

# STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

For forty-eight years—IRON TRADE REVIEW

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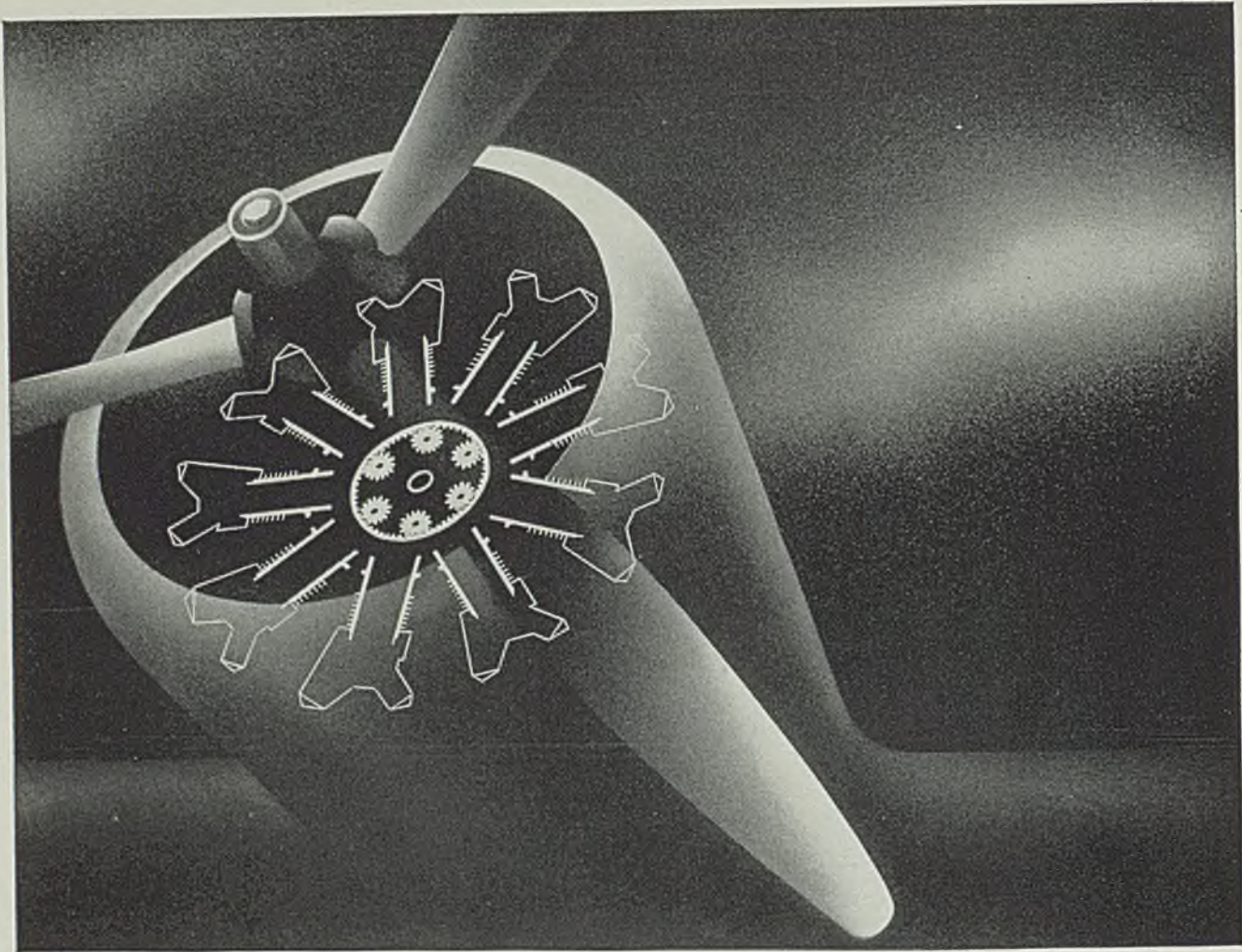
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## As the Editor Views the News

**L**ABOR relations dominated industrial news in the first full week of the new year. The clash between CIO and General Motors Corp. was attended by much publicity, but its actual effect upon industrial operations (p. 13) was somewhat less drastic than was generally realized. In spite of curtailment of output by some G. M. C. units, total production of automobiles for the week ending Jan. 9 was 96,780, a gain of 24,980 cars over output in the previous week. Also, while "stop" orders were prevalent in certain steel producing districts, the national rate of steelworks operations advanced half a point to 79.5 per cent of capacity.

In giving the impression it seeks the right to speak for all G. M. C. employes, CIO probably has placed itself in an untenable position. It met a stiff rebuff when G. M. C. announced Tuesday (p. 31) that it "will not recognize any union as the sole bargaining agency for its workers, to the exclusion of all others."

### CIO Is in Hot Spot

The position of CIO on this point was further weakened Thursday when four A. F. of L. unions petitioned the manager of one G. M. C. plant to resume operations to permit their members to go back to work. Likewise unaffiliated workers, yet unheard from, resent CIO's officious attitude.

Therefore, it looks as if the present labor situation may develop into a contest among various agencies for authority to represent employes. If the trend in this direction continues, the competition between professional unions may conceivably overshadow the clash between CIO and employers. In the steel industry, support of employe representation plans is gaining strength (p. 14), and when the hearing is resumed this week before the National Labor Relations board, strong arguments in defense of ERP will be presented. Increasing evidence that membership in a CIO or A. F. of L. union under present conditions

### Unions Fight Among Selves

involves strong possibilities of continual jurisdictional feuds cannot help but cool the ardor of employes who have been solicited to join a professional union. The present spectacle looks too much like a battle for personal power within union ranks, rather than the campaign for the right of collective bargaining that it is claimed to be.

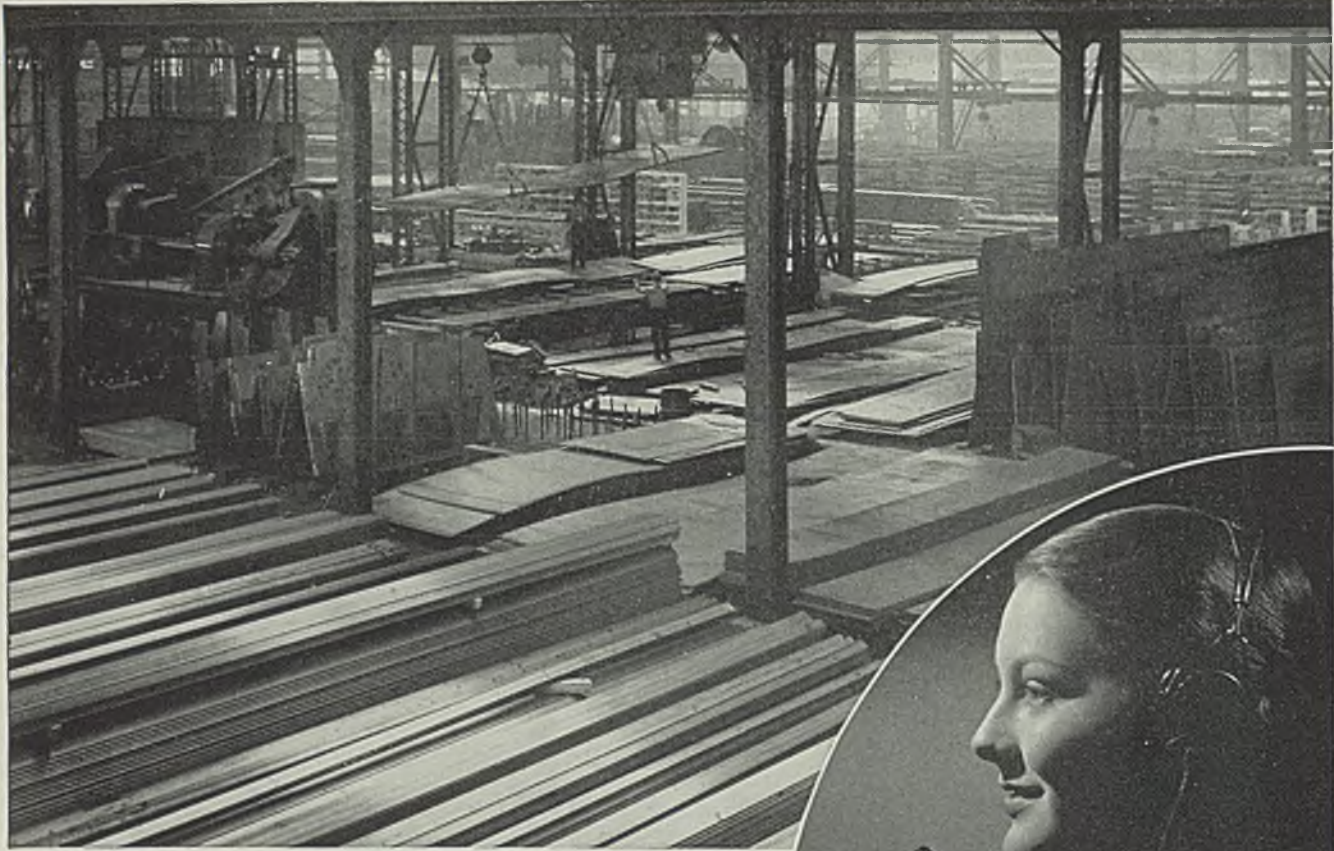
When one sees the superbly finished body of an automobile or refrigerator, he probably does not appreciate the great volume of research and development work which is involved in perfecting many of the metal-forming operations employed in modern manufacturing. Today mild steel sheets and strips are being deep drawn and otherwise formed into intricate shapes which would have been impossible a few years ago. Progress in this direction is due not only to improved materials and equipment, but also to a better knowledge of the principles involved in the plastic working of metals. Metallurgists, research workers and other technical experts constantly are studying problems in this field. Their recent symposium on plastic working (p. 37) affords an excellent illustration of how their activities are contributing to improved practice.

### Progress in Deep Drawing

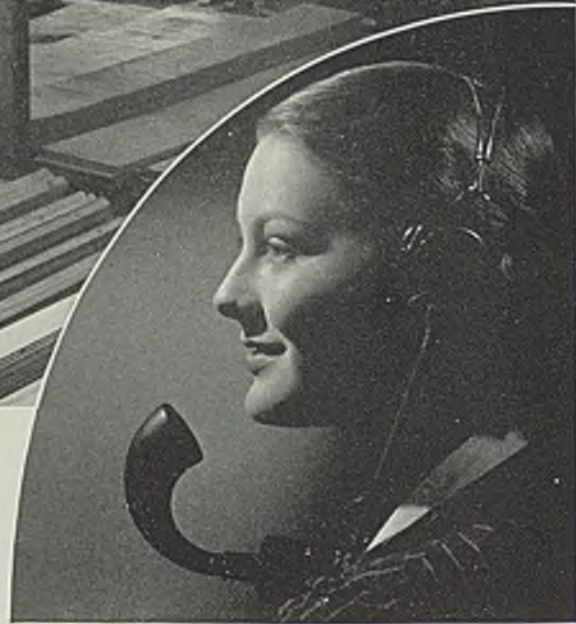
While mass production methods are receiving much attention today, it should be remembered that only a small portion of the total activity in metal manufacturing is adaptable to this practice. Much work must be performed on a unit basis—one job at a time. Another class of work, embracing railroad passenger cars, some machines and certain heavy equipment, involves some repetitive operations which lend themselves to a modified mass production technique. In these cases, the approach to assembly line methods usually lies in the direction of efficiency in materials handling. An eastern manufacturer of railroad cars and automobile bodies (p. 41) now employs mass production methods for the auto bodies. It will be interesting to notice how much of this technique gradually can be adapted to railroad car manufacture.

