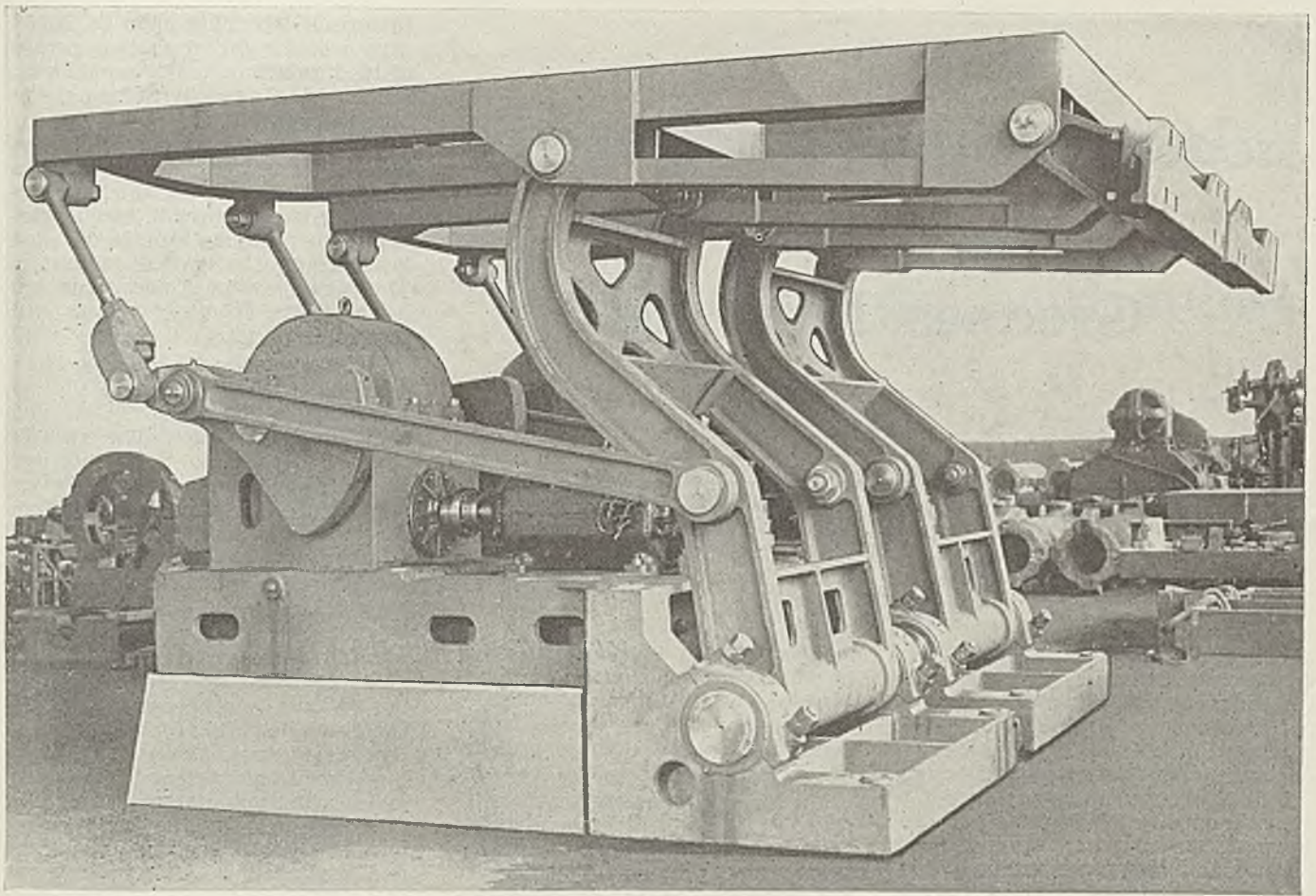
The problem must be solved by engineering, the final result a better car built for less cost through savings in both labor and material as well as cost of operation of the car. Unless these results can be accomplished by a safe margin, no one will be found to invest the capital.

The same general conditions hold in the application of welding to merchant ship construction. It is very different from building naval vessels. The American Merchant Marine has two strikes on it already. Foreign competition has almost driven it off the seas. Welded ships can overcome some of the handicaps of government regulations but probably not all. Large scale welding operations with heavy capital investment for machinery will reduce the labor cost of construction. It is possible to do the job so well that American shipyards can compete successfully with foreign shipyards for the ships that travel under foreign registry. Again it is an engineering job where conditions are fixed and only one result is permissible—better ships at lower cost.

## Welding Manipulator Has Positive Control



FACEPLATE of the welding manipulator illustrated can be tilted through an angle of 165 degrees, and rotated through 360 degrees. Both motions are individually power driven through self-locking worm drives, and the face plate has been provided with many means of locating and mounting in order to bring any welding job into the downward-V position for easier work. The one-ton unit was built by United Engineering & Foundry Co., Pittsburgh



# Slab Pushers . . . .

**ALSO COMPLETE  
EQUIPMENT FOR**

- THE FINISHING END OF  
STRIP MILLS
- TIN MILLS AND SHEET MILLS
- ROLLING MILL MACHINERY
- ROLL LATHES
- STRAIGHTENING MACHINES
- STRETCHER LEVELLERS
- SPIKE MACHINES
- TUBE MILL EQUIPMENT
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Drive, Compact Construction and Proven  
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# Industrial Lubricating

## Greases Must Be

## Selected Intelligently

**P**ROPER selection and application of lubricants, use of quality lubricants and the correct design of bearings are essential for satisfactory lubrication. Bearing and lubricant manufacturers and users must, therefore, work together for the benefit of all. For this purpose representatives of these three groups exchanged experiences and viewpoints on their common problems during the fifth annual convention of the National Lubricating Grease institute at the Blackstone Hotel, Chicago, Oct. 4-5.

In discussing roller bearing lubrication problems, O. L. Maag, lubrication engineer, Timken Roller Bearing Co., Canton, O., spoke of the changing and increased lubricating requirements. Every day brings new problems to the lubrication engineer and to the manufacturer of lubricants. The steady increase in the application of antifriction bearings in all branches of industry, the increase in bearing loads, gear loads, higher speeds and greater precision, all play their part in complicating the problem of economical, efficient lubrication.

### Co-operation Is a Requisite

Lubrication is no longer merely a messy job to be handled by any laborer with an oil can or a grease paddle, he emphasized. Lubricants must be properly applied as well as properly compounded. Intelligent selection of the type and grade of product to be used is important and cooperation between the manufacturer of lubricants, the bearing manufacturer and the user of the equipment essential. Too much lubricant may prove nearly as disastrous as too little.

Poor selection or a poor quality of lubricant is likely to prove expensive. Much still remains to be done in closure design and, until closures

are perfected, a lubricant must act in part as a seal as well as a lubricant, which still further complicates the situation. Every bearing application presents a potential problem in lubrication.

Mr. Maag pointed out that specifications for lubricants are being drawn tighter and tighter as users study their problems. Difficulties are inevitable as equipment manufacturers and users become more and more insistent upon having lubricants compounded to meet their special conditions. Many problems have to be solved, among them being how to improve the stability of various types of lubricants both in service and in storage; how to reduce the difference in consistency between milled and unworked greases; how to reduce or eliminate the abrasive and corrosive action of certain types of extreme pressure products.

Compounders in the opinion of Mr. Maag, can play an important part in solving these problems and can be of valuable assistance to users of equipment in solving their particular problems without the need for too many special products. In turn, he emphasized that his company is at all times willing to cooperate with manufacturers and users of lubricants in their endeavor to improve operation, reduce maintenance and increase bearing life.

### Lubricants May Cause Failure

At another session on lubrication problems presented by different types of ball bearing applications H. R. Reynolds chairman of the lubricating committee, American Bearing Engineering council, and chief engineer, Fafnir Bearing Co., New Britain, Conn., emphasized the interdependence of manufacturers of bearings and of lubricants because bearings will not operate without lubricant. Also, the bearing manu-

facture is dependent upon the lubricant used for the operating success of his products, as failure of the lubricant is followed by failure of the bearing.

In the use of lubricants ball bearing manufacturers have two main requirements: One, the rapidly growing use of prelubricated bearings, either the self-contained sealed bearing, or the sealed mounting. The other, customer use, where renewal of the lubricant is arranged for and required.

Unfortunately, designers seldom give much consideration to the application of lubricant. Cost and available space quite often restrict them when they do. So the average bearing application is much more critical of the lubricant used than would be the case if all conditions were worked out to give the lubricant most favorable conditions.

Of especial need, according to Mr. Reynolds, is a grease for prelubricated bearings which can be guaranteed not to be affected by storage but to have long operating life. In the discussion which followed tentative arrangements were made for a meeting of committees from grease and bearing manufacturers to make more detailed studies of the requirements of ball bearing manufacturers and operators.

### Many Problems in Steel Mills

In discussing grease lubrication requirements in steel mills, C. C. Pecu, lubrication engineer, Lackawanna plant, Bethlehem Steel Co., pointed out the wide and varied conditions under which bearings operate. These include not only rolling mills of various types and sizes but in addition the equipment serving coke ovens, blast furnaces, open hearths, handling, cutting and to some extent working on the product. Many of these operate under severe conditions of high or low temperatures with bearings exposed to water, dust and scale.

Some plants use as much as 100,000 pounds of grease per month. A modern strip mill may have over 9000 bearings. A bearing failure in many important points would stop production. In the paper, which will be reproduced in an early issue of STEEL, Mr. Pecu described the characteristics of the different greases for various applications.

Most important considerations in steel mill lubrication, according to Mr. Pecu, are an understanding of what a lubricant may be expected to do and where it may be applied and to make the men who service the equipment "lubrication conscious." He assumes responsibility for determining the proper application. Mr. Pecu stated that each Friday he holds separate department meetings of the superintendents and foremen of the electrical and the mechanical



forces to discuss lubrication, any failures or other problems that come up. Whenever an important bearing fails he must be notified.

In addition, these heads receive monthly reports on lubrication costs, amounts used in various departments and other information which may assist them in reducing the cost but not the effectiveness of lubrication. In some departments the use of lubricants is so standardized that the lubricant is allocated to them according to the work scheduled. By careful study of requirements the costs of lubrication and of maintenance, which is influenced by proper or improper lubrication, have been reduced.

Other papers covered automotive hypoid gear and chassis lubrication and the testing of lubricants by the makers. Several present emphasized the need of a low cost and simple testing equipment and determination of easily applied methods of testing which can be applied by grease manufacturers and users to check the serviceability of lubricants.

## New Refractories Developed For High Temperatures

A new series of super refractories adapted particularly for use in high temperature furnaces and in contact with corrosive materials has been developed recently at Mellon institute, according to an announcement made today by Dr. E. R. Weidlein, Director of the institute. These new refractories, which have been given the trade name "Monofrax", were evolved through the research of Dr. A. P. Thompson, incumbent of the Abrasive Fellowship, in cooperation with the research laboratories of the Carborundum Co., Niagara Falls, N. Y.

Several large scale installations of "Monofrax" have already been made in the construction of glass melting furnaces and of furnaces for the handling of molten slag. The performance of these refractories has been outstandingly successful and it is expected that these materials will find much wider application in the erection of other types of furnaces.

"Monofrax" blocks are cast, by methods similar to those employed in foundry practice, from a melt produced in the electric furnace. Because of the non-metallic nature of their constituents, however, much higher temperatures are required than in casting iron, and the problems involved are therefore much more complex. Through the use of unique methods of forming the blocks, these obstacles have been largely overcome, with the result that this material is now available commercially.

# Chicago Power Exposition

## Attracts Large Audience

**M**ORE than a million dollars worth of machinery and plant equipment was exhibited by 153 companies in the Chicago Exposition of Power and Mechanical Engineering held in the International Amphitheatre, Chicago, Oct. 4-9. Previous Chicago Power shows had been organized under local auspices, but this one was directed by the International Exposition Co., New York, which handles the New York biennial power show. Total attendance was over 50,000, and sales during the week were estimated at \$10,000,000.

Of particular interest to the metal industry were extensive exhibits of ferrous and nonferrous metals utilized in valves, pipes and tubes for resisting corrosion or withstanding high pressures and temperatures.

Power plant equipment predominated, this including stokers, insulating material, boiler tubes, water softeners, recording and control instruments, valves, wrenches, pipe tools, and miscellaneous items. Coal handling equipment drew interest.

Bearing exhibits ranged from a four-row antifriction bearing for a 29 $\frac{3}{4}$ -inch roll neck to single-row ball bearings for  $\frac{1}{8}$ -inch shafts. Bronze and babbitt bearing metals also were on display.

### Control Equipment Demonstrated

One manufacturer showed a working model of a solenoid motor control used on an automatic high-speed milling machine. Table travel speed is controlled for rapid approach or reverse and slow cutting by pre-set dogs on the table. All functions, except placing and removing work, are performed electrically at predetermined speeds instead of mechanically. Timers and contactors for repeat or nonrepeat control of spot welders and switches operating at 150 times per minute were shown. Automatic and manual control for alternating and direct-current motors and power valve opening and closing controls were demonstrated.

Advantages of modernized group drive were explained on a panel

board showing working models of miniature lathes. Several types of pivoted motor bases which maintain tension under load were exhibited.

Numerous variable-speed transmission units of mechanical and fluid-power types were in operation. In one case, a fluid power unit demonstrated how speed may be controlled within a variation of 0.3 per cent by time, and independent of changes in load, voltage, frequencies, oil temperature and viscosity. Other exhibits included a drill press drive providing speeds from 250 to 2000 revolutions per minute by movement of a lever; a unit giving any speed from zero to input speed; variable-speed control of a winding operation; a special motor base with V-belt on variable-pitch sheaves; and a unit giving positive feed changes. Speed reducers of all types from 1/50 to 75 horsepower were shown.

### Show Lubricating Devices

Automatic lubrication of multiple bearings by grease and by oil was demonstrated by working models. In one exhibit, a unit provided for intermittent, continuous and splash lubrication of various types of bearings and gears from a single power feed source. Several methods of applying a predetermined amount of lubricant at fixed intervals were demonstrated.

Trolley hoists with air wheel drive; trolleys for various loads; an acid-resisting trolley and monorail; hoists; lifters; and a crane scale, were prominent in the materials handling exhibit. Other items shown were 6000-pound electric platform and telescopic fork-type tiering trucks; hand lift trucks; gas-powered tractors; warehouse and 4-wheeled platform trucks; storage racks; tiering machines; and air compressors.

Gas and arc welding equipment; lighting units; metal bandsawing and filing machines; flexible shaft equipment; flexible couplings; a metal stamping process for making stampings in small quantities; air filters; and air conditioning apparatus, were other types of equipment featured.

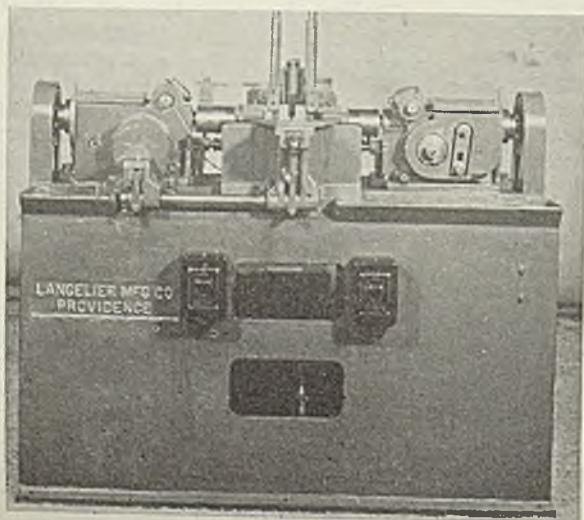
# NEW EQUIPMENT

## Rolling Grilles—

J. G. Wilson Corp., 1841 Broadway, New York, is manufacturing the Wilson rolling grille. This decorative and protective screen is constructed of  $\frac{3}{8}$ -inch round rods separated by  $\frac{1}{8}$  x  $\frac{3}{4}$ -inch steel triangular-shaped links to form a substantial curtain yet not hinder the view of the premises or merchandise it protects. It coils on a pipe shaft enclosing a helical, counterbalancing spring and travels in steel guide channels in which the ends of the curtain are secured to prevent their being dislodged. The coil may be surrounded by a sheet metal hood either square or round. Operation may be by hand, chain, crank, or motor. Grille may be placed on the face of the wall to coil above the lintel, or between jambs and below lintel, or on the outside face of the wall, with operation from either side. Several types of locking devices are available, depending on use of the grille. It may also be made of bronze or aluminum.

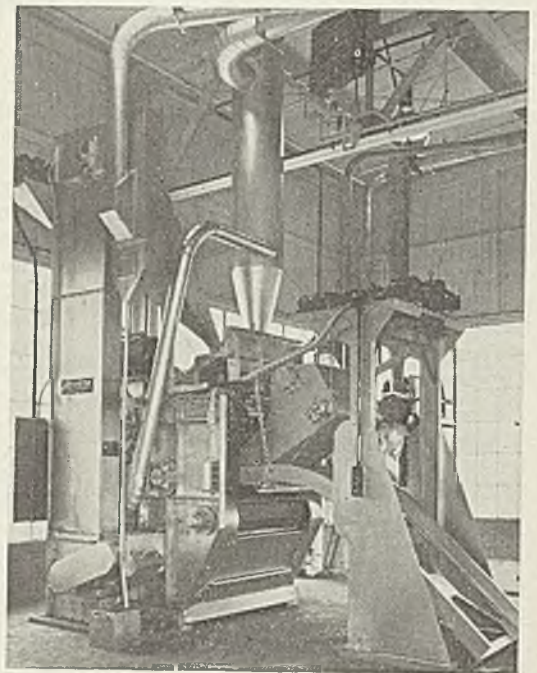
## Threading Machine—

Langelier Mfg. Co., Providence, R. I., is manufacturing the double



Langelier double-end threading machine has box-type base also serving as lubricant reservoir

end threading machine illustrated, in this case for threading door knob spindles. It consists of a magazine-fed, horizontal duplex opposed machine using two No. 11 drilling units and driven from individual motors,



New Wheelabrator Tum-Blast is now of welded steel construction

the machine having a box-type base which also serves as a reservoir for the cutting lubricant. The parts are loaded into a vertical magazine and shifted to the operating station by means of a cam actuated by the left hand unit. This unit also has a cam-actuated device for clamping the part during threading. The right hand unit is started in operation automatically by a limit switch on the left hand or control unit, which closes a circuit to actuate a solenoid. This trips the clutch mechanism, and the head makes one complete cycle and then stops. Self-opening die heads are used on the spindles and, after the operation is completed, the parts are ejected automatically.

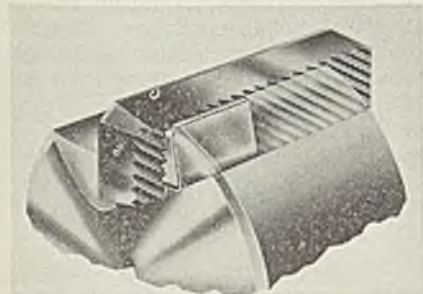
## Blast Cleaner—

American Foundry Equipment Co., Mishawaka, Ind., has announced a new model 36 x 42-inch Wheelabrator Tum-Blast, centrifugal abrasive blast cleaner. Side

frames are now fabricated from steel, and welded joint and corner construction is said to assure extra ruggedness and dust-free operation. Centrifugal force is utilized in whipping steel abrasive onto metal pieces being cleaned in the new unit, a gentle tumbling and complete exposure of all parts in the blasting zone being obtained by use of an endless conveyor apron. A suction-type, abrasive separator included at the elevator head keeps abrasive clean by removing dust and broken-down abrasive after burned sand, forging scale, and other foreign material are extracted by the rotary screen. The new machine, with standard conveyor, cleans metal parts weighing up to 30 pounds. Pieces weighing 75 pounds can be cleaned when machine is equipped with heavy-duty conveyor.

#### Blade and Lock—

Gairing Tool Co., Detroit, has announced a new method of locking adjustable, inserted blades in milling cutter heads. Locking member, positioned in a shouldered recess adjacent to the blade slot, fits the serrated blade and locks it securely. Blade and lock are inserted lengthwise. Facility of adjustment is claimed as an advantage of this design; there are no wedges to drift out or upset. A tap on the rear of the blade releases it instantly and it



Both detail and full view of Gair-Lock method of locking adjustable, inserted blades in milling cutter heads is shown



can be set out the required distance. A single blade may be removed and replaced without loosening or removing other blades in the head. Blades may be set at correct angle and rake to obtain solid tooth cutting action. This unit, known as the Gair-Lock, is said to prevent

blade shifting or tilting, permit more blades per diameter, afford more chip clearance and eliminate serrating of cutter body.

#### Linestarters—

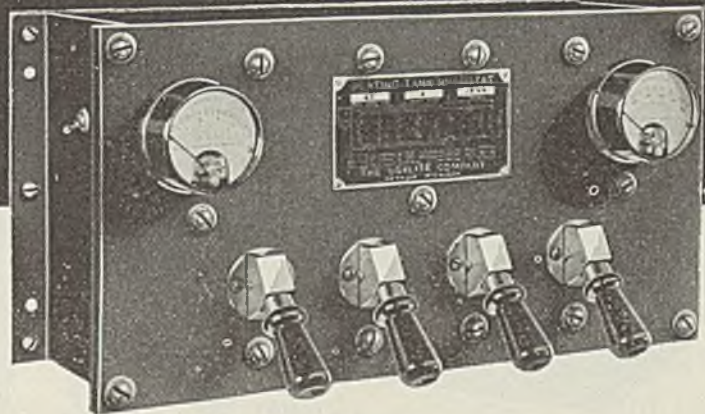
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has announced totally - oil - immersed linestarters known as low-voltage-type DNO designed for applications where explosive or corrosive gases may be present. The combination starters provide in one oil tank, corrosion-resisting motor control, motor disconnect switch, and circuit protective device. They are claimed to be

of weatherproof, dripproof, splash-proof and dust-tight construction with cast iron top casting and heavy sheet steel tank with gasketed joint, and are designed for wall or frame mounting with tapped holes for conduits on top. Ends and back of top casting may be tapped for conduit. Overload protection is provided by two thermal induction, oil-immersed, automatic reset, overload relays. Low voltage protection is obtained with three-wire, push-button control. Complete safety is said to be assured by interlocking breaker handle with the tank so that latter cannot be lowered unless the breaker handle is in off position. Breaker

## Close Current Control— Better Plating Results

*With the*

## UDYLITE RHEOSTAT



#### Self-Cleaning, Cam-Type Switch

The Self-Cleaning, Cam-Type Switch is the heart of the Udylite Rheostat. It operates easily—positively—efficiently under all service conditions. Perfect contact with bus bars is ensured because switch leaves are ground when in closed position. Extra current carrying capacity is provided through ample contact surface and cross-sectional area. The leaves of the self-cleaning cam-type switch are actually multiple cleaning units. The switch in closing causes the leaves to exert a wiping action on the surface of the bus, insuring positive contact at all times and at all points.



Current variations are frequently the cause of poor plating results. And poor plating results cost money!

The Udylite Rheostat smooths out current "peaks and valleys" by providing you with close control over the current entering the plating bath. It further enables you to step up production by reducing plating time through maintenance of maximum permissible current in the tank.

An instrument of precision, the Udylite Rheostat is built to stand the knocks of continuous service in the plating room. Cam-type, self-cleaning switches govern resistors made of helically coiled, nichrome wire. Coil brackets have large radiating surface insuring cool resistor contacts. Instruments—ammeter and voltmeter—are of highest quality obtainable. All metal parts are Udylited for efficient protection.

Udylite Rheostats are furnished for all electroplating processes in standard sizes from 15 to 5000 ampere rating with voltage drops from 1 to 5. Higher voltage drop rheostats are made to special order.

## THE UDYLITE COMPANY

1651 E. Grand Blvd., Detroit, Mich.

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114 Sansome Street

cannot be closed with tank lowered unless the interlock is deliberately tripped. In addition to the breaker and starter combination unit, there is also available a combination unit with non-automatic disconnect switch and a plain starter without disconnect.

#### Wrench Set—

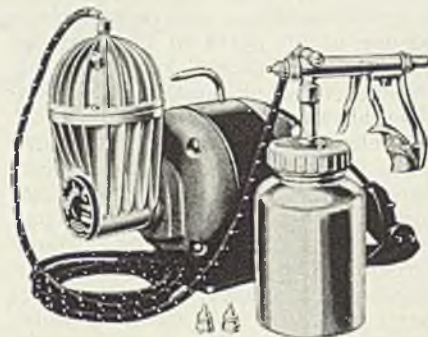
Holo-Krome Screw Corp., Hartford, Conn., has announced its new socket screw wrench set No. 22. This outfit contains nine File-Hard surfaced, socket screw wrenches to fit all hex-type hollow set screws

from No. 9 to 3/4-inch diameter inclusive, all socket head cap screws from No. 8 to 1/2-inch diameter inclusive, and all sizes of socket head stripper bolts from 3/8 to 1/2-inch diameter inclusive. Set box is compact, with black crackle finish and attached, hinged cover.

