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## *Nickel Alloy Steels*

**THE INTERNATIONAL NICKEL COMPANY, INC., NEW YORK, N. Y.**

## As the Editor Views the News

**H**OUSING rapidly is coming to the front as one of the principal markets which will engage the attention of the iron, steel and metal-working industries during the next decade. The hundreds of homes erected in recent years in which metal has been used for frames or for walls and other parts have provided diversified experience from which the trend of future development will be derived. For some time certain producers of materials, architects and builders have recognized the need of co-ordinating the efforts of the various pioneers in the housing field, and it is gratifying that at last action is to be taken along this line.

The first major attempt at co-ordination will be launched by the Congress of American Industry (p. 17) at its meeting in New York, Dec. 9-10, under the sponsorship of the National Association of Manufacturers. A committee of the association will urge action toward "supplying proper housing for the lower income

groups by providing more and more value at less and less cost." The committee stresses the need of "effective building . . . on an important scale in the cost range from \$2000 to \$3000." This movement deserves success because of two compelling incentives: First, the social problem awaits solution. Secondly, co-ordination supplies the logical approach to low-cost construction.

As industry delves into the housing problem, it will discover conditions which are similar to those in the automobile market. Already the operators of continuous wide strip mills—built primarily to meet the needs of the automobile industry—are envisioning the low-cost housing field as a potential consumer of

### Co-ordination Is Key

the mills' tonnage. Last week as Republic Steel was breaking ground for a new continuous mill in Cleveland (p. 18), its chairman, Tom Girdler, was predicting that tomorrow as much strip will be used

for house construction and household equipment as is being used for automobiles today. The remarkable high-quality, low-priced automobiles, with all-steel bodies and tops, displayed at the current shows, illustrate what co-ordination among dozens of industries (p. 29) has achieved in the motor car field. Perfect that same degree of co-ordination for house construction and the housing problem will be solved!

So much interest was aroused by the article on flame hardening by the oxyacetylene method published on page 42 of the Nov. 9 issue, that the editors of STEEL have been seeking additional authoritative information on that important subject. As a result, we present in this issue (p. 32) a comprehensive discussion of localized surface hardening in which the problems attending the treatment of steels of various typical analyses are outlined in detail. The article touches upon the hardening of cast iron and steel parts as well as upon rolled steel products. . . . One large manufacturer has devoted detailed time and motion study to its intricate problems of materials handling. The results of these studies (p. 39), were of great value to the company in selecting and co-ordinating its material handling facilities.

### Hardening by Torch Process

Important in the news of the week are the announcements of active purchasing by the railroads. Orders for 100 locomotives, 900 freight cars and 123,000 tons of rails—all in one week—represent a scale of buying (p. 61) reminiscent of 1930 and preceding years. Rails ordered in the month of November will total 330,000 tons. . . . Unless he looks at the detailed figures, the average individual does not realize the extent to which activity today exceeds that of the corresponding period of 1929. Steel production and electric power output are running about 20 per cent (p. 30) above the levels of November, 1929, and automobile assemblies are double. In scanning the industrial picture today, it is evident that the main change from 1929 conditions lies in the present continued lag in the building industries.

### Railroads Are Buying Again

*E. L. Shaner*

# Scrap Tops Pig Iron as Raw Material in Steel Industry

BY RICHARD J. LUND and H. W. DAVIS  
United States Bureau of Mines

THE large importance of ferrous scrap as a basic raw material in the iron and steel industry is illustrated by the industrial consumption of 26,415,000 gross tons of this material in the United States in 1935, compared with 20,505,000 tons of pig iron, according to a survey recently completed by the United States bureau of mines.

The total scrap figure includes almost equal proportions of home or plant scrap and purchased scrap, the tonnage of the former amounting to 13,347,000 tons and of the latter 13,069,000 tons.

Even excluding the home scrap, comprising largely recycled material, the tonnage of purchased scrap in 1935 still amounted to no less than 72 per cent of the iron content of the total iron ore consumed in blast furnaces, indicating the conservational aspects involved in the collection and use of scrap iron and steel. Although information on consumption of these materials was not received from all consumers, the compilations include plants absorbing about 98 per cent of the total ferrous scrap and pig iron in uses which involve remelting of the scrap.

## Define Scrap Classifications

In this study the term "home" or "plant" scrap refers to scrap produced at the plant of the establishment reporting, including (1) new scrap such as spills, risers, skulls, cappings, mill scale, cinder, etc., and (2) old scrap, any items of equipment discarded after use. The term "purchased" scrap includes both purchased material and scrap transferred from other plants under the same corporate control, as well as scrap received under exchange contracts or conversion agreements. No doubt the largest proportion of home scrap consumed consists of recycled "new" material.

Scrap consumption centered in the great steelmaking districts in Ohio, Pennsylvania, Indiana and Illinois. These states consumed, respectively, 24, 24, 11 and 9 per cent of the total home scrap; of the total purchased they absorbed 23, 19, 10 and 9 per cent, respectively; and of the total pig iron they used 25, 26, 12 and 9 per cent respectively. Thus, the two states of Ohio and Pennsylvania, producing some 53 per cent

of the country's steel in 1935, consumed almost one-half of the total scrap and over one-half of the pig iron absorbed in that year.

The practice of increasing the proportion of purchased scrap in the total scrap and pig iron part of the charge in areas not enjoying easy access to pig iron supplies is shown by the fact that in the Southwestern district (Arkansas, Oklahoma, Louisiana, and Texas) the per cent of purchased scrap to total scrap plus pig iron was 74 per cent; in the Pacific Coast district (Alaska, Oregon, Washington, and California) it was 59 per cent; and in New England (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont) it was 51 per cent. In other districts, each including at least one important pig iron consuming area, the percentages were markedly lower.

In the Middle Atlantic district (Delaware, New Jersey, New York, and Pennsylvania) the proportion of purchased scrap in the total scrap plus pig iron part of the charge was lowest, 24 per cent; the Southeastern district (south of the Ohio river and east of the Mississippi) and North Central district (lake and prairie states) were next, 28 per cent each; followed by the Rocky Mountain district, 31 per cent.

Judging from the number of operators reporting no pig iron consumption, it is not at all uncommon for furnaces of various types to operate all year on nothing but scrap, aside from fuel, fluxes, and frequently some ferroalloys. A total of 488 operators were in this category, comprising 385 cupola op-

erations, 91 electric steel, six air furnaces, five open-hearth furnaces, and one bessemer converter operation.

Consumption of ferrous scrap and pig iron in different types of furnaces is shown in the accompanying table and chart. Almost three-fourths of the total scrap consumption took place in open-hearth furnaces; cupolas consumed about 16 per cent, a total in these two types of 88 per cent. The proportion of purchased scrap to total scrap plus pig consumption was highest in electric-steel furnaces, where it was 48 per cent; next in crucible furnaces, 43 per cent; then in cupolas, 33 per cent; open-hearth furnaces, 29 per cent; air furnaces, 23 per cent, and puddling furnaces, 21 per cent. Finally, in bessemer converters it was almost negligible, 0.17 per cent.

## Provides Useful Information

In submitting these results the bureau of mines seeks to fill a gap which has existed heretofore in metalliferous statistics due to lack of adequate official figures on consumption of ferrous scrap on an annual basis. This type of information is designed to meet the needs of: (1) Consumers of ferrous scrap, including operators of blast furnaces, steel mills, ferrous foundries, and rolling mills; (2) marketers of scrap iron and steel, including large brokers who sell, and dealers who collect, prepare, and sell the material; (3) large scrap producers; (4) producers of iron ore, with which scrap competes indirectly; and (5) other individuals and agencies interested in more general economic analysis, since the scrap market has repeatedly been cited as one of the most sensitive of all industrial barometers. In order to correlate ferrous scrap consumption more closely with pig iron consumption, figures for the latter were also obtained.

The bureau appreciates that its first efforts in this field may not meet all expectations; but it hopes to develop gradually through suggestions, advice and criticism from

## Scrap and Pig Iron Consumption, 1935

Type of furnace	No. active plants reporting	Gross Tons, Scrap			Gross Tons, Pig Iron
		Home	Purchased	Total	
Open hearth	127	9,589,017	9,530,610	19,119,627	13,944,239
Bessemer	30	212,862	6,452	219,314	3,542,719
Electric	217	464,783	450,776	915,559	33,186
Cupola	2,287	1,916,835	2,241,788	4,158,623	2,675,827
Air	115	278,140	168,103	446,243	295,008
Crucible	10	244	609	853	566
Puddling	5	1,371	4,020	5,391	13,492
Blast	67	883,500	666,220	1,549,720	.....
	*2,858	13,346,752	13,068,578	26,415,330	†20,505,037

\*Where two or more separate departments, such as blast furnace department, open-hearth department, foundry department, etc., are located at the same place and are operated by one establishment, each of these departments appears as a plant in the total figure.

†In addition 115,426 tons were reported consumed in direct castings.

the industrial groups most interested a type of analysis that will be in close accord with technical processes and best meet the needs of all groups vitally interested in supplies and use of ferrous scrap. Comment and suggestions from the trade regarding improvements to be desired will be appreciated.

A more complete discussion of scrap iron and steel consumption in 1935, with detailed figures, is given in report of investigations 3329 of the bureau of mines. Readers of STEEL may secure the detailed report by addressing a request to the director, United States bureau of mines, Washington.

## Atlantic City Gets 1937 Metal Show and Congress

The 1937 National Metal congress and exposition will be held Oct. 18-22 in the Auditorium, Atlantic City, N. J. This decision was reached by the board of trustees of the American Society for Metals meeting in Cleveland, Nov. 19-20, and was announced by W. H. Eisenman, secretary of the society and managing director of the show.

Atlantic City was selected because of its fine Auditorium and convenient and adequate hotel facilities. It is the first time that the congress and exposition, held annually for 18 years, has gone to this city. The policy of opening the show only to those actively interested in production and use of metals, initiated at the Cleveland show this year and meeting with favor, will be continued in 1937.

## Canadian Shell Makers Buy Annealing Furnaces

Several orders for annealing furnaces, for annealing shells, have been placed in the Pittsburgh district recently by Canadian shell manufacturers.

From Montreal it is reported National Steel Car Co. has received "a small order" for shells from the British government, and that with the successful handling of this order considerable additional business is expected from the same source.

## Colorado Fuel & Iron To Spend \$2,500,000

Colorado Fuel & Iron Co. has announced a \$2,500,000 improvement program. About \$1,500,000 will be spent at the Minnequa steel plant, near Pueblo, Colo.; about \$500,000 to develop new iron ore bodies at the company's Sunrise mine in Wyoming, and the remainder at mines in Colorado and New Mexico.

# Factors in Steel Recovery Are Cited by Institute

INTERESTING perspectives on current steel consumption, prices and wages were presented last week by the American Iron and Steel institute. The large proportion of steel in new automobile models, and the relatively low cost of the material; the increase in the use of steel products by ultimate consumers; the gains in railroad buying this year; the greater distribution of money to employes—these were among the reports reflecting business improvement.

Expanding purchases of steel-made goods by the ultimate consumer have been an important factor in raising employment in the industry to the present record level.

Demand for lighter steels used in goods bought by individuals has been relatively steadier in recent years than that for the steels used by capital goods industries.

Since 1929 the average number of man-hours of steel mill labor necessary to produce one ton of finished steel of the kind being sold, has risen from 30 man-hours per ton to 33 last year, it is calculated from data collected by the department of labor. Full-time jobs for 36,000 men were created by the 10 per cent increase in man-hours per ton.

Output of the highly finished products in 1929 represented only 32 per cent of the year's total production, while in 1935 the tonnage was 52 per cent.

About 80 per cent of the tonnage of highly finished steel products which can be traced goes into automobiles, refrigerators, household and farm equipment and other products bought by individuals.

## WAGE INCREASE TAKES HALF OF 1936 PROFITS

Basic wage rates of the country's steel employes are now about 19 per cent higher than in 1929, as a result of recent increases.

The new rate of pay is the highest in the peace-time history, and total employment of 526,000 is the largest ever recorded.

Average hourly earnings of wage earners according to the latest compilation, for September, amounted to 66.3 cents. The application of the new rates will increase the average to about 73 cents.

Total payrolls of the industry are now at the annual rate of \$860,000,000. In 1929 the total was \$914,000,000.

It is estimated that earnings by

the steel industry in 1936 will be approximately \$150,000,000, about 3 per cent on total capitalization. The addition to the industry's wage bill over the next year will amount to 50 per cent of the estimated figure of earnings for 1936.

## RAILROAD STEEL BUYING LARGEST SINCE 1930

Railroad buying of steel for maintenance of way and equipment in 1936 promises to be heavier than for any year since 1930.

Locomotive orders, exclusive of specially designed units for streamlined trains, totaled 180 in the first ten months this year, compared with 83 in all 1935.

Freight cars bought in the ten months total 38,664, compared with 18,699 in all 1935, and 46,360 in 1930.

Purchases of passenger cars in the ten months total 146, compared with 63 in all 1935. Except for 1934, when 388 passenger cars were bought, 1936 has the best record since 1930.

Rails and fastenings produced during ten months this year amount to 1,200,000 tons, 78 per cent over the corresponding period of 1935.

Last week rail orders amounted to 123,150 tons, bringing the total for November to 330,000 tons. Also, 100 locomotives and 900 freight cars were purchased.

## AUTO INDUSTRY SAVES \$60,000,000 ON STEEL

Automobile manufacturers will pay \$60,000,000 less for autobody steel this year than they would have had to spend for like tonnage ten year ago. This saving is said to reflect a 30 per cent decline in the price of high-grade autobody steel since 1926 when the continuous mill was introduced.

Steel requirements for the automobile industry are steadily expanding, the institute points out. The average increase per car in 1937 models is estimated as 65 pounds, compared to a year ago.

Fully 80 per cent of the weight of the average car is steel, although only a small fraction of the purchase price, probably not over \$60, is represented by the cost of steel. It is estimated 125 different types of steel are used in modern automobiles and that the use of alloy steel has cut in half the weight of cars over the last 20 years.

# Pro-Lewis Steel Factions Seen "Boring from Within"

**W**ITH the CIO watching its chance to drive a wedge farther into the steel industry's employe representation plan, 34 delegates from 17 plants of the Carnegie-Illinois Steel Corp. were scheduled to open one of their quarterly discussion meetings in Pittsburgh Monday, Nov. 30.

As chairman, the Lewis advocate, E. J. Maloy, of Duquesne, Pa., who recently protested to Secretary of Labor Perkins against the company's wage plan, was prepared to direct the discussion of many problems, including collective bargaining.

Considerable agitation has been current recently for the removal of Maloy. The Wood works, McKeesport, Pa., has withdrawn from the council due to Maloy's election as chairman, and the Homestead works' representatives have based their refusal to affiliate with the council in part to his influence.

## Would Form New Council

Last week Maloy took steps to organize a Youngstown-Cleveland district council along the general lines of the Pittsburgh district central group, but with the important difference that the plan contemplates banding together employe representatives from competitive companies. At a closed meeting in Youngstown he unfolded before 80 persons a dream of organizing an "Institute" of steel employes which might submit problems "simultaneously and with greater effect to all steel concerns at once."

When many of the persons attending the meeting indicated by their questions that they had no desire to be connected with the CIO, Maloy said the Youngstown-Cleveland council would not be linked with the Lewis organization, but this was a promise made recently to employes in other cities.

John J. McGowan, of the Youngstown Sheet & Tube Co., was named chairman of the Youngstown-Cleveland council, which indorsed the 30-hour week, two-week vacations for employes, a \$5-a-day minimum wage for laborers, \$1.25 an hour for all other workers and time and a half pay for all work over 35 hours a week.

Ever since Lewis ordered the CIO to complete its drive for steelworks organization within 90 days (STEEL, Nov. 16, page 23), efforts have been redoubled to create the impression that CIO has the backing of large

groups of employe representatives. There have been many indications, however, that the majority of employe representatives are unwilling to be misled by men who apparently are seeking to achieve renown as clever organizers.

At Cleveland, for instance, a meeting of steel workers arranged by the CIO was canceled last Sunday when only 30 persons appeared.

Some employe representatives said last week that steps undoubtedly would be taken to oust the pro-Lewis faction from the councils.

In the last ten days CIO campaigners are reported to have made extensive use of their offer to cancel dues for 90 days for new members. In some instances employes have said they signed up merely to escape the pressure being exerted upon them by the organizers.

Last week the Western Sheet and Tin Plate Manufacturers association agreed with the Amalgamated Association of Iron, Steel and Tin Workers to a 5½-cent per hour minimum wage increase. This would be added to the wage scale based on tonnage, which was signed last July between the two organizations. About 7500 skilled and unskilled workmen are affected by this advance.

## Production

**T**HE national steelworks rate pushed up 1 point last week to 75½ per cent, peak for the year to date, and highest level since the

spring of 1930. Anticipatory buying, preceding the price advances announced last week on finished and semifinished steel and pig iron, was reported responsible for the heavier operating schedules in all major steel centers.

**New England**—Gained 15 points to 88 per cent, with an increase to 91 per cent indicated for this week.

**Central eastern seaboard**—Up fractionally to 48½ per cent, with indications of further expansion.

**Youngstown**—Rose 2 points to 75 per cent, as Republic Steel Corp. added two open hearths here and one at Warren, O., and Carnegie-Illinois Steel Corp. added one at its Ohio works and one at its Farrell plant. Youngstown Sheet & Tube Co.'s bessemer closed down last Tuesday, but is scheduled to resume the middle of this week.

**Cleveland-Lorain**—Off 2½ points to 77 per cent, as Otis Steel Co. took off one furnace to operate seven all week. Republic Steel Corp. continued with 12, and National Tube Co. at Lorain with 11.

**St. Louis**—Held at 68 per cent, with little variation expected this week.

**Detroit**—Without change last week at 100 per cent. All 21 of the district's open hearths continue on ingot-making schedule.

**Wheeling**—Steady at 89 per cent. Out of 37 open hearths, 33 were on the active list.

**Pittsburgh**—Up 3 points to 70 per cent. A 4-point increase by Corporation subsidiaries to 68 per cent, and the continuation of a 78 per cent average for the independents account for the increase. In turn, this is traceable to a heavy influx of steel orders entered against the first quarter advance. Forty-four out of 60 steelworks blast furnaces are active, listing 22 for Corporation units and 22 among four independent works.

**Cincinnati**—Steelmaking operations remained at 96 per cent, 23 open hearths being active. Capacity operations throughout this quarter are assured.

**Chicago**—Increased ½ point to 77 per cent, a new high level for the year. On the basis of tonnage output, operations are the heaviest for this period in history and are equal to practically 100 per cent, on the basis of 1929 capacity. Blast furnace operations are unchanged at 25 active stacks out of 38, but lighting of additional units is scheduled for this month.

**Birmingham**—Maintained at 74 per cent, with sixteen open-hearth furnaces on steady schedule.

**Buffalo**—Thirty-one open hearths are in operation and no major change is planned for this week. Bookings generally are satisfactory, but some executives feel the natural trend of operations here will be downward as navigation closes.

## District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended		Same week	
	Nov. 28	Change	1935	1934
Pittsburgh	70	+ 3	45	20
Chicago	77	+ ½	62½	33½
Eastern Pa.	48½	+ ½	39	18½
Youngstown	75	+ 2	58	35
Wheeling	89	None	78	54
Cleveland	77	- 2½	82	46
Buffalo	84	None	40	24
Birmingham	74	None	56	27½
New England	88	+15	90	47
Detroit	100	None	94	48
Cincinnati	96	None	†	†
St. Louis	68	None	†	†
Average	75½	+ 1	56	28

†Not reported.

# Group Industrial Action Urged on Housing Problem

**A**PPPOINTMENT of a group of industrialists to help solve problems of low cost housing and to co-ordinate the attack on those problems, will be urged upon the Congress of American Industry at its meeting in New York Dec. 9-10, by a committee of which Charles R. Hook, president, American Rolling Mill Co., Middletown, O., is chairman.

Estimates of the shortage of homes vary from 1,000,000 to 6,000,000 units, according to this report from the National Association of Manufacturers' committee on housing and employment. Particular emphasis must be given to low cost and low rent housing in the cost range from \$2000 to \$3000.

"The provision of proper housing," said Mr. Hook, "is not only an important responsibility of the construction industry but it is a responsibility requiring the attention of all industry, all business and all interested in the creating and maintenance of a satisfied and effective

citizenry. The owning of a home certainly tends to make a man deeply interested in the form of his government and the economical and efficient administration of that government.

"Our attack must be directed at supplying proper housing for the lower income groups, in providing more and more value at less and less cost."

The committee points out that satisfactory and effective building has never been undertaken or accomplished on an important scale in the cost range from \$2000 to \$3000.

"We believe it is vital," says the report, "that there should be some organization which will act as a self starter and directing agency in following through on this important subject.

"We deplore the threat of federal competition in the normal house building field. This constant threat delays the entrance of private capital and enterprise into an activity that gives promise of safety

of investment with a reasonable return on the capital employed.

"We believe it is the duty of the manufacturing industry to lend its aid to the development of a program which will quickly start the work of producing the home for the working man. To that end we recommend that an appropriate committee of the National Association of Manufacturers co-operate with those who are sponsoring constructive solutions of the housing problem."

## Steel Executives Inspect New Welded Steel House

Construction principles of a welded steel house in the \$20,000 class, built by the Arcy Corp., New York, drew the attention of steel executives, financiers, industrialists and housing experts in Cleveland last Tuesday at a private showing.

The building is faced with brick, and the steel sections are insulated with corkboard. It consists of five bedrooms, three baths, an electrically equipped kitchen and a completely finished basement. A two-car garage is attached to the house.

Four other homes which are under construction are expected to be completed within three weeks. The company has plans for 16 houses of various sizes and designs, ranging from \$6500 to \$20,000 without the land. These will be augmented by plans to bring the number to 50.

Among those attending the first showing were: Benjamin F. Harris, president, National Tube Co., Pittsburgh; R. E. Zimmerman, vice president, United States Steel Corp.; C. W. Bennett, former president, American Sheet & Tin Plate Co.; Paul Voight Jr., manager, stainless steel division, Carnegie-Illinois Steel Corp.; M. L. Gardner, assistant

## Modern Apartment House Resplendent with Stainless Steel



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**B**ALCONY railings, architraves, ornamental strips running up the sides of the building—even the trim on the tank room, at the extreme left atop this New York apartment house—are of stainless steel. First buildings in the metropolitan area to use stainless for exteriors were the skyscrapers; now it is being specified for apartments. Several hundred tons glisten on this new structure at West End avenue and Eightieth street. Photo courtesy Republic Steel Corp.

treasurer, and J. C. Whetzel, assistant manager of the tin plate sales department, Carnegie-Illinois Steel Corp.; and J. J. Nance, vice president, Delco Frigidaire Corp.

## Republic Begins Work on Strip Mill

**F**UTURE demand for strip steel in homes, not only in the structure itself, but in cabinets, cupboards and other accessories will open a market tomorrow that will rival the automobile market today," said T. M. Girdler, chairman-president, Republic Steel Corp. in announcing details of Republic's \$15,000,000 strip mill project in Cleveland.

Contracts for the major mill machinery were awarded to United Engineering & Foundry Co., Pittsburgh, and work was begun on the mill buildings. The hot mill will roll strip up to 90 inches wide and have annual capacity for 720,000 to 840,000 tons. The mill will have a maximum speed of 2100 feet of strip steel per minute. It will be supplied with three heating furnaces capable of heating approximately 150 tons of slabs per hour.

The hot mills will be motor driven. The electrical equipment will consist of four 3000 horsepower motors, one 3500 horsepower motor, and five 4500 horsepower motors, many smaller motors and four very large motor-generator sets.

The cold mill will consist of two

lines of continuous pickling vats; annealing furnace equipment; one three-stand tandem cold mill, one stand driven by a 1500 horsepower motor and two stands driven by 2500 horsepower motors; two single stand finishing mills of similar size and various cold mill equipment including high speed cutting units, flatteners, uncoilers, etc. The cold mill will take its strip from the hot mill and will have an initial capacity of about 25,000 tons a month, which will be increased as business warrants.

## Inland Steel Awards Blast Furnace and Coke Ovens

Inland Steel Co.'s contract for a blast furnace at Indiana Harbor, Ind., has been awarded to Arthur G. McKee & Co., Cleveland. The fur-

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**A**DDITIONAL news of the steel and metalworking industries will be found on page 80.

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nace with appurtenances will cost about \$2,500,000 and have a daily capacity for 1000 tons of pig iron. The company now has four stacks with a combined annual capacity of 1,003,000 tons. As stated in STEEL, Nov. 23, page 25, this will be the first blast furnace to be built in the United States since 1928. Total an-

nual pig iron capacity in the United States now is 49,777,893 tons.

Inland Steel also awarded Koppers Co., Pittsburgh, contract for the erection of 59 coke ovens and for other construction and replacements at its Indiana Harbor plant. New low differential type Becker ovens with self-sealing doors and other modern auxiliaries, will be installed. The ovens are equipped so that they can be fired with blast furnace gas.

Inland's benzol and by-product plants will be modernized. Improvements to the company's coal and coke handling equipment are included in the contract.

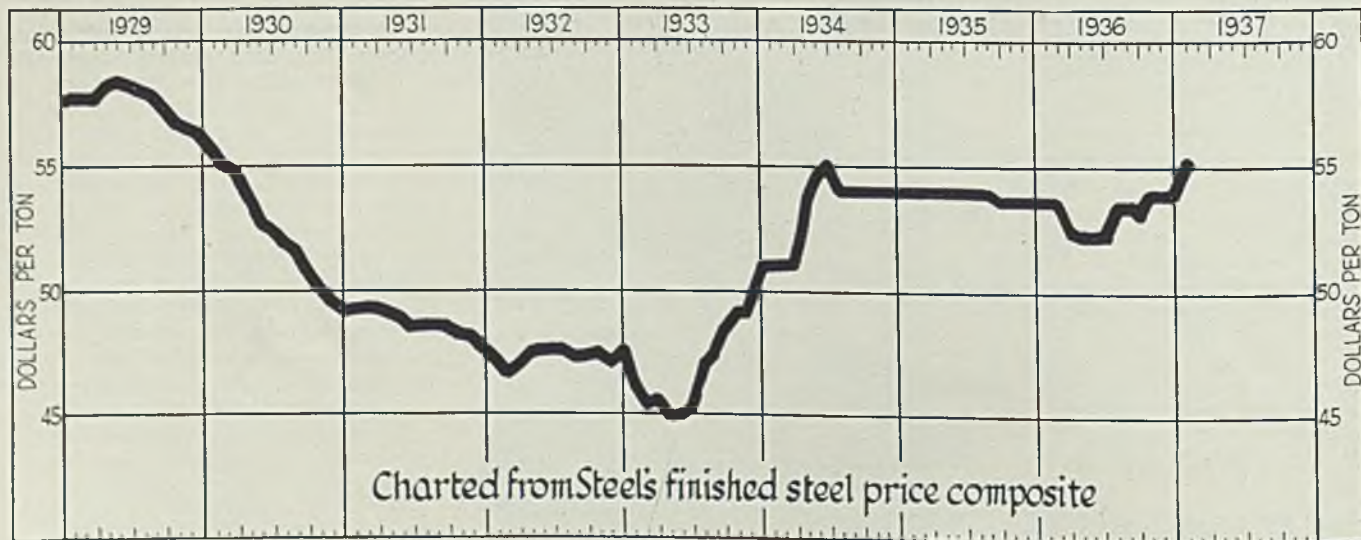
## Blast Furnace Runs 79 Months on One Lining

Weirton Steel Co.'s No. 2 blast furnace, Weirton, W. Va., was blown out Nov. 1 after having been in continuous operation since April 2, 1930, and having produced 1,856,584 tons of metal. The furnace lining was furnished by Harbison-Walker Refractories Co. During the campaign no repairs whatsoever were required to the lining, the stock line or the stock line plates.

## Observe Carnegie's Birthday

The 101st anniversary of the birth of Andrew Carnegie was marked at Pittsburgh Nov. 24 when exercise at the Carnegie Music hall there by the Carnegie Foundation paid tribute to the famous industrialist and philanthropist.

Trend of Steel Prices; Composite Up to Level of January, 1930



**N**EW prices of finished steel for first quarter, as reflected by STEEL's composite, are practically at the level of January, 1930. On the basis of the price changes so far announced the composite will be \$55.60, or \$1.70 over the current figure. The composite will be \$2.93 lower than the high — \$58.53 — in May, 1929, and \$10.66 above the

low, \$44.94, in April, 1933. First quarter increases include \$2 per ton on semifinished steel; \$3 on wire rods, plates, shapes and bars; \$4 on strip, nails, cold-finished bars, tin mill black and sheets, except enameling sheets, \$3. Pig iron prices are up \$1 a ton in all districts. For further details see market section.



# WINDOWS of

# WASHINGTON

## WASHINGTON

**C**LOSER co-operation between government and business seems to be the trend of present thought throughout industry generally. The question is whether the present administration is going to be able to cash in on this feeling or whether it is going to muffle the ball.

One thing is certain, that the government would be in a much stronger position now if there were a central body through which industry could co-operate, instead of being up against the problem of not knowing whether to deal with the Major Berry organization or the Roper business advisory council. Of course, it is felt that the Berry organization, with the labor leader at its head, could never get the close co-operation of business. In addition, information has gone out from many quarters in Washington that it makes little difference whether the forthcoming Berry conference, scheduled for December 10 and 11, is a success.

### Roper Council Favored

In this connection the Roper business advisory council drafted a letter to Secretary Roper at its recent meeting signed by George H. Mead, chairman, in which he calls the secretary's attention to the fact that the council is "an advisory body" and that it renders "a constructive and nonpartisan service to the department of commerce, which is the channel of communication between industry and the government. It is, therefore, gratifying to know that the council's scope of usefulness is now to be extended and strengthened."

This, in itself, reading between the lines, certainly indicates that at least the members of the Roper council, comprising some of the leading industrialists of the country, believe that this co-operation should be through the Roper organization. While government officials will not discuss the matter, because of the delicate situation, it is believed here that members of the Roper council will not attend the Berry meeting in

December unless they should be represented in some way by their own unofficial observers.

The acute situation between the Roper and Berry councils is just about the same this year as last, when Berry called his conference which turned out to be such a fiasco. However, it is not expected there will be any open break this year.

The only hope that the Roper sympathizers have as far as the Berry conference is concerned, is that when the President returns to Washington he will realize just how acute the situation is, and try to do something about it. In fact, it is thought that if the President had not been so busy just before starting to South America he would have eased the situation before now, either by appointing Berry to some other position and making someone else co-ordinator of industrial co-operation, or abolishing his office.

It is interesting to recall, apropos of the Berry conference here in Washington, that on the same days the congress of American industry is to be held in New York. It is pointed out, however, that the New York meeting was called before Berry called his conference and no one here will state just what significance is to be attached to this coincidence, if it is one.

### Procedure of Conference

According to present plans for the Berry conference, the session Dec. 10, the first day, will be open to all and will be devoted to a general discussion of industrial problems, with emphasis on the current need of industrial legislation. Berry has announced that all who attend the open session will be asked to register before entering the federal auditorium, stating business connections and whether they attend as individuals or as representing certain organizations or groups.

Dec. 11, the second day of the conference, the council will meet in executive session, to be attended by members only. Committee reports will be made and adopted.

Major Berry, and his press agent

state that "indications at the co-ordinator's office today were that the coming meetings probably will be the most largely attended of any held in Washington in connection with industrial affairs in recent years." The wish undoubtedly is father to the thought.

### BUSINESS NEEDS TO KEEP CLOSE TOUCH WITH CONGRESS

The need for American business and industry to maintain intimate contact with developments in Washington was never greater than now, with the approach of the seventy-fifth congress.

This need arises not merely from the desirability that industry be intelligently informed as to legislative and administrative proposals of importance to the future of business generally. It arises equally from the need that there be reflected to congress, by industry, an alert and active interest in pending legislation, whether that interest be in support of or opposition to the pending measures.

No industry has a greater stake in this situation than steel. Whether the proposed action be social or economic in its aims, whether it involves labor relations, merchandising operations or trade practices, the future of the steel industry will be directly touched by a large part of the legislative and administrative program of the next year.

Immediately in sight, as questions that are certain to fall within the field of congressional consideration in the coming session and which are of direct interest and importance to steel are: Revival of anti-basing point legislation; legislation for the federal licensing of industries operating in interstate commerce, this to include minimum wage and maximum hour provisions; proposals to broaden the application of the Walsh-Healey government contract act; amendments to tighten the social security act and to clarify and simplify the Robinson-Patman act, and measures to prevent or regulate stream pollution—to name a few.

If final action on all such meas-

ures is to be the result of full information, it is necessary that industry know and understand their intent and application and in turn make known its position thereon and the reasons therefor. This is a direct responsibility not only to itself but to the country at large.

Senator Pat Harrison, Mississippi, chairman of the all-powerful senate finance committee and also chairman of the joint congressional committee on internal revenue, was in Washington for a few days last week and made some interesting and highly important comments on the tax situation and its relation to the coming session of congress.

The senator expressed himself highly pleased with the operation of the surplus corporation tax, as evidenced by year-end dividends and wage increases by the various corporations. He admitted that there are many inequalities in this law and intimated that while congress may make some amendments to ease up specific conditions nothing will be retroactive and the principle of the tax will not be changed. The government, he stated, wants to have this law in effect for a couple of years to see just how it works out.

#### **May Encourage Modernization**

A possible change that might be considered, the senator stated, is a provision to encourage modernization or rebuilding of plants. Such a provision would grant a more liberal tax schedule for corporations undertaking such work.

Senator Harrison stated that he believed some tax hearings would begin during December, but he failed to say whether it would be early or late in the month.

"In my opinion," said Senator Harrison, talking to newspapermen on the tax question, "the law is going to work out all right. There will, however, be a study of its provisions with a view to trying to present a more liberal basis of taxation in the case of corporations which are in debt or have obligations. No doubt some corporations had to pass through many lean years. They found it necessary to borrow money to continue to operate. It seems rather hard that, when they have just one good year, they should be forced to pay a heavier tax, when they have already paid much money out to reduce their debts. We tried to make some adjustment to meet such cases. But the time was short. It was a difficult problem. The experts desired more time to work it out."

The senator stated definitely that in his opinion it will not be necessary to increase taxes at the next session of congress. The so-called nuisance taxes expire June 30 and

a careful study is being made of them. There is a story here that the actual profits to the government on some of these taxes do not much more than cover the cost of collection. If cases of this kind are found it is expected that a switch will be made in these taxes. It is possible that some of the nuisance taxes will be abolished but certainly not all of them.

The Mississippi senator predicted that the budget will be balanced in 1938. During the first three months of this year, he pointed out, there was an increase of government receipts over the corresponding period of last year of 14 per cent. At the same time there was a drop in government spending of 9 per cent.

On this subject he said: "I believe that because of the great increase in business there will be a rational decrease in government expenditures for certain activities of emergency character. I am sure the country will welcome as great a curtailment of expenditures as the rational needs and demands of the country will permit."

He came out strongly for the social security law. "I see no reason for changing the tax rates or the philosophy of the law," he said.

#### **MINE WORKERS OUTLINE LEGISLATION FOR LABOR**

A detailed legislative program was adopted here last week at the meeting of the international executive board of the United Mine Workers of America.

Taking up both national and state legislation the board recommended, among other bills, "an act eliminating unincorporated communities of the kind and character of Weirton, W. Va. This city, having a population of 20,000, is unincorporated and thus completely controlled by the Weirton Steel Corp. It operates to the detriment of civil liberties and is used as an instrument to prevent all independent labor organization."

The board recommended a long list of state laws favorable to labor and then resolved that: "In order to assure labor a fair share of the increased productivity of industry and of the growing wealth of the country, thereby increasing mass purchasing power, the executive board recommends that the executive officers formulate, for incorporation into the national and uniform state legislative program, measures which will provide to labor higher wages, shorter hours, improved working conditions, improved housing conditions and which will provide for a more comprehensive and adequate social security legislation."

Taking up still further the matter

of labor legislation the board authorized and directed officers of the union "that in connection with the efforts to bring about the unified labor legislative program, serious consideration be given to the constitutional objections that may be raised and upheld against any outstanding or proposed social and economic legislation. If it be determined that such legislation cannot be effectively enforced in the absence of a constitutional amendment, the executive officers shall join with other labor, farm and progressive groups to formulate and sponsor the necessary constitutional amendment."

#### **UNEMPLOYED NOW ESTIMATED AT ONLY FOUR MILLION**

The administration should now adopt a policy of gradually discontinuing work relief, according to a report submitted last week by the special committee on employment of the chamber of commerce of the United States, headed by John W. O'Leary, Chicago.

The committee points out that experience has demonstrated the difficulty of attempting to obtain accurate figures on unemployment through census methods.

The number of unemployed, who, if employed, would find their places in business and industry, is placed by the committee as at the present time under 4,000,000. It is explained that all statements respecting numbers of unemployed are necessarily estimates. The chamber's committee, in submitting its own estimates, makes it clear that its figure of less than 4,000,000 applies only to those normally employed on wages or salaries and that it has no reference to unemployed farm labor or the unemployed among the professional classes. It includes those now on government relief work.

#### **BIDDING CASE NOT READY**

Asked about progress being made in the collusive bidding investigation, Attorney General Cummings at a press conference last week said it is advancing, but he refused to make any further statement. Asked specifically if the case is anywhere near ready for grand jury action, Mr. Cummings said, "Most certainly not."

#### **FIRST PATMAN HEARING SET**

Federal trade commission has set the first hearing under the Robinson-Patman law at Boston, Dec. 7, in connection with the complaint against Bird & Son Inc., East Walpole, Mass., and Montgomery Ward & Co., Chicago. Charles F. Diggs, trial examiner, will conduct the hearing and William L. Pencke and James I. Rooney will be attorneys for the commission.

# Men of Industry

**W**ILLIAM E. CROCOMBE has been elected vice president, American Brake Shoe & Foundry Co., New York. He started as office boy for the Minnesota Iron Co., Minnesota Steamship Co. and Duluth & Iron Range Railroad Co., and when these companies consolidated with the United States Steel Corp., Mr. Crocombe went to work at the South Works plant of the Illinois Steel Co. From 1907 to 1909 he was in the open-hearth department of the Lackawanna Steel Co., Buffalo; from 1909 to 1915 he was with the Union Drop Forge Co. at Chicago. In 1915 he organized the forge department of the Ajax Forge Co., now the American Forge division of American Brake Shoe & Foundry, and he was elected president of American Forge Co. in 1924. In 1933 he was elected president of American Manganese Steel Co. Both of these latter companies are divisions of the American Brake Shoe & Foundry Co.



William E. Crocombe

Alfred Musso has been re-elected president, Burden Iron Co., Troy, N. Y.

F. Connell has been appointed assistant manager of sales, New York district, American Steel & Wire Co., succeeding R. H. Pratt, resigned. H. S. Lockwood, district manager of the company's New York merchant department, also has resigned.

Drew M. Thorp has been elected vice president in charge of sales, General Refractories Co., Philadelphia. L. Y. Greene has been made vice president in charge of plant operations, and R. P. Heuer, vice president in charge of research.

Grant Goodwin, 503 Illinois building, Indianapolis, is now associated with the Lindberg Engineering Co., Chicago, as district manager of the Indiana and southern Illinois territory. Mr. Goodwin was formerly metallurgist, Muehlhausen Spring Co., and before that was with the Allison Engineering Co. and the Chicago Screw Co.

Norman Franklin, Jackson Iron & Metal Co., Jackson, Mich., was elected president, Michigan chapter, Institute of Scrap Iron and Steel Inc. at the annual meeting of the chapter Nov. 18 in Detroit. Other officers elected include, vice president, Ben Kramer, Modell Iron & Metal Co., Detroit; secretary, Milton Mahler, Morrow Steel Co., Detroit; treas-

urer, Abe Kasle, A. Kasle Co., Detroit.

Morris E. Lowder, associated with Superior Steel Corp.'s Chicago office for several years, has been appointed district sales manager for the company, with headquarters at 122 South Michigan boulevard, Chicago. James E. Chadderton, affiliated with the Philadelphia office of Superior for the past seven to eight years, has been appointed district sales manager at Philadelphia.

Dr. Edward Bausch and Henry Ford will share honors on the evening of Tuesday, Dec. 1, when the American Society of Mechanical Engineers makes its annual awards for



C. D'W. Gibson

Who has been elected president of the International Acetylene association, as noted in STEEL, Nov. 23, page 26. Mr. Gibson is assistant vice president and general sales manager, Air Reduction Co. Inc., New York

distinguished service in engineering and science, and "for great and unique acts of an engineering nature that have accomplished a great and timely benefit to the public." Dr. Bausch will receive the A. S. M. E. medal and Mr. Ford will receive the Holley medal.

William Monroe White, chief engineer and manager of the hydraulic department, Allis-Chalmers Mfg. Co., Milwaukee, sailed from San Francisco Nov. 26 for the Orient on a world tour.

Joseph Kinney, identified with the machinery sales department since 1931, United Engineering & Foundry Co., Pittsburgh, has been made assistant manager of machinery sales for the company.

P. B. Engstrom has been appointed distributor by the Link-Belt Co., Chicago, of its crawler shovels, draglines and cranes, in the Los Angeles and southern California territory. He has his headquarters at the Link-Belt office in Los Angeles, 361-369 South Anderson street.

B. Howard MacNeal has been transferred from Memphis, Tenn., to the Link-Belt office in Philadelphia, where he will specialize on the sale of crawler and locomotive cranes in the Philadelphia and New York territories.

Sam Kasle, Kasle Iron & Metal Co., Toledo, O., was elected president, northern Ohio chapter, Institute of Scrap Iron and Steel Inc. at the annual meeting of the chapter, in Cleveland, Nov. 16. Other officers elected include, first vice president, Ed Stein, United Iron & Metal Co., Canton, O.; second vice president, Max Friedman, Max Friedman Co., Cleveland; secretary, T. P. Hodgkiss, Lederer Iron & Steel Co., Cleveland; treasurer, Ben Newman, Luntz Iron & Steel Co., Cleveland.

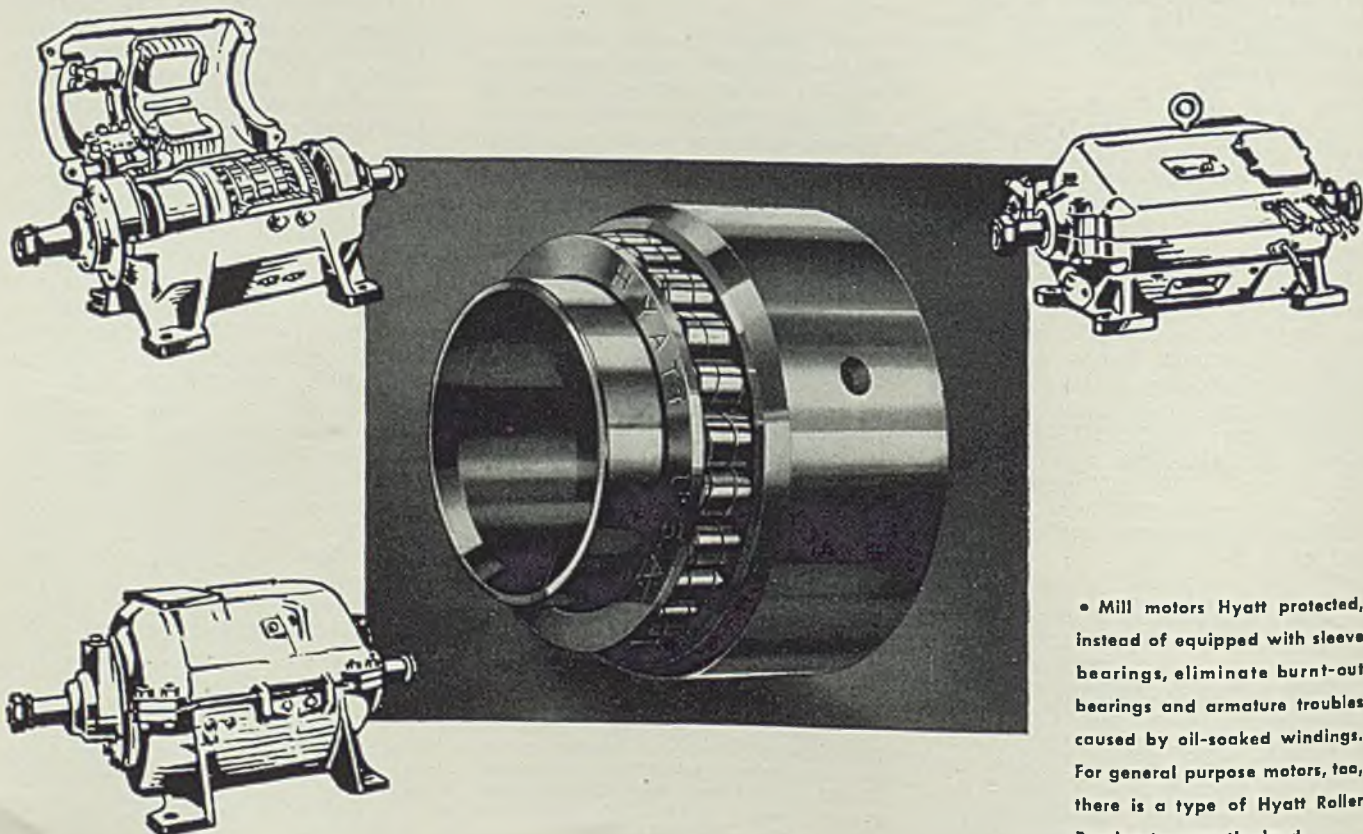
D. L. Mathias has been made research engineer, Metal & Thermit Corp., New York. Mr. Mathias was connected with Mackintosh-Hemphill Co. Pittsburgh as metallurgist until 1920, and for the following seven years was editor of *Heat Treating & Forging*, returning to Mackintosh-Hemphill in 1927 for a period of two years. In 1929, Mr. Mathias went with the process engineering department, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., and later was transferred to the Westinghouse research laboratories staff. He is the inventor of a number of types of welding electrodes and processes.

Arthur Newell Talbot, professor emeritus in engineering, University of Illinois, has been awarded the 1937 John Fritz gold medal, which

(Please turn to Page 26)

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# MIRRORS of

# MOTORDOM

## DETROIT

**A**T NO time in its history has the automobile industry come up to a December with the outlook for the coming year as promising as it is at present.

Some persons in Detroit might consider the situation parallel to the last month of 1928, when a year with 4,358,759-unit production was just closing. But it is doubtful if even the most venturesome at that time looked forward into 1929 and thought it would result in more than 5,000,000 assemblies.

Those were the days when production of four and a half million cars constituted a whopping big year. They were also the days when talk of an automobile saturation point was heard over and over. Few dreamed that making and selling 5,000,000 automobiles was entirely possible.

Thus, since production of 5,000,000 units seems assured in 1937, the situation at this writing appears unprecedented.

Considering the short term outlook, 900,000 cars probably will be built even before the calendar year is over. Now talking entirely in terms of 1937, the motor industry wrote off 1936 a full month ago.

### Five Million in 1937

This imposing total of 900,000 cars will be made up of 400,000 assemblies for November, followed by 500,000 in December, according to the reliable calculation covering the industry which General Motors' statisticians have compiled.

Nor will any doubt be cast that coming up to New Year's day with almost a fifth of the entire year's work completed is a mighty comfortable cushion. This leaves, roughly, ten months remaining in which to pass the 5,000,000 goal.

To put it another way, the industry will have ten months to turn out 4,100,000 models or a monthly average of 410,000. The spring months will exceed the average by a margin wide enough to brace up the last month or two of the 1937 run.

So, you can put 1937 down for a substantial, though not a sensa-

tional gain over 1936. The coming year also will be the fifth in succession in which automobile production has increased. The upward trend started in 1932 and it has not been interrupted since.

Percentage increases in production since 1933 (when related to the year just preceding) have been 45 per cent, 40 per cent, 40 per cent, 30 per cent and 25 per cent. Next year should be 10 to 15 per cent ahead of 1936. All this might seem to indicate to some persons that by 1938 the automobile industry will fast be reaching a cyclical stage.

At all events, with 1937 just commencing the motor people find themselves more vitally interested in immediate problems at hand. The outlook is not entirely rosy, however. These pen-and-paper calculations agree on a 5,000,000-car year for 1937, yet the question of labor may come to disrupt temporarily many a well-laid plan.