### Modified Mass Production

*E. L. Shaner*



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# RYERSON

# Motors Strike Fails To Shake Steel; Workers Vote To Defend ERP

IF IT was CIO's intention to bite into the steel industry while at the same time attacking steel's leading consumer, automobile manufacture, it met with only partial success last week, and so far as steel itself was concerned, practically none.

Reports from principal steel producing centers indicated there was little disturbance in operations; the national steelworks average actually advanced  $\frac{1}{2}$ -point to 79  $\frac{1}{2}$  per cent. Automobile output for the week advanced to 96,780 units from 71,800 in the preceding week, as Ford and other manufacturers increased schedules, while 18 General Motors units were idle.

For steel, the explanation for this continuing high operating rate is, of course, the vast backlog of orders. Distribution for the present merely has been diverted—to the extent of General Motors' suspended requirements—into other channels. In many manufacturing industries,

where pressure for material has been strong, this is welcomed. If the strike is not protracted, the release of General Motors specifications may bulwark steel demand in February.

Spokesmen for the CIO last week admitted that the time "for a crisis in steel" had not yet arrived. They claim 154 lodges in the Amalgamated Association of Iron, Steel & Tin Workers, want 250, and say this number will be obtained within 30 days.

## Opposition Is Formidable

In its drive against steel, unlike that against General Motors, the CIO has a strong counter-force in militant employe representative groups. Some measure of this force was taken last week when the representatives of 18 Carnegie-Illinois Steel Corp. plants voted to unite in a campaign to resist the CIO.

As one of their first steps they ousted Elmer J. Maloy, an avowed CIO supporter, as chairman of the general works council. Maloy was

dethroned by a vote of 25 to 12 when he opposed a resolution to have the various representative bodies work together in the movement to defend the ERP. He continues, however, as a member of the council. In his place as chairman, the council elected W. R. Hill, Canton, O., a strong advocate of the employe representation plan.

Another significant move was the decision of the Carnegie-Illinois Homestead works representatives to enter the council, something which it had refused to do ever since the council was organized two months ago.

The anti-Lewis group's plan of action includes publication of a weekly news letter for the various plants, organization of a speakers group of eight men who will visit the plants, and sending witnesses to Washington. So it is probable that when the labor relations board resumes its hearings this week, on CIO complaints that Carnegie-Illinois has interfered with the operations of the Wagner act, it will receive strong rebuttal evidence from the employes.

In this case the board sits virtually as prosecutor, judge and jury. Last week the Marine Engineers Beneficial association, lodge No. 30, revealed a letter it had received from the board—inviting complaints—asking for information on "any unfair practices of the Carnegie-Illinois Steel Corp. toward labor in the mills or elsewhere." The reply stated that there was no complaint, and "further that the Carnegie-Illinois Steel Corp. has been a leader in every movement that has bettered the conditions for marine engineers and other steamboat crews."

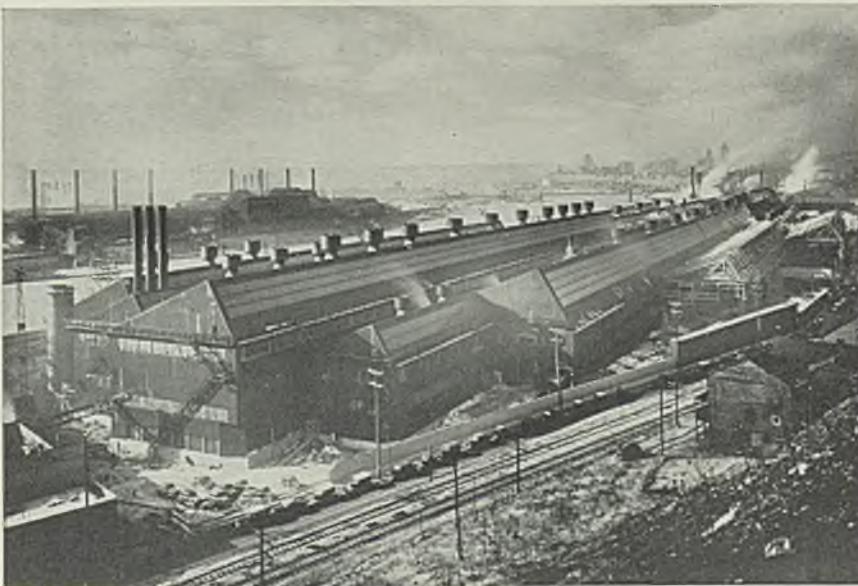
Myron C. Taylor, chairman, United States Steel Corp., last Friday visited President Roosevelt at the White House, and it was believed discussed the labor situation with him, though no information was divulged.

## ADVANTAGE TO OTHER CONSUMERS

The automotive industry's labor disturbances have not yet had any serious effect on aggregate operations or employment in the Pittsburgh district, where production is not quite so closely keyed to this single industry as in other steel-making areas.

Suspension orders from General

## Steel's \$25,000,000 New Year's "Baby"



JONES & LAUGHLIN STEEL CORP.'S wide strip-sheet mill, Pittsburgh, is rapidly nearing completion and will be ready for operation in a few weeks—first in 1937 of the five strip-sheet mills now under construction. Also, it will be the first of such mills ever to be erected in the Pittsburgh district. Annual capacity, 720,000 tons. Other strip-sheet mills now being built: Republic Steel Corp., Cleveland; Bethlehem Steel Co., Sparrows Point, Md.; Carnegie-Illinois Steel Corp., Homestead, Pa.; Tennessee Coal, Iron & Railroad Co., Birmingham. Total annual capacity of these five mills, all scheduled for completion this year, 3,000,000 tons

Motors in sheets, strip and other automotive materials have been extensive, but the Pittsburgh mills, in view of the unusually heavy backlogs, have been able to work off advantageously orders for other consumers by putting them ahead. Under ordinary circumstances, of course, the stop orders would have been reflected much sooner.

Partsmakers in the Pittsburgh district have been more seriously affected. District producers of forgings, nuts, bolts and other articles for the Michigan plants report an extensive curtailment in their orders.

Standard Steel Spring Co., Coraopolis, Pa., maker of bumpers, was one of the first of the partsmakers to curtail operations. One of this company's plants was closed Jan. 1, resulting in idleness for 400 men.

### VALLEY HAS BACKLOG FOR SEVERAL WEEKS

Steelworks and rolling mills in the Youngstown district have been little affected by the decrease in demand from their usual automotive customers.

Youngstown Sheet & Tube Co. made a shift in the cold-rolling department at its Campbell works. Suspension of orders for cold-rolled wide strip from partsmakers closed down this cold mill until it could be prepared for resuming on a huge tonnage of other miscellaneous business in hand. Delay was occasioned for a couple of days until the complementary hot mill could roll sufficient "breakdowns" to warrant starting the cold mill again, which was accomplished later in the week.

Other independent valley and Cleveland district mills have sufficient specifications for sheets and strip from miscellaneous sources to insure continued capacity operations for three or four weeks. Some partsmakers continue to press mills for shipment of finished flat rolled products in the belief that, if the auto suspension lasts only a few weeks, then when settlement is made there will follow a heavy demand for parts that the makers will find difficulty in supplying unless they can make and store a huge surplus.

### EASTERN PARTSMAKERS SLOW PRODUCTION

Steel suspensions in the East due to automobile labor troubles are increasing. Alloy steels, particularly bars, and sheets and strip and to some extent wire are among the principal items affected.

So far, however, these suspensions have not resulted in an actual drop in ingot output, although they may have kept operations from going higher than otherwise. In the

central eastern seaboard district steel output was actually up one point over the past week.

Those in the East furnishing steel for parts and bodies for General Motors Corp. are chiefly affected, with the New Departure Mfg. Co., Bristol, Conn., and the Hyatt Roller Bearing Co., Harrison, N. J., two General Motors subsidiaries, forced to curtail schedules. At the Harrison plant 700 to 1700 employes have been temporarily laid off, while at Bristol employes have kept on, but have been forced to work shorter hours until more normal schedules can be resumed. Under this latter plan all workers are participating in such production as there is available.

At Philadelphia, the Heintz Mfg. Co. has held up shipments of steel for Chevrolet work, although schedules on fabrication for manufacturers of other cars have continued unchanged so far. Schedules at the Edward G. Budd Mfg. Co., that city, are reported affected on some lines. Manufacturers of automobile radios, so far as can be learned, have not as yet held up shipments.

### CIO After "Tribute", Says Weir to Representatives

Congratulating representatives recently elected by employes of the Weirton Steel Co., E. T. Weir, chairman, National Steel Corp., of which Weirton is a subsidiary, sharply criticizes the CIO. Mr. Weir calls attention in a letter to the

high percentage of employes who voted in the election (STEEL, Dec. 28, p. 18) and says:

"Your election, coming as it does after months of propaganda and high pressure organizing effort emanating from the headquarters of the committee for industrial organization, disproves the claim that the employe representation plans are being destroyed.

"Of course, I know that none of you employe representatives is fooled by the professed aims of the CIO. I believe, moreover, that comparatively few steel workers have been fooled. They know what CIO is after. They know that there is no issue of wages and hours. They know that the CIO wants to bring the steel industry under its domination so that it can exact tribute from the steel workers, and dictate the terms under which a man can get and hold a job.

### Situation Is Grotesque

"I believe that steel workers as a whole resent the fact that CIO has branded them in the public eye as a lot of helpless invertebrates totally incapable of handling their own affairs and forced to beg for leadership of coal miners and milliners. That is rather grotesque in view of the fact that in the steel industry wage rates are nearly 20 per cent higher than in the boom year of 1929, and the fact that the number of dollars in Christmas pay envelopes approached boom year totals.

"The newspapers are full of reports of strikes and threats of strikes in such important industries as automobiles, rubber and glass. Any shut-down of those industries would throw millions out of work and have a paralyzing effect upon the whole country.