#### Portable Airpainting Unit—

Paasche Airbrush Co., 1909 Diversey parkway, Chicago, has announced the development of a new baby portable, electric, airpainting unit for maintenance work in small industrial plants or buildings,

automotive refinishing shops or for individual use. The complete outfit comprises a motor-driven air compressor, airbrush, material cup and hose. Motor is 1/6-horsepower.

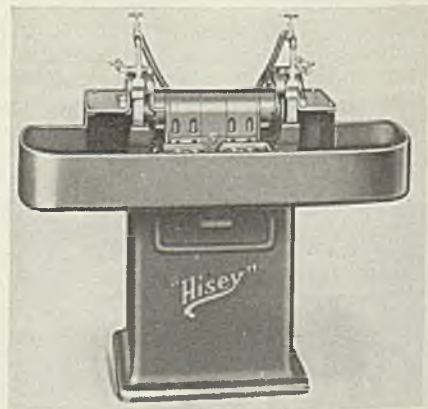


Paasche portable airpainting outfit is small, driven by 1/6-horsepower motor

Although the unit is compact enough to carry in an ordinary traveling bag, it is said to be large enough for automobiles, furniture, small buildings, fences, and painting jobs of similar size.

#### Wet Grinder—

Hisey-Wolf Machine Co., Cincinnati, has announced a new two-wheel wet grinder made in sizes for 10, 12 and 14-inch wheels and designed for use with motors of any electrical characteristics. Correct spindle speeds are obtained through V-belt drive, speeds being changed easily when desired. Constant stream of coolant is supplied directly to the work and dust is eliminated, a stream of water carrying away all dust and grit. A separator re-



Hisey wet grinder is made for 10, 12, or 14-inch wheels

moves grit before returning the water to the reservoir, and flow of water is controlled by convenient valve on top of the guard. Separator is easily removed for cleaning. Pump is self-priming and driven by V-belt from the spindle.



**NO** skidding from side to side, quick stops and sure starts—the same features which make Inland 4-Way Floor Plate safer underfoot make it also safer under plant haulage equipment. It is equally slip-proof in all directions.

Inland originated the 4-Way Safety pattern to provide greater floor protection against accidents, easy cleaning and extra stiffness to withstand heavy loads and hard wear. Write for our illustrated booklet on how to secure safer industrial floors.



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## Pittsburgh Coal Meeting Program Is Announced

In an attempt to develop a better understanding of the interlocking problems of coal producers and consumers, the coal division of the American Institute of Mining and Metallurgical Engineers and fuels division of the American Society of Mechanical Engineers have completed plans for their first joint meeting at the William Penn hotel, Pittsburgh, Oct. 27-29, in co-operation with the local sections of the two organizations.

The program includes four sessions on coal preparation and use, one session on coal mining safety, a banquet, and several inspection trips. Details of the program are as follows:

### Wednesday, October 27

#### MORNING

"Chain or Traveling Grate Stokers," by Gosta Ambro, power engineer, Colgate-Palmolive-Peet Co., Jersey City, N. J.  
"Underfeed Stokers," by J. E. Tobey, manager, fuel engineering department, Appalachian Coals Inc., Cincinnati.

#### AFTERNOON

"Economics of Preparing Coal for Steam Generation," by H. F. Hebley, advisory engineer, Commercial Testing & Engineering Co., Chicago.  
"Chemical Treatment of Coal and Coke," by P. Nicholls, United States bureau of mines, Pittsburgh.  
"Fundamental Factors Involved in the Dustproofing of Coal," by M. F. Fife, Mellon institute, Pittsburgh.

### Thursday, October 28

#### MORNING

"Theoretical and Practical Aspects of Segregation in the Handling of Coal," by D. R. Mitchell, assistant professor of mining engineering, University of Illinois, Urbana, Ill.  
"Statistical Interpretation of Laboratory Coal Tests and Sampling Methods," by G. B. Gould, president, Fuel Engineering Co., New York.

#### AFTERNOON

"Selection of Coal for Pulverizers," by B. E. Tate, chief engineer, power plant, National Cash Register Co., Dayton, O.  
"Small Underfeed Stokers," by G. M. Guthrie, chairman, Engineering Committee, Stokers Manufacturers Association.  
"Status of Our Knowledge of Coal Selection for Steam-Generating Equipment," by Ralph E. Sherman, fuel engineer, Battelle Memorial institute, Columbus, O.

#### EVENING

Banquet. Address: "Future Problems Involved in Governmental Regulation of the Coal Industry," by Alex Bailey, Commonwealth Edison Co.

## New Compound Improves Punching Performance

Life of punches is increased and dressing of punches is cut at least 50 per cent through the use of Key-Craw, a new lubricating compound produced by Oak Chemical Products Co., Bechtelsville, Berks county, Pa. It is diluted or cut back with an inex-

pensive grade of machine oil to the desired consistency and then painted on both sides of the steel sheet to be perforated. It may be used on high and low carbon, stainless steel, brass, copper and other sheets. On the softer metals it is cut back to a lighter viscosity. It also may be used as a drawing compound.

A difficult problem in punching 18-8 chromium-nickel stainless steel sheets both heavy and light gages, was overcome by using this compound, the company states. The punch press was so set up that on each stroke 800 holes were punched. After two strokes, or 1600 holes, the

machine had to be stopped for the reason that the punches become so hot that some broke off and a curl of flame came up from the sheet about three inches from the first row of punches. The machine remained shut down until the punches and sheet had cooled. As a result only a few sheets could be punched per day.

With the use of the new lubricating compound the punch press was run at full speed which meant approximately 40 strokes per minute, 800 holes per stroke, or 32,000 to 40,000 holes in these stainless steel sheets per minute.



## Shrinkage Problems Solved with **LIQUITOL** for IRON AND STEEL CASTINGS

Increases temperature of riser metal.....Holds it liquid three times the normal setting time.... Permits feeding of castings.

### **SPEEDY MOISTURE TESTER**

for Accurate Control of  
Core and Molding Sand

### **LUXIT**

for

Cupolas—Ladles  
Slag Holes—Crucibles

THE  
**ALPHA·LUX**  
COMPANY, INC.

192 Front St., New York City

## World Increasing Its Steelmaking Facilities

(Concluded from Page 16)

are to be increased to convert this into steel for the new mills.

In Manchuria, where steel and iron requirements total 400,000 tons annually, domestic production is only 200,000 tons. Tariff barriers are to be removed to encourage imports. Showa Steel Works, Manchuria, plans to establish a plant for producing thick and medium iron plates for building purposes,

with 60,000 tons annual capacity. Demand now is for 40,000 tons of this material, and it is increasing steadily.

In Australia 72 Otto-Wilputte by-product coke ovens and an additional open hearth are under construction by Australian Iron & Steel Ltd. Tasmanian Iron Mines Ltd. is being organized to build a plant to make pig iron, pipe and fittings. Broken Hill Proprietary Co. Ltd. is producing at capacity, and for the 52 weeks ending May 9 this year turned out 772,000 tons of steel ingots, compared with 171,000 tons in

the corresponding period of 1932.

In Sweden, Hofors Bruk Steel Works is making extensions, including a rolling mill with capacity for 150,000 tons annually and two electric furnaces, to increase annual capacity for steel ingots from 73,000 to 100,000 tons.

In South Africa the combined output of South African Iron & Steel Industrial Corp. and Union Steel Corp. Ltd. in April was 18,128 short tons of pig iron and 32,743 short tons of steel ingots.

The president of the Chilean Republic has announced the government's intention to sponsor the manufacture of steel for domestic use and for export to other South American countries. The Compania Electro-Sederurgica Industrial de Valdivia, in Corral, will be equipped for this purpose. A ban is to be imposed shortly on steel scrap exports.

Turkey, as part of its awakening to Occidental ideas, has started construction of its first steelworks. A contract has been placed with H. A. Brassert & Co. Ltd., London, for a plant to cost \$15,000,000 at Karabuk, about 125 miles northwest of Angora, the Turkish capital. It is designed for an annual capacity of 150,000 tons of steel, and will be operated for the Turkish government by the Sumer bank at Angora.

China does not loom large in the world's new steel picture. It has deposits of iron ore which surveys indicate do not exceed 555,700,000 tons, widely distributed and for the most part remote from tidewater and therefore unavailable for heavy export. In 1936 China exported 1,307,700 tons of ore, practically all to Japan. Only four steel producing units are operating in China, all in or close to Shanghai, two being owned by Japanese interests.

Russia, from being an importer of steel and iron, has become the largest exporter of pig iron in the world and has almost ceased to import steel, except in the form of machinery. American engineers were called on to build great steel plants at Magnitogorsk in the Urals and at Kuznetsk in mid-Siberia, as well as other plants in European Russia. In 1936 ingot production was estimated at 16,000,000 tons and pig iron output at 14,000,000 tons. The corresponding figures for 1929 were 4,828,000 and 4,253,000 tons, respectively.

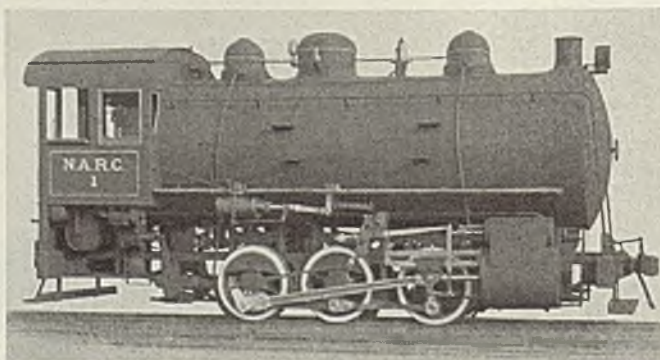
In 1931 Russia imported 68,000 tons of pig iron but in 1932 began to export this product and steadily increased its shipments until in the first nine months of 1936 it exported 613,750 tons, which represented 31.7 per cent of the world's pig iron exports, taking first place in this respect. The present aim of the soviet government is 25,000,000 tons annually of steel ingots.

# What "Steel" thinks of

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- "Survey of operating cost indicates that the Fireless Steam Locomotive is preferable to any other type."
- "We use the Fireless Locomotive 24 hours a day, and have found it very efficient and much more economical than the regular steam locomotive."
- "The locomotive does far more work on one charge than we had expected."
- "Our Fireless is extremely quiet in operation."

The above statements are quotations from a few of the many letters received by us from steel mill executives and operators throughout the industry. Why not investigate the remarkable possibilities of the Porter Fireless.



Send for the Porter Fireless 16 page descriptive booklet—of interest to every economy-minded steel executive.

### H. K. PORTER COMPANY

Established 1866  
PITTSBURGH, PENNA.

# MATERIALS HANDLING



## Permitting Continuous Operation in Wire Mill

(Concluded from Page 50)

received on skids. These coils are placed on the payoff reels by a 1-ton electric crane with cross and longitudinal travel. There are two payoff reels for each of the 40 strands of wire in the electrogalvanizing unit, thus again providing for continuous operation. With a welding unit on the crane, the operator welds the ends of the two coils together.

Wire from the galvanizing unit is coiled in 400-pound bundles which are again placed on a skid by an electric hoist on an overhead tram-rail for transportation to the nail making, barbed wire or fence making machines or to temporary storage by the powered trucks.

The nail machines are serviced by six 1-ton overhead, floor-operated tramrails which handle the coils from skids to either of two reels directly behind the machines. Similar hoists handle wire to the bale tie and the barbed wire machines.

Nails drop into inspection tote pans and are accumulated in 1000-pound, 2-wheeled buggies with a rigid bail for handling by a traveling hoist. This 1-ton, cab-operated, electric hoist travels on a system of monorails with switches which permit servicing each aisle between nail making machines. The pickup of the buggies by the rigid bail is handled by the hoist operator from his cab without floor assistance.

The operator carries the loaded buggy to the platform over the nail tumblers, weighs the load and dumps the nails into the tumblers through openings in the steel floor and returns the buggy to the nail machine.

After tumbling with sawdust, to remove the nail "whiskers," the nails are dumped into a hopper where the dust and whiskers are exhausted. The nail kegs are filled one-half floor lower on a slow-moving drag conveyor which pushes the keg onto a solid steel plate alongside the scales where they are weighed up to exactly 100 pounds per keg and the head set in. The kegs are then raised to the main floor level by a continuous chain elevator where the top hoop is nailed on the kegs which are piled on pallets for moving to storage.

Barbed wire, nails and fence are warehoused on pallets. A pallet holds 27 rolls of barbed wire in three layers of nine each. Kegs of nails are piled 4 x 4 in two tiers high on

a pallet, thus handling and storing 32 kegs at a time. These pallets are stored four tiers high by the fork-type electric or gas powered trucks.

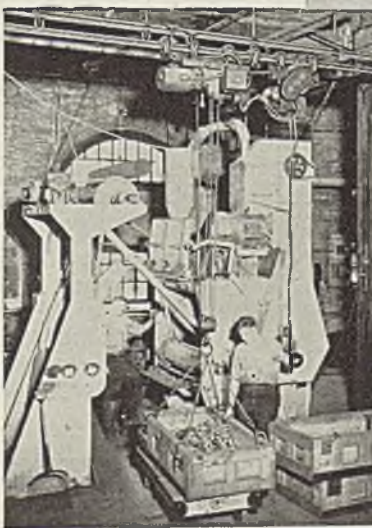
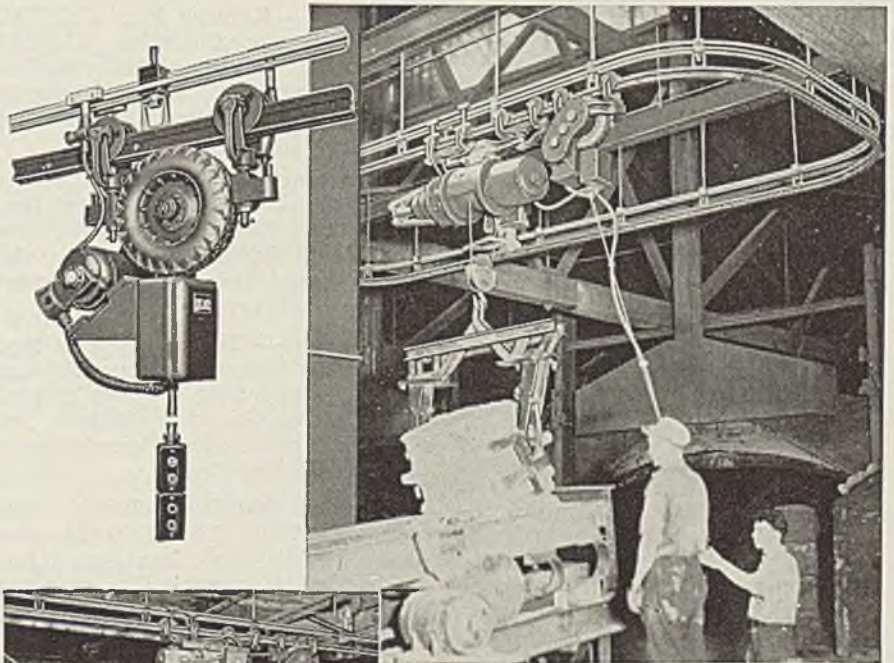
Bale ties are deposited in bundles of 250 on a long 4-wheel, rubber-tired, steel floor truck with swivel casters at both ends so they are movable at the machines by the operator. For the longer distance to storage the end of the platform of a gas-powered low-lift truck is run under the swivel end of the truck load of bale ties, elevated and the load trailed to its destination.

Similar trucks, except that one end is provided with skid legs instead

of wheels, are used for handling galvanized steel corrugated roofing, which is not made at this plant but warehoused with some other articles for shipment with fencing, nails and barbed wire. These are also moved in a similar manner by the gas-powered truck.

Throughout the entire movement of materials every effort is made to move in large quantities. The smallest quantity handled any distance is the nails in 1000-pound lots. Most transports average from 3000 pounds to 6000 pounds at a load. In every case possible mechanical means are provided for lifting and piling.

## American Mono Tractors accelerate foundry handling



By eliminating the "heave" and "tug" labor of handling loaded annealing pots through shakeout process, a modern foundry cut 64% from the cost of unloading its furnaces.

This remarkable saving lead to the installation of similar systems in the cleaning department. Small castings now are tumbled, sorted and weighed with but one rehandling from original tote boxes.

A mere touch of the finger moves heavy loads on hoists, cranes or carriers by means of the rubber wheel drive. Unlimited application of electric controls permits remote and automatic operations.

Specialized engineering experience is available without cost to help solve your handling problems. Write for 24 page book describing the American MonoTractor.

# AMERICAN MONORAIL CO.

13102 Athens Ave., Cleveland, O.



# 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

**Heating Equipment**—Heil & Co., 3088 West 106th street, Cleveland, has issued a folder dealing with methods of heating corrosive liquids.

**Diamond Tools**—Capitol Diamond & Tool Co. Inc., 8011 Mandalay, Detroit, is distributing a folder on its Cluustertite diamond dressing tools.

**Hard-Facing**—Linde Air Products Co., New York, announces publication of an eight-page folder describing its steel hard-facing procedure.

**Compressors**—Fuller Co., Catasauqua, Pa., is distributing bulletin C3-A illustrating and describing single and two-stage compressors and vacuum pumps.

**Electrode Holder**—Jackson Electrode Holder Co., 6553 Woodward avenue, Detroit, has published an illustrated folder on its insulated electrode holders.

**Pumps and Motors**—Oilgear Co., 1319 West Bruce street, Milwaukee, has described its line of fluid power pumps and motors in a new 56-page booklet.

**Synthetic Rubber**—Thiokol Corp., Yardville (Trenton), N. J., has released a list of manufacturers of finished products in the United States and foreign countries.

**Finishes**—James B. Sipe & Co. Inc., Pittsburgh, has released a 12-page catalog listing industrial finishes for maintenance and production work.

**Brass Shims**—Laminated Shim Co., Long Island City, N. Y., has compiled a convenient specifications file folder on laminated brass shim stock.

**Carbide Tools**—Carboloy Co., Detroit, has issued illustrated booklet T-37 describing a process by which users can make Carboloy-tipped tools in their own plants.

**Grinder**—Landis Tool Co., Waynesboro, Pa., has issued catalog No. K-137 applying to the Landis 12 x 28-inch universal and tool grinder.

**Microscopes**—Bausch & Lomb Optical Co., Rochester, N. Y., has published catalog D-15 dealing with binocular microscopes, Greenough type.

**Condensers**—Foster Wheeler

Corp., 165 Broadway, New York, is distributing bulletins on expanded tube condensers, waste heat boilers and general regulators.

**Cables**—General Cable Corp., 420 Lexington avenue, New York, has published bulletin BW3 on building wires and cables, and bulletin SS2 on Super Service portable cables.

**Tools**—Firth-Sterling Steel Co., McKeesport, Pa., has released a price list of its standard tools, bits and tips and containing engineering drawings throughout.

**Doors**—Kinnear Mfg. Co., 7000 Fields avenue, Columbus, O., has printed an eight-page bulletin, No. S-17, illustrating and describing in detail its push-button door control units.

**Valves**—Hancock Valve division, Manning, Maxwell & Moore Inc., Bridgeport, Conn., has issued a new illustrated bulletin describing the redesigned Hancock Flo-control valves.

**Welders**—Harnischfeger Corp., 4400 West National avenue, Milwaukee, is distributing a folder entitled "Characteristics of a Modern Arc Welder," a technical description of modern welder design.

**Magnets and Controllers**—Ohio Electric Mfg. Co., 5900 Maurice avenue, Cleveland, has issued bulletin No. 110 describing its improved lifting magnets and magnet controllers.

**Nickel Manganese Steel**—Stulz-Sickles Co., Newark, N. J., has issued a catalog on Manganal, 11 to 13½ per cent nickel manganese steel, filler bar, welding electrodes, forged wedges and wedge bars.

**Water Cooling Equipment**—Binks Mfg. Co., 3114 Carroll avenue, Chicago, has announced publication of a new set of catalogs containing engineering data and information on its line of water cooling towers and industrial spray nozzles.

**Instruments**—Wheelco Instruments Co., 1929 South Halsted street, Chicago, is distributing a new bulletin on Wheelco indicating pyrometers ranging in size from small portable to 8-inch scale, wall-mounted type.

**Time Recorders**—National Acme

Co., 120 East One-hundred Thirty-first street, Cleveland, has published a new booklet describing three new models of Chronologs and giving complete information on their uses and operation.

**Grinder**—Norton Co., Worcester, Mass., has issued a bulletin announcing the Norton Multipurpose grinder, showing features of the new machine.

**Furnaces**—Surface Combustion Corp., Toledo, O., has published bulletin form SC-83 on Carbottom furnaces for general heat treating purposes.

**Furnaces**—Leeds & Northrup Co., 4901 Stenton avenue, Philadelphia, recently has released a broadside dealing with its complete line of Vapocarb-Hump and Homo furnaces for hardening, tempering and nitriding.

**Galvanized Sheets**—American Rolling Mill Co., Middletown, O., offers a new folder entitled "Unwrap Galvanized Sheets Like Chocolate Bars?" which is designed to help sheet metal shops sell more galvanized iron for all sheet metal uses.

**Contour Machining**—Continental Machine Specialties Inc., 1301 S. Washington avenue, Minneapolis, Minn., has issued a four-page bulletin illustrating and describing models "MD" and "M" DOALL Metalmaster.

**Flow Meters**—Cochrane Corp., 17th street and Allegheny avenue, Philadelphia, has issued a folder dealing with Cochrane flow meters, particularly installations in government buildings in Washington.

**Insulating Varnishes**—John C. Dolph Co., Newark, N. J., has issued a 32-page catalog on Dolph insulating varnishes and compounds including baking varnishes, air drying varnishes, Electric Lacquer, finishing varnishes, enamels, and insulating compounds.

**Babbitt Metal**—Consolidated Metals Corp., 5531 Woodward avenue, Detroit, is distributing a descriptive circular and price list covering its complete line of Motex products and containing a chart showing weights and sizes of standard bearing bronze bars, useful in estimating costs on maintenance repairs.

**Electrical Equipment**—General Electric Co., Schenectady, N. Y., has issued the following new GEA literature: No. 2710 on the D-C operated A-C contactors, No. 2577 on the size 00 A-C contactor, CR2810, No. 1518 on the CR9516 shoe-type thruster brakes, No. 96A on the type FP-7 pole line oil circuit breakers, No. 2434 on the types JE-41 and JE-42 indoor potential transformers, and No. 2645 on modern small panel instruments.



# Current Prices Extended into First Quarter

May Revive Buying;  
Scrap at Year's Low;  
Auto Output Rises

**A**NNOUNCEMENT late last week by the leading steel and wire producers of extension of prices on most products through first quarter of 1938 is expected to have a favorable effect and to stabilize buying by clarifying the market for that period. Independent steelmakers are taking similar action. The announcement is qualified by the proviso that prices are subject to changes in freight rates.

Although little pressure has been exerted to obtain lower prices some sentiment developed to the effect that present light buying might bring a reduction. With labor and other expenses high and probability of increased freight rates on raw materials little possibility existed for a lower range.

Call for a special session of congress is an unsettling factor, in view of the program for further legislation on hours and wages and other matters in which industry has a deep interest. On the other hand rumors are current of a considerable rearmament program which would tend to increase steel demand.

Much interest is aroused by the inquiry of the government for bids on 5000 to 8000 tons of ferromanganese of 68 to 72 per cent manganese and an alternate of 15,000 to 24,000 tons of manganese ore of 40 per cent manganese. The ferromanganese specification is for material 10 points below the standard grade and the manganese content of the ore is low, enabling domestic producers to compete. However, this grade of ore is not suited to production of standard ferromanganese.

This proposed purchase is believed to be for the purpose of establishing a backlog for government use in case of a runaway market, such as prevailed during the World war. Bids will be opened Oct. 29 and the degree of participation by domestic producers is a matter of interest.

Continued shortening of steelworks production last week brought the national operating rate down 3 points to 63 per cent of capacity. Chicago made the greatest recession, dropping 8 points to 57 per cent. Eastern Pennsylvania mills dropped 4.5 points to 51 per cent, Pittsburgh 2 points to 60, Youngstown 2 points to 58, Buffalo 2.5 to 67.5 and Birmingham 7 to 70. Cleveland rose 5 points to 68 and New England 5 to 70 per cent. Unchanged conditions prevailed at Wheeling at 74, Detroit 92, Cincinnati 70 and St. Louis 60 per cent.

With ingot production for nine months only 2 per

## MARKET IN TABLOID

*DEMAND . . . . . Light,  
as consumers draw on stocks.*

*PRICES . . . . . Reaffirmed  
for first quarter.*

*PRODUCTION . . . . . Operations  
down 3 points to 63 per cent of  
capacity.*

*SHIPMENTS . . . . . Still  
exceed new orders.*

cent below the same months of 1929 an average rate of about 69 per cent of capacity for the remaining three months will be required to equal the record of that year. As the final quarter of 1929 showed a steep decline from earlier months a new record this year is possible.