### What About Labor Problems?

Last week, that point was driven home when the "sit-down" strike at Bendix Products Co.'s South Bend, Ind., plant reacted on many of the assembly lines in Detroit.

By the close of the week, not a few of the assembly line foremen in the industry were chafing. Furthermore, since Bendix's automotive products are diversified, effects were far-reaching.

Packard, lacking enough Bendix brake assemblies on hand, was forced to remain closed until Tuesday after the weekend, yet used the time to best advantage by taking inventory.

Buick, which uses a Stromberg carburetor, also made by Bendix, began thinking of other sources of supply. Hudson, which calls on Bendix for its electric-hand gear shifting device, was given many a worry but was not forced to close.

Likewise, Cadillac-LaSalle, which draws its supply of carburetors from South Bend, was perturbed. Remaining General Motors' plants, such as Olds, Chevrolet and Pontiac, have other sources and temporarily have no worries.

In Detroit professional labor or-

ganizers are not showing their hands to the extent they did at South Bend. True, a number of labor skirmishes, without benefit of publicity in the daily press, are going on right now in certain departments of some large plants, but so far there has been no effect on operations.

Of all the leading motor makers, the position of General Motors on strike losses is the least vulnerable. Starting from the lesson learned in the spring of 1934, General Motors has slowly fortified itself, simply through the duplication of production capacity.

The die division of Brown-Lipe-Chapin was reopened at Syracuse, N. Y.; Fisher Body built a large stamping plant at Grand Rapids; assembly plants at Los Angeles and Baltimore were constructed. Chevrolet transmissions are now made at three plants instead of solely at Toledo. Motor block warehouses have sprung up at a number of points—and so on, ad infinitum, all to the theme that protection against delay is best served by the simple insurance of more than one available plant.

The coming Christmas bonuses from General Motors and Chrysler may serve to allay friction. There has been some criticism on the bonus leveled at Chrysler and General Motors from the thousand and one small parts plants around Detroit.

### Numerous Favorable Factors

However, where these uncertainties lurk, there are a number of favorable factors to be set down on the other side of the ledger.

Since the conclusion of the shows, automobile executives have had no need to draw up interpretations as to what the shows proved. Retail demand was instantaneous, dwarfing the post-show orders of a year ago.

At this writing, General Motors visualizes that it can sell all of its output until Feb. 15; Chrysler considers it is sold out until late January and Ford by its actions shows it will also be busy at peak for at

# Mirrors of Motordom

least two months more, turning out cars to fill present orders.

Taking into account the dangling sword, possible labor trouble, this is a remarkable short-term view, fully justifying a tentative 900,000 assemblies in the last two months of 1936.

Unfilled orders from the field have been so lusty that schedules just as close to capacity as possible are on the boards at not only the plants of the big three, but through the list of the independents such as Hudson, Packard, Nash and Graham.

One surprising result will be the discovery by steelmakers and suppliers of other materials that the automobile industry within another two weeks will have placed orders covering finished steel for half of the entire 1937 production of automobiles.

The steel industry is coming to find that before Dec. 15 it will have material on its unfilled order books in sufficient quantity to make 2,500,000 finished cars.

Individually, all of the motor builders have held to the same line in the extent of this forward buying. General Motors with advance orders for steel out covering roughly 800,000 assemblies is closely followed by Chrysler with orders for 650,000 jobs and Ford at better than 500,000 units.

## Half of Steel Ordered

Chevrolet leads the General Motors total with advance buying on 500,000, Olds is down for 100,000, with Buick and Pontiac each having obligated themselves for 90,000. Cadillac and LaSalle together have signed purchase orders on materials for around 15,000 units.

In each case, these figures are fully half of what that maker will build in all of the 1937 season. For example, Chevrolet thinks it can make and sell 1,150,000 cars in the coming model season; Olds, 200,000; Buick and Pontiac each 180,000; Cadillac and LaSalle combined, about 30,000.

In every case these order sums are, of course, aggregates. Fisher Body, plus the numerous General Motors parts plants have all combined to stack up such a vast aggregate.

Chrysler, up until a week ago, had steel obligations out for 450,000 models, counting in all of Plymouth, Dodge, DeSoto and the three Chry-

## Automobile Production

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

	1934	1935	1936
Jan. ....	155,666	289,728	364,004
Feb. ....	230,256	332,231	287,606
Mar. ....	338,434	425,913	420,971
Apr. ....	352,975	452,936	502,775
May ....	330,455	361,107	460,565
June ....	306,477	356,340	452,955
July ....	264,933	332,109	440,999
Aug. ....	234,811	237,400	271,291
Sept. ....	170,007	87,540	135,130
Oct. ....	131,991	272,043	224,628
10 mo. ....	2,516,005	3,147,347	3,560,924
Nov. ....	83,482	395,059	.....
Dec. ....	153,624	404,528	.....
Year ....	2,753,111	3,946,934	.....

Estimated by *Cram's Reports*

Week ended:

Nov. 7 .....	84,305
Nov. 14 .....	104,248
Nov. 21 .....	110,160
Nov. 28 .....	104,283

ler lines themselves. To this, in just the last week, steel orders for another 200,000 jobs were added.

Ford's steel buying, representative of 500,000 models, is of course subject to adjustment upward, considering the 30 to 35 per cent slice of its own requirements which its own steel plant will supply internally.

The question now raises itself as to what form these orders are in. Most of them, so far, are simply on paper but will be subject to rapid release for rolling at the mills through December and January. Obviously, the liberal slant the automobile industry places on future requirements was hastened by the \$2, \$3, and \$4 per ton price advances on steel which came out last week for effect Jan. 1.

## Buy at Present Prices

Since many automotive steel suppliers will be shipping through January to their Detroit customers and invoicing them at the old fourth-quarter price, it becomes obvious that the material costs—at least insofar as steel is concerned—to the automotive industry will be scarcely felt until about the beginning of the last half of 1937.

When specifications for shipment begin to be issued by the automobile purchasing departments here, better than 75 per cent of the ton-

nage will be ordered immediately to be made up into parts for storage. Rather than repeat the experience of June, 1934, when blank sizes of sheets, bars, and strip were ordered and simply stored on the ground against the price advance at that time, the motor people are preferring to stack up their largest finished parts bank in history.

True, this broad buying policy will tie up as much working capital as it will storage space, but from the steel saving alone, plus the circumvention of possible labor trouble, the move seems well worth it.

Bearing out what General Motors thinks of the retail market for the next 60 days, Chevrolet was fast bending toward a 6000-unit day average last week on its various assembly lines. The weekly total was just under 30,000 jobs.

In the last three weeks Ford has made notable progress, moving from around 5000 assemblies to better than 26,000 last week, and thereby closely pressing Chevrolet. It's a good bet right now that Ford will pass Chevrolet's production before the present calendar year is out, for they are talking about 6500 to 7000 assemblies a day at Dearborn. Ford is reopening its Pittsburgh assembly plant next week, idle for four years.

## Plymouth Output Is Up

Plymouth contributed strongly to the industry's total for the week, making more than 13,000 finished jobs. The split-up finds about 2000 a day, five days, coming from Detroit lines, plus 1800 a week from Evansville, Ind., 1500 a week from the Pacific coast division.

Having made better than 500,000 of the 1936 model—a goal which it set out to do thirteen months ago—at Plymouth they're talking up the 1937 model as good for 600,000.

About the first of December Hudson will step up the tempo of its assembly lines, planning to get around 90 jobs an hour instead of the 70 per hour averaged through late November. The latter rate has been good for 3700-3800 finished assemblies a week, but it would not be surprising to see the 4000-mark crossed soon.

As related, Packard's assemblies were hit by the Bendix strike last week, though Packard counts its unfilled orders now as running up to 25,000-odd on the 115-inch-wheel-base six and around 15,000 for 120.



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Furnaces	Signs
Farm Equipment	Steel Buildings
Heating Elements	Steel Furniture
Lamps (Auto)	Stoves
Lockers	Toys
Name Plates	Vehicles (Children's)
Oil Burning Units	Water Heaters

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TINNERMAN STOVE & RANGE CO.

Speed Nut Division

CLEVELAND, OHIO

# Men of Industry

(Concluded from Page 21)

is awarded annually for scientific or industrial achievement. Professor Talbot, who is 79, was cited as "a mold of men, eminent consultant on engineering projects, leader of research and outstanding educator in civil engineering."

Earl C. Hughes, has resigned as assistant sales manager, Norton Co., Worcester, Mass., to become secretary of the Bay State Abrasive Products Co., Westboro, Mass. His resignation terminated a service of 18 years with Norton, in various sales capacities.

George H. Weiler has become associated with Vanadium Corp. of America as manager, eastern railroad division, with headquarters in New York. For a number of years Mr. Weiler was sales manager, American Locomotive Co., New York; later secretary-manager, Forging Manufacturers' association, New York; and more recently was connected with the Standard Steel Works Co., Burnham, Pa.

Ernest A. Barbeau has been appointed sales manager of the hyp-pressure jenny division, Homestead Valve Mfg. Co., Coraopolis, Pa. Mr. Barbeau takes up his duties after serving for three years as industrial sales manager for the Texas Co. in New York state. Previously he was head of E. A. Barbeau & Co., Schenectady, N. Y., investment security dealer and broker, and before that was sales engineer, General Electric Co., for ten years, at various times having headquarters at Chicago, Schenectady, Cleveland, Akron, O., and Minneapolis, devoting his chief efforts to the sale of heavy power and industrial equipment.

Joseph E. Jacobson, Luria Bros. & Co. Inc., Pittsburgh, was elected president, Pittsburgh chapter, Institute of Scrap Iron and Steel Inc. at the annual meeting of the chapter Nov. 17. Other officers elected include, vice president, Meyer W. Singer, M. W. Singer & Co., Pittsburgh; secretary, Richard Rosenberg, Pennsylvania Iron & Steel Co., Pittsburgh; treasurer, David L. Wilkoff, D. L. Wilkoff Co., Pittsburgh.

Reuben N. Trane, president, Trane Co., La Crosse, Wis., heating and air conditioning manufacturer, recently left with his family for a vacation in California.



Ernest A. Barbeau

## Died:

LEVIN FAUST, 73, in Rockford, Ill., Nov. 18. He was one of the founders of the Mechanics Universal Joint Co., Rockford Drop Forge Co., Forgings & Stampings Inc., Rockford Machine Tool Co., National Lock Co., Sundstrand Adding Machine Co., Sundstrand Machine Tool Co., and the Sundstrand Engineering Co. Recently he was president of the Elco Tool & Screw Co., vice president of the Rockford Drop Forge Co., treasurer of Forgings & Stampings Inc.,



"THE IRONMASTER" IN PERSON. Ready to "tell the world" again of industrial and social developments is Bennett Chapple, vice president, American Rolling Mill Co. Radio listeners, over a coast-to-coast hookup, this winter will hear his Sunday evening talks, designed to foster greater public appreciation of the significant role American industry plays in bringing about a higher standard of living

and vice president of Sundstrand Machine Tool Co.

Alfred D. Gile, president, Jacobs & Gile Inc., Portland, Oreg., in that city, Nov. 14.

Walter Ayer, 66, from 1910 to 1925 president, Fuller & Johnson Co., Madison, Wis., gasoline engines, in Chicago, Nov. 18.

Othmar I. Larsen, 53, assistant to the president, Borg-Warner Corp., Chicago, and formerly president, Marvel-Schebler Carburetor division of Borg-Warner Corp., in Highland Park, Ill., Nov. 23.

Walter Flannery, 45, at one time representative in the Detroit district for Vanadium Corp. of America, and member of the Pittsburgh family which developed the company, at New York, Nov. 23.

Prof. John Calder, 70, head of the industrial relations course, Springfield college, Springfield, Mass., and long recognized as an industrial management expert, in that city, Nov. 20. He had been associated with General Motors Corp., New York Shipbuilding Co., and Remington Typewriter Co.

Capt. George E. Nesbitt, 72, labor superintendent of the Pittsburgh Steamship Co. until his retirement two years ago, in Cleveland, Nov. 24.

George Anglin, 47, formerly identified with Mackintosh-Hemphill Co., and later with the E. W. Bliss Co., Salem, O., at Sharpville, Pa., Nov. 18. He was a brother of E. J. Anglin, vice president, Weirton Steel Co.

William P. Seibert, 77, former assistant general manager of sales, Carnegie Steel Co., Pittsburgh, at Sewickley, Pa., Nov. 18. He entered the steel business as an employe of McConway-Torley Corp., Pittsburgh, and later was identified with the Park Steel Co. and Ohio Steel Co. When the latter was merged into the National Steel Co. in 1898, Mr. Seibert stayed with the concern and first became identified with Carnegie in 1901. He retired in 1931.

Thomas L. Kirk, 60, formerly assistant general sales manager, Spang, Chalfant & Co. Inc., Pittsburgh, at Pittsburgh, Nov. 21. Mr. Kirk first became identified with H. C. Fownes at Pittsburgh, who operated the Carrie Furnace Co. In subsequent years he became sales manager, Standard Seamless Tube Co., Ambridge, Pa., and in 1928 when the company was merged with Spang, Chalfant & Co., he went with the latter firm. He retired a year ago.



# Meetings

## WILL DISCUSS PROBLEMS OF TAXES AND FINANCES

TAX and financial problems of American corporations, including such topics as the revenue act of 1936, the "Unjust Enrichment" tax, the social security act, and other legislation affecting corporate set-ups will be discussed Dec. 2-3 at a two-day conference sponsored by the American Management association at the Waldorf Astoria, New York.

Addresses by fiscal officers of industrial organizations and banks, tax authorities and certified public accountants, are included on the program announced by Alvin E. Dodd, association president.

Questions may be asked of chairmen and speakers and the "clinic sessions" will provide opportunity for intimate discussion of particular corporate problems.

## FOREIGN TRADE FAIR TO BE HELD IN NEW YORK

The first international trade fair in America will be held in New York, May 10-22, 1937. This exposition, to be known as the World Two-Way Trade fair, will occupy the five acres of space in Commerce Hall of the Port of New York Authority Commerce building. The second week of the fair will coincide with observance of Foreign Trade Week throughout the country and will close with National Maritime Day, May 22.

It is proposed to set up an international clearing house for world trade. The fair will include exhibits of American manufacturers, and the federal government, official government exhibits from foreign countries, and private exhibits from foreign firms. Headquarters are at 111 Eighth avenue, New York.

## GALVANIZERS COMMITTEE IN PERMANENT ORGANIZATION

A new permanent organization, the Galvanizers committee, definitely allying technical groups in the steel and zinc industries, resulted from a two-day meeting in Pittsburgh last week attended by representatives of more than 20 companies.

The plan originated with sheet galvanizers during the annual meeting of the American Zinc institute in St. Louis last April.

Close relationship of galvanizing departments to the zinc industry led to adoption of a plan whereby the Zinc institute assumes the sponsorship of the new organization, the president and secretary of the institute to be ex-officio members. Affairs of the group will be admin-

istered by a council, consisting of one individual from each company represented in the membership, and a governing board of seven chosen from the council. Two meetings will be held each year, one in conjunction with the annual meeting of the Zinc institute in April, the other in the fall.

Members of the organizing committee for last week's meeting were elected to the governing board for the coming year. They include F. G. White, Granite City Steel Co., Granite City, Ill., who will continue as chairman of the Galvanizers committee; G. A. Brayton, Newport Rolling Mill Co., Newport, Ky.; F. W. Brown, Inland Steel Co., Chicago; N. E. Cook, Wheeling Steel Corp., Wheeling, W. Va.; B. P. Finkbone, American Rolling Mill Co., Middletown, O.; H. E. McCoy, Gulf States Steel Co., Birmingham, Ala.; J. L. Schueler, Continental Steel Corp., Kokomo, Ind. Howard I. Young, president, American Zinc institute, is ex-officio member, as is also Ernest V. Gent, 60 East Forty-second street, New York, who was elected secretary-treasurer.

## PREPARES SCHEDULE OF EXPOSITIONS FOR 1937

Exhibitors Advisory council, 330 West Forty-second street, New York, has released its second annual edition of all industrial, trade, agricultural, professional, business and miscellaneous shows and expositions scheduled in 1937. Copies may be obtained by companies not members of the council for \$5 each.

Easy reading of the schedule has been made possible by an industry and trade classification of the shows listed. Dates and location of each show are given. This is said to be the most complete 1937 record of expositions which has been compiled.

## FOUNDRYMEN ANNOUNCE EXCHANGE PAPER AUTHORS

American Foundrymen's association has selected O. W. Ellis and W. Paul Eddy Jr. as exchange paper authors for 1937 meetings of the British and French foundry associations, respectively.

Mr. Ellis, director of metallurgical research, Ontario Research foundation, Toronto, will present the exchange paper before the Institute of British Foundrymen. Mr. Eddy will prepare the paper for the annual meeting of the French organization, the Association Technique de Fonderie.

This exchange of papers among leading foundry technical associations of the world was begun in 1920, the first paper being presented by the late George K. Elliott on behalf of the A.F.A. before a meeting of the Institute of British Foundrymen. An international committee was later organized to control the exchange

arrangement and to schedule periodically International Foundry congresses.

## TO OBSERVE ANNIVERSARY OF DIESEL POWER IN U. S.

Fortieth anniversary of the introduction of diesel power into the United States will be observed Dec. 2 by a distinguished group of 300 leaders in business, industry and engineering at a luncheon at the Waldorf Astoria, New York, arranged by the diesel committee of the Exposition of Power and Mechanical Engineering. The date coincides with "diesel day" at the Power show which opens Nov. 30.

Although millions of diesel horsepower are installed in the country's railroads, mines, mills, ships, pumping stations and power houses and millions more employed in mobile units on engineering projects, on farms, in forests, and in countless other major industries, the projected luncheon is the first time public interest will have been focused on progress and importance of the diesel industry as a whole. Part of the program will be broadcast over a coast-to-coast radio network of the National Broadcasting Co.

## Wire Rope 7½ Miles Long, Without Splices

What is claimed to be "the world's largest steel wire rope" was recently produced in Warrington, Lancashire, Eng. This rope is 4½ inches in circumference, approximately 7½ miles long in one continuous length without joints or splices, and weighing approximately 57 tons. It took eight weeks to manufacture.

The rope consists of 144 wires grouped in six strands each of 19 wires. These six strands in turn are closed over a manila center. The working speed of the rope in service is 13½ miles per hour. Manufacture of the rope is reported in *Industrial Britain*, published by the Travel and Industrial Development association of Great Britain and Ireland, 6, Arlington street S. W. 1, London.

## Prime Galvanized Sheets Are Marked for Quality

Prime galvanized sheets are being stenciled by a number of manufacturers, following the recommendation by the National Association of Sheet Metal Distributors at its recent meeting in Atlantic City, N. J. Several producers are stenciling "Prime" on their high-grade sheets and others are preparing to adopt the custom.

The suggestion has been made that "Second" be stenciled on the lower grade of sheets as well.

# Activities of Steel Users and Makers

**P**RESSED STEEL CAR CO., Pittsburgh, will sell for dismantling its long unused car shops, North Side, Pittsburgh. Aside from a number of machine tools, it is estimated that about 800 tons of scrap will be reclaimed from the building.

Climax Molybdenum Co., New York, has removed its Detroit office and laboratory to its new building at 14410 Woodrow Wilson avenue.

S. O. Otrich Co., San Francisco, has been appointed sales representative by the Stearns Magnetic Mfg. Co., Milwaukee, manufacturer of magnetic separators, clutches, brakes and other equipment.

Atlantic Brass & Copper Co., New York, wholesale jobber of metals, has removed its office and ware-

house from 579 Broadway to larger quarters at 140 Grand street. H. M. Schwartz is in charge.

Pfaudler Co., Rochester, N. Y., has purchased from the Ferro Enamel Corp., Cleveland, a large box-type furnace for porcelain enameling tanks. The furnace is to be equipped with Surface Combustion Co.'s gas-fired alloy radiant tubes.

American Steel Foundries, Chicago, is preparing to reopen its plant at Verona, Pa., in the Pittsburgh district, which has been idle about six years, about Jan. 1. Capacity at the Verona works includes three 25-ton open-hearth furnaces, a machine shop and a pattern shop.

Joseph Schonthal Co., scrap merchant, announces that it will be absorbed by its parent company, Summer & Co., Columbus, O., because of legislation affecting holding companies. Its entire property will be taken over by the parent company and its business will be carried on

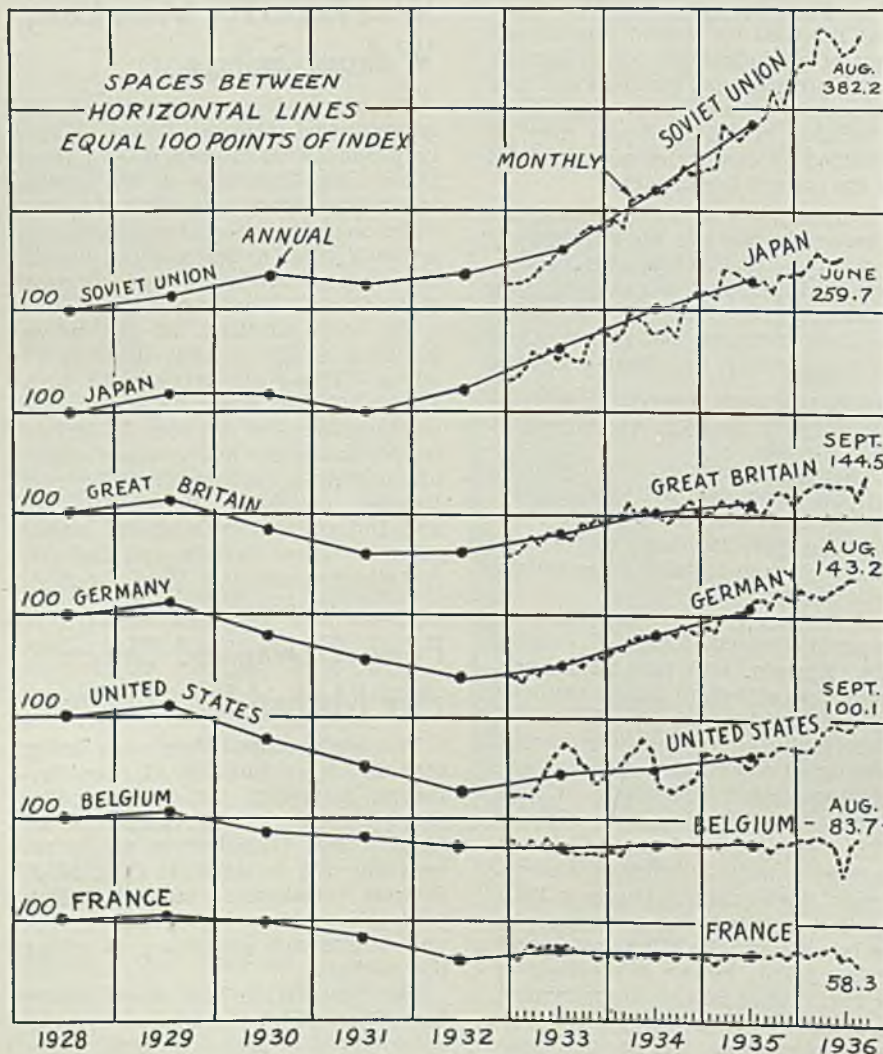
under the present management by and in the name of Summer & Co.

Fulton Iron Works, St. Louis, has been awarded a \$2,500,000 machinery and equipment contract by the Mexican government, in connection with a \$4,000,000 sugar factory and refinery which the government is building at Zacatepec, state of Morelos. The contract calls for shipment of machinery and equipment within eight months.

Union Wire Rope Corp., Kansas City, Mo., has appointed Wendrick Steel Products Co., its distributor in Illinois, Wisconsin and northern Indiana, with offices at 53 West Jackson boulevard, Chicago. Union also announces that its modern research laboratory and its engineering staff are at the service of all wire rope users.

Latrobe Electric Steel Co., New York, announces that the International Nickel Co. Inc., New York, has just concluded a license for the United States and foreign countries to use Armstrong patents Nos. 1,997,538 and 2,044,742 for the manufacture of clad products, plates, sheets and the like, using the electrolytic iron bonding or welding method, which process has been used by the Latrobe company for the past few years, and recently by Jessop Steel Co., Washington, Pa.

### Eight Years of Steel Production in Seven Countries



**B**ASING output of steel ingots and castings on 1928 as 100, in each of the seven countries, the National Industrial Conference board has here charted the index figure for each subsequent year. In the United States the index in 1932 was lower—in comparison with 1928—than in any other country. The index in the United States in September was 100.1. On the basis of annual averages, steel output in this country this year has recovered about 77 per cent of the depression decline; Great Britain about 142 per cent; Germany 127 per cent; France 22 per cent; Belgium about 21. In the Soviet Union output has risen fairly steadily for eight years. In Japan this year it is more than two and one-half times as great as in 1931

## Why Not Apply Automobile Technique to Home Building?

**W**HEN future writers chronicle the development of the American automobile, they will refer to 1936 as the year in which the all-steel body and top became practically a universal standard for the industry.

In the current shows, at which 1937 models are being displayed, the all-steel construction is being emphasized by all but two or three companies. Buick, Chevrolet, Chrysler, DeSoto, Dodge, Ford, Hudson, Lincoln, Oldsmobile, Plymouth, Pontiac, Studebaker and Willys all are stressing steel construction in their advertising.

The phrasing varies only slightly. Hudson offers "bodies all of steel with seamless steel roofs." General Motors units announce "Unisteel bodies by Fisher with turret tops." The Chrysler subsidiaries ring in variations of the theme "Safety all-steel bodies with beautiful one-piece steel roofs." Studebaker presents "all-steel bodies reinforced by steel." Lincoln describes its construction as "all-steel rigid body and frame—welded into a single unit." Willys uses the cryptic "all-steel body and top." Ford, more specific than some of its rivals, says, "Not an ounce of wood used for structural strength. Frame structure all steel, sheathed with steel panels—top, sides and floor. All are welded into a single steel unit of great strength."

### Transition from Wood to All-Steel Construction Accomplished Voluntarily in Less Than Decade

One cannot contemplate this general shift, first from wood, then to composite construction and finally to all-steel fabrication without recognizing several significant factors.

One is the speed with which the transition has taken place. Speaking conservatively, it can be stated that the changeover has been effected in considerably less than a decade. Also, it should be noted that the transition has been accomplished voluntarily by the manufacturers of automobiles, without undue pressure of public demand and certainly without any suggestion from government authority.

Compare this example of change with the experience of the railroads. The rail transportation companies have been in the process of eliminating passenger cars of wood and composition construction for more than 20 years and today thousands of these units still are in active service. Moreover, the insistence for change came from a public demand for safety,

which aroused the interstate commerce commission to the point of requesting the roads to adopt steel construction. We realize that the conditions of ownership and operation of railroad cars and automobiles are not comparable. Nevertheless, the contrast in speed of change is significant.

Another factor is the co-operation among industries which facilitated the transition to steel. Here the iron, steel and metalworking industries justly share honors with the automobile manufacturers. Without the continuous mills, the facilities for rolling wide flat material, the intricate equipment for shaping it and the modern services of welding and finishing, the all-steel bodies and tops could not be produced at a cost that would permit them to be incorporated in today's cars at today's prices. It is this co-operation between industries which provides encouragement to the hope that American industry has found a new key to success. As has been pointed out many times in this column, the ability to co-ordinate industry's resources to capitalize the opportunities of mass production for mass consumption is one of the nation's most important assets.

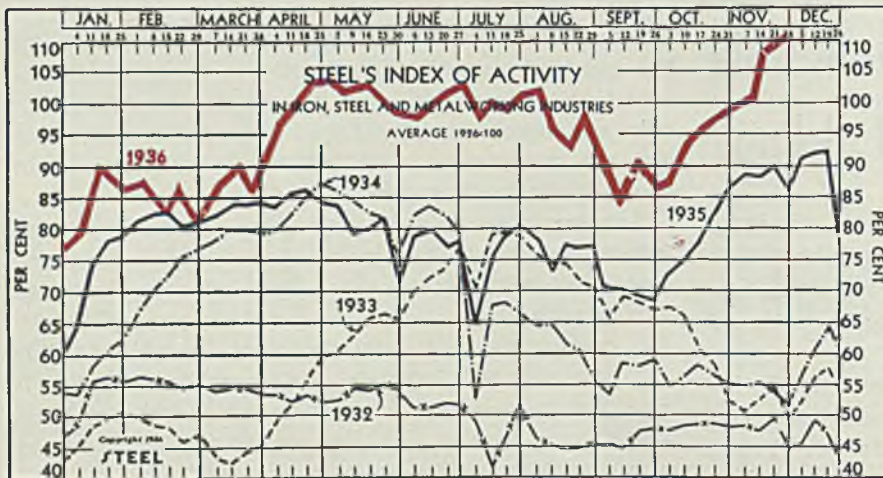
### Co-operation of Many Industries Speeds Progress In Auto Development; Might Solve Home Problem

The third factor cannot be appreciated without the exercise of some imagination. The display of all-steel bodies shows the extent to which the co-ordination of the efforts of many industries has broadened the markets for automobiles. What would the same degree of co-ordination accomplish in other profitable mass consumption markets? And, specifically, what is the most attractive mass consumption market now awaiting development?

Considering the last question first, the answer is the market for low-priced homes. The obvious reply to the other inquiry is that if the co-ordination among industries which has proved so effective in the case of automobiles can be applied to the building construction problem, the solution will be found in less than a decade.

Executives in the iron, steel and metalworking industries should give prompt attention to the small house market. Somebody is going to find the way to adapt the demonstrated advantages of industry co-operation to the building problem. Right now we would almost bet that various branches of industry will continue to fumble the small house opportunity until in the end the automobile manufacturers will step in and make a success of it. It is almost conceivable that the entry into housing by the way of the present trailer fad may give the motor car interests an advantage which other aspirants may not be able to overcome.

# THE BUSINESS TREND



STEEL'S index of activity in the iron, steel and metalworking industries gained 2.0 points to 109.9 in the week ending November 21:

Week ending	1936	1935	1934	1933
Aug. 22.....	97.7	77.0	60.3	71.6
Aug. 29.....	94.0	77.3	55.1	70.3
Sept. 5.....	87.5	70.9	53.5	65.5
Sept. 12.....	83.1	70.1	58.7	69.1
Sept. 19.....	90.1	69.4	58.1	68.2
Sept. 26.....	86.2	68.5	59.3	66.9
Oct. 3.....	89.0	73.3	54.7	67.4
Oct. 10.....	93.4	74.9	56.4	66.0
Oct. 17.....	95.5	77.4	58.2	60.9
Oct. 24.....	97.1	82.4	56.3	58.0
Oct. 31.....	99.1	86.4	55.0	52.3
Nov. 7.....	102.1	88.4	54.9	50.7
Nov. 14.....	107.9†	88.8	55.2	52.6
Nov. 21.....	109.9*	90.8	54.4	55.4

†Revised. \*Preliminary.

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

## Industry Now Faring Better Than in Same 1929 Period

**O**UTSTANDING in the record of business for November is the sharp upward swing which developed shortly after election day. This marked the first major deflection of the trend of business in 1936 from the pattern traced throughout 1935.

A glance at the chart of STEEL'S index of activity, appearing above, shows that the 1935 and 1936 trend lines moved up to seasonal peaks in April, tapered off slightly until the end of September and mounted at almost the same angle in October. But whereas the 1935 trend line leveled off in November, the 1936 line shot upward in that month.

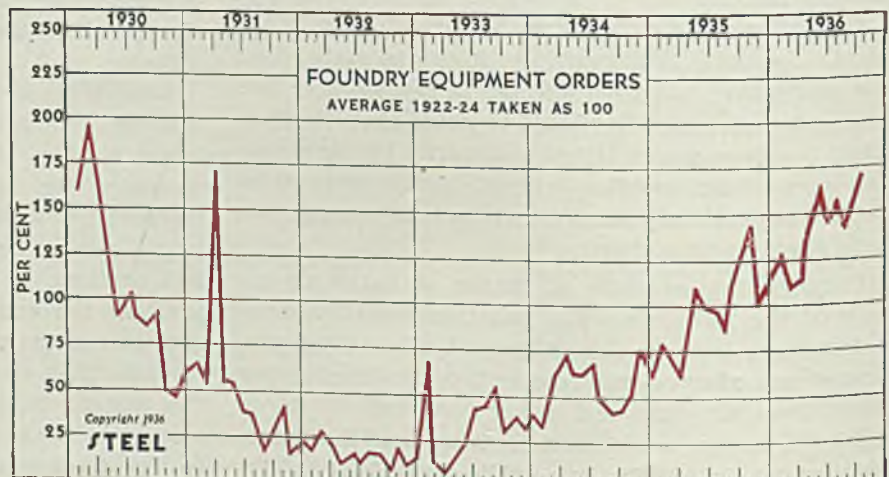
This sudden spurt establishes industrial activity on

a plane which compares very favorably with the records of the last few months of 1929. As a matter of fact, the iron, steel and metalworking industries fared surprisingly better in November, 1936 than in November or October of the much publicized year of 1929. This is easily demonstrated by a few direct comparisons.

Steelworks operations in November, 1936, will average about 74 or 75 per cent. The average in November, 1929, was 74.1. But this understates the 1936 position, because the percentages of operation are based on different capacities. The actual production of steel ingots in November, 1929, was 3,513,025 gross tons. The comparable figure for November, 1936, will be around 4,500,000 tons, or about 28 per cent greater than the output of the 1929 month.

A similarly favorable comparison can be made of automobile production. Assemblies in November, 1929, averaged about 50,000 weekly. The corresponding av-

	Per Cent			
	1936	1935	1934	1933
Jan. ....	127.0	86.6	37.2	68.4
Feb. ....	110.4	75.7	65.8	16.1
March ...	115.0	69.4	75.4	9.8
April ....	134.0	113.2	67.9	19.4
May ....	165.4	100.7	66.5	25.6
June ....	141.4	100.2	70.4	45.5
July ....	159.6	94.0	50.7	48.8
Aug. ....	144.8	113.0	43.1	56.3
Sept. ....	161.0	128.5	46.4	34.9
Oct. ....	173.8	140.0	55.3	42.5
Nov. ....	100.4	100.4	80.4	36.6
Dec. ....	118.1	66.9	43.8	

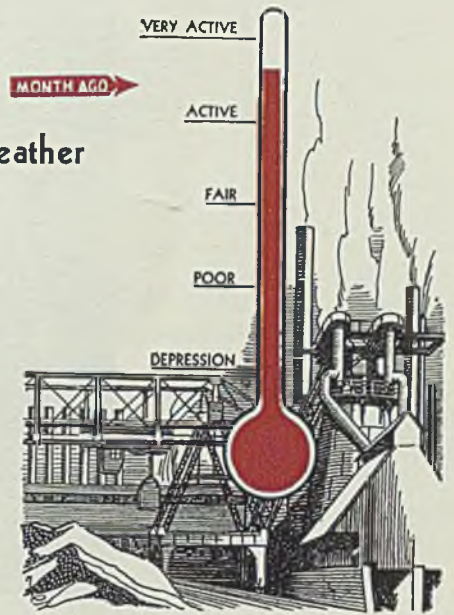


erage for November, 1936, will exceed 100,000 cars weekly or double the 1929 average.

Electric power output in November, 1929, was running at about 1,800,000,000 kilowatt-hours weekly. Today it is clinging consistently to a level of about 2,169,000,000 kilowatt-hours, a noteworthy increase of 20 per cent.

In railroad freight traffic the official figures are unfavorable to 1936. Revenue car loadings averaged 998,000 a week in November, 1929, and will run about 790,000 in November, 1936—an apparent decline of 20 per cent. However, freight car loading figures do not present an accurate measure of freight traffic. To round out the picture we need a record of tonnage carried by motor trucks. If statistics of highway truck shipments were available, we might find that Novem-

### Industrial Weather



**TREND:**  
*Upward*

### Where Business Stands

Monthly Averages, 1935=100

	Oct., 1936	Sept., 1936	Oct., 1935
Steel Ingot Output .....	156.6	148.9	108.4
Pig Iron Output .....	167.3	157.6	110.6
Freight Movement .....	135.1	126.2	118.8
Building Construction .....	175.1	169.1	132.5
Automobile Production ....	67.4	35.9	81.3
Wholesale Prices .....	.....	102.8	102.9

ber, 1936, traffic compares favorably with that of the eleventh month of 1929.

Perhaps the greatest contrasts in conditions now and in the closing months of 1929 lie in the direction of

trend and in character of the support for industrial activity. The tendency in November, 1929, was sharply downward; today it is moderately upward. Then industry still was being bolstered by a considerable volume of building construction. Today even the government-sponsored public works added to private construction equals only a fraction of the building activity enjoyed in the latter months of 1929.

Currently industrial activity is supported to a large extent by demands originating in the mass production industries, such as automotive, household equipment, etc. From now on, construction and heavy equipment building should figure more prominently in the picture of expanding business.

### The Barometer of Business

#### Industrial Indicators

	Oct., 1936	Sept., 1936	Oct., 1935
Pig iron output (daily average, tons) .....	96,509	90,942	63,818
Machine tool index .....	127.5	132.0	102.9
Finished steel shipments... ..	1,007,417	961,803	686,741
Ingot output (daily average, tons) .....	168,333	160,043	116,535
Dodge building awards in 37 states (sq. ft.) .....	36,718,900	35,448,000	27,775,900
Automobile output .....	*235,000	139,785	283,334
Coal output, tons .....	42,935,000	37,200,000	37,768,000
Business failures; number ..	611	586	1,097
Business failures; liabilities	\$8,441,000	\$9,819,000	\$22,243,000
Cement production, bbls. ....	.....	12,292,000	7,510,000
Cotton consumption, bales ..	646,000	630,000	552,000
Car loadings (weekly av.) ..	819,125	765,280	720,481

\*Estimate.

#### Financial Indicators

	Oct., 1936	Sept., 1936	Oct., 1935
25 Industrial stocks .....	\$231.67	\$222.14	\$186.84
25 Rail stocks .....	\$45.85	\$44.15	\$26.73
40 Bonds .....	\$89.63	\$88.95	\$81.18
Bank clearings (000 om'ted) .....	.....	\$23,927,000	\$20,483,390
Commercial paper rate (New York, per cent) ...	%	%	%
*Commercial loans (000 omitted) .....	\$8,721,000	\$8,753,000	\$7,902,000
Federal Reserve ratio, per cent .....	80.0	79.5	76.5
Railroad earnings .....	†\$70,166,026	\$64,680,717	\$57,359,339
Stock sales, New York, stock exchange .....	43,998,322	30,872,287	46,662,841
Bond sales, par value .....	\$337,065,500	\$304,837,900	\$275,608,200

\*Leading member banks Federal Reserve System.  
†September, August and September respectively.

#### Foreign Trade

	Oct., 1936	Sept., 1936	Oct., 1935
Exports .....	.....	\$219,967,000	\$221,215,000
Imports .....	.....	\$215,525,000	\$189,240,000
Gold exports .....	.....	\$42,000	\$76,000
Gold imports .....	.....	\$171,866,000	\$315,424,000

#### Commodity Prices

	Oct., 1936	Sept., 1936	Oct., 1935
STEEL's composite average of 25 iron and steel prices ..	\$34.67	\$34.15	\$32.84
Bradstreet's index .....	.....	\$10.27	\$10.28
Wheat, cash (bushel) .....	\$1.30	\$1.28	\$1.16
Corn, cash (bushel) .....	\$1.18	\$1.26	\$1.08
Petroleum, crude (Bbl.) .....	.....	\$1.08	98c

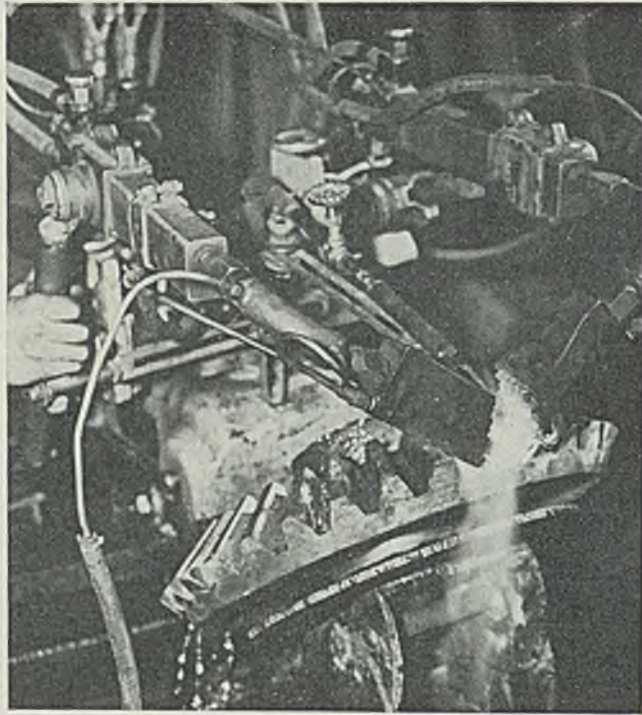


Fig. 1—General setup for machine hardening gear teeth by means of the oxyacetylene flame

## LOCALIZED SURFACE HARDENING

Now Widely Done with the Oxyacetylene Flame.  
Analysis of the Steel Is an Important Factor

BY R. L. ROLF\*

**W**HILE the idea of using the acetylene flame for surface hardening long antedates the Shorter experiments in England, the credit for mechanizing and standardizing this process belongs to him. It was due to his efforts that this technique was revived and its application spread over a large variety of work.

Until recently this procedure was one of experimental nature but today it assumes a wide commercial importance for localized surface hardening.

This method of hardening imparts a hardened layer to the surface of the material without altering its chemical composition. And since it does not effect a chemical change in the surface, it must be differentiated from those processes which require the addition or absorption of other elements. Such other processes are carburizing, chapmanizing, nitriding, cyaniding and aero-casing.

These latter processes require prolonged heating at high temperatures in special furnaces, thus making many jobs prohibitive,

from the standpoints of size and shape. The long time cycle at elevated temperatures often results in excessive distortion involving expensive straightening operations or costly machine work, with the necessity for allowing ample stock to take care of this anticipated distortion.

In many instances only a portion of the component requires hardening. It seems quite wasteful in such instances to heat, for example, an entire gear weighing 7000 pounds to a temperature of 1700 degrees for 90 to 100 hours when only the teeth, about 10 per cent of the total area, require hardening.

For mass heat treating of small objects which are to be uniformly hardened the furnace method is beyond question the most efficient and economical. There are many instances, however, where the parts are of considerable size or where there is danger that distortion, when using the furnace method, cannot be

\*Consulting metallurgist, Cleveland, and metallurgical engineer, Lakeside Steel Improvement Co., Cleveland.

prevented. In such cases, the oxyacetylene flame may well be used to advantage since this process permits the hardening of any accessible portion of an article with no measurable distortion.

In this process, one of the first points to be considered is steel analysis. To obtain any appreciable degree of hardening it is obvious that the material treated must be of such a chemical composition as readily to respond to heating and quenching. For straight carbon steels the carbon content should be at least 0.40 per cent, the best range being between 0.40 and 0.70 per cent. Steels having a carbon content greater than this have been hardened successfully but greater care has to be exercised to prevent surface checking or cracking. The low alloy steels appear to be the most desirable for treatment by this flame process. These steels usually harden to a good degree and except for certain types they may be heated and quenched without danger of cracking. Steels in the higher alloy category present a more difficult prob-

lem and many analyses are to be avoided.

Steels with only a slight abnormality and having a McQuaid-Ehn rating of 6-8 are preferable as this combination develops a martensitic structure in the hardened zone without the usual martensitic cracks.

While steels in the "as cast" or "as forged" state may be successfully treated, for best results the parts should first be heat treated by quenching and drawing to a sorbitic structure or by normalizing to produce a grain size which closely approaches the heat treated structure.

#### Chemistry of Steels Listed

Table 1 gives the approximate chemistry of steels which have been successfully hardened by the oxy-acetylene flame.

In this process the surface of the material is brought rapidly to the desired temperature by means of an oxyacetylene flame and immediately quenched, permitting practically no time for diffusion.

Water is the most common quenching medium but there are instances where a more severe quench is desired. In such cases caustic or brine is substituted. For milder quenching, hot water, soap solutions, soluble oil or a spray may be used, while an air blast is employed on air hardening steels.

Thus optimum hardness values may be obtained on the surface of the part, thereby permitting these surfaces to resist wear, but at the same time the original strength and toughness is retained in the core as is evidenced by the results tabulated in Table 2.

#### Physical Properties Vary

Fig. 6 illustrates the effect of hardening on S. A. E. 5140 steel and is representative of curve tendencies of many other types. From this curve we observe: that up to 200 degrees Fahr. there is only a slight falling off in maximum stress but after reaching this point it falls off rapidly; that the toughness, as measured by impact, is at a minimum between 0 degrees and 700 degrees Fahr., and then increases rapidly from this point to 1300 degrees Fahr.; and that the Brinell hardness shows a sharp decline after passing 200 degrees Fahr.

Here we note that with the standard heat treating procedure, high hardness values are accompanied by low toughness but high tensile properties. Lowering the hardness, the tensile decreases with resulting increase in toughness. Confronted with these facts, the designer is forced to compromise, selecting a hardness that will wear reasonably well and still possess fair shock resisting properties.