"These sinister threats are being

### Walter P. Chrysler, as "One of the Boys"



VISITING his Plymouth plant recently, on the occasion of a production record, Mr. Chrysler, smiling broadly shook hands with the workmen, told them how proud of them he was and posed for his photo

made just at a time when business is getting on its feet, when wages and jobs are increasing after long years of depression. The real issue involved in these threats is not better wages and working conditions for employes but the closed shop which would put workers in the power of a ring of labor-politicians.

"The menace of these strike threats is the only obstacle I see in the path of continued recovery for the steel industry. Judging from the practically unanimous participation of Weirton employes in the recent election there is no doubt in my mind that they are determined to avoid any interruption of the present improvement."

## Employe Plan Best For All, Says Grace

Competitive enterprise is the keynote for success in the steel business, according to E. G. Grace, president, Bethlehem Steel Corp. in his forward appearing in the current issue of the *Bethlehem Review*, distributed to Bethlehem employes.

"The success of our company in the long run depends upon its ability to meet competition and to forge ahead in every department of its efforts," says Mr. Grace.

This issue features high-spot Bethlehem accomplishments during 1936. Among the things not hitherto brought to public notice is the fact of an addition to the tool steel facilities at the Bethlehem plant, which will include a furnace to pre-heat ingots prior to hammer cogging, cut-off machines and new polishing equipment.

Another item not hitherto announced by the company except in special trade advertising is its development of a new type of pipe for refrigerating service, called Ammonoduct.

"For nearly 20 years now the representation plan has served the interests of employes," says Mr. Grace. "What it has accomplished is reflected in the greatly improved wages and working conditions that exist today. Based as it is on confidence and co-operation it promotes industrial peace. Industrial peace, not strife, is what we need. Those who would serve best the interests of labor will protect the plan. They will protect it for what it is—a fair, square, effective and responsible method of collective bargaining."

## \$1,500,000 Can Plant

American Can Co. will start construction immediately of a \$1,500,000 plant at Houston, Tex., to manufacture a general line of containers. This is its first important plant expansion in several years.

# Dawes, with Two "Hits", Sees New Heights of Prosperity

**B**USINESS prosperity the next two years will reach greater heights than are commonly anticipated at present. This is the forecast of Gen. Charles G. Dawes, Chicago banker and former United States vice president, who on two previous occasions has shown remarkable accuracy in predictions.

In December, 1934, Gen. Dawes stated that the steel industry would lead a definite business recovery starting around the middle of 1935. The sustained rise in steelmaking during the second half of 1935 confirmed this forecast. About six months ago, the former vice president asserted that steel plants would be practically at capacity at the turn of the year, and this prognostication also was almost fulfilled.

Speaking at Chicago recently concerning the future trend, Gen. Dawes pointed to a "tremendous potential demand, stored in five years of the greatest depression this country has ever experienced." Demand for commodities, especially in the heavy goods industries, is accentuated by the fact that artificial influences sustained price levels during this latest depression in a way that was not done in 1873 and 1893, he maintains. Price agreements and union labor were responsible for holding up prices.

### Requirements Underestimated

As a result of the sharpest drop in business in the history of world depressions, the requirements are even larger than most economists are inclined to believe, he said. Referring to his previous forecasts, he told how the same methods which produced those conclusions have been applied to the coming years. These studies showed that definite parallels exist in the course of business gains and recessions.

Gen. Dawes found that after five years and three months of depression there is an upswing in stocks as a result of returning confidence. Such a rise lasts from six to 18 months, but almost exactly after five and three-quarters years of depression a renewed demand for durable goods makes itself felt.

How much stronger this is to be in 1937 than in other post-slump periods is indicated, he added, by the fact that the United States used more pig iron with a smaller population two and a half years after the 1873 crash than it did after the 1929 collapse.

There is going to be a greater ac-

tivity in exchanges of goods than we are inclined to predict or to feel—and these things are largely a matter of feeling. I had expected a similarity in trends during periods of depression. We do normal things in hard times. It is in prosperity that we have to watch ourselves. So I had not expected to find such a close parallel in terms of action after the depressions. Since I have extended the depression charts, I found to my surprise a similar exposition of mass action.

"When a war or some similar element interferes with mass action, it interferes with any charts. But otherwise, mass action is as inevitable as the tides."

## Steel-Hungry Europe Asks Help from American Mills

Steelmakers in the Youngstown district have received concrete evidence of world shortage of steel in recent inquiries for semifinished and finished products for export. One asks for 5000 tons of 4 x 4 billets from Manchester, England, usually supplied from Belgium. Another is for 1000 tons of steel bars for shipment to Stamboul, Turkey, usually supplied from Germany. On account of demands by domestic buyers valley mills have not quoted on this business.

## Would Double Iron Ore Occupation Tax

"Joker" in the Minnesota tax commission's recommendation last week for an increase in the occupation tax on iron ore mining was that, if adopted, it will more than double the tax.

The commission asked the state legislature to provide an occupation tax "equal to 8 per cent of gross valuation of all ore mined or produced." The present tax is 6 per cent on net valuation, that is, after deducting all mining costs and royalties. It urges elimination of the Lake Erie price as a valuation basis, pointing out that this price has not changed in eight years.

The commission also advocates a state income tax on mining companies identical with that on other corporations.

# Pig Iron Production in 1936

## Increases 45.8 Per Cent

**A**N ACCELERATING rate of pig iron production, broken only in two months, carried the 1936 total to within less than half a month's production of the 1930 figure at the start of the depression. Blast furnaces in the United States last year made 30,682,704 gross tons of coke iron; the 1930 total was 31,441,488 tons. Compared with the 1935 output of 21,040,483 tons, the 1936 production was an increase of 9,642,221 tons, or 45.8 per cent.

December finished strong with total output over 3,000,000 tons and daily rate over 100,000 tons for the first time since May, 1930. Active blast furnaces during the month rose to 170, a gain of five over No-

### MONTHLY IRON PRODUCTION

	Gross Tons		
	1936	1935	1934
Jan. ....	2,029,304	1,478,443	1,225,643
Feb. ....	1,838,932	1,614,905	1,270,792
March ....	2,046,121	1,770,990	1,625,588
April ....	2,409,474	1,671,556	1,736,217
May ....	2,659,643	1,735,577	2,057,471
June ....	2,596,528	1,558,463	1,936,897
July ....	2,595,791	1,520,340	1,228,544
Aug. ....	2,711,726	1,759,782	1,060,187
Sept. ....	2,728,257	1,770,259	899,075
Oct. ....	2,991,794	1,978,379	951,353
Nov. ....	2,949,942	2,066,293	957,906
Dec. ....	3,125,192	2,115,496	1,028,006
Total .....	30,682,704	21,040,483	15,977,679

ember. This total was the best since May, 1930, with 180.

Average daily production in December was 100,183 gross tons, this being an increase of 2482 tons, or 2.5 per cent, over the 98,331-ton rate of November. In December, 1935, the average daily rate was 68,242 tons.

Total output for December was 3,125,192 tons, which, compared with the 2,949,942 tons of the preceding month, was a gain of 175,250 tons, or 5.9 per cent. More than half of this, however, is accounted for by the fact that December was a one day longer month than November. Production in December, one year ago, was 2,115,496 tons.

Relating production to capacity, operations in December were at 74.2 per cent, compared with 72.3 per cent in November and 49.0 per cent in December, a year ago.

The 170 active blast furnaces on Dec. 31 compared with 165 on Nov. 30. At the end of December, 1935, only 120 were producing iron. During the month seven nonmerchant or steelworks stacks resumed and

three were blown out or banked. Of the merchant classification, two were made active and one was blown out.

Blast furnaces resuming in December were: In Ohio: Lorain No. 3, National Tube Co. In Pennsyl-

### AVERAGE DAILY PRODUCTION

	Gross Tons			
	1936	1935	1934	1933
Jan. ....	65,461	47,692	39,537	18,348
Feb. ....	63,411	57,675	45,385	19,752
March ...	66,004	57,120	52,438	17,484
April ....	80,316	55,719	57,873	20,786
May ....	85,795	55,986	66,370	28,784
June ....	86,551	51,949	64,563	42,165
July ....	83,735	49,043	39,630	58,108
Aug. ....	87,475	56,767	34,199	59,137
Sept. ....	90,942	59,009	29,969	50,264
Oct. ....	96,509	63,818	30,689	43,824
Nov. ....	98,331	68,876	31,930	36,124
Dec. ....	100,813	68,242	33,161	38,456
Ave. ....	83,832	57,694	43,774	36,223

vania: Perry, Interlake Iron Corp.; Bethlehem G, Bethlehem Steel Co.; Edgar Thomson C, Carnegie-Illinois Steel Corp.; one Swede, Alan Wood Steel Co. In Illinois: South Chicago No. 5, Youngstown Sheet & Tube Co. In Indiana: Gary No. 11, Carnegie-Illinois Steel Corp. In Colorado: Minnequa A, Colorado Fuel & Iron Co. In West Virginia: Weirton No. 1, National Steel Corp.

Stacks blowing out or banking were: In Ohio: Lorain No. 2, National Tube Co. In Pennsylvania: One Aliquippa, Jones & Laughlin Steel Corp. In Kentucky: Norton,

### DECEMBER IRON PRODUCTION

	No. in blast last day of Dec.		Total tonnage Merchant Non-merchant	
	Dec.	Nov.	Merchant	Non-merchant
Ohio .....	36	36	88,244	613,125
Penna. ....	60	57	116,254*	910,820*
Alabama ...	15	15	117,513	93,678
Illinois ...	13	12	69,067	211,229
New York ...	13	13	76,339	153,338
Colorado ...	2	1		
Indiana ...	15	14	19,753	487,196
Maryland ...	5	5		
Virginia ...	0	0		
Kentucky ...	1	2		
Mass. ....	0	1		
Tenn. ....	0	0		
Utah ....	1	1	9,673	158,963
West Va. ...	3	2		
Michigan ...	4	4		
Minnesota ...	2	2		
Missouri ...	0	0		
Total .....	170	165	496,843*	2,628,349*

\*Includes ferro and spiegeleisen.

### RATE OF OPERATION

(Relation of Production to Capacity)

	1936 <sup>1</sup>	1935 <sup>2</sup>	1934 <sup>3</sup>	1933 <sup>4</sup>
Jan. ....	48.2	34.2	28.3	13.3
Feb. ....	46.6	41.4	32.5	14.3
March ....	48.5	41.0	37.5	12.7
April ....	59.1	40.0	41.4	15.1
May ....	63.1	40.2	47.5	20.9
June ....	63.6	37.2	46.3	30.6
July ....	61.5	35.2	28.4	42.4
Aug. ....	64.3	40.7	24.5	42.8
Sept. ....	66.9	42.5	21.5	36.4
Oct. ....	71.0	45.8	22.1	31.8
Nov. ....	72.3	49.5	22.8	26.2
Dec. ....	74.2	49.0	23.7	27.9

<sup>1</sup>Based on capacity of 49,777,893 gross tons, Dec. 31, 1935; <sup>2</sup>capacity of 50,845,741 gross tons, Dec. 31, 1934; <sup>3</sup>capacity of 50,975,561 tons, Dec. 31, 1933; <sup>4</sup>capacity of 50,313,975 tons, Dec. 31, 1932. Capacities by American Iron and Steel Institute.