Acceleration of activity in producing new models is bringing automotive figures back toward a normal level, the total last week increasing almost 20,000 units from the preceding period. Last week's output was 89,680, compared with a revised figure of 71,958 for the week ending Oct. 9. General Motors increased from 31,875 to 43,600, Ford from 213 to 300, Chrysler from 22,450 to 27,250 and other builders from 17,420 to 18,530.

Imports of steel and iron in August totaled 61,489 tons compared with 47,012 tons in July. The gain was due to larger inflow of scrap. Imports exclusive of scrap were 38,379 tons, compared with 41,388 tons in July.

Germany has reduced its import duty on pig iron from 40 cents to 4 cents per 220 pounds, effective Oct. 18 and continuing to Oct. 31, 1938. This indicates need for more iron from outside sources.

British steelworks set a new alltime record in ingot production in September with 1,163,000 gross tons, some 54,500 tons greater than the previous high mark made in March of this year.

Declines of 50 cents in steelmaking grades at Chicago and Pittsburgh and of \$1 in Eastern Pennsylvania have brought the composite of steelmaking scrap down 67 cents, to \$16. This is the lowest figure for the present year and equal to the composite of the third week in November. It represents a decline of \$6.08 from the high mark of \$22.08 in early April. Lower scrap prices brought the iron and steel composite down 13 cents to \$39.60. Finished steel composite is unchanged at \$61.70.

## COMPOSITE MARKET AVERAGES

	Oct. 16	Oct. 9	Oct. 2	One Month Ago Sept., 1937	Three Months Ago July, 1937	One Year Ago Oct., 1936	Five Years Ago Oct., 1932
Iron and Steel ....	\$39.60	\$39.73	\$39.81	\$40.16	\$40.03	\$34.67	\$28.90
Finished Steel ....	61.70	61.70	61.70	61.70	61.70	53.90	47.64
Steelworks Scrap ..	16.00	16.67	17.17	18.99	18.51	16.44	6.96

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

<b>Finished Material</b>	Oct. 16, 1937	Sept. 1937	July 1937	Oct. 1936	<b>Pig Iron</b>	Oct. 16 1937	Sept. 1937	July 1937	Oct. 1936
Steel bars, Pittsburgh	2.45c	2.45c	2.45c	2.05c	Bessemer, del. Pittsburgh	\$25.26	\$25.26	\$25.26	\$20.8132
Steel bars, Chicago	2.50	2.50	2.50	2.10	Basic, Valley	23.50	23.50	23.50	19.00
Steel bars, Philadelphia	2.74	2.74	2.74	2.36	Basic, eastern del. East. Pa.	25.26	25.26	25.26	20.81
Shapes, Chicago	2.30	2.30	2.30	1.95	No. 2 fdy., del. Pittsburgh	25.21	25.21	25.21	20.3132
Tank plates, Pittsburgh	2.25	2.25	2.25	1.90	No. 2 fdy., Chicago	24.00	24.00	24.00	19.50
Tank plates, Philadelphia	2.43 1/2	2.43 1/2	2.43 1/2	2.09	Southern No. 2, Birmingham	20.38	20.38	20.38	15.50
Tank plates, Chicago	2.30	2.30	2.30	1.95	Southern No. 2, del. Cincinnati	23.69	23.69	23.69	19.44
Sheets, No. 10, hot rolled, Pitts.	2.40	2.40	2.40	1.95	No. 2 X eastern, del. Phila.	26.135	26.135	26.135	21.68
Sheets, No. 24, hot ann., Pitts.	3.15	3.15	3.15	2.60	Malleable, Valley	24.00	24.00	24.00	19.50
Sheets, No. 24, galv., Pitts.	3.80	3.80	3.80	3.20	Malleable, Chicago	24.00	24.00	24.00	19.50
Sheets, No. 10, hot rolled, Gary	2.50	2.50	2.50	2.05	Lake Sup., charcoal, del. Chicago	30.04	30.04	30.04	25.7528
Sheets, No. 24, hot anneal., Gary	3.25	3.25	3.25	2.70	Gray forge, del. Pittsburgh	24.17	24.17	24.17	19.6741
Sheets, No. 24, galvan., Gary	3.90	3.90	3.90	3.30	Ferromanganese, del. Pittsburgh	107.29	107.29	107.29	80.13
Plain wire, Pittsburgh	2.90	2.90	2.90	2.50					
Tin plate, per base box, Pitts.	\$5.35	\$5.35	\$5.35	\$5.25					
Wire nails, Pittsburgh	2.75	2.75	2.75	2.05					
					<b>Scrap</b>				
					Heavy melting steel, Pittsburgh	\$17.25	\$20.40	\$19.40	\$18.15
					Heavy melt. steel, No. 2, E. Pa.	13.75	16.69	18.00	13.95
					Heavy melting steel, Chicago	14.75	17.85	17.05	16.25
					Rails for rolling, Chicago	16.75	20.35	20.30	16.95
					Railroad, steel specialties, Chicago	19.25	20.50	20.20	17.75
					<b>Coke</b>				
					Connellsville, furnace, ovens	\$4.40	\$4.45	\$4.50	\$4.00
					Connellsville, foundry, ovens	5.25	5.25	5.30	4.25
					Chicago, by-product foundry, del.	11.00	11.00	11.00	9.75

# Steel, Iron, Raw Material, Fuel and Metals Prices

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

<b>Sheet Steel</b>	<b>Tin Mill Black No. 28</b>	<b>Corrosion and Heat-Resistant Alloys</b>	<b>Structural Shapes</b>
Prices Subject to Quantily Extras and deductions (Except Galvanized)	Pittsburgh		Pittsburgh
<b>Hot Rolled No. 10, 24-48 in.</b>	Gary		Philadelphia, del.
Pittsburgh	St. Louis, delivered	Pittsburgh base, cents per lb.	New York, del.
Gary	Granite City, Ill.	<b>Chrome-Nickel</b>	Boston, delivered
Chicago, delivered		No. 302 No. 304	Bethlehem
Detroit, del.	<b>Cold Rolled No. 10</b>	Bars	Chicago
New York, del.	Pittsburgh	Plates	Cleveland, del.
Philadelphia, del.	Gary	Sheets	Buffalo
Birmingham	Detroit, delivered	Hot strip	Gulf Ports
St. Louis, del.	Philadelphia, del.	Cold strip	Birmingham
Granite City, Ill.	New York, del.		Pacific ports, f.o.b. cars,
Pacific ports, f.o.b. dock	St. Louis, del.	<b>Straight Chromes</b>	dock
	Granite City, Ill.	No. No. No. No.	St. Louis, del.
<b>Hot Rolled Annealed No. 24</b>	Pacific ports, f.o.b. dock	410 430 442 446	
Pittsburgh		Bars	<b>Bars</b>
Gary	<b>Cold Rolled No. 20</b>	Plates	<b>Soft Steel</b>
Chicago, delivered	Pittsburgh	Sheets	(Base, 3 to 25 tons)
Detroit, delivered	Gary	Hot strip	Pittsburgh
New York, del.	Detroit, delivered	Cold stp.	Chicago or Gary
Philadelphia, del.	Philadelphia, del.		Duluth
Birmingham	New York, del.		Birmingham
St. Louis, del.	St. Louis, del.		Cleveland
Granite City, Ill.	Granite City, Ill.		Buffalo
Pacific ports, f.o.b. dock	Pacific ports, f.o.b. dock		Detroit, delivered
			Pacific ports, f.o.b. cars,
<b>Galvanized No. 24</b>	<b>Enameling Sheets</b>		dock
Pittsburgh	Pittsburgh, No. 10	<b>Steel Plate</b>	Philadelphia, del.
Gary	Pittsburgh, No. 20	Pittsburgh	Boston, delivered
Chicago, delivered	Gary, No. 10	New York, del.	New York, del.
Philadelphia, del.	Gary, No. 20	Philadelphia, del.	Pitts., forg. qual.
New York, delivered	St. Louis, No. 10	Boston, delivered	
Birmingham	St. Louis, No. 20	Buffalo, delivered	<b>Rail Steel</b>
St. Louis, del.		Chicago or Gary	To Manufacturing Trade
Granite City, Ill.	<b>Tin and Terne Plate</b>	Cleveland, del.	Pittsburgh
Pacific ports, f.o.b. dock	Gary base, 10 cents higher	Birmingham	Chicago or Gary
	Tin plate, coke, (base box), Pittsburgh	Coatesville, base	Cleveland
	Waste-waste, 2.75c; strip	Sparrows Pt., base	Moline, Ill.
	Long ternes, No. 24, unassorted, Pitts.	Pacific ports, f.o.b. cars, dock	Buffalo
		St. Louis, delivered	Birmingham

**Iron**

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

**Reinforcing**

New billet, straight lengths, quoted by distributors	
Pittsburgh .....	2.55c
Chicago, Gary, Buffalo, Cleve., Birm., Young...	2.60c
Gulf ports .....	2.65c
Pacific coast ports, f.o.b. car docks .....	
Philadelphia, del. ....	2.84c
Rail steel, straight lengths, quoted by distributors	
Pittsburgh .....	2.40c
Chicago, Buffalo, Cleve- land, Birm., Young.....	2.45c
Gulf ports .....	2.80c

**Wire Products**

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

Base Pitts.-Cleve. 100 lb. keg.	
Standard wire nails .....	\$2.75
Cement coated nails .....	\$2.75
(Per pound)	
Polished staples .....	3.45c
Galv. fence staples .....	3.70c
Barbed wire, galv. ....	3.40c
Annealed fence wire .....	3.15c
Galv. fence wire .....	3.55c
Woven wire fencing (base C. L. column) .....	
Single loop bale ties, (base C. L. column) .....	.63

**To Manufacturing Trade**

Plain wire, 6-9 ga. ....	2.90c
Anderson, Ind. (merchant prod- ucts only) and Chicago up \$1; Duluth and Worcester up \$2; Birmingham up \$3.	
Spring wire, Pitts. or Cleveland .....	3.50c
Do., Chicago up \$1, Worc. \$2.	

**Cold-Finished Carbon Bars and Shafting**

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

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

**Alloy Steel Bars (Hot)**

(Base, 3 to 25 tons)

Pittsburgh, Buffalo, Chi- cago, Massillon, Can- ton, Bethlehem .....	3.00c
Alloy	
S.A.E. Diff. S.A.E. Diff.	
2000 .....	0.35 3100 .....
2100 .....	0.75 3200 .....
2300 .....	1.55 3300 .....
2500 .....	2.25 3400 .....
4100 0.15 to 0.25 Mo. ....	0.55
4600 0.20 to 0.30 Mo. 1.50- 2.00 Ni. ....	1.10
5100 0.80-1.10 Cr. ....	0.45
5100 Cr. spring .....	0.15
6100 bars .....	1.20
6100 spring .....	0.85
Cr. N., Van .....	1.50
Carbon Van. ....	0.85
9200 spring flats .....	0.15
9200 spring rounds, squares	0.40

**Piling**

Pittsburgh .....	2.60c
Chicago, Buffalo .....	2.70c

**Strip and Hoops**

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

Hot strip to 23 1/2-in.	
Pittsburgh .....	2.40c
Chicago or Gary .....	2.50c
Birmingham base .....	2.55c
Detroit, del. ....	2.60c
Philadelphia, del. ....	2.69c
New York, del. ....	2.73c
Cooperage hoop, Pittsburgh .....	2.50c
Chicago .....	2.60c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland .....	3.20c
Detroit, del. ....	3.40c
Worcester, Mass. ....	3.40c
Cleve. Worces- ter, Mass. ....	3.40c
Carbon	
0.26-0.50 .....	3.20c 3.40c
0.51-0.75 .....	4.45c 4.65c
0.76-1.00 .....	6.30c 6.50c
Over 1.00 .....	8.50c 8.70c

**Rails, Track Material**

(Gross Tons)

Standard rails, mill .....	\$42.50
Relay rails, Pittsburgh, 20-100 lbs. ....	32.50-35.50
Light rails, billet qual., Pittsburgh, Chicago. ....	\$43.00
Do., rerolling quality .....	42.00
Angle bars, billet, Gary, Pittsburgh, So. Chicago	2.80c
Do., axle steel .....	3.35c
Spikes, R. R. base .....	3.15c
Track bolts, base .....	4.35c
Tie plates, base .....	\$46.00
Base, light rails 25 to 60 lbs.;	
20 lbs. up \$2; 16 lbs. up \$4; 12 lbs. up \$8; 8 lbs. up \$10. Base railroad spikes 200 kegs or more; base tie plates 20 tons.	

**Bolts and Nuts**

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

Carriage and Machine	
1/2 x 6 and smaller .....	65-5 off
Do. larger, to 1-in. ....	60-10 off
Do. 1 1/4 and 1 3/4-in. ....	60-5 off
Tire bolts .....	50 off
Plow Bolts	
All sizes .....	65-5 off
Stove Bolts	
In packages with nuts at- tached 70 off; in packages with nuts separate 70-10 off; in bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.	
Step bolts .....	50-10-5 off
Elevator bolts .....	50-10-5 off

**Nuts**

S. A. E. semifinished hex.:	
1/2 to 1 1/4-inch .....	60-10 off
Do., 9/16 to 1-inch. ....	60-5 off
Do., over 1-inch .....	60 off
Hexagon Cap Screws	
Milled .....	50-10 off
Upset, 1-in., smaller .....	60 off
Square Head Set Screws	
Upset, 1-in., smaller .....	75 off
Headless set screws .....	75 off

**Rivets, Wrought Washers**

Structural, Pittsburgh, Cleveland .....	3.60c
Structural, Chicago .....	3.70c
1/2-inch and smaller, Pitts., Chl., Cleve. ....	
65-5 off	
Wrought washers, Pitts., Chl., Phila. to jobbers and large nut, bolt mfrs. l.c.l. \$5.40; c.l. \$5.75 off	

**Cut Nails**

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

**Welded Iron, Steel Pipe**

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

**Butt Weld Steel**

In.	Blk.	Galv.
1/2	59 1/2	49
3/4	62 1/2	53
1-3	64 1/2	55 1/2
Iron		
1/2	26	8
1-1 1/4	30	14
1 1/2	34	16 1/2
2	33 1/2	16

**Lap Weld Steel**

2	57	47 1/2
2 1/2-3	60	50 1/2
3 1/2-6	62	52 1/2
7 and 8	61	50 1/2
9 and 10	60 1/2	50

**Iron**

2	26 1/2	10
2 1/2-3 1/2	27 1/2	12 1/2
4	29 1/2	16
4 1/2-8	28 1/2	15
9-12	24 1/2	10

**Line Pipe Steel**

1 to 3, butt weld .....	63 1/2
2, lap weld .....	56
2 1/2 to 3, lap weld .....	59
3 1/2 to 6, lap weld .....	61
7 and 8, lap weld .....	60
10-inch, lap weld .....	59 1/2
12-inch, lap weld .....	58 1/2

**Butt Weld Iron**

Blk.	Galv.
1/2	25
1 and 1 1/4	29
1 1/2	33
2	32 1/2

**Lap Weld**

1 1/2	23 1/2	7
2	25 1/2	9
2 1/2 to 3 1/2	26 1/2	11 1/2
4	28 1/2	15
4 1/2 to 8	27 1/2	14
9 to 12	23 1/2	9

**Boiler Tubes**

Carloads minimum wall seam-  
less steel boiler tubes, cut  
lengths 4 to 24 feet, f.o.b. Pitts-  
burgh, base price per 100 feet  
subject to usual extras.

**Lap Weld**

Sizes	Steel	Char- coal
1 1/2" OD x 13 Ga. ....	\$10.45	\$23.71
1 3/4" OD x 13 Ga. ....	11.89	22.93
2" OD x 13 Ga. ....	13.31	19.35
2" OD x 11 Ga. ....	15.49	23.36
2 1/4" OD x 13 Ga. ....	14.82	21.68
2 1/4" OD x 11 Ga. ....	17.38	26.02
2 3/4" OD x 12 Ga. ....	17.82	26.57
2 3/4" OD x 12 Ga. ....	18.86	29.00
3" OD x 12 Ga. ....	19.73	31.36
3 1/2" OD x 11 Ga. ....	24.89	39.81
4" OD x 10 Ga. ....	30.81	49.90
5" OD x 9 Ga. ....	47.57	73.93
6" OD x 7 Ga. ....	73.25	

**Seamless**

Hot Rolled	Cold Drawn
1" OD x 13 Ga. ....	\$ 8.41 \$ 9.46
1 1/4" OD x 13 Ga. ....	9.96 11.21
1 1/2" OD x 13 Ga. ....	11.00 12.38
1 3/4" OD x 13 Ga. ....	12.51 14.09
2" OD x 13 Ga. ....	14.02 15.78
2 1/4" OD x 13 Ga. ....	15.63 17.60

2 1/2" OD x 12 Ga. ....	17.21	19.37
2 1/2" OD x 12 Ga. ....	15.35	21.22
2 3/4" OD x 12 Ga. ....	19.98	22.49
3" OD x 12 Ga. ....	20.97	23.60
4 1/2" OD x 10 Ga. ....	40.15	45.19
3 1/2" OD x 11 Ga. ....	26.47	29.79
4" OD x 10 Ga. ....	32.83	36.94
5" OD x 9 Ga. ....	50.38	56.71
6" OD x 7 Ga. ....	77.35	87.07

**Cast Iron Water Pipe**

**Class B Pipe-Per Net Ton**

6-in. & over, Birm. ....	\$46.00-47.00
4-in., Birmingham .....	49.00-50.00
4-in., Chicago .....	57.00-58.00
6 to 24-in., Chicago .....	54.00-55.00
6-in. & over, east fdy. ....	50.00
Do., 4-in. ....	53.00

Class A Pipe \$3 over Class B  
Std. ftgs., Birm., base \$100.00

**Semifinished Steel**

**Billets and Blooms**

4 x 4-inch base; gross ton	
Pitts., Chl., Cleve., Bur- falo, Young, Bham. ....	\$37.00
Philadelphia .....	42.30
Duluth .....	39.00
<b>Forging Billets</b>	
6 x 6 to 9 x 9-in., base	
Pitts., Chicago, Buffalo ..	43.00
Forging, Duluth .....	45.00
<b>Sheet Bars</b>	
Pitts., Cleve., Young, Sparrows Point .....	37.00
<b>Slabs</b>	
Pitts., Chicago, Cleve- land, Youngstown .....	37.00
<b>Wire Rods</b>	
Pitts., Cleve., No. 5 to 3/8-inch incl. ....	47.00
Do., over 3/8 to 1 1/2-inch incl. ....	52.00
Chicago up \$1; Worcester up \$2	
<b>Skelp</b>	
Pitts., Chl., Young, Buff., Coatesville, Sparrows Pt. ....	2.10c

**Coke**

**Price Per Net Ton**

**Beehive Ovens**

Connellsville, fur. ....	\$4.35-4.50
Connellsville, fdry. ....	5.00-5.50
Connell prem. fdry. ....	6.00-6.50
New River fdry. ....	6.50-6.75
Wise county fdry. ....	5.75-6.00
Wise county fur. ....	4.75-5.00

**By-Product Foundry**

Newark, N. J., del. ....	10.85-11.30
Chl., ov., outside del. ....	10.25
Chicago, del. ....	11.00
Milwaukee, ovens. ....	11.00
New England, del. ....	12.50
St. Louis, del. ....	11.00-11.50
Birmingham, ovens	7.50
Indianapolis, del. ....	10.50
Cincinnati, del. ....	10.50
Cleveland, del. ....	11.00
Buffalo, del. ....	10.50
Detroit, del. ....	11.10
Philadelphia, del. ....	10.60

**Coke By-Products**

Spot, gal. Producers' Plants

Pure and 90% benzol. ....	16.00c
Toluol .....	30.00c
Solvent naphtha .....	30.00c
Industrial xylo. ....	30.00c
Per lb. f.o.b. Frankford and St. Louis	
Phenol (200 lb. drums) ..	16.25c
do. (450 lbs.) .....	15.25c
Eastern Plants, per lb.	
Naphthalene flakes and balls, in bbls. to job- bers .....	7.25c
Per ton, bulk, f.o.b. oven or port	
Sulphate of ammonia .....	\$28.50

## Pig Iron

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

### Basing Points:

	No. 2 Foundry	Malleable	Basic	Bessemer
Bethlehem, Pa.	\$25.00	\$25.50	\$23.50	\$26.00
Birdsboro, Pa.	25.00	25.50	24.50	26.00
Birmingham, Ala.	20.38	20.88	19.38	25.00
Buffalo	24.00	24.50	23.00	25.00
Chicago	24.00	24.00	23.50	24.50
Cleveland	24.00	24.00	23.50	24.50
Detroit	24.00	24.00	23.50	24.50
Duluth	24.50	24.50	25.00	25.00
Erie, Pa.	24.00	24.50	23.50	25.00
Everett, Mass.	25.75	26.25	25.25	26.75
Hamilton, O.	24.00	24.00	23.50	24.50
Neville Island, Pa.	24.00	24.00	23.50	24.50
Provo, Utah	22.00	22.00	23.50	24.50
Sharpsville, Pa.	24.00	24.00	23.50	24.50
Sparrows Point, Md.	25.00	25.00	24.50	25.50
Swedeland, Pa.	25.00	25.50	24.50	26.00
Toledo, O.	24.00	24.00	23.50	24.50
Youngstown, O.	24.00	24.00	23.50	24.50

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

### Delivered from Basing Points:

Akron, O., from Cleveland	25.26	25.26	24.76	25.76
Baltimore from Birmingham	25.58	25.58	24.46	25.46
Boston from Birmingham	26.37	26.37	25.87	26.87
Boston from Everett, Mass.	26.25	26.75	25.75	27.25
Boston from Buffalo	26.25	26.75	25.75	27.25
Brooklyn, N. Y., from Bethlehem	27.27	27.77	26.77	27.77
Brooklyn, N. Y., from Bmghm.	27.05	27.05	26.55	27.55
Canton, O., from Cleveland	25.26	25.26	24.76	25.76
Chicago from Birmingham	24.22	24.22	24.10	25.10
Cincinnati from Hamilton, O.	24.07	25.01	24.51	25.51
Cincinnati from Birmingham	23.69	23.69	22.69	23.69
Cleveland from Birmingham	24.12	24.12	23.62	24.62
Mansfield, O., from Toledo, O.	25.76	25.76	25.26	26.26
Milwaukee from Chicago	25.00	25.00	24.50	25.50
Muskegon, Mich., from Chicago, Toledo or Detroit	26.90	26.90	26.40	27.40
Newark, N. J., from Birmingham	26.01	26.01	25.51	26.51
Newark, N. J., from Bethlehem	26.39	26.89	25.89	26.89
Philadelphia from Birmingham	25.38	25.38	24.88	25.88
Philadelphia from Swedeland, Pa.	25.76	26.26	25.26	26.26
Pittsburgh district from Neville Island	24.50	24.50	24.00	25.00
Saginaw, Mich., from Detroit	26.25	26.25	25.75	26.75
St. Louis, northern	24.50	24.50	24.00	25.00

## Nonferrous

### METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

Copper			Straits Tin		Lead	Lead	Zinc	Alumi-	Antimony	Nickel
Electro, del.	Lake, del.	Casting, refnery	Spot	Futures	N. Y.	East St. L.	St. L.	num 99%	American Spot, N. Y.	Cathodes
Oct. 8	12.00	13.12½	54.62½	53.900	6.00	5.85	6.25	20.00	16.50	35.00
Oct. 9	12.00	13.12½	54.25	53.37½	6.00	5.85	6.25	20.00	16.50	35.00
Oct. 11	12.00	13.12½	54.00	53.12½	6.00	5.85	6.25	20.00	16.50	35.00
Oct. 12	12.00	13.12½	52.62½	51.87½	6.00	5.85	6.25	20.00	16.50	35.00
Oct. 13	12.00	13.12½	51.62½	50.75	6.00	5.85	6.25	20.00	16.50	35.00
Oct. 14	12.00	13.12½	51.75	51.00	6.00	5.85	6.25	20.00	16.50	35.00
Oct. 15	12.00	13.12½	50.87½	50.12½	5.75	5.60	6.00	20.00	16.50	35.00

MILL PRODUCTS			OLD METALS		
F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 13.00c Conn. copper			Nom. Deal. buying prices		
<b>Sheets</b>			No. 1 Composition Red Brass		
Yellow brass (high)	19.25		New York	7.12½-7.37½	
Copper, hot rolled	21.12½		Cleveland	7.25-7.50	
Lead, cut to jobbers	9.50		*Chicago	7.25-7.50	
*Zinc, 100-lb. base	11.00		*St. Louis	7.00-7.25	
<b>Tubes</b>			<b>Heavy Copper and Wire</b>		
High, yellow brass	22.00		New York, No. 1	9.00-9.25	
Seamless copper	21.87½		Cleveland, No. 1	8.75-9.00	
<b>Rods</b>			*Chicago, No. 1		8.75-9.00
High yellow brass	15.75		*St. Louis	8.50-8.75	
Copper, hot rolled	17.62½		<b>Composition Brass Borings</b>		
<b>Anodes</b>			*New York		6.62½-6.87½
Copper, untrimmed	18.37½		<b>Light Copper</b>		
<b>Wire</b>			New York	7.00-7.25	
Yellow brass (high)	19.50		Cleveland	6.75-7.00	
			*Chicago	6.50-7.00	
			*St. Louis	6.50-7.00	

Light Brass			Lead		Zinc		Aluminum	
Cleveland	3.74-4.00		New York	5.25	*New York	3.25-3.50	Borings, Cleveland	9.75-10.00
*Chicago	4.50-4.75		Cleveland	5.00-5.25	Cleveland	3.00-3.25	Mixed cast, Cleve.	13.25-13.50
*St. Louis	4.25-4.75		Chicago	4.50-4.75	*St. Louis	4.00-4.50	Clips, soft, Cleve.	15.25-15.50
<b>Lead</b>			<b>Aluminum</b>		<b>SECONDARY METALS</b>		<b>Light Copper</b>	
New York			New York		Brass, ingot, 85-5-5-5, 1cl.		New York	
Cleveland			Cleveland		Stand. No. 12 alum.		Cleveland	
Chicago			Chicago				*Chicago	
*St. Louis			*St. Louis				*St. Louis	

No. 2 Malle-Fdry.	Malle-able	Basic	Besse-mer
St. Louis from Birmingham	\$24.12	23.82	26.44
St. Paul from Duluth	25.94	25.94	26.44
Over 0.70 phos.			