Flame hardening to a large extent removes this compromise, for

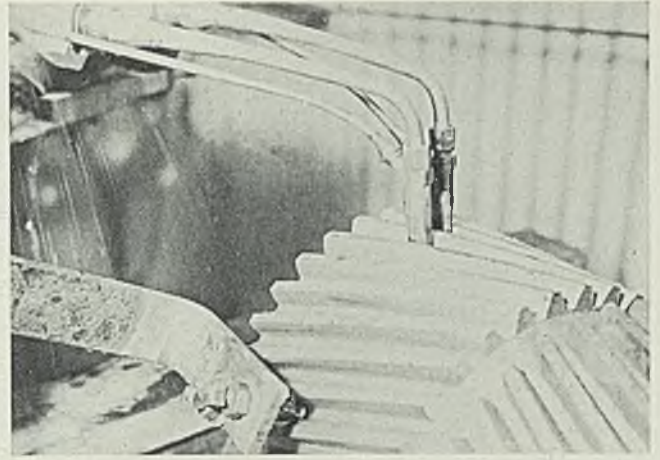


Fig. 2—In hardening gear teeth, heating is done by an oxy-acetylene flame and quenching by a stream or spray which follows immediately behind the torch

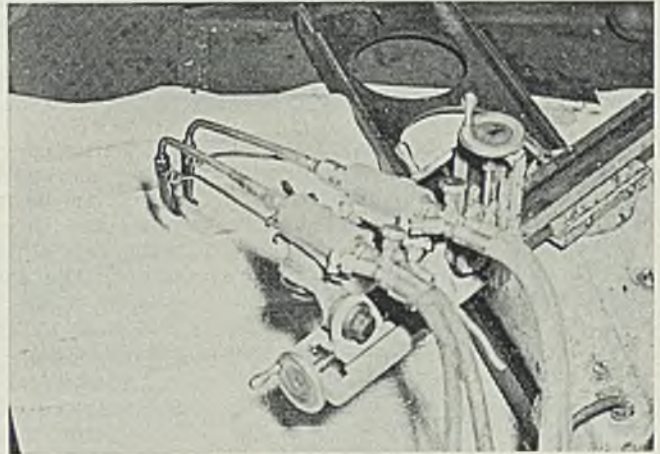


Fig. 3—Monitor type flame hardening machine

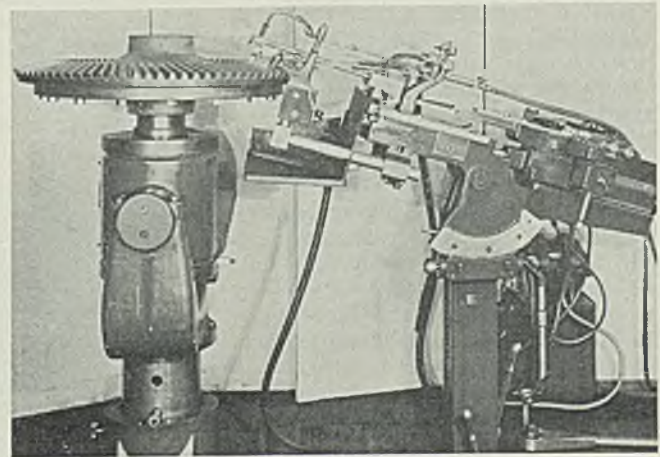


Fig. 4—Gleason gear hardening machine

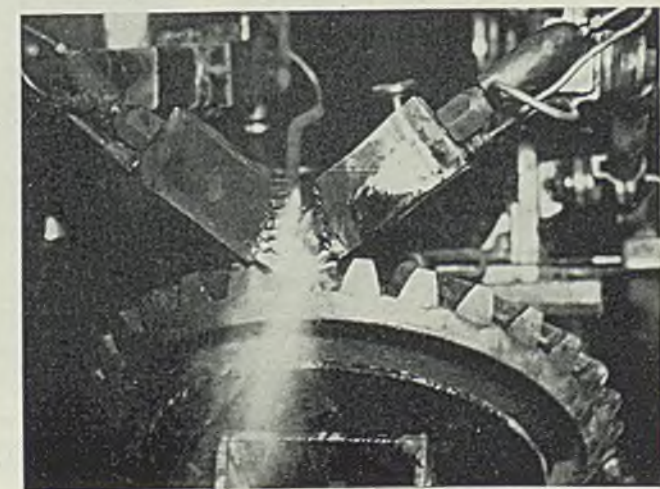


Fig. 5—In hardening of gear teeth the head is so designed as to allow operation in the restricted area between the teeth

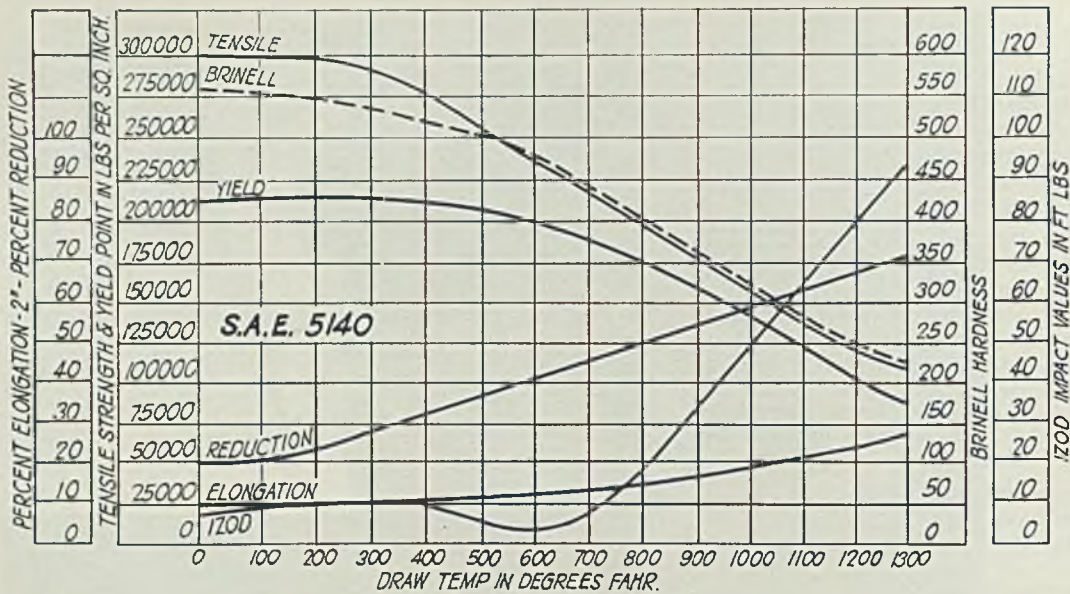


Fig. 6—Illustrating the effects of hardening on S. A. E. 5140 steel, these curves show that with standard heat treating procedure high hardness values are accompanied by low toughness but high tensile properties. Lowering the hardness, the tensile decreases with resulting increase in toughness. These curves show necessity for a compromise in selecting a hardness that will wear reasonably well and still possess fair shock resisting properties

with this process hard wearing surfaces may be produced on a core of the proper physical characteristics without affecting the original core properties.

Methods employed in torch hardening depend primarily on the nature of the work treated. While there are many instances where this operation must be performed by hand, practically all torch hardening operations still can be made mechanical. These methods may be divided into two general types: Progressive hardening, where the torch travels along the face of a stationary object; the spinning method, where the specimen to be hardened is spun or rotated in front of a stationary flame.

#### Outline of Processes

This latter method may again be sub-divided into two groups according to the speed of rotation; in one of them the work is rotated very slowly in front of the blow pipe; in the other the specimen is spun at a fair rate of speed, between 70 to 150 revolutions per minute, in front of one or more blow pipes.

In progressive hardening, when hardening a stationary object, a blow pipe with a head of sufficient flame area to cover the path of the section being hardened, as shown in Fig. 2, is directed against the surface of the work and then moved at the maximum speed which will bring the work to the desired hardening temperature. Following immediately behind the torch is a stream or spray which progressively quenches the heated surface. While the usual speed of travel is between 6 and 8 inches per minute, it may vary anywhere from 4 to 10 inches per minute, depending upon the analysis of the material, the depth of penetration, the hardness desired and the nature of the work.

The spinning method permits the

hardening of circular paths by rotating the specimen to be hardened under one or more stationary blow pipes and then quenching the part while it is still spinning, either permitting the work to spin under a cooling spray or by ejecting the part from the machine into the coolant selected.

Although the speed of rotation is not very critical and may vary widely without affecting the final structure, it has been noted that a range of 70 to 150 revolutions per minute generally is satisfactory for most work, such as small gears and pinions, conveyor rollers and similar objects.

For larger work, such as track

wheels, forming rolls, and circular sections too large to spin, progressive heating and quenching by one slow revolution is the most desirable. This procedure is similar to the straight line operation, except that in this instance the torch is stationary and the work revolves under the flame at a speed which permits the metal to be heated rapidly as it passes. The quenching is accomplished by a spray or stream immediately behind the blow pipe and directed against the heated surface, as in the progressive hardening arrangement.

There are two outstanding types of flame hardening machines used in the United States today, the monitor

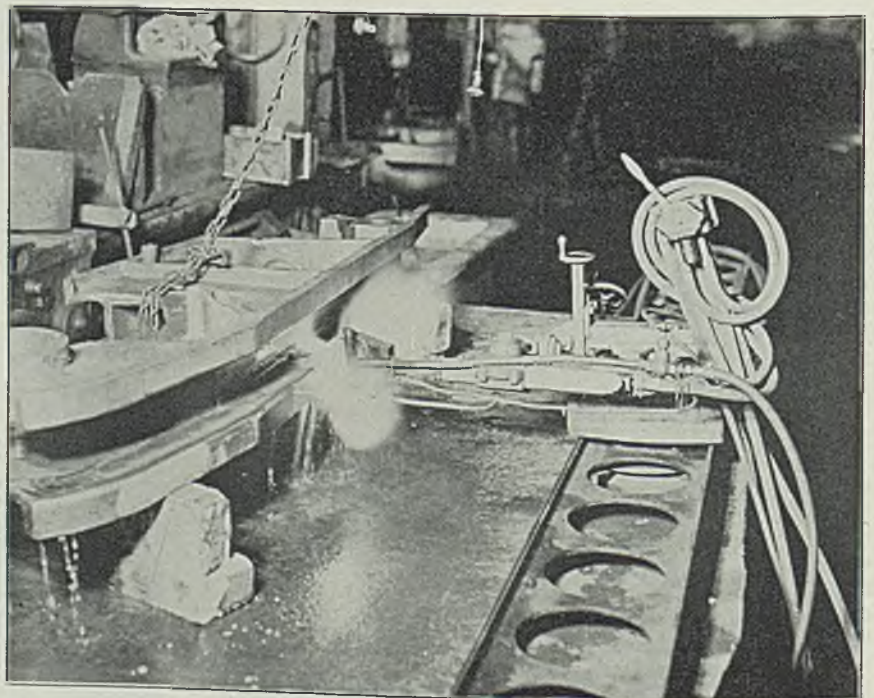


Fig. 7—A good example of straight line or progressive hardening; it is necessary to harden only the flat portions of these guides for a coal mining machine, the remainder of the casting being left soft



type of construction which is illustrated in Fig. 3 and the Gleason design shown in Fig. 4. With the exception of indexing, all machines are entirely mechanical. Variable speed travel permits uniform heating of sections of different sizes and sections of tapering thickness.

For general application the equipment consists of a large capacity water cooled oxyacetylene blow pipe and various types of water cooled multiflame heads which pass about 300 cubic feet of each gas per hour. There are many applications where this large capacity head is not applicable, as on small work. In such cases the welding blow pipe equipped with the proper multiflame head is all that is necessary.

The water cooled heads in use today are of two general types, one for gear teeth and the other for flat work.

In gear hardening the head is so designed as to allow operation in the restricted area between the teeth as may be observed from Fig. 5. Two blow pipes generally are used. These heat the tooth on both sides simultaneously, thus reducing the possibilities of twisting, distortion, or checking of the tooth. The hardening also is accomplished much faster than in applications where only one blow pipe is employed.

#### Heads Designed for Flexibility

Heads used for flat work and gear hardening are designed to have a wide range of hardening applications. With a choice of tip sizes and the possible adjustment of heated area by removable plugs located in each head, there is a certain amount of flexibility in heat intensity.

Even with this flexibility, it is not possible to cover the entire range of possible applications, as there are many instances where heads of special design are essential, such as for the hardening of sheaves, grooved rolls, and other like objects.

Quenching is a simple problem. In many applications only a small stream is required to remove the heat from the hardened area. Where

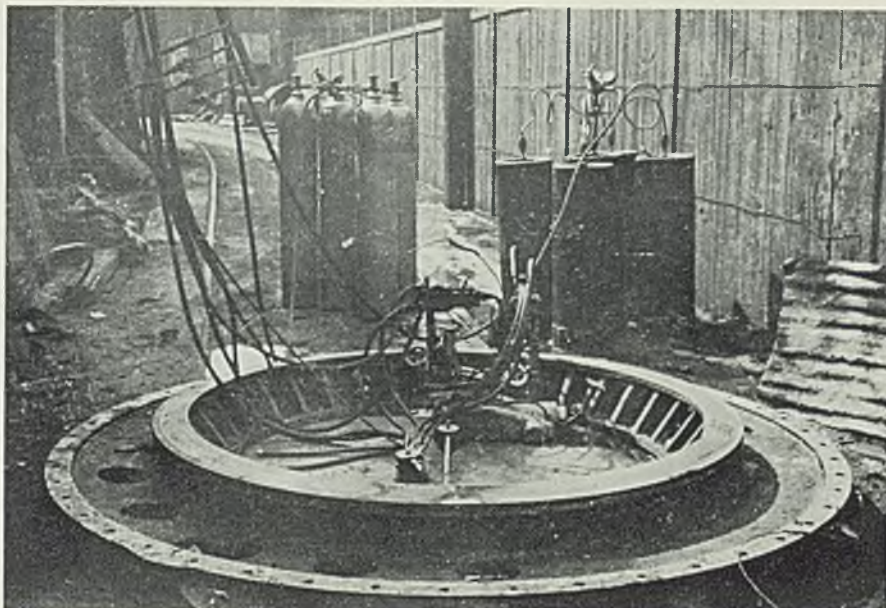


Fig. 8—This view shows progressive hardening of a circular path on a 4000-pound steel casting

a larger quantity is necessary, a fan-shaped nozzle or a spray may be used. But where work is quenched by the spinning method, the pipe carrying the quenching medium should be affixed to the torch holder in such a manner as to permit proper adjustment of the quenching solution on the heated areas. This solution should follow the last flame as closely as possible, but the distance between the flame and quench is not critical. In fact, the spacing may vary up to about 1 inch.

Drawing or stress relieving is absolutely essential and should follow closely after quenching. The primary importance of this operation is to eliminate the danger of cracking or checking. This operation is performed in a standard type heat treating furnace held at a temperature of 250 to 300 degrees Fahr. This low temperature is sufficient to relieve the stresses set up by quenching, but has very little, if any, effect upon the hardness. After

heating the work for a sufficient length of time at this temperature the parts may be removed from the furnace and cooled in still air, or they may remain in and cool down with the furnace.

A few specific instances may give the reader a clearer conception of the widespread application of this process.

#### German Hardening Process

In 1931 the Bergische Stahlindustrie, Reinscheid, Germany, perfected a double hardening process which the company termed "Doppel-Duro." This process was found to be especially applicable to the hardening of round parts such as bearing raceways on crank shafts. This double hardening process used a steel similar to our S.A.E. 4140 which was hardened to a scleroscope hardness of 80 to 90 or an equivalent brinell hardness of 600 to 700. In this instance the shaft was normalized after forging, machined and har-

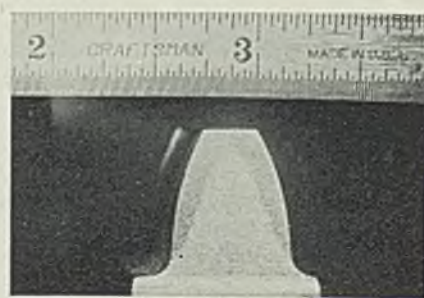
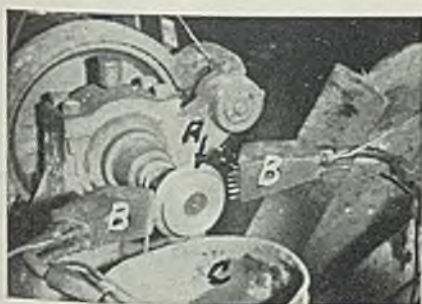


Fig. 9 (left)—An example of the spinning method; A, the part being treated, is mounted on the headstock of a standard lathe while the multiflame torches, B, heat the circumference as the part spins between the heads; when the desired temperature has been reached the part is ejected into the quenching medium, C. Fig. 10 (center)—Shapes such as this are only partly adaptable to the machine hardening method; sides of the clutch teeth, A, are torch hardened manually while the teeth at bevel end, B, are machine hardened. Fig. 11 (right)—Section of gear tooth, showing depth of surface hardening obtained by machine hardening with the oxyacetylene process

Table 1

## Approximate Chemistry of Steels Which Have Been Hardened Successfully by the Oxyacetylene Flame

S. A. E. Series No.	Carbon, per cent	Manganese, per cent	Chromium, per cent	Nickel, per cent	Molybdenum, per cent	Vanadium, per cent	Silicon, per cent
1000	0.35-0.60	0.60-0.90					
1300	0.25-0.40	1.25-1.90					
3100	0.25-0.45	0.50-0.90	0.45-0.75	1.00-1.50			
3200	0.25-0.45	0.30-0.60	0.90-1.25	1.50-2.00			
3300	0.25-0.45	0.30-0.60	1.25-1.75	3.25-3.75			
4100	0.25-0.45	0.50-0.90	0.50-1.10		0.15-0.25		
5100	0.20-0.35	0.30-0.60	0.60-1.10				
6100	0.25-0.45	0.30-0.90	0.80-1.10			0.15-0.25	
Cromansil	0.25-0.45	1.00-1.20	0.40-0.60				0.80-1.00

dened and drawn to a brinell hardness of 300, prior to flame hardening the surface.

In 1933 the Oxyweld Railroad Service Co. put into operation a new and improved method of hardening rail ends by the oxyacetylene method. In this process a rather large oxyacetylene flame was used so that the surface of the rail could be brought to the desired hardening temperature before the deep seated portion of the rail was materially heated. Removal of the flame permitted the simple conduction of heat from the cold rail to act as a quenching medium, the rate of quenching being such that the surface is automatically left at the desired hardness.

Another application for machine hardening is illustrated in Fig. 7, showing the setup for hardening guides for a coal mining machine. In this instance only the flat portions of the guides are required hard, the remainder of the casting is left soft. Note how the monitor bearing the torches is mounted on a track parallel to the surface to be hardened. This is a good example of straight line or progressive hardening.

### Hardening Large Casting

Fig. 8 illustrates progressive hardening of a circular path on a 4000-pound casting. In applications such as this there will exist a small diagonal path across the hardened face which, though refined, will be several points softer in hardness than the hardened area. These are the starting and stopping points. But if these small soft areas are simply placed at an angle, the wearing qualities of the part will not be impaired.

An example of the spinning method is shown in Fig. 9. The part being treated, A, is mounted on the headstock of a standard lathe. Multi-flame torches, B, heat the circumference as the part spins between the heads at about 90 revolutions per minute. When the component reaches the desired quenching temperature, the operator ejects the

part from the machine into the quenching medium, C.

Shapes such as illustrated in Fig. 10 are hardened by hand. Specimens of this nature are almost impossible to machine harden but are very adaptable to the hand method. Fig. 11 illustrates a combination hand and machine operation. In these castings it was required only that the gear teeth, A, and the side faces of the clutch jaws, B, be hardened. The gear teeth were machine hardened but the jaws were hardened manually.

### Malleable Iron Is Hardened

Malleable iron seldom is regarded as a metal susceptible to hardening. However, under the quick, sharp heat of the oxyacetylene flame a very satisfactory hardness can be attained.

The surface hardness which can be anticipated from torch hardening is approximately the same as what the material would produce if hardened in a conventional furnace and water quenched.

The best results have been found on machined surfaces. Rough castings and forgings may be flame hardened successfully, but on material of this type it must be considered that the decarburized areas will not respond to hardening any more than in the usual method of heat treatment. When checking rough sections for hardness, it is important that all

the decarburized surface be removed and the test made on parent metal. Otherwise a hardness considerably below the actual hardness may be read.

## Hard Facing Reduces Wear On Tire Chain Cross Links

Drops of tungsten carbide deposited on cross-links of a set of truck tire chains so hardened the links, according to *Oxy-Acetylene Tips*, that the reverse side next to the tire showed more wear than the street side. Tests were made by operators of a fleet of 700 delivery trucks in the vicinity of New York, with the result the company has standardized on chain links hard faced with a composite rod containing Haystellite, tungsten carbide material. Conventional chains and hard faced chains were operated on the same truck. After a run of 265 miles, the former were almost completely worn through, while the hard faced chains showed relatively little wear, the deposit being only slightly flattened.

## A.I.M.E. Transactions Made Available in Volume

*Transactions of American Institute of Mining and Metallurgical Engineers, Iron and Steel Division, 1936*; cloth, 411 pages, 6 x 9 inches; published by the institute, New York; supplied by STEEL, Cleveland, for \$5, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

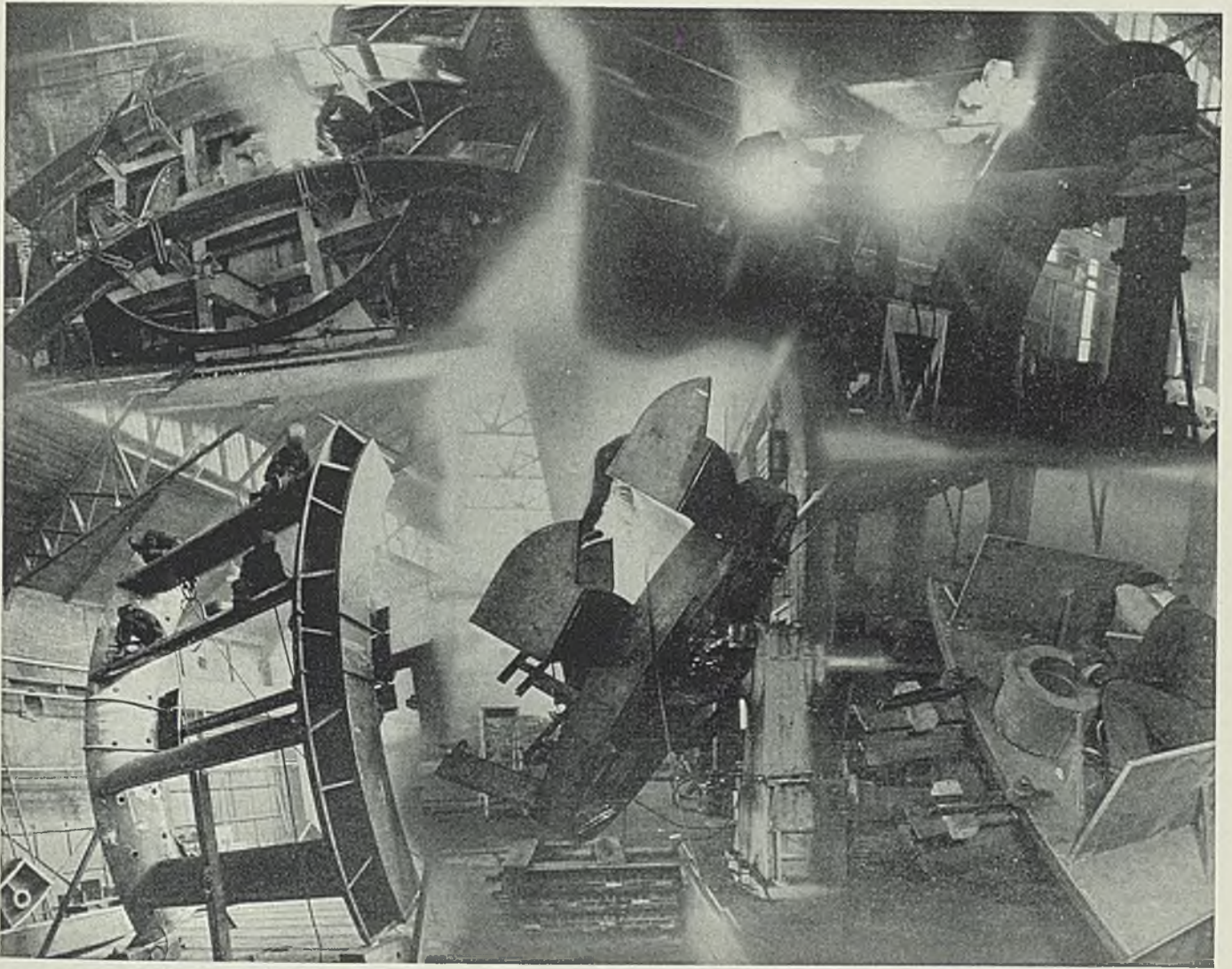
Papers and discussions before the iron and steel division at the meetings held at Chicago, Oct. 1-3, 1935, and at New York Feb. 17-21, 1936, make up this volume. There are 19 papers, including the Howe memorial lecture by H. F. Moore on "Correlation Between Metallography and Mechanical Testing."

In addition to the papers the volume contains the proceedings of the round table on qualities of pig iron, held in Chicago in October, 1935.

Table 2

## Results of Brinell Hardness Tests on Core and Surface of Typical Steels after Flame Hardening

Carbon, per cent	0.47	0.36	0.42	0.18	0.42
Manganese, per cent	0.68	1.92	0.69	0.47	0.56
Chromium, per cent			0.97		0.83
Nickel, per cent				1.64	
Molybdenum, per cent			0.18	0.24	
Elastic limit, pounds per square inch	85,000	115,000	130,000	105,000	135,000
Tensile, pounds per square inch	115,000	124,700	147,000	120,000	150,000
Izod impact, foot-pounds		60	40	62	48
Brinell on core	258	255	350	250	325
Brinell on hardened surface	341	415	514	477	495



# W

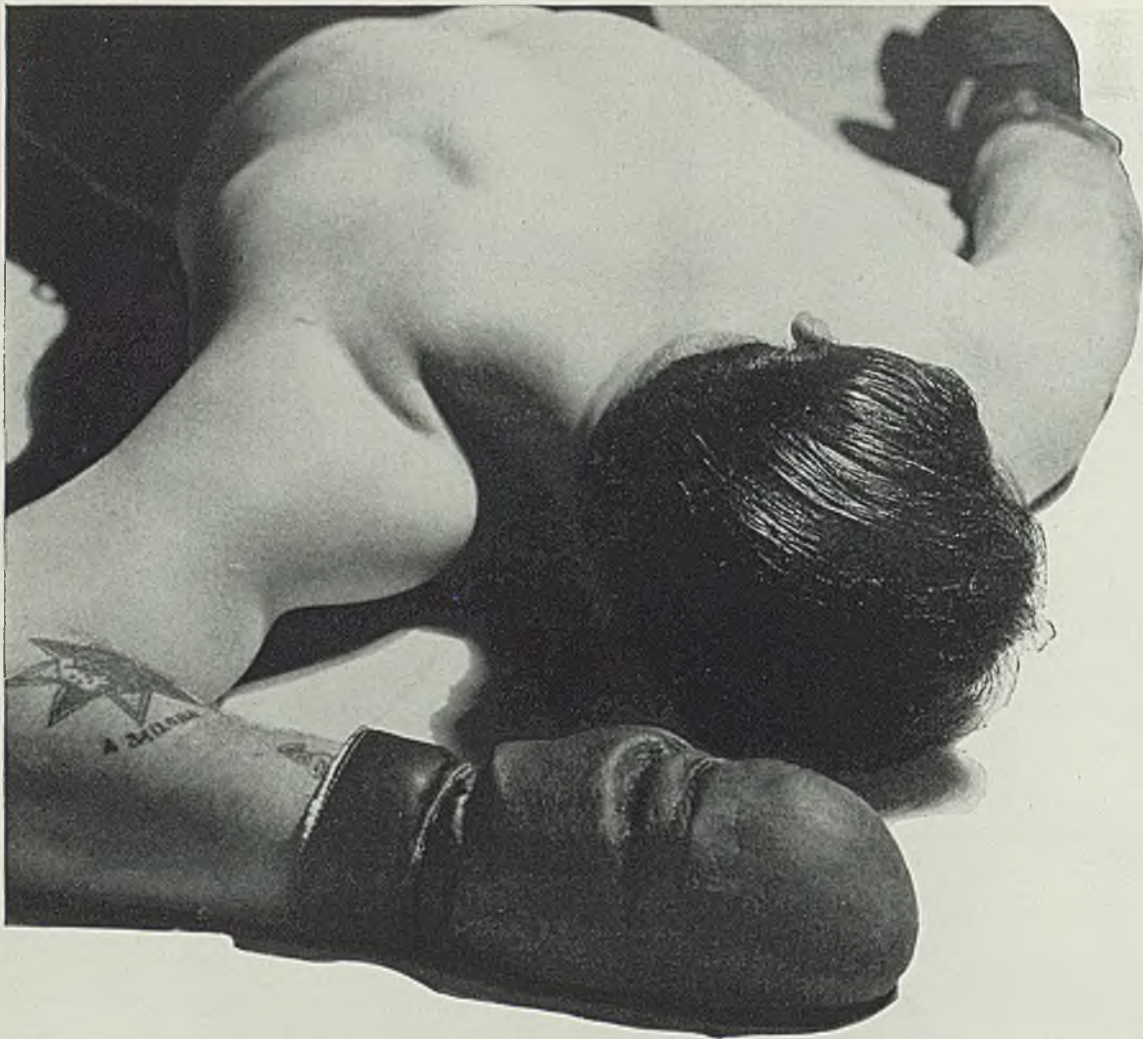
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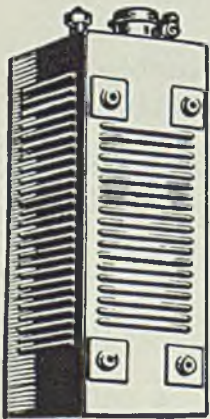
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# Materials Handling

## What Time Study Has Taught Westinghouse About its Materials Handling System

**T**HE great variety of types and sizes of electric apparatus manufactured at the East Pittsburgh works of the Westinghouse Electric & Mfg. Co. and their varying quantitative activities present equally varied and intricate materials handling problems.

In the iron foundry, forge shop and generating apparatus machining and assembling departments, facilities must be provided for safe and efficient transporting and handling of large castings, forgings and assembled units such as the 65-ton

BY G. A. BAESLACK

Study and Methods Department  
Westinghouse Electric & Mfg. Co.,  
East Pittsburgh, Pa.

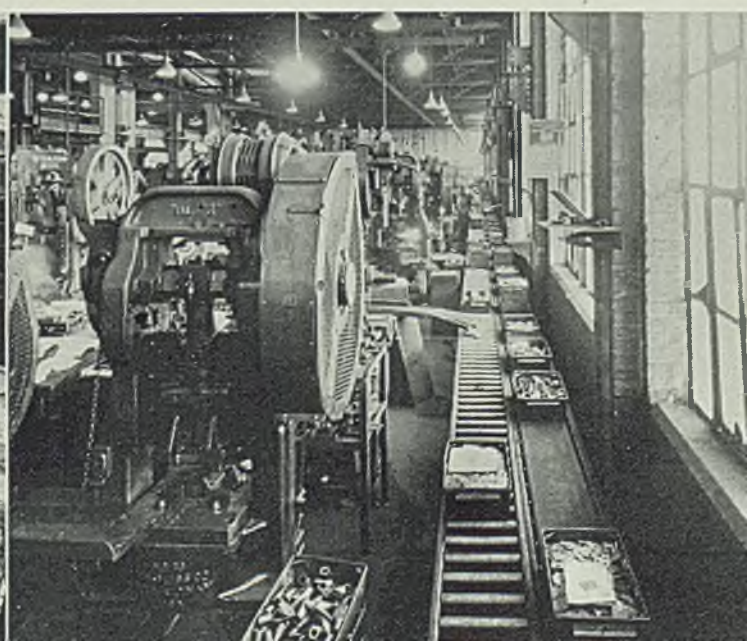
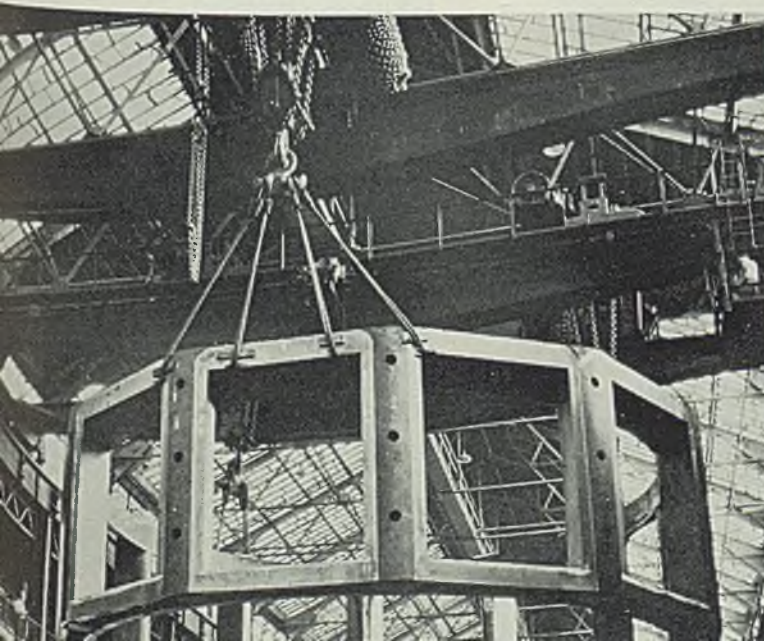
Boulder Dam gate frame shown in Fig. 1. On the other hand, in the metal stamping, automatic screw machine, switch, medium and small motor machining and assembling, testing, packing and shipping departments, conveying and transportation appliances for efficient handling of comparatively large quantities of medium and small size detail parts are required to permit progressive processing and assembling of such parts into complete units.

In Fig. 2, for example, is a par-

allel arrangement of roller and belt conveyors in one of the metal stamping sections, the roller conveyor serving for the transportation of parts from machine to machine between operations, the belt conveyor carrying tote pans loaded with finished parts to the detail inspection and shipping stations at the far end of the section. The conveyORIZED sensitive multiple spindle drill press and washing machine set up, Fig. 3, permits efficient moving of tote pan loads of small parts to and away from these machines, while cleaned parts are shipped via the

Fig. 1—Handling 65-ton gate frame for Boulder Dam is typical of handling jobs that would be impossible without heavy overhead traveling cranes

Fig. 2—A parallel arrangement of roller and belt conveyors in a metal stamping section, each type of conveyor serving a definite purpose



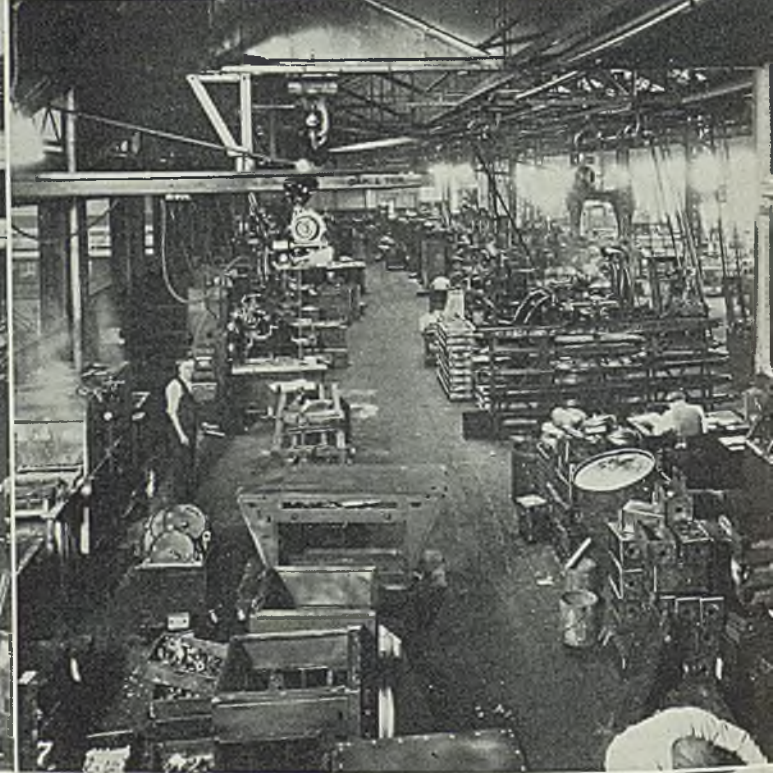
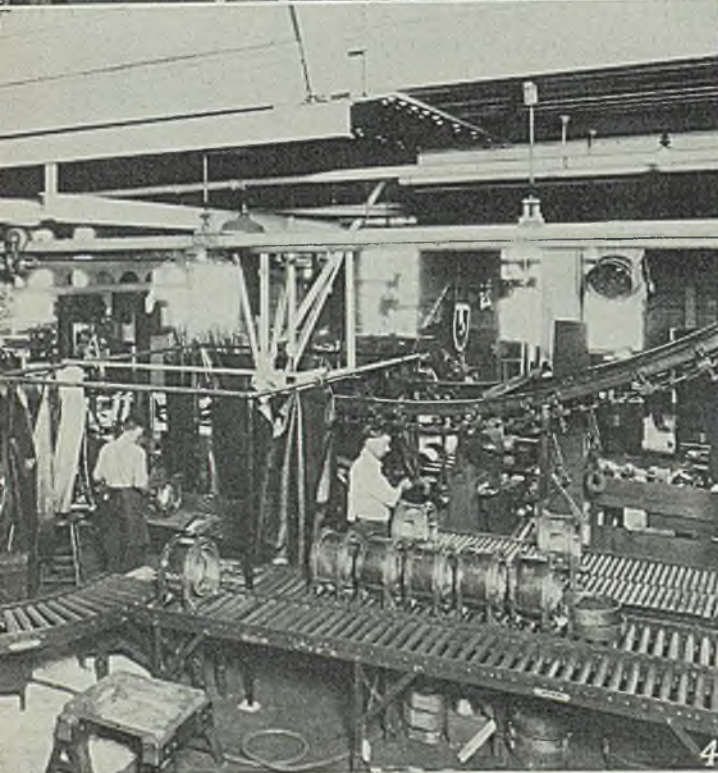
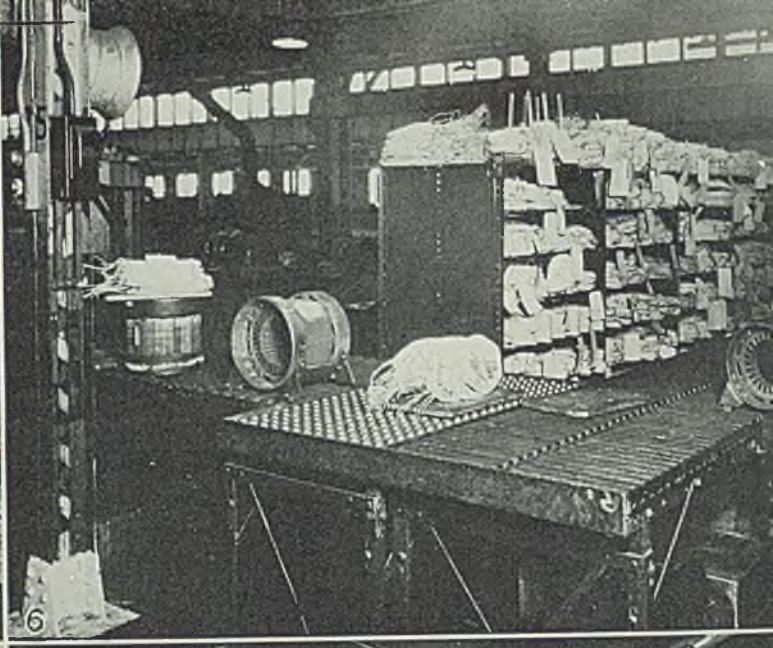
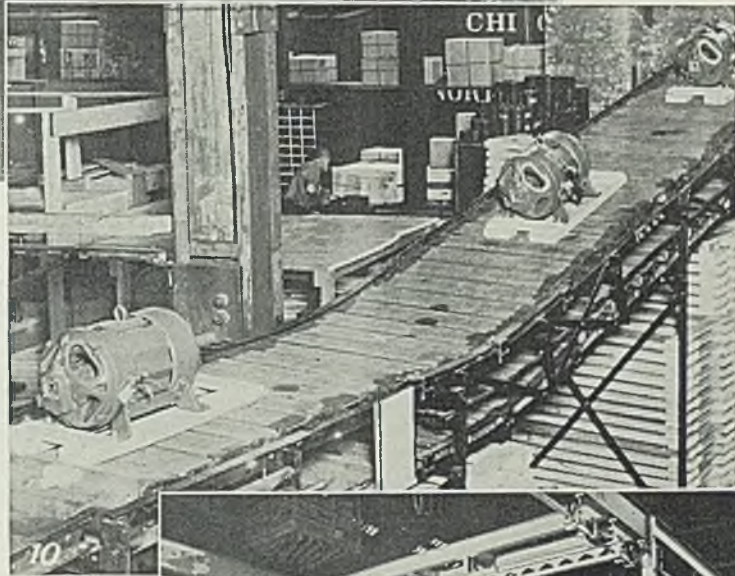


Fig. 3—Efficient moving of tote pan loads of small parts at drill press and washing machine. Figs. 4 to 6—Transporting motor frames from ground floor machining section to upstairs coil storage and from there to winding section in the background. Figs. 7 and 8—Views of a job dispatcher's section before and after installation of power belt and gravity conveyors and rearrangement of machine tools





**Figs. 9 and 10—Section of progressive assembling line for motors with power conveyor, electric hoist and inclined power conveyor**



**Figs. 11 and 12—Good example of fatigue eliminating equipment as applied to foundry work in the Westinghouse plant**

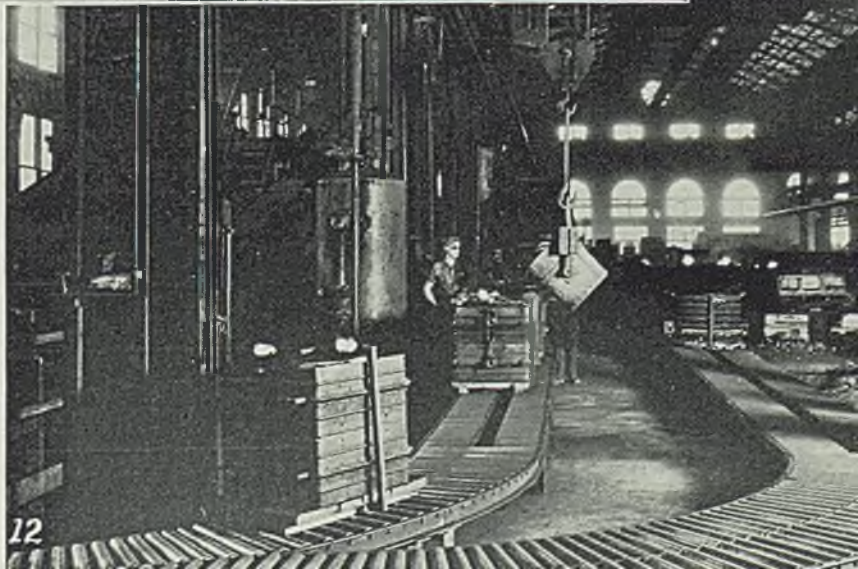
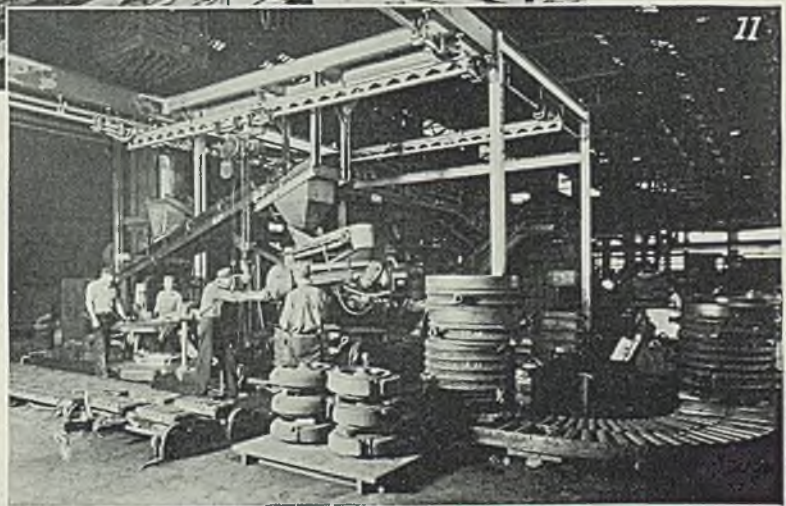
conveyor to the adjacent assembling section.

An overhead chain conveyor transports motor frames from the ground floor machining section to the upstairs coil storage, where the frames are deposited on a roller conveyor, and each frame receives its set of stator coils and insulating parts and is transferred to the winding section. Figs. 4 to 6.

It is in connection with supplying reliable data to guide the management in the selection of the most suitable and economically efficient material and parts handling equipment, commensurate with the activity of the respective apparatus involved, that detail time and motion study renders valuable pioneering service.

Time and motion study has been able to convince the management that the application of modern materials handling appliances to the many processing, storing assembling and shipping operations is a paying investment.

By no other method of investigation can actual facts pertaining to economic losses inherent in non-existing, inadequate, or perhaps



wrongly applied materials handling equipment, be as convincingly established as by thorough critical analysis of the various elements involved, which accompanies detail and motion study.

The results of such investigations are clearly shown by some of the accompanying illustrations. For example, Figs. 7 and 8 present views of a job dispatcher's station, adjacent to a detail parts storeroom in a machining section, before and after a power belt and gravity conveyors were installed, and the machine tool equipment rearranged to permit straight line production and

the elimination of the inefficiencies time studies had revealed. This rearrangement resulted in savings sufficient to pay in approximately two years for the expense involved.

In progressive assembly of motors, a power conveyor carries the assembled motors to the spray hood. An electric tramway hoist enables the operator to set the painted motors on another conveyor which carries them to the test station. After the test, the motors are bolted to skids and placed on an inclined power conveyor, which carries them to the packing and shipping department located on the ground floor of the adjacent building, Figs. 9 and 10.

The conveyor released other equipment for other transportation work, improved freight elevator service to adjacent departments, eliminated congestion on the motor packing floor and reduced crane lifts.

Time studies not only have disclosed occasionally excessive losses in time, due to manual handling

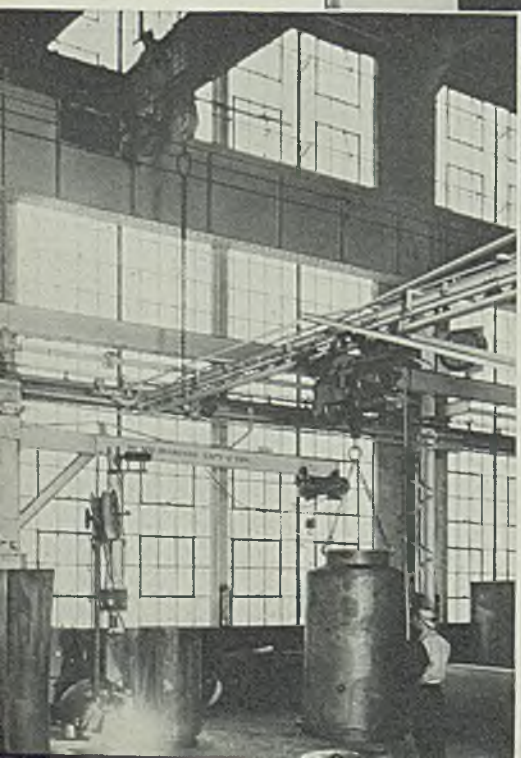
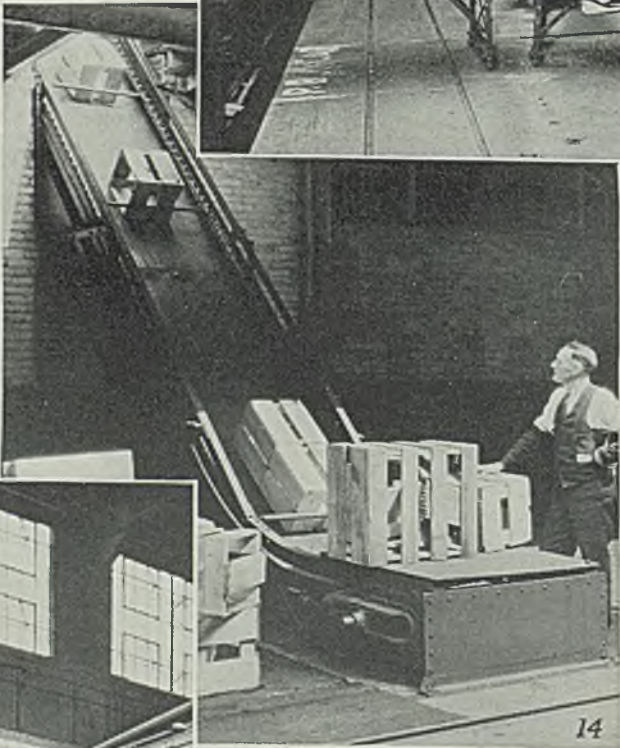
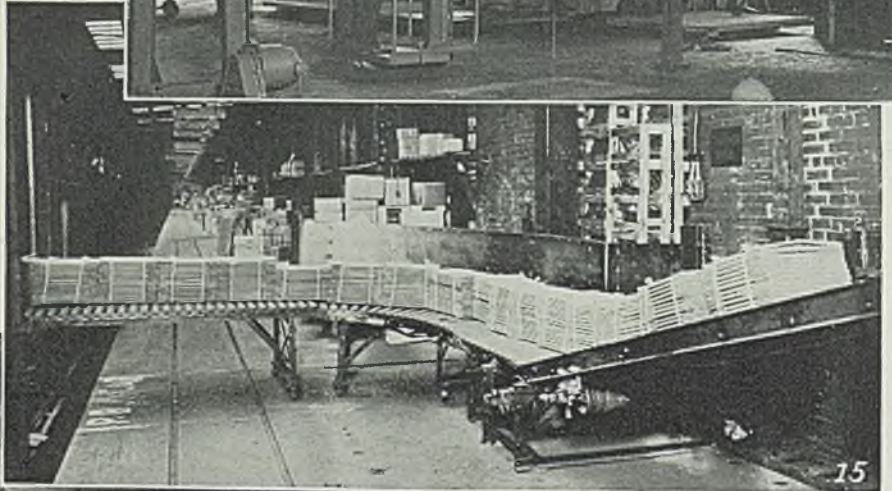
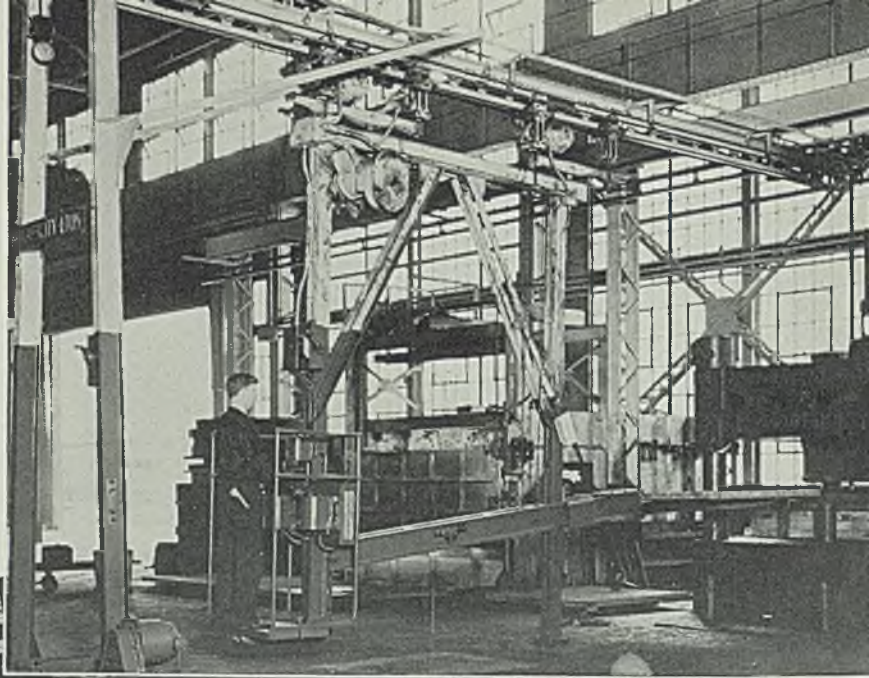


Fig. 13—Three types of lifting and transporting appliances for serving welders and tank testers. Fig. 14—Power operated chain conveyor carries empty boxes and crates to storage room

Fig. 15—Freight car on depressed track served by inclined power belt conveyor. Fig. 16—Electric tram-rail cantilever hoist serving 1500-ton hydraulic press and adjacent furnace

of materials or parts, in the course of repetitive assembling or machining operations, but they have brought to light accumulative retarding effects upon the balance of the operations resulting from physical and eventual mental fatigue of operators caused by repeated lifting and carrying of comparatively heavy parts.