American Rolling Mill Co. In Massachusetts: Everett, Mystic Iron Works.

## Machinery Exports Up 30 Per Cent in 1936

Exports of industrial machinery from the United States during November were valued at \$12,725,356, a slight increase compared with exports valued at \$12,619,169 in November last year, according to the machinery division of the department of commerce.

The increase was distributed generally over the various machinery lines; however, the more noticeable advance taking place in the sales of mining, well, and pumping machinery.

While there was a noticeable decrease in the exports of power-driven metal-working machinery, the November, 1936, value totaling \$3,785,013, compared with \$3,923,375 exported in November, 1935, exports of lathes advanced to \$442,898 from \$340,464; sheet and plate metal working machines to \$410,930 from \$193,127; and forging machinery to \$174,388 from \$133,787.

The 11 months' total value for industrial machinery exports from the United States in 1936 was \$143,696,712, about 30 per cent more than in the corresponding period of 1935.

## \$200,000,000 Allotted For Highway Improvements

Secretary of Agriculture Henry A. Wallace has apportioned to the various states \$125,000,000 for improvement of the federal-aid highway system, \$25,000,000 for improvement of secondary or farm-to-market roads, and \$50,000,000 for elimination of hazards at grade crossings. The new apportionments are for year beginning July 1.

In accordance with the general



plan used in previous federal-aid highway work, projects for improvement will be selected by state highway departments, subject to federal approval, and the states will be required to match the funds for improvement of the federal-aid system and for secondary roads. It is not required that grade crossing funds be matched. Improvement of secondary roads and elimination of grade crossings with federal funds were first initiated as an emergency measure to relieve the unemployment situation.

## Contract for Furnace; Old Stack To Be Moved

Frey Engineering Co., Chicago, has been awarded a contract by the Hamilton Coke & Iron Co., American Rolling Mill Co. subsidiary, for building a 500-ton blast furnace at Hamilton, O.

This stack, it develops, will be the American Rolling Mill's East furnace at Columbus, O., to be torn down, moved and entirely revamped and modernized. The East stack was built in 1901.

In addition to the new stack at Hamilton provision has been made for a new gas cleaning equipment, water cooling basin, extension to the ore yard, stock house and bin system. The furnace will supplement Hamilton's present 700-ton stack.

# December Ingots Set New Record

STEEL ingot production in 1936 totaled 46,919,362 gross tons, 40 per cent more than the 33,417,985 tons made in 1935, according to the American Iron and Steel institute, New York. This marks the fourth consecutive year of improvement and is the third largest total in the history of the steel industry, exceeded only in 1928 and 1929.

Average per cent of capacity operated in 1936 was 68.52, compared with 48.54 per cent in 1935. This was the best ratio of output to capacity since 1929 but was only the twelfth best in the past 20 years because of steady increases in the industry's producing capacity as population advanced.

Fourth quarter production was 13,314,058 tons, compared with 12,278,969 tons in third quarter and with 9,366,573 tons in fourth quarter, 1935. Output for the final quarter was the largest for any three-month period since third quarter of 1929 and represented the largest fourth quarter in history. Operations in the quarter averaged 77.77 per cent of capacity, compared with 71.73 per cent in the preceding quarter and 52.24 per cent for fourth quarter of 1935.

December production was 4,431,-

645 tons, compared with 4,337,412 tons in November and 3,073,405 tons in December, 1935. This is the largest December output in the history of the industry. The previous December record, 4,018,208 tons, was attained in 1928.

## Joliet Works Transferred to American Steel & Wire Co.

Transfer of the Joliet, Ill., plant and property of the Carnegie-Illinois Steel Corp. to the American Steel & Wire Co. has been announced by G. C. Kimball, executive vice president of Carnegie-Illinois. Both are United States Steel Corp. subsidiaries. Property transferred includes the splice bar mills, spike mill, merchant mills and bolt and nut factory. Carnegie-Illinois will retain two blast furnaces and the coke plant.

The wire company will operate new rod mills now under construction on the property. Carnegie-Illinois will continue to market the track accessories manufactured at the Joliet works as it has done in the past. These products include angle bars, cut-thread bolts, heat-treated bolts, spikes and screw spikes.

The Joliet plant is numbered among the oldest steel producing units in the Chicago area. Operations began in July, 1870, under the management of the Union Coal, Iron & Transportation Co., which was later known as the Joliet Iron & Steel Co. A bessemer plant was completed on the site nine years after the close of the Civil war. In May, 1889, the Joliet plant was sold to the Illinois Steel Co., which had been organized only two days previously. The Illinois Steel Co. later became a subsidiary of the United States Steel Corp. upon its organization in 1901.

## Swedish Steelworks Buys 3-High Mill from Lewis

Lewis Foundry & Machine Co., Pittsburgh, subsidiary of the Blaw-Knox Co., has received an order from Domnarfvets Steel Works, Domnarfvets, Sweden, for a three-high mill, complete with automatic feeder and catcher tables, furnace run out table, and gear drive. The order was placed through Canada Iron Foundries Ltd.

Purchase of this equipment is said to reflect a general movement on the part of steel plants in other countries to achieve the economies which are afforded by American steel mill practice.

## Steel Ingot Statistics

	Monthly Production—Complete for Bessemer; Open Hearth, Calculated from Reports of Companies Making 98.03 per cent						daily production, all com- panies (gross tons)	Number of working days
	—Open Hearth—		—Bessemer—		—Total—			
	Gross tons	Per cent of capacity	Gross tons	Per cent of capacity	Gross tons	Per cent of capacity		
1936								
Jan. ....	2,849,557	53.73	196,389	31.54	3,045,946	51.40	112,813	27
Feb. ....	2,761,973	56.25	202,445	35.11	2,964,418	54.03	118,577	25
March ....	3,157,579	61.83	185,040	30.86	3,342,619	58.58	128,562	26
April ....	3,637,479	71.23	304,775	50.83	3,942,254	69.09	151,625	26
May ....	3,744,161	73.32	302,092	50.38	4,046,253	70.91	155,625	26
June ....	3,649,948	71.47	334,897	55.85	3,984,845	69.83	153,263	26
July ....	3,596,125	70.42	326,606	54.47	3,922,731	68.74	150,874	26
Aug. ....	3,844,570	75.28	350,560	58.47	4,195,130	73.52	161,351	26
Sept. ....	3,858,060	75.55	303,048	50.54	4,161,108	72.92	160,043	26
Oct. ....	4,227,291	79.71	317,710	51.03	4,545,001	76.70	168,333	27
Nov. ....	4,007,859	81.62	329,553	57.16	4,337,412	79.05	173,496	25
Dec. ....	4,127,049	80.82	304,596	50.80	4,431,645	77.66	170,448	26
Total .....	43,461,651	70.92	3,457,711	48.06	46,919,362	68.52	150,383	312
1935								
Jan. ....	2,630,303	49.70	239,858	34.99	2,870,161	48.02	106,302	27
Feb. ....	2,549,935	54.21	224,336	36.82	2,774,271	52.22	115,595	24
March ....	2,634,482	51.70	230,810	34.97	2,865,292	49.78	110,204	26
April ....	2,408,686	47.27	231,916	35.14	2,640,602	45.88	101,562	26
May ....	2,378,865	44.95	254,796	37.17	2,633,661	44.06	97,543	27
June ....	2,048,177	41.80	210,487	33.17	2,258,664	40.81	90,347	25
July ....	2,043,371	40.10	224,456	34.01	2,267,827	39.40	87,224	26
Aug. ....	2,682,569	50.69	223,361	34.05	2,915,930	48.78	107,997	27
Sept. ....	2,591,267	52.88	233,737	36.83	2,825,004	51.04	113,000	25
Oct. ....	2,872,046	54.27	270,719	39.50	3,142,759	52.58	116,398	27
Nov. ....	2,898,246	56.87	252,163	38.20	3,150,409	54.73	121,170	26
Dec. ....	2,845,013	58.06	228,392	35.99	3,073,405	55.53	122,936	25
Total .....	30,582,954	50.17	2,835,031	35.91	33,417,985	48.54	107,453	311

Capacity percentages for 1935 are based on open-hearth capacity of 60,954,717 gross tons and bessemer of 7,895,000 gross tons on Dec. 31, 1934; for 1936 on open-hearth capacity of 61,280,509 gross tons and bessemer of 7,195,000 gross tons, as of Dec. 31, 1935.

# Production

**S**TEELWORKS operations advanced  $\frac{1}{2}$  point last week to 79 $\frac{1}{2}$  per cent.

**Youngstown, O.**—Averaged 76 per cent, down 2 points, as Carnegie-Illinois Steel Corp.'s Ohio works, Republic Steel Corp.'s plant at Youngstown, and Youngstown Sheet & Tube Co.'s plants at Brier Hill and Campbell each dropped one open hearth. Republic's bessemer furnace resumed Tuesday night, after being down ten days for repairs.

**Cleveland**—Up 3 points to 80 per cent. Both Otis Steel Co. and National Tube Co., Lorain, added one unit, the former to operate all 8, and the latter, 11. Corrigan, McKinney division of Republic Steel Corp. operated 12, off 1 from the week previous.

**Detroit**—Down 5 points to 95 per cent.

**Pittsburgh**—Up 3 points to 80 per cent, with the United States Steel Corp. interests operating at close to 80 per cent and the leading independents at around 78 per cent.

**Wheeling**—Up 2 points to 94 per cent, with 35 out of 37 open hearths active.

**Central eastern seaboard** — Advanced 1 point to 53 per cent. Unless there is a more substantial backing up of orders than has yet developed, as a result of the automobile labor situation in the Middle West, a further increase in steel output is expected before Jan. 31.

**Chicago**—Continued around 77 per cent despite the reduced rate of shipments of automotive material. Despite possibility of a further reduction in automotive demand, backlogs are sufficient to support schedules for the coming week.

**New England**—Up 10 points to 85 per cent. One producer is operating 100 per cent. A slight change is expected in open-hearth production this week.

**Birmingham**—First week of new year saw steelmaking rate again put up 2 points to 76 per cent. Tennessee Coal, Iron & Railroad Co. is operating 12 open hearths and Gulf States Steel Co., 5.

**Buffalo**—Held at 84 per cent. Some doubt was expressed as to how long this production would continue if there should be a general tieup of automobile production.