### Low Phos.

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

Gray Forge	Charcoal	
Valley furnace	Lake Superior fur.	\$27.00
Pitts. dist. fur.	do., del. Chicago	30.04
	Lyles, Tenn.	26.50

### Silvery†

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

### Bessemer Ferrosilicon†

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

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

## Refractories

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

Fire Clay Brick	Magnesite	
Super Quality	Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	\$45.00
Pa., Mo., Ky.	Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	43.00
First Quality	Base Brick	
Pa., Ill., Md., Mo., Ky.	Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.	
Alabama, Georgia	Chrome brick	\$49.00
New Jersey	Chem. bonded chrome	49.00
Second Quality	Magnesite brick	69.00
Pa., Ill., Ky., Md., Mo.	Chem. bonded magnesite	59.00
Georgia, Alabama		
New Jersey		
Ohio		
First quality		43.70
Intermediate		39.90
Second quality		35.15

### Malleable Bung Brick

All bases	\$59.85
<b>Silica Brick</b>	
Pennsylvania	\$51.30
Joliet, E. Chicago	59.85
Birmingham, Ala.	51.30
<b>Ladle Brick</b>	
(Pa., O., W. Va., Mo.)	
Dry press	\$30.00
Wire cut	\$28.00

## Fluorspar, 85-5

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

## Ferroalloys

Dollars, except Ferrochrome	
Ferromanganese, 78-82%, tidewater, duty pd.	\$102.50
Do., Baltimore, base	102.50
Do., del. Pittsburgh	107.29
Spegeleisen, 19-21% dom.	
Palmerton, Pa., spot	33.00
Do., New Orleans	33.00
Do., 26-28%, Palmer-ton	39.00
Ferrosilicon, 50% freight allowed, c.i.	69.50
Do., less carload	77.00
Do., 75 per cent	126-130.00
Spot, \$5 a ton higher.	
Silicomane, 2% carbon	106.50
2% carbon 111.50; 1%, 121.50	
Ferrochrome, 66-70 chromi-um, 4-6 carbon, cts.	
lb. del.	10.50
Ferrotungsten, stand., lb. con. del. cars	2.95-3.00
Ferrovandium, 35 to 40% lb., cont.	2.70-2.90
Ferrotitanium, c. l., prod. plant, frt. all., net ton	142.50
Spot, carlots	145.00
Spot, ton lots	150.00
Ferrophosphorous, per ton, c. l., 17-19% Rockdale, Tenn., basis, 18%, \$3 unitage	63.50
Ferrophosphorous, electro-lytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% \$3 unitage	80.00
Ferromolybdenum, stand.	
55-65%, lb.	0.95
Molybdate, lb. cont.	0.80
†Carloads. Quan. diff. apply	

# Warehouse Iron and Steel Prices

*Cents per pound for delivery within metropolitan districts of cities specified*

**STEEL BARS**

Baltimore	4.00c
Boston†	4.05c
Buffalo	3.90c
Chattanooga	4.21c
Chicago (j)	3.85c
Cincinnati	4.05c
Cleveland	3.75c
Detroit	3.93½c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.96c-4.11c
New Orleans	4.20c
New York‡ (d)	4.12c
Pitts. (h)	3.80c
Philadelphia	4.00c
Portland	4.50c
San Francisco	4.20c
Seattle	4.45c
St. Louis	4.09c
St. Paul	4.10c-4.25c
Tulsa	3.35c

**IRON BARS**

Portland	3.50c
Chattanooga	4.21c
Baltimore*	3.25c
Cincinnati	4.05c
New York‡ (d)	3.65c
Philadelphia	4.00c
St. Louis	4.09c
Tulsa	3.35c

**REINFORCING BARS**

Buffalo	3.10c
Chattanooga	4.21c
Cleveland (c)	2.55c
Cincinnati	3.75c
Houston	3.25c
Los Angeles, c.l.	2.975c
New Orleans*	3.24c
Pitts., plain (h)	2.55c
Pitts., twisted squares (h)	3.95c
San Francisco	2.97½c
Seattle	2.975c
St. Louis	3.99c
Tulsa	3.25c
Young	2.30c-2.60c

**SHAPES**

Baltimore	3.90c
Boston†	3.92c
Buffalo	3.80c
Chattanooga	4.11c
Chicago	3.75c
Cincinnati	3.95c
Cleveland	3.86c
Detroit	3.95c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.86c
New Orleans	4.10c
New York‡ (d)	3.97c
Philadelphia	3.90c
Pittsburgh (h)	3.70c
Portland (l)	4.25c
San Francisco	4.05c
Seattle (l)	4.25c
St. Louis	3.99c
St. Paul	4.00c
Tulsa	3.60c

**PLATES**

Baltimore	3.90c
Boston†	3.93c
Buffalo	3.80c
Chattanooga	4.11c
Chicago	3.75c
Cincinnati	3.95c
Cleveland, ½-in. and over	3.86c
Detroit	3.95c
Detroit, ¾-in.	4.15c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.86c
New Orleans	4.10c
New York‡ (d)	4.00c
Philadelphia	3.90c

Phila. floor	5.25c
Pittsburgh (h)	3.70c
Portland	4.25c
San Francisco	4.05c
Seattle	4.25c
St. Louis	3.99c
St. Paul	4.00c
Tulsa	3.60c

**NO. 10 BLUE**

Baltimore	3.95c
Boston (g)	4.00c
Buffalo, 8-10 ga.	3.97c
Chattanooga	4.16c
Chicago	3.85c
Cincinnati	4.00c
Cleveland	3.91c
Det. 8-10 ga.	3.93½c
Houston	3.45c
Los Angeles	4.50c
Milwaukee	3.96c
New Orleans	4.35c
New York‡ (d)	4.07c
Portland	4.25c
Philadelphia	4.00c
Pittsburgh (h)	3.75c
San Francisco	4.30c
Seattle	4.50c
St. Louis	4.39c
St. Paul	4.10c
Tulsa	3.80c

**NO. 24 BLACK**

Baltimore*†	4.50c
Boston (g)	4.75c
Buffalo	4.80c
Chattanooga*	4.06c
Chicago	4.45c-5.10c
Cincinnati	4.75c
Cleveland	4.66c
Detroit	4.68½c
Los Angeles	5.05c
Milwaukee	4.56c-5.21c
New York‡ (d)	4.82c
Philadelphia	4.65c
Pitts.** (h)	4.75c
Portland	5.15c
Seattle	5.35c
San Francisco	5.15c
St. Louis	4.84c
St. Paul	4.75c
Tulsa	4.85c

**NO. 24 GALV. SHEETS**

Baltimore*†	4.70c
Buffalo	5.45c
Boston (g)	5.30c
Chattanooga*	4.76c
Chicago (h)	5.10c-5.75c
Cincinnati	5.40c
Cleveland	5.31c
Detroit	5.40c
Houston	4.50c
Los Angeles	5.75c
Milwaukee	5.21c-5.86c
New Orleans*	5.75c
New York‡ (d)	5.47c
Philadelphia	5.30c
Pitts.** (h)	5.40c
Portland	5.90c
San Francisco	5.85c
Seattle	5.90c
St. Louis	5.49c
St. Paul	5.40c
Tulsa	5.20c

**BANDS**

Baltimore	4.20c
Boston†	4.25c
Buffalo	4.22c
Chattanooga	4.41c
Cincinnati	4.25c
Cleveland	4.16c
Chicago	4.10c
Detroit, ¾-in. and lighter	4.185c
Houston	3.35c
Los Angeles	4.80c
Milwaukee	4.21c
New Orleans	4.75c
New York‡ (d)	4.32c

Philadelphia	4.10c
Pittsburgh (h)	4.00c
Portland	5.00c
San Francisco	4.80c
Seattle	4.95c
St. Louis	4.34c
St. Paul	4.35c
Tulsa	3.55c

**HOOPS**

Baltimore	4.45c
Boston†	5.25c
Buffalo	4.22c
Chicago	4.10c
Cincinnati	4.25c
Detroit, No. 14 and lighter	4.185c
Los Angeles	6.55c
Milwaukee	4.21c
New York‡ (d)	4.32c
Philadelphia	4.35c
Pittsburgh (h)	4.50c
Portland	6.50c
San Francisco	6.50c
Seattle	6.30c
St. Louis	4.34c
St. Paul	4.35c

**COLD FIN. STEEL**

Baltimore (c)	4.50c
Boston*	4.65c
Buffalo (h)	4.35c
Chattanooga*	4.86c
Chicago (h)	4.30c
Cincinnati	4.50c
Cleveland (h)	4.30c
Detroit	4.30c
Los Ang. (f) (d)	6.85c
Milwaukee	4.41c
New Orleans	5.10c

New York‡ (d)	4.57c
Philadelphia	4.53c
Pittsburgh	4.15c
Portland (f) (d)	7.10c
San Fran. (f) (d)	6.80c
Seattle (f) (d)	7.10c
St. Louis	4.54c
St. Paul	4.77c
Tulsa	4.80c

**COLD ROLLED STRIP**

Boston	3.845c
Buffalo	3.79c
Chicago	3.87c
Cincinnati	3.82c
Cleveland (b)	3.60c
Detroit	3.43c
New York‡ (d)	3.92c
St. Louis	4.54c

**TOOL STEELS**

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

Base	
High speed	69c
Oil carbon, Cr.	45c
Oil hardening	26c
Special tool	24c
Extra tool	20c
Regular tool	16c
Water hardening 12½c	
Uniform extras apply.	

**BOLTS AND NUTS**

(100 pounds or over)	
Discount	
Chicago (a)	.55 to .60
Cleveland	60-50-65
Detroit	70-10
Milwaukee	.60 to .65

New Orleans	60
Pittsburgh	65-5

(a) Under 100 lbs., 50 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Quantity base; (e) New mill classif. (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less; (l) Under 3 in.; (j) Shapes other than rounds, flats, fillet angles, 0.15c higher.

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

‡Domestic steel; \*Plus quantity extras; \*\*One to 9 bundles; † 50 or more bundles; †New extras apply; ††Base 10,000 lbs., extras on less.

## Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Oct. 14

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

	British gross tons U. K. ports	Continental Channel or North Sea ports, metric tons	
		Quoted in dollars at current value	**Quoted in gold pounds sterling
	£ s d		£ s d
<b>PIG IRON</b>			
Foundry, 2.50-3.00 Silicon	\$29.76 6 0 0	\$22.36	2 15 6
Basic bessemer	19.47 3 18 6	23.30	2 18 0
Hematite, Phos. .03-.05	35.96 7 5 0*		
<b>SEMIFINISHED STEEL</b>			
Billets	\$39.06 7 17 6	\$43.20	5 7 6
Wire rods, No. 5 gage	53.69 10 16 6	49.22	6 2 6
<b>FINISHED STEEL</b>			
Standard rails	\$50.22 10 2 6	\$46.20	5 15 0
Merchant bars	2.43c 11 0 0	2.18c to 2.28c	6 0 0 to 6 5 0
Structural shapes	2.35c 10 12 6	1.96c	5 7 6
Plates, ¼ in. or 5 mm.	2.56c 11 11 3	2.59c	7 2 6
Sheets, black, 24 gage or 0.5 mm.	3.32c 15 0 0	3.18c	8 15 0†
0.5 mm.	4.14c 18 15 0	3.92c	10 10 0
Sheets, gal., 24 gage, corr.	3.03c 13 15 0	2.37c	6 10 0
Bands and strips	4.31c 19 10 0	2.54c	7 0 0
Plain wire, base			
Galvanized wire, base	5.14c 23 5 0	3.18c	8 15 0
Wire nails, base	4.09c 18 10 0	2.90c	8 0 0
Tin plate, box 108 lbs.	\$ 6.45 1 6 0		

British ferromanganese \$102.50 delivered Atlantic seaboard, duty-paid.

## Domestic Prices at Works or Furnace—Last Reported

	£ s d	French Francs	Belgian Francs	Reich Marks
Fdy. pig iron, Si. 2.5	\$25.05 5 1 0(a)	\$17.02 505	\$26.96 800	\$25.29 63½
Basic bessemer pig iron	24.80 5 0 0(a)			27.90 (b) 69.50
Furnace coke	8.80 1 15 6	6.00 178	7.25 215	7.63 19
Billets	39.06 7 17 6	25.53 757.50	32.35 960	38.74 96.50
Standard rails	2.24c 10 2 6	1.62c 1,080	2.06c 1,375	2.38c 132
Merchant bars	2.53c 11 9 0	1.49c 995	1.65c 1,100	1.98c 110
Structural shapes	2.44c 11 0 6	1.46c 970	1.65c 1,100	1.93c 107
Plates, ¼-in. or 5 mm.	2.59c 11 14 3	1.86c 1,240	2.06c 1,375	2.29c 127
Sheets, black	3.48c 15 15 0‡	2.48c 1,650‡	2.36c 1,575‡	2.59c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	4.31c 19 10 0	3.38c 2,250	2.85c 1,900	6.66c 370
Plain wire	4.31c 19 10 0	2.28c 1,520	2.49c 1,650	3.11c 175
Bands and strips	2.70c 12 4 0	1.68c 1,120	2.33c 1,550	2.29c 127

\*Basic. †British ship-plates. Continental bridge plates, ‡24 ga. †1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel a del. Middlesbrough, b hematite, ††Close annealed. \*\*Gold pound sterling carries a premium of 65.5 per cent over paper sterling.

# Iron and Steel Scrap Prices

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

### HEAVY MELTING STEEL

Birmingham, † No. 1	14.00
Birmingham, † No. 2	13.00
Bos. dock No. 1 exp.	15.00-15.50
N. Eng. del. No. 1.	14.50-15.00
Buffalo, No. 1	16.50-17.00
Buffalo, No. 2	14.50-15.00
Chicago, No. 1	14.50-15.00
Cleveland, No. 1.	16.00-16.50
Cleveland, No. 2.	15.00-15.50
Detroit, No. 1	13.00-13.50
Eastern Pa., No. 1.	16.00-16.50
Eastern Pa., No. 2.	13.50-14.00
Federal, Ill.	14.00-14.50
Granite City, R. R.	15.50-16.00
Granite City, No. 2.	14.00-14.50
New York, No. 1.	†14.00
N. Y. dock No. 1 exp.	14.50-15.00
Pitts., No. 1 (R. R.)	18.00-18.50
Pitts., No. 1 (dir.)	17.00-17.50
Pittsburgh, No. 2.	15.00-15.50
St. Louis, R. R.	15.50-16.00
St. Louis, No. 2.	14.00-14.50
Toronto, dlrs. No. 1.	12.00
Toronto, No. 2	11.00
Valleys, No. 1	17.50-18.00

### COMPRESSED SHEETS

Buffalo, dealers	14.50-15.00
Chicago, factory	14.00-14.50
Chicago, dealer	13.50-14.00
Cleveland	15.50-16.00
Detroit	14.00-14.50
E. Pa., new mat.	16.00-16.50
E. Pa., old mat.	11.00-11.50
Pittsburgh	17.00-17.50
St. Louis	11.00-11.50
Valleys	17.00-17.50

### BUNDLED SHEETS

Buffalo	10.50-11.00
Cincinnati, del.	11.50-12.00
Cleveland	12.00-12.50
Pittsburgh	16.00-16.50
St. Louis	10.50-11.00
Toronto, dealers	8.00

### SHEET CLIPPINGS, LOOSE

Chicago	10.50-11.00
Cincinnati	10.00-10.50
Detroit	11.00-11.50
St. Louis	9.00-9.25

### STEEL RAILS, SHORT

Birmingham	15.00
Buffalo	21.00-21.50
Chicago (3 ft.)	18.00-18.50
Chicago (2 ft.)	19.00-19.50
Cincinnati, del.	19.00-19.50
Detroit	19.50-20.00
Pitts., 3 ft. and less	21.50-22.00
St. Louis, 2 ft. & less	18.00-18.50

### STEEL RAILS, SCRAP

Boston district	†14.00-14.50
Buffalo	17.50-18.00
Chicago	14.50-15.00
Cleveland	18.50-19.00
Pittsburgh	18.75-19.25
St. Louis	16.50-17.00

### STOVE PLATE

Birmingham	9.50-10.00
Boston district	†11.00-11.50
Buffalo	13.50-14.00
Chicago	10.00-10.50
Cincinnati, dealers	9.50-10.00
Detroit, net	10.25-10.75
Eastern Pa.	14.00-14.50
New York, fdry.	†10.50-11.00
St. Louis	11.50-12.00
Toronto, deal'rs, net	10.00

### SPRINGS

Buffalo	20.50-21.50
Chicago, coil	21.00-21.50
Chicago, leaf	19.00-19.50
Eastern Pa.	23.00-23.50
Pittsburgh	22.00-22.50
St. Louis	20.50-21.00

### ANGLE BARS—STEEL

Chicago	16.00-16.50
St. Louis	17.00-17.50

### RAILROAD SPECIALTIES

Chicago	19.00-19.50
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### LOW PHOSPHORUS

Buffalo, billet and bloom crops	20.00-21.00
Cleveland, billet, bloom crops	23.00-23.50
Eastern Pa., crops	22.50-23.00
Pittsburgh, billet, bloom crops	22.00-22.50
Pittsburgh, sheet bar crops	22.00-22.50

### FROGS, SWITCHES

Chicago	14.50-15.00
St. Louis, cut	16.50-17.00

### SHOVELING STEEL

Federal, Ill.	14.00-14.50
Granite City, Ill.	14.00-14.50
Toronto, dealers	10.00

### RAILROAD WROUGHT

Birmingham	13.50-14.00
Boston district	†10.00-10.25
Buffalo, No. 1	13.50-14.00
Buffalo, No. 2	16.50-17.00
Chicago, No. 1 net.	12.50-13.00
Cincinnati, No. 2	13.00-13.50
Eastern Pa., No. 1.	16.50-17.00
St. Louis, No. 1.	12.00-12.50
St. Louis, No. 2.	15.50-16.00
Toronto, No. 1 dir.	16.00

### SPECIFICATION PIPE

Eastern Pa.	15.50-16.00
New York	†11.50-12.00

### BUSHELING

Buffalo, No. 1	14.50-16.00
Chicago, No. 1	13.50-14.00
Cincn., No. 1, deal.	12.00-12.50
Cincinnati, No. 2.	8.00-8.50
Cleveland, No. 2.	12.00-12.50
Detroit, No. 1, new.	13.50-14.00
Valleys, new, No. 1	16.50-17.00
Toronto, dealers	9.00

### MACHINE TURNINGS

Birmingham	6.00-7.00
Buffalo	10.50-11.00
Chicago	9.50-10.00
Cincinnati, dealers	8.50-9.00
Cleveland	11.00-11.50
Detroit	9.00-9.50
Eastern Pa.	11.00-11.50
New York	†8.50-9.00
Pittsburgh	11.50-12.00
St. Louis	8.00-8.50
Toronto, dealers	8.00-8.50
Valleys	13.50-14.00

### BORINGS AND TURNINGS

For Blast Furnace Use	
Boston district	†7.00

Buffalo	10.00-10.50
Cincinnati, dealers	8.00-8.50
Cleveland	12.00-12.50
Detroit	9.50-10.00
Eastern Pa.	10.50-11.00
New York	†7.00-7.50
Pittsburgh	12.75-13.25
Toronto, dealers	8.00-8.50

### CAST IRON BORINGS

Birmingham	8.00
Boston dist. chem.	†9.50
Bos. dist. for mills	†8.75
Buffalo	10.00-10.50
Chicago	9.50-10.00
Cincinnati, dealers	8.00-8.50
Cleveland	12.00-12.50
Detroit	9.50-10.00
E. Pa., chemical	14.50-15.00
New York	†8.00-8.50
St. Louis	8.00-8.50
Toronto, dealers	9.00

### PIPE AND FLUES

Cincinnati, dealers	9.50-10.00
Chicago, net	10.50-11.00

### RAILROAD GRATE BARS

Buffalo	11.00-11.50
Chicago, net	10.00-10.50
Cincinnati	9.50-10.00
Eastern Pa.	14.00-14.50
New York	†10.50-11.00
St. Louis	11.50-12.00

### FORGE FLASHINGS

Boston district	†11.25-11.50
Buffalo	14.50-15.00
Cleveland	16.00-16.50
Detroit	13.00-13.50
Pittsburgh	15.25-15.75

### FORGE SCRAP

Boston district	†9.50-10.00
Chicago, heavy	19.00-19.50

### ARCH BARS, TRANSOMS

St. Louis	19.00-19.50
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### AXLE TURNINGS

Boston district	†11.00-11.50
Buffalo	14.50-15.00
Chicago, elec. fur.	14.50-15.00
Eastern Pa.	14.00-14.50
St. Louis	12.00-12.50
Toronto	9.50

### STEEL CAR AXLES

Birmingham	19.00-20.00
Buffalo	19.75-20.75
Boston district	†24.00-25.00
Chicago, net	22.50-23.00
Eastern Pa.	24.00-24.50
St. Louis	19.50-20.00

### SHAFTING

Boston district	†17.00
New York	†18.50-19.00
Eastern Pa.	23.00
St. Louis	18.00-18.50

### CAR WHEELS

Birmingham	17.00-18.00
Boston dist. iron	†15.00-15.25
Buffalo, steel	19.00-19.50
Chicago, iron	17.00-17.50
Chicago, rolled steel	17.00-17.50

Cincinnati, iron	17.50-18.00
Eastern Pa., iron	19.00-19.50
Eastern Pa., steel	22.50-23.00
Pittsburgh, iron	17.75-18.25
Pittsburgh, steel	22.00-22.50
St. Louis, iron	17.00-17.50
St. Louis, steel	21.00-21.50

### NO. 1 CAST SCRAP

Birmingham	15.50-16.00
Boston, No. 1 mach.	†14.50-15.00
N. Eng. del. No. 2.	14.00-14.50
N. Eng. del. textile.	18.00
Buffalo, cupola	15.00-15.50
Buffalo, mach.	16.00-16.50
Chicago, agri. net.	11.50-12.00
Chicago, auto	12.50-13.00
Chicago, rail'd net	12.50-13.00
Chicago, mach. net	13.50-14.00
Cincn., mach. cup.	13.50-14.00
Cleveland, mach.	18.50-19.00
Eastern Pa., cupola	18.50-19.00
E. Pa., mixed yard.	15.50-16.00
Pittsburgh, cupola	18.25-18.75
San Francisco, del.	13.50-14.00
Seattle	8.00-9.00
St. Louis, No. 1.	12.75-13.25
St. L., No. 1, mach.	13.75-14.25
Toronto, No. 1, mach., net	14.00-15.00

### HEAVY CAST

Boston dist. break.	†12.50
N. Eng. del.	14.50-15.00
Buffalo, break.	14.00-14.50
Cleveland, break.	16.00-17.00
Detroit, break.	13.00-13.50
Detroit, auto net.	14.00-14.50
Eastern Pa.	17.00-17.50
New York, break.	†13.00-13.50
Pittsburgh	15.00-15.50

### MALLEABLE

Birmingham, R. R.	12.50-13.50
New England, del.	20.00
Buffalo	17.00-17.50
Chicago, R. R.	16.25-16.75
Cincn., agri. del.	14.00-14.50
Cleveland, rail.	17.50-18.00
Detroit, auto	13.50-14.00
Eastern Pa., R. R.	18.00
Pittsburgh, rail	17.75-18.25
St. Louis, R. R.	15.00-15.50

### RAILS FOR ROLLING

5 feet and over	
Birmingham	17.00-18.00
Boston	†15.50
Chicago	16.50-17.00
Eastern Pa.	19.50-20.00
New York	†16.50-17.00
St. Louis	18.00-18.50

### LOCOMOTIVE TIRES

Chicago (cut)	19.00-19.50
St. Louis, No. 1	18.00-18.50

### LOW PHOS. PUNCHINGS

Buffalo	20.50-21.00
Chicago	18.00-18.50
Eastern Pa.	23.00-23.50
Pittsburgh (heavy)	21.25-21.75
Pittsburgh (light)	20.25-20.75

## Iron Ore

Lake Superior Ore	
Gross ton, 51 1/2%	
Lower Lake Ports	
Old range bessemer	\$5.25
Mesabi nonbess.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbess.	5.10

### Eastern Local Ore

Cents, unit, del. E. Pa.	
Foundry and basic	
56.63% con.	9.00-10.00
Cop.-free low phos.	
58-60%	nominal
Foreign Ore	
Cents per unit, i.a.s. Atlantic	
Foreign manganiferous ore, 45.55% iron, 6-10% man.	

nom.	13.00-14.00
No. Afr. low phos.	
nom.	18.00-20.00
Swedish low phos.	
nominal	
Spanish No. Africa	
basic, 50 to 60%	
nom.	15.00
Tungsten, Nov.-Dec.	
sh. ton, unit, duty	
pd.	nominal
N. F., fdy., 35%	7.00

Chrome ore, 48%	
gross ton, c.i.f.	\$25.50-26.50

## Manganese Ore

Prices not including duty, cents per unit cargo lots.	
Caucasian, 50-52%	
non. 50.00	
So. African, 50-52%	
non. 50.00	
Indian, 50-52%	
Nominal	

## Prices Reaffirmed For First Quarter

The following announcements have been made by leading producers relative to prices on most steel products, covering first quarter of 1938. Other producers are expected to make similar announcements soon.