Elimination of these causes of fatigue by installation of suitable mechanical lifting or carrying appliances invariably improved the efficiency of the entire cycle of operations involved, and made the duration of the cycle more nearly constant throughout the daily working period.

Many good examples of fatigue elimination equipment are found in applications in foundry work. The sand slinger and its mechanized



sand screening and conditioning apparatus eliminated fatiguing shoveling, screening and ramming operations, while the roller conveyor and electric tramway hoist permit easy handling of steel flasks to and from molding machines, Figs. 11 and 12. This operation is entirely independent of the services of a traveling crane until the molds are lined up to be poured, Fig. 12. The oscillating shake-out screen permits dumped sand to fall on a conveyor which carries it to the sand conditioning machine. This installation resulted in a 20 per cent increase in the output of the molding machines and a better quality of castings.

#### Devices in Tank Shop

Other fatigue eliminating and efficiency promoting materials handling appliances are in use in the tank shop, Fig. 13, where three types of lifting and transporting appliances are available to serve welders and tank testers. A power operated chain conveyor, Fig. 14, carries empty boxes and crates, received from the box shop, to the storage room for empty containers. This room is located above the packing section on the second floor. Portable roller conveyor sections connect an inclined power belt conveyor with freight cars spotted on an adjacent depressed railroad track, Fig. 15. This permits unloading and transporting to the storage room of a carload of bundles of cartons with a minimum of physical exertion on the part of the laborers.

Modern materials handling appliances not only increase operating efficiency by lessening physical and mental fatigue, but also they materially reduce accident hazards. Electric tramway hoists and jib cranes make it possible for machine operators, assemblers and storeroom

workers to stack and handle heavy parts that formerly were spread out all over the floor, and the manual moving of which altogether too frequently caused crushed toes and fingers and even more serious injuries.

With an electric tramway cantilever hoist, Fig. 16, the operator with ease and safety is enabled to place heavy steel plates in the 1500-ton hydraulic press, and in and out of the adjacent furnace. A locomotive type crane truck, Fig. 17, has eliminated back straining and spraining from the operations of handling and stocking of heavy boxes of sheet metal stock in a storeroom. This crane truck also serves the tote box rack, Fig. 18, the individual compartments of which are equipped with roller conveyor sections that slant slightly downward toward the rear, thus permitting insertion and removal of loaded tote boxes without danger or much exertion.

## Handbook for Mechanical Engineers Is Revised

*Mechanical Engineer's Handbook*, eleventh revised edition, Power; leather, 125 pages, 5% x 8% inches; published by John Wiley & Son Inc., New York; supplied by STEEL, Cleveland, for \$5, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

In this revised edition a revolutionary change has been made in the setup, the present volume dealing with the entire field of power and its applications of interest to the mechanical engineer; the other, in press, covering in detail present

methods in design and shop practice.

Larger type has been used for clearness and diagrams and illustrations are larger and clearer. The same plan will be followed in the forthcoming volume.

There are 17 sections in the power volume, covering air, water, heat, combustion, fuel, steam, steam boiler, steam engine, turbine, condensing and cooling equipment, heating and air conditioning, internal combustion engines, transportation, electric power and power test codes.

The central aim is to present clearly and fully the practice approved in each division. Users of the previous editions will appreciate the changes and additions in this issue. It is edited by Robert Thurston Kent, assisted by a staff of 28 specialists.

## Practices Reaffirmed in Concrete Joist Floors

Division of simplified practice of the national bureau of standards Washington, has announced that Simplified Practice Recommendation R87-32, covering forms for concrete joist construction floors, has been reaffirmed without change by the standing committee of the industry.

This recommendation, which covers the dimensions of standard and special forms for concrete joist construction floors, was originally effective from March 22, 1929, and the current revision was effective from May 1, 1932. Copies of the recommendation may be obtained from the superintendent of documents, government printing office, Washington.

Fig. 17—Crane truck eliminates back straining in handling heavy boxes of sheet metal stock

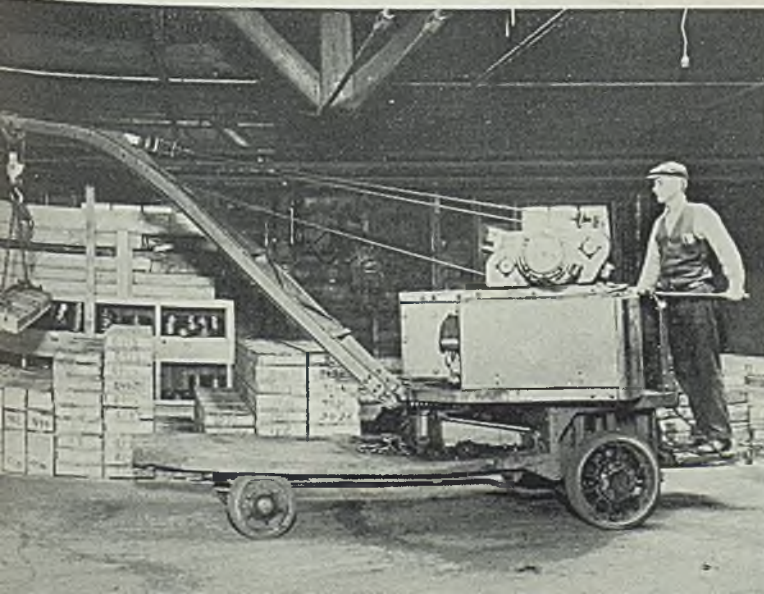


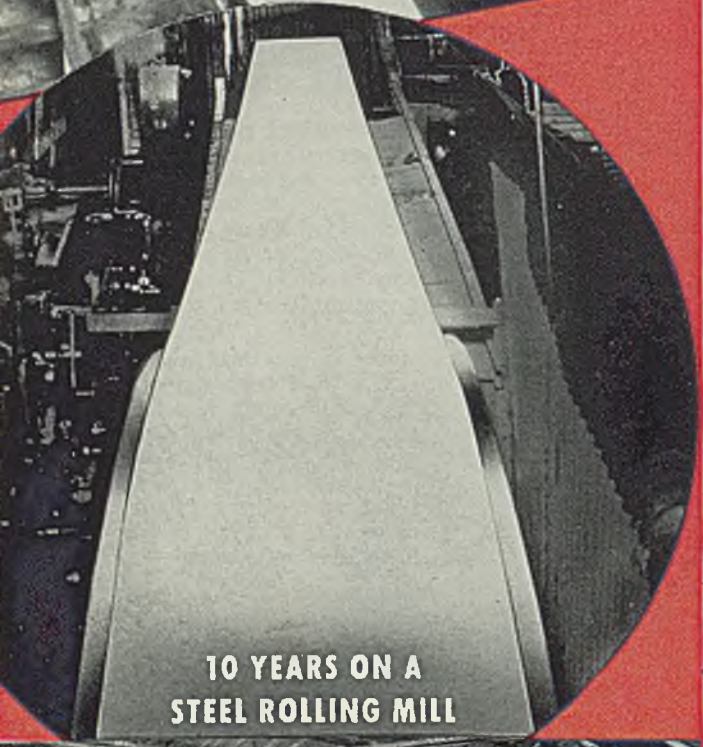
Fig. 18—Crane truck also serves tote box rack equipped with roller conveyor sections



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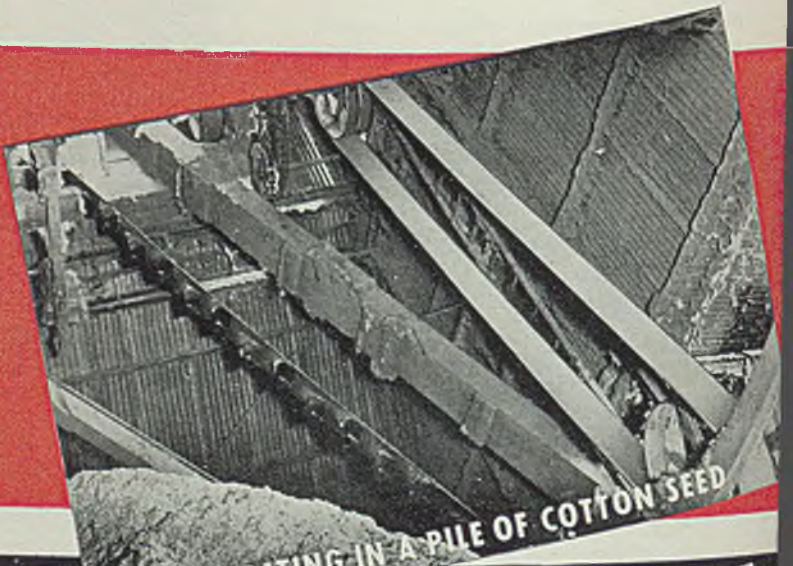
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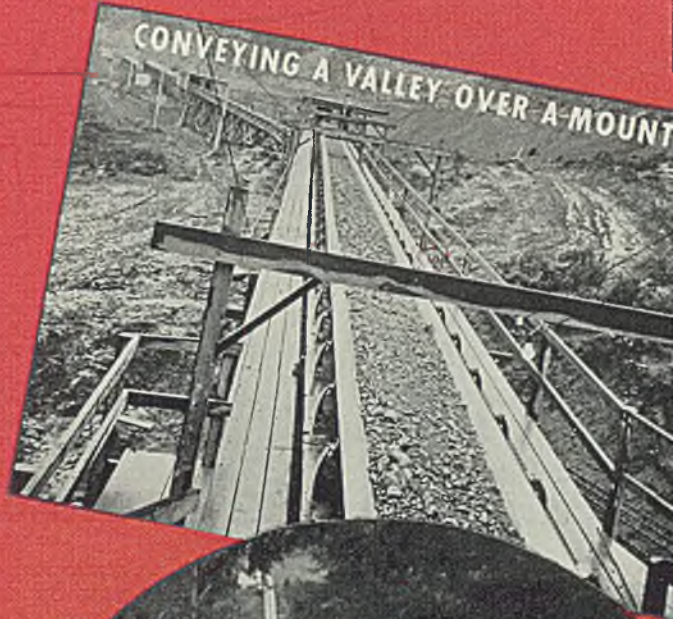
# A U.S. TAILORED BELT!

## Fitted to Their Loads

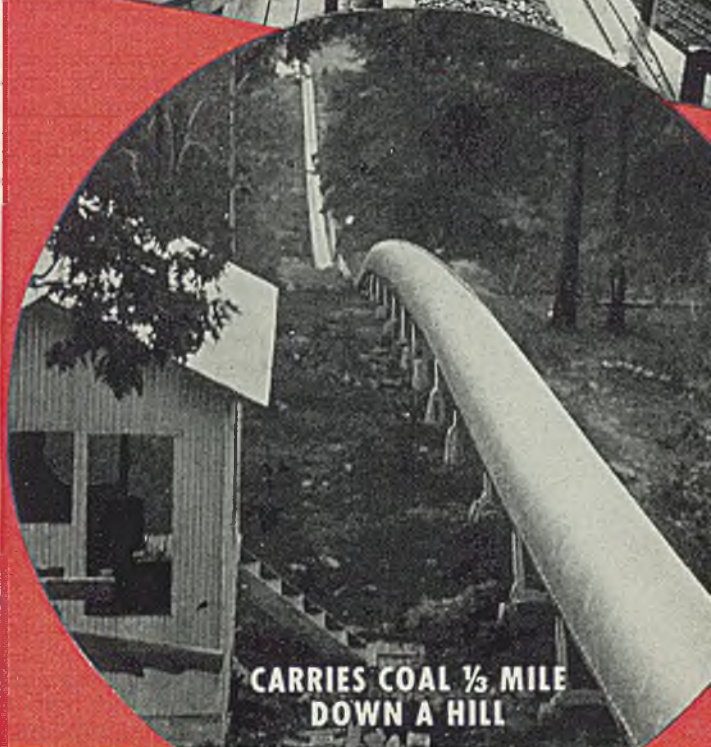
**U.S.** Conveyor Belts are also tailored to carry their loads fittingly. Go down into a mine . . . or a big excavating job . . . or walk through most any great plant . . . you'll find them hard at work.

On the Grand Coulee Dam you will see 60" U. S. Matchless Conveyor Belts which have already carried 11,000,000 cubic feet of excavation from dam site to dump nearly a mile away, and almost 400 feet above the river. On a Pennsylvania hill-top a U. S. Giant Conveyor Belt 1800 feet long lowers run-of-mine coal from the mouth of the mine to tippie. Many other U. S. Conveyor Belts underground in this mine take coal from mine face to surface. In a large limestone plant U. S. Matchless Conveyor Belts especially tailored of 42-ounce duck for exceptional strength to lift 2800 tons an hour, 147 feet, using 500 horsepower. A "whopper" of a belt! 1355 feet of 60", 10-ply U. S. Matchless Conveyor Belt especially "fitted" to do a bigger job for a western mining company. This roll of belt is 11 feet high; weight 15 tons; made under ideal conditions in the huge, well-equipped belt room of U. S. Rubber, Passaic, N. J. Specifications were checked and double checked to insure a "perfect fit" without a repair or blemish. Now in service, it's carrying approximately 20,000 tons of copper ore a day.

These are typical of many installations where U. S. Conveyor Belts are effecting large savings in conveying costs — and carrying their loads efficiently over long periods of time. Use them on *your* job. We will gladly send you, on request, the U. S. Conveyor Belt Album of installation photographs.



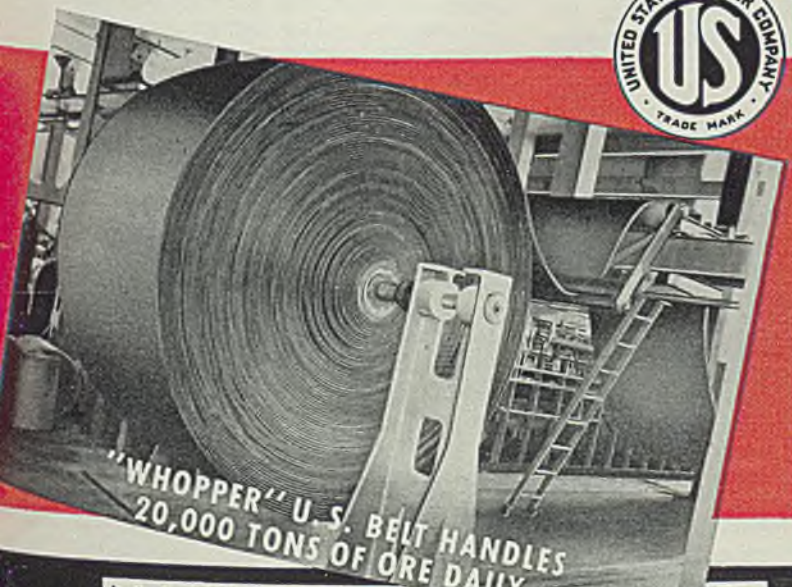
CONVEYING A VALLEY OVER A MOUNTAIN



CARRIES COAL 1/3 MILE DOWN A HILL

## Rubber Company


70 Broadway, New York, N. Y.



"WHOPPER" U. S. BELT HANDLES 20,000 TONS OF ORE DAILY



2,800 TONS OF LIMESTONE PER HOUR ON THIS U. S. CONVEYOR BELT

UNITED STATES RUBBER COMPANY  
**MATCHLESS CONVEYOR**  
 32-OZ.  P-61

UNITED STATES RUBBER COMPANY  
**AMAZON CONVEYOR**  
 32-OZ.  P-44



## Red Tape on Maintenance Brings High Production Costs Instead of Savings

**P**LANTS where stringent restrictions were made on performing maintenance work during years of low production should now consider ways of relieving the red tape which slows up necessary emergency work. In some plants executive approval has been made necessary before anything but the most minor work can be done by the maintenance crew.

While this resulted in an apparent economy, it generally meant "stealing" parts from idle equipment and skimping on necessary work so that repairs had to be done over sooner than should have been the case. In many plants these procedures resulted in double expenses in the end.

One plant engineer stated to the writer that over half the equipment in the plant had been partially dismantled to supply emergency parts to other duplicate units. No record had been kept (keeping records costs money) of the "stolen" parts and where they went nor of the damaged parts taken out of service so they could be repaired and replaced. In many cases broken or worn parts had been junked or improperly handled and were useless although they could have been repaired profitably so as to give efficient service.

### Expenses Rise Rapidly

The resultant expense, in his estimation, was over four times what the cost would have been if properly handled as each emergency occurred. Taking parts from one machine and replacing them is double labor.

One of the extreme examples of practice inaugurated in one plant of requiring the service man, when a fuse blew or lamp burned out, to

go to the shop, get the fuse or lamp, return to the maintenance stores clerk, make out a ticket, get the new fuse or lamp and return to replace it. The practice had cut the fuse bill about half, so it was proudly stated. But was it a real economy?

The minimum time for a machine out of service would be more than doubled over having the man take the fuse or lamp with him. As this plant covered a large area many of the machines would be out of service almost an hour. Counting 10 minutes for each trip each way, which would be about the average, would mean  $\frac{1}{2}$  hour out of service per machine.

### Add Up the Minutes

But look at the record. The machine would be down 20 minutes more than would have been necessary if the fuse arrived with the first trip of the service man. Also, the service man made two trips extra or another 20 minutes. Total: 20 minutes idle machine plus 20 minutes idle operator, plus 20 minutes lost production, plus 20 minutes extra labor of service man equals the purchase price of a great many fuses.

In all probability much of the saving in fuses had resulted from piece workers buying a fuse. Most likely this bootleg unit was of a higher rating than should have been inserted, just to be sure that it would not blow so soon again. Men working at hourly rates would simply take a rest at company expense. To dock them for this time would result in much labor unrest, as the men were not responsible for the delay.

Few plants went to this extreme. However, many are still operating

under emergency restrictions which could be lightened to profitable advantage.

## Fan Motor Trouble

**F**OR no apparent cause the fan motor in a wall ventilator burned out frequently. This indicated a serious overload, but how could such a load be created?

One day the maintenance electrician, who kept an eye on the fan every time he entered the room, noticed the fan slowing down, finally stop and then start to revolve in the opposite direction. The fan discharged directly into the open and occasionally a very strong wind blew directly against the fan, thus increasing the outlet pressure and load.

The solution was to run a section of duct from the outlet to the roof and add a rotating weathervane outlet at the top so that the discharge was always with the wind.

The resistance of this duct, of course, increased the pressure against which the fan operated when no wind was blowing against the blades. This resistance, however, was considerably less than even a normal wind.

*When planning new distribution circuits, or replacing those which have become too small, anticipate probable future requirements for at least five years. The extra material is a small item compared to the labor and material required if the installation must be replaced before that time.*

Comparative freedom from emergency maintenance is not an accident. It can be obtained only by ceaseless, careful and systematic effort. Detecting trouble and promptly remedying it is the ABC of maintenance work.

# WELDING, etc.

by Robert E. Kinkead

## First Conversion to Welded Construction Is Easiest

A recent private survey of the attitude of machinery builders towards more extended use of welded steel construction disclosed in practically every case investigated, more extensive use of the method is contemplated. The companies interviewed were all using some welded steel construction, so they had first hand knowledge of the subject.

The companies investigated wanted to use more welded steel; the suppliers of rolled steel were interested in the same thing; the welding industry, comprising both gas and electric interests, were enthusiastic for more sales of their equipment. With three well defined interests all operating in the same direction, it is perhaps surprising to find the practice does not develop more rapidly in the case of many companies which could make profitable use of it.

### Cost Is Important Factor

In many cases with which we are familiar, the program of converting to welded steel construction gets stalled because the costs of using welded steel are greater than the costs of using other forms of metal. It is all very well to pick a few easy jobs for welded steel and convert without spending an important sum on capital account or having much experience in shop production of welded construction. Where the cost differential is high neither brains or capital is required to do the job. In many cases, the program bogs down when these easy jobs have been converted.

Under such circumstances the whole problem has to be studied in the light of experience with shop production of welded steel to see what is necessary to bring the cost of production down. With the cost of production brought down to predetermined levels, it is logical then to study the equipment to be built to see what changes in design may be made in the conversion to bring the total cost below existing figures.

The first few easy jobs of conver-

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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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sion are like cutting out paper dolls. After these jobs are converted, the problem is one requiring highly specialized experience in this particular field.

## Sources of Welding Heat

PRACTICALLY every large advance in welding is the result of applying a new source of welding heat to the job. The following represent the most important methods of heating used at present:

Hammer welding—Furnace or forge  
Resistance welding— $I^2R$  conversion

of electrical energy to heat  
Electric arc welding— $I^2R$  conversion of electrical energy to heat with electrode resistance  
Atomic hydrogen welding— $I^2R$  conversion of electrical energy to heat with hydrogen as an intermediate agent  
Oxyacetylene welding—Heat produced by burning fuel gas in oxygen  
Thermit welding—Chemical reaction

Possible additional sources of energy for welding are high frequency induction, high frequency mechanical vibration, reflection.

\* \* \*

Wags among the welding operators who saw the new Harnischfeger automatic welding machine at the show in Cleveland suggested that it might also be provided with an air conditioning system and radio since the operator would have nothing to do between one loading of the hopper and the next. The equipment is a novel and interesting solution of how to burn coated welding rod in short lengths in an automatic machine.

## Fast Plane Is Mostly of Metal



*Steel and metals were used largely in construction of Time Flies, new super-speed airship designed by Lt. Com. Frank Hawks and Howell Miller, built by Hawks Aircraft Co., Redding, Conn., and sponsored by Gruen Watch Co., Cincinnati. Strength members in fuselage and other parts are of chromium-molybdenum steel tubing. Aluminum is used extensively. This plane has a speed at sea level of 375 miles per hour and is completely equipped with all latest instruments for safe flying*

# SURFACE TREATMENT

# AND FINISHING OF METALS

## Portable Electroplating Apparatus Opens New Fields for Metal Coatings

**W**ITH the rapid advances in methods and styles of plating which recent years have witnessed, it was perhaps inevitable a method of electroplating which did not require a tank would be produced. The limitations and difficulties of tank plating in certain fields have long been recognized and up to the present it has been considered impracticable to electroplate many objects because of the expense involved in upkeep and repair of the finish. The enormous field open to a proved portable method of plating is unquestioned especially if it permits parts to be plated in the field without dismantling the assembly of which they are a part.

Electroplating in the field without the use of a tank was demonstrated as an accomplished fact by Nickel and Chromium Products Co., 250 Park Avenue, New York, at the National Metal Congress and Exhibition held in Cleveland Oct. 19 to 23. The method, as demonstrated, was

completely portable and capable of plating chromium, nickel, zinc, tin, cadmium, copper, rhodium and other metals.

The unit, known in this country as the Connecticut Portable Plater, consists of a current supply unit, plating brush, anodes, electrolytes and suitable cleaning agents. Current supply units of either the rectifier or motor generator type are obtainable. Both types, which can be plugged into commercial lighting circuits, are shown in accompanying illustrations. The plating brush, which has the appearance of an ordinary round brush, is made from

*Bright work on this locomotive, owned by London, Midland, Scottish railroad, England, was plated with portable plating apparatus. The ease and economy with which the work was done opens new possibilities in the decoration of "name" trains*

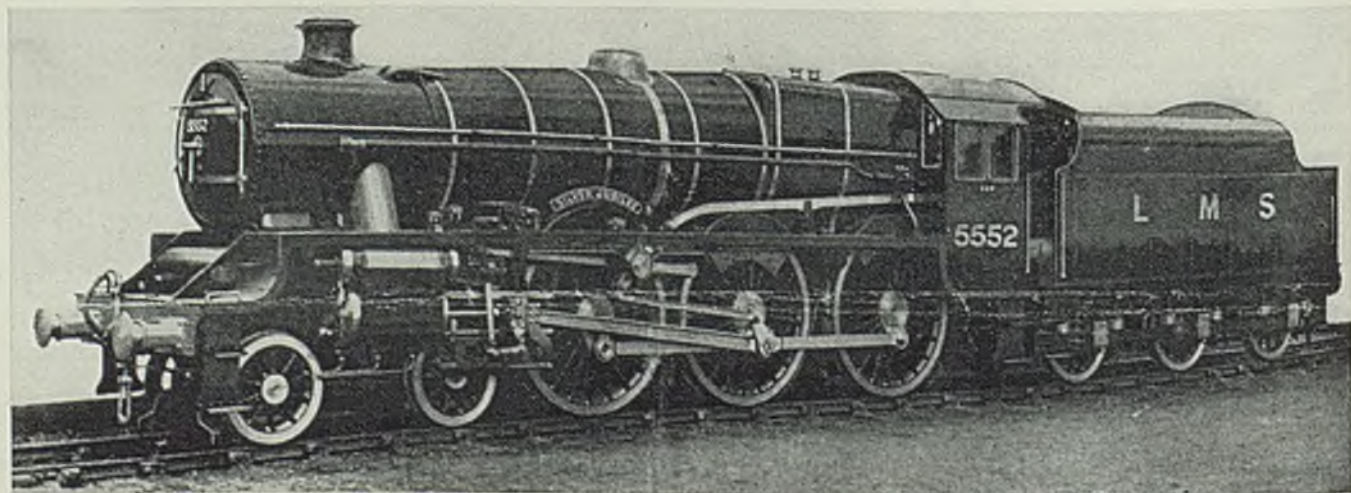
human hair and contains a special anode fastened to a metal rod which runs through the handle. These anodes are easily replaced when eroded.

The electrolytes, which are the unusual feature of this process, are used in the form of a paste for a reason which will be explained later. Prepared electrolytes for each type of plating are sold by the company to simplify the process in the field.

### Careful Preparation Required

Before any actual plating is carried out, the metal to be plated must be carefully prepared. It must first be polished with some type of portable polishing wheel, unless the surface is already polished and buffed, and then cleaned with a specially prepared cleaning solution. This solution, which is also sold in the prepared form by the company, can be easily applied with a brush or sponge. After rubbing the surface well with the cleaner, it is washed with cold water leaving a surface free from water break.

Immediately after this operation and before the surface is dry the plating is begun. Having plugged into the lighting circuit, the operator attaches the brush to the positive lead of the current supply and the work to the negative lead. The cur-





*Small objects also are economically plated with the smaller portable unit. Compare the plated section of the shell (right) with the unplated section (left)*

whole unit is a collection of the brush, current supply unit, electrolyte and cleaning materials—all equally important. Power supply, of course, is a vital factor and the current supply unit, manufactured by General Electric Co., is especially designed to meet the requirements of the process. The process has been used to a fairly large extent in England during the past three or four years, but it has been stated here and even in England that the product now being developed in America is superior to the English product. Rapid progress has been made in the refinement of the apparatus used in this country.

#### Skill Not Necessary

When chromium is to be plated by this method it is necessary to use the motor generator type of current supply. Chromium plating reveals the full advantages of this method of plating. In the tank method of chromium plating there is always the danger of fumes and even though safety appliances are obligatory there is still a liability of injury to operators. With the portable plater there is no risk. However, as in the case of tank plating, more care is required with the chromium electrolyte as it is liable to stain. Even though some care is necessary, a skilled electroplater is not required since any intelligent workman can be trained to use the process in a few hours. The conditions of plating for all metals are essentially the same and if the operator can deposit one, he can deposit them all.

Many interesting experiments  
(Please turn to Page 60)

rent is turned on and the brush is dipped into the electrolyte which is contained in a glass jar. The brush is applied to the surface with slow even strokes, holding it at such an angle that the anode does not come into contact with the work at any time. Best results are obtained when the anode is kept within an inch of the surface. Thickness of coating is determined by the length of time the brush is applied.

The finish appears immediately the brush is applied to the surface. The deposit does not become dull from repeated brushing to build up the thickness of the coating. No buffing is required after plating; the surface needs only to be wiped and dried.

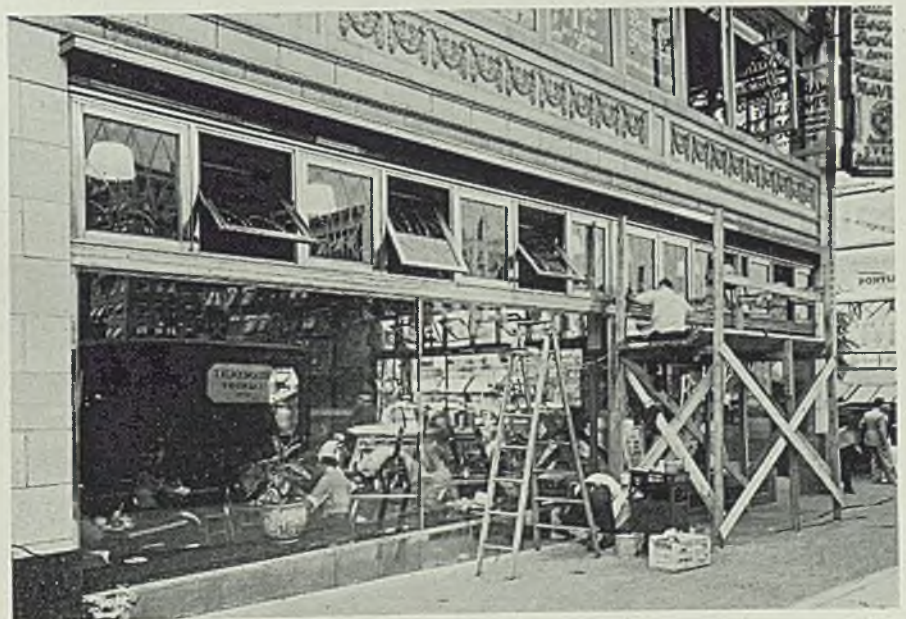
#### High Plating Efficiency

It is not advisable for the operator to attempt to plate too great a surface, the best results being obtained when a surface of from 10 to 150 square inches is taken at any one time. The plating efficiency of this method is remarkably high. This is undoubtedly due to the proximity of the anode to the work, the agitation of the electrolyte in the brushing and the heat generated. The operation of brushing continues, according to the area of the surface being plated, from three to twelve minutes in most cases. If a large surface is to be plated, it is claimed, the operator may proceed from space to space with showing any line of demarcation and even a door or wall can be plated with a uniform coating of nickel or whatever metal is being applied.

During the plating operation it is

desirable that the electrolyte remain in the small area being treated. To keep it from flowing too freely it is prepared in a paste form. Thus vertical surfaces can be plated with the same ease as horizontal surfaces. The paste form also facilitates brushing and retards evaporation.

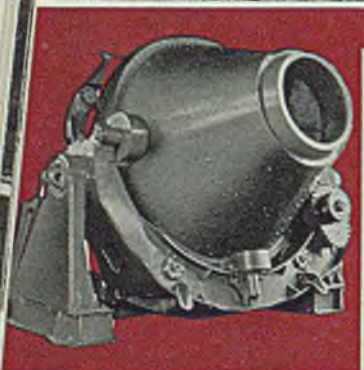
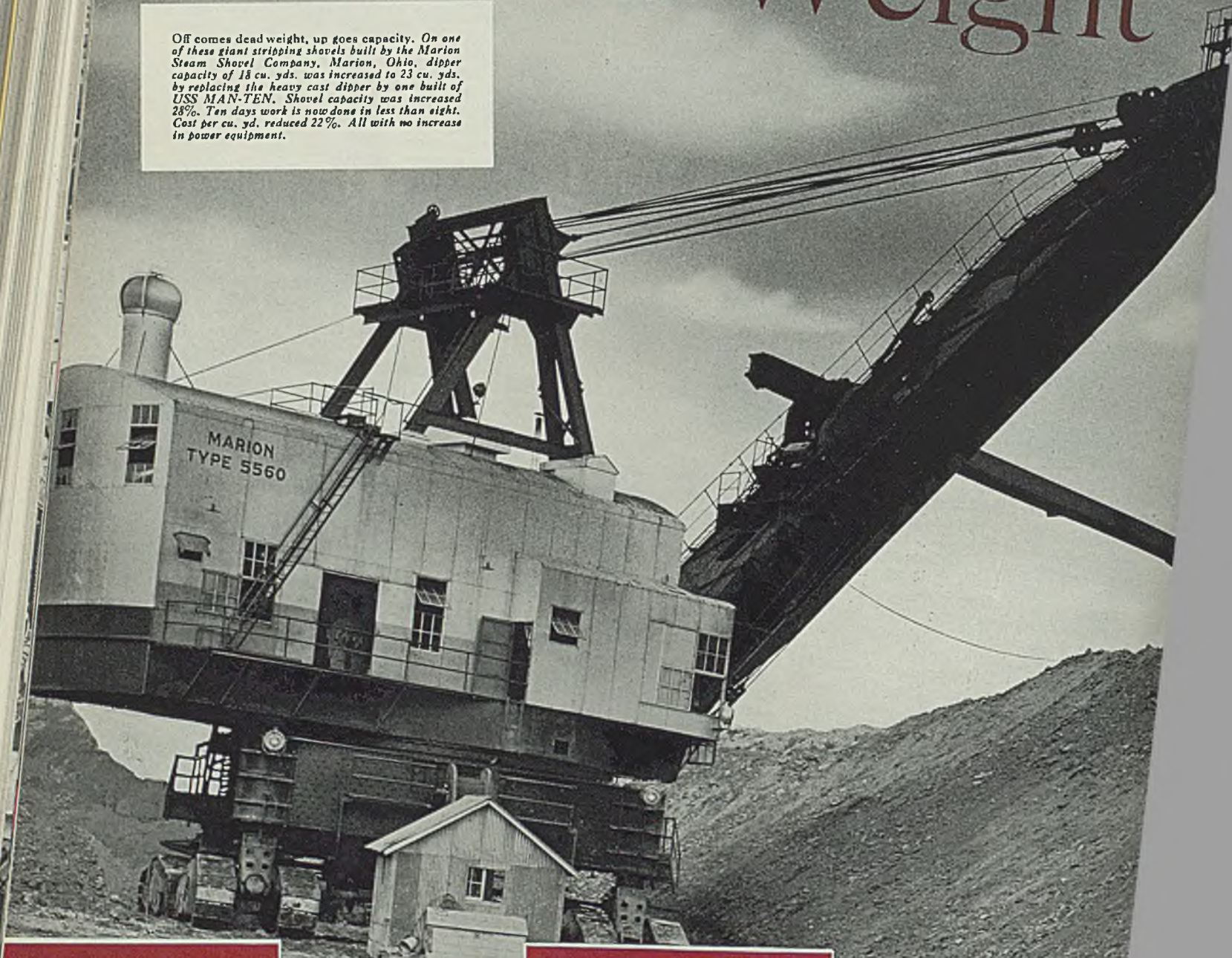
It has been pointed out by the directors of the Nickel and Chromium Products Co. that the success of the process has been largely due to the bringing into practice of American British patents. The



*This brass store front was one of the first in this country to be nickel plated by means of the portable plating machine. The unit shown in this illustration can also be used for chromium plating*

# If Dead Weight

Off comes dead weight, up goes capacity. On one of these giant stripping shovels built by the Marlon Steam Shovel Company, Marion, Ohio, dipper capacity of 18 cu. yds. was increased to 23 cu. yds. by replacing the heavy cast dipper by one built of USS MAN-TEN. Shovel capacity was increased 28%. Ten days work is now done in less than eight. Cost per cu. yd. reduced 22%. All with no increase in power equipment.



Built tough for a tough job. This concrete mixer is one of eight recently developed for pouring concrete on the Grand Coulee Dam project. USS MAN-TEN used in the lower main frame, side pedestals and cradles drastically lightens weight over former construction. Adds toughness . . . increases ability to withstand abuse and rough handling.



Light-weight construction increases capacity 20%. This gigantic coal bucket built of USS COR-TEN is among the largest ever built. Weighs 17,000 lbs. Will pick up 24,000 lbs. of coal at one bite. Weight-capacity ratio is 1 to 1.4 as compared to 1 to 1 obtained by conventional steel construction. Built by Robins Conveying Belt Company, Passaic, N. J.



On the largest Trail-Car ever built — 33 cu. yds. capacity. "In designing our Trail-Cars for automotive haulage we were confronted with the necessity for reducing the weight to a minimum, while still using a steel which would resist abrasion. We found these qualities in MAN-TEN Steel, and it has given us entire satisfaction." (The Austin-Western Road Machinery Co., Aurora, Illinois.)



"Two of our 35-ton Speedcranes with 85 ft. booms of MAN-TEN steel successfully handled loads on the Triborough Bridge up to 37 1/2 tons at 18 ft. radius. It is estimated that the stresses resulting were in excess of 60% greater than those for which the boom was designed. This is indeed a tribute to the quality of MAN-TEN Steel." (Forsythe Equipment Co., New York.)



# handicaps your equipment

## ... trim it Off!

**W**HAT is dead weight, you ask. Briefly we define dead weight as that part of the weight of any equipment which can be eliminated economically through light-weight design employing modern high tensile steels.

Dead weight, in other words, is needless weight—excess poundage that costs you money every time you move it. It adds its costly load to your power plant . . . increases wear on parts . . . slows up operation . . . limits capacity. Dead weight is a perpetual drag on earnings—it has no place in modern machine construction.

Today engineers and designers are waging a ruthless battle against the waste of dead weight. Among their most potent and economical weapons are USS COR-TEN and USS MAN-TEN. The greater tensile strength, the increased toughness, and the greatly

increased corrosion resistance of these new low-alloy, low cost steels have made it possible to build industrial equipment as much as 30% lighter—yet without any loss of strength, safety or endurance. In countless applications this weight reduction has been translated into greater capacity—lower operating costs—increased revenue.

That is why "Built of COR-TEN" or "Made of MAN-TEN" is today a recognized mark of a superior product.

If your equipment is built of old-fashioned, conventional steels why not find out how much tare weight you can safely get rid of—and what it will cost to eliminate it? Our engineers are fully competent to answer these questions. If the change over to light-weight construction will not justify its cost, they'll be the first to tell you. Write us, send us your blue-prints; we welcome the opportunity to assist you.

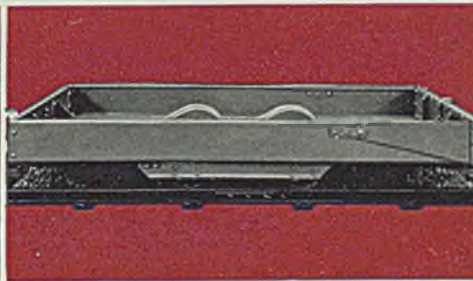
## U.S.S HIGH TENSILE STEELS

AMERICAN STEEL & WIRE COMPANY, Chicago and New York · CARNEGIE-ILLINOIS STEEL CORPORATION, Pittsburgh and Chicago · COLUMBIA STEEL COMPANY, San Francisco · NATIONAL TUBE COMPANY, Pittsburgh · TENNESSEE COAL, IRON & RAILROAD COMPANY, Birmingham

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



"The Rex modern cone drum of the Rex Moto-Mixer is built of USS MAN-TEN steel of 80,000 lbs. tensile strength for lighter weight, greater strength and longer life. We find that it resists the abrasive action of pounding concrete inside the drum and consequently will prolong the life of the mixer." (Chain Belt Company, Milwaukee, Wis.)



COR-TEN mine car hauls 19% less dead weight. These cars stand but 20" above the rail yet have full level capacity of 105 cu. ft. 225 of them were recently built of COR-TEN by the American Car & Foundry Co. In 39" coal, the car capacity is practically four tons—they weigh 525 lbs. less than those built of ordinary steel.

Mine Cage Built 30% lighter with MAN-TEN. Vertical ore ship and double-deck hoisting cage built by the Allis-Chalmers Mfg. Co., Milwaukee, for the El Potosi Mining Company of Mexico. Replaced old cages of same capacity—is 30% lighter, permitting cage to reach mine level 860 feet lower without increasing rope pull on hoist . . . saved buying new hoisting equipment.



# UNITED STATES STEEL

# Oxyacetylene Process Wins Wider Use

## In Many Diversified Applications

**A**MONG the important papers presented at convention of the International Acetylene association, in St. Louis, Nov. 18-20, was one describing the new procedure in inspecting welded pipe lines which is to be adopted shortly by the Hartford Steam Boiler Inspection & Insurance Co., Hartford, Conn. This paper, prepared and read by William D. Halsey, assistant chief engineer, boiler division, that company, will be published in abstracted form in an early issue of STEEL. One of the principal features of this new procedure is that it will place no limitations on welding methods used, thus permitting entire freedom for the development of new ideas. All that is asked is proof that the process employed will produce welds of satisfactory tensile strength, ductility and soundness and that the welding operators can make sound welds by that process.

The value of the oxyacetylene process in quantity production plants was stressed in a paper by R. G. LeTourneau, president, R. G. LeTourneau Inc., Peoria, Ill., manufacturer of all-welded earthmoving machinery. He alluded to the possibilities of automatic gas cutting machines equipped with one or more torches for making duplicate parts with accuracy and at low cost. To get full advantage of the process, he stressed the importance of exercising ingenuity in so designing jigs that the parts to be welded can be assembled with facility and that the joint to be welded is placed right side up in a good position for the welder.

### Uses for Welding

One big advantage of welding, said Mr. LeTourneau, is that different types of metal can be used in the same unit. For instance, the company makes an 18-inch ring gear with a heavy hub. The hub is pressed cold of mild steel, while the disk is made of a strong alloy steel. The rim is rolled from a bar of alloy steel suitable for the production of gear teeth to be carburized. The rim of this gear is welded to the disk and the joint where the bar comes together is welded on the inside of the rim but not on the outside. A crack, the depth of the tooth to be cut, is left in the rim and this crack cut out by the gear machine; there is no crack in the finished gear and there is no weld metal in any of the gear teeth.

When welds fail, said Mr. LeTourneau, the failure in 9 cases out

of 10 is due to poor design. The company designs all its welds so that if the welds actually are 50 per cent weld metal they will have more than the required strength. For instance, the company does not butt two bars together and make a flush weld the size of the bar unless it knows that the strain will be less than half the strength of the bar. If the strain is to be greater a strap weld is made. The company does a great deal of strap welding. Its basic concept in this connection is that a  $\frac{3}{8}$ -inch weld is fully half as strong as a  $\frac{1}{2}$ -inch weld but it only has half as much metal in it and can be put on more than four times as fast. By using a strap or by lapping the pieces, said Mr. LeTourneau, it is possible to obtain a full strength union with almost any size weld that is desired, and it becomes necessary only to find a happy medium between the length of the strap and the size of the weld.

### Relieving Tension

In earlier days when he made his own torches, said Mr. LeTourneau, he always arranged the valves so that the hand that held the torch could manipulate all valves without using the other hand. He expressed the belief that this is a necessary improvement in present torch design, saying that much greater speed can be obtained by increasing and decreasing the volume of the flame with the operating hand without dropping the rod in the other hand and stopping the work to do the necessary manipulating.

To relieve the tension in gas cut edges, said Mr. LeTourneau, good results are obtained by beating along the edges with a hammer, although heating in a furnace to relieve stresses is required when subsequent machine operations are to be performed.

With reference to the trend toward high strength steels, Mr. LeTourneau warned against cutting and welding steels of high carbon content. Whereas the usual attitude is that 0.35 per cent carbon is about the limit, he has found that this amount of carbon is far too high for ordinary alloy steels; when alloy steels containing 0.35 carbon are cut, the edges become glass hard after cooling and minute cracks develop along the face of cut. He offered another practical hint in connection with jobs in which it is necessary to weld on a shaft which has a bending moment at the weld; in such a case the weld should be de-

signed to run lengthwise of the shaft instead of crosswise.

**A**N INTERESTING paper by T. R. Jones, T. R. Jones Inc., Dallas, Tex., and, in the absence of Mr. Jones, read by F. C. Hutchison, Linde Air Products Co., Kansas City, dealt with progress in pipeline welding. In particular, it described the increasing adoption of the all bellhole welding method which Mr. Jones recently applied to the laying of 50 miles of 10-inch line in Kansas. By this method all of the operations are consolidated within a relatively narrow area so that better supervision can be maintained over the job. Improvements are necessary in purely mechanical operations in order to keep pace with present welding speed. Anything that can be done to increase the speed with which pipe can be bent in accordance with the contour of the country, and to increase the speed of opening up ditches will increase the speed of laying pipe lines. Speaking about joint design, Mr. Jones expressed the belief that the welding fraternity is agreed, as a result of exhaustive tests, that maximum joint efficiency is obtained from the single vee butt weld. Mr. Jones commented on the great progress in the past five years through the development of new welding techniques and the introduction of multiple flame welding equipment. He mentioned the high operating stresses which characterize many welded overland pipe lines; he cited cases where pipe with wall thickness of  $\frac{1}{4}$ -inch and diameter of 1-inch is being used for pressures of 700 to 800 pounds per square inch.

### Power Plant Piping

In discussing power plant piping, Wilson A. Benoist, assistant engineer, Anheuser-Busch Inc., St. Louis, said that welded piping offers many advantages which make it more desirable than mechanical joints for the company's plants. Piping systems in these plants carry steam, water, air, ammonia and brewery products, and tightness of the lines is of utmost importance. Welded installations are lower on first cost and also in maintenance; they also have superior operating characteristics. The company welds all lines more than 2 inches in diameter. The company now is investigating the welding of valves.

Presiding over the general industries session, A. E. Gibson, vice president Wellman Engineering Co., Cleveland, and president, American Welding society, declared his belief that welded construction still is in its infancy and that in its future are possibilities which mean real profits to those who will see and develop them. He cited an experience with clamshell buckets which

# NO

# DECEPTION . . . .



**INFERIOR QUALITY SOON  
SHOWS UP UNDER HARD  
USAGE IN THE FIELD!**

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How can you be sure that the material you specify will give the service and performance you require and expect?

Take sheared steel plate, for example. Two plates may look exactly alike—cursory tests may show little difference. Yet one may fail to withstand the battering and pounding, the gruelling punishment given *your* product in the field . . . may make a dissatisfied customer for you, one that can never be sold again!

We submit the fact that WORTH Sheared Steel Plate has won an enviable acceptance through pure merit . . . has given uniformly rugged, long-lived performance in the innumerable fabrications for which it has been chosen . . . and is backed by a reputation for integrity.

IF IT'S A

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**WORTH STEEL COMPANY · CLAYMONT · DEL.**

the company makes in all sizes, catering particularly to dredging contractors who give the buckets severe usage. Formerly the company made the buckets of low carbon steel plate and steel castings and despite attempts to stiffen the castings it was impossible to give them enough impact strength to resist breakage in service. About two years ago the company began making these buckets of all welded steel construction, with a subsequent heat treatment to relieve stresses. It is able to sell these buckets with guarantees that they will not break as a result of the changeover in construction methods.