**Cincinnati**—Up 4 points to 96 per cent, with 23 open hearths active.

Magnaflux Corp., Chicago, has removed its main office and laboratory from 333 North Michigan avenue to 605 West Washington street.

## District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended		Same week	
	Jan. 9	Change	1936	1935
Pittsburgh ...	80	+ 3	40	27
Chicago .....	77	None	51 $\frac{1}{2}$	49
Eastern Pa. ...	53	+ 1	35 $\frac{1}{2}$	26
Youngstown...	76	- 2	62	56
Wheeling ....	94	+ 2	68	84
Cleveland ...	80	+ 3	60	82
Buffalo .....	84	None	50	39
Birmingham..	76	+ 2	41	33 $\frac{1}{2}$
New England	85	+10	83	68
Detroit .....	95	- 5	88	59
Colorado .....	88	†	†	†
Cincinnati ..	96	+ 4	†	†
Average....	79 $\frac{1}{2}$	+ $\frac{1}{2}$	51 $\frac{1}{2}$	45 $\frac{1}{2}$

†Not reported.

## Canada Makes Gains In Steel, Pig Iron, Autos

Steel ingot and casting production in Canada in November was 98,534 gross tons compared with 98,330 tons in October, and 94,074 tons in November, 1936. For 11 months output was 1,010,598 tons compared with 836,794 tons in the period last year.

Pig iron production in November was the highest in six years at 74,337 tons, compared with 70,051 tons in October and 64,562 tons in November, 1935. For 11 months output was 610,173, against 529,147 in 11 months in 1935. Ferroalloy production in November was 5950 tons; in October, 5253 tons. For 11

months the total was 67,290 tons; in 11 months last year, 52,213 tons.

Canadian automobile factories produced 10,812 units in November doubling October's output of 5361 units.

## New Forged-Seamless Mill Will Double Tube Plant

Standard Tube Co. is doubling capacity of its Oakland avenue, Detroit, plant by addition of 50,000 square feet of floor space to house a forged-seamless tube mill. During fourth quarter, 1936, its shipments were nearly three times those of fourth quarter, 1935. For the entire year they were 80 per cent above those of 1935.

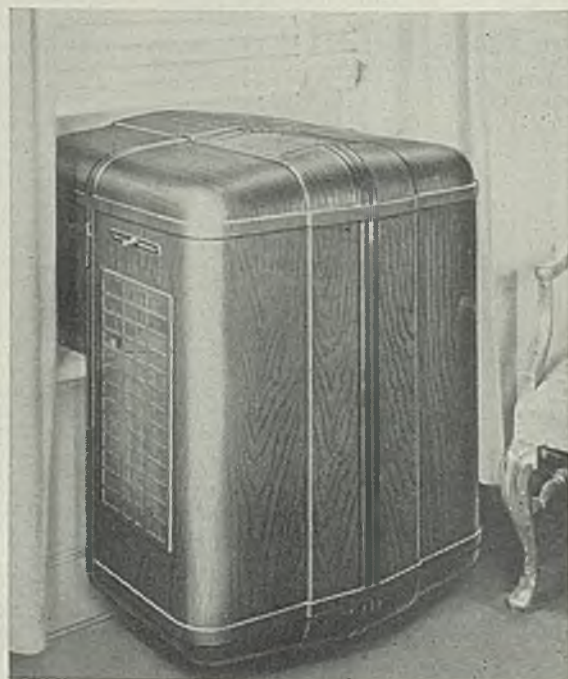
The new mill will be ready about Feb. 1, according to George B. Storer, president.

"The process we will use represents a great technical advancement in seamless tube manufacture," said Mr. Storer. "It is comparatively new, less than a dozen mills in the world being equipped to make tubes by this process. It is based on recent European patents and the finest and most modern tube mills in England, Russia, Poland, Germany, France, Japan, and Australia have been completed in recent years under these patents.

"With completion of the new mill, we will be the only manufacturer in the United States producing all types of steel tubing, forged-seamless, welded and butted. We estimate that commissioning of the new mill will add several hundred workers to our payrolls."

## Plug In—Your Room Is Air Conditioned, with This Steel Unit

*WITH welded steel framework and steel cabinet, this new Westinghouse Electric & Mfg. Co.'s new room cooler may be installed in less than 25 minutes. It is necessary only to open the window of a room about half way, rest the unit on the sill and plug the cord into the wall socket. Heat absorption is claimed equal to that of a half ton of ice every day. Internal features include a compressor and motor cooled by refrigerant lines around the shell, and air filters*



# Steel Exports Are Best Since 1929-30

EXPORTS of manufactured steel and iron products from the United States in November attained the highest mark since August, 1930, except for October, 1936, according to the metals and minerals division

## FOREIGN TRADE OF UNITED STATES IN IRON AND STEEL

	Gross Tons		Gross Tons	
	1936	1935	1936	1935
	Imports	Exports	Imports	Exports
Jan....	50,489	241,564	22,695	262,740
Feb....	43,358	213,802	28,905	228,657
March...	56,720	264,337	21,470	323,017
April...	49,621	301,987	28,866	205,341
May....	59,391	314,950	47,719	286,599
June....	59,910	294,951	33,208	286,333
July....	47,940	296,738	31,894	296,782
Aug....	60,697	295,341	32,312	247,312
Sept....	59,993	235,571	53,158	244,367
Oct....	64,509	261,882	59,473	238,350
Nov....	61,970	203,297	56,637	204,838
11 mo...	614,254	2,923,502	416,337	2,824,336
Dec....			53,678	239,269
Total...			470,015	3,063,605

of the department of commerce. They were also the highest for any November since 1929. Total exports of manufactured steel and iron products in November were 127,255 gross tons, compared with 94,696 tons in November, 1935. Compared with the 136,525 tons exported in October, 1936, there was a loss of 7.7 per cent in quantity.

Total exports for November, including scrap, were 203,297 tons, compared with 261,882 tons in October and 204,838 tons in November, 1935. The loss of 58,505 tons from

## ORIGIN OF NOVEMBER IMPORTS

	Gross Tons			
	Iron ore	Pig iron	Man-ganese ore	Ferro-ganese
Norway....	7,018	129		2,845
Sweden....	28,481			
United Kingd.	6			
Canada....	60	648		
Cuba....	54,500		3,250	
Chile....	107,700			
Algeria and Tunis	6,250			
Mexico....	357			
Netherlands		4,147		1,242
U. S. S. R.		2,953	11,748	
British India		2,738	6,423	
Brazil....			7,313	
Gold Coast			8,049	
France....				103
Italy....				21
Japan....				57
Poland....				416
Total....	204,372	10,615	36,783	4,684

	Gross Tons			
	Sheets, skelp and sawplate	Structural steel bars	Steel bars	Hoops and bands
Belgium....	497	4,543	2,566	1,579
France....	16	1,198	529	727
Germany....	1,060	9	48	38
United Kingd.	4	49	99	
Japan....	3			
Czechoslovakia		18	2	20
Sweden....			451	1
Austria....			10	
Total....	1,580	5,817	3,705	2,365

October to November is made up largely by the decline of 49,315 tons in scrap exports, which dropped from 125,357 tons in October to 76,042 tons in November. Scrap exports in November, 1935, were 110,142 tons.

November exports also showed smaller tonnages of steel plates, shapes and barbed wire and gains in black sheets and casing and oil line pipe.

For 11 months exports of manufactured steel totaled 1,091,497 tons in 1936, compared with 868,757 tons in the corresponding period of 1935. Scrap exports for 11 months of 1936 were 1,832,005 tons; in 1935 they were 1,955,579 tons. Total exports for 11 months were 2,923,502 tons, compared with 2,824,336 tons for the same period of 1935.

Imports of steel in November were 61,970 gross tons, compared with 64,509 tons in October and with 56,637 tons in November, 1935. Manufactured products imported increased from 45,977 tons in October to 49,466 tons in November. In November, 1935, they were 41,245 tons. Scrap imports declined from 18,532 tons in October to 12,504 tons in November.

Cumulative imports for 11 months of 1936 totaled 614,254 tons, compared with 416,337 tons in the cor-

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

Articles	Gross Tons			
	Nov. 1936	Oct. 1936	Jan. thru Nov. '36	Nov. '36
Pig iron.....	10,615	7,264	156,486	
Sponge iron.....	305	181	1,895	
Ferromanganese (1)	4,684	3,914	26,721	
Spiegelisen.....	12,819	4,532	48,158	
Ferrosilicon (2)	15	10	46	
Ferrosilicon (3)	23	6	476	
Other ferroalloys (4)			526	
Steel ingots, blooms		4	83	
Billets (5)	173	107	895	
Concrete reinf. bars	101	151	3,515	
Hollow bar, drill steel	38	169	1,805	
Bars, solid, hollow	3,705	4,342	36,936	
Iron slabs.....	14		14	
Iron bars.....	175	165	1,347	
Wire rods.....	1,222	1,924	17,525	
Boiler, other plate		45	421	
Sheets, skelp, saw pl.	1,580	2,503	21,120	
Die blocks, blanks	3	16	177	
Tin plate, taggers',terne plate	7	36	188	
Structural shapes	5,817	6,817	53,769	
Sheet piling.....	183	132	2,512	
Rails, fastenings	338	595	7,170	
Cast iron pipe, ftgs.	127	199	703	
Mall. iron pipe, ftgs.	1	36	167	
Welded pipe.....	67	354	5,170	
Other pipe.....	2,902	5,549	27,936	
Cotton ties.....	10	41	1,680	
Hoops, bands.....	2,365	2,225	22,345	
Barbed wire.....	480	1,289	13,708	
Round iron, steel wire	437	329	4,545	
Tele. and tel. wire	1	1	38	
Flat wire, strips	214	218	2,597	
Wire rope, strand	171	268	2,241	
Other wire.....	49	381	1,783	
Nails, tacks, staples	531	1,997	20,248	
Bolts, nuts, rivets	68	12	493	
Horse, mule shoes	5	60	365	
Cast'gs and forgings	221	105	1,275	
Total gross tons	49,466	45,977	486,079	
Iron and steel scrap	12,504	18,532	128,175	
GRAND TOTAL	61,970	64,509	614,254	

(1) Manganese content; (2) chrome content; (3) silicon content; (4) alloy content; (5) new classes. No comparable figures for previous year.

responding period of 1935. Imports of manufactured steel products for the same periods were 486,079 tons in 1936 and 362,574 tons in 1935.

December imports of iron ore were 204,372 tons, compared with 193,170 tons in October. Manganese ore increased from 34,994 tons in October to 36,783 in November.