"Carnegie-Illinois Steel Corp. announces that present prices on blooms, billets, slabs and sheet bars, bars and small shapes, structural shapes, plates, strip, sheets, sheet piling, standard and light T rails and accessories, car and locomotive axles and solid wrought steel wheels for delivery and consumption in the United States during the first calendar quarter of the year 1938, are reaffirmed, subject to any change in freight rates at time of shipment."

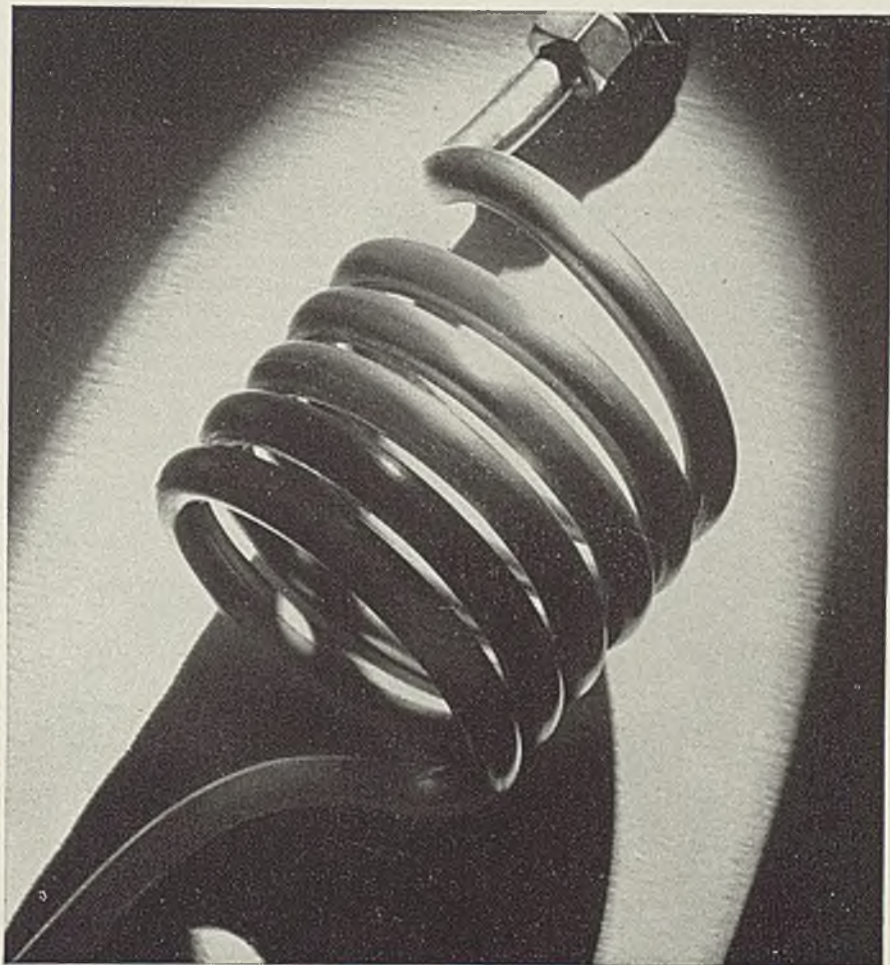
"American Steel & Wire Co. has reaffirmed present fourth quarter base prices of wire and wire products for shipment in the first quarter of 1938 (i.e., until March 31, 1938) subject to any change in freight rates at the time of shipment."

## Sheets

Sheet Prices, Page 78

**Pittsburgh**—A beneficial effect is expected to result from announcement reaffirming sheet prices for first quarter of 1938, subject to any change in freight rates at time of shipment. Hot-rolled No. 10 sheets are 2.40c, Pittsburgh; hot-rolled annealed No. 24, 3.15c, Pittsburgh; galvanized No. 24, 3.80c, Pittsburgh; cold-rolled No. 10, 3.10c, Pittsburgh; cold-rolled No. 20, 3.55c, Pittsburgh. New business in sheets is fair, recent automotive buying having helped to partially check the decline. In addition, refrigerator manufacturers are active and specifying well. Sheet deliveries continue easy, however, with relatively quick shipment obtainable where necessary. Operations on the national scale are down to 66-68 per cent. Some sellers point to the fact that few cancellations have been received since general business began sagging, even though some consumers had filed their orders before the ensuing bearish developments were apparent.

**Cleveland**—A moderate increase in specifications from local stamping concerns is noted as the automotive industry is resuming normal



## Bundy Tubing Contributes Dependability

Great strength and ability to resist vibration are inherent qualities in Bundy Tubing. It is by virtue of these characteristics that Bundy Tubing is making an important contribution to the dependability and durability of automobiles, refrigerators, and the many other mechanisms in which these qualities are taken for granted by the purchaser.

Bundy Tubing is rolled from copper-coated steel; both inside and outside surfaces are clean and free from oxides. It is available in a wide range of sizes, in lengths or completely fabricated. Quotations will be gladly made from your blueprints or samples.

BUNDY TUBING CO.  
DETROIT

operations. Mills remain active at the reduced rate and some sellers feel that a further decline will not be necessary since incoming tonnage in many instances is sufficient to maintain current operations. Manufacturers of stoves, refrigerators and other household appliances continue to specify against current needs, contrary to the belief that most consumers have substantial stocks.

**Chicago**—Automotive sheet releases, while moderately heavy, still are not up to expectations. Sheet mill backlogs and operations reflect

the slow rate of new business. Deliveries range from one or two weeks on hot-rolled sheets to two or three weeks on hot-rolled annealed, cold-rolled and galvanized material. Some consumers still have rather heavy inventories and are not expected to be active buyers before reduction in these stocks. Actual consumption is believed to be at a higher rate than is indicated by the volume of new business.

**Boston**—Lack of buying continues to emphasize the over-bought position of numerous sheet consumers and distributors. Orders are most-

ly for fill-in needs at about the rate of consumption, with tonnage releases for inventories light. Most larger direct-mill buyers are taking less than anticipated, including stove, range, refrigerator and stamping shops. Some small tank builders are well stocked and in a few instances have asked delayed shipment. Small lot orders are slightly more numerous. In addition to awards to Lukens Steel Co., contracts for sheets required for submarines, Portsmouth, N. H., navy yards went to Carnegie-Illinois at 3.42¢, delivered, on most of the moderate tonnage.

**New York**—While there has been an improvement in buying since Labor day, most sheet sellers report that the past few days have witnessed little change. Meanwhile, deliveries continue to improve with nearby shipments available on the heavy gages of hot-rolled and three to four weeks on galvanized, light gage hot-rolled and on most descriptions of cold-reduced sheets. Jobbers are specifying a little for fill-in needs, but in general they have substantial stocks.

**New York Central railroad closes Oct. 26** on air conditioning equipment for passenger cars, taking a substantial volume of sheets.

**Philadelphia** — Buying of sheets still lags. Radio requirements are apparently up to expectations but releases from auto bodymakers and stove and range boilermakers are disappointing. Releases for warehouse delivery are also light. Generally speaking hot-rolled deliveries are at two to three weeks and cold-rolled three to four weeks. Galvanized deliveries require three to five weeks.

**Cincinnati** — Although the sheet market is sluggish mills are heartened by the outlook for early improvement, particularly for automobiles and refrigerators. Orders for galvanized continue in fair volume despite heavy jobber buying last month in anticipation of the new price schedule. Rolling schedules are 70 to 75 per cent.

**St. Louis**—Producers and distributors of sheets report specifying by customers on a current requirement basis, but volume holds up well, showing moderate betterment since the first of October. New orders, however, are disappointing and fail to show the expected upturn. Makers of small tanks and containers are taking large quantities, and the same is true of the stove and implement makers.

**Birmingham, Ala.**—Demand for sheets continues the outsanding feature of the market here. Sheet mills are heavily booked on this class of business.

# Service!

1906  1937

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)



# Strip

Strip Prices, Page 79

**Pittsburgh** — Hot and cold-rolled strip steel prices will be unchanged in the first quarter of 1938, according to announcement last week. Hot strip is 2.40c, Pittsburgh; cold strip, 0.25 carbon and under, 3.20c, Pittsburgh or Cleveland. Operations of hot and cold strip mills on the national scale are off several points to around 56 to 58 per cent, respectively. Demand has not yet shown notable gains, although some improvement has been noted in specifications from automotive parts-makers and a few seasonal sources. Producers are confident some of the hesitancy apparent so far this fall will be dissipated soon.

**Cleveland**—Producers of hot and cold-rolled wide and narrow strip report a moderate increase in new business particularly for wider cold-rolled material. Electrical and farm equipment manufacturers continue to specify for current needs and building up depleted stocks. Auto partsmakers have increased specifications materially following renewed activity in the automotive field. Present operations seem to be more in line with current requirements than any time within 30 days.

**Chicago**—Strip demand still is lagging despite moderately heavier releases from automotive industry. Excess stocks of some consumers are regarded a barrier to an early increase in new business. Mills have little backlog and rollings are at a reduced rate. Steady prices are reported.

**Boston**—Narrow cold strip buying has failed to improve materially. Miscellaneous industrial demand is confined to replacements for prompt delivery, with little forward buying. While shipments to consumers in the agricultural equipment industry are well sustained, new automotive tonnage has been slow. Consumption in strip steel in some industries has declined. This is true of builders' hardware.

**New York**—Improvement, if any, in cold strip buying is slight. A few sellers note a spotty gain in replacement orders and automotive demand, but such developments are exceptional. Many consumers still are operating on inventory stocks, buying for fill-in needs only for prompt shipment, and producers expect such stocks will be materially lowered before widespread replacement. Hot strip buying follows closely activity in cold finished and is light. Re-rollers stocked heavily earlier and still have substantial tonnage. Prices are steady and few

instances of pressure for concessions are evident.

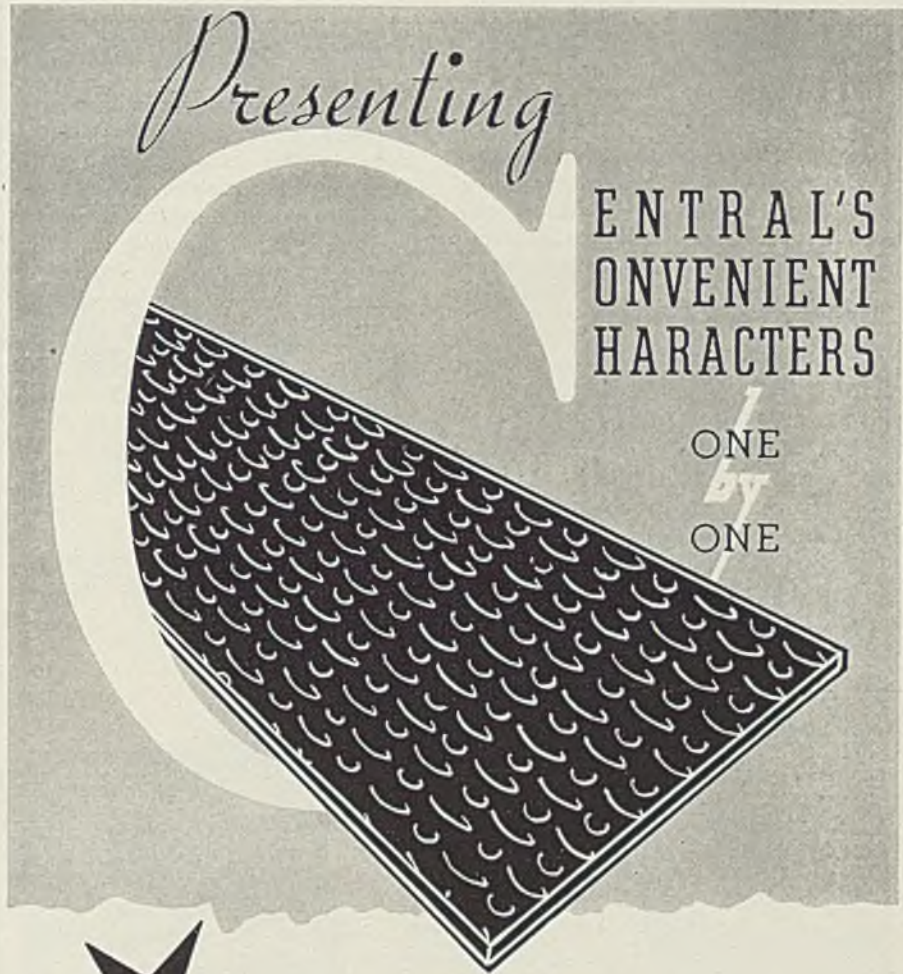
**Philadelphia**—The strip market reflects expanding specifications from radio manufacturers but the situation is otherwise featureless, with deliveries on both hot and cold-rolled available within a fortnight.

**Birmingham, Ala.**—Considerable tonnage in cotton ties accounts for much activity in strip in the South, although other specifications are slower than had been anticipated for this season.

# Plates

Plate Prices, Page 78

**Pittsburgh** — Announcement last week reaffirming the 2.25c, Pittsburgh, quotation on plates clears up the price question. Buyers had shown a tendency to wait until the outlook for fall and winter could be better determined. Demand has been slow this month. Railroad and barge specifications are at a



## "KNOBBY" Floor Plate

The simple, effective pattern of this CENTRAL non-skid, rolled steel floor plate has a wide latitude of uses. From stair treads to rock spreaders its durability serves to a better performance. Perhaps its descriptive folder can furnish ideas for a character change in your plant or product!

**CENTRAL IRON AND STEEL COMPANY**  
HARRISBURG EST. 1853 PENNA.

# Behind the Scenes with STEEL

Hi, Cunnel!

*W*ON'T be long now before STEEL's editors will be carting bags and baggage down to Birmingham to "be there" at the convention of the International Acetylene association. Down in the Southland beginning November 10 the hot-flame boys will make Mr. Justice Black and his nitriders think their fiery crosses are just slightly warmed up. As usual, STEEL will bring you all the dope in its special section of November 1 and in a review after the show. Move over, Cunnel Applegate, suh, and you, Jason, fetch us a mint julep to fill that vacant curve in our palm, so we can harangue about welding, cutting and hardening.

## STEEL Is There

**H**ERE, gentlemen, is an invite. In order to get to the exhibits at the Metal Show you'll have to go past STEEL's booth, L-2, right in the main entrance. There we'll have a map of the whole show so you can find where you want to go—on hand will be men who have studied the show and know most of the personages there, so drop in and let us tell you what you want to know. It will be a fine chance for you to meet the men who prepare the world's most interesting weekly summary of the metalworking and metal producing industries. There you will also discover why STEEL is the most progressive of business

papers, although nobody will tell you anything about it. We'll all stand around like the guides in Radio City, ready to serve you. Cmfwyp, the zinc-line camera man, took an X-ray shot of our imagination and got the fine creation shown below. We'll need all six of those arms before the week is over.

• • •

## Slips That Pass On

**O**NE of our most valued services to companies who subscribe to the most progressive journal in the metalworking and metal producing industries is the free supplying of routing slips. One company, well known to all readers of these columns, recently sent in a new order for slips on one of their subscriptions. The old slip which read:

Buck  
Herb  
John  
Mike

was outmoded by a change in personnel. The new slip was ordered to read:

Buck  
Herb  
John  
Mike  
Bob

Welcome, Bob, to the ever widening circle of STEEL readers. And may that happy day come when the slip will be led off with "Bob" instead of finishing up with it.

low point, and tank fabricators are only moderately active. Plate deliveries have greatly improved.

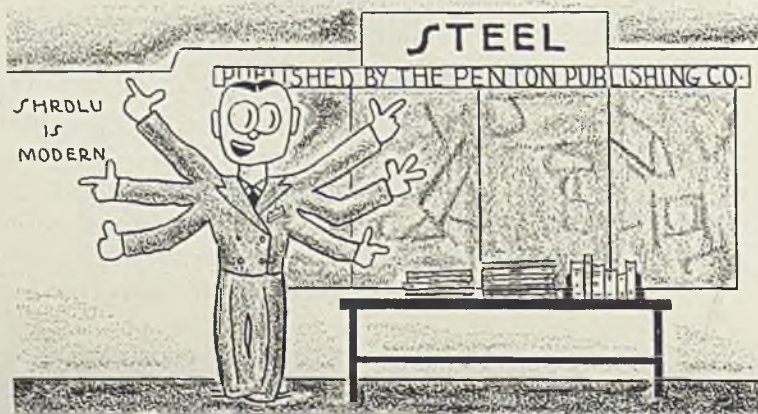
**Cleveland**—Sellers are now offering deliveries within one or two weeks, in spite of the fact operations have been substantially curtailed. Miscellaneous requirements are unchanged and little improvement is anticipated, with the possible exception of increased requirements for ship repairs. Additional buying by railroads appears somewhat more encouraging, but there is no probability of marked improvement from this source until next quarter.

**Chicago**—The outstanding plate project is the Grand Coulee dam penstock involving 10,000 tons of plates on which bids are to be asked soon. Railroads provide only small plate orders in the form of miscellaneous repair material and business for new railroad equipment is scant. Tank fabricators continue busy but plate requirements of structural fabricators are light. Plate deliveries range up to ten days.

**Boston**—Fuel tank requirements are lower following a moderate upturn, but plate demand continues centered largely around specified projects and shipyards. As wide plates will be used to a considerable extent in the two submarines being built at Groton, Conn., part of this tonnage will be rolled at the Coatesville, Pa., mill. Boiler shops in most instances have fair backlogs and are doing some moderate buying. Miscellaneous demand is slack, however, and jobbers, mostly well stocked, are releasing tonnage sparingly. Babcock & Wilcox Co. is low on main boilers and parts for the navy at \$732,795 with an alternate of \$702,485.

**New York**—Plate specifications are holding fairly steady at the restricted rate of the past fortnight or so. There is fair oil refinery demand and sufficient volume of miscellaneous replacement buying to check the downward decline in new buying. However, in absence of railroad buying and important ship work there is little tonnage inquiry. Except for heavy gage sheets of extra width, plates are available for shipment within 10 days and less. Wide plates of heavy gage are available within three to four weeks.

**Philadelphia** — Plate buying is featured by distribution of a few hundred tons among eastern producers by the Reading railroad for repairs to hopper cars. Buying is generally light and producers look for little improvement much before November when excess stocks in the hands of jobbers and consumers are nearer depletion. Deliveries range from one to two weeks on



most specifications and in some instances better can be done.

**San Francisco**—Interest in the plate market centers around the opening of bids Oct. 20 for 1000 tons for a 60-inch welded steel discharge pipe line for San Francisco. Other pending business is confined to small lots of less than 100 tons. So far this year only 44,464 tons have been placed, compared with 106,004 tons for the same period a year ago.

**Seattle**—No important projects are up for immediate action but shops report a fair run of orders involving small tonnages. Several cities are planning steel storage tanks, among them Vancouver, Wash., Toppenish, Wash., bids Oct. 21, alternate concrete, and Twin Falls, Idaho. Montana oil interests are considering construction of a refinery and storage facilities at Spokane, Wash.

**Birmingham, Ala.**—Buying of plates continues to hold the improvement shown a couple of weeks ago but is not up to expectations. Specifications, however, are due on several sizable bookings and will be available, it is expected, immediately.

## Plate Contracts Placed

850 tons, tanks, 235,000-barrel capacity, Pontiac Refining Co., Corpus Christi, Tex., to Mid-Continent Engineering Co., Dallas, Tex.

265 tons, pontoons for United States engineer's office, Memphis, Tenn., to St. Louis Shipbuilding & Steel Co., St. Louis.

200 tons, welded tanks, Procter & Gamble Co., Baltimore, to Hammond Iron Works, Warren, Pa.

200 tons, two steel derrick boats, U. S. engineer, second district, New Orleans, La., to St. Louis Ship Building & Steel Co., St. Louis, \$79,300 for both boats, specification No. 1096-38-19.

100 tons, water tank, federal jail, Tallahassee, Fla., to R. D. Cole Mfg. Co., Newnan, Ga., \$10,467 with \$276 added for alternate, bids Sept. 30.

Unstated tonnage, water tank, bureau of yards and docks, San Diego, Calif., to Chicago Bridge & Iron Co., Chicago, \$8390, specification S370.

## Plate Contracts Pending

10,000 tons, penstock, Grand Coulee dam, Washington.

990 tons, 60-inch welded steel pipe, Sunset discharge line, San Francisco; bids Oct. 20.

500 tons, estimated, seagoing hopper dredge, 2500 cubic yards capacity, 300 feet, 2 inches long, 56 feet wide and 29 feet deep, chief of engineers, war department, Washington; plans will be ready this week with bids early in November.

320 tons, high-tensile black, welding quality, for boiler shop use, Washington navy yard; bids Oct. 22, bureau of supplies and accounts, schedule 1851, delivery 45 days.

160 tons, grade M black, welding quality, industrial department, shop 11, Norfolk, Va., navy yard; bids Oct. 22, bureau of supplies and accounts, schedule 1858.

Unstated tonnage, 1000-horsepower twin

screw steam tug, Inland Waterways Corp., New Orleans, Dubuque Boat & Boiler Works, Dubuque, Iowa, low, \$198,750, delivery 300 days, bids Oct. 5. Unstated tonnage, one 50-foot steel hull inspection boat, U. S. engineer, Baltimore, Higgins Industries Inc., New Orleans, low, \$30,500, delivery 150 days; bids Oct. 8. Unstated, 30 and 36-inch discharge pipe for Cowlitz county, Washington, diking district; bids to U. S. engineer, Portland, Oreg., Oct. 26.

## Bars

Bar Prices, Page 78

**Pittsburgh**—Hot-rolled bars have been reaffirmed at 2.45c, Pittsburgh, for first quarter of 1938, subject to any change in freight rate at time of shipment. This is expected to have a clarifying influence. Medium-sized orders in fair volume have helped support the market recently and it appears to have a better tone. Included in this business are a few 500-ton purchases. Alloy grades are more active, with some orders for November shipment recently from automotive sources. Caution is still apparent on the part of most consumers in view of general easier business.

Prompt shipments are obtainable.

**Cleveland**—Producers of commercial carbon steel bars report deliveries can generally be made within a week to ten days, although at least one seller can do better than that. The spread between shipments and incoming business is narrowing which leads to belief no further reduction in operations will result in the near future. Local forging concerns have increased specifications moderately following additional bookings from automotive builders. Requirements from farm equipment manufacturers remain steady at the high level of the last 30 days.

**Chicago**—Despite better releases from the automotive industry, steel bar specifications show little change and continue relatively light. Most consumers are interested in ordering only for early needs and in some cases still are reducing inventories. Demand from the farm equipment industry has been curtailed in certain directions by the closing of plants for inventory, though sales of implements and tractors continue active. Early delivery can be given on most bar sizes.

**Boston**—Mild improvement in demand for alloy and forging bars,



**Set Screws**  
CUP, OVAL  
CONE, FLAT  
AND DOG  
Points

• You can get case hardened Cleveland Set Screws in any quantity you require on short notice—from either factory or warehouse stocks. A full range of sizes and all usual points wanted in today's production lines are available. Made to the same close tolerances as Cleveland Cap Screws—a Class 3 fit is standard. In finish, tensile strength and thread accuracy, you will find Cleveland Set Screws meeting all requirements of your specifications. Samples on request. Ask for Catalog E and current Price List. THE CLEVELAND CAP SCREW COMPANY, 2935 East 79th Street, Cleveland, Ohio.

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the latter from shops connected with the automotive and airplane industries, has failed to stimulate commercial steel bar buying. On 600 tons, pearlitic manganese steel bars, Newport, R. I., torpedo station, Empire Finished Steel Corp., Newark, N. J., is low, although most of the 11 tenders were uniform. Bid of 6.835c, delivered, prevailed on a part of the tonnage. Deliveries on commercial steel bars are down to 10 days on most specifications, which coupled with stabilized prices for this quarter, lower consumption and substantial jobber stocks tends to retard volume buying.