Mr. Gibson advised designers to study the possibilities of new materials such as the new low alloy, high yield strength steels. The company now has under construction an installation of welded coal handling machinery which would have weighed too much for the dock's capacity, if built out of plain carbon steel. By persuading a steel company to roll 33-inch beams out of low alloy steel, the company is able to build machinery of the approved welded design which will be within the capacity of the dock.

**ERIK OBERG**, editor, *Machinery*, New York, submitted a paper detailing the advantages to the machine designer which are made possible by designing for welded construction. By means of flame cutting and welding the manufacturer can make quick changes in the design of a product whenever desirable. New designs can be brought out without long delays and quickly can be placed on the market. In the past the designer always has had to take into consideration the possibility of a complete changeover in machine equipment for producing a redesigned product. With the new methods hardly any limitations of this kind are placed on him. Mistakes in welded designs can be corrected, and welded construction permits designs not otherwise possible. Hence, said Mr. Oberg, the possibilities of welded construction give the designer flexibility which he never had before.

In discussion, Mr. Gibson suggested a way of softening high carbon or high air hardening steel which has been hardened by gas cutting. His experience with steel containing less than 0.40 carbon indicates that it may be softened by annealing with a second oxyacetylene torch immediately following the cutting torch.

Berthoud Clifford, vice president, Radiant Fuel Corp., St. Louis, presented an interesting description of the use of the oxyacetylene cutting and welding processes in constructing and maintaining the company's

coke ovens devoted to making an expensive smokeless fuel for domestic use out of relatively low grade local coals. Use of the torch permitted great savings in the construction of the plant and cuts materially the maintenance cost.

A paper prepared by B. F. Orr, superintendent of car shops, Cleveland, Cincinnati, Chicago and St. Louis railroad, Beech Grove, Ind., and read by Thomas Quinn of that organization, was devoted to the use of the oxyacetylene process in the preparation and cutting of steel plate and sheet for cars. This paper, to be abstracted in an early issue of **STEEL**, detailed the economies and other advantages obtained from the stack cutting method.

H. R. Wass, St. Joseph Lead Co., Bonne Terre, Mo., declared that the oxyacetylene process is indispensable for construction and maintenance work in the metal mining industry. Saying that welded construction involves design problems which differ from those with other fabricating methods, he stressed the importance of making generally available all welded design data, thus making it easier for the designer to derive full advantages from the economies and other benefits gained by using the oxyacetylene process.

A paper prepared by G. Stuart Jenkins, general superintendent, Consolidated Coal Co., St. Louis, and read by C. C. Conway of that company, told in a broad way about the modernization of coal mines. Installation of complete mechanical equipment first began to be manifested in a noticeable way in 1928 at the mines located in the areas of higher wage rates, so as to enable these mines to compete against those in the low wage rate districts. The modernized mines operate machine shops for the repair and maintenance of their equipment. They follow the policy of reclaiming all machine parts which can be reclaimed for an expenditure equivalent to 50 per cent or less of their replacement cost. The savings obtained average 25 cents a ton of coal which, for his company, with a high daily output, aggregates \$25 to \$50 a day. In the reclamation and maintenance work the oxyacetylene torch is an indispensable tool.

Charles H. Ellaby, United States Engineer department, St. Louis, declared that engineers who design large steel structures such as dams, dam gates, bridges and buildings still feel that they know more about the behavior of riveted heavy structures and hence are not yet inclined to take any chances with the use of the welding process on these large jobs. Discussion brought out the welding of large structures at Boulder dam and the progress made elsewhere and it was suggested that the failure of engineers to utilize

welding on a larger scale in the design of large structures results from inertia toward progress rather than to an absence of engineering data based on actual experience.

Welding by the oxyacetylene process is universally regarded as essential in the operation and maintenance of pipe lines, said R. P. Gonzales, assistant superintendent, pipeline division, Arkansas-Louisiana Gas Co., Shreveport, La. His paper described the uses to which the process is put in this industry.

**SHERMAN T. SEELEY**, sales engineer Midwest Piping & Supply Co., St. Louis, read an interesting paper entitled "Why Should Piping Contractors Recommend Welding to Architects and Engineers?". It went exhaustively into the possibilities in connection with welded pipe lines and included an analysis showing that welded construction offers lowest cost, the savings in many instances being in excess of 80 per cent. Mr. Seeley said that welding generally has been accepted by architects and engineers so that the pipe welding contractor now finds a ready ear when he starts to tell what sort of work he is in a position to do.

Ira T. Hook, research engineer, American Brass Co., Ansonia, Conn., presented a paper outlining in detail the technique for gas welding of cupro-nickels and copper silicon alloys.

Despite the built-in safety features on oxyacetylene equipment, the number of fires resulting from the use of the process is increasing with the improvement in business. These fires result from carelessness of oxyacetylene operators, so that it was thought at the meeting that the safety angle is due for some effective promotion.

## Calcium Carbonate Used in Mold Binder Mixture

An improved variation in the use of sodium silicate or water glass as a binder for making molds is the application of calcium carbonate in the mixture, according to a recent patent. The preferred composition is 87 parts of washed silica sand and 1 part of precipitated calcium carbonate which is mixed together and then 12 parts of 42 degrees become sodium silicate (3.25 SiO<sub>2</sub>: 1 Na<sub>2</sub>O) is added. The mixture is shaped into a mold and baked at 400 degrees Fahr. or higher in the absence of carbon dioxide which tends to weaken the bond. Molds made with the mixture are suitable for cast iron, resist moisture and resist heat. The calcium carbonate is claimed not to decrease the porosity.

# PROGRESS IN STEELMAKING

## Markets New Coil Lifter

Coils of strip steel in a wide variety of diameters and widths are handled easily by a newly-marketed coil lifter. The tongs are held open by a latch until they rest on the coil. The latch, tripped either by hand or by a solenoid, allows the tongs to close in on the coil in parallel motion on rails as the crane starts the lift. When the load is discharged, which is completed automatically, the latch drops in place and the tongs open to receive the next lift.

♦ ♦ ♦

## New Compound Is Insoluble

New compound permits the sealing of all joints whether threaded or flanged. The material is applied directly to metallic or other parts to be sealed without the necessity of using an intermediary gasket unless a definite clearance is necessary. Once the compound has set from heat or atmospheric exposure it is insoluble in any known solvent. Pipe lines on which the product is used can be taken apart easily without injury to the parts. Application is made with a spatula or stiff

brush; all that is necessary is to use a thin uniform coating, allow it to set for a few moments and then bring the parts together. Where it is essential to make a joint with a stripped thread this readily can be done by saturating hemp, cotton waste, oakum or other fibrous material and winding it around the thread before the application of pressure. Since high pressure, high and low temperatures, hot or cold water, acids, alkalies and other chemicals have no effect on the compound, it is suitable for sealing horizontal joints of steam turbines and pipe lines insulated in pickling and by-product coke departments through which acids, benzol, toluol and other similar chemicals are conveyed.

♦ ♦ ♦

## Paint Retards Oxidation

Corrosion is retarded by a new paint developed for coating all metal surfaces exposed to fumes prevalent in industrial atmospheres. It affords protection to steelwork exposed to acid fumes from pickling tanks as well as fumes from galvanizing pots. The product is

waterproof and is recommended for all types of hot surfaces below 600 degrees Fahr. and not in direct contact with flames or fire. The coating sets to touch in two hours and dries in six hours to a hard but elastic film. The material is for application on structural steel, metal sheeting, galvanized products, smokestacks, furnaces, boiler fronts, blast furnace stoves, gas washers, dust catchers, pipe lines, underground tanks, and on other steelwork at iron and steel plants.

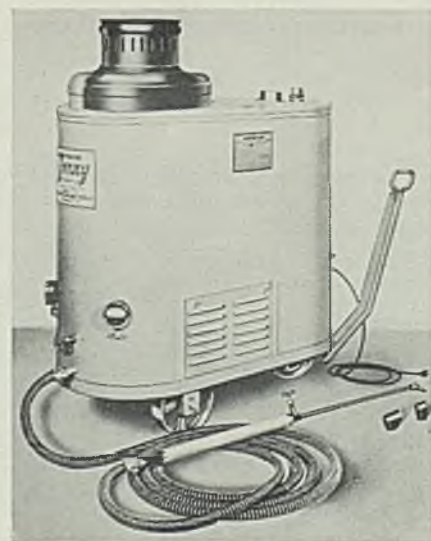
♦ ♦ ♦

## Identification Is Assured

An Ohio wiremaker employs a simple method for preventing various grades of steel becoming mixed while in transit through the mill. When a different type of steel billets is to be charged into the reheating furnace the men on the discharge end of the furnace are notified. Later when the rod is discharged from the reel a red flag is placed on the coil and the heater or assistant heater follows the starting bundle to make sure that it is identified properly at the end of the mill.

## Electrically-Operated Pressure Cleaning Unit Finds Wide Application at Steel Plants

**A**CKNOWLEDGMENT by the steel industry of the importance of maintaining safe working conditions in plants has led to the use of mechanically steam cleaning equipment for removing heavy smudge and grease from and around operating and production machinery and for cleaning walls, floors, ribbed glass windows, etc. One type of cleaner, the Hypressure Igny, carries the water and fuel tanks on a truck and it is only necessary to plug in an electrical connection. Water at 200 degrees Fahr. strikes the air with a pressure up to 175 pounds per square inch and flashes it into a spray of steam and water. This spray pelts the area to be cleaned with fine globules of water. Approximately 700 pounds of steel is used in the manufacture of a pressure unit shown in the accompanying illustration, according to the Homestead Valve Mfg. Co., Coraopolis, Pa. Eleven units now are being used by the Carnegie-Illinois Steel Corp., Pittsburgh, two by the Pittsburgh Steel Co., Monessen, Pa., and various models by the Wheeling Steel Corp., Wheeling, W. Va., Oliver Iron & Steel Co., Pittsburgh, and the Parkersburg Rig & Reel Co., Parkersburg, W. Va.



# Discusses Industrial Interest In Protection of Employes

**F**OUNDRYMEN and insurance carriers have more common interest and dependence than in most other industries, said Roger Williams, New York, in his address on "Other Controllable Costs," given at the closing session of the National Founders association in New York, Nov. 19. He outlined a proposed attitude of foundrymen toward compensation and occupational disease legislation. Proper protests against unjustly high rates for compensation purposes and setting up "proper safeguard to avoid the accidents expected" are means of obtaining lower rates.

Mr. Williams pointed out that industry early recognized the place and value of protection of workers in hazardous industries and he raised the question of why industry has permitted others to administer these protective measures.

## Industry Started Progress

"We know that industry has initiated much of this social progress," said Mr. Williams, "and proven its value before legislators took it up. As far back as 1900 elements of the steel industry discovered the economic value of preventing accidents to reduce operating costs and increase wages of workmen. Sick benefits, retirement plans, group insurance and other benefits have been tried by industry, without legislative pressure.

"I naturally wonder why industry has so easily permitted these matters to be taken out of its hands. Perhaps the explanation is that many employers, when asked about their responsibilities for high compensation losses, explain that they have no concern because it is up to the insurance carriers to pay them.

It would be preferable for industry to carry through with its responsibility and enjoy the pride of parenthood of desirable progress."

Industry should take more initiative in matters pertaining to legislation affecting this group, Mr. Williams said, pointing out that in the long run the industrialist probably gives more time by helping in the defensive action after the cost of legislation becomes apparent and he is forced to act in self-preservation, than would have been necessary if action had been taken earlier.

## Little Work Done

The foundry group, like other competitive industries, has found it desirable to work harmoniously for the common good, said Mr. Williams, but, with the exception of the National Founders association's farsightedness in the silicosis situation, he did not believe its average in anticipation, appraisal and prevention of future legislation is very high. The reason generally is that every employer is concentrating his efforts and thoughts upon operating costs and feels he cannot give time to legislative proposals.

Accident prevention has proven to be one of the most useful vehicles for better employer-employee relations, said Mr. Williams, because neither could benefit at the expense of the other.

"Uses and Limitations of Respiratory Protective Equipment" was the subject of an address by Philip Drinker, professor of industrial hygiene, Harvard School of Public Health. Effectiveness of respiratory equipment can be nullified by improper or careless use of suitable equipment, he averred. How work-

ers often misuse their respiratory equipment was demonstrated in pictures shown during the talk.

Through analyses of the contents of the air of foundries Drinker says that in ordinary casting practices the dangers from silicosis are slight. In view of these findings he said it would be advisable for foundrymen to make tests of their own plants and make the findings known. The dust which is found in foundries results, as a general rule, from the binding material rather than the quartz sand which causes silicosis. Except in sandblasting, and occasional chipping, he said, quartz is not ground up.

A paper on "A Precision High Power Metals Microscope and Its Application to the Study of Fatigue Cracks in Cast Iron" prepared by F. F. Lucas, member of technical staff, Bell Telephone Laboratories Inc., New York, was read by R. H. Sample.

Careful preparation of specimens which are to be photographed at extremely high magnification should be made, Lucas said in the paper, even though present-day microscopes have been vastly improved in recent years. Otherwise the imperfections in the polish will be of a greater magnitude than the detail we hope to photograph.

Expressing the hope foundrymen will carry the thought to business that "a man off relief is a tax off the back," Walter H. Smith, representative of the National Re-Employment Service, New York, discussed phases of the program of this agency in placing men back once more in industry. He asserted that in the final analysis business can provide jobs for those on relief at a lower cost than the government. He praised the heavy industries for their job in employment loads during the depression.

## Materials Supply Cited by Army Ordnance Officer

Strategic materials of the United States were discussed by Col. C. T. Harris Jr., Ordnance department, United States Army, in an address before the New York chapter, American Society for Metals, in a recent meeting. America, declared Col. Harris, is endowed with iron, copper, lead and zinc, but is lacking in manganese, nickel, chromium, antimony and tin in the field of metals. Also lacking are various materials in the nonmetallic substances. Methods should be adopted, he stated, to build up a reserve in peace time as insurance against war needs. Research in industry and government is needed to evolve substitutes for materials in which we are deficient.

## Die Cast Micrometer



*MICROMETERS for which the perfection of hand-tooled instruments is claimed have been placed in volume production by Doehler Die Casting Co., Toledo, O., as aluminum alloy die castings*

# THE YEARBOOK ISSUE

January 4, 1937

Editorial:—  
**IS INDUSTRY  
PREPARED FOR  
REAL PROSPERITY  
?**

This dominant theme will be carried through-  
out the "YEARBOOK" and everyone of the  
more than 30 major articles will be pointed  
toward the single question:—

**IS INDUSTRY PREPARED?**

The 1937 Yearbook will also contain all of the  
established articles and departments, making  
this issue of year round value to iron, steel and  
metalworking executives.

## ADVERTISING VALUE PLUS

The 1937 Yearbook will offer advertising value plus because of the authoritative editorial discussion of the state of preparedness for prosperity in the iron, steel and metalworking industry.

Presidents, vice presidents, secretaries, treasurers, works and general managers, purchasing agents, engineers and foremen are thinking of preparedness in terms of their own plants, equipment and personnel. This issue will consolidate pertinent facts of timely value. Your advertisement will literally "strike while the iron is hot". In addition, the usual valuable features and departments in previous Yearbook issues are retained, thus assuring the expected long life of your advertisement by virtue of continued reference.

Use adequate space to tell your complete story.  
Make this your "master advertisement" of the year.  
Final forms close December 21.

# S T E E L

PRODUCTION • PROCESSING • DISTRIBUTION • USE

# NEW EQUIPMENT

## Rod Straightener—

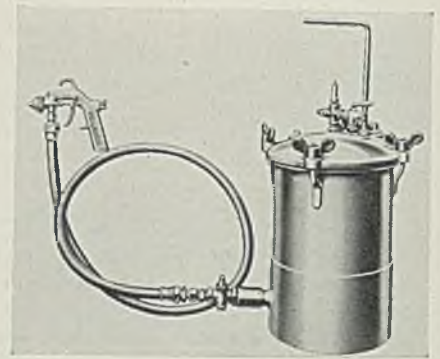
American Foundry Equipment Co., 555 S. Byrkit St., Mishawaka, Ind., announces an improved rod straightener and shear machine. This new machine was designed for reclamation of rods, bolts wire and nails. Rapidity of operation in both straightening and shearing is limited only by the speed of the operator in feeding stock into the machine. The rod straightener and shear machine is made in all sizes from a small hand operated model with a maximum straightening capacity of ¼-inch rods to a large compressed air unit with maximum straightening capacity of 2½ inch rods. With the exception of the hand operated model, all machines are operated by compressed air, sixty pounds being the minimum

pressure for satisfactory operation. Straightening mechanism is composed of manganese steel dies which close as a contracting square on the rod or bar and deliver an impact on four sides simultaneously. Operation is controlled and the force of the blow is regulated by a hand control lever which actuates the air throttle valve. A gagger attachment is obtainable on several of the models. Machine is constructed of cast steel with the exception of cylinder parts which are cast iron.

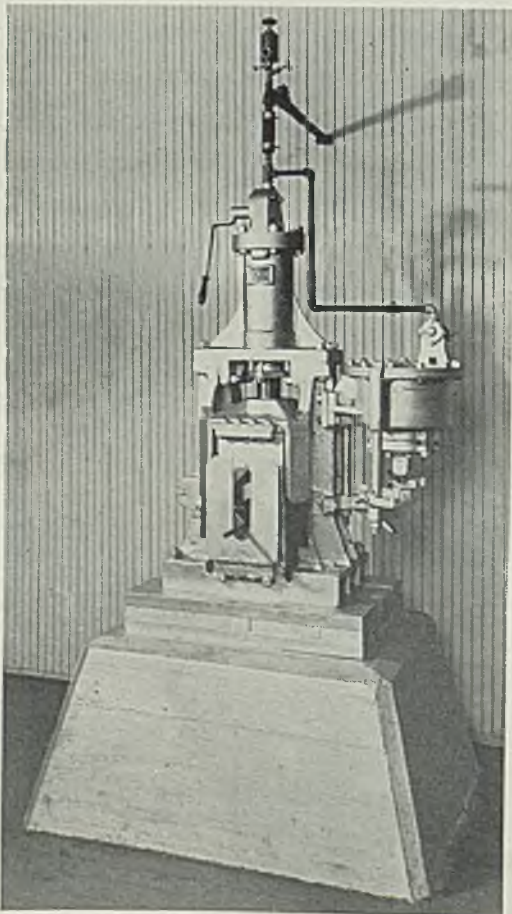
## Pressure Tank—

Binks Mfg. Co., 3114 Carroll avenue, Chicago, is the maker of a series of pressure cup and pressure tank outfits for sound deadener

spraying. Units are designed for all types of spraying with heavy materials such as cut back and emulsified asphalt, where production requirements are slight. Nozzle of the gun gives round spray only, and



*Binks spraying outfit for use with sound deadener and other heavy liquids*



*Rod straightener and shear for reclamation purposes built by American Foundry Equipment Co.*

outfit requires 5 to 9 cubic feet per minute at 30 to 60 pounds pressure. The device is supplied with either a 2-quart cup or 2-gallon pressure tank. The cup holds enough material to cover 6 to 8 square feet to a depth of 1/16-inch, while the tank will hold enough to cover 28 to 30 square feet.

## Utility Blow Torch—

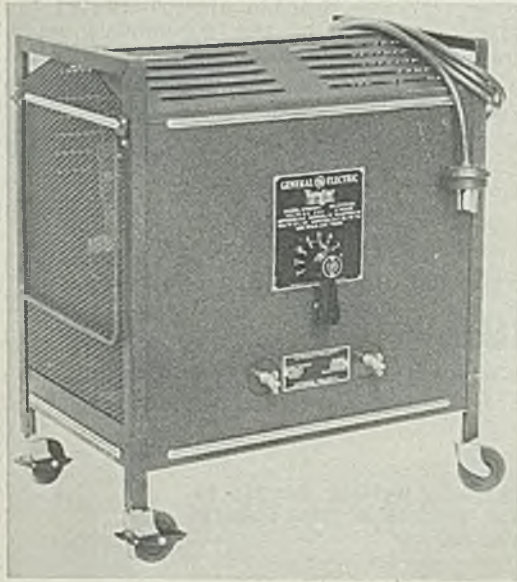
Turner Brass Works, Sycamore, Ill., has developed a new type of utility blow torch designed to thaw frozen switches, start back fires, burn weeds and similar uses in maintenance work. Originally designed in cooperation with the forestry service, the torch has been widely applied for industrial purpose, according to the maker. Torch is equipped with a coil burner of the firepot type which develops a wide spreading blue flame. Burner is protected by a sheet metal shield. Tank is made of heavy seamless brass tubing with cast bronze ends brazed into place. An adjustable handle which may be folded flat when the torch is moved is provided. Serving as a filler plug is a



quick action pump. On one filling of gasoline the torch will burn 2½ hours, the tank having a capacity of ¾-gallon.

#### Arc Welder—

General Electric Co., Schenectady, N. Y., announces a new low range direct current arc welder utilizing rectifier bulbs instead of rotating equipment. The welder, designed to operate on three phase 50 or 60-



*General Electric Tungar direct current arc welder using rectifier bulbs instead of rotating equipment*

cycle power of 230, 440 or 550 volts, uses four mercury tungar bulbs. Ample capacity for welding all light gage car or truck parts in construction and maintenance work has been provided. It can be used to fabricate metal roofs and ceilings, steel cabinets, blowers and ventilating systems and steam fittings. It is light weight, easily portable and has a current range of from 25 to 75 amperes controlled by a nine point tap switch. Equipment is mounted on hard rubber casters for easy moving and weighs 140 pounds net. Overall dimensions are 27 x 24 x 14 inches.

#### Belts—

Manhattan Rubber Mfg. division, Raybestos-Manhattan Inc., has recently developed two new styles of Condor compensated belt, known as style F and style B. Both have the Condor principle of equalized ply stresses at the point of contact, but are designed for conditions where some slip is required. Style F has a red friction pulley surface and is designed for use where a slight starting slip is desired, while style B has a bareback untreated duck pulley surface and is built for conditions requiring a greater slip, or

where slip is essential, as in the case of Winder drives.

#### Notching Tool—

Whitney Metal Tool Co., Rockford, Ill., announces a new notching tool for fabricating sheet metal for air conditioning and heating systems, eaves, downspouts, roofing and the like. The new device has two important features. The first is the construction of the dies,

which are made of two pieces of hardened tool steel and has full clearance so that the punchings can drop through. The second is the double-duty depth gage mounted on the right side of the die. This gage has two lugs on opposite sides and is reversible so that any depth of notch can be set without the gage projecting beyond the end of the die. Gage is locked in position by a screw, and the hardened tool steel punch is locked to the upper die. Handles are steel forgings, finished

*Centerless feed polishing machine for cylindrical work, built by Production Machine Co.*

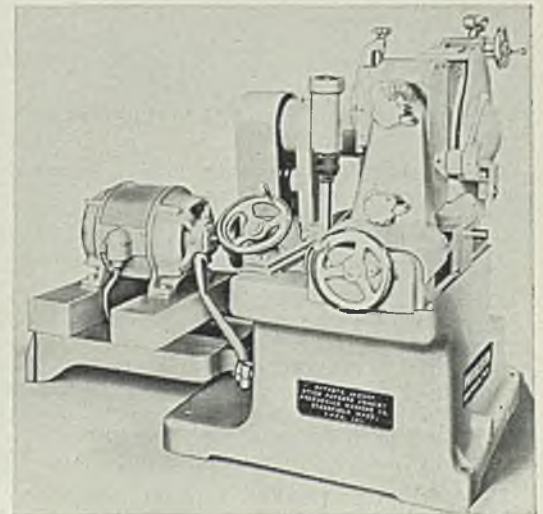
in lacquer with polished handles of comfortable design. A strong return spring between the handles is mounted on a pin. All parts are carefully machined for a good working fit.

#### Small Drills—

Grobet File Corp. of America, 3 Park Place, New York, has recently marketed a series of small flat drills in high speed steel, diameters of which range from 0.002-inch to 0.100-inch. Drills are manufactured by F. L. Grobet, Swiss file manufacturer. Maker guarantees the drills to be accurate in dimension and absolutely centered. According to the company, accuracy is retained by the drill up to 15,000 holes. Greater drilling speeds are possible than with the older type carbon steel drills, it is claimed. Uses for which these drills are designed include dies for artificial silk, carburetors, ejectors, sprayguns, electrical and surgical instruments and the like.

#### Polishing Machine—

Production Machine Co., Greenfield, Mass., announces a new centerless feed polishing machine for cylindrical work, designed for polishing and buffing to give any grade finish. Wheel mounting is heavy, the shaft running in self aligning ball bearings and driven by a triple V-type drive. Swinging frame provides adjustment for wheels varying in diameter from 10 to 16 inches. Suitable trueing device is provided for trueing the wheels while in motion. Feed is of the centerless type mounted in a tilting housing which enables the operator to vary the speed as desired. Work support is adjustable with the feed unit so the support is always in the proper position for work of various diameters. All parts are carefully guarded and at the same time easily accessible.



## Portable Plating Machine Opens New Opportunities

(Concluded from Page 49)

have been carried out to find new uses for this process with satisfactory results. Store fronts have been plated, as shown in an accompanying illustration, with very satisfactory results. Many other permanent installations such as architectural metal grills, plumbing and lighting fixtures and the like have all been successfully plated. The upkeep of such equipment has been thus materially reduced and an appearance standard never before attainable can be maintained. The use of this process to plate the bright-work of the locomotive shown in an

accompanying illustration opens entirely new possibilities in the decoration of "name" trains, since the coatings can be renewed with the same ease as paint.

Possibly one of the most important applications of the process will be in the maintenance of nickel lined industrial apparatus. Food manufacturers who have had to dismantle vats and send them away for renickeling will appreciate the cost savings possible if they can be replated in place. Equipment of this type needs only to be thoroughly cleaned by the methods described above and it is ready for plating by the portable plating apparatus. The actual cost of plating is not only lower but the equipment is out of service only a matter of hours in-

stead of days or weeks as would be the case if tank plating were resorted to. The cost of dismantling, shipping and reassembling is entirely eliminated.

In maintenance work it will be found in many cases that the old plate is loose and rough in spots. As in the case of tank plating, defects such as these can not be covered and the old deposit must be removed. This can be done electrolytically by reversing the current and using a special stripping electrolyte exactly as in the case of applying a deposit.

The possible applications of this process in the automotive repair field are too numerous to mention. Other applications are limited only by the imagination of the reader.

## 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.

**Waste Prevention Instruments**—Esterline-Angus Co., Indianapolis, Ind. Folder No. 1316, illustrating how its various graphic instruments prevent waste in industry.

**Thermometers** — Cooper Oven Thermometer Co., Pequabuck, Conn. Catalog No. 200 on the company's stove, room, and custom-made thermometers.

**Flow Meter Engineering**—Brown Instrument Co., Philadelphia. Handbook covering almost every phase of flow meter engineering principles, designs, applications and installation.

**Forging Presses**—Chambersburg Engineering Co., Chambersburg, Pa. Bulletin No. 300, covering steam-hydraulic high-speed forging presses; illustrations of various types are included.

**Circuit Breakers**—Square D Co., 6060 Riverside drive, Detroit. Bulletin No. CA-543, describing its multi-breaker line of low priced circuit breakers for domestic and small commercial buildings.

**Thermometer and Pressure Gage**—Brown Instrument Co., Philadelphia. Catalog No. 6703, covering the complete line of Brown thermometers and pressure gages and enumerating the wide range of industries to which they are applicable.

**Photo-Micrography** — Bausch & Lomb Optical Co., Rochester, N. Y.

Catalog No. F-19, on low power photomicrography with micro tessar and tessar 11b lenses; catalog No. E-240, on research, metallographic equipment.

**Anodes and Plating Chemicals**—Hanson-Van Winkle-Munning Co., Matawan, N. J. Catalog No. AC-104, containing description of anodes and chemicals and includes a brief description of bright nickel plating process and zinc plating process.

**Measuring Instruments**—Leeds & Northrup Co., 4904 Stanton avenue, Philadelphia. Catalog-type broadside No. 160 on power plant measuring instruments, telemeters and automatic controls; specific applications are mentioned.

**Roof Protection**—Johns-Manville, 22 East Fortieth street, New York. Booklet prepared to help owners of buildings to reduce maintenance expense by showing where most roof troubles start and how best to prevent them.

**Roll Grinders** — Farrel-Birmingham Co. Inc., Ansonia, Conn. Bulletin No. 111, on heavy duty roll grinders, describing design and construction features; contains tabulations giving specifications, dimensions and weights.

**V-Belt Drives**—Medart Co., 3500 De Kalb street, St. Louis. Catalog No. 56-V, describing its various types of V-belt drives and sheaves,

including dimension and price tables, specifications, instruction as to installation and operation.

**Tractors and Trailers** — Mercury Mfg. Co., 4130 South Halsted street, Chicago. Booklet describing and illustrating the principal units in the Mercury line, including the "Huskie" gas tractor and high and low lift trucks, telescopic ram trucks, trailers and dump bodies.

**Turbine Pumps**—Roots - Connersville Blower Corp., Connersville, Ind. Bulletin No. 260-B11B, descriptive of its line of type T turbine pumps; a selection table, showing pumps for capacities from 5 to 200 gallons per minute, at heads up to 300 feet, is included.

**Vanadium Steel**—Vanadium Corp. of America, 420 Lexington avenue, New York. Catalog covering specific applications of vanadium steels for locomotive and car construction, to achieve a minimum of dead weight without sacrifice of safety standards.

**Handling Equipment** — Gifford-Wood Co., Hudson, N. Y., Catalog No. 136, on its equipment for handling raw material in bulk, packaged goods in various forms, ice handling in blocks, aggregate handling, such as stone, sand, gravel and cement and power plant equipment for unloading, storing and reclaiming of coal and removal of ashes.

# Operations Up to 75½; Railroad Orders Large

## Price Announcements

## Stimulate Demand for

## Many Commodities

**D**EMAND for steel showed an appreciable increase last week following the price announcements, and the national steelworks operating rate advanced 1 point to 75½ per cent, highest since the spring of 1930.

Large orders for rails and railroad equipment provided the feature of the week. In these lines and in other iron and steel commodities where the price advances are expected to stimulate bookings, there were many indications that a high rate of operations will be assured for the balance of this year and into the first quarter of 1937.

The week's rail awards totaled 123,150 tons, bringing the November aggregate to more than 330,000 tons, which is one of the heaviest monthly totals in recent years. New York Central allocated 82,150 tons, Chicago, Rock Island & Pacific 35,000 and the Long Island 6000. Other substantial rail orders are expected soon. Prices are advancing from \$36.375 to \$39 a ton, the first increase in three years.

New York Central's purchase of 100 locomotives is among the largest single orders since before the depression began. Freight car purchases included 600 for Western Maryland, and 300 for Gulf, Mobile & Northern. Chesapeake & Ohio, in addition to the 2000 cars recently inquired for, will be in the market shortly for 135 freight cars of various kinds.

Norfolk & Western is inquiring for 18,000 kegs of spikes and 13,000 tons of tie plates. Missouri Pacific has permission to buy 33,950 tons of rails.

### Auto Industry Buying Heavily

**O**NE of the longest-term buying programs in the history of the automobile industry is under way at present. By the middle of December it is expected that commitments will have been made for more than 2,000,000 automobiles.

It is roughly estimated that General Motors' advance orders will be sufficient for approximately 800,000 assemblies, while Chrysler's will be for 650,000 and Ford's for more than 500,000.

Many persons expect that 900,000 cars of the 1937 lines will be built before this calendar year is over. Last week, because of the holiday, production was down about 6000 units to 104,283.

Shape awards, 16,940 tons during the week, were

### MARKET IN TABLOID

**DEMAND** . . . Protective buying becoming heavy.

**PRICES** . . . Many products advanced, effective Dec. 1.

**PRODUCTION** . . Operations advance to 75½.

**SHIPMENTS** . . . Strong.

up 5794, and included 3800 tons for the Sixth avenue subway, New York. Bids will be opened Dec. 8 on 47,700 tons of cast iron segments for the Port of New York authority. Bids were opened last week for a floating navy drydock for Pearl Harbor, Hawaii, which will require 22,636 tons of plates.

Cast pipe has been increased \$2 a ton to \$45 in New York. Announcements during the week included the following general price advances, effective Dec. 1 for first quarter delivery: Wire rods, up \$3 a ton; nails, up \$4 a ton; semifinished steel, including sheet bars, up \$2 a ton; bars, shapes and plates, up \$3 a ton; hot-rolled strip, sheets and tin mill black, up \$4 a ton, except enameling sheets which have advanced \$3 a ton; and cold finished carbon steel bars, up \$4 a ton.

### Pig Iron Increase Anticipated

**P**IG iron at all points is now up \$1 a ton. Lake Superior charcoal iron advanced 50 cents a ton on all grades, effective Nov. 24 for delivery up to Jan. 1. Consumers anticipated the pig iron price increase and many of them covered their needs through the balance of 1936. November pig iron shipments are the best for any month to date this year. An advance may be made in the spring on Lake Superior iron ore, which has been unchanged in price since 1929.

Reflecting higher prices in some of the eastern districts, STEEL'S scrap composite has gained 12 cents and is now at \$16.12. From the middle of October up to last week it had been declining gradually.

The iron and steel composite is up 20 cents to \$34.79, because of the increase in pig iron. The current finished steel index is unchanged at \$53.90.

Operations in the Pittsburgh district increased .3 points to 70 per cent; Youngstown 2 to 75; Chicago ½ to 77; Eastern Pennsylvania ½ to 48½, and New England 15 to 88. Cleveland was down 2½ to 77.

# COMPOSITE MARKET AVERAGES

	Nov. 28	Nov. 21	Nov. 14	One Month Ago Oct., 1936	Three Months Ago Aug., 1936	One Year Ago Nov., 1935	Five Years Ago Nov., 1931
Iron and Steel . . . . .	\$34.79	\$34.59	\$34.60	\$34.67	\$33.88	\$33.15	\$30.16
Finished Steel . . . . .	53.90	53.90	53.90	53.90	53.40	53.70	48.17
Steelworks Scrap . . . . .	16.12	16.00	16.04	16.44	14.66	12.92	8.22

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

## A COMPARISON OF PRICES

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

Finished Material	Nov. 28,	Oct.	Aug.	Nov.	Pig Iron	Nov. 28,	Oct.	Aug.	Nov.
	1936	1936	1936	1935		1936	1936	1936	1935
Steel bars, Pittsburgh . . . . .	2.05c	2.05c	1.95c	1.85c	Bessemer, del. Pittsburgh . . . . .	\$21.8132	20.8132	20.8132	20.81
Steel bars, Chicago . . . . .	2.10	2.10	2.00	1.90	Basic, Valley . . . . .	20.00	19.00	19.00	19.00
Steel bars, Philadelphia . . . . .	2.36	2.36	2.26	2.16	Basic, eastern del. East. Pa. . . . .	21.8132	20.8132	20.8132	20.81
Iron bars, Terre Haute, Ind. . . . .	1.95	1.95	1.85	1.75	No. 2 fdy., del. Pittsburgh . . . . .	21.3132	20.3132	20.3132	20.31
Shapes, Pittsburgh . . . . .	1.90	1.90	1.90	1.80	No. 2 fdy., Chicago . . . . .	20.50	19.50	19.50	19.50
Shapes, Philadelphia . . . . .	2.11 1/2	2.11 1/2	2.11 1/2	2.01 1/2	Southern No. 2, Birmingham . . . . .	16.50	15.50	15.50	15.50
Shapes, Chicago . . . . .	1.95	1.95	1.95	1.85	Southern No. 2, del. Cincinnati . . . . .	20.44	19.44	19.44	20.2007
Tank plates, Pittsburgh . . . . .	1.90	1.90	1.90	1.80	No. 2X eastern, del. Phila. . . . .	22.6882	21.6882	21.6882	21.68
Tank plates, Philadelphia . . . . .	2.09	2.09	2.09	1.99	Malleable, Valley . . . . .	20.50	19.50	19.50	19.50
Tank plates, Chicago . . . . .	1.95	1.95	1.95	1.85	Malleable, Chicago . . . . .	20.50	19.50	19.50	19.50
Sheets, No. 10, hot rolled, Pitts. . . . .	1.95	1.95	1.95	1.85	Gray Sup., charcoal, del. Chicago . . . . .	26.2528	25.7528	25.2528	25.25
Sheets, No. 24, hot ann., Pitts. . . . .	2.60	2.60	2.50	2.40	Gray forge, del. Pittsburgh . . . . .	20.6741	19.6741	19.6741	19.67
Sheets, No. 24, galv., Pitts. . . . .	3.20	3.20	3.20	3.10	Ferromanganese, del. Pittsburgh . . . . .	80.13	80.13	80.13	90.13
Sheets, No. 10, hot rolled, Gary . . . . .	2.05	2.05	2.05	1.95					
Sheets, No. 24, hot anneal., Gary . . . . .	2.70	2.70	2.60	2.50	<b>Scrap</b>				
Sheets, No. 24, galvan., Gary . . . . .	3.30	3.30	3.30	3.20	Heavy melting steel, Pittsburgh . . . . .	\$17.50	\$18.15	\$16.00	\$13.65
Plain wire, Pittsburgh . . . . .	2.50	2.50	2.40	2.30	Heavy melt. steel, No. 2, east Pa. . . . .	13.75	13.95	12.80	11.00
Tin plate, per base box, Pitts. . . . .	5.25	5.25	5.25	5.25	Heavy melting steel, Chicago . . . . .	16.50	16.25	15.45	13.20
Wire nails, Pittsburgh . . . . .	2.05	2.05	2.10	2.40	Rail for rolling, Chicago . . . . .	17.25	16.95	16.40	14.30
					Railroad steel specialties, Chicago . . . . .	18.25	17.75	16.65	13.75
<b>Semifinished Material</b>					<b>Coke</b>				
Sheet bars, open-hearth, Youngs. . . . .	\$32.00	\$32.00	\$30.00	\$29.50	Connellsville, furnace, ovens . . . . .	\$4.00	\$4.00	\$3.45	\$3.55
Sheet bars, open-hearth, Pitts. . . . .	32.00	32.00	30.00	29.50	Connellsville, foundry, ovens . . . . .	4.25	4.25	4.25	4.35
Billets, open-hearth, Pittsburgh . . . . .	32.00	32.00	30.00	28.50	Chicago, by-product foundry, del. . . . .	9.75	9.75	9.75	9.75
Wire rods, No. 5 to 1 1/2-inch, Pitts. . . . .	40.00	40.00	38.00	38.00					

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

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

Finished steel prices apply on 1936 delivery; for first quarter prices have been advanced \$2 on semifinished; \$3 on plates, shapes, bars; \$4 on strip and sheets, except enameling sheets \$3

<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 Quantity Extras and Deductions (Except Galvanized)	Pittsburgh . . . . . 2.75c Gary . . . . . 2.85c St. Louis, delivered . . . 3.08c	Pittsburgh base, cents per lb. Chrome-Nickel	Pittsburgh . . . . . 1.90c Philadelphia, del. . . . . 2.11 1/2c New York, del. . . . . 2.16 1/2c Boston, delivered . . . . . 2.30 1/2c Bethlehem . . . . . 2.00c Chicago . . . . . 1.95c Cleveland, del. . . . . 2.10c Buffalo . . . . . 2.00c Gulf Ports . . . . . 2.30c Birmingham . . . . . 2.05c Pacific ports, f.o.b. cars, dock . . . . . 2.45c
<b>Hot Rolled No. 10, 24-48 in.</b>	<b>Cold Rolled No. 10</b>	No. 302 No. 304	<b>Bars</b>
Pittsburgh . . . . . 1.95c Gary . . . . . 2.05c Chicago, delivered . . . . . 2.08c Detroit, del. . . . . 2.15c New York, del. . . . . 2.30c Philadelphia, del. . . . . 2.26c Birmingham . . . . . 2.10c St. Louis, del. . . . . 2.28c Pacific ports, f.o.b. cars, dock . . . . . 2.50c	Pittsburgh . . . . . 2.60c Gary . . . . . 2.70c Detroit, delivered . . . . . 2.80c Philadelphia, del. . . . . 2.91c New York, del. . . . . 2.95c Pacific ports, f.o.b. cars, dock . . . . . 3.20c	Bars . . . . . 23.00 24.00 Plates . . . . . 26.00 28.00 Sheets . . . . . 33.00 35.00 Hot strip . . . . . 20.75 22.75 Cold strip . . . . . 27.00 29.00	<b>Soft Steel</b> (Base, 3 to 25 tons)
<b>Hot Rolled Annealed No. 24</b>	<b>Cold Rolled No. 20</b>	<b>Straight Chromes</b>	Pittsburgh . . . . . 2.05c Chicago or Gary . . . . . 2.10c Duluth . . . . . 2.20c Birmingham . . . . . 2.20c Cleveland . . . . . 2.10c Buffalo . . . . . 2.15c Detroit, delivered . . . . . 2.20c Pacific ports, f.o.b. cars, dock . . . . . 2.60c Philadelphia, del. . . . . 2.36c Boston, delivered . . . . . 2.47c New York, del. . . . . 2.40c Pitts., forg. qual. . . . . 2.40c
Pittsburgh . . . . . 2.60c Gary . . . . . 2.70c Chicago, delivered . . . . . 2.73c Detroit, delivered . . . . . 2.80c New York, del. . . . . 2.95c Philadelphia, del. . . . . 2.91c Birmingham . . . . . 2.75c St. Louis, del. . . . . 2.935c Pacific ports, f.o.b. cars, dock . . . . . 3.25c	Pittsburgh . . . . . 3.05c Gary . . . . . 3.15c Detroit, delivered . . . . . 3.25c Philadelphia, del. . . . . 3.36c New York, del. . . . . 3.40c	No. No. No. 410 430 442 446 Bars . . . . . 17.00 18.50 21.00 26.00 Plates . . . . . 20.00 21.50 24.00 29.00 Sheets . . . . . 25.00 28.00 31.00 35.00 Hot strip 15.75 16.75 21.75 26.75 Cold stp. 20.50 22.00 27.00 35.00	<b>Steel Plate</b>
<b>Galvanized No. 24</b>	<b>Enameling Sheets</b>		Pittsburgh . . . . . 1.90c New York, del. . . . . 2.19c Philadelphia, del. . . . . 2.09c Boston, delivered . . . . . 2.32c Buffalo, delivered . . . . . 2.15c Chicago or Gary . . . . . 1.95c Cleveland, del. . . . . 2.09 1/2c Birmingham . . . . . 2.05c Coatesville, base . . . . . 2.00c Sparrows Pt., base . . . . . 2.00c Pacific ports, f.o.b. cars, dock . . . . . 2.45c St. Louis, delivered . . . . . 2.18c
Pittsburgh . . . . . 3.20c Gary . . . . . 3.30c Chicago, delivered . . . . . 3.33c Philadelphia, del. . . . . 3.51c New York, del. . . . . 3.55c Birmingham . . . . . 3.35c St. Louis, del. . . . . 3.53 1/2c Pacific ports, f.o.b. cars, dock . . . . . 3.80c	Pittsburgh, No. 10 . . . . . 2.45c Pittsburgh, No. 20 . . . . . 3.05c Gary, No. 10 . . . . . 2.55c Gary, No. 20 . . . . . 3.15c		<b>Rail Steel</b> To Manufacturing Trade
	<b>Tin and Terne Plate</b>		Pittsburgh . . . . . 1.90c Chicago or Gary . . . . . 1.95c Moline, Ill. . . . . 1.95c Cleveland . . . . . 1.95c Buffalo . . . . . 2.00c
	Gary base, 10 cents higher.		
	Tin plate, coke base (box) Pittsburgh . . . . . \$5.25		
	Do., waste-waste . . . . . 2.75c		
	Do., strips . . . . . 2.50c		
	Long ternes, No. 24 unassorted, Pitts. . . . . 3.50c		
	Do., Gary . . . . . 3.60c		

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

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

**Wire Products**

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

Base Pitts.-Cleve. 100 lb. keg.	\$2.05
Cement coated nails.....	\$2.05
Galv. nails, 15 gage and finer .....	\$3.05
do. finer than 15 ga.....	\$4.55
(Per pound)	
Polished staples .....	2.75c
Galv. fence staples .....	3.00c
Barbed wire, galv. ....	2.55c
Annealed fence wire.....	2.80c
Galv. fence wire .....	3.15c
Woven wire fencing (base column, c. 1.)...\$60.00	
<b>To Manufacturing Trade</b>	
Plain wire, 6-9 ga. ....	2.50c
Anderson, Ind. (merchant products only) and Chicago up \$1; Duluth up \$2; Birmingham up \$3.	
Spring wire, Pitts. or Cleveland .....	3.05c
Do., Chicago up \$1, Worc. \$2.	

**Cold-Finished Carbon Bars and Shafting**

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

*10,000 to 19,999 lbs. ....	2.55c
*20,000 to 59,999 lbs. ....	2.50c
*0,000 to 99,999 lbs. ....	2.25c
*100,000 to 299,999 lbs. ....	2.42 1/2c
*300,000 lbs. and over .....	2.40c
Gary, Ind., Cleve., Chi., up 5c; Buffalo, up 10c; Detroit, up 15c; eastern Michigan, up 20c.	

**Alloy Steel Bars (Hot)**

(Base, 3 to 25 tons)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem .....	2.55c	
<b>Alloy</b>		
S.A.E. Diff. S.A.E. Diff.		
2000 .....	0.25 3100 .....	0.55
2100 .....	0.55 3200 .....	1.35
2300 .....	1.50 3300 .....	3.80
2500 .....	2.25 3400 .....	3.20
4100 0.15 to 0.25 Mo. ....		0.50
4600 0.20 to 0.30 Mo. 1.25-1.75 Ni .....		1.05
5100 0.80-1.10 Cr. ....		0.45
5100 Cr. spring .....	base	
6100 bars .....	1.20	
6100 spring .....	0.70	
Cr., Ni., Van. ....	1.50	
Carbon Van. ....	0.95	
9200 spring flats .....	base	
9200 spring rounds, squares .....	0.25	

**Piling**

Pittsburgh .....	2.25c
Chicago, Buffalo .....	2.35c

**Strip and Hoops**

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

Hot strip to 23 1/2-in.	
Pittsburgh .....	1.95c
Chicago or Gary .....	2.05c
Birmingham base .....	2.10c
Detroit, del. ....	2.15c
Philadelphia, del. ....	2.26c
New York, del. ....	2.30c
Cooperage hoop,	
Pittsburgh .....	2.05c
Chicago .....	2.15c
Cold strip, 0.25 carbon and under,	
Pitts., Cleveland. ....	2.60c
Detroit, del. ....	2.81c
Worcester, Mass. ....	2.80c
Cleve- Worces- ter, Mass.	
Carbon Pitts. ....	2.80c
0.26-0.50 .....	2.60c
0.51-0.75 .....	3.70c
0.76-1.00 .....	5.45c
Over 1.00 .....	7.50c

**Rails, Track Material**

(Gross Tons)

Standard rails, mill	\$39.00	
Relay rails, Pitts. 20-100 lbs. ....	25.50-28.00	
Light rails, billet qual. Pitts., Chi. ....		\$35.00
Do., reroll. qual. ....	34.00	
Angle bars, billet, Gary, Ind., So. Chi. ....	2.55c	
Do., axle steel. ....	2.10c	
Spikes, R. R. base. ....	2.75c	
Track bolts, base. ....	3.75c	
Tie plates, base. ....	2.00c	
Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up \$2; 16 and 20 lbs., up \$1; 12 lbs. up \$2; 8 and 10 lbs., up \$5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.		