## UNITED STATES EXPORTS OF IRON AND STEEL PRODUCTS

Articles	Gross Tons		
	Nov. 1936	Oct. 1936	Jan. thru Nov. '36
Pig iron.....	286	246	2,225
*Other ferroalloys	107	40	2,104
Ingots, blooms, etc.	2,773	2,770	19,041
Bars, iron.....	52	53	956
†Bars, concrete	135	133	2,871
†Bars, other steel	4,253	5,485	46,283
Wire rods.....	3,493	2,775	33,405
Boiler plate.....	360	438	3,373
Other pl., not fab.	10,894	13,141	70,408
Skelp.....	16,549	16,003	65,789
Iron sheets, galv.	159	138	1,509
Steel sheets, galv.	6,932	7,789	55,205
Steel sheets, blk.	17,347	13,132	129,668
Iron sheets, black	704	350	6,654
Strip, cold-rolled	1,848	2,062	20,836
Strip, hot-rolled	4,158	3,338	35,855
Tin plate and taggers' tin	20,577	19,396	211,223
Terne plate.....	256	208	2,992
Tanks, exc. lined	908	1,727	49,780
Shapes, not fab.	4,968	7,418	54,802
Shapes, fab.	2,047	8,307	23,201
Plates fabricated	228	341	3,159
Metal lath.....	95	63	846
Frames, sashes	71	57	743
†Sheet piling.....	92	734	2,775
†Rails, 60 lb.	7,148	7,238	63,215
†Rails, und. 60 lb.	233	237	5,405
Rail fastenings	720	740	7,193
Switches, frogs, etc.	70	252	1,663
Railroad spikes	195	260	2,268
R. R. bolts, nuts	59	130	749
Boiler tubes, smls.	725	1,061	6,360
Do., welded	1	33	411
Casing and oil-line pipe, smls.	4,239	2,884	21,090
Do, welded	286	475	2,636
Seamless blk. pipe, other than casg.	428	324	3,479
Mall. iron scrwd. pipe fittings	288	473	3,277
Cast iron do.	159	183	1,872
Cast iron pres. do.	1,367	525	10,107
Cast iron soil do.	478	762	5,527
Welded steel pipe	962	725	9,610
Welded wrought iron pipe	97	527	2,331
Welded galv. steel pipe	969	758	8,205
Welded wrought iron pipe	59	52	1,193
Riveted iron or steel pipe & ftgs.	75	145	1,007
Iron or steel wire	2,118	2,488	22,617
Galvanized wire	1,517	2,317	19,352
Barbed wire	2,237	3,248	29,273
Woven wire fencg.	247	143	2,229
Do. screen	104	85	1,011
Wire rope	246	240	2,964
Other wire & mfrs.	363	526	4,427
Wire nails	337	728	6,909
Horseshoe nails	70	74	658
Tacks	17	28	294
Other nails, staples	138	144	1,964
Bolts, etc.	598	713	6,030
Iron castings	402	545	6,330
Steel castings	161	358	2,974
Car wheels, axles	661	539	7,147
Horseshoes, calks	2	4	118
Iron and steel forgings, n.e.s.	175	310	3,446
Total gross tons	127,255	136,525	1,091,497
Iron & steel scrap	69,113	119,568	1,778,685
Tin plate scrap	780	1,274	13,827
Waste-waste tin pl.	6,149	4,515	39,493
Total, scrap	76,042	125,357	1,832,005
GRAND TOTAL	203,297	261,882	2,923,502

\*New class. No comparable figures for previous year.  
†New class. Previously included under former classification "steel bars."  
‡New class. Includes alloy, nonalloy and stainless steel bars (excepting concrete reinforcement bars).  
§New class. Previously included with "frames and sashes."  
¶Previously shown at "50 pounds."

# Activities of Steel Users and Makers

**ALLIS-CHALMERS MFG. CO.**, Milwaukee, is operating its subsidiary company, Condit Electric Mfg. Corp., Boston, as a company unit, to be known as Allis-Chalmers Mfg. Co.—Condit Works. The plant will continue to specialize in the manufacture of switchgear products as a division of the electrical department under R. S. Flesheim, manager. The personnel, with headquarters at Hyde Park is as follows:

George A. Burnham, assistant manager of the electrical department, in charge of sales and engineering of the switchgear division; W. S. Edsall, manager of sales, switchgear division; H. V. Nye, engineer in charge of the switchgear division, with headquarters at Milwaukee.

The works organization will be under the direction of Frank W. Young, works manager, and Richard Bechtner, assistant works manager, reporting to William Watson, vice president at Milwaukee. R. H. Closson will continue as production supervisor.

Wheelco Instruments Co., Chicago, has opened a Detroit office at 5432 Cass avenue, with James A. Harrison, engineer, in charge as district manager.

Sherman-Manson Mfg. Co., 620 South Kolmar avenue, Chicago, is preparing to produce a line of tables, desks, typewriter stands, end tables, and other products, all to be made mainly from pressed steel sheet and tubular steel.

Crawford Oven Co., New Haven, Conn., has become a part of the American Machine & Foundry Co., New York, and will be known as the Crawford Oven division. No changes in personnel have been made, and the division will continue to service all existing installations.

Worthington Co. Inc., with offices in Seattle, San Francisco, Los Angeles and El Paso, Tex., has been absorbed by its parent organization, Worthington Pump & Machinery Corp., Harrison, N. J. Worthington also absorbed the Carbondale Machine Corp., another subsidiary.

Firth-Sterling Steel Co., McKeesport, Pa., will have in operation early this year its new plant at McKeesport devoted entirely to the production of carbide and carbide tools. L. Gerald Firth, president, says 1936 demand for increased production in all lines of manufacture has been reflected in the largest tool steel volume since 1929 and

the outlook for an even greater increase for this industry during 1937 is in evidence.

McQuay-Norris Mfg. Co. of Indiana has been dissolved and the company will operate as a division of the McQuay-Norris Mfg. Co., St. Louis. It will be known as the McQuay-Norris Mfg. Co.—Connersville division, Connersville, Ind. No change in operations or personnel will be made.

Foote Bros. Gear & Machine Corp., Chicago, has completed a new addition to its plant, which adds 5300 square feet of floor space to the assembling and testing departments. The company recently was awarded contract for operating machinery for segmental valves and lock gates for the Chickamauga and Tuntersville locks on the Tennessee river by the Tennessee Valley Authority.

Central Steel Tubing Co., Clinton, Iowa, manufacturer of cold finished steel tubing, has under construction a complete new plating plant expected to be ready for operations before the end of January. With this improvement, the company will be in a position to market ground and polished steel tubing, bent, fabricated and plated, to manufacturers who desire to purchase their requirements of tubing in a condition ready for assembling.

# Meetings

SEVERAL papers of interest to the metalworking industry are to be presented at the annual meeting of the Society of Automotive Engineers, Book-Cadillac hotel, Detroit, Jan. 11-15.

At an aircraft session afternoon of Jan. 14, G. O. Hognlund, Aluminum Co. of America, New Kensington, Pa., will speak on "Spot and Seam Welding the Aluminum Alloys." J. B. Johnson, army air corps, Wright Field, Dayton, O., will read a paper, "Aircraft Engine Materials," at the aircraft engine session, morning of Jan. 15.

Papers scheduled for presentation at the production session on the evening of Jan. 15 are "Developments in Close Machining Practice in Automotive Production," by Fred Pyper, Buick Motor Co., Flint, Mich., and "Budgeting Expense and Cost of Handling Materials in Automotive Plants," by George Miller, budget supervisor, Chrysler and Chrysler-Kercheval plants, Chrysler Corp., Detroit.

Dr. Hugo Eckener, famous German airship designer-operator-skipper, is to be the principal speaker at the dinner on Jan. 14.

## JORDAN TO ADDRESS MINING AND METALLURGICAL SOCIETY

Virgil Jordan, president, National Industrial Conference board, New

## Cars on Cars for 3000-Mile Cross-Country Journey



**I**N RAILWAY parlance this freight shipment is a triple-car load; origin, Wilmington, Del., destination, Oakland, Cal. But to the Key System, California, it is the first to be completed and shipped of 88 new 2-car articulated units that will go into service across San Francisco-Oakland bay bridge. It is one of 63 units being built for Key System by Bethlehem Steel Co., Harlan plant, Wilmington. For the 3000-mile shipment the cars are mounted by special means, rather than merely loaded, on three flat cars

York, will be the principal speaker at the annual meeting and dinner of the Mining and Metallurgical Society of America to be held Jan. 12 at the Engineers' club, New York. "The Industrial Outlook and Its Relation to the Mining Industry" will be his subject. Percy E. Barbour, 90 Broad street, New York, is secretary of the society.

♦ ♦ ♦  
**STEEL MEN TO BE GUESTS  
AT SCRAP INSTITUTE BANQUET**

Benjamin F. Fairless, president Carnegie-Illinois Steel Corp., will be among the guests of honor at the formal banquet at the ninth annual convention of the Institute of Scrap Iron & Steel, Netherland Plaza hotel, Cincinnati, Jan. 15. Other guests who will participate include Maurice Pollak, president, Pollak Steel Co., Cincinnati, and W. W. MacMillen, purchasing agent, National Malleable & Steel Castings Co., Cleveland.

♦ ♦ ♦  
**FOUNDRY EQUIPMENT MAKERS  
TO MEET IN CLEVELAND**

Foundry Equipment Manufacturers' association will conduct its annual meeting at Cleveland hotel, Cleveland, Feb. 2. The program calls for the election of new directors and officers, committee reports and discussion of problems common to the industry.

Four standing committees will submit reports on credit interchange, finance, statistics and membership. The field of customer relations and service will be carefully explored and attention will be given to methods for increasing sales without substantially increasing the ratio of sales expense. Another topic scheduled is "What you have a right to expect from your trade association."

Nonmembers of the association are invited to attend.

Arthur J. Tuscany, 632 Penton building, Cleveland, is secretary of the association.

♦ ♦ ♦  
**BIG INCREASE IN EXHIBITS  
FOR MILWAUKEE FOUNDRY**

American Foundrymen's association, Chicago, announces that applications for space in the foundry show to be held in the Milwaukee Auditorium, Milwaukee, May 3-7, were over 100 per cent greater on Dec. 29 than at the corresponding time a year ago. Many of the applications came from companies which did not exhibit in 1936. Better business conditions and choice of Milwaukee as the exhibit city are among the reasons cited for the increase. The show was last held in this city in 1924.

Present indications are that the show will be the largest from standpoint of number of exhibitors that

has been held in several years, larger even than last year's event in Detroit. Plans for technical sessions and papers for the forty-first annual convention, to be held concurrent with the show, are nearing completion. A Milwaukee convention committee is being organized with W. F. Bornfleth, Cutler-Hammer Inc., as general chairman.

♦ ♦ ♦  
**HOLD ANNUAL CONFERENCE  
DEALING WITH COAL BURNING**

Fuel engineers and sales executives of companies affiliated with Appalachian Coals Inc., Cincinnati, were to meet in that city Jan. 11 for the seventeenth engineers' meeting sponsored by the company's fuel engineering division. Papers scheduled for presentation were to cover: What is coal? grindability, fusibility of ash, and burning problems in industrial kilns.