**New York**—Eastern bar sellers indicate they will follow the lead of Carnegie-Illinois Steel Corp. in extending current prices into first quarter but have not made formal announcements yet. Buying is irregular, with deliveries available within a week to 10 days on carbon grades. Both jobbers and railroads, the principal buyers here, appear well stocked.

**Birmingham, Ala.**—Business in bars continues to lag and backlogs have virtually disappeared. Manufacturers of heavier agricultural implements have been slower than usual in placing specifications.

**Philadelphia** — Commercial steel

bars are moving better than most heavy steel products, due in part to demand from forge shops, which, generally speaking, are quite active.

## Pipe

Pipe Prices, Page 79

**Pittsburgh**—Seamless oil country requirements are still fairly well maintained, but standard pipe continues quiet, due to lull in demand from construction, the railroads, mines and public utilities. Atlantic Refining Co., which is constructing a gasoline line from Williamsport, Pa., to Buffalo, has purchased a right of way for extension of the line from Buffalo to Utica, N. Y. Seamless pipe in small sizes, under 2 inches, has been advanced. The increases will have only a small effect in the industry. One-half and ¾-inch sizes are up 5 points, approximately \$10 per ton; 1 and 1¼ inches up 4½ points; and 1½ inches up 3 points, or approximately \$6 per ton. On ¼, ⅜ and ½-inch sizes the advance is approximately 10 per cent.

**Cleveland**—Outstanding award of the week went to Youngstown Sheet

& Tube Co., Youngstown, O., involving 500 tons of 24-inch steel pipe with ¾-inch wall, for the second section of the West side water main, Cleveland. This is the largest individual tonnage award since Bethlehem Steel Co. booked 600 tons for the Industrial Rayon Co.'s new plant at Painesville, O. Inquiries are generally disappointing for both cast and steel pipe, although considerable tonnage of the former is pending as small municipalities await federal aid.

**Chicago** — Cast iron pipe orders and inquiries continue small and shipments show some decrease. A downward trend in business is in prospect for this quarter. High costs occasionally have resulted in a reduction in amount of proposed installations while lack of a larger supply of federal funds for municipal improvements also is restricting activity.

**New York** — For Westchester county, New York, two cast iron pipe contracts involve 405 tons, but buying is mostly in small lots for prompt delivery. Demand for WPA projects, purchases by the treasury procurement division have slumped, the bulk of such activity being for Newark, N. J. Several small lots of 12-inch have been bought for that district.

**San Francisco**—Cast iron pipe is more active lately than in several weeks and several fair-sized inquiries are current. The total booking for the year now aggregates 22,987 tons, compared with 39,360 tons for the corresponding period in 1936. Redding, Calif., has voted bonds for a \$200,000 water system improvement and has accepted a PWA grant of \$162,000. No call for bids for pipe has yet been issued.

**Birmingham, Ala.**—Pipe plants continue to operate on a hand-to-mouth basis. Production is little better than 45 per cent. Available business is widely scattered and in small lots.

### Cast Pipe Placed

350 tons, various sizes, Latham water district, Colonie, N. Y., to United States Pipe & Foundry Co., Burlington, N. J.  
300 tons, 10-inch, Mount Vernon, N. Y., to Donaldson Iron Works, Emaus, Pa.  
165 tons, 6-inch, Class C, 12-foot lengths, Raleigh, N. C., to Glamorgan Pipe & Foundry Co., Lynchburg, Va.  
156 tons, 4 and 6-inch, class 250, specification X-105, Los Angeles, to United States Pipe & Foundry Co., Burlington, N. J.  
115 tons, Vancouver, Wash., to Pacific States Cast Iron Pipe Co., Provo, Utah.  
105 tons, 4 to 12-inch, White Plains, N. Y., to Warren Foundry & Pipe Co., Phillipsburg, N. J.

### Cast Pipe Pending

505 tons, 4 to 10-inch, class 150, Fresno, Calif.; bids opened.

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340 tons, 4 to 8-inch, class 150, Tucson, Ariz.; bids Oct. 18.  
225 tons, 10-inch, McNeil Island, Wash.; transite pipe purchased.  
150 tons, 4 to 8-inch, class 150, Sacramento, Calif.; bids opened.

## Steel Pipe Placed

500 tons, 24-inch, 3/8-inch wall, second section West side water main, Cleveland, to Youngstown Sheet & Tube Co., Youngstown, O.; includes 70 tons of cast pipe.

Unstated tonnage, 50 lengths, 12-foot each, 12-inch diameter steel shore pipe, U. S. engineer, Savannah, Ga., to the Dixie Culvert & Metal Co., Atlanta, Ga.; bids Oct. 8, schedule 70.

## Wire

Wire Prices, Page 79

**Pittsburgh**—Following announcement by the leading producer reaffirming many steel prices for first quarter, an announcement pertaining to wire prices is anticipated soon. New business, shipments and operations of wire producers are a little better than some other branches of the steel industry, although still somewhat below expectations. So far this month, specifications have held about even with the comparable period of September, which in turn was better than August. Export inquiry is active. Prices are steady.

**Cleveland** — Wire producers are generally disappointed with the current rate of improvement. Consumers apparently have ample stocks and because mill deliveries can be made within a week in most instances and their own sales have fallen below former estimates, there is little incentive for renewed buying. However, a moderate improvement in manufacturers' wire has developed recently from the auto trade, believed to be a forerunner of greatly increased demand from this source.

**Chicago**—Wire demand is dragging in most directions, business receiving only moderate support from improved operations in the automotive industry. Requirements of miscellaneous users of manufacturers' wire also are slow to increase. Movement of merchant wire products in farra districts makes a favorable comparison with previous years.

**New York**—While in spots wire demand has gained slightly, total volume of incoming tonnage is about maintained at the recent low levels. From the automotive industry have come moderate releases for specialties entering into mechanical springs, but specifications from that source are still inclined to lag.

**Boston**—Wire consumers continue to draw on stocks for current needs,

buying for replacement as needed. This policy has reached a point where many believe consumer stocks will be lowered materially before real buying develops. Failure of volume from the automotive industry has been a disappointing factor. Backlogs are small and operations are slowing down.

**Birmingham, Ala.**—Bookings of wire products are considerably below what had been expected. Demand, however, is in somewhat better proportion to current shipments.

## Transportation

Track Material Prices, Page 79

Announcement by the Chicago, Burlington & Quincy of its intention to build 600 box cars, 250 automobile cars and 400 coal cars, and to purchase 100 ballast cars and 13 passenger cars is the only bright spot in an otherwise dull market for railroad equipment. The Burlington also will build five freight locomotives. High tensile steel will be used liberally in this new equipment. While other equipment buying programs are under consideration, these are held in abeyance and

freight car builders steadily are reaching the end of their backlogs. Mills are receiving moderate orders for miscellaneous car repair material but shipments of bars, plates and shapes for freight car building now are light.

Brazil is in the market for six locomotives and there is some other export inquiry. Word as to what decision the interstate commerce commission will make with respect to freight rate advances is still being eagerly awaited.

American Car & Foundry Co. has booked an order for 240 air activated containers from the L. C. L. Corp., New York.

Virginian railroad has awarded \$200 tons of rails to Bethlehem Steel Co. and has divided accessories among a number of suppliers.

## Car Orders Placed

Chicago, Burlington & Quincy, 600 box cars, 400 coal cars, 250 automobile cars to own shops.

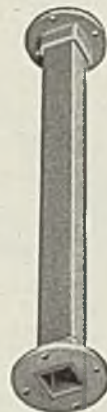
## Rail Orders Placed

Board of transportation, New York, 100 tons, special track work, rails, frogs and switches, city-owned subway lines, to Bethlehem Steel Co., Bethlehem, Pa., \$16,250; bids Sept. 24.  
Virginian, \$200 tons, to Bethlehem Steel

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## Locomotives Placed

Chicago, Burlington & Quincy, five 4-8-4 freight locomotives to own shops, West Burlington, Iowa.

## Car Orders Pending

Chicago, Burlington & Quincy, 100 ballast cars, 13 coaches and diners; bids asked.

# Shapes

Structural Shape Prices, Page 78

**New York**—American Bridge Co., Pittsburgh, lowest of four bidders on the main span, Bronx-Whitestone bridge, East river, New York, quoted \$4,846,070.20. With bridges leading, new structural tonnage is slightly heavier, three New York state spans are out for figures requiring 1800 tons, while the Central railroad of New Jersey closes Oct. 22 on three bridges, 830 tons. Commercial and industrial construction requirements are light, although a Brooklyn wire producer is considering an 1100-ton structure.

**Boston**—Contracts approximating 3000 tons are led by 1710 tons, for a suspension bridge at Deer Isle, Me.

**Pittsburgh** — Structural shapes will be carried unchanged in price through first quarter at 2.25c, Pittsburgh. Sheet piling prices also will be the same as at present. Inquiry includes 1100 tons for a factory building at Maspeth, N. Y., and numerous plant extensions ranging

from 500 to 1000 tons. Awards include 1000 tons for a Rockford, Ill., boiler house, and 850 tons for a brewery stock house in Pittsburgh.

**Cleveland**—Awards are confined to small tonnages for minor plant extensions, although a number of good size state projects are pending. Character of recent inquiries offer considerable encouragement to fabricators who in many cases have approximately cleared up the tonnage booked within the last few months. Mill deliveries are greatly improved and some of the larger fabricators report larger stocks than for some time.

**Chicago** — Inquiries and awards continue small. Only a few projects involve up to 1000 tons at a time while the number of small jobs is declining. Fabricators of oil derricks are busy in some districts.

**Seattle** — While shops are busy with backlogs, new projects have not developed. Pending work includes 810 tons for the proposed naval hangar at Sand Point, Seattle.

## Shape Contracts Placed

20,000 tons, main suspension span and viaduct approaches, Bronx-Whitestone bridge over East river, New York, to American Bridge Co., Pittsburgh, \$4,846,070.20, bids Oct. 13 to Triborough Bridge authority, New York. Tonnage includes: 4950 tons, silicon structural steel, main span and viaduct approaches; 8200 tons, carbon structural steel, same sections; 4175 tons, cable wire; 100 tons, wrapping wire; 67,000 linear feet, suspender rope; 15,600 linear feet, hand rope; 520 tons, cast and forged steel for cable saddles, cable bents, anchorage saddles and miscellaneous needs; 34,200 pounds high tensile steel bolts; contract WB-5. Other bids: Mount Vernon Bridge Co.,

Mount Vernon, O., \$5,086,701; Bethlehem Steel Corp., Bethlehem, Pa., \$5,085,610; John A. Roebling's Sons Co., Trenton, N. J., \$5,602,805.

2000 tons, superstructure, bridge, causeway, coastal canal, Galveston, Tex., to Austin Bridge Co., Dallas, Tex.

1710 tons, including structurals, castings, forgings, anchorage steel and supports, superstructure, suspension bridge, Deer Isle-Sedgwick, Me., to Phoenix Bridge Co., Phoenixville, Pa., at \$459,850, Robinson & Steinman, New York, engineers; bids Oct. 2 on steel direct. Unit steel bids on this project appear in this department, STEEL.

1015 tons, bridge NRS-2690, Washington county, Georgia, to Nashville Bridge Co., Nashville, Tenn., Wilkinson Co., Atlanta, general contractor.

850 tons, stock house, Duquesne Brewing Co., Pittsburgh, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

555 tons, Aronomink school, Philadelphia, to Fort Pitt Bridge Works, Pittsburgh.

550 tons, building, St. Louis, to Mississippi Valley Structural Steel Co., St. Louis.

530 tons, buildings 12-A and 29-B, Buick Motor Co., Flint, Mich., to Flint Structural Steel Co., Flint, Mich.

500 tons, grade crossing, Denver, to Bethlehem Steel Co., Bethlehem, Pa.

500 tons, grade crossing, New York Central railroad, Belle Isle, N. Y., to American Bridge Co., Pittsburgh; Walsh Construction Co., Syracuse, N. Y., general contractor.

415 tons, building, school of architecture, Massachusetts Institute of Technology, Cambridge, Mass., to New England Structural Co., Everett, Mass.; Stone & Webster Inc., Boston, general contractor.

325 tons, cutting shed, Cold Springs Granite Co., Cold Springs, Minn., to Minneapolis Moline Power Implement Co., Minneapolis.

315 tons, mill building, General Electric Co., Pittsfield, Mass., to American Bridge Co., Pittsburgh.

300 tons, addition, building 21, Chrysler Corp., Detroit, to Whitehead & Kales Co., Detroit.

255 tons, ship model testing plan, bureau of yards and docks, navy department, Carderock, Md., to Belmont Iron Works, Eddystone, Pa.; Turner Construction Co., New York, general contractor.

245 tons, bridge FAP-321-A, Marlboro-Chesterfield counties, South Carolina, to Carolina Iron & Steel Co., Greensboro, N. C.

210 tons, theater, Niagara Falls, N. Y., to R. S. McMannus Steel Construction Co., Buffalo; M. Shapiro & Son, New York, general contractor.

200 tons, factory building, Ford Motor Co., Milford, Mich., to R. C. Mahon Co., Detroit.

160 tons, state highway beam spans, Eastport-Perry, Me., to Bethlehem Steel



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## Shape Awards Compared

	Tons
Week ended Oct. 16 .....	32,454
Week ended Oct. 9 .....	10,845
Week ended Oct. 2 .....	17,638
This week, 1936 .....	10,435
Weekly average, 1936 .....	16,332
Weekly average, 1937 .....	24,687
Weekly average, September .....	18,073
Total to date, 1936 .....	942,659
Total to date 1937 .....	1,036,868

Includes awards of 100 tons or more.

—The Market Week—

Corp., Bethlehem, Pa.  
 155 tons, bridge stronger spans, Eastport-Perry, Me., to Bethlehem Steel Corp., Bethlehem, Pa.  
 155 tons, bridge WPGH and WPGM-288-A and C, Hampton and Beaufort counties, South Carolina, to Carolina Iron & Steel Co., Greensboro, N. C.  
 145 tons, two bridges, Manitowoc county, Wisconsin, to Wausau Iron Works, Wausau, Wis.  
 140 tons, additions, Baptist Memorial hospital, Memphis, Tenn., to Pidgeon-Thomas Iron Co., Memphis; S. & W. Construction Co., Memphis, general contractor.  
 140 tons, state highway bridge TR-422-159, Niles, O., to Truscon Steel Co., Youngstown, O.  
 135 tons, warehouse, Montgomery Ward Co., Denver, to Midwest Steel & Iron Works Co., Denver.  
 130 tons, state highway bridge, SH-8512, Shandaken, N. Y., to American Bridge Co., Pittsburgh.  
 126 tons, building, Highland hospital, Rochester, N. Y., to Genesee Bridge Co., Rochester; through John B. Pike & Co., Rochester.  
 125 tons, repairs, Long Beach bridge, Long Island, N. Y., to American Bridge Co., Pittsburgh; Andrew Weston Co., New York, general contractor.  
 120 tons, bridge No. 784.33, Union Pacific railroad, Omaha, Nebr., to American Bridge Co., Pittsburgh.  
 120 tons, state bridge over Gihon river, Johnson, Vt., to Vermont Structural Steel Co., Burlington, Vt.  
 120 tons, engine house, Pennsylvania railroad, Cincinnati, to L. Schreiber & Sons Co., Norwood, O.  
 108 tons, including 23 tons floor plates; also 106 grating type stair treads, crusher building of construction plant, Hiwassee dam, Tennessee Valley authority, Knoxville, Tenn., to Johnson City Foundry & Machine Co., Johnson City, Tenn.; bids Sept. 23.  
 100 tons, factory unit, Sterling Blower Co., Hartford, to Standard Structural Steel Co., Hartford, Conn.; through Robbin Co., Hartford.  
 Unstated tonnage, structural steel for lock gates, U. S. engineer, Milwaukee, to Walter E. Lipman Engineering Works, Milwaukee, \$22,679.32, proposal 26.

**Shape Contracts Pending**

1600 tons, General Purchasing office, Panama canal, schedule 3292; bids Oct. 18.  
 1600 tons, bridge approach and grade crossing, Cypress avenue, Southern boulevard and Major William F. Deegan boulevard, Bronx, N. Y.; J. Leopold & Co., New York, low; bids Oct. 13, president of borough, Bronx.  
 1177 tons, additions, Manual training high school, Brooklyn, N. Y., Lehigh Structural Steel Co., Allentown, Pa.; low, \$111,509, Oct. 11, board of education, New York, steel work direct, fabricating and erecting, Harris Structural Steel Co., New York, second, \$111,850.  
 1100 tons, factory building, Circle Wire & Cable Co., Maspeth, N. Y.  
 1000 tons, plant addition, Armstrong Cork, Lancaster, Pa.; bids Oct. 27.  
 830 tons, bridges 9/69, 9/65 and 9/60, contract 6-No. 1142, Central Railroad of New Jersey, Elizabeth, N. J.; bids Oct. 22, A. E. Owen, chief engineer, Jersey City, N. J.  
 757 tons, state highway bridge, Columbia county, New York; bids Oct. 26, department of public works, highway division, Albany, N. Y.  
 735 tons, warehouse and foundry, Muskegon Heights, Mich.  
 500 tons, bridge over Blue river, Kansas City Terminal railway, bids rejected

and new bids asked.  
 450 tons, Canal street post office station, New York; bids Nov. 19.  
 450 tons, extension, building No. 2, Lever Bros. Co., Cambridge, Mass.  
 430 tons, state hospital, Selins Grove, Pa., John McShan, Philadelphia, low.  
 400 tons, building, Montgomery Ward & Co., Kansas City, Mo.  
 385 tons, turbo-generator supports, Long Island Lighting Co., Glenwood Landing, N. Y.  
 350 tons, shapes and bars, additional buildings and utilities, veterans' hospital, Whipple, Ariz.; Charles J. Dorfman, Los Angeles, Calif., low, bids Oct. 12.  
 350 tons, library, Lubbock, Tex.  
 340 tons, bridge over Licking creek, Parkhead, Md.  
 330 tons, viaduct, Kemper Lane, Cincinnati.  
 310 tons, building, New York school for Deaf, Greenburgh, N. Y.  
 300 tons, radial gates, bureau of reclamation, Calexico, Calif.  
 300 tons, part of Columbia avenue viaduct, city of Cincinnati; bids in.  
 295 tons, machine shop, John Simmons Co., Long Island City, N. Y.  
 252 tons, bridge, Port Reading branch, route 35 extension, section 13, Woodbridge, N. J., bids Oct. 18, state highway department, Trenton, N. J.  
 250 tons, addition, oil process building, Procter & Gamble, Long Beach, Calif.; bids Oct. 19.  
 250 tons, state bridge, Richmond, Me.  
 250 tons, New Jersey state bridge, route 35, section 13; bids Oct. 18.  
 215 tons, Farview hospital, Wayne county, Pennsylvania; Herman Mairlander, Wilkesboro, Pa., low.  
 215 tons, laboratory and shop buildings, United States agricultural department,

Arlington, Va.; bids Oct. 20.  
 200 tons, county bridge, Mantalocking, N. J.; bids Oct. 27.  
 165 tons, administration building, Buffalo sewage authority, Bird Island, N. Y. bids Oct. 28.  
 155 tons, bridge over Eastern canal, contract 3, Lowell, Mass.; Coleman Bros. Corp., Boston, low, \$22,850.75, bids Oct. 8, department of public works, Boston.  
 155 tons, grade crossing, Kennedy, N. Y.  
 153 tons, grade crossing elimination, Kennedy, N. Y., bids in.  
 150 tons, unloading dock, Pennsylvania railroad, Sandusky, O.  
 150 tons, I-beam bridge and multiple I-beam bridge, project 435A, Chadron, Nebr.  
 150 tons, multiple span bridge and viaduct, project WPGH-40, Belvidere, Nebr.  
 150 tons, state highway bridge No. 5526, Willmar, Minn.  
 150 tons, dormitory, Brynmawr college; bids Oct. 20.  
 135 tons, plant addition, Ray-Burn Mfg. Co., Philadelphia.  
 110 tons, Westcott department store, Binghamton, N. Y.  
 106 tons, highway work, Ouray county, Colorado; bids Oct. 18.  
 100 tons, addition to building, Spang Baking Co., Cleveland.  
 100 tons, women's building, Masonic home, St. Louis, Wm. B. Ittner Inc., St. Louis, architects, Koerner Engineering Co., St. Louis, engineers.  
 Unstated, fish lift gates, trash racks and other items for Bonneville project; bids to U. S. Engineer, Oct. 26.  
 Unstated, gates, trash racks, etc. for Enterprise Irrigation district; bids at Klamath Falls, Oreg., Oct. 27.



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# Reinforcing

Reinforcing Bar Prices, Page 79

**New York**—Several thousand tons of reinforcing for Queens sewers are active following heavy purchases for similar work. Bridge needs are also larger, including 1600 tons for a grade crossing, Bronx, N. Y. Mesh requirements for New York state are still unplaced, while part of 900 tons figured for New Jersey have been placed. Reinforcing bar and mesh prices to contractor-buyers continue vulnerable.

**Pittsburgh** — Carnegie - Illinois Steel Corp. has been awarded 3200 tons for section 3 of the Baby Creek sewer, Detroit. Inquiry is headed by 1400 tons for flood gates for Fort Peck dam, Montana. On the whole, activity currently is well maintained, somewhat better than sellers anticipated. Export inquiry continues good. Prices on this class of business are lower in some cases.

**Cleveland** — Reinforcing awards are limited to small tonnages from private sources, although considerable work is pending in conjunction with state structural projects. Among private inquiries is a retaining wall for the Pennsylvania railroad at its Sandusky, O., dock, requiring approximately 375 tons. Mills are still able to make prompt deliveries, with the result most fabricators are carrying substantial stocks.

**Chicago** — Despite a decrease in number of awards, bookings are maintained by larger orders. The

latter include 305 tons for the Moody Bible institute building here. General business uncertainty is reflected in the postponement of a few building projects. Shipments and mill backlogs show a decrease compared with those of the past two quarters.

**Boston**—Small-lot buying of reinforcing steel is well sustained, but volume of active tonnage has been materially reduced. The Northampton, Mass., Connecticut river bridge, not yet out for figures, will take close to 800 tons. Bridge and highway needs are smaller. Prices are still soft.

**Philadelphia**—Reinforcing bar buying is expected to spurt as several fair tonnages are pending. Most of state work calls for rail steel with the result that there is little outstanding to test billet bar prices.

## Reinforcing Steel Awards

- 3200 tons, Baby Creek sewer, section No. 3, Detroit, to Carnegie-Illinois Steel Corp., Pittsburgh; through S. A. Healy, contractor.
- 1870 tons, storm trunk sewer, contract 3, project 2, including storm sewer in Seventieth road and Seventy-eighth avenue, second ward, Queens, N. Y., to Truscon Steel Co., Youngstown, O.; Nicholas Di Menna & Sons Inc., New York, general contractors, bids Sept. 20, borough president, Queens.
- 500 tons, brewery warehouse, Beadleston & Woerz, New York, to Truscon Steel Co., Youngstown, O.; placed direct by owner.
- 500 tons, sewer contract 2, project 1, in Third ward, Queen, N. Y., to Joseph T. Ryerson Son Inc., Chicago; through Cleverock Inc., New York.
- 305 tons, building, Moody Bible Institute, Chicago, to Joseph T. Ryerson & Son Inc., Chicago.

- 290 tons, overhead bridge, Southern railroad, Williamstown, Ky., to Pollack Steel Co., Cincinnati, O.
- 280 tons, highway, route 6, section 10, Morris county, New Jersey, to Igoe Bros., Newark, N. J.; through Franklin Contracting Co., Newark.
- 235 tons, additions, Baptist Memorial hospital, Memphis, Tenn., to Jones & Laughlin Steel Corp., Pittsburgh; S. & W. Construction Co., Memphis, general contractor.
- 220 tons, state crossing, Black Canyon, Ida., to unstated interest.
- 175 tons, highway route 25, section D, Edizabath, N. J., to Igoe Bros., Newark.
- 150 tons, cottages, Laurelton state village, Laurelton, Pa., to Bethlehem Steel Corp., Bethlehem, Pa.
- 150 tons, warehouse, Branch River Wool Combing Co., Smithfield, R. I., to Bancroft & Martin Rolling Mills Co., Portland, Me.; Temple & Crane Inc., Boston, general contractor. Shapes to Providence Steel & Iron Co., Providence, R. I.
- 125 tons, girls' dormitory, Northwestern university, Evanston, Ill., to Concrete Steel Co., Chicago.
- 122 tons, crossing, East Forty-sixth avenue, Denver, Colo., to unnamed interest.
- 120 tons, Auto-Hotel, Bloomington, Ill., to Laclede Steel Co., St. Louis.
- 116 tons, courthouse addition, Waukesha, Wis., to Carnegie-Illinois Steel Corp., Pittsburgh; through W. H. Plpkorn Co., Milwaukee.
- 100 tons, addition, Hotel Roanoke, Roanoke, Va., to Knoxville Iron Co., Knoxville, Tenn.
- 100 tons, sewage disposal plant, Marysville, Mich., to Bethlehem Steel Corp., Bethlehem, Pa.
- 100 tons, storage warehouse and other projects, Seattle, to Bethlehem Steel Corp., Seattle.
- 100 tons, bureau of reclamation, invitation 48,089-A. Cody, Wyo., to unnamed interest.
- 100 tons, San Lorenzo river bridge, Santa Cruz county, California; to unnamed interest.
- 100 tons, Illinois state road work, to Ceco Steel Products Corp., Chicago.