**Bolts and Nuts**

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

<b>Carriage and Machine</b>	
1/2 x 6 and smaller .....	70-10 off
Do. larger .....	70-5 off
Tire bolts .....	50 off
<b>Plow Bolts</b>	
All sizes .....	70-5 off
<b>Stove Bolts</b>	
In packages with nuts attached 75 off; in packages with nuts separate 75-5 off; in bulk 82 1/2 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.	
Step bolts .....	65 off
Elevator bolts .....	65 off
<b>Nuts</b>	
S. A. E. semifinished hex.:	
1/2 to 1 1/8-inch .....	60-20-10 off
Do., 1/2 to 1-inch. ....	60-20-10 off
Do., over 1-inch. ....	60-20-10 off
<b>Hexagon Cap Screws</b>	
Milled .....	50-10 off
Upset, 1-in., smaller .....	60 off
<b>Square Head Set Screws</b>	
Upset, 1-in., smaller .....	75 off
Headless set screws .....	75 off

**Rivets, Wrought Washers**

Struc., c. 1., Pittsburgh, Cleveland .....	3.05c
Struc., c. 1., Chicago .....	3.15c
1/8-in. and smaller, Pitts., Chi., Cleve. ....	70-5 off
Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs. ....	\$6.00 off

**Cut Nails**

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

**Pipe and Tubing**

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

**Welded Iron, Steel Pipe**

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

<b>Butt Weld Steel</b>			
In.	Blk.	Galv.	
1/2 and 3/4 .....	60	44 1/2	
1/2 .....	64 1/2	55	
3/4 .....	67 1/2	59	
1-3 .....	69 1/2	61 1/2	
<b>Iron</b>			
1/2 .....	31 1/2	15	
3/4 .....	36 1/2	20 1/2	
1-1 1/4 .....	39 1/2	25 1/2	
2 .....	41 1/2	26	
<b>Lap Weld Steel</b>			
2 .....	62	53 1/2	
2 1/2-3 .....	65	56 1/2	
3 1/2-6 .....	67	58 1/2	
7 and 8 .....	66	56 1/2	
9 and 10 .....	65 1/2	56	
<b>Iron</b>			
2 .....	37	22 1/2	
2 1/2-3 1/4 .....	38	25	
4-8 .....	40	28 1/2	
<b>Line Pipe Steel</b>			
1/2, butt weld .....	56		
1/2 and 3/4, butt weld. ....	59		
1/2, butt weld .....	63 1/2		
1, butt weld .....	66 1/2		
1 to 3, butt weld .....	68 1/2		
2, lap weld .....	61		
2 1/2 to 3, lap weld. ....	64		
3 1/2 to 6, lap weld. ....	66		
7 and 8, lap weld. ....	65		
<b>Iron</b>			
1/2-1 1/2 inch, black and galv. take 4 pts. over; 2 1/2-6-inch 2 pts. over discounts for same sizes, standard pipe lists, 8-12-inch, no extra.			
<b>Boiler Tubes</b>			
G. L. Discounts, f.o.b. Pitts.			
<b>Lap Weld Steel</b>			
2-2 1/4 .....	33	1 1/4 .....	8
2 1/2-2 3/4 .....	40	2-2 1/4 .....	13
3 .....	47	2 1/2-2 3/4 .....	16
3 1/2-3 3/4 .....	50	3 .....	17
4 .....	52	3 1/2-3 3/4 .....	18
4 1/2-5 .....	42	4 .....	20
		4 1/2 .....	21

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

Lapwelded steel: 200 to 9999 pounds, ten points under base, one 5% and one 7 1/2%. Under 2000 pounds 15 points under base, one 5% and one 7 1/2%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 lbs., 2 pts. under base.

**Seamless Boiler Tubes**  
Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from 1/2 to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound.

Less-carloads revised as of July 1, 1935, card.  
Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices being on lb. and 100 ft. basis

**Seamless Tubing**

Cold drawn; f.o.b. mill disc. 100 ft. or 150 lbs. .... 32%  
15,000 ft. or 22,500 lbs. .... 70%

**Cast Iron Water Pipe**

**Class B Pipe—Per Net Ton**

6-in. & over, Birm. ....	\$39.00-40.00
4-in., Birmingham .....	42.00-43.00
4-in., Chicago .....	50.40-51.40
6 to 24-in., Chicago. ....	47.40-48.40
6-in. & over, east. fdy. ....	45.00
Do., 4-in. ....	46.00
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., Chi., Cleve., Buffalo and Young. ....	\$32.00
Philadelphia .....	37.67
Duluth .....	34.00

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

Pitts., Chicago, Buffalo. ....	39.00
Forging, Duluth .....	41.00

**Sheet Bars**

Pitts., Cleve., Young., Chi., Buffalo, Canton, Sparrows Point .....	32.00
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**Slabs**

Pitts., Chicago, Cleveland, Youngstown. ....	32.00
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**Wire Rods**

Pitts., Cleve., No. 5 to 1 1/2-inch incl. ....	40.00
Do., over 1 1/2 to 1 1/4-inch incl. ....	42.00
Chicago up \$1; Worcester up \$2	

**Skeip**

Pitts., Chi., Young, Buff., Coatesville, Sparrows Pt. 1.80c	
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**Coke**

**Price Per Net Ton**

<b>Beehive Ovens</b>	
Connellsville, fur. ....	\$3.75- 4.00
Connellsville, fdy. ....	4.25- 4.50
Connell. prem. fdy. ....	5.50
New River fdy. ....	6.00
Wise county fdy. ....	4.45- 5.00
Wise county fur. ....	4.00- 4.50
<b>By-Product Foundry</b>	
Newark, N. J., del. ....	10.20-10.65
Chi., ov., outside del. ....	9.00
Chicago, del. ....	9.75
New England, del. ....	12.00
St. Louis, del. ....	10.00-10.50
Birmingham, ovens .....	6.50
Indianapolis, del. ....	9.40
Cincinnati, del. ....	9.50
Cleveland, del. ....	10.30
Buffalo, del. ....	10.50
Detroit, del. ....	10.70
Philadelphia, del. ....	9.88

**Coke By-Products**

Spot gal. Producers' Plants

Pure and 90% benzol. ....	16.00c
Toluol .....	30.00c
Solvent naphtha .....	30.00c
Industrial xylol .....	30.00c
Per lb. f.o.b. Frankford	
Phenol (200 lb. drums) ..	15.50c
Do., (450 lbs.) .....	14.50c
Eastern Plants, per lb.	
Naphthalene flakes and balls, in bbls., to jobbers .....	8.25c
Per 100 lbs. Atlantic seaboard	
Sulphate of ammonia ..	\$1.275
*Western prices, 1/2-cent up.	

## 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 Fdry.	Malleable	Basic	Bessemer
*Bethlehem, Pa.	\$21.50	\$22.00	\$21.00	\$22.50
*Birdsboro, Pa.	21.50	22.00	21.00	22.50
*Birmingham, Ala., southern del.	16.50	16.50	15.50	22.00
*Buffalo	20.50	21.00	19.50	21.50
*Chicago	20.50	20.50	20.00	21.00
*Cleveland	20.50	20.50	20.00	21.00
*Detroit	20.50	20.50	20.00	21.00
*Duluth	21.00	21.00	21.00	21.50
*Erie, Pa.	20.50	21.00	20.00	21.50
*Everett, Mass.	21.50	22.00	21.00	22.50
*Hamilton, O.	20.50	20.50	20.00	21.00
*Jackson, O.	20.25	20.25	19.75	20.00
*Neville Island, Pa.	20.50	20.50	20.00	21.00
*Provo, Utah	18.50	18.50	18.00	19.00
*Sharpsville, Pa.	20.50	20.50	20.00	21.00
*Sparrows Point, Md.	21.50	21.50	21.00	22.00
*Swedeland, Pa.	21.50	22.00	21.00	22.50
*Toledo, O.	20.50	20.50	20.00	21.00
*Youngstown, O.	20.50	20.50	20.00	21.00

Delivered from Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
*Akron, O., from Cleveland	21.76	21.76	21.26	22.26
*Baltimore from Birmingham	22.08	22.08	20.96	21.96
*Boston from Birmingham	21.62	21.62	21.50	22.00
Boston from Everett, Mass.	22.00	22.50	21.50	23.00
*Boston from Buffalo	22.00	22.50	21.50	23.00
*Brooklyn, N. Y., from Bethlehem	23.93	24.43	23.43	24.43
*Brooklyn, N. Y., from Bmghm.	23.55	23.55	23.05	24.05
*Canton, O., from Cleveland	21.76	21.76	21.26	22.26
*Chicago from Birmingham	20.72	20.72	20.60	21.10
*Cincinnati from Hamilton, O.	20.82	21.58	21.08	21.58
*Cincinnati from Birmingham	20.44	20.44	19.82	20.32
*Cleveland from Birmingham	20.62	20.62	20.12	20.62
*Cincinnati from Hamilton, O.	22.17	22.77	22.27	22.77
*Mansfield, O., from Toledo, O.	22.26	22.26	21.76	22.26
*Milwaukee from Chicago	21.57	21.57	21.27	22.07
*Muskegon, Mich., from Chicago, Toledo or Detroit	23.60	23.60	23.10	24.10
*Newark, N. J., from Birmingham	22.61	22.61	22.11	23.11
*Newark, N. J., from Bethlehem	22.99	23.49	22.99	23.49
*Philadelphia from Birmingham	21.93	21.93	21.81	22.31
*Philadelphia from Swedeland, Pa.	22.31	22.81	21.81	22.31
*Pittsburgh district from Neville Island	21.00	21.00	20.50	21.00
*Saginaw, Mich., from Detroit	22.75	22.75	22.25	22.75
*St. Louis, northern	21.00	21.00	20.50	21.00

Delivered from Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
*St. Louis from Birmingham	20.68	20.68	20.50	21.00
*St. Paul from Duluth	22.94	22.94	22.94	23.44
†Over 0.70 phos.				

### Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., \$25.00, Phila. base, standard and copper bearing, \$25.13.

### Gray Forge

*Valley furnace	\$20.00
*Pitts. dist. fur.	20.00

### Charcoal

*Lake Superior fur.	\$23.00
* do., del. Chicago	26.25
*Lyles, Tenn.	23.50

### Silvery†

Jackson county, O., base: 6-6.50 per cent \$22.75; 6.51-7—\$23.25; 7-7.50—\$23.75; 7.51-8—\$24.25; 8-8.50—\$24.75; 8.51-9—\$25.25; 9-9.50—\$25.75; 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. Work	Chester, Pa., and Baltimore bases (bags)
Fire Clay Brick	\$45.00
Super Quality	
Pa., Mo., Ky.	\$55.00
First Quality	
Pa., Ill., Md., Mo., Ky.	\$45.00
Alabama, Georgia	\$38.00-45.00
Second Quality	
Pa., Ill., Ky., Md., Mo.	40.00
Georgia, Alabama	35.00
Ohio	
First quality	\$40.00
Intermediary	37.00
Second quality	28.00
Malleable Bung Brick	
All bases	50.00
Silica Brick	
Pennsylvania	\$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	48.00
Ladle Brick (Dry Press)	
Pa., O., W. Va., Mo.	\$24.00
do., wire cut	22.00
Magnesite	
Imported dead-burned grains, net ton f.o.b.	

## Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	\$22.50
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	\$18.00
Do., for barge	\$19.00

## Ferroalloys

*Dollars, except Ferrochrome*

Ferromanganese, 78-82% tidewater, duty paid	75.00
Do., Baltimore, base	75.00
Do., del. Pittsburgh	80.13
Spiegeleisen, 19-20% dom.	
Palmerston, Pa., spot	26.00
Do., New Orleans	26.00
Ferrosilicon, 50% freight allowed, c. l.	69.50
Do., less carload	77.00
Do., 75 per cent	126-130.00
Spot, \$5 a ton higher.	
Silicomani, 2 1/2 carbon	85.00
2% carbon, 90.00; 1%, 100.00	
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del.	10.00
Ferrotungsten, stand, lb. con. del.	1.30-1.40
Ferrovanadium, 35 to 40% lb., cont.	2.70-2.90
Ferrotitanium, c. l., prod. plant, frt. all, net ton	137.50
Spot, 1 ton, frt. allow., lb.	7.00
Do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17-19% Rockdale, Tenn., basis, 18%, \$3 unitage	58.50
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% \$3 unitage	75.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80
†Carloads. Quan. diff. apply.	

## Nonferrous

### METAL PRICES OF THE WEEK

*Spot unless otherwise specified. Cents per pound*

Copper				Straits Tin		Lead		Zinc	Alumi- num	Antimony	Nickel
Electro, del. Conn.	Lake, del. Midwest	Casting, refinery	Spot	Futures	Lead N. Y.	Lead East St. L.					
Nov. 21	10.50	10.62 1/2	10.20	51.00	50.65	5.20	5.05	5.05	*19.00	12.50	35.00
Nov. 23	10.50	10.62 1/2	10.12 1/2	51.00	50.70	5.20	5.05	5.05	*19.00	12.50	35.00
Nov. 24	10.50	10.62 1/2	10.12 1/2	51.75	51.45	5.20	5.05	5.05	*19.00	12.50	35.00
Nov. 25	10.50	10.62 1/2	10.12 1/2	52.50	51.95	5.20	5.05	5.05	*19.00	12.50	35.00
Nov. 26—Holiday											
Nov. 27	10.50	10.62 1/2	10.12 1/2	52.60	52.05	5.20	5.05	5.05	*19.00	12.50	35.00

\*Nominal range 19.00 to 21.00c.

### MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 10.50c Conn. copper

<b>Sheets</b>	
Yellow brass (high)	16.25
Copper, hot rolled	18.25
Lead, cut to jobbers	8.75
Zinc, 100-lb. base	9.50
<b>Tubes</b>	
High yellow brass	18.50
Seamless copper	18.75
<b>Rods</b>	
High yellow brass	14.25
Copper, hot rolled	15.00
<b>Anodes</b>	
Copper, untrimmed	15.75
<b>Wire</b>	
Yellow brass (high)	16.50

### OLD METALS

Deal. buying prices, cents lb.

<b>No. 1 Composition Red Brass</b>	
*New York	6.75-6.87 1/2
Cleveland	7.50-7.75
Chicago	7.00-7.25
St. Louis	6.75-7.25
<b>Heavy Copper and Wire</b>	
*New York, No. 1	8.25-8.37 1/2
Chicago, No. 1	8.37 1/2-8.62 1/2
Cleveland, No. 1	8.50-8.75
St. Louis, No. 1	8.25-8.75
<b>Composition Brass Borings</b>	
*New York	6.25-6.37 1/2
<b>Light Copper</b>	
*New York	7.25-7.37 1/2
Chicago	6.75-7.00
Cleveland	6.75-7.00
St. Louis	6.75-7.25

### Light Brass

Chicago	4.00-4.25
Cleveland	4.25-4.50
St. Louis	3.75-4.25

### Lead

New York	4.37 1/2-4.50
Cleveland	4.00-4.25
Chicago	4.00-4.25
St. Louis	4.00-4.25

### Zinc

New York	2.50-2.62 1/2
St. Louis	2.50-3.00
Cleveland	2.50-2.75

### Aluminum

Borings, Cleve.	9.75-10.00
Mixed, cast, Cleve.	13.00-13.25
Mixed, cast, St. L.	13.00-13.25
Clips, soft, Cleve.	14.75-15.00

### SECONDARY METALS

Brass ingot, 85-5-5-5, l.c.l.	10.75
Stand. No. 12 alum.	16.75-17.25

# Iron and Steel Scrap Prices

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

<b>HEAVY MELTING STEEL</b>	<b>COUPLERS, SPRINGS</b>	Buffalo .....	10.00-10.50	Cincinnati, iron ...	13.00-13.50
Birmingham† .....	Buffalo .....	Cincinnati, dealers.	6.50- 7.00	Eastern Pa., iron ...	16.50-17.00
Bos. dock, No. 1 exp.	Chicago, springs ...	Cleveland .....	11.00-11.50	Eastern Pa., steel ...	19.50-20.00
†12.00	Eastern Pa. ....	Detroit .....	9.00- 9.50	Pittsburgh, iron ...	18.00-18.50
N. Eng. del. No. 1..	Pittsburgh .....	Eastern Pa. ....	8.50- 9.00	Pittsburgh, steel ...	20.50-21.00
12.75	St. Louis .....	New York .....	14.25- 4.75	St. Louis, iron ....	14.00-14.50
Buffalo, No. 1 .....	16.50-17.00	Pittsburgh .....	11.50-12.00	St. Louis, steel....	16.50-17.00
16.00-16.50	<b>ANGLE BARS—STEEL</b>	Toronto, dealers ...	4.00	Toronto, net .....	8.50
Buffalo, No. 2 .....	Chicago .....	<b>CAST IRON BORINGS</b>			
14.50-15.00	St. Louis .....	Birmingham .....	6.00- 6.50	<b>NO. 1 CAST SCRAP</b>	
Chicago, No. 1 .....	18.00-18.50	Boston dist. chem..	†6.25- 6.50	Birmingham .....	11.50-12.50
16.25-16.75	St. Louis .....	Boston dist. for mills	†6.00- 6.25	Bos. dis. No. 1 mch.	†10.75-11.00
Cleveland, No. 1 ...	15.50-16.00	Buffalo .....	10.00-10.50	N. Eng., del. No. 2..	†9.00- 9.25
15.00-15.50	Buffalo .....	Chicago, dealers ...	9.25- 9.75	N. Eng., del. textile.	12.00-12.50
Cleveland, No. 2 ...	14.50-15.00	Cincinnati, dealers.	6.50- 7.00	Buffalo, cupola ...	15.00-15.50
13.00-13.50	<b>RAILROAD SPECIALTIES</b>	Cleveland .....	11.00-11.50	Buffalo, mach. ....	16.00-16.50
Eastern Pa., No. 1..	Chicago .....	Detroit .....	9.00- 9.50	Chicago, agri. net..	12.00-12.50
15.00	18.00-18.50	E. Pa., chemical...†	10.00-13.00	Chicago, auto .....	12.50-13.00
Eastern Pa., No. 2..	<b>LOW PHOSPHORUS</b>	New York .....	†6.00- 6.50	Chicago, mach. net	14.00-14.50
13.50-14.00	Buffalo, billet and	St. Louis .....	7.00- 7.50	Chicago, rail'r'd net	13.00-13.50
Federal, Ill. ....	bloom crops .....	Toronto, dealers ...	4.50- 5.00	Cincl., mach. cup..	13.50-14.00
13.25-13.75	18.50-19.00	<b>PIPE AND FLUES</b>		Cleveland, mach...†	16.25-16.75
Granite City, R. R.	Cleveland, billet,	Cincinnati, dealers.	9.00- 9.50	Eastern Pa., cupola.	16.00-16.50
15.25-15.75	bloom crops .....	Chicago, net .....	8.00- 8.50	E. Pa., mixed yard.	14.00-14.50
17.25-18.25	19.00-19.50	<b>RAILROAD GRATE BARS</b>		Pittsburgh, cupola..	17.00-17.50
Granite City, No. 2.	Eastern Pa., crops..	Buffalo .....	11.00-11.50	San Francisco, del..	13.50-14.00
13.50-14.00	20.00-20.50	Chicago, net .....	10.00-10.50	Seattle .....	10.00-11.00
New York, No. 1 ..	Pittsburgh, billet,	Cincinnati .....	9.00- 9.50	St. Louis, No. 1....	12.50-13.00
†11.00-11.50	bloom crops .....	Eastern Pa. ....	12.00-12.50	St. L. No. 1, mach.	13.00-13.50
N. Y. dock, No. 1 exp.	21.50-22.00	New York .....	†8.00- 8.50	Toronto, No. 1,	
†10.00-10.50	Pittsburgh, sheet	St. Louis .....	10.50-11.00	mach., net .....	9.50-10.00
Pitts., No. 1 (R. R.)	bar crops .....	Toronto, dealers ...			
17.25-17.75	19.50-20.00	<b>FORGE FLASHINGS</b>			
Pittsburgh, No. 2 ..	<b>FROGS, SWITCHES</b>	Buffalo district .....	9.55	<b>HEAVY CAST</b>	
16.00-16.50	Chicago .....	Buffalo .....	14.50-15.00	Boston, dist. break..	†9.75
St. Louis, R. R. ...	16.00-16.50	Cleveland .....	14.50-15.00	New England del....	11.00-11.50
15.25-15.75	St. Louis, cut .....	Detroit .....	12.00-12.50	Buffalo, break. ....	13.50-14.00
St. Louis, No. 2 ...	15.25-15.75	Pittsburgh .....	15.75-16.25	Cleveland, break...†	13.00-13.50
13.50-14.00	<b>SHOVELING STEEL</b>	<b>FORGE SCRAP</b>		Detroit, No. 1 mach.	
Toronto, dlrs. No. 1.	Chicago .....	Boston district .....	†6.50- 7.00	net .....	13.50-14.00
10.50-11.00	16.25-16.75	Chicago, heavy .....	18.00-18.50	Detroit, break. ....	11.50-12.00
Toronto, No. 2 .....	Federal, Ill. ....	Eastern Pa. ....	14.00	Detroit, auto net...†	13.50-14.00
9.50-10.00	13.25-13.75	New York .....	10.50-11.00	Eastern Pa. ....	15.50
Valleys, No. 1 .....	Granite City, Ill..	St. Louis .....		New York, break...†	10.50-11.00
16.75-17.25	13.25-13.75	Toronto, dealers ...		Pittsburgh .....	14.50-15.00
<b>COMPRESSED SHEETS</b>	Toronto, dealers ...				
Buffalo, dealers ...	6.50	<b>ARCH BARS, TRANSOMS</b>		<b>MALEABLE</b>	
14.50-15.00	<b>RAILROAD WROUGHT</b>	St. Louis .....	16.50-17.00	Birmingham, R. R.	13.50-14.00
Chicago, factory ...	Birmingham .....	<b>AXLE TURNINGS</b>		New England, del.†	16.25-17.50
15.00-15.50	Boston, district ...	Boston district .....	†7.25- 7.50	Buffalo .....	17.00-17.50
Chicago, dealer ...	†8.00- 8.25	Buffalo .....	12.50-13.00	Chicago, R. R. ....	18.00-18.50
14.00-14.50	Buffalo, No. 1 .....	Cleveland .....	16.00-16.50	Cincl., agri. del. ...	14.00-14.50
Cleveland .....	14.50-15.00	Detroit .....	13.00-14.00	Cleveland, rall. ....	17.50-18.00
15.00-15.50	Buffalo, No. 2 .....	Pittsburgh .....	15.75-16.25	Detroit, auto, net..	14.50-15.00
St. Louis .....	Chicago, No. 1, net.	<b>FORGE SCRAP</b>		Eastern Pa., R. R..	16.50-17.50
13.50-14.00	14.00-14.50	Boston district .....	†6.50- 7.00	Pittsburgh, rall ...	17.50-18.00
E. Pa., new mat....	Cincinnati, No. 2...†	Chicago, heavy .....	18.00-18.50	St. Louis, R. R. ...	15.50-16.00
15.00	14.00-14.50	Eastern Pa. ....	14.00	Toronto, net .....	7.00
E. Pa., old mat....	Eastern Pa. ....	<b>STEEL CAR AXLES</b>		<b>RAILS FOR ROLLING</b>	
12.50-13.00	13.00-13.50	Birmingham .....	14.50-16.00	5 feet and over	
Pittsburgh .....	St. Louis, No. 2 ...	Boston district ...†	†14.50-15.00	Birmingham .....	14.00-15.00
17.25-17.75	15.00-15.50	Buffalo .....	18.50-19.50	Birmingham .....	†11.00-11.50
St. Louis .....	Toronto, No. 1 dir..	Chicago, net .....	18.00-18.50	Buffalo .....	17.50-18.50
10.50-11.00	7.00	Eastern Pa. ....	21.50	Chicago .....	17.00-17.50
Valleys .....	<b>SPECIFICATION PIPE</b>	Toronto .....	8.50	Eastern Pa. ....	16.00
16.50-16.75	Eastern Pa. ....	<b>STEEL CAR AXLES</b>		New York .....	†12.00-12.50
<b>BUNDLED SHEETS</b>	14.00-14.50	Birmingham .....	14.50-16.00	St. Louis .....	16.50-17.00
Buffalo .....	New York .....	Boston district ...†	†14.50-15.00	<b>LOCOMOTIVE TIRES</b>	
12.75-13.25	14.00-14.50	Buffalo .....	18.50-19.50	Chicago (cut) ....	18.00-18.50
Cincinnati, del. ...	Busheling	Chicago, net .....	18.00-18.50	St. Louis, No. 1....	13.50-14.00
9.50-10.00	Buffalo, No. 1 .....	Eastern Pa. ....	21.50	<b>LOW PHOS. PUNCHINGS</b>	
Cleveland .....	14.50-15.00	Toronto .....	4.50	Buffalo .....	13.00-18.50
12.50-13.00	Chicago, No. 1 .....	<b>FORGE SCRAP</b>		Chicago .....	18.50-19.00
Pittsburgh .....	14.75-15.25	Boston district .....	†6.50- 7.00	Eastern Pa. ....	18.50-19.00
16.00-16.50	Cinclin., No. 1, deal.	Chicago, heavy .....	18.00-18.50	Pittsburgh (heavy)..	20.00-20.50
St. Louis .....	11.00-11.50	Eastern Pa. ....	14.00	Pittsburgh (light)..	19.50-20.00
8.75- 9.25	Cincinnati, No. 2...†	<b>SHAFTING</b>			
Toronto, dealers ..	6.50- 7.00	Boston district .....	†15.25-15.50		
4.50	Cleveland, No. 2 ...	Eastern Pa. ....	20.50-21.50		
<b>SHEET CLIPPINGS, LOOSE</b>	11.00-11.50	New York .....	15.00-16.00		
Chicago .....	Detroit, No. 1, new	St. Louis .....	17.00-17.50		
10.00-10.50	12.50-13.00	Toronto .....	8.50		
Cincinnati .....	Valleys, new, No. 1.	<b>CAR WHEELS</b>			
8.50- 9.00	16.00-16.50	Birmingham .....	14.00-15.50		
Detroit .....	Toronto, dealers...†	Boston dist. iron...†	†11.00-11.50		
10.00-10.50	7.00	Buffalo, iron .....	16.00-17.00		
St. Louis .....	<b>BUSHELING</b>	Buffalo, steel .....	18.50-19.00		
8.00- 8.50	Buffalo, No. 1 .....	Chicago, iron .....	16.50-17.00		
<b>STEEL RAILS, SHORT</b>	14.50-15.00	Chicago, rolled steel	18.25-18.75		
Birmingham .....	Chicago, No. 1 .....				
14.00-16.00	14.75-15.25				
Buffalo .....	Cinclin., No. 1, deal.				
18.50-19.50	11.00-11.50				
Chicago (3 ft.) ...	Cincinnati, No. 2...†				
17.50-18.00	6.50- 7.00				
Chicago (2 ft.) ...	Cleveland, No. 2 ...				
18.50-19.00	11.00-11.50				
Cincinnati, del ...	Detroit, No. 1, new				
16.50-17.00	12.50-13.00				
Detroit .....	Valleys, new, No. 1.				
16.50-17.00	16.00-16.50				
Pitts., open-hearth,	Toronto, dealers...†				
3 ft. and less ...	6.00				
20.50-21.00	<b>MACHINE TURNINGS</b>				
St. Louis, 2 ft. & less	Birmingham .....				
16.00-16.50	6.00- 6.50				
<b>STEEL RAILS, SCRAP</b>	Buffalo .....				
Boston district ...	9.75-10.25				
†11.00	Chicago .....				
Buffalo .....	8.50- 9.00				
16.50-17.00	Cincinnati, dealers.				
Chicago .....	7.50- 8.00				
16.25-16.75	Cleveland .....				
Pittsburgh .....	10.50-11.00				
18.00-18.50	Detroit .....				
St. Louis .....	8.25- 8.75				
15.50-16.00	Eastern Pa. ....				
Toronto, dealers ..	10.50				
8.50	New York .....				
<b>STOVE PLATE</b>	†5.00- 5.50				
Birmingham .....	Pittsburgh .....				
8.00- 9.00	11.75-12.25				
Boston district ...	St. Louis .....				
†7.00- 7.25	6.00- 6.50				
Buffalo .....	Toronto, dealers ...				
12.25-12.75	4.00- 4.50				
Chicago .....	Valleys .....				
9.00- 9.50	10.75-11.25				
Cincinnati, dealers.	<b>BORINGS AND TURNINGS</b>				
9.50-10.00	For Blast Furnace Use				
Detroit, net .....	Boston district ...				
9.00- 9.50	†5.25- 5.50				
Eastern Pa. ....					
12.00-12.50					
New York, fdry. ...					
†10.00					
St. Louis .....					
8.50- 9.00					
Toronto, deal'rs, net					
5.50- 6.00					

## Iron Ore

<b>Lake Superior Ore</b>	
Gross ton, 51½%	
<b>Lower Lake Ports</b>	
Old range bessemer ..	\$4.80
Mesabi nonbess. ....	4.50
Hlgh phosphorus .....	4.40
Mesabi bessemer .....	4.65
Old range nonbess. ....	4.65

<b>Eastern Local Ore</b>	
Cents, unit, del. E. Pa.	
Foundry and basic	
56-63% con. (nom.)	8.50- 9.00
Cop.-free low phos.	
58-60% (nom.)....	10.00-10.50
<b>Foreign Ore</b>	
Cents per unit, f.a.s. Atlantic	
ports (nominal)	
Foreign manganiferous ore, 45.55%	

Iron, 6-10% man.	11.00
No. Afr. low phos..	13.50
Swedish basic, 65%	10.00
Swedish low phos..	11.50
Spanish No. Africa	
basic, 50 to 60%.	nom.
Tungsten, spot sh.	
ton unit, duty pd..	\$15.85-16.00
N. F. fdy., 55% ...	7.00
Chrome ore, 48%	
gross ton, c.l.f....	19.50-19.75

## Manganese Ore

(Nominal)

Prices not including duty, cents per unit cargo lots.	
Caucasian, 50-52% ....	27.00
So. African, 50-52% ....	27.00
Indian, 50-52% .....	27.00

# Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

### STEEL BARS

Baltimore*	3.20c
Boston††	3.30c
Buffalo	3.10c
Chattanooga	3.56c
Chicago (j)	3.20c
Cincinnati	3.42c
Cleveland	3.10c
Detroit	3.29c
Houston	3.10c
Los Angeles	3.80c
Milwaukee	3.31c-3.46c
New Orleans	3.55c
New York† (d)	3.51c
Pitts. (h)	3.15c-3.30c
Philadelphia*	3.25c
Portland	3.70c
San Francisco	3.60c
Seattle	3.90c
St. Louis	3.45c
St. Paul	3.45c-3.60c
Tulsa	3.35c

### IRON BARS

Portland	3.50c
Chattanooga	3.56c
Baltimore*	3.10c
Cincinnati	3.42c
New York† (d)	3.15c
Philadelphia*	3.25c
St. Louis	3.45c
Tulsa	3.35c

### REINFORCING BARS

Buffalo	2.60c
Chattanooga	3.56c
Chicago	2.10c-2.60c
Cleveland (c)	2.10c

Cincinnati	3.25c
Houston	3.25c
Los Angl., cl.	2.45c
New Orleans	3.50c
Pitts., plain (h)	3.05c
Pitts., twisted squares (h)	3.175c
San Francisco	2.45c
Seattle	3.50c
St. Louis	3.35c
Tulsa	3.25c
Young	2.30c-2.60c

### SHAPES

Baltimore*	3.10c
Boston††	3.29c
Buffalo	3.35c
Chattanooga	3.66c
Chicago	3.30c
Cincinnati	3.52c
Cleveland	3.41c
Detroit	3.52c
Houston	3.10c
Los Angeles	3.80c
Milwaukee	3.41c
New Orleans	3.65c
New York† (d)	3.47c
Philadelphia*	3.10c
Pittsburgh (h)	3.25c
Portland (l)	3.75c
San Francisco	3.60c
Seattle (l)	3.75c
St. Louis	3.55c
St. Paul	3.55c
Tulsa	3.60c

### PLATES

Baltimore*	3.10c
Boston††	3.31c

Buffalo	3.47c
Chattanooga	3.66c
Chicago	3.30c
Cincinnati	3.52c
Cleveland, ½-in. and over	3.41c
Detroit	3.52c
Detroit, ¾-in.	3.85c
Houston	3.10c
Los Angeles	3.60c
Milwaukee	3.41c
New Orleans	3.65c
New York† (d)	3.50c
Philadelphia*	3.10c
Phila. floor	4.95c
Pittsburgh (h)	3.25c
Portland	3.75c
San Francisco	3.80c
Seattle	3.75c
St. Louis	3.55c
St. Paul	3.55c
Tulsa	3.60c

### NO. 10 BLUE

Baltimore*	3.20c
Boston (g)	3.40c
Buffalo	3.72c
Chattanooga	3.46c
Chicago	3.15c
Cincinnati	3.32c
Cleveland	3.21c
Det. 8-10 ga.	3.24c
Houston	3.45c
Los Angeles	3.90c
Milwaukee	3.26c
New Orleans	3.65c
New York† (d)	3.41c
Portland	3.85c
Philadelphia*	3.20c

Pittsburgh (h)	3.05c
San Francisco	3.60c
Seattle	3.85c
St. Louis	3.40c
St. Paul	3.40c
Tulsa	3.80c

### NO. 24 BLACK

Baltimore*†	3.80c
Boston (g)	4.05c
Buffalo	3.35c
Chattanooga*	3.36c
Chicago	3.55c-4.55c
Cincinnati	3.97c
Cleveland	4.01c
Detroit	4.14c
Los Angeles	4.35c
Milwaukee	4.16c
New Orleans*	3.32c
New York† (d)	4.10c
Philadelphia*†	3.85c
Pitts.** (h)	3.65c-4.95c
Portland	4.30c
Seattle	4.60c
San Francisco	4.20c
St. Louis	3.30c
St. Paul	4.10c
Tulsa	4.85c

### NO. 24 GALV. SHEETS

Baltimore*†	3.90c
Buffalo	4.10c
Boston (g)	4.00c
Chattanooga*	3.96c
Chicago (h)	4.15c-5.15c
Cincinnati	4.82c
Cleveland	4.61c
Detroit	4.82c
Houston	4.50c
Los Angeles	4.80c
Milwaukee	4.76c
New Orleans*	3.92c
New York† (d)	4.50c
Philadelphia*†	4.50c
Pitts.** (h)	4.30c-5.55c
Portland	4.60c
San Francisco	5.00c
Seattle	5.10c
St. Louis	4.90c
St. Paul	4.60c
Tulsa	5.20c

### BANDS

Baltimore*	3.30c
Boston††	3.40c
Buffalo	3.52c
Chattanooga	3.71c
Chicago	3.40c
Cincinnati	3.57c
Cleveland	3.46c
Detroit, ½-in. and lighter	3.49c
Houston	3.35c
Los Angeles	4.30c
Milwaukee	3.51c
New Orleans	4.05c
New York† (d)	3.66c
Philadelphia*	3.30c
Pittsburgh (h)	3.30c
Portland	4.35c
San Francisco	4.20c
Seattle	4.35c
St. Louis	3.65c
St. Paul	3.65c
Tulsa	3.55c

### HOOPS

Baltimore	3.55c
Boston ††	4.40c
Buffalo	3.52c
Chicago	3.40c
Cincinnati	3.57c
Det., No. 14 and lighter	3.49c
Los Angeles	6.05c
Milwaukee	3.51c
New York† (d)	3.66c
Philadelphia*	3.55c
Pittsburgh (h)	3.80c
Portland	5.85c
San Francisco	6.25c
Seattle	5.70c
St. Louis	3.65c
St. Paul	3.65c

### COLD FIN. STEEL

Baltimore (c)	3.98c
Boston*	4.15c
Buffalo (h)	3.70c
Chattanooga*	4.38c
Chicago (h)	3.75c
Cincinnati	3.97c
Cleveland (h)	3.75c
Detroit	3.84c
Los Ang. (f) (d)	6.10c
Milwaukee	3.86c
New Orleans	4.55c
New York† (d)	3.96c
Philadelphia*	4.01c
Pittsburgh	3.60c
Portland (f) (d)	6.25c
San Fran. (f) (d)	6.05c
Seattle (f) (d)	6.25c
St. Louis	4.00c
St. Paul	4.27c
Tulsa	4.80c

### COLD ROLLED STRIP

Boston	3.245c
Buffalo	3.39c
Chicago	3.27c
Cincinnati (b)	3.22c
Cleveland (a)	3.00c
Detroit	3.18c
New York† (d)	3.36c
St. Louis	3.41c

### TOOL STEELS

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

Base	
High Speed	59 ¼c
High carbon, high chrome	39c
Oil hardening	23c
Special tool	21c
Extra tool	17 ½c
Regular tool	14 ½c
Uniform extras apply.	

### BOLTS AND NUTS

(100 pounds or over)	
Discount	
Chicago (a)	.65
Cleveland	.70
Detroit	.70
Milwaukee	.70
Pittsburgh	.65-5

(a) Under 100 lbs., 60 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Quantity base; (e) New mill classif. (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less; (i) Under 3 in.; (j) Shapes other than rounds, flats, fillet angles, 3.35c.

Prices on heavier lines are subject to new quantity differentials: 399 lbs. and less, up 50 cts.; 400 to 3999 lbs., base; 4000 to 7999 lbs., 15 cts., under; 8000 to 14,999 lbs., 25 cts., under; 15,000 to 39,999 lbs., 35 cts., under; 40,000 lbs. and over, 50 cts., under; (except Boston).

†Domestic steel; \*Plus quan. extras; \*\*Under 25 bundles; †50 or more bundles; †New extras apply; ††Base 40,000 lbs., extras on less.

## Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Nov. 25

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

	British gross tons U. K. ports	Continents Channel or North Sea ports, metric tons	
		Quoted in dollars at current value	**Quoted in gold pounds sterling
<b>PIG IRON</b>			
Foundry, 2.50-3.00 Silicon	\$15.28 3 2 6*	\$14.23	1 15 0
Basic bessemer	15.28 3 2 6*	11.79	1 9 0
Hematite, Phos. .03-.05	18.34 31 5 0		
<b>SEMIFINISHED STEEL</b>			
Billets	\$28.73 5 17 6	\$19.10	2 7 0
Wire rods, No. 5 gage	43.77 8 19 0	36.61	4 10 0
<b>FINISHED STEEL</b>			
Standard rails	\$40.34 8* 5 0	\$44.74	5 10 0
Merchant bars	1.85c 8 10 0	1.20c	3 5 0
Structural shapes	1.80c 8 5 0	1.14c	3 1 6
Plates, ½-in. or 5 mm.	1.88c 8 12 6	1.60c	4 6 6
Sheets, black, 24 gage or 0.5 mm.	2.23c 10 5 0	2.30c	6 5 0††
Sheets, gal., 24 gage, corr.	2.80c 12 15 0	2.67c	7 5 0
Bands and strips	2.02c 9 5 0	1.48c	4 0 0
Plain wire, base	2.13c 9 15 0	1.94c	5 5 0
Galvanized wire, base	2.51c 11 10 0	2.15c	5 17 6
Wire nails, base	2.62c 12 0 0	1.75c	4 15 0
Tin plate, box 108 lbs.	\$ 4.58 0 18 9		

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

### Domestic Prices at Works or Furnace—Last Reported

	£ s d	French Francs	Belgian Francs	Reich Marks
Fdy. pig iron, Si. 2.5	\$18.34 3 15 0(a)	\$14.65 315	\$15.54 460	\$25.37 63
Basic bessemer pig iron	18.34 3 15 0(a)	8.83 190	14.53 430	27.99 (b)69.50
Furnace coke	5.26 1 1 6	5.91 127	4.63 137	7.65 19
Billets	29.95 6 2 6	22.32 480	19.60 580	38.86 96.50
Standard rails	1.80c 8 5 0	1.41c 671	1.73c 1,150	2.38c 132
Merchant bars	2.04c 9 7 0	1.40c 665	1.05c 700	1.98c 110
Structural shapes	2.05c 9 7 6	1.37c 650	1.05c 700	1.93c 107
Plates, ½-in. or 5 mm.	2.11c 9 13 9	1.74c 830	1.28c 850	2.29c 127
Sheets, black	2.62c 12 0 0‡	1.79c 850‡	1.39c 925‡	2.59c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	3.05c 14 0 0	2.84c 1,350	2.25c 1,500	6.66c 370
Plain wire	2.18c 10 0 0	2.31c 1,100	1.95c 1,300	3.11c 173
Bands and strips	2.20c 10 2 0	1.62c 770	1.28c 850	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. Middlebrough. b hematite. ††Close annealed. \*\*Gold pound sterling carries a premium of 67.00 per cent over paper sterling.



# Bars

Bar Prices, Page 62

**Pittsburgh**—Applying on sales for first-quarter shipment and effective generally on specifications placed after Dec. 1, hot-rolled carbon steel bars and small shapes will be advanced \$3 a ton to 2.20c, f.o.b. Pittsburgh, and hot-rolled alloy steel bars, \$4 to 2.75c, f.o.b. Pittsburgh. Announcement of these advances has been driving in much advance buying, with the result that many bar mills are now well booked up over the remainder of the present quarter. The present high rate of automotive assemblies at better than 100,000 units per week account for the largest outlet for carbon alloy bars. A leading maker of alloy bars reports total bookings as 2000 tons better in November than in October, with a large amount going to manufacturers of forgings, conveyors, and automotive parts.

**Cleveland**—Recent price announcements are expected to drive in considerable tonnage over the remainder of the quarter. Deliveries now stand at two to three weeks, but some producers feel that if they accepted all business offered them in the next few weeks it would be impossible to complete deliveries on such orders before Jan. 15 at the earliest. With this in mind there is a strong tendency to limit purchasers to tonnages in proportion to their past requirements.

**Chicago**—Heavier bookings of both iron and steel bars are anticipated following announcement of an increase of \$3 a ton in prices, effective Dec. 1. The new market will be 2.25c, base, billet steel bars, 2.10c for rail steel, and 2.15c, Chicago, and 2.10c, Terre Haute, Ind., for bar iron. Since the advances were not unexpected, some consumers already had covered part of their forward requirements. Consumption continues active, with automotive needs expanding steadily, though not yet at the peak which is anticipated for this quarter. Operations of the farm implement industry still are gaining.

**New York**—Due to the impending advance of \$3 on first quarter tonnage, protective covering in commercial steel bars has increased sharply. It is probable that this character of buying will be noticeable into December as it is believed that rolling schedules will still permit the handling of some business at old prices. There will probably be a carry-over into first quarter on deliveries, but less of this is expected than upon previous occasions. The new first quar-

ter price will be 2.55c, New York.

**Philadelphia**—Some leading producers of commercial steel bars will accept specifications at present prices up to the end of December, provided shipments can be completed by Jan. 31. Such a liberal policy is not indicated yet in other major products. Specifications are heavy, as is the case with cold-drawn bars, which are up \$4 for first quarter.

# Plates

Plate Prices, Page 62

**Pittsburgh**—A \$3 per ton increase in the price of hot-rolled carbon steel plates on sales for first-quarter shipment will place the market at 2.05c, f.o.b. Pittsburgh, or 2.075c for delivery within the Pittsburgh district switching area. A similar advance, according to report, is being made in floor plates. A. M. Byers Co. at its Economy, Pa., plant is completing rolling of about 380 tons of wrought iron to be used on trash racks at the Fort Peck dam, Montana, and Dravo Contracting Co. last week was laying wrought iron bottom plates for the first of two large dredges which it will build for the government for use on the upper Mississippi river. Wheeling Steel Corp. is repairing three of its Ohio river steel barges which were recently damaged, and Weirton Steel Co. is repairing one of its barges. The navy department is supplementing its large dock inquiry for the Pearl Harbor, Hawaii, navy yard by a recent inquiry for construction of a steel floating drydock 446 feet long by 68-foot width, designated as "ARD-2." This is in addition to the drydock designated as "ARD-3," on which bids were closed Nov. 25.

**Cleveland**—Considerable plate tonnage is involved in railroad buying now under consideration and in that already at the bidding stage. Individual tonnage, while in small lots, aggregates a good total. Recent price advance is expected to drive in some business throughout the remainder of the quarter.

**Chicago**—Plates have been advanced \$3 a ton to 2.10c, Chicago or Gary, effective Dec. 1. The higher price is expected to bolster mill backlogs, which have been receding as a result of heavy shipments the past 60 days. Additional orders are in prospect for railroad equipment building. Specifications from car builders have been slightly heavier recently, but new bookings await the closing on freight cars now pending.

**New York**—Eastern plate producers are experiencing a sharp in-

crease in tonnage, with consumers covering against the \$3 advance which becomes effective on first quarter tonnage. It appears eastern producers will be virtually out of the market by early in December. There will probably be heavy buying, however, at old prices on identified projects for which 30 days' protection is allowed. Many oil refinery projects will fall in this category along with riveted pipe jobs and new railroad equipment construction. The new first quarter price will be 2.15c, Coatesville, or 2.34c, New York.

**Philadelphia**—Owing to a \$3 advance for first quarter consumers of plates are specifying much more actively. To date, however, there is not the pressure noted in lighter flat-rolled products. Platemakers in this district still have two or three weeks capacity available in this quarter. Substantial locomotive tonnage is pending here apart from requirements for ten locomotives for the Western Maryland on which early action is expected. Norfolk & Western continues to place good specifications for its car construction program.

**Birmingham, Ala.**—Demand for plates continues good and mills are operating almost at capacity. Structural fabricators are receiving numerous lettings which require small tonnages of plate but the aggregate is satisfactory. Smaller consumers of steel state that there is little delay on the part of manufacturers to deliver.

**San Francisco**—Interest centers around the outcome of bids on the floating drydock for Pearl Harbor, T. H., involving over 22,000 tons of plates and 7000 tons of structurals. It is understood Bethlehem Shipbuilding Corp. is the only bidder, at \$21,312,000. To date this year 113,542 tons have been booked, compared with 43,550 tons for the same period a year ago. Effective Dec. 1 plate prices advance \$3 a ton from 2.45c to 2.60c f.o.b. cars dock, Pacific Ports.

**Seattle**—Plates are more active than other steel but consumers are handicapped by inability to obtain material. Present quotations are based on rail shipment on delivery when water traffic is resumed.

## Contracts Placed

830 tons, eight 20,000, one 15,000-barrel oil tanks, Chelsea, Mass., for Metropolitan Coal Co., Boston, to Graver Tank & Mfg. Co., Chicago.

500 tons or more, 2500 feet 70-inch irrigation pipe, Bitter Root project, Mont.; J. L. McLaughlin, Great Falls, Mont., general contractor.

310 tons, pressure and dredge pipe, Quabbin, Mass., to Walsh-Holyoke Steam Boiler Works, Holyoke, Mass.

200 tons, welded steel pipe, treasury department, San Francisco. Invitation

2838, to Steel Tank & Pipe Co., Berkeley, Calif.  
110 tons, steel pipe, for Metropolitan water supply, Quabbin, Mass., to Walsh-Holyoke Steam Boiler Works, Holyoke, Mass.  
100 tons, 29 truck bodies, specification 3547, Los Angeles, to Fager Mfg. Co., Los Angeles.  
100 tons, reduction units, Horse Mesa dam, Ariz., to Consolidated Steel Corp., Los Angeles.

## Contracts Pending

22,636 tons, floating drydock, Pearl Harbor, T. H.; bids opened.  
3200 tons, Crystal Springs pipe line No. 2, San Francisco; bids Dec. 9.  
500 tons, 24-inch pipe, water main, city of Cleveland; bids taken.  
175 tons, 78-inch welded for Cedar river power project, Seattle, Wash.; bids in.  
Unstated, river siphon, Roza division, Yakima irrigation project; bids to bureau of reclamation, Yakima, Wash., Dec. 14.

## Sheets

Sheet Prices, Page 62

**Pittsburgh**—A \$4 per ton price increase vertically through all grades of sheets, with the exception of enameling material, which has advanced \$3 a ton, was announced last week for effect Dec. 1, applying on sales for first-quarter shipment. The advanced market will thus be, f.o.b. Pittsburgh: hot-rolled sheets, 10 gage, 2.15c; hot-rolled annealed, 24 gage, 2.80c; cold-rolled primes (with seconds arising), 10 gage, 2.80c and 20 gage, 3.25c; galvanized, 24 gage, 3.40c; with enameling sheets, 10 gage, 2.60c, and 20 gage, 3.20c. Electrical sheets have also been advanced \$4 a ton and now are quoted on the basis of 4.05c. The advanced prices on corrugated galvanized material in 26-inch widths after standard 2½-inch corrugation, will be 4.34c per square for 28 gage base, f.o.b. Pittsburgh.

**Cleveland**—Producers are seriously considering limiting the tonnage sought by consumers during the remainder of the quarter, in proportion to their former needs. Automotive requirements have shown considerable improvement since the middle of the month.

**Chicago**—While the increase of \$4 a ton on most sheet grades is expected to stimulate new buying, mills already are booked solidly through the remainder of this quarter and have indicated that they will accept only those tonnages which can be delivered before Feb. 1. This will curtail the amount of new business that can be booked. Consumption in the automotive industry continues to expand, while requirements of other users are steady or rising.

**New York**—While the \$4 advance on most grades of sheets becomes

effective Dec. 1 on first quarter shipments, it appears doubtful that much new tonnage can be handled by mills in December at present prices. Some leading sellers are already virtually out of the market for this quarter; certain others will be shortly. Further, it is believed stock supplies will be snapped up quickly, leaving little available tonnage in December at present prices.