♦ ♦ ♦  
**TO HOLD DEL MONTE STEEL  
CONFERENCE NEXT MONTH**

The thirteenth annual conference of the Iron, Steel and Allied Industries of California will be held at Del Monte, Calif., Feb. 11-13. Charles H. Knight, director industrial department, California State chamber of commerce, San Francisco, is secretary.

## "Scab" 8 Feet Thick Blasted Off Inner Lining while Furnace Is Operating

THE removal of a "scab" or fused deposit 8 feet thick and 12 to 15 feet long from the inner lining of a blast furnace by blasting with dynamite—probably the first time this was ever attempted—was successfully accomplished recently at the Sloss Sheffield Steel & Iron Co. plant, North Birmingham, Ala.

The scab was removed while the furnace was in operation.

Holes 3 inches in diameter spaced 4 feet apart, in rows which were 4 feet apart, were first burned through the steel jacket. To permit plugging the holes, short lengths of 3-inch threaded pipe were electrically welded to the jacket. Holes 5 feet deep were then drilled through the brick lining into the scab.

It was found that raveling of the holes could be prevented by tamping them with moistened clay. After tamping with the clay a 1-inch pipe was forced into the hole and withdrawn, giving a good hole for the insertion of the cartridge.

Each explosive charge consisted

## President Satisfied Navy Will Get Steel

At his press conference last Friday President Roosevelt was asked concerning the lack of bids for steel and other materials for two battle-ships. In a recent opening on 8784 tons of steel, bids covered only about 25 per cent of the requirements (STEEL, Dec. 28, page 20) and navy officials attributed this to the Walsh-Healey act. The President merely replied that he does not anticipate trouble in getting sufficient steel for the navy.

## Otis Raises Bond Issue

Otis Steel Co., Cleveland, filed an amendment with the SEC increasing the amount of its proposed bond issue to \$15,000,000 and extending the maturity date to Jan. 15, 1962. The original statement covered \$13,000,000 of 4½ per cent first mortgage sinking fund bonds, series A, with a due date of June 15, 1956. The interest rate on the amended statement remains unchanged.

Harter Corp., Sturgess, Mich., is starting to manufacture a new line of steel office chairs.

of two or three cartridges, primed with an electric blasting cap. The charge was put into a 1-inch pipe, with a small hole burned near one end. Wires of the blasting cap were pulled through this hole so that pressure could be applied to the end of the pipe when placing it in the bore hole.

As the furnace was hot, the charge had to be fired as quickly as possible. For this reason the connections were made before the charge was placed in the hole. One man placed the charge and another stood back with the blasting battery and leading wire ready to touch off the shot. When the charge was placed in the hole a handful of mud was dabbed over it and the charger ran to a safe place while the man at the blasting battery touched off the shot.

No damage was done to the furnace, beyond the drill holes in jacket and lining.

The work was done under the direction of a field man of E. I. du Pont de Nemours & Co.

# Men of Industry

**N**D. DEVLIN has been named vice president in charge of operations by directors of the Rotary Electric Steel Co. (Michigan), Detroit, in recognition of his services as general superintendent the past two years. Before his connection with Rotary organization, Mr. Devlin was with Timken Steel & Tube Co., Canton, O.; Central Alloy Steel Corp. and the former Carnegie Steel Co.

Arthur L. Collins has been appointed assistant sales manager, Horace T. Potts Co., Philadelphia. A graduate of Stevens Institute of Technology in 1914, he entered the Potts organization in 1922. For the past ten years he has been manager, tool and alloy steels division. He served as president, and also for five years as secretary-treasurer of the Philadelphia chapter, American Society for Metals, and has been a frequent lecturer before technical groups.

Allan W. Ainsworth, who is succeeding Mr. Collins, is a graduate chemical engineer and has been in the Potts company's tool and alloy steel division since 1927.

C. C. Canfield, manager for 34 years of the marine business of Pickands, Mather & Co., Cleveland, retired Jan. 1. He will leave early this month for Florida, returning in the spring to spend most of his time on his farm at Wakeman, O. Mr. Canfield went with Pickands, Mather & Co. in 1902 to handle the vessel movement of coal, and in the following year became manager of the marine department. Before that he was with W. A. Hawgood in the vessel brokerage business. He will be succeeded by George S. Kendrick who has been his assistant for several years.

J. Leslie Miller has been named assistant combustion engineer, Republic Steel Corp., Cleveland. Mr. Miller, assistant chief engineer, Carnegie-Illinois Steel Corp. from 1928 to 1936 in the Youngstown district, will have his headquarters in Cleveland. A native of Wellsburg, W. Va., Mr. Miller has been employed in the steel industry since 1909. He is a member of the Association of Iron and Steel Engineers.

Tell Berna has been named general manager, National Machine Tool Builders' association, Cleveland. A graduate of Cornell university with a degree of mechanical engineer, Mr. Berna has been general sales manager, National Acme Co., Cleve-



Tell Berna

land, for the past six years, and before that was successively sales manager, Union Twist Drill Co., Athol, Mass.; G. A. Gray Co., Cincinnati; and manager of the Cincinnati office, Cutler-Hammer Inc., Milwaukee.

Mrs. Frida F. Selbert continues as secretary of the association.

Mr. Berna succeeds Herman H. Lind who was general manager of the association from 1932 through 1936 and is now executive vice president, American Institute of Bolt, Nut and Rivet Manufacturers.

Charles Grace has acquired a substantial stock interest in the Heintz Mfg. Co., metal fabricator,



Dr. E. E. Dreese

Chairman, department of electrical engineering, Ohio State university, Columbus, O., who as announced in STEEL, Jan. 4, page 436, will have principal charge of the James F. Lincoln Arc Welding Foundation, an organization established by the Lincoln Electric Co., Cleveland

Philadelphia, and has been named vice president, a newly created position, and a member of the board of directors. Mr. Grace is a son of Eugene G. Grace, president, Bethlehem Steel Co., Bethlehem, Pa., and for several years was affiliated with the Jones & Laughlin Steel Corp.

Thomas C. Williams, Niles, O., has been appointed superintendent of the Mahoning Valley Steel Co., that city. Mr. Williams formerly was superintendent of the hot mill department for more than six years, and before that was superintendent of the Thomas and Empire Steel Cos., having been in charge of the old Thomas plant for 11 years.

W. L. Martwick has been appointed general sales manager, Foster Wheeler Corp., New York. He has been with the organization since 1926, when it acquired the Aero Pulverizer Co., of which he was president. Mr. Martwick served in various divisions of Foster Wheeler, becoming manager of the steam division, from which he was advanced to his present post.

S. S. Marshall Jr., assistant general manager of manufacturing operations, Jones & Laughlin Steel Corp., Pittsburgh, has been named general manager of manufacturing operations. He has spent his entire business career with Jones & Laughlin, beginning in 1903 in the engineering department. Later he was made general superintendent of the Pittsburgh works.

T. F. Schilling has resigned as general manager, Gas Machinery Co., Cleveland, to become president of the newly organized Industrial Manufacturers Inc., with headquarters and plant at 4389 Martin avenue, Cleveland. The latter company will engage in the production of fabricated steel structures.

C. H. Wood, vice president, Ohio Seamless Tube Co., and identified with the steel industry for 42 years, has resigned. He went to Shelby, O., in August, 1901, from the Toledo, O., branch of the company where he had been superintendent. Before that he was head of the Pope Steel Co., Hartford, Conn.

William Cordes Snyder Jr., vice president, Lewis Foundry & Machine Co., subsidiary of Blaw-Knox Co., has been elected a director of the Blaw-Knox Co.

D. P. Armbruster has resigned his connection with the Bryant Heater Co., Cleveland, to become furnace engineer, Gas Machinery Co., Cleveland.

David T. Croxton, associated with the pig iron industry for many

years, has retired from active connection with the Cleveland-Cliffs Iron Co., Cleveland. When the Cleveland Furnace Co. was organized in 1902, Mr. Croxton was made general manager and later served as president, until it was acquired by Otis Steel Co. in 1919. Since then he has been in charge of pig iron sales for Cleveland-Cliffs. After a South American trip Mr. Croxton will return to Cleveland.

Eugene L. Ripple, formerly identified with the Dover, O., office of the Greer Steel Co., has been promoted to district representative at Chicago. He succeeds Cleveland Morse who has become affiliated with Standard Steel & Wire Corp., Chicago.

Edward A. France Jr., editorial representative at Pittsburgh for STEEL, and other publications of the Penton Publishing Co., Cleveland, for the past five years, resigned Jan. 1 to become associated with the Standard Statistics Co., New York, as a field analyst. His headquarters will be at 1032 Union Trust building, Cleveland. He was graduated from the Wharton School of Finance and Commerce, University of Pennsylvania in 1929 and since then has been continuously employed by the Penton company in an editorial capacity in the Pittsburgh and Detroit districts.

Donald R. James, associate editor at Cleveland, has been named resident editor at Pittsburgh, succeeding Mr. France.

L. W. Harston has been elected vice president in charge of sales, Steel & Tubes Inc., subsidiary of Republic Steel Corp., Cleveland. Mr. Harston, who has been manager of sales for the company's mechanical tube division, became associated with Steel & Tubes 20 years ago.

J. A. Ireland has been appointed manager of sales for the mechanical tube division, and J. J. I. Jamieson has been named district sales manager for the central district.

Rudolph Furrer has rejoined the A. O. Smith Corp., Milwaukee, which he served as chief engineer and director of research from 1927 to 1932. After leaving the Smith company he was assistant to the vice presidents, National Tube Co., Pittsburgh, until several months ago, when he accepted appointment as industrial engineer of the manufacturing department, Allis-Chalmers Co., Milwaukee.

Russell T. Kernoll has been appointed chief engineer of welded fabrication, Edge Moor Iron Works, New York. He formerly was a member of the engineering department, M. W. Kellogg Co., Jersey



Henry H. Erkelenz

Who, as noted in STEEL, Nov. 16, page 28, has been appointed manager of engineering and works, Harnischfeger Corp., Milwaukee. Mr. Erkelenz has been associated with Harnischfeger 25 years

City, N. J., and was associated with Struthers-Wells Co., Warren, Pa., in executive and engineering capacities.

## Died:

J. F. MAX PATITZ, 70, chief consulting engineer, Allis-Chalmers Mfg. Co., Milwaukee, in that city, Jan. 3, of heart attack. He was associated with Allis-Chalmers for more than 51 years, nearly 26 of which he served as consulting engineer. He was born in Germany and came to America as a boy, entering the old E. P. Allis Co. 51 years ago in a minor capacity, and without training in a technical school, rose to chief consulting engineer. Mr. Patitz is credited with important parts in the development of Allis-Chalmers steam turbines and gas engines. He was a member of the American Society of Mechanical Engineers since 1891 and also was



J. F. Max Patitz

a member of the Society of Automotive Engineers.