## Reinforcing Steel Pending

- 2500 tons, storm trunk sewer, contract 3, project 1, from station 105+09.28 to bulkhead line of Flushing river and including all sewers in Fowler avenue, third ward, Queens, N. Y.; bids Oct. 26, borough president. Contract also includes 55 tons steel sheet piling; bolts, nuts and washers for 638,000 feet, board measure, timber decking, and small quantities of cast, wrought iron and galvanized pipe.
- 1600 tons, bars and mesh, bridge approach and grade crossing, Cypress avenue, Southern boulevard and Major William F. Deegan boulevard, Bronx.

## Concrete Awards Compared

	Tons
Week ended Oct. 16	8,958
Week ended Oct. 9	2,778
Week ended Oct. 2	3,981
This week, 1936	3,002
Weekly average, 1936	6,005
Weekly average, 1937	6,343
Weekly average, September	8,084
Total to date, 1936	291,126
Total to date, 1937	266,403

Includes awards of 100 tons or more.

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N. Y.; Leopold & Co., New York, low, bids Oct. 13, borough president, Bronx, 1400 tons, flood gates, Fort Peck dam, Montana.  
 725 tons, Sutter By-Pass, Sutter county, California; bids Oct. 27.  
 500 tons, laboratory and shop buildings, United States agricultural department, Arlington, Va.; bids Oct. 20.  
 400 tons, administration building, Buffalo Sewage authority, Bird Island, N. Y., bids Oct. 28.  
 375 tons, retaining wall, Pennsylvania railroad, Sandusky, O., dock; bids Oct. 25.  
 350 tons, rail steel bars, hospital, Selins Grove, Pa.  
 280 tons, state house, Oklahoma City, Okla.  
 275 tons, building, Stewart Dairy Goods Co., Louisville, Ky.  
 250 tons, building, Kurth Malting Co., Milwaukee.  
 225 tons, dry creek bridge, Galt, Calif.; bids Oct. 20.  
 200 tons, paving of deck and approaches, viaduct, Eggleston avenue, Cincinnati.  
 200 tons, main building and miscellaneous work, sewer project, Buffalo, N. Y., bids Oct. 28.  
 200 tons, Womans building, Masonic home, St. Louis; Wm. B. Ittner Inc., architect, Koerner Engineering Co., St. Louis, engineers.  
 140 tons, bridge, Dakota City, Nebr.  
 135 tons, state highway projects, Bergen and Morris counties, New Jersey; bids Oct. 18.  
 130 tons, tank, Pabst Brewery Co., Milwaukee.  
 125 tons, highway work, Chaffee county, Colorado; bids opened.  
 125 tons, Bronx-Whitestone bridge, East river, New York, contract WB-5; American Bridge Co., Pittsburgh, Pa., low, bids Oct. 13, Triborough Bridge authority, New York.  
 110 tons, crossing, Thornton, Madison county, Idaho; bids opened.  
 100 tons, Abbott hospital, Minneapolis.  
 Unstated tonnage, six-story addition, Ralston Purina Co. building, St. Louis; Mauran, Russell, Crowell & Mullgart, St. Louis, architects.

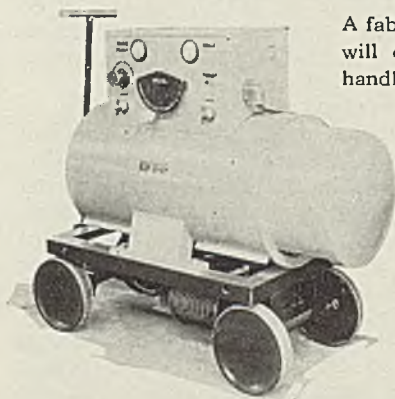
month continue moderately above September, but remain well below former estimates. Most improvement has originated from foundries serving the auto trade. Little forward buying is reported as many consumers have ample stocks and continue to specify on a hand-to-mouth basis. Apparent weakness in the trend of scrap is an important adverse influence, but many sellers feel that this condition will reverse itself soon.

**Boston**—Pig iron buying con-

tinues on a hand-to-mouth basis. The third quarter has been marked by absence of large tonnage purchases by domestic melters. Lower foundry operations have worked against building of stocks of raw material. Export inquiry and some sales for foreign shipment continues, and sellers are competing for this tonnage more keenly with premium prices less of a factor.

**New York**—Little domestic buying of pig iron is noted and over the past week less inquiry has de-

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## Pig Iron

Pig Iron Prices, Page 80

**Pittsburgh** — Little improvement over September has been shown so far this month and demand is well below earlier expectations. Prices are holding well, with few consumers trying for lower quotations and hardly enough business for a sale to break the market. Small-lot buyers are seeking prompt shipments, which producers are able to meet satisfactorily.

**Chicago**—Gains in pig iron shipments so far this month compared with September are being narrowed and expectations for October as a whole are for little if any improvement over September. Foundry operations are spotty. Production of automotive castings is increasing steadily but some farm equipment plants have closed for inventory. Jobbing plants in most instances are restricting operations.

**Cleveland**—Daily shipments this

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veloped from abroad. Some sellers report fairly good specifications against contracts, but the situation is spotty even in this respect. Certainly some foundries in the district are operating at the lowest point this year. As a result of the turn in conditions over recent weeks, most sellers are now looking for business.

**Philadelphia**—Pig iron specifications are fairly well sustained, but new inquiries are light and spotty. Foreign inquiry has declined.

**Buffalo** — Although lagging tendencies continue in pig iron buying, shipments for October are expected to at least equal September. Foundries are slackening operations from the peak levels maintained generally since Jan. 1. Producers report heavy orders for shipment during the last quarter and hope little of current tonnage booked will be carried over into the next quarter. Practically no talk of price changes is heard.

**St. Louis**—Movement of pig iron continues in substantial volume, total for the first half of October comparing favorably with the similar period in August and somewhat ahead that of 1936. However, buying is on a limited scale, the policy of melters being to consume existing inventories, and take only what they need for immediate use. The melt as a whole is steady.

**Toronto, Ont.**—Holiday on Monday gave a minor setback in the pig iron markets for the week, but sales again are picking up. Interest is almost entirely from melters

who purchase for spot needs. No forward delivery contracts were placed last week. Deliveries are going forward on schedule against contracts, while movement on spot account totals better than 2000 tons weekly.

## Scrap

Scrap Prices, Page 82

**Pittsburgh**—Scrap is considerably weaker and there is no market for material. In addition to declines in many grades, all indications point to further weakness. If purchases are made, it is likely that they will be at lower levels than now quoted. No. 1 heavy melting steel is \$17 to \$17.50, but this is absolutely nominal. Mills are in no hurry to buy even though prices are the lowest of the year.

**Cleveland** — Scrap buying is somewhat more liberal and contract shipments are moving better. Embargoes in the Youngstown district are being modified somewhat. Buying has brought lower quotations and declines of 50 cents to \$1 or more have been made from nominal quotations.

**Chicago**—Heavy melting steel is off 50 cents a ton to the lowest level since August, 1936, on a sale of 10,000 tons at \$15. Most other grades have weakened correspondingly. Shipments are light as a consequence of quiet demand for a number of weeks, but offerings are

only moderate. Dealers' stocks are low and distress offerings are small, despite quiet in new business.

**Boston**—Still dull, scrap prices continue to sag, notably machine shop turnings and stove plate. Dealers are offering as low as \$6.25, cars, for turnings and \$10 for stove plate. Domestic buying is stagnant and lacking a test, quotations on numerous grades are nominal. Buying for export also drags, with fewer boats available for loading. Two cargoes for Japan just clearing, however, include close to 15,000 tons.

**New York**—Absence of domestic buying and lack of available ships for export loading have further depressed prices, most grades being lower. Shippers are reluctant to load barges heavier and await arrival of cargo space, due to increased costs. Heavy melting steel for domestic shipment is nominal, due to the few transactions on which to base a price.

**Philadelphia** — Prices continue easy on practically the entire scrap list. Most revisions are nominal, as demand is negligible. Scattered orders include a moderate tonnage for Coatesville, Pa., at \$16 to \$16.50, delivered. With at least a temporary settlement in the labor dispute all Philadelphia yards now are operating.

**Buffalo**—Announcement that the leading consumer would partially lift the embargo on scrap shipments today failed to halt the downward drift in the nominal price range.

**Detroit**—Declines of about 50 cents per ton have been registered in several grades of scrap but resistance to the downward trend is developing and the market is likely to level off. Heavier automobile production is expected to produce increased supplies which will be something of a burden while consumers continue to be unwilling to buy.

**Cincinnati** — Dealers in iron and steel scrap cut 50 cents off heavy melting steel, bringing quotations to \$13 to \$13.50, with other heavy grades also lower. Sheet clippings and borings have resisted the latest cut. A fair volume of scrap is moving to district consumers. Nearby outlets are curtailed and no forward commitments made.

**St. Louis**—Lack of interest on the part of melters and a disposition to await developments among dealers are responsible for a further sharp decrease in prices of iron and steel scrap.

**Toronto, Ont.** — Iron and steel scrap is moving steadily but without special feature. Consumers find less difficulty in obtaining supplies of cast scrap and stove plate, although dealers' stocks continue low.



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# Warehouse

Warehouse Prices, Page 81

**Pittsburgh**—Demand for the most part is routine upon warehouses, the fall seasonal movement being less than expected. A number of industrial and other firms temporarily have sidetracked minor improvement programs, in view of current uncertainties, and requirements of the building industry are light. To date, the month appears about even with the comparative period of September.

**Cleveland**—Warehouse distributors report a slight increase in aggregate tonnage shipped so far this month, although little improvement in the number of orders booked.

**Chicago**—Sales show no improvement, holding around the September rate. Buyers are cautious about covering beyond early needs. Better deliveries by mills make for a diversion to producers of some business received by warehouses earlier in the year when mill shipments were deferred.

**Boston**—While industrial demand for sheets out of warehouse has improved slightly, aggregate buying continues dull. Alloy and special steel, moving in small lots, are relatively more active than most standard lines, including plates, shapes and bars. Prices are fairly steady with no changes since diamond floor plates advanced to 6.03c. There is some scattered shading, but usually by jobbers who consistently seek volume with concessions.

**New York**—Slightly improved demand for steel out of warehouse thus far this month is well spread, cold finished moving in relatively better volume than most standard lines. Tonnage is running just ahead of the rate last month. Prices are generally firm, although galvanized sheets frequently move \$5 a ton under listed quotations.

**Buffalo**—Warehouse sales are only fair. Specialty and alloy steel items are in best demand with heavy products lagging. Demand generally reflects current tapering in other industrial lines. Most orders placed are of hand-to-mouth character. Prices are steady.

**Cincinnati**—Warehouse sales fail to disclose any autumn pickup although an occasional increase in volume may raise the tonnage moderately over September. Buyers are restricting orders to immediate needs.

## Cold Finished

Cold Finished Prices, Page 79

**Pittsburgh**—Specifications from the automotive industry recently

have been mostly of moderate size with quick shipment desired. Other consuming sources are hesitant to cover more than immediate needs, although in a few cases, these needs amount to a fair volume. While producers several times this fall have been disappointed when business failed to improve as expected, it is still confidently believed that a better volume will be forthcoming soon.

# Steel in Europe

Foreign Steel Prices, Page 81

**London**—(By Cable)—September was a banner month in British steel production, an alltime record being set at 1,163,000 gross tons of steel ingots. This compares with 1,109,500 tons in March this year, the previous high. September output was 175,300 tons greater than the August total of 987,700 tons. Pig iron output in September totaled 726,000 gross tons, a gain of 13,400 tons over the August total. Active furnaces at the end of the month numbered 132, compared with 130 at the end of August.

Pig iron supplies have been helped by substantial imports from Canada. The semifinished situation is also easier and British mills are producing at capacity with Continental importations larger and more regular. Export demand is falling off.

The Continent reports export inquiry is dull and markets for pig iron, black sheets and galvanized sheets weak.

# Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 79

Bolt, nut and rivet specifications continue slow, being affected adversely by light requirements of railroad shops and freight car builders. Miscellaneous demand also has shown little response to seasonal influences. Automotive parts manufacturers are taking larger lots and the farm equipment industry is holding consumption at a high rate for this period. Rivet consumption by structural fabricators reflects reduced activity in that industry.

# Tin Plate

Tin Plate Prices, Page 78

**Pittsburgh**—Tin plate producers are working against export and other current business, having cleaned up well on low-priced business to can manufacturers. District operations show a variance, ranging downward from one producer's rate of 94 per cent, based on 16 turns. Hot mills of another producer were shut down for delayed vacations with pay. Demand for shipment before Dec. 31 is light, although this had generally been expected. Packing is still under way in some sections.

**New York**—Tin plate specifications for domestic account continue to taper, depressing seasonal influences being aided by sporadic labor troubles at various canmaking plants. This causes stocks on hand at consuming plants to loom larger than recently. Some trade leaders



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predict now that 90 to 95 per cent of all the tin plate consumed this year will be at the \$4.85 price which went out Oct. 1; in other words, excess stocks laid in on contracts before the increase will go further than originally expected. Export inquiry continues brisk, with prices on a parity with the domestic market.

## Semifinished

Semifinished Prices, Page 79

Blooms, billets, slabs and sheet bars have been reaffirmed for first quarter of 1938, subject to any change in freight rate at time of shipment. Billets and blooms, sheet bars and slabs are \$37, Pittsburgh, per gross ton. Demand for semifinished has shown little change recently, remaining quiet in comparison to the specifications coming in a few months ago. Export inquiry is active, but actual new bookings of this class of business are light. Tin plate producers having cleaned up well on their low-priced tonnage, requirements from this division are much easier. Wire rods continue in fair demand.

## Metallurgical Coke

Coke Prices, Page 79

Demand is more active seasonally for heating coke. Otherwise, conditions remain without extensive change either way.

Interest centered last week upon the action of the coal commission

in Washington in denying the application of Wheeling Steel Corp. to exempt from the soft coal code and its tax provisions two coal mines owned by its subsidiaries, Consumers Coal Co. and Emperor Coal Co. The commission granted another petition by Wheeling for exemption from the code of its wholly-owned mine at Beach Bottom, W. Va.

Republic Steel Corp. has resumed operations at its Taylor mine near Brownsville, Pa.

## Ferroalloys

Ferroalloy Prices, Page 80

New York—Decline in ferromanganese shipments, resulting from the drop in steel output, is still being cushioned by the fact that some consumers who laid in excess stocks in June, which have been carrying them along, now have to make replacements. One seller reports that actual shipments over the past week have been larger than in the week before, due to this replacement buying. However, most sellers look for a drop for this month as a whole. Prices continue at \$102.50, duty paid, Atlantic and Gulf ports.

## Iron Ore

Iron Ore Prices, Page 82

Cleveland—The balance of iron ore on dock at Lake Erie ports Oct. 1, was approximately 700,000 tons more than on the comparable day

a year ago, according to Lake Superior Iron Ore association.

Receipts of iron ore at lower lake ports this season to Oct. 1. shipments to interior furnaces and dock balances follow:

Port	Receipts		Shipments	Dock bal.
	Season	Season		
Buffalo ...	4,723,048	576,073	3,028	Oct. 1, '37
Erie .....	2,313,179	2,144,190	225,180	
Conneaut...	8,468,414	8,057,814	1,683,974	
Ashtabula..	5,939,322	4,889,136	1,801,464	
Fairport ..	1,751,994	1,713,158	444,409	
Cleveland..	8,515,251	6,354,225	607,884	
Lorain ...	3,290,351	1,390,924	95,949	
Huron ....	867,123	854,249	217,175	
Toledo ....	1,718,033	995,477	47,937	

Total ...	37,586,715	26,975,246	5,127,000
Year ago ..	22,909,898	17,948,763	4,422,187

Receipts at other than Lake Erie ports for September and the season to Oct. 1 follow:

Port	Month		Season
	Month	Season	
Detroit .....	255,667	1,055,144	
Indiana Harbor...	461,009	2,141,236	
Gary .....	819,399	5,071,230	
So. Chi. (loc. fecs.)	1,144,112	6,191,741	
Sault Ste. Marie, Ont.	51,241	404,440	
Hamilton, Ont.....	102,277	530,131	

Total .....	2,833,705	15,393,922
Year ago.....	1,903,790	9,405,260

New York—An easier tone prevails in foreign iron ore and manganese ore, the latter now appearing available for shipment next year at around 50 cents, without duty. Recently as high as 56 cents was quoted in some quarters on manganese ore, although no business was reported.

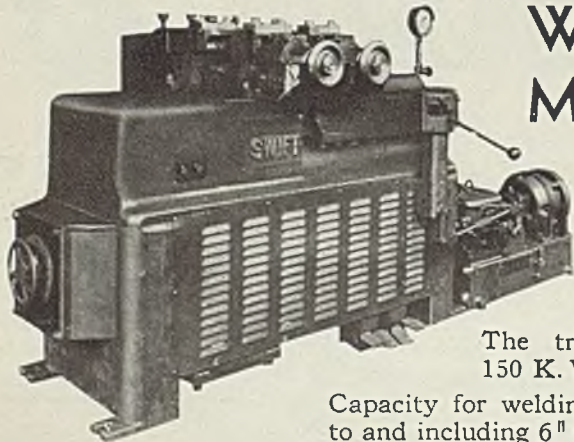
While there is still strong demand abroad and continued shortage of boats, foreign iron ore prices show a softening tendency, due, it is said, to requests of some buyers for suspension of shipments under contracts. There has not been a great deal of this, just enough apparently, to relieve some of the recent price tension.

Manganiferous ore, 45 to 55 per cent iron and 6 to 10 per cent manganese, appears quotable at around 13c to 14c per unit f.a.s. Atlantic ports, compared with a nominal asking price recently of 17 cents, a change reflected in STEEL's table last week.

North African low phosphorus ore now appears nominal at around 18c to 20c, and Spanish North African basic, 50 to 60 per cent, at 15c. There are no actual transactions at these figures, as far as can be learned, however.

While indications point to 50c on manganese ore for next year, there has been little if any contracting. trade leaders assert. Most large consumers have large stocks on hand and, particularly in view of the turn the steel markets have taken here in recent weeks, are apparently in no hurry to contract. Some consumers are reported to have enough on hand to run them well into next

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year, if not throughout the entire year, if necessary. This heavy stock is attributable, it is said, in part to excess buying earlier in the year in expectation of a possible tie-up in Mediterranean shipping.

Of course, notwithstanding these large stocks, some contracting for next year is regarded as likely to develop soon, for large consumers make it a usual practice to keep at least reasonably well ahead on their supplies.

While foreign prices on tungsten ore, as indicated in London, continue at the equivalent of around \$35 to \$36, duty paid, per short ton unit, the views of American consumers appear to be \$5 or so a ton under and there are indications, it is said, that some domestic scheelite may be had at about these lower levels. Most domestic consumers, however, are covered for the next month or so, with a result there is little actual buying here in any quarter.

## Coke By-Products

Coke By-Product Prices, Page 79

**New York**—Demand for distillates, notably toluol and xylol, has slackened in some directions. Lacquer makers have been slow to buy for automobile finishing material. Buying in other industries holds and there are no accumulations, production having dropped slightly. Some distributors are unable to fill export inquiries for benzol, due to lack of supplies. For industrial uses, naphthalene is fairly active, but for household use buying is seasonally light. The synthetic resin industry is absorbing good shipments of phenol. Sulphate of ammonia spot demand is small, most releases being against contracts in equal monthly amounts. The spot price advances 50 cents a ton Nov. 1.

## Nonferrous Metals

Nonferrous Metal Prices, Page 80

**New York**—Tin, lead and zinc prices declined here last week due to light consumer demand and sharply lower prices in London.

**Lead**—Prices declined \$5 per ton on Friday to 5.75c, New York, and 5.60c, East St. Louis. St. Joseph Lead continued to ask \$1 premium on certain brands in the East. The price reduction failed to stimulate consumer buying interest.

**Copper**—Demand for electrolytic was insufficient to absorb the limited tonnage available from customer smelters at 12.00c, Connecticut. Primary mine producers continued to quote 13.00c. Copper statistics were favorable since foreign stocks

declined on heavier consumption although world refined stocks showed an increase of 13,427 tons.

**Zinc**—Prime western zinc declined \$5 per ton Friday to 6.00c, East St. Louis, and 6.35c, New York. Tonnage available at the new level was far more than adequate to meet the slack demand but the entire market did not quote the lower levels.

**Tin**—Prices broke sharply to the lowest levels recorded since February with Straits spot at 50.87½c.

**Antimony**—American spot held at 16.50c, New York, but Chinese spot eased to 18.25c, duty paid New York.

## Equipment

**Pittsburgh** — Considering recent easier tone of general business, equipment buying is well maintained. Some minor plans have been sidetracked, but in general cancellations have not been large. The new \$2,500,000 Chevrolet motor and axle plant at Buffalo is expected to be ready for operation by Jan. 1. It will have a capacity of 1200 motors and 1200 axles daily.

**New York**—Decline in machinery orders is partially offset by heavy buying for export, notably by Russia through the Amtorg Trading Co. Purchases totaling several thousand dollars follow large orders placed in recent weeks. Part of this equipment is for an airplane building plant. Domestic demand has slackened moderately with a substantial volume already figured.

Some of this business is being held up by a more cautious policy of industrial plant purchasing executives. Deliveries are beginning to improve on lighter equipment, including lathes, drills and milling machines, a few sellers promising shipment in a month or six weeks on some tools. Backlogs continue large, but in some instances are growing smaller.

**Boston** — Builders of grinding equipment continue to book good domestic orders and some are taking more business than three weeks ago. Several shops are operating three shifts and have scheduled highest production rates of the year for December. This applies primarily to grinding machinery builders, however, orders for other lines having declined. District shops in some cases are banked high with export orders for Russia, Japan and other countries with deliveries extending into May. Deliveries on some lines to domestic buyers are beginning to improve. Textile mill operations are slowing steadily with some influence on shops and foundries producing textile mill equipment. More molders are available.

**Chicago**—Machine tool sales are holding gains recorded in September and inquiries point to active business during the next month or two. A bright outlook for the coming year was indicated at the recent meeting of machine tool dealers at French Lick, Ind., and the current letdown in general business activity is not regarded as a serious barrier to maintenance of satisfactory demand for machinery and plant

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- your business at a price—and turn out bad work to make his margin).
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equipment. While railroads still are rather inactive in machine tool buying, several small inquiries are pend-

ing and others are in prospect for 1938 needs. Small tool demand is well maintained.

in the aluminum piston field, according to F. C. Crawford, president.

**CLEVELAND** — Metal Coating Products Co. has been organized and incorporated with 1250 shares of no par value common stock by R. E. Remley, Janet Melziva and Julia Andrassy. Frank W. Warady, Standard building, represents the firm.

**CLEVELAND** — Cleveland Tungsten Mfg. Co., 94 St. Catherine avenue, manufacturer of tungsten rods, wire contact points and ribbon heating elements for electric furnaces, has purchased a tract on Meech avenue at East 102nd street, and plans have been drawn for construction of a one-story building containing 15,000 square feet of floor space, costing \$35,000. Work to be started soon.

**DAYTON, O.**—Terminal Cold Storage & Ice Co., 38 Eaker street, has awarded contract to B. G. Davis Co., 1530 East First street, for erection of two-story addition to cold storage and refrigerating plant. Cost to exceed \$45,000.

**WILLOUGHBY, O.**—Ohio Rubber Co. plans installation of motors and controls, conveyors and other equipment in new three-story addition to its plant. Cost close to \$100,000.

### Illinois

**CHICAGO**—E. I. duPont de Nemours & Co., 2120 Elston avenue, has awarded contract to C. O. Henriksen Co. for one-story boiler house addition at local chemical plant, to cost over \$45,000.

**CHICAGO**—Swift & Co., Union Stock yards, plans erection of one-story power house at St. Boniface, near Winnipeg. Man., for its subsidiary Swift Canadian Packing Co., Winnipeg.

**CHICAGO**—Glidden Co., 5165 West Moffat street, plans installation of motors and controls, regulators, conveyors and other equipment in new three-story addition to paint and varnish plant. Cost over \$200,000.

**SPRINGFIELD, ILL.**—State prison department, State Capitol building, Springfield, has authorized extensions in power house at Illinois state penitentiary, Joliet, Ill.

### New York

**NEW YORK**—National Lead Co., 111 Broadway, plans erection of power house at lead smelting and reclaiming plant near Dallas, Tex. Cost over \$500,000.

### Pennsylvania

**EAST LATROBE, PA.**—Anchor Drawn Steel Co. will erect an addition to its plant costing \$50,000.

**HAMBURG, PA.**—Pennsylvania Electric Steel Casting Co. plans repairing and altering plant. Cost to exceed \$50,000.

**HARRISBURG, PA.** — Pennsylvania general state authority, State Capitol building, plans improvements in power house at State Village, Laurelton, Union county; also will make additions and betterments in steam-electric distributing system. Fund of \$1,225,000 arranged through federal aid.

**OIL CITY, PA.**—Frampton Oil Co. plans purchasing and installing power plant equipment, including gas engines, compressors, eccentric units and other machinery to replace equipment recently destroyed by fire.

### Connecticut

**HARTFORD, CONN.**—G. F. Hueblein & Bro., 285-305 Broad street, are having

(Please turn to Page 100)

# Construction and Enterprise

## Michigan

**ANN ARBOR, MICH.** — American Broach & Machine Co. will build a small addition to its plant on West Huron street. Rudy-Fing Co., Detroit, has the contract.

**BAY CITY, MICH.**—City plans new municipal light plant with coal loading and mechanical handling facilities from water front to station site, and complete electrification of municipal water-works. Cost \$790,000. Financing being arranged through federal aid.

**DETROIT**—Cadillac-LaSalle division of General Motors Corp. is spending over \$6,500,000 for retooling and machinery in preparation for 1938 model production.

**DETROIT**—Detroit Abrasives Co. has been formed with \$50,000 capital to manufacture abrasives, by Earl A. Rice, 9050 Alpine avenue.

**DETROIT**—Service Die & Engineering Co., 5101 Campbell avenue, has been incorporated with \$50,000 to manufacture dies and tools, by Clarence J. Berini, Detroit.

**DETROIT**—Carboloy Co. Inc., East Jefferson avenue, a subsidiary of General Electric Co., is considering erection of a plant, involving an expenditure of \$750,000, in Macomb county.

**DETROIT**—Universal Gear Works Inc., 1301 East McNichols road, has been incorporated with \$100,000 to deal in tools, dies, etc., by Frank J. Brown, Highland Park.

**DETROIT**—Diveco Twin Truck Co., East Jefferson avenue, has purchased 12

acres for future expansion. James A. Spencer, secretary, stated the company had no immediate plans for erection of a building on the property.

**DETROIT**—Giffels & Vallet Inc., L. Rossetti, associated engineers and architects, are taking figures on structural steel for erection of a foundry in Muskegon, Mich., for the Sealed Power Corp.

**FLINT, MICH.**—City plans erection of municipal steam-electric station. Estimated cost \$18,650,000.

**HOWELL, MICH.** — Howell Electric Motors Co. plans plant improvements. Total expenditure \$40,000. Owners will finance by stock issue.

**LANSING, MICH.**—State department of buildings, Capitol building, plans steam-electric plant at Newberry, costing \$250,000. Derrick Hubert, 1065 Sheridan road, Menominee, Mich., is architect. E. R. Little, Ford building, Detroit, is engineer.

**MOUNT PLEASANT, MICH.**—Plans are being drawn for municipal electric plant and distributing system, costing \$538,000.

**TRAVERSE CITY, MICH.**—Plans are under way for improvements in municipal light plant, costing \$125,000.

## Ohio

**CLEVELAND**—Great Lakes Welding & Boiler Co., 1724 Rockwell avenue, is erecting a one-story factory building estimated to cost \$20,000.

**CLEVELAND** — Thompson Products Inc., 2196 Clarkwood road, is planning a substantial expansion of its activities

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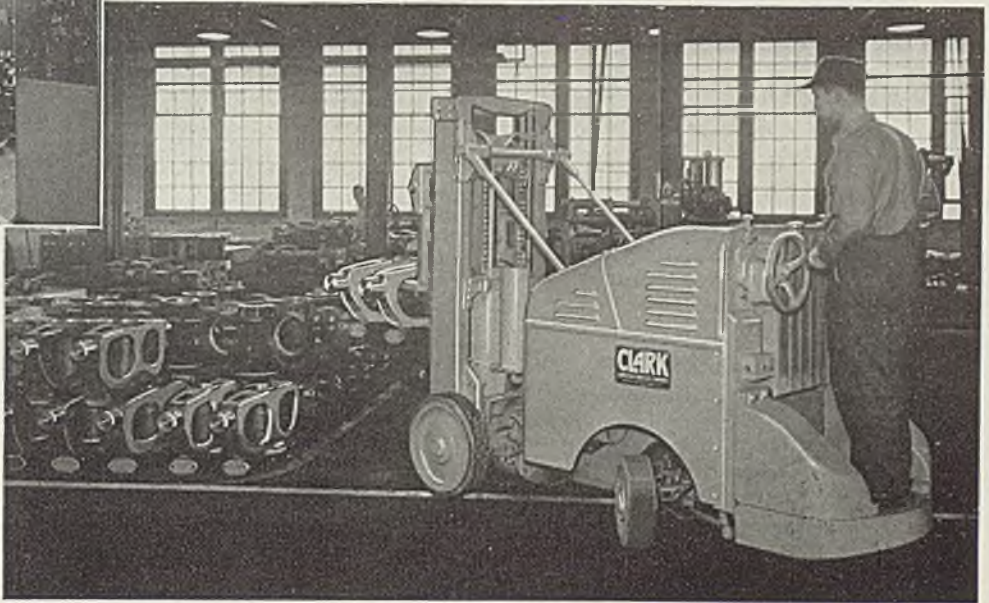
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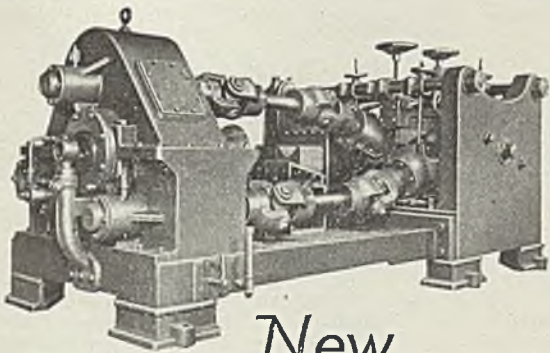
This Clark Finger Lift Truck has self-starter, hydraulic brakes, rear wheel steer, front wheel drive, with giant wide tires under the load. Two speed ranges—1 to 3 and 1 to 6 m. p. h., turns in intersecting 85 in. aisles. Like all other Clark machines, it's direct gas powered—therefore capable of 24 hr. continuous service and just as potent the last hour as the first.

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(Continued from Page 98)

plans prepared by C. J. Malmfeldt, architect, 15 Lewis street, Hartford, for constructing addition to plant for distillery, storage and bottling plant. Estimated cost exceeds \$40,000.

NEW HAVEN, CONN.—Gesner Equipment Corp., 1881 Dixwell avenue, plans erection of one-story, 40 x 40-foot shop and office. Cost \$40,000.

**Maine**

PORTLAND, ME.—Portland Fish Co., Custom House wharf, will install cold storage and refrigerating equipment in new building on water front. Cost over \$70,000.



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GARAGE IN CONNECTION

**Rhode Island**

HILLSGROVE, R. I.—Several additions to the plant of King Union Co. Inc., here, are under construction. They include a storage building, an addition to the machine shop and a two-story addition to the foundry building.

**Massachusetts**

BOSTON—Shawinigan Resins Corp., 50 State street, plans boiler house at new chemical plant at Indian Orchard, costing close to \$100,000. McClintock & Craig, 458 Bridge street, Springfield, Mass., consulting engineers.

NORWOOD, MASS.—Surveys and estimates of cost are being made for constructing municipal electric plant.

REVERE, MASS.—Mauro Construction Co. Inc., Providence, R. I., has been awarded contract by Sun Oil Co., Philadelphia, for erection of new bulk oil storage and distributing plant here. Steel tanks, pumping machinery and other equipment will be installed. Estimated cost \$75,000.

**Alabama**

BIRMINGHAM, ALA.—Virginia-Carolina Chemical Corp., Richmond, Va., plans installation of electric power equipment in new sulphuric acid plant on site adjoining fertilizer works. M. S. Purvis, vice president in charge. (Noted Sept. 20).

LAFAYETTE, ALA. — Town plans waterworks extension including pumping station, filter plant and distribution system. Estimated cost about \$56,000. PWA has allocated \$25,364.

MOBILE, ALA. — Hollingsworth & Whitney Co., 140 Federal street, Boston, has acquired 100 acres of land here for establishment of \$5,000,000 pulp and paper plant.

**Maryland**

BALTIMORE—Frankfort Distilleries Inc., Dundalk, Md., plans new steam power system and service at distillery. Cost close to \$30,000, including boilers and auxiliary equipment.

MT. WINANS, MD.—C. O. Wertzberger & Sons will alter and make repairs to its machine shop. Cost \$40,000 with equipment.

OAKLAND, MD.—City plans extensions and improvements in electrical distribution system, including new power substation in Terra Alta district. Cost \$50,000.

**District of Columbia**

WASHINGTON—Bureau of supplies and accounts, navy department, will take bids until Oct. 22, schedule 1865, leg and bench type engine lathes, delivered Newport, R. I.; schedule 1866, two motor-driven ram type turret lathes, delivered Norfolk, Va.; schedule 1872, one motor-driven combination lathe milling and drilling machine, delivered Norfolk, Va.; schedule 1859, steel angles, delivered Norfolk, Va.; schedule 1822, two gasoline driven industrial tractors; schedule 1858, steel plates, delivered Norfolk, Va.; bids until Oct. 26, schedule 1867, 240,000 aluminum alloy forgings, delivered Newport, R. I.

**Kentucky**

IRVINE, KY.—City will vote Nov. 2 on \$275,000 bonds for construction of electric light and power plant.

WILLIAMSTOWN, KY.—Common coun-

cil has plans maturing for new municipal electric power plant and electrical distributing system, costing \$90,000. Financing arranged through federal aid. (Noted Oct. 4).

**Florida**

MACLENNY, FLA.—Common council has plans under way for new municipal ice manufacturing and cold storage plant estimated to cost \$32,700 with equipment.

MIAMI, FLA.—Schaaf Preserving Co. will install electric power equipment in new one-story food processing and canning plant. Total expenditure about \$60,000.

**Georgia**

DAWSON, GA.—D. B. Brazeal, Fourth avenue and Pecan street, will erect a machine shop for construction of automobile trailers and skidders.

**Louisiana**

NEW ORLEANS—Harry Bros. Co., 3505 South Carrollton avenue, will install electric power equipment in the new addition it is erecting to sheet metal products plant. (Noted Oct. 4).

THIBODAUX, LA.—Waverly Cane Sugar Mills, A. F. Delbert, general manager, Canal Bank building, New Orleans, will make improvements to its plant, including new boilers and power equipment. Estimated cost \$75,000.

**Tennessee**

ERWIN, TENN.—Cinchfield Railroad Co. has purchased 1100 cars and will modernize trucks on about 120 cars of the 1100 cars it recently purchased, and will install equipment for welding and repairing locomotives. Estimated cost \$58,000.

**West Virginia**

CHESTER, W. VA.—Taylor, Smith & Taylor Co. will soon let contract for erection of an addition to its pottery plant, including a kiln unit, and installations of conveyors and other mechanical handling equipment. Estimated cost \$100,000.

**Virginia**

NORFOLK, VA.—Chesapeake Box & Lumber Co., Board of Trade building, will increase its production by utilizing 80,000 square feet of space in plant at foot of Chautauqua avenue, Port Norfolk, Va., for box shook and crating factory, and a metal building will also be erected on site containing 48,000 square feet.

**Missouri**

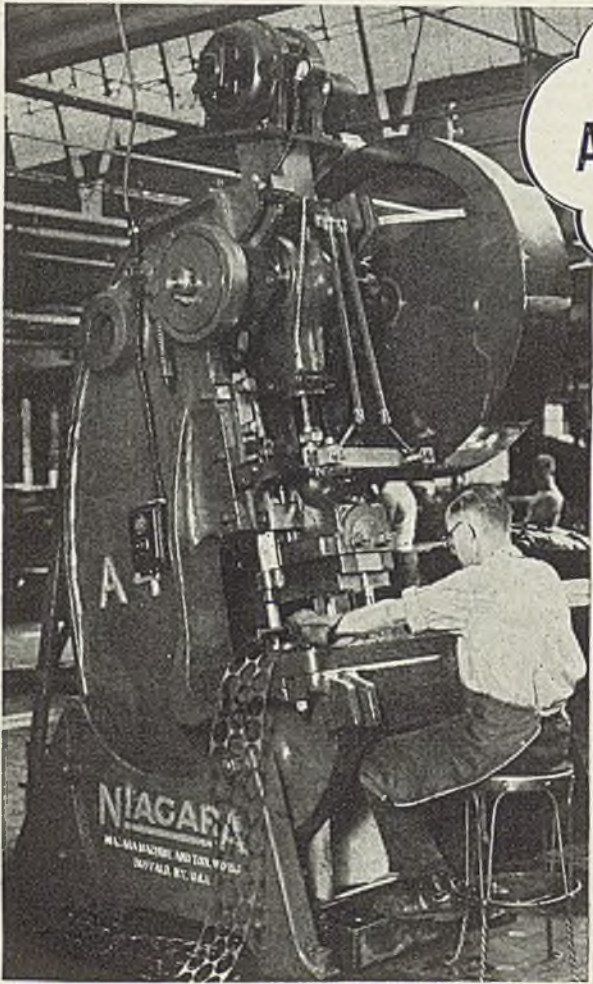
KANSAS CITY, MO.—Marley Co., Leon T. Mart, 1915 Walnut street, has acquired tract of land on Fairfax road for erection of building for manufacture of water cooling equipment. Drawings are being prepared by Keene & Simpson, architects, Land Bank building.

ROCKPORT, MO.—City has secured federal grant of \$47,000 for municipal electric plant and \$18,000 for ice and refrigerating plant. Engineering Service Co., Railway Exchange building, Kansas City, Mo., is consulting engineer. (Noted July 26.)

**Wisconsin**

MILWAUKEE — Milwaukee Western  
(Please turn to Page 102)





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(Concluded from Page 100)

Malting Co., which is building a \$350,000 malting house addition, has placed general contract for equipment with Galland-Henning Mfg. Co., 2751 South Thirty-first street, Milwaukee.

MILWAUKEE—J. E. Robertson Co., 1409 East Underwood avenue, Wauwatosa, Wis., is successful bidder at \$77,540 for furnishing chemical equipment for new \$5,000,000 municipal water purification plant. Joseph P. Schwada is city engineer.

MILWAUKEE—Globe-Union Inc., 900 East Keefe avenue, maker of storage batteries, spark plugs, roller skates, etc.,

has moved into a new plant in Seattle, increasing its battery output to 500 per day. The Seattle plant, established about four years ago, has since been supplemented by another Pacific coast factory at Los Angeles.

WHITEWATER, WIS.—Auto Products Co., Cedarburg, Wis., maker of hub caps and other replacement parts for the automobile trade, is about to transfer its factory to Whitewater where it will occupy the plant being vacated by the Whitnall Conveyor Co., which has acquired a larger building and is remodeling it for its use.

**Minnesota**

WORTHINGTON, MINN.—City is preparing plans for modernization of coal handling and storage system at municipal power plant. Work to be carried out early in 1938.

**Texas**

CORPUS CHRISTI, TEX.—Columbian Carbon Co., 45 East Forty-second street, New York, will build a \$400,000 carbon black plant here with capacity of 35,000 pounds daily. Construction to begin this month.

GROESBECK, TEX.—City plans \$70,000 waterworks improvements, including 150,000-gallon elevated tank, 600,000-gallon per day filtration plant. Hawley, Freese & Nichols, engineers, Capps building, Fort Worth, Tex.

McALLEN, TEX.—Harry M. Bigger, McAllen, has been awarded contract by St. Clair Foods Co., R. W. Higginbotham Jr., 5002 Swiss street, Dallas, Tex., for erection of canning plant.

MERCEDES, TEX. — Missouri-Pacific Railroad Co., C. S. Kirkpatrick, chief engineer, 2405 Yupon drive, Houston, Tex., will erect a one and two-story packing plant. G. E. Watson Packing Co., Mercedes, is the lessee.

PALESTINE, TEX.—City, J. H. Handorf, mayor, receives bids Oct. 25 for improvements to water treating plant, including pump house and mechanical and electrical equipment, piping, mechanical aerator, fittings, etc. Cost \$19,000. H. L. Thackwell, engineer, Longview, Tex.

SOMERSET, TEX.—Crane Porcelain & Pottery Mfg. Co., care of Murray Rice, architect, 516 West Laurel street, San Antonio, Tex., has plans nearing completion for erection of factory, 100 x 150 feet, including drying rooms, kilns and shipping facilities.

**Kansas**

ALMA, KANS.—City plans municipal electric plant, cost of which is estimated at \$50,000. Paulette & Wilson, National Reserve building, Topeka, Kans., are consulting engineers.

**Nebraska**

BLAIR, NEBR.—Black & Veatch, 4706 Broadway, Kansas City, Mo., consulting engineers, will submit a report soon to city on construction of addition and alterations to municipal power and light plant. Henry Christensen is city clerk.

**Colorado**

ENGLEWOOD, COLO.—Town is considering municipal electric plant.

**Pacific Coast**

EL SEGUNDO, CALIF.—Interstate Aircraft Corp. has built a \$350,000 plant to make aircraft precision parts. Harry Reynolds is president.

GLENDALE, CALIF. — Don Baxter Inc., 1505 Gardena street, is having plans prepared by E. P. Eiden, 106 East Wilson street, Glendale, architect, for constructing a laboratory building, warehouse and boiler room. Estimated cost \$40,000.

SEATTLE—Navy department will call bids Nov. 17 for constructing an electric generating plant, including gasoline engine, switchboard, gas and water tanks, on Alea reservation, Oahu, T. H.

TACOMA, WASH.—Hooker Electro-Chemical Co. is building a \$100,000 hydrogenation plant, equipment including hydrogen compressors, converters, refining and storage facilities for raw and finished oils. Company engineers are in charge. Alan Porter Lee Inc., New York, is consulting and contracting engineer.

TOPPENISH, WASH.—J. A. Bennett, clerk, will take bids Oct. 21 for construction of proposed 200,000-gallon water storage tank. G. D. Hall, Yakima, Wash., is engineer.

VANCOUVER, WASH.—City council will call bids soon for proposed 250,000-gallon steel water storage tank, a second unit to be added later.

PORTLAND, OREG.—Portland Chain Co. will ask bids soon for proposed \$25,000 factory building, 100 x 150 feet. J. W. DeYoung is architect.

TULE LAKE, OREG.—William Wales, Klamath Falls, Oreg., is preparing plans for proposed \$30,000 municipal water system and sewage disposal plant.



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**Ohio Crankshaft Doubles Plant Capacity**



NEW \$700,000 factory of the Ohio Crankshaft Co., Cleveland, will double the company's present capacity for machining and Tocco-hardening of crankshafts and other automotive parts. The building, at East Forty-second street and Harvard avenue, will provide 75,000 square feet of floor space and employment for an additional 300 workmen



*Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.*

## Suggestions Helpful

*To the Editor:*

We wish to compliment you on the comprehensive article "Codifying Relations Between Buyer and Seller of Stampings" which appeared in STEEL, Oct. 11.

This article came at an opportune time for us since we are having a controversy with one of our die suppliers. A number of the suggestions made by Mr. Worth were helpful to us in presenting our case.

A. W. COLLINS.

*Purchasing Agent,  
Ice Cooling Appliance Corp.  
Morrison, Ill.*

## Neutrality vs Courage

*To the Editor:*

Referring to "neutrality" regarding which so many editorials are now being written, are there not extremely important considerations which should receive more attention than is being given them by the editors of almost all of the American papers, trade papers and other publications?

"Neutrality", or its benevolent equivalent, "do-nothing", has been preached and practiced in all of the following matters:

1. Aggressions of Japan in China.
2. Blockades of several thousand miles of Chinese coast line and interference with the life and rightful activity of the peoples of other nations.
3. Mussolini in Ethiopia.
4. Hitler and Mussolini in Spain.
5. Hitler in the violation of

all pacts made since Armistice Day, 1918.

6. Submarine attacks amounting to piracy.

7. Abandonment of America's historic policy of protecting its own nationals and their rights to engage in commerce and shipping.

8. Sit-down strikes and unlawful occupation of other people's property.

9. Unemployment and unemployables.

10. Mass and individual murders by racketeers and thugs.

11. Cowardice or ignorance on the part of law-abiding weak sisters everywhere.

Does not each of the above lead to murder, war, revolution, destruction of civilization?

Do they not lead inevitably to loss of liberty in America?

Does not every one of them represent a scourge worse than cholera, yellow fever, or leprosy, which a truly American government would help stamp out or prevent anywhere in the world?

Do they not demand that the voice of America be raised in emphatic and forceful protest?

Can we afford to let any such conditions get worse?

Must we not find answers with or without the aid of the rest of the world?

How can the mothers and fathers of this country be passive to the do-nothing shilly-shally, or neutrality of diplomats and executives in this and other countries not already under the rule of murderous dictators?

Where has a voice been raised

effectively to prevent the continuing murders?

Where can it be expected to be heard?

What religious leaders have risen up to prevent the universal murder which these gangsters and maniacs are precipitating?

Is there such a voice or leader in America?

Where does neutrality (benevolent or otherwise) lead us?

Is not every one of the above a situation which could have been prevented by a George Washington?

Would not a George Washington command the co-operation of every other government of peaceful nations, liberty-loving peoples, and everyone but murderers the world over?

The above is submitted to you in an earnest hope that supplanting "neutrality" with courage will bring to light a new Washington or Lincoln.

OHIO MANUFACTURER

## Worker Comfort vs. Costs

*To the Editor:*

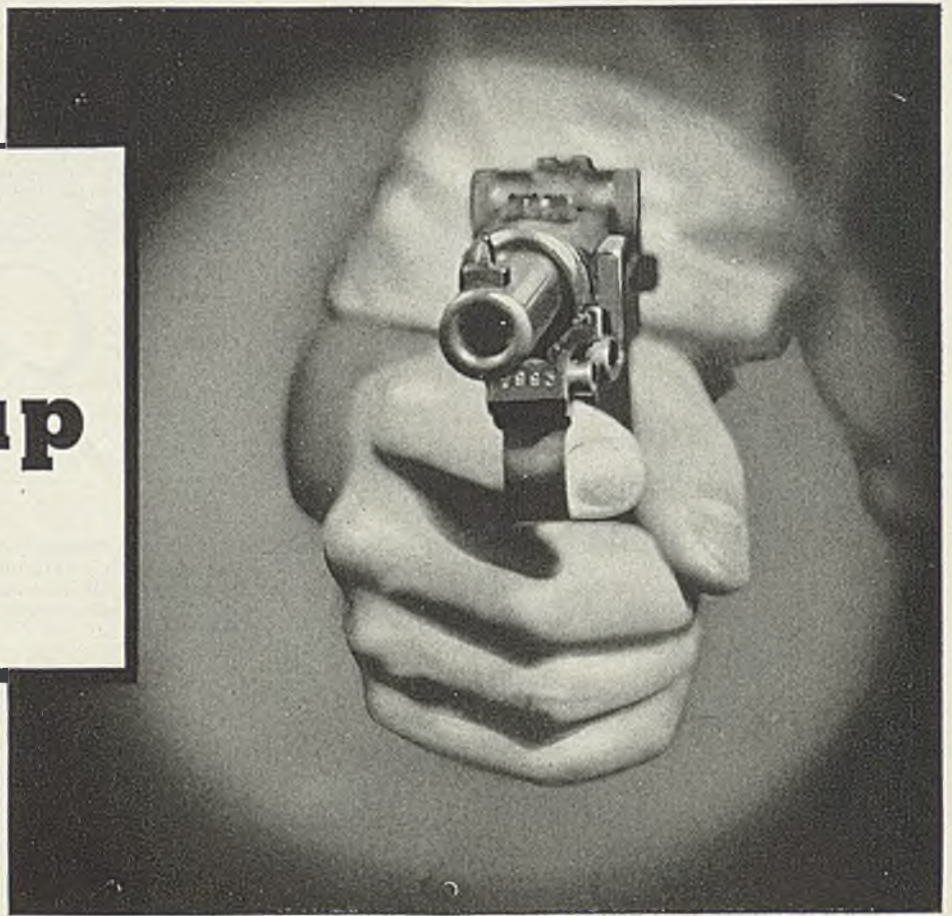
The article in STEEL, June 28, on the application of unit heaters is very interesting.

I have discussed it here, and while it is agreed that undoubtedly there must be some relation between comfort and cost, we do not have sufficient data to warrant making any definite statement. We feel, in general, that unit heaters represent the most economical form of factory heating and all new construction or remodeling includes that type of heating. Of course, our plant now uses a wide range of heating units.

R. P. BROWN.

*Timken Roller Bearing Co.,  
Canton, O.*

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# MORSE Scales