**Philadelphia**—While some sheet sellers are out of the market for the remainder of the quarter others will probably be able to take tonnage on most descriptions through the first week of December before fully booking for that month. With an advance of \$4 on all grades except enameled sheets, which advanced \$3, consumers are ordering heavily.

**Buffalo**—No slackening of demand for sheets appears although it had been thought there might be a reduction of operations here after the close of navigation. Sheet mills continue however to run close to capacity and are reported booked as long as four months on some grades.

**Cincinnati**—The American Rolling Mill Co. announced higher prices for first quarter, the advance on sheets being \$4 except for enameling which went up \$3. New prices are, in practice, effective at once because books are closed for the remainder of this quarter. Some extended deliveries on current contracts may be anticipated although operations are at capacity. Automobile makers' specifications are expanding.

**St. Louis**—Producers and distributors of sheets report a moderate recession in orders but shipments and specifications maintaining recent high levels. Stove manufacturers are using heavy tonnages and the implement and household appliance trade is also accounting for a heavy quota.

**San Francisco**—Sheet prices advance \$3 a ton effective Dec. 1, and the new quotations on hot-rolled No. 10, hot-rolled No. 24, cold-rolled No. 10 and galvanized sheets No. 24 will be, respectively, 2.70c, 3.45c, 3.60c and 4.00c, f.o.b. cars, Pacific ports. Due to the maritime strike canmakers on the Pacific Coast find it difficult to obtain material and may be forced to shut down if the strike continues much longer. Demand, generally, is holding up well and Coast producers are operating 100 per cent.

## Tin Plate

Tin Plate Prices, Page 62

**Pittsburgh**—An advance of \$4 a ton on 28 gage base tin mill black plate to 2.95c, f.o.b. Pittsburgh, be-

comes effective Dec. 1, applying on sales for first-quarter shipment, and a similar advance in No. 24 gage unassorted long ternes will place this market for first quarter at 3.70c, Pittsburgh. A week previous to these price announcements made early last week, was the extension of standard tin plate at \$4.85 per base box, net, without allowance of the 7½ per cent discount.

## Pipe

Pipe Prices, Page 63

**Pittsburgh**—Phillips Petroleum Co.'s plans for the construction of a pipe line from the Rodessa field in Louisiana to Kilgore, Tex., doubtless will result in a sizable contract for line pipe. Otherwise, the market is devoid of sizable line pipe business. With the reaffirmation of skelp at 1.80c, f.o.b. Pittsburgh, for the first quarter of 1937, assurances have been given that discounts on finished tubular products will remain unchanged for shipment at that time.

**Cleveland**—General pipe requirements have shown little change over the last few weeks. However, sales this month are expected to compare favorably with October. Domestic requirements have slackened somewhat since the first of the month, but industrial needs have shown continued activity. No price adjustments have been announced. Some feel there will not be an advance within the near future.

**Chicago**—Whether the recent advance in pig iron prices will affect cast pipe quotations is problematical. Pipe currently is \$2 higher than at this time in 1929 and \$1 above 1926, while pig iron is priced \$2.50 above 1929 and \$3.50 below 1926. Pipe has been advanced \$13 a ton since the depression low of mid-1932. Shipments are slightly less active. Small lots predominate.

**New York**—Cast pipe has been increased \$2 a ton to \$45. This is the first price advance since May, 1935, and brings this commodity back to this level for the first time since July, 1927. PWA has allotted funds for seven miles of 20 and 24-inch pipe for Mamaroneck, N. Y.; and 28,900 lineal feet of 6 and 8-inch for Spotswood, N. J. More than 100,000 feet for various federal aid projects are still pending.

**San Francisco**—Several new inquiries for cast pipe have come out for figures and awards aggregated 515 tons.

**Seattle**—Demand for cast pipe is slow, and no important jobs are pending. Small tonnages are being moved out of stock, but dealers are

handicapped by reason of lack of water transportation. Seattle has appropriated \$20,000 for an extension into the Blue Ridge district, bids soon. Tacoma will take bids early next year for 49,805 feet of 5 to 20-inch cast pipe.

## Cast Pipe Placed

343 tons, 6 to 12-inch, class 250, Glendale, Calif., to United States Pipe & Foundry Co., Burlington, N. J.  
172 tons, 6-inch, treasury department, Los Angeles, to United States Pipe & Foundry Co., Burlington, N. J.  
90 tons, grade elimination, Bellevue, O., to James B. Clow & Sons Co., Chicago, through Freeman & Jones, Cleveland, general contractors.

## Cast Pipe Pending

627 tons, 2 to 10-inch, Safford, Ariz.; bids opened.  
200 tons, water main, Medina, O.; bids taken.  
150 tons, 2 to 8-inch, Issaquah, Wash.; bids opened.  
150 tons, 4 and 10-inch, treasury department, invitation 2844, Los Angeles; bids opened.  
103 tons, 3 to 8-inch, metropolitan water district, Los Angeles; specification 179; bids Dec. 14.

# Transportation

Track Material Prices, Page 63

The largest single locomotive order placed with independent locomotive builders in at least several years has just been allocated by the New York Central, 50 Hudson type passenger engines going to American Locomotive Co., New York, and 50 8-wheel switch engines for its subsidiary, the Pittsburgh & Lake Erie, going to the Lima Locomotive Works, Lima, O. Cost of the 100 locomotives will be \$8,600,000.

In addition, New York Central closed on 82,150 tons of rails at a cost of \$5,500,000, the second largest rail order placed in the East this year, being surpassed only by the 100,000 tons recently announced by the Pennsylvania. Of the New York Central rails, Carnegie-Illinois Steel Corp., Pittsburgh, received 38,500 tons, the Bethlehem Steel Co., Bethlehem, Pa., 32,750 tons; Inland Steel Co., Chicago, 5900 tons; and Algoma Steel Co., Sault Ste. Marie, Ont., 5000 tons.

Chicago, Rock Island & Pacific has placed 35,000 tons of rails with three western producers. Prospects are good for closing on more than 250,000 tons of rails within a short time.

Missouri Pacific has been granted permission by federal court to buy 33,950 tons of rails at the November price, for 1937 replacements.

Long Island railroad has purchased 6000 tons of rail and another

carrier is reported to have closed on 4000 tons.

Eastern car buying included the Western Maryland list, which went to the Bethlehem Steel Co., Bethlehem, Pa., comprising 500 box cars and 100 gondolas. American Car & Foundry Co., New York, has booked 300 box cars for the Gulf, Mobile & Northern. The Bangor & Aroostook is inquiring for three buffet coaches, two standard passenger coaches and two baggage and mail cars.

Size of New York Central locomotive equipment order bears out recent predictions that increasing material costs would in all likelihood cause carriers to buy more than original inquiries indicated. At first the New York Central inquiry called for 50 locomotives; what was purchased represented an increase of an even 100 per cent in the number of units.

The New York Central order is said to have brought the locomotive bookings of the American Locomotive Co. for this year up to 133 engines, and of the Lima Locomotive Works to 83.

Bessemer & Lake Erie, a subsidiary of the United States Steel Corp. in the Pittsburgh district is inquiring for ten freight locomotives of the Texas type and two eight-wheel switching locomotives. The Union railroad, also a Corporation subsidiary, is inquiring for four Union-type 10-wheel switching engines.

The first advance in the price of standard rails in three years is effective Dec. 1 on sales for first quarter shipment, when the market will be advanced to \$39 per gross ton, f.o.b. mill. This applies on standard rails of over 60-pound weight per lineal yard. At the same time, angle splice bars will be advanced \$3 a ton to 2.70c, f.o.b. Pittsburgh, and tie plates, \$2 to 2.10c, base, Pittsburgh.

In addition to inquiry already out for 2000 cars, the Chesapeake & Ohio soon will issue another for 50 stock cars, 50 hoppers, 25 cabooses and 10 horse express cars.

Effective Dec. 1 and for first quarter track bolts and screw spikes have been advanced \$5 per ton to 4.00c and 4.60c, base, Pittsburgh, respectively.

Norfolk & Western is inquiring for 18,000 kegs of spikes, 13,000 tons of tieplates. Steel axles have been advanced \$5 per ton, effective Dec. 1 for first quarter delivery.

Elgin, Joliet & Eastern is inquiring for 1100 gondolas.

An advance of at least \$2 is expected on light rails. Prospects of a price increase has resulted in substantial buying the past week by

coal mining companies and other industries.

## Car Orders Placed

Gulf, Mobile & Northern, 300 box cars to American Car & Foundry Co., New York.  
Western Maryland, 500 box cars, 100 gondolas, to Bethlehem Steel Co., Bethlehem, Pa.

## Locomotives Placed

Chicago, Rock Island & Pacific, six diesel engines to Electro Motive Corp., La Grange, Ill., for streamlined trains, awarded to Edward G. Budd Mfg. Co.  
New York Central, 100, of which 50 Hudson-type passenger locomotives went to American Locomotive Co., New York, and 50 8-wheel switch engines for Pittsburgh & Lake Erie to Lima Locomotive Works, Lima, O.

## Rail Orders Placed

Chicago, Rock Island & Pacific, 35,000 tons divided among Carnegie-Illinois Steel Corp., Chicago, Colorado Fuel & Iron Co., Denver, Inland Steel Co., Chicago.  
Long Island, 6000 tons, to an unnamed producer.  
New York Central, 82,150 tons, of which 38,500 went to Carnegie-Illinois Steel Corp., Pittsburgh; 32,750, Bethlehem Steel Co., Bethlehem, Pa.; 5900, Inland Steel Co., Chicago, and 5000, Algoma Steel Co. of Canada.

## Car Orders Pending

Bangor & Aroostook, five coaches and two baggage-mail cars.  
Elgin, Joliet & Eastern, 1100 gondolas.

## Locomotives Pending

Bessemer & Lake Erie railroad, Pittsburgh, ten freight and two switching locomotives.  
Union railroad, Pittsburgh, four switching locomotives.

## Rail Orders Pending

Missouri Pacific, 33,950 tons, court permission granted to buy.

## Buses Booked

Twin Coach Co., Kent, O.: Twenty-five 44-passenger trolley coaches for Youngstown Municipal Railway Co., Youngstown, O.; twelve 41-passenger for Railway Equipment & Realty Co., Oakland, Calif.; ten 40-passenger for Baltimore Transit Co., Baltimore; ten 40-passenger trolley coaches for Cincinnati Street Railway Co., Cincinnati; ten 25-passenger for Pacific Electric Co., Los Angeles; eight 23-passenger for Arkansas Power & Light Co., Little Rock, Ark.; five 31-passenger for Northern Texas Traction Co., Fort Worth, Tex.; five 24-passenger for Duluth-Superior Bus Co., Duluth; four 41-passenger and three 31-passenger for Los Angeles Railway Corp., Los Angeles; three 25-passenger for Bluebird Coach Lines Inc., Chicago; three 20-passenger for King Bros. Transportation Co., Cincinnati.  
A. C. F. Motors Co., New York; Ten 30-passenger for Connecticut Co., New Haven, Conn.; eleven 41-passenger for Capital Transit Co., Washington; nine 30-passenger for Transit Co. of Harrisburg, Pa.; eight 36-passenger for Florida Motor Lines Inc., Jacksonville,

Fla.; four 36-passenger for Carolina Coach Co., Raleigh, N. C.; four 42-passenger for Worcester Street Railway, Worcester, Mass.; four 41-passenger for Capital Transit Co., Washington.

2.55c, f.o.b. Pittsburgh; 2.60c, Cleveland, Chicago and Gary, Ind., and 2.65c, Buffalo. The market at Detroit becomes 2.70c for carload lots and 2.79c for less carloads, and Eastern Michigan, 2.75c for carload requirements. No change in the classification of quantity differentials from the base of 10,000 to 19,999-pound lots was made, nor were there any changes affecting extras. Although hot-rolled carbon steel bars were advanced \$3 a ton, the \$4 a ton advance in cold-finished bars does not exactly compensate the nonintegrated maker of the lat-

ter product. Their \$1 a ton higher advance over hot-rolled, it is pointed out, does not begin to cover the 10 per cent increase in wages they granted for effect with Nov. 16.

## Cold Finished

Cold Finished Prices, Page 63

**Pittsburgh** — Leading makers of cold-finished carbon steel bars on Nov. 24 announced a price increase of \$4 a ton, effective immediately on all sales for shipment in first quarter, thus placing the market at

## Strip

Strip Prices, Page 63

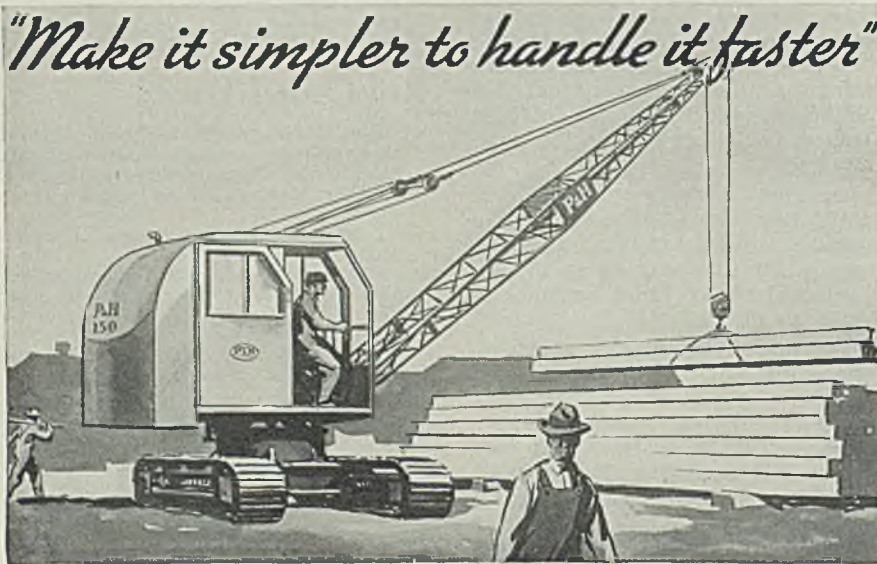
**Pittsburgh**—Hot-rolled strip steel in its advance for first quarter of \$4 a ton brings a market for shipment at that time of 2.15c, f.o.b. Pittsburgh, or 2.175c for delivery within the Pittsburgh switching area. Over the past week strip users have been anxiously covering their near-future needs by placing orders in greater quantity. Most sellers are still accepting orders at 1.95c, Pittsburgh, and doubtless shipments will be carried out through as late as January because of tight rolling schedules.

**Cleveland**—Miscellaneous requirements of cold-rolled strip have shown increasing activity since the first of the month and are expected to be further stimulated by the recent price announcements. Electrical equipment manufacturers are particularly active preparing for the holiday trade. Auto partsmakers and small farm tool builders have also shown the stimulus resulting from rapid return to activity in those fields.

**Chicago** — Announcement of an advance of \$4 a ton in hot-rolled strip, effective Dec. 1, is expected to be followed by an equal or larger increase on cold-rolled strip. The latter commodity was not raised at the time of the last advance on hot material. Mills already are well engaged for fourth quarter and intend to accept only as much hot and cold rolled business as can be shipped by Jan. 31.

**New York** — The \$4 advance on strip for first quarter is stimulating further activity in narrow hot strip and as producers are not booked more than two or three weeks ahead, there is likely to be continued brisk buying until producers are no longer able to accept tonnage for delivery in this quarter. The market on hot strip for next quarter will be 2.50c, New York. Most cold strip sellers are now practically out of the market for the remainder of the year.

**Philadelphia**—Considerable confusion is present with respect to prices on narrow cold-rolled strip, with talk of impending advances of \$5 to \$6 per ton. However, one leading seller is standing firm on a \$4 increase and is advising the trade accordingly. There appears to be no question relative to the \$4 increase on hot-rolled strip.



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& "SWITCHER" CRANES**

# Wire

Wire Prices, Page 63

**Pittsburgh**—An advance of \$4 a ton on principal merchant wire products and of \$2 a ton on manufacturing wire products becomes effective on specifications not placed before Dec. 1. Most principal users, however, have anticipated requirements and will not be obliged to pay higher prices until January. The new nail price becoming effective this week, will be \$2.25 per keg, f.o.b. Pittsburgh or Cleveland with the usual allowance of 15 cents to jobbers and plain wire will be 2.60c, base Pittsburgh or Cleveland.

**Cleveland**—Mills report increased demand from partsmakers serving the automotive trade. Agricultural dealers are expected to be in the market soon in preparing for the spring trade. Bolt and nut concerns and wire specialty manufacturers continue to rank as leading consumers here. Producers feel it essential to curtail speculative buying as much as possible if they are to obtain any immediate benefit from proposed price advances.

**Chicago**—Price advances effective this month range from \$2 to \$4 a ton and raise plain wire to 2.65c, Chicago, nails to \$2.30, and wire rods to \$44 to \$47. The upturn on merchant products is effective only on December business, since producers have not indicated that the new prices will be extended into next quarter. New quotations on other items include 3.00c for polished staples, 2.80c for barbed wire, 3.00c for annealed fence wire, and 3.25c for spring wire. The price announcements have served to stimulate demand which previously was active, and both consumers and distributors are expected to add to their stocks during December. The lack of the usual decrease in fencing demand after mid-year prevented producers from adding extensively to their stocks and production currently is heavy in anticipation of further gains in sales next year.

**Philadelphia**—With advances of \$2 to \$7 per ton wire makers are swamped. Even nails, which have been decidedly weak throughout the year, are being specified more freely in view of the impending advance of \$4 per ton to \$2.25, Pittsburgh.

## Semifinished

Semifinished Prices, Page 63

Effective on specifications placed after Dec. 1 and on shipments after Jan. 1, 1937, semifinished steel will be advanced \$2 per ton, f.o.b. Pittsburgh and other basing points. The

Pittsburgh base will thus become \$34 for rerolling billets, blooms, slabs and sheet bars, or \$34.50 per gross ton for these products delivered within the Pittsburgh switching area. Forging billets, slabs and blooms will be advanced \$1 a ton to \$40, base, Pittsburgh, or \$40.50, delivered within the switching area. A \$4 per ton advance will be made under the same conditions for hot-rolled alloy steel billets, blooms and slabs, thus raising the market from the present \$51, Pittsburgh, base to \$55, f.o.b. Pittsburgh. Under the same conditions wire rods will be

increased \$3 a ton to \$43, Pittsburgh, for No. 5 to 15/32-inch and \$3 to \$45 base for 15/32 to 47/64-inch, inclusive.

Copperweld Steel Co., Glassport, Pa., has declared an extra dividend of \$1.30 per share, payable 30 cents in cash and \$1 in the form of certificates of indebtedness on Dec. 15 to Dec. 1 record. An unusual feature was the approval by stockholders of an indebtedness for \$214,241, to avoid payment of surtax on undistributed earnings. At present the company has no debt.

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BUFFALO, N. Y.

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# Shapes

Structural Shape Prices, Page 62

New York—Lettings of structural shapes last week totaled more than 3800 tons, which was slightly higher than during the previous week. Belmont Iron Works is low on 2500 tons of shapes for a hangar at Newark, N. J., but only 800 tons is guaranteed as the minimum to be bought.

New projects were few in number, but it is expected that the \$3 advance, effective during first quarter, will bring in a number of projects before the end of this year. Bids will be taken Dec. 5 by the port authority of New York on bonds for the proposed vehicular tube under the Hudson river to supplement the tube now under construction. Based on requirements of the present tube, 49,000 tons of cast iron tunnel rings, 14,500 tons of structural steel, 2600 tons of steel lining, and 3300 tons

of miscellaneous cast iron will be needed.

**Pittsburgh**—A price increase of \$3 a ton on both standard structural shapes and steel sheet piling becomes effective Dec. 1, applying on sales for first-quarter shipment, and brings the market on structural shapes to 2.05c, base, Pittsburgh, and on steel sheet piling to 2.40c, f.o.b. Pittsburgh. The market on Zee piling will also be advanced \$3 a ton to 2.50c, Pittsburgh. Last week American Bridge Co. closed on 880 tons for Tennessee Valley authority transmission tower.

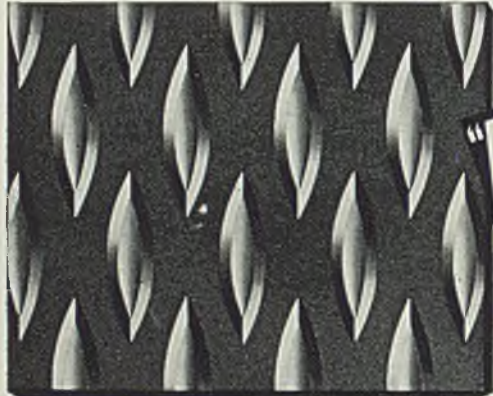
**Cleveland**—Mills report little change in general run of shipments. However, fabricators are anticipating considerable increase over the next few weeks, because of the general price adjustments to go into effect the first of the year. Bethlehem Steel Corp., Bethlehem, Pa., was awarded 600 tons for the Brewing Corporation of America, this city.

**Chicago**—Inquiries for fabricated structural steel are fairly numerous, particularly for lots of less than 100 tons. Awards continue light, but pending business points to an early increase. The Dec. 1 advance of \$3 a ton in plain material to 2.10c, Chicago, is expected to be followed by prompt closing on pending tonnages.

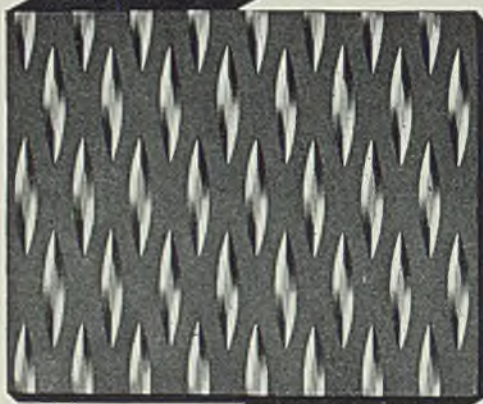
**Philadelphia**—Shape sellers are experiencing heavier demands with the \$3 advance scheduled for first quarter. A leading structural award involved 1220 tons state bridge Luzerne county, Pennsylvania, to Bethlehem Steel Corp., Bethlehem, Pa.

**Buffalo**—Demand for structurals continues exceptionally heavy for the season with many inquiries pending for first half coverage. The building outlook is especially good for first half.

**St. Louis**—Activities at fabricators have receded slightly from the rate obtained two weeks back. This reflects the lack of new lettings, though a number of sizable highway projects are in prospect. The only award of any size was 550 tons of shapes to the Mississippi Valley



"A. W." Standard Diamond pattern, half size. For heavy traffic duty where high projections are of advantage.



"A. W." Diamondette pattern, half size. Ideal for pedestrian traffic and light trucking. Noiseless.



"A. W." Super-Diamond pattern, half size. Completely safe tread, from every possible angle, under any condition.

*Low first cost, no maintenance cost*

Quick installation without disturbing men or production. Cut to any required shape. Slip proof, oil proof, heat proof, crack proof. Toughest traffic can't damage or impair it. PERMANENT. Immediate delivery, in various patterns to meet all requirements.

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BRANCHES:

Philadelphia, New York, Boston, Detroit, Los Angeles, San Francisco, Seattle, Houston

110 YEARS' IRON- AND STEEL-MAKING EXPERIENCE



## Shape Awards Compared

	Tons
Week ended Nov. 27	16,860
Week ended Nov. 20	11,146
Week ended Nov. 13	25,671
This week, 1935	21,229
Weekly average, 1935	17,081
Weekly average, 1936	2,180
Weekly average, October	16,068
Total to date, 1935	804,170
Total to date, 1936	1,046,327

Structural Steel Co., Decatur, Ill., for the Ruberiod Co. building here.

**Birmingham, Ala.**—Structural steel fabricating shops in this district are busy, new business being in small tonnages, but maintaining backlogs. Shops start new year with still much tonnage on hand and good business in prospect.

**San Francisco**—Demand for structural shapes remains quiet and awards totaled less than 2000 tons, bringing the aggregate for the year to 152,370 tons, compared with 109,948 tons for the same period last year. The only new inquiry of size calls for 213 tons for a bridge near Flagstaff, Ariz., up for figures on Dec. 4. Due to the maritime strike warehouses on the Pacific Coast of eastern steel producers are practically closed down, seriously affecting distributors and users of steel products. Work on the Golden Gate bridge might have to cease within the next few days unless a settlement is reached. The mill base price, effective Dec. 1, advances \$3 a ton and will be quoted at 2.60c f.o.b. docks, Pacific ports. The orders placed before the first of the month will take the low price if ready for shipment before the first of February.

**Seattle**—The market is quiet. Plants generally are busy but contracts are approaching completion. Operations are handicapped by shortage of some materials due to lack of water transportation.

### Shape Contracts Placed

3800 tons, Sixth avenue subway, route 101, section 11, from West Forty-seventh to West Fifty-third streets, New York, to Bethlehem Steel Co., Bethlehem, Pa.

2375 tons, Sanitation garage, Fifty-sixth street and Twelfth avenue, New York, to Bethlehem Fabricators Inc., Bethlehem, Pa.

1500 tons, Museum of Science and Industry, Chicago, to Bethlehem Steel Co., Bethlehem, Pa.

1220 tons, state bridge, Luzerne county, Pennsylvania, to Bethlehem Steel Corp., Bethlehem, Pa.

1200 tons, Overseas road and toll bridge, Miami, Fla., to Bethlehem Steel Co., Bethlehem, Pa.

865 tons, state highway bridge No. 1454, Tippecanoe county, Indiana, to Vincennes Steel Corp., Vincennes, Ind.

600 tons, brewery, for the Brewing Corp. of America, Cleveland, to Bethlehem Steel Corp., Bethlehem, Pa.

550 tons, for Ruberoid Co. building, St. Louis, to Mississippi Valley Structural Steel Co., Decatur, Ill.

500 tons, bridge, Cedar City, Utah, to Bethlehem Steel Co., Bethlehem, Pa.

360 tons, bridge over route No. 24, for Michigan Central railroad, Dearborn, Mich., to Bethlehem Steel Co., Bethlehem, Pa.

340 tons, school, St. Clair, Pa., to Bethlehem Steel Corp., Bethlehem, Pa.

300 tons, plant building, Johns-Manville Co., Somerville, N. J., to Savary & Glaeser, Dunnellin, N. J., through Wigton Abbott Corp., Plainfield, N. J.

280 tons, state highway bridge, route 260, WPF-33-SW-200, Williamsburg, Pa., to Fort Pitt Bridge Works, Pittsburgh.

275 tons, bridge, Biddeford-Saco, Me., to American Bridge Co., Pittsburgh.

250 tons, mill building, for Edwards & Co., Stamford, Conn., to Bethlehem Steel Co., Bethlehem, Pa.

250 tons, bridge, for Pennsylvania railroad, Iselin, N. J., to Phoenix Bridge Co., Phoenixville, Pa., through J. Rich Steers Inc., New York.

240 tons, high school addition, for board of education, Latrobe, Pa., to Moore Metal Mfg. Co.

235 tons, bridge, Brownfield, Me., to Harris Structural Steel Co., New York.

210 tons, substation extension, Coal

Creek, Tenn., for Tennessee Valley authority, to Lehigh Structural Steel Co., Allentown, Pa.

200 tons, tunnel ribs, metropolitan water district, Los Angeles, to Commercial Shearing & Stamping Co., Youngstown, O.

200 tons, building, Wallerstein Laboratories, Mariners' Haven, Staten Island, N. Y., to H. R. Goeller Inc., Hillside, N. J., through Wigton Abbott Corp., Plainfield, N. J.

155 tons, water service station for treasury department, Brooklyn, N. Y., to Eggleston Bros. & Co., Long Island City, N. Y.

150 tons, building, Hoffman Beverage Co., Newark, N. J., to Bethlehem Steel Co., Bethlehem, Pa.

150 tons, state bridge, Foxboro, Mass., to

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**SM40** — Mortar Cement — Stubbornly resists flame cutting and the penetration of corrosive and dust-laden gases. A high quality bond for brickwork.

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THE 3300° SUPER-REFRACTORY

Boston Bridge Works Inc., Cambridge, Mass.; Coleman Bros. Corp., Boston, general contractors.  
145 tons, grade crossing elimination over D. L. & W. railroad, Linwood, N. Y., to American Bridge Co., Pittsburgh.  
140 tons, Pennsylvania railroad grade crossing elimination, Avenel, N. J., to Bethlehem Steel Co., Bethlehem, Pa.  
140 tons, Second Otter stream bridge, Milford, Me., to American Bridge Co., Pittsburgh.  
130 tons, building, National Aniline & Chemical Co., Buffalo to Ernst Iron Works Inc., Buffalo.  
125 tons, extension building No. 3, navy yard, Philadelphia, to Belmont Iron Works, Philadelphia.  
125 tons, foundry for American Foundry

Co., Los Angeles, to Consolidated Steel Corp., Los Angeles.  
125 tons, Hohenadel Brewery Co., Philadelphia, to American Steel Engineering Co., Philadelphia.  
105 tons, state highway bridge, Norwalk, Conn., to American Bridge Co., Pittsburgh.  
100 tons, addition to plant of Gladding-McBean & Co., Los Angeles, to Consolidated Steel Corp., Los Angeles.  
100 tons, packing plant, Briggs Lemon association, Santa Paula, Calif., to Consolidated Steel Corp., Los Angeles.  
100 tons, bridge, Archuleta county, Colorado, to unnamed interest.  
100 tons, plant addition, Rainier Pulp & Paper Co., Shelton, Wash., to Pacific Car & Foundry Co., Seattle.

## Shape Contracts Pending

47,700 tons, cast iron segments, for Port of New York authority; bids Dec. 8.  
2740 tons, cast steel linings, for Midtown Hudson Tunnel; bids Dec. 8.  
2500 tons, hangar, Newark, N. J., for treasury department; Belmont Iron Works, Philadelphia, low.  
1700 tons, state grade crossing elimination, Elmhurst, Lombard and Villa Park, Ill.; bids Dec. 11.  
1650 tons for bridge over Red river connecting Bryan and Fennin counties. Oklahoma; Kansas City Bridge Co. low.  
1250 tons, bridge WF-36, Queens, N. Y.; bids Dec. 11.  
1200 tons, piling, levee wall, Monroe, La 1000 tons, bridge WF-36-5, Queens, N. Y.; bids Dec. 18.  
800 tons, bridge WF-36-4, Queens, N. Y.; bids Dec. 18.  
800 tons, apartment, East Seventy-third street, New York.  
754 tons, grade crossing elimination. Thirty-ninth street, Chicago; Mississippi Valley Structural Steel Co., Decatur, Ill., low.  
600 tons, one story addition for Blue Ridge Co., Glasgow, Va.  
572 tons, state bridge, Colorado.  
500 tons, state bridge Ottawa county. Ohio; bids Dec. 5.  
500 tons, grade crossing, Vermilion, O.; bids Dec. 5.  
460 tons, through truss bridge, Hunting-ton county, Pennsylvania; C. L. Johnson & Son, Mansfield, Pa., low bidder at \$95,190 in Nov. 20 state letting. Included, 61 tons of plain steel bars.  
400 tons, transit road grade elimination. Depew, N. Y., for Delaware, Lackawanna & Western railroad.  
350 tons, crane runway, Philadelphia navy yard; bids Dec. 2.  
300 tons, postoffice building, West New York, N. J., for United States government.  
300 tons, sewage plant, Buffalo.  
280 tons, high school, Lebanon, Pa.; bids Nov. 27.  
250 tons, building, Weehawken, N. J., for Port of New York authority; George Slegler Co. Inc., Jersey City low.  
213 tons, bridge near Flagstaff, Cochino county, Arizona; bids Dec. 4.  
210 tons, platform extensions, Chicago Rapid Transit.  
200 tons, warehouse, for Proctor & Gamble, Port Ivory, N. Y.  
175 tons, bridge, for public works department, Buffalo, at Flushing Meadow Park, Queens, N. Y.; Wilson & English Construction Corp. Inc., New York, low  
150 tons, Bronx Eye & Ear Infirmary, city of New York; being refigured.  
140 tons, plain structural steel, made up of individual lots as follows in Dec. 4 state highway letting, Harrisburg, Pa.; 52 tons, Erie county; 49 tons, Chester county; 29 tons, Center county, and 10 tons, Bradford county.  
131 tons, two-span steel truss bridge, East Keating township, Clinton county, Pennsylvania; bids to state highway department, Harrisburg, Pa., Dec. 4. Included, 15 tons of plain steel bars.  
131 tons, bridge in Crowley county, Colorado; bids opened.  
128 tons, plate girder bridge, Wyoming county, Pennsylvania; F. D. Kessler Inc., Northumberland, Pa., low bidder at \$210,661 in Nov. 20 state letting Included, 41 tons of plain steel bars  
125 tons, spans, Iowa, Chicago Great Western railroad.  
125 tons, bridge, North Haven, Conn. A. I. Savin Construction Co., Hartford, Conn., low.

## Behind the Scenes with STEEL

### A.S.M. List Improved

THE AMERICAN SOCIETY FOR METALS is to be congratulated on the improved nature of its registration list for the 1936 National Metal Exposition. Every effort was expended to purify the list and to offer to the exhibitors only the worthwhile names in which they might be interested.

### Conglomeration

Le dernier cri in smart office appliances is the desk piece to banish all other desk pieces. In one unit, 22 by 10 inches, are grouped a 4-tube AC-DC radio, a self starting electrical clock, alguide temperature and humidity gage combined, an automatic cigar lighter, two ash receivers, and a pen and pencil set. To stress the exclusive nature of this creation, the distributor claims that it was designed and will be sold only for business promotion purposes, honor awards, sales prizes and business gifts. Sort of rules out the fellow that would like to buy one for himself.

### Steel Need a Tonic?

You never know what the day's mail will bring. Just the other day we received a letter inquiring about the metal field and requesting a sample copy from a manufacturer of "the great general tonic."

### Guessing

Now that football pools and turkey raffles are over, all that is left in the guessing line is the course of the present administration. Some enterprising game manufacturer might bring out a roulette wheel or spinning game, with the quadrants marked off in various degrees of right and left.

### Bathtub Leader

Americans may not be the cleanest people on earth, but they evidently have the reputation for having the best bathtubs. Just the other day we were reading that the muzhiks of Moscow were flabbergasted at the carloads of bathtubs being installed in the American embassy by the new American ambassador to Russia. Then along came a request from a sub-

scriber in England for all the recent literature on pressed steel bathtubs.

Incidentally, he wanted copies of STEEL in which were described the latest methods of manufacture. And, to prove his susceptibility to American methods, the manufacturer added "We are members of the London Chamber of Commerce."

### Two for Three

HAVE you come across that interesting and unusual photograph which you are going to send us for publication in the Inquisitive Camera Dept. of this column and win yourself two bucks? Better hurry, Santa Claus can't wait forever.

### Subs Roll In

UNLOOSENING of the purse-strings by many corporations in the form of renewed or enlarged dividends, wage increases and bonuses is having its effect on circulation activities. Many former subscribers to STEEL who for pecuniary reasons were obliged to do without the paper during the depression, again are joining our ever-increasing reader family.

### Help Reclassify Industry

One of the constructive tasks attempted by NRA was the reclassification of industry. Anybody who has tried to use the complicated system now in vogue by the bureau of census appreciated the magnitude of the task. Recent correspondence with Major George L. Berry, Co-ordinator for Industrial Co-Operation, indicates that any assistance by industry will be welcomed.

### Arkansas Heard From

AMONG a host of new subscribers to STEEL last week was the Engineering Works at Van Buren, Ark. Speculating as to the possibility of these people being the manufacturers of Bob Burns' bazookas, from which he draws such corny tones each Thursday evening, we looked them up. They don't make bazookas, however, unless they have recently gone into the business. Specialize mostly on mine cars and castings, according to the dope we have.

SHRDLI



100 tons, plate girder underpass, Aston and Middleton townships, Delaware county, Pennsylvania; bids to state highway department, Harrisburg, Pa., Dec. 4. Included, 32 tons of plain steel bars.

100 tons, state bridge, Delaware county, Pennsylvania; bids Dec. 4.

90 tons, two high pressure gates for Arrowrock dam, Boise project, Idaho; Koppers Co., Fort Wayne, Ind., low.

Unstated tonnages, bridges, Queens, N. Y.; bids due Dec. 18.

## Reinforcing

Reinforcing Bar Prices, Page 63

**New York**—With lettings of only 100 tons of reinforcing bars last week the market remained quiet for the second consecutive week. An award is expected soon on the 1300 tons for government work at Haverhill, Mass. Prices are nearer the bases than for some time, but not firm, despite mill advances for first quarter in nearly all lines.

**Pittsburgh**—No announcement of the first quarter market on reinforcing bars, either rail or new billet quality, has been made yet.

**Cleveland**—General requirements continue to be limited to small lots, but the aggregate is sufficient to keep mills active. Nothing definite has been announced on the expected price adjustment for reinforcing material. At present they are firmer than at any time in the last few months. Concrete Steel Co., New York, was awarded 800 tons of bars for sewage disposal contract No. 93, this city.

**Philadelphia** — Reinforcing bar trade expecting early increase and jobbers specifying more freely. Few construction jobs are active, but remain in line with seasonal activity.

**Chicago**—A continuation of recent prices of concrete bars is anticipated for December. Business remains fairly active for this period, but is off seasonally from earlier months. Fairly large tonnages are pending for Chicago sanitary district sewers, Illinois grade crossing eliminations and a local housing project. Iowa

has taken bids on about 2000 tons for road work. While highway building will be curtailed during the next several months, bridge and grade crossing work will be continued.

**San Francisco**—While an advance of \$3 a ton on mild steel bars goes into effect on Dec. 1, no change has been made in the reinforcing bar price. Awards aggregated 2060 tons and brought the total for the year to 223,866 tons, compared with 198,149 tons the same period in 1935.

**Seattle**—Demand has slowed perceptibly although some business in less than 100 ton lots is being placed or is pending. Local mills are still

working on backlogs, but production is expected to be reduced next month. Railroad orders for tieplates and other accessories are likely to be placed shortly. Bids by the Reclamation bureau at Yakima, Wash., Dec. 14 for the Roza division, Yakima project, involve 1513 tons of reinforcing.

## Reinforcing Steel Awards

900 tons, Western Furniture exchange, San Francisco, to Soule Steel Co., San Francisco.

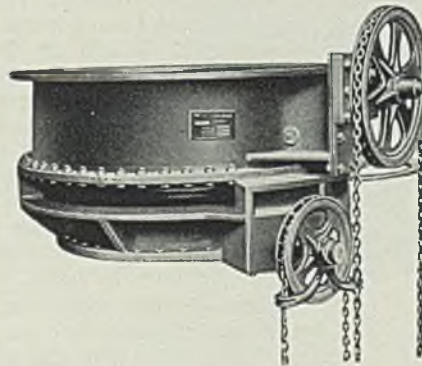
800 tons, sewage disposal contract No. 93, Cleveland, to Concrete Steel Co., New York.

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in the gas mains leading to  
Blast Furnace Stove Burners.  
They have proven quick and  
efficient in operation and safe  
for the workman.

No obstruction to the flow of gas in the main.

No moving mechanical parts such as gears, screws or toggles inside the gas main to corrode, warp or accumulate dirt.

No expansion joints required.

All operating parts completely enclosed.

Satisfactory Operation Guaranteed.

## Concrete Awards Compared

	Tons
Week ended Nov. 27 .....	000,000
Week ended Nov. 20 .....	2,706
Week ended Nov. 13 .....	2,702
This week, 1935 .....	2,935
Weekly average, 1935 .....	6,862
Weekly average, 1936 .....	000,000
Weekly average, October...	3,728
Total to date, 1935 .....	333,844
Total to date, 1936 .....	000,000

# WILLIAM M. BAILEY COMPANY

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MAGEE BLDG.

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

650 tons, Museum of Science and Industry, Chicago, to Jos. T. Ryerson & Son Co., Chicago.  
 630 tons, dam, Le Claire, Iowa, to Inland Steel Co., Chicago.  
 244 tons, crossing, Deming Luna county, New Mexico, to unnamed interest.  
 204 tons, bureau of reclamation, invitation A-42,137-A, Potholes, Calif., to Bethlehem Steel Co., Bethlehem, Pa.  
 200 tons, lemon storage plant, Whittier, Calif., to unnamed interest.  
 114 tons, highway work near Dunsmuir, Calif., to unnamed interest.  
 103 tons, Brunswick Laundry Co., Jersey City, N. J., to Jos. T. Ryerson & Son Co., Chicago.  
 100 tons, highway work in Orange, Imperial and Nevada counties, California, to unnamed interests.



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Die Blocks & Piston Rods

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 IRVINE, WARREN COUNTY, PENNA.

## Reinforcing Steel Pending

2000 tons, state road work, Iowa.  
 1513 tons, Roza division, Yakima, Wash., project; bids to bureau of reclamation, Yakima, Wash., Dec. 14.  
 1300 tons, flood control project, Haverhill, Mass.; Bethlehem Steel Corp., Bethlehem, Pa., low.  
 800 tons, Calumet intercepting sewer, Chicago sanitary district; Paschen Bros., Chicago, awarded general contract.  
 338 tons, bureau of reclamation, invitation 44,116-A, Earp, Calif.; bids opened.  
 230 tons, schedule C, Broadway low level tunnel, Oakland, Calif.; bids Dec. 9.  
 180 tons, paving work, Cumberland-Perry counties, Pennsylvania; Roberts Paving Co., Salisbury, Md., low on Nov. 20 letting at \$456,914.  
 170 tons, Huntington park bridge, Cleveland; bids soon.  
 115 tons, bridge, Duchess county, New York; A. E. Ottlavanio, Croton-on-Hudson, N. Y., low.  
 109 tons, bureau of reclamation, invitation A-42,144-A, Knob, Calif.; bids opened.  
 105 tons, bureau of reclamation, invitation A-42,142-A, Potholes, Calif.; bids opened.  
 Unstated, state capitol, Salem, Oreg.; Ross S. Hammond Co., Portland, low.  
 Unstated tonnage, grade crossing eliminations, Lombard, Elmhurst and Villa Park, Ill.; bids Dec. 11.

## Pig Iron

Pig Iron Prices, Page 64

**Pittsburgh**—The \$1 per ton price increase in all grades of pig iron, f.o.b., Pittsburgh district furnace, will name at this basing point: \$20 for basic iron, \$20.50 on No. 2 foundry and malleable, and \$21 for bessemer iron. Gray forge pig iron will be advanced to \$20, Pittsburgh district. Buyers are finding it difficult at present to place orders of any size and have shipments completed by Jan. 1. All of the available merchant blast furnaces, except one, are now in blast.

**Cleveland**—Prices were advanced \$1 last week, effective at once. Sales during the remainder of the quarter are not expected to show much activity, unless some consumers having underestimated their needs will be forced to enter the market for additional tonnage. Shipments during November will top October, making the sixth consecutive month to show an advance. Requirements of auto foundries has shown a substantial increase and those to farm equipment concerns are expected to improve in the near future.

**Chicago**—Pig iron prices have been advanced \$1 a ton, effective Nov. 23. Duluth prices also have been advanced \$1 a ton. Lake Superior charcoal iron has been advanced 50 cents per ton on all grades, effective Nov. 24, for delivery up to Jan. 1, 1937. Con-

sumers had anticipated this rise and in most instances already have covered needs through the balance of this year, and in some cases through a portion of next quarter. Shipments have increased steadily and the November movement will set a peak for the year to date.

**New York**—Pig iron prices have been advanced \$1 a ton. Producers are quoting at the new prices for delivery over the remainder of this quarter only, but are expected to apply the same prices for first quarter. Relatively little new buying is expected, as most consumers are fully protected on needs over the remainder of this year at the old prices and in some cases have anticipated first quarter requirements.

Mystic Iron Works will blow out its furnace at Everett, Mass., Dec. 1.  
**Philadelphia**—Following the recent advance of \$1 on all grades of pig iron, buying has dropped off sharply. However, specifications are expanding and the melt is heavier.

**Buffalo**—With new prices now in effect here, buying of pig iron is expected to be resumed shortly on a good scale. By putting into effect immediately a \$1 increase on all grades, producers prevented further speculative purchases after these had reached fair proportions. Shipments continue heavy.

**Cincinnati**—Pig iron prices are up \$1 a ton, effective at once. Northern iron, No. 2 foundry and malleable, is \$20.50, base Hamilton, and basic iron \$20. Southern iron is likewise up \$1 at these quotations, delivered Cincinnati; No. 2 foundry, \$20.44; basic, \$19.82. Northern iron, delivered Cincinnati, is computed on the Birmingham base for competitive grades, because of federal regulations, and are: No. 2 foundry, \$20.82; malleable, \$21.58; basic, \$21.08. Books of furnace interests are loaded with orders and much of this tonnage will be moved in the first quarter.

**St. Louis**—Pig iron prices have been advanced \$1 per ton, effective last week. This rise has had the effect of virtually halting new buying and considerably accelerating shipments on tonnages previously booked. Backlogs of sellers are large and some doubts exist as to ability to get all the iron forward before Jan. 1. It is believed, however, that blast furnace interests will make deliveries into 1937 at prices paid by melters during the past six months.

**Birmingham, Ala.**—Base price of pig iron, here has been advanced \$1 per ton, to \$16.50, No. 2 foundry, effective immediately. Two blast furnaces have been put into commission, adding 700 or more tons daily to capacity. Shipment

of pig iron is very active, melters having very little stock on yards.

## Scrap

Scrap Prices, Page 65

**Pittsburgh**—Based on participation of at least two mills here last week to the extent of purchases of 25,000 tons of No. 1 heavy melting steel at \$17.50 this market has advanced 2½ cents to a range of \$17.25 to \$17.75. This is the first scrap advance here since the middle of September and is being strongly supported by willingness of brokers to pay \$17.50 freely for short order coverage.

**Cleveland**—Heavy snowfall in this locality has put a temporary quietus upon scrap yard work and shipments. However, shipments are going on in a desultory sort of manner but the volume of new business continues light. Large consumers in northern and eastern Ohio have good-sized stock piles and the smaller users continue to cover only immediate needs. Quotations here and at Youngstown have not changed in the week.

**Chicago**—Scrap is marking time, though prices have lost none of their recent strength. Dealers and brokers continue to pay from \$16.50 to nearly \$17 for No. 1 heavy melting steel, but find mills not interested in making new commitments at more than \$16.50. Scrap is coming out in no more than sufficient volume to meet old orders. A lower market on cast iron borings is in early prospect in view of the end of the lake shipping season and the lack of a market for this material among local blast furnaces.

**Boston**—Prices of steel and iron scrap are 25 to 50 cents higher as demand shows greater strength. This includes stove plate, borings and turnings.

**New York**—Scrap is in an unsettled condition but with a strong undertone. Mills are coming back into the market for larger commitments but supplies are coming out relatively slowly. Export buying is only nominal.

**Philadelphia**—The leading scrap consumer is paying up to \$15, Bethlehem, for No. 1 heavy melting steel from Northern New Jersey and it appears consumers in this district with less favorable freight would have to pay closer to \$15.50 on any tonnage of size. An advance in No. 2 steel is predicated on small orders and in heavy breakable cast on a few thousand tons for an Eastern Pennsylvania consumer. Cast scrap in general is decidedly stronger, with supplies less plentiful.

**Buffalo**—Scrap is firm with dealers again moving prices upward as they see large orders in prospect within the next 60 days. All grades of steel rails have risen 50 cents or more as small lots were purchased at asking prices of dealers. Reports also were current this week that stove plate had been sold in tonnage at or above \$12.50. Cast continues to move at firm prices with \$16.50 now asked for No. 1 machinery by some of the larger holders. Tonnage purchases of No. 2 heavy melting steel at \$15, up from last transaction were being completed late last week.

**Detroit**—Quotable declines of 25 and 50 cents a ton were general last week. Primarily the close of navigation caused accumulation of heavier supplies and a weaker tone. No. 1 melting steel, which is off 50 cents a ton, is now \$13 to \$13.50; hydraulic compressed at \$13.50 to \$14 and No. 2 steel at \$12.25 to \$12.75 are down a similar amount. Losses of 25 cents a ton have been recorded in blast furnace scrap and machine shop turnings.

**Cincinnati**—Activity in iron and steel scrap is confined to small-lot dealings. The undertone has gained strength as dealers take a long position and seek to build up stocks.