Benjamin Lewis Hirshfield, 63, a director, Blaw-Knox Co., Pittsburgh, at Verona, Pa., Jan. 2. He was one of the original directors of Blaw-Knox when it was formed in 1906. In 1909 he was made treasurer and general counsel of the company. He retired Jan. 1, 1930, but continued as a director. Mr. Hirshfield was also a director of the Washington Trust Co., National Alloy Steel Co., Union Steel Casting Co., and Pittsburgh Rolls Corp.

James Francis McCormick, 64, mechanical engineer, Standard Air Conditioning Inc., New York, at his home in New Rochelle, N. Y., Jan. 5. After his retirement in 1927 as production engineer, Consolidated Machine Tool Corp., Mr. McCormick became active in local politics. He returned to business over a year ago.

Mrs. Emma P. Smith, 73, president, George H. Smith Steel Casting Co., Milwaukee, since 1932, in that city recently. She was the widow of George H. Smith, founder of the company and its president until his death in 1912.

Joseph R. Royston, 49, who was connected with the American Nut & Bolt Fastener Co., Pittsburgh, 30 years, having served as secretary, treasurer, and director, in Bellevue, Pa., Jan. 4.

W. Lowell Robertson, 44, general manager, Robertson Steel & Iron Co., Cincinnati, in that city, Jan. 1. He also was an officer of the Hill Brown Fence Co. and other concerns headed by his father, W. F. Robertson.

Eugene Thayer, 55, a director, Chicago Pneumatic Tool Co., Bethlehem Co., Otis Elevator Co., Stewart-Warner Corp., and many other companies, in Chicago, Jan. 1.

F. Trevor Boundy, 58, treasurer, Pressed Steel Tank Co., Milwaukee, and associated with the firm 35 years, in Milwaukee, Dec. 24.

Jacob Bishop Perkins, 82, organizer, Hill Clutch Machine & Foundry Co., Cleveland, and its president until 1931, in Cleveland, Dec. 27.

Daniel Stewart, St. David, Pa., former director of Vanadium Alloy Steel Co., at Miami Beach, Fla., Dec. 29.

Henry Vogt, 80, president, Henry Vogt Machine Co., Louisville Ky., in that city, Dec. 27.

John F. Hawkrige, 76, president, Hawkrige Bros. Co., Boston, in Malden, Mass., Dec. 19.

# WHY FORD USES ONLY V-TYPE 8-CYLINDER ENGINES

FORD cars have always been built around a basic idea. The Ford became famous because it filled a fundamental need—"Dependable, economical transportation."

As roads and cars improved, Ford kept ahead. In 1932 a new fundamental step was taken—the introduction of the V-type 8-cylinder engine in a low-price car.

The V-8 engine was not new. It had been used for years. But always in large, expensive cars. Ford found the way to produce this really superb power plant in a really low-price car.

Today, more than three million owners enjoy brilliant Ford V-8 performance. Their cars are set apart from others by a fundamental principle—the V-type 8-cylinder power plant —

not merely the day's temporary and changing styles and fancies.

Eight cylinders give smoothness, performance and flexibility that a lesser number of cylinders, naturally, cannot give. And V-type is the most advanced power-plant construction — on land, water, or in the air.

Still pioneering, Ford provides for 1937 a choice of two V-type 8-cylinder engines. 85 horsepower for maximum performance. 60 horsepower (available in the five standard body types) for maximum economy. Each is built into the same big car, with the same modern features. Each will prove to you, in its own way, how much the V-8 engine contributes to make Ford the quality car in the low-price field.



F O R D M O T O R C O M P A N Y



# MIRRORS of MOTORDOM

DETROIT

**N**OT all the headaches in this city last week were hangers from New Year's celebrations. With some 20 General Motors plants, mostly outside Detroit, closed; with Ternstedt hardware division forced to suspend operations; with Briggs reported closed Thursday as a result of a "spontaneous" sit-down; with the pinch in glass supplies extending to other parts such as electrical accessories, instrument boards and others, the situation daily is becoming more critical.

But some observers look for an early settlement of difficulties. They say the industry is too large, involves too much capital and the welfare of too many employes to be throttled for any length of time. Late last week it appeared this view might be correct, as conferences between William S. Knudsen, executive vice president of GM, Gov. Frank Murphy of Michigan, federal labor department conciliators and union representatives paved the way to resumption of operations in General Motors plants. Gov. Murphy was thought by some to be acting for President Roosevelt, but this was officially denied at Washington.

## Management's Statement Applauded

Alfred P. Sloan's statement, appearing in all GM plants and in newspapers, drew much favorable comment. He seemed to have summed up the situation nicely when he declared, "The real issue is perfectly clear—will a labor organization run the plants of General Motors Corp. or will the management continue to do so . . . Have no fear that any union or any labor dictator will dominate the plants of General Motors . . . No worker need join any organization to get a job or to keep a job."

Differences between the corporation and the U.A.W. appear to center on two single points—the 40-hour week and recognition of the union as the sole bargaining agency for all employes. Without any question, the corporation will never

accede to recognition of the union as the only representative of employes. With regard to the 40-hour week, although Mr. Sloan's statement reiterated the fact that the standard work week will continue to be 40 hours with time and a half for overtime, there is some opinion that an adjustment may be made on this point. Perhaps, by the time this appears, such an adjustment may have been made.

From the standpoint of wages, the union, which actually represents possibly 15 or 20 per cent of the employes affected, has no cause for complaint. Figures announced last week by the National Industrial Conference board show that average weekly earnings of wage earners in the automobile industry in November were approximately 40 per cent higher than the average for 25 manufacturing industries. Hourly earnings were 27.1 per cent above the average. Weekly earnings averaged \$36.16, hourly earnings averaged 79.3 cents.

## Attacks the "Speed-up"

About the only real grievance which ex-preacher Homer Martin, president of the U.A.W., listed in his demands was, as he termed it, the "inhuman speedup." By this he means accelerating the speed of conveyor lines to boost car production. Formerly, when group bonus systems were offered in most automotive plants, the so-called speed-up meant more money for workers. But, due to pressure against the group bonus system in favor of a straight hourly wage, most plants have changed to the latter. Settlement of this dispute might be accomplished by including it as a plant grievance and referring the matter to local plant managers, empowered to make such adjustments as were required.

However, looking at the picture broadly, and even assuming difficulties between GM and the union are patched up, there still remains the tie-up in glass, and current supplies of all car builders, including independents, are estimated to be sufficient to last for about another

month at the outside. Foreign sources of glass are being tapped, but it is doubtful if these could meet the demands of the industry from the standpoint of quantity or quality for any sustained period.

**W**HILE both competitors and suppliers of General Motors were watching developments carefully, at the same time other carbuilders were pushing production feverishly. Ford had stepped up to 30,775 weekly, highest rate since last fall. Chrysler was running full and planning to expand even further. Hudson was holding at a rate of 4000 per week or 800 daily. Packard and Graham also were bending every effort to turn out more cars, but observers reported they probably could not hold the pace beyond Feb. 1.

Whether the union tactics in sniping at General Motors first, and in timing the trouble coincident with a peak production season were carefully planned or simply happenstance is problematical. Certainly the U.A.W. might well figure that GM would be eager to adjust differences speedily because of the competitive situation. But sober second thought indicates that on the matter of labor the industry stands together, and while it realizes that GM is more or less on the spot in this instance, the corporation is actually meeting an adversary of the entire industry—and even other industries, such as steel. Hence the outcome is eagerly awaited by these industries. In fact, throngs of motor executives gathered around office radios Wednesday afternoon to hear President Roosevelt's message on the state of the nation, on the chance he would make some reference to the government's plans or attitude with regard to the automotive industry's difficulties. But not a word did he say which could be interpreted as having any bearing on Detroit's headache.

It was even suggested by some in Detroit that if the union succeeded

# Mirrors of Motordom

in closing down General Motors, other producers might close down in sympathy—in other words, a lockout of capital. However, it is not likely any such step will be taken. In the first place, it would not be politic under present conditions; in the second place, shortages of glass and parts may force other builders to suspend anyway.

Nearly all suppliers of materials and parts have been flooded with stop-orders from General Motors. At first these orders were merely to stop shipments, but quickly instructions came to hold up both shipments and production, with no word as to when resumption might be possible. For the present, suppliers have been able to divert this business to other channels, and the effect on mill schedules probably will not be noticed for two or three weeks.

Other lines, stoves for instance, are moving at full tilt, and many of these industries were quite surprised to find that material which they had ordered for delivery some weeks hence was at their door for unloading.

A manufacturer of screw machine parts, supplying large quantities to General Motors plants, was able to keep its plant going by virtue of switching the business to other accounts—lawnmowers and rifles, to cite two.

**SIT-DOWN** strikes are the topic of the hour in Detroit today. While most of them up to now have been in plants outside the motor capitol, they are moving in, as evidenced by the trouble reported at Briggs which, incidentally, supplies bodies for Lincoln-Zephyr and Chrysler. Union officials were quick to disclaim any authorization of the "sit-down" at Briggs, and said it should not be considered as directed by the union at the Ford Motor Co. Late Friday Cadillac and LaSalle were forced to close, throwing out 4800 at the former.

An interesting story is going the rounds, concerning how one "sit-down" was settled. It seems that in a certain plant about 1000 workers had decided to sit down. Half of the crowd were men, the other half girls. As they were sitting around the plant doing nothing, the management thought it might be well to provide a little entertainment to keep up their spirits. So a dance orchestra was called in, several bar-

## 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
Nov. ....	83,482	395,059	394,890
Dec. ....	153,624	404,528	*460,000

Year .... 2,753,111 3,946,934 4,415,814  
\*Estimated.

Estimated by Cram's Reports

Week ended:

Dec. 12 .....	119,455
Dec. 19 .....	121,038
Dec. 26 .....	79,019
Jan. 2 .....	71,800
Jan. 9 .....	96,780

rels of beer were set up for dispensing, and trays heaped with sandwiches and other edibles brought in for the sit-downers. The orchestra started playing, the beer started flowing, everyone was having a fine time.

At this juncture, someone started making the rounds of the men's homes, quietly informing their wives of the party in progress. Seizing their rolling pins and brooms, the enraged wives banded together and marched on the plant. Firmly grasping their respective spouses by the ear, they directed them homeward amid a shower of choice language. The "sit-down" was over.

This may be a funny story to some, but you couldn't get a laugh from any motor executive in Detroit today with it. The affair just isn't a laughing matter.

Late last week in Cleveland four craft unions affiliated with the A. F. of L. formally demanded reopening of the Fisher Body plant there