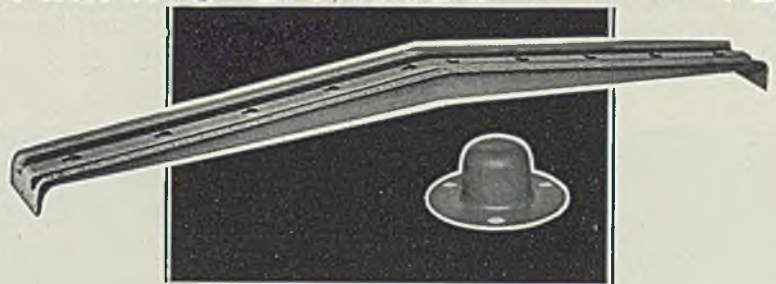
However, some material is being freed, partly to apply on recent heavy mill purchases, and partly to supply active foundry demand for short rails and malleable.

**St. Louis**—The market for iron and steel scrap continues strong, influenced by the tight supply situation, upturn in pig iron prices and heavy demand from mills. In addition to a large potential demand locally, inquiries from outside are increasing, both from eastern and western consuming points.

**Birmingham, Ala.**—Steady movement of iron and steel scrap is evident though consumers are buying in small quantities with one or two exceptions. Quotations are generally unchanged.

**Seattle**—The market is weaker and local demand has tapered slightly. The export movement from American ports is entirely suspended because of lack of shipping facilities. Japan is not interested although some export business has been placed in British Columbia where steamship service continues. Dealers on this side are selling fair tonnages to foundries and mills and are accumulating stocks in the expectation that Japan will be an active factor as soon as trans-Pacific space is available.

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## Warehouse

Warehouse Prices, Page 66

**Pittsburgh**—Steel warehouse interests expect to follow the recent mill price advance of \$3 and \$4 a ton in finished steel for first quarter. Meanwhile, many jobbers are adding to stocks at current prices.

**Cleveland**—Sales of warehouse products continue to be influenced to some extent by delayed delivery conditions in sheets, strip and bars. The tool tonnage sold this month is expected to exceed October by a comfortable margin. Prices have not yet been adjusted to the recent advances in mill products, but such a move is expected within a few weeks.

**Chicago**—November sales held up better than usual, the comparison with the peak October volume being the best in many years. Warehouses are expected to adjust prices to compensate for the higher mill quotations.

**New York**—Sales of cold strip were extremely heavy last week as consumers began to protect themselves against the \$4 advance, effective during the first quarter, and against delay in deliveries, occasioned by the pentup condition at the mills. Other items are selling satisfactorily.

**Detroit**—Heavy call for finished steel products for immediate shipment continues from a wide diversity of consumers. Jobbers are building up stocks in anticipation of the mill price advance Jan. 1, and indicate that resale prices on finished

steel will be advanced about mid-December.

**Cincinnati**—The warehouse price schedule remains unchanged although there are prospects it will be adjusted later to mill advances. Demand continues active, with sheets a feature. Tonnage for November is near October volume.

**St. Louis**—Warehouse business is holding up well, with average daily orders so far this month on a parity with October, and showing substantial gains over a year ago. Demand continues well diversified, but during the past week or ten days, plate and sheet orders are outstanding, due to persistent talk of higher prices. Wire and wire products are more than seasonally active, with fencing and accessories moving in substantial volume.

**Seattle**—Strikes and seasonal restrictions have reduced the jobbing turnover, many plants affected by the maritime strike having been forced to close. Volume is consequently far below a month ago. All jobbing interests are expecting to revise prices to meet higher mill schedules.

## Ferroalloys

Ferroalloy Prices, Page 64

**New York**—A general increase is expected in ferroalloys, when sellers open books for first quarter. This increase may extend to ferromanganese, now holding at \$75, duty paid, Atlantic and Gulf ports, although sellers have not yet indi-

cated what action may be taken. The trade expectation of an advance is based not only on prospects for continued heavy consumption in this country but on the growing scarcity abroad and the sharp increasing tendency in manganese ore prices. Current prices on manganese ore are nominal but it is believed firm quotations will be named shortly and at considerably higher levels on next year's contracts. Ferromanganese sellers expect shipments in December to reach one of the highest points this year in view of the outlook for still expanding steelmaking operations.

Domestic spiegeleisen, 19 to 21 per cent is holding at \$26, Palmerton, Pa., on lots up to 50 tons and \$24 on 50 tons and over.

A Canton, O., steelmaker has recently purchased 1000 tons of ferromanganese in a single lot from an integrated Pittsburgh district steel producer. From the standpoint of smaller sized orders, the market is also quite active and remains based on \$75, base, tidewater, or \$80.13, delivered, Pittsburgh.

## Iron Ore

Iron Ore Prices, Page 65

**New York**—A sharp advance in foreign ore prices at any moment is being predicted here. Within the past week North African low phosphorus ore has been moved up a half cent to 13.50c, f.a.s. Atlantic ports, and steeper increases on other grades may follow soon. Meanwhile, current prices are purely nominal. Some trade leaders look for an increase of two or three cents on manganese ore before the end of this year, if not sooner.

This strength in foreign ores reflects not only good demand in this country but an active market abroad with supplies becoming increasingly scarce and with the continued suspension of shipments from the Spanish mines due to the Spanish rebellion contributing to the scarcity abroad. Another important factor is fast mounting ocean freight rates, with the end not yet in sight, according to importers.

**Cleveland**—Recent price advances in pig iron and finished steel products foreshadow a possible increase next spring in iron ore. The last advance was made over 8 years ago, April 16, 1928. Before that prices were adjusted much more frequently, varying from one to three years.

With the exception of Superior, Wis., all docks at the head of the lakes have closed for the season. Shipmasters arriving from Lake Superior reported considerable ice at the Soo and in the rivers below. However, all boats bound for the



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lower lakes will be out of Lake Superior before ice conditions cause much trouble.

## Metallurgical Coke

Coke Prices, Page 63

A steady demand for both by-product and beehive coke at the highest level in years continues to be reported in the Western Pennsylvania region. All available ovens are in operation with output being rapidly absorbed not only for metallurgical but domestic uses and the assurance at hand that the present heavy volume will continue for some months. Present trading reveals an unchanged range of \$3.75 to \$4 a ton, f.o.b. Connellsville, Pa., ovens on standard beehive furnace coke, and common foundry coke holding between \$4.25 and \$4.50, ovens. Duncane-Ruane Coal Co., Uniontown, Pa., having fired 20 additional beehive ovens last week, will soon start up 50 more, also near Uniontown.

December prices have been continued at the November level in most districts. In New England a single price of \$12 per ton has been established for December, replacing the \$11.50 price for delivery in the Boston district, making it even with the delivered price west of Worcester, Mass., which has been \$12.

## Steel in Europe

Foreign Steel Prices, Page 66

London—(By Cable)—Stringency of pig iron supplies in Great Britain continues and one additional blast furnace stack is being relighted. Exports have practically stopped except for 1000 tons to Germany. Fresh ore supplies are becoming difficult to obtain. The steel trade continues active with growing export demand only partially met. Increased Continental import quota is relieving domestic requirements in part.

The Continent is experiencing activity in the principal export markets and plates have been increased 16d, gold, on the export basis.

## Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 63

Bolt, nut and rivet producers defer announcement of first quarter's prices. In view of higher raw material costs resulting from recent advances in steel products, an upturn in bolts, nuts and rivets is indicated. Quotations on bolts and nuts lately

have continued irregular, with nominal levels not generally adhered to. Rivets have been fairly steady. Demand has been heavier the past week or two, reversing the trend of early November. Heavier requirements have appeared from the automotive, tractor and farm implement industries. Railroad and car building needs have been steady, with increased consumption seen for next quarter.

## Nonferrous Metals

Nonferrous Metal Prices, Page 64

New York—Attention of leaders in the three major nonferrous metal markets last week was directed mainly toward consolidation of positions at present price levels, the highest since 1930. Tin alone displayed price activity. Consumer buying in general continued to taper.

Copper — Consumer buying was light but all first hands quoted electrolytic firm at 10.50c, Connecticut. Sellers are satisfied with the current rate of buying in view of the previous heavy coverage which carried October business to a new record of 178,801 tons and that for the current month through last Wednesday to 86,331. Export copper advanced further to 10.77½c, c.i.f. European ports.

Zinc — Undertone of the market continued strong although the tenseness has been relieved and steady prices at 5.05c, East St. Louis, are now expected to hold over the immediate future.

Lead — Fair sales were reported

during the week but demand was less pressing. All sellers were firm at 5.05c, East St. Louis. Domestic refined stocks are at the lowest level since October, 1933.

Tin — An extremely tight supply situation developed with sellers having difficulty in making November deliveries. Prices jumped sharply to around 10.60c on straits spot. Consumption of tin by the tin plate industry in the United States so far this year has been the highest on record.

Antimony — American spot advanced ¼c to 12.37½c, New York, despite continued light demand. Chinese spots was nominally unchanged at 12.50c, duty paid New York.

## Pig Iron, Ore Imported

Baltimore—Iron ore arrivals here continue heavy, with importations between Nov. 3 and Nov. 15, inclusive, involving 71,877 tons, manganese ore, 29,700 tons and chrome ore 12,500 tons. In addition there were arrivals of ferromanganese and ferrochrome.

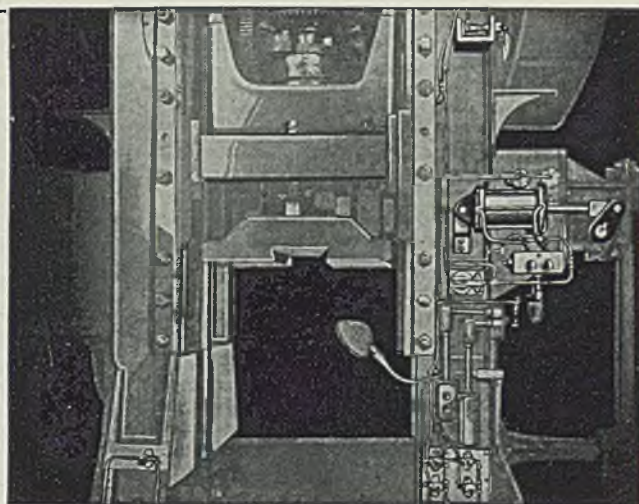
Iron ore shipments included 11,000 tons, Daiquiri, Cuba, Nov. 4; 7127 tons, Lulea, Sweden, Nov. 4; 21,500 Cruz Grande, Chile, Nov. 9; 10,750, Abu Zenima, Egypt, Nov. 9 and 21,500 Cruz Grande, Chile, Nov. 13.

Manganese ore arrivals comprised 7200 tons, Poti, Russia, Nov. 8; 6250, Santiago, Cuba, Nov. 11; 8550, Poti, Russia, Nov. 13; and 6200, Poti, Russia, Nov. 14; and 1500 Colombo, Ceylon, Nov. 8.

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# Construction and Enterprise

## Ohio

**BELLAIRE, O.**—Pipe & Steel Supply Co. has been formed here by Simon Axelrod, office in First National Bank building, and is clearing site on Baltimore & Ohio railroad between Thirty-second and Thirty-third streets for erection of office building, warehouse, etc.

**CHILLICOTHE, O.** — City is having survey made for water softening plant, to cost \$150,000. Burgess-Niple Co., 568 East Broad street, Columbus, is consulting engineer on survey.

**CINCINNATI** — Newton Products Co., 323 Lock street, is having plans drawn for extensive remodeling and alterations to factory and office buildings. Joseph L. Fay is president; Fosdick & Hilmer, Union Trust building, are engineers.

**CINCINNATI** — Glow Electric Co., 17-19 East Second street, is taking bids for construction of \$4500 warehouse building on Richmond avenue, west of Harriet street. John H. Boll is architect.

**CIRCLEVILLE, O.** — City approved issue of \$75,000 bonds for construction of sewage disposal plant. Consulting engineer not yet selected, applications being taken. Wm. J. Graham is mayor. (Noted Nov. 16).

**CLEVELAND** — L. L. Broda, architect, 1643 Lee road, has completed plans for one-story, 50 x 50-foot factory building at Bessemer and Seventy-ninth street. Bids for construction will be taken soon.

**CLEVELAND** — Cleveland Cap & Screw Co. is ready for bids on \$35,000 addition to factory at 2917 East Seventy-ninth street. H. M. Morse, 1500 Superior avenue, is engineer.

**COLUMBUS, O.**—Ohio Bedding Co., 1242 Parsons avenue, has plans nearing completion for addition to mattress plant. Will take bids soon.

**EAST LIVERPOOL, O.**—Crucible Steel Co., 405 Lexington avenue, New York, has purchased plant of National Drawn Steel Co. here, and will manufacture cold-drawn steel and copper bond products for the automobile industry.

**GALION, O.** — City is taking separate bids, due noon Dec. 11, for \$150,000 municipal light plant equipment. Wm. C. Kammerer & Associates, 1001 Huron road, Cleveland, are consulting engineers. (Noted Nov. 9).

**MARION, O.** — Defiance Pressed Steel Co., moving here from Defiance, has awarded contract for construction of building to house executive offices, to John Baldauf & Sons. Cost is estimated at \$10,000. This building is part of extensive preparations for moving the Defiance company to the site of the former Power Mfg. Co. here. (Noted Oct. 19).

**MASSILLON, O.**—Reliance Washer & Spring Division, Eaton Mfg. Co., has awarded general contract for construction of \$30,000 plant addition to G. & H. Construction Co. Geo. S. Rider, Marshall building, Cleveland, is architect. (Noted Nov. 23).

**NELSONVILLE, O.** — City deferring action on bids received Nov. 9 for \$80,000 light and waterworks improvements. Will probably readvertise about Dec. 1. (Noted Oct. 19).

**NORTH RIDGEVILLE, O.** — Ridge Tool Co., Ridge road, has awarded gen-

eral contract for construction of \$15,000 factory addition to T. J. Hume, 435 Hamilton avenue, Lorain.

**REPUBLIC, O.** — Village is having preliminary plans prepared for construction of proposed waterworks system. Federal aid will be applied for. George Paden is village clerk; Champe-Finkbeiner & Associates, Nicholas building, Toledo, are consulting engineers.

**TOLEDO, O.** — Libbey-Owens-Ford Glass Co., East Broadway, has awarded general contract for construction of \$150,000 plant addition to A. Bentley & Sons Co. Forester Wernert & Taylor, Nichols building, are architects.

**WELLSVILLE, O.**—City council has approved application for \$47,250 PWA grant for construction of filtration plant and improvements to municipal waterworks to cost \$105,000. Howard L. Kelley is mayor; Paul M. Fogo is city clerk.

**YOUNGSTOWN, O.**—Youngstown Sheet & Tube Co. plans broad program of plant improvements to increase capacity and efficiency at both Youngstown, O., and Indiana Harbor, Ind., plants. Frank Purnell is president.

## Michigan

**CHELSEA, MICH.** — Village will take bids until Dec. 11 for construction of \$54,000 sewage treatment plant. Geo. W. Champe & Associates, 1025 Nicholas building, Toledo, are consulting engineers. (Noted Nov. 23).

**DETROIT** — Detroit Smelting Corp., 2200 Penobscot building, has moved to Beatrice E. Roberts, 1650 Balmoral drive, to deal in metals.

**DETROIT**—Crown Tool & Die Co., 4155 St. Austin avenue, has moved to larger quarters at 487 West Alexandrine avenue, formerly occupied by M & G Machine Co.

**DETROIT**—Dossin Food Products Co., 3659 Gratiot, will erect factory building on Superior street. Louis W. Kiel is architect.

**DETROIT**—Midland Steel Products Co., 6660 Mt. Elliott avenue, has awarded contract for construction of addition to power plant to O. W. Burke Co.

**DETROIT**—Maurice W. Fox & Co., 2834 East Grand boulevard, will erect a tool shop on East Milwaukee avenue. Hyde & Williams are architects.

**HARTFORD, MICH.**—Village is having revised plans prepared for construction of \$20,000 sewage disposal plant by Andrew Lenderink, Kalamazoo sanitary engineer.

**JACKSON, MICH.**—Gulf Refining Co., Gulf building, Pittsburgh, plans construction of 100,000-gallon bulk plant here, at an estimated cost of \$25,000.

**KALAMAZOO, MICH.**—Sanlax Paper Co., 436 North Park street, has awarded contract for construction of \$15,000 factory addition to H. L. Vander Horst, 106 Thompson.

**LANSING, MICH.**—Motor Wheel Corp., 712 East Saginaw street, has started construction of its \$1,000,000 foundry building. George Hagemer & Son, Lansing, have the general contract. (Noted Nov. 9.)

## Illinois

**CHICAGO**—Sherwin-Williams Co., Cottage Grove avenue and East 115th street,

plans \$125,000 addition to paint and varnish plant.

**CHICAGO**—Continental Scale Co., 5700 South Claremont avenue, has awarded general contract for one-story plant addition, 50 x 141 feet, to August Federici, 6451 South Albany avenue. E. G. McClellan, 7541 Cottage Grove avenue, is architect.

**CHICAGO** — U. S. engineer office is in the market for one deep-well, turbine pump and equipment, circular 30. Bids will be taken Dec. 2.

## Indiana

**BEDFORD, IND.** — City has PWA grant of \$34,650 toward construction of waterworks improvements estimated to cost \$77,000. Project consists of erection of steel water tank and construction of additions to distribution system.

**INDIANA HARBOR, IND.**—Inland Steel Co., Chicago, will build blast furnace here of 1000 tons capacity. Arthur G. McKee & Co., Cleveland, are engineers and contractors.

## Connecticut

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**LONG ISLAND CITY, N. Y.** — United

Metal Hose Co., W. S. Wolfe, secretary, has moved its manufacturing facilities and office from 724 Garrison avenue, the Bronx, to Cassidy building, Forty-third avenue and Thirty-sixth street, here. Company manufactures bronze and brass metal hose.

NEW YORK—Fred L. Stellwagen & Son Inc., Manhattan, has been formed to deal in machinery and electrical equipment. Well & Fenster, 291 Broadway, are correspondents.

YONKERS, N. Y.—City council has authorized sale of city-owned waterfront properties to Habirshaw Cable & Wire Corp., a subsidiary of Phelps-Dodge Products Corp., for proposed plant expansion. (Noted Nov. 16.)

### New Jersey

CAMDEN, N. J. — R. C. A. Mfg. Co. Inc., has begun work on extensive improvements to power house at its plant here. Work will include building modification, installation of two turbines, two boilers and auxiliary machinery, at an estimated cost of \$500,000.

GLASSBORO, N. J. — Owens-Illinois Glass Co., Toledo, O., is renovating its plant in South Glassboro, for the manufacture of metal bottle tops.

KENILWORTH, N. J. — Kenilworth Mfg. Co. has acquired plant of Sims Machinery Corp. here. Property, 100,000 square feet, includes several one and two-story buildings and railroad siding.

TRENTON, N. J. — Trenton public ownership league is sponsoring project for construction of municipally owned and operated power plant, at an estimated cost of \$8,000,000. Referendum will be taken soon.

### Pennsylvania

ERIE, PA. — Bueg Coal Co. has building permit for construction of coal tipple at 1710 Raspberry street. Cost is estimated at \$1000.

GLASSMERE, PA. — United Iron & Metal Co., Catharine street, Baltimore, has acquired plant of Allegheny Plate Glass Co., here, from Ford Motor Co., Detroit. Building will be dismantled for scrap.

INDIANA, PA. — State Teachers College is taking bids, due Dec. 2, for construction of shop building. F. J. Everts, 207 North Lime street, Lancaster, Pa., is architect.

PITTSBURGH — City of Pittsburgh, 440 City-County building, is receiving bids until Dec. 8 for construction of steam generating unit at Ross pumping station.

WARREN, PA. — United Refining Co. plans construction of power house in Struthers, Pa., as part of \$250,000 plant expansion program. H. W. Schmidt is general manager.

WEST BRIDGEWATER, PA. — Pennsylvania Rye Distilleries Inc. plans extensions to steam power plant, including installation of boiler units.

### Alabama

BIRMINGHAM, ALA. — City receives bids Dec. 8 for furnishing and delivering six sluice gates for impounding dam now under construction for Birmingham industrial water supply project; specifications from engineering commission, 501 Martin building.

CHEROKEE, ALA. — Town has PWA allotment of \$34,545 for construction of waterworks system, including improvement of spring, installation of two pumps and erection of 100,000-gallon

elevated storage tank and distribution system.

LEIGHTON, ALA. — Town has PWA allotment of \$32,727 for construction of complete waterworks system, consisting of deep well, two pumps, pump house, chlorinator, 80,000-gallon elevated steel tank and distribution facilities.

MONTGOMERY, ALA. — City plans extension and improvement of waterworks system, including drilling of six wells, installation of six pumps and erection of pump houses, construction of 1,000,000-gallon elevated steel storage tank on 75-foot steel tower. Cost is estimated at \$340,000. Grant of \$153,000 has been approved by PWA.

PINE APPLE, ALA. — Town has PWA allotment of \$23,636 for construction of municipal waterworks system. Project includes deep well, electric service pump, pump house and 60,000-gallon elevated steel tank on 100-foot tower.

### Maryland

BALTIMORE—Poole Foundry & Machine Co., Woodberry, will start work immediately on construction of foundry and shop building. Carlstrand Engineering Co. is contractor.

BALTIMORE — Standard Wholesale Phosphate & Acid Works Inc., Continental building, plans addition to plant in Curtis Bay area.

ILCHESTER, MD. — Bartis Brothers Co., manufacturer of paper board, plans two-story plant addition, to cost \$37,000.

### District of Columbia

WASHINGTON—Bureau of supplies and accounts, Navy department, receives bids until Dec. 8 for miscellaneous rough-machined steel forgings, schedule 9361, for delivery various east and west coast points.

WASHINGTON — Bureau of district commissioners, District building, will install two motor-driven pumping units at Bryant street pumping station. Fund of \$123,000 has been secured.

WASHINGTON — Treasury department, procurement division, federal warehouse, will receive bids until Nov. 30 for one motor-driven back-gear screw cutting precision lathe, and one frame bench, invitation No. 6494-SP-11-30, for delivery U. S. Public Health service, 210 East Bay street, Savannah, Ga.

### Florida

JACKSONVILLE, FLA. — City has PWA approval for grant of \$1,127,000 toward construction of improvements to light plant; will issue certificates for \$1,250,000 as city's share of cost. Improvements will include installation of \$1,000,000 steam turbine unit. Ernest E. Anders is commissioner of public utilities.

WINTER HAVEN, FLA. — Rathbone, Hare & Ridgeway Corp., 1440 West Twenty-first place, Chicago, has acquired packing plant of Florence association here, and will install \$30,000 new machinery to manufacture fruit and vegetable containers.

### Georgia

ALBANY GA.—Albany Mfg. Co., care A. Blum, New Albany hotel, has awarded contract to C. M. Guest & Sons, Anderson, S. C., for construction of hosiery mill. Charles H. Blatchley, Drexel building, Philadelphia, is engineer.

COVINGTON, GA. — Snapping Shoals

Power & Light Co., Newton county courthouse, receives bids Dec. 7 for furnishing about 331 meters and constructing approximately 102 miles of transmission lines in Newton, Butts, Henry and Rockdale counties. J. B. McCrary Engineering Corp., 22 Marietta street building, Atlanta, is engineer.

OCILLA, GA. — Irwin county rural electric association, W. A. Sutton Jr., has allocation from PWA of \$150,000 for construction of 150 rural lines in Irwin county.

VALDOSTA, GA.—American Cyanamid & Chemical Corp., 530 Fifth avenue, New York, plans erection of addition to plant here. Structure will be of reinforced concrete, brick, structural steel, metal roof, steel sash.

### Kentucky

LOUISVILLE, KY.—Falls City Brewing Co., Thirtieth street and Broadway, has awarded contract for construction of malt storage building to Struck Construction Co. Cost estimated at \$40,000. Walter Wagner is architect.

### Louisiana

BERNICE, LA. — Town receives bids Dec. 3 for construction of waterworks system. J. M. Talbot is mayor; Huey & Cage, Monroe, are engineers.

MONROE, LA.—U. S. engineer office, Vicksburg, Miss., receives bids Dec. 3 for furnishing materials and constructing concrete steel sheet pile levee wall here.

### Mississippi

SUMMIT, MISS.—Summit Textile Co. has approved plans for construction of one-story dye works building and boiler plant. Total cost of improvement is estimated at \$30,000.

### North Carolina

GREENSBORO, N. C. — W. J. Carter, Jefferson building, and associates, plan erection of textile mill, 234 x 419 feet, to manufacture rayon. Cost is estimated at \$750,000. Nelson Slater, Slater Corp., Inc., 81 Worth street, New York, is interested in the project.

LENOIR, N. C.—Construction of 290 miles rural lines in Caldwell county has been approved by FEA. W. W. Corcoran is project engineer.

### South Carolina

ABBEVILLE, S. C.—City has PWA approval of \$500,000 hydroelectric power development on Rocky River, near here. Federal aid has been granted to the extent of \$435,000.

CHESTER, S. C.—Springs Cotton Mills Co. has plans for two-story, 100 x 100-foot addition to Gayle mill here. Cost, including equipment, is estimated at \$65,000.

GREENVILLE, S. C.—American Spinning Co., Allen F. Johnson, president, plans installation of machinery and remodeling of entire plant in its \$250,000 modernization program; company recently merged with Florence mills.

TACAPAU, S. C.—Startex Mfg. Co., 527 South Wells avenue, Chicago, is improving former plant of Tucapan Mfg. Co. here, by installation of air-conditioning system, 500,000-gallon water tank, and other equipment. Cost will be about \$500,000.

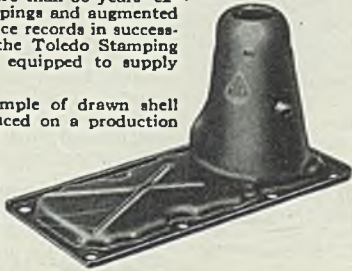
### Tennessee

MEMPHIS, TENN.—City will call for  
(Please turn to Page 84)

# TOLEDO STAMPINGS

Headed by a man with more than 50 years' experience in producing stampings and augmented by a staff having long service records in successful stamping production, the Toledo Stamping & Mfg. Company is well equipped to supply you with stampings.

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Chicago Office: 333 North Michigan Ave., Chicago, Ill.

# SCREENS

of Perforated Metal



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Standard Sizes 25 lbs. to 100 Tons Capacity  
Most Rapid and efficient for making  
Tool Steels, Alloy Steels, Forging Steels  
Steel Castings, Malleable Iron, Gray Iron  
Carbide, Ferro-Alloys, Etc.  
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P.O. BOX 1257, FOOT OF 32ND ST. PITTSBURGH, PA. U.S.A.

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Estimates made on any quantity - any material

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**M. D. HUBBARD SPRING CO.**  
613 CENTRAL AVE., PONTIAC, MICH.

**WE GUARANTEE RESULTS**

Using Bituminous and Anthracite Coal, Raw and Scrubbed Gas, for Displacing Oil, City and Natural Gas Coal and Coke in furnaces of all descriptions.

**Flinn & Dreffeln Co.**  
308 W. Washington St.      Chicago, Ill.

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LEADERS IN BUILDING AND DESIGNING ELECTRIC AND COMBUSTION FURNACES, KILNS AND OVENS.  
HOME OFFICE: DETROIT—BRANCHES: CHICAGO, PHILADELPHIA  
CANADA; WALKER METAL PRODUCTS, LTD. WALKERVILLE, ONT.

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**HOLCROFT & COMPANY**  
DETROIT - MICH.

**H. A. BRASSERT & CO.**  
CONSULTING ENGINEERS  
for Iron, Steel,  
Fuel and Heavy Metallurgical Industries.  
PROJECTS, PLANT DESIGN  
CONSTRUCTION, OPERATION  
MARKETS, FINANCE  
AND MANAGEMENT

310 South Michigan Ave.      Chicago, Ill.

*SC&H Furnaces are made for annealing, case hardening, carburizing, forging, cyaniding, lead hardening & oil tempering.*

**STRONG CARLISLE & HAMMOND**

1400 W. 3rd St., Cleveland, O.

*SC&H Furnaces are built in all sizes of Oven, Pot, Continuous, and Special Types for Electric, Oil or Gas application.*

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**THE OHIO ELECTRIC MFG. CO.**  
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LIFTING MAGNETS—Improved Design—Greater Lifting Capacity  
SEPARATION MAGNETS—Stronger Pulling Capacity  
MAGNET CONTROLLERS—With Automatic Quick Drop

**JIGS — FIXTURES — SPECIAL MACHINES — PUNCHES — DIES — "to your measure"!**

Let our trained engineers apply our 28 years' experience to your equipment problem. Our successes in other plants of all types, and proved methods assure a solution of any question involving production machinery. Write us in detail without obligation.

**THE COLUMBUS DIE, TOOL AND MACHINE CO.**  
COLUMBUS, OHIO



## Financial

IN THE first nine months this year United States Steel Corp.'s net earnings amounted to \$29,901,904. From Oct. 1, 1931, to July 1 this year it had incurred a deficit from operations totaling \$116,286,000, while dividends paid in that period amounted to \$54,791,000.

Indicating the rapidity of the come-back in business, last week the corporation authorized payment of \$25,219,667 on its arrearage on preferred stock, as a dividend of \$7 per share, payable Dec. 24, to record Dec. 1. This will reduce the remaining arrearage to \$33,326,012. The balance of arrearage is equivalent to \$9.25 per share.

Dividends on preferred were continuously paid at the regular rate of 7 per cent from the time of incorporation to and including the last quarter of 1932. The first change in the rate was made in January, 1933, when it was reduced from 7 to 2 per cent, or 50 cents per quarter. This rate remained in effect until Oct. 27 when a dividend was declared at the regular rate, \$1.75 for the quarter. At the same time \$2 per share was paid on account of arrearages which at that time amounted to \$18.25 per share, or a total of \$65,751,300.75, leaving arrearages of \$16.25 per share or a total of \$58,545,679.

General Electric Co. has declared the usual quarterly dividend of 25 cents per share for the fourth quarter, and an extra dividend of 50 cents per share, payable Dec.

21, to record of Nov. 27. Estimated amount available under the general profit sharing plan for the last six months of 1936 is 6 per cent of the earnings of participating employees. This will be paid on or about Dec. 21.

Mesta Machine Co., West Homestead, Pa., has declared a dividend of 50 cents a share in addition to a 75-cent quarterly dividend. The former is payable Dec. 24 to Dec. 16 record, and the latter, Jan. 1 to Dec. 16 record. With these payments the company will have paid \$4.50 in dividends in 1936, compared with \$1.62½ in 1935.

Republic Steel Corp., Cleveland, declared the regular quarterly dividend of \$1.50 on the 6 per cent cumulative prior preference stock series A. In addition a dividend of \$12 per share on 6 per cent cumulative convertible preferred stock was declared. Both are payable Dec. 19 to record Dec. 9.

### Issues Additional Ruling On Walsh-Healey Act

An additional regulation, "intended to prevent dealers from defeating the intent of congress in the Walsh-Healey act by selling goods to the government produced in factories which are not complying with the labor standards of the act," was promulgated last week by Secretary of Labor Frances Perkins. It follows:

"Whenever a dealer, to whom a contract within the act and regula-

tions has been awarded, causes a manufacturer to deliver directly to the government the materials, supplies, articles or equipment required under the contract, such dealer will be deemed the agent of the manufacturer in executing the contract. As the principal of such agent the manufacturer will be deemed to have agreed to the stipulation contained in the contract."

"The effect of this regulation," Secretary Perkins said, "is not to eliminate dealers from bidding on government contracts but to check a practice which has been reported by various contracting agencies the past few days under which dealers, instead of furnishing goods from stock, have been placing orders with factories which are not conforming to the labor conditions of the law, and having such factories ship their products direct to the government. As a result of this practice there have been some instances where manufacturers, submitting proposals in their own name and thereby expressly agreeing to the stipulations required under the act, have been placed at a competitive disadvantage."

### Profit on \$1 Worth of Ore 7/10 of One Cent

Nearly 27 cents of every dollar paid for Lake Superior iron ore delivered at lower lake ports go to pay taxes levied on iron mining companies, the American Iron and Steel institute reports. Actual cost of mining ore takes 15 cents of the ore dollar, of which half is paid directly to labor. Labor also gets an important part of the 42 cents out of each ore dollar which goes to pay various transportation charges.

Other demands on the ore dollar are 9 cents for royalties and 6 cents for cost of developing properties and marketing ore. Only seven-tenths of one cent remains as net profit accruing on sale of \$1 worth of iron ore.

### Labor Asks Right to Speak to President

Making a second request for an amendment to their representation plan within a month, a joint ways and means committee laying claim to speak for Jones & Laughlin Steel Corp.'s 23,000 employees has demanded the right on negotiations to lay any future subject directly before President S. E. Hackett, rather than department superintendents. The first request was recently denied by the company, but it gave the superintendents more bargaining power, as a compromise.

**CLEVELAND**  
*Acclaims*  
**THE CARTER**

The special regard in which its fellow Clevelanders hold the Hotel Carter, is another reason why you should enjoy its hospitality. Its 600 guest rooms, all newly furnished and decorated outside rooms with private bath and circulating ice water, are famous for their comfort and economy. Room rates begin at \$2.50.

Three delightful restaurants serve the finest food and beverages at reasonable prices. Club breakfasts as low as 30 cents. While right in the heart of things—Union Terminal only 5 blocks away—there's plenty of parking space and an adjoining garage.

**HOTEL CARTER**  
FAY M. THOMAS, Manager CLEVELAND



# Construction and Enterprise

## Ohio

**BELLAIRE, O.**—Pipe & Steel Supply Co. has been formed here by Simon Axelrod, office in First National Bank building, and is clearing site on Baltimore & Ohio railroad between Thirty-second and Thirty-third streets for erection of office building, warehouse, etc.

**CHILLICOTHE, O.** — City is having survey made for water softening plant, to cost \$150,000. Burgess-Niple Co., 568 East Broad street, Columbus, is consulting engineer on survey.

**CINCINNATI** — Newton Products Co., 323 Lock street, is having plans drawn for extensive remodeling and alterations to factory and office buildings. Joseph L. Fay is president; Fosdick & Hilmer, Union Trust building, are engineers.

**CINCINNATI** — Glow Electric Co., 17-19 East Second street, is taking bids for construction of \$4500 warehouse building on Richmond avenue, west of Harriet street. John H. Boll is architect.

**CIRCLEVILLE, O.** — City approved issue of \$75,000 bonds for construction of sewage disposal plant. Consulting engineer not yet selected, applications being taken. Wm. J. Graham is mayor. (Noted Nov. 16).

**CLEVELAND** — L. L. Broida, architect, 1643 Lee road, has completed plans for one-story, 50 x 50-foot factory building at Bessemer and Seventy-ninth street. Bids for construction will be taken soon.

**CLEVELAND** — Cleveland Cap & Screw Co. is ready for bids on \$35,000 addition to factory at 2917 East Seventy-ninth street. H. M. Morse, 1500 Superior avenue, is engineer.

**COLUMBUS, O.**—Ohio Bedding Co., 1242 Parsons avenue, has plans nearing completion for addition to mattress plant. Will take bids soon.

**EAST LIVERPOOL, O.**—Crucible Steel Co., 405 Lexington avenue, New York, has purchased plant of National Drawn Steel Co. here, and will manufacture cold-drawn steel and copper bond products for the automobile industry.

**GALION, O.** — City is taking separate bids, due noon Dec. 11, for \$150,000 municipal light plant equipment. Wm. C. Kammerer & Associates, 1001 Huron road, Cleveland, are consulting engineers. (Noted Nov. 9).

**MARION, O.** — Defiance Pressed Steel Co., moving here from Defiance, has awarded contract for construction of building to house executive offices, to John Baldauf & Sons. Cost is estimated at \$10,000. This building is part of extensive preparations for moving the Defiance company to the site of the former Power Mfg. Co. here. (Noted Oct. 19).

**MASSILLON, O.**—Reliance Washer & Spring Division, Eaton Mfg. Co., has awarded general contract for construction of \$30,000 plant addition to G. & H. Construction Co. Geo. S. Rider, Marshall building, Cleveland, is architect. (Noted Nov. 23).

**NELSONVILLE, O.** — City deferring action on bids received Nov. 9 for \$80,000 light and waterworks improvements. Will probably readvertise about Dec. 1. (Noted Oct. 19).

**NORTH RIDGEVILLE, O.** — Ridge Tool Co., Ridge road, has awarded gen-

eral contract for construction of \$15,000 factory addition to T. J. Hume, 435 Hamilton avenue, Lorain.

**REPUBLIC, O.** — Village is having preliminary plans prepared for construction of proposed waterworks system. Federal aid will be applied for. George Paden is village clerk; Champe-Finkbeiner & Associates, Nicholas building, Toledo, are consulting engineers.

**TOLEDO, O.** — Libbey-Owens-Ford Glass Co., East Broadway, has awarded general contract for construction of \$150,000 plant addition to A. Bentley & Sons Co. Forester Wernert & Taylor, Nichols building, are architects.

**WELLSVILLE, O.**—City council has approved application for \$47,250 PWA grant for construction of filtration plant and improvements to municipal waterworks to cost \$105,000. Howard L. Kelley is mayor; Paul M. Fogo is city clerk.

**YOUNGSTOWN, O.**—Youngstown Sheet & Tube Co. plans broad program of plant improvements to increase capacity and efficiency at both Youngstown, O., and Indiana Harbor, Ind., plants. Frank Purnell is president.

## Michigan

**CHELSEA, MICH.** — Village will take bids until Dec. 11 for construction of \$54,000 sewage treatment plant. Geo. W. Champe & Associates, 1025 Nicholas building, Toledo, are consulting engineers. (Noted Nov. 23).

**DETROIT** — Detroit Smelting Corp., 2200 Penobscot building, has been formed by Beatrice E. Roberts, 1650 Balmoral drive, to deal in metals.

**DETROIT**—Crown Tool & Die Co., 4155 St. Austin avenue, has moved to larger quarters at 487 West Alexandrine avenue, formerly occupied by M & G Machine Co.

**DETROIT**—Dossin Food Products Co., 3659 Gratiot, will erect factory building on Superior street. Louis W. Klei is architect.

**DETROIT**—Midland Steel Products Co., 6660 Mt. Elliott avenue, has awarded contract for construction of addition to power plant to O. W. Burke Co.

**DETROIT**—Maurice W. Fox & Co., 2834 East Grand boulevard, will erect a tool shop on East Milwaukee avenue. Hyde & Williams are architects.

**HARTFORD, MICH.**—Village is having revised plans prepared for construction of \$20,000 sewage disposal plant by Andrew Lenderink, Kalamazoo sanitary engineer.

**JACKSON, MICH.**—Gulf Refining Co., Gulf building, Pittsburgh, plans construction of 100,000-gallon bulk plant here, at an estimated cost of \$25,000.

**KALAMAZOO, MICH.**—Saniwax Paper Co., 436 North Park street, has awarded contract for construction of \$15,000 factory addition to H. L. Vander Horst, 106 Thompson.

**LANSING, MICH.**—Motor Wheel Corp., 712 East Saginaw street, has started construction of its \$1,000,000 foundry building. George Hagemelr & Son, Lansing, have the general contract. (Noted Nov. 9.)

## Illinois

**CHICAGO**—Sherwin-Williams Co., Cottage Grove avenue and East 115th street,

plans \$125,000 addition to paint and varnish plant.

**CHICAGO**—Continental Scale Co., 5700 South Claremont avenue, has awarded general contract for one-story plant addition, 50 x 141 feet, to August Federici, 6451 South Albany avenue. E. G. McClellan, 7541 Cottage Grove avenue, is architect.

**CHICAGO** — U. S. engineer office is in the market for one deep-well, turbine pump and equipment, circular 30. Bids will be taken Dec. 2.

## Indiana

**BEDFORD, IND.** — City has PWA grant of \$34,650 toward construction of waterworks improvements estimated to cost \$77,000. Project consists of erection of steel water tank and construction of additions to distribution system.

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**LONG ISLAND CITY, N. Y.** — United

## —Construction and Enterprise—

(Concluded from Page 82)

bids within two weeks on first contract of proposed power system, including grading of sites for first six substations. Thomas H. Allen is chairman of light and water commission. (Noted Nov. 9.)

### West Virginia

CLARKSBURG, W. VA. — Clarksburg water board takes bids Dec. 11 for construction of steel storage tanks and appurtenances. Fuller & McClintock, 11 Park place, New York, are engineers.

COLLIERS, W. VA. — Guarantee Specialty Co. will erect brick, steel, and concrete building at an estimated cost of \$150,000. Railroad sidings are now being constructed.

### Virginia

AMPTHILL, VA.—DuPont Rayon Co. Inc., Buffalo, a subsidiary of E. I. du Pont de Nemours & Co. Inc., plans additions to rayon mill here, to increase capacity of plant 7,000,000 pounds of yarn annually. Willis Shackelford is manager of Ampthill plant.

HARRISONBURG, VA. — City has REA loan of \$100,000 for construction of addition to power plant. Dr. Meade Ferguson is president of Virginia power board.

MANASSAS, VA. — Bull Run Power Co. received additional allotment of \$56,000 for construction of extension to present rural distribution system and addition to power plant capacity.

NORFOLK, VA.—Bircherd's Dairy Inc., Monticello avenue, plans two-story milk products plant. Cost is estimated at about \$120,000. Conveyors and other motorized equipment will be installed.

SOUTH NORFOLK, VA.—City project of power plant and distribution system is estimated to cost \$325,000. \$148,000 will be supplied by PWA. (Noted Nov. 2.)

VIRGINIA BEACH, VA.—City plans construction of \$168,000 sewage disposal plant. Roy Smith is mayor.

### Missouri

ST. LOUIS—S. G. Adams Metalware Co., 412 North Sixth street, has acquired site on northeast corner of Delmar and Garrison streets, and plans addition to plant.

ST. LOUIS — St. Louis Trailers Inc., has been formed here by Paul R. Dolvin, 4941 Columbia street, and E. M. Wilson, with capital of \$20,000.

### Arkansas

ALMA, ARK. — Town has PWA allotment of \$21,819 for construction of sewage collection system and treatment plant.

AMITY, ARK. — Town has PWA allotment of \$34,545 for construction of waterworks system, consisting of deep well, pumping stations, reservoir, elevated steel storage tank, chlorinator and cast iron pipe distributing system.

BRADFORD, ARK. — City will build complete waterworks system, including deep well and pump, 50,000-gallon steel tank on 100-foot tower, pipes and hydrants. Allotment of \$30,910 has been approved for this purpose by PWA.

LUXORA, ARK. — Town will construct waterworks system and purchase existing facilities. Project consists of deep well supply, 100,000-gallon ground reservoir, 50,000-gallon elevated steel tank, cast iron water mains and appurtenances.

YELLVILLE, ARK. — Zinc ore mill,

owned by H. C. Urschel and associates, was seriously damaged by fire recently.

### Texas

AUSTIN, TEX. — Schumacher Co., care N. J. Perltz, 110 East Fourth street between Nueces and San Antonio streets. H. F. Kuehne, Littlefield building, is architect.

BAY CITY, TEX.—City will vote Dec. 1 on \$225,000 bonds for power plant and distribution system. Garrett Engineering Co., 308 Hughes street, Houston, is engineer.

BRYAN, TEX.—Rural Electrification Administration has allotted \$256,000 for construction of 256 miles distributing lines in Brazos county.

DUMAS, TEX. — Shamrock Oil & Gas Corp., Amarillo, is scheduled to start work in January on \$500,000 oil refinery. Company is completing \$450,000 butane gas plant of 40,000-gallon daily capacity.

HANDLEY, TEX.—Board of directors, Tarrant county water control and improvement district No. 2, Dr. W. C. Foster, president, receives bids Dec. 9 for construction of sewage treatment plant. Hawley, Freese & Nichols, Capps building, Fort Worth, are engineers.

HEMPSTEAD, TEX. — City receives bids about Dec. 10 for construction of complete sanitary sewer system and disposal plant. Joe J. Rady, 410 Majestic building, Fort Worth, is engineer.

LLANO, TEX. — Board of directors, Lower Colorado river authority, Room 806 Littlefield building, Austin, receives bids Dec. 15 for furnishing two 12,500-KVA generators, two 17,300-horsepower hydraulic turbines and two governors with pumping equipment required for dam No. 1, Llano county.

SAN ANTONIO, TEX.—City has voted \$48,000 sewer extension bonds.

### Wisconsin

ASHLAND, WIS.—A. E. Appleyard has been granted rights by Iron county board for hydroelectric power development on Potato river at Gurney Falls. Power will be used for operation of plant converting steel scrap into "shot" used in cutting granite. Cost is estimated at \$100,000.

MANITOWOC, WIS.—L. J. Kaufman Co., general machine shop and stamping works, has purchased properties of Duono Mfg. Co. at Twenty-ninth street and Meadow lane to increase capacity.

MILWAUKEE—Pressed Steel Tank Co., 6673 West Greenfield avenue, has started work on two-story addition to research and administrative departments. Herman O. Brumder is president.

MILWAUKEE—Chain Belt Co., 1660 West Bruce street, will begin work on erection of machine shop, 150 x 300 feet, at its West Milwaukee works, and will add to equipment. Total cost is estimated at \$250,000.

MILWAUKEE — Milwaukee sewerage commission has let contract at \$77,249 to Wenzel & Henoch Co., for furnishing and installing 900-horsepower boiler in Jones Island treatment plant. Lippman Engineering Works Co. will furnish coal bunkers and conveyors at \$7100.

### Iowa

AMANA, IOWA—Amana Society Electric Service Co. plans erection of 6600-volt transmission line to connect with

system of Iowa Electric Light & Power Co., Cedar Rapids. Cost of entire project is estimated at \$85,000.

OELWEIN, IOWA — City receives bids Dec. 8 for installing 500,000-gallon water tank and elevated tower and materials for distribution system, at an estimated cost of \$25,000. E. E. Schenk, Waterloo, Iowa, is engineer.

FOREST CITY, IOWA—City has plans for construction of municipal electric light and power plant. Bids for equipment, including distribution lines, will be taken soon; \$165,000 is available. Young & Stanley Inc., Muscatine, Iowa, is consulting engineer.

### Arizona

PHOENIX, ARIZ.—Contracts for gates and machinery at Horse Mesa dam, near here, have been awarded to Consolidated Steel Corp. Ltd., Los Angeles. Cost of equipment was \$49,546.

### Pacific Coast

EL CENTRO, CALIF.—City has PWA allotment of \$2,760,000 for construction of first unit of All-American canal power project. Four power plants will be erected at sites along the canal. First unit will include construction of plant 4, additions to diesel plant at Brawley, Calif., and construction of power distribution lines.

ABERDEEN, WASH.—Harbor Plywood Co., John J. Long, president, plans plant expansion program, including 40,000-square foot increase in area, additional machinery and equipment. Cost is estimated at \$150,000.

COLFAX, WASH.—Parvin Power & Light Co. Inc. has been formed by Fred Harter and associates.

KENT, WASH. — Northwest Metal Products Co. is building frame factory structure, corrugated iron walls, 300 x 100 feet, for manufacture of sheet metal and steel products. Plant was formerly at Seattle.

SEATTLE—Mameco Mfg. Co., 315 Wall street, has been incorporated by W. E. Mather and associates, with capital of \$49,000, to fabricate heating appliances.

SEATTLE—Pommerelle Co., wine manufacturer, is remodeling building at 714 Dearborn street, for purpose of plant expansion.

YAKIMA, WASH.—Bureau of reclamation has called for bids Dec. 14 for construction of one unit of the Roza irrigation project, including placing of 1513 tons of reinforcing bars, 27 tons gates and metal work. Cost is estimated at \$729,000.

### Canada

CORNWALL, ONT.—Powdrell & Alexander of Canada Ltd. is extending plant to provide additional bleaching and finishing space.

CORNWALL, ONT.—Canadian Cottons Ltd. has awarded general contract for construction of five-story, 105 x 130-foot mill addition, to Anglin Norcross Ltd., Montreal, Que.

HAMILTON, ONT.—Dominion Foundries & Steel Co. Ltd. is planning expansion of plant facilities on Depew street.

NIAGARA FALLS, ONT. — Niagara Wire Weaving Co. Ltd. is erecting \$15,000 factory addition.

SIMCOE, ONT.—Brock Woolen Co. has plans for mill improvements, including erection of one-story building addition. Cost is estimated at over \$75,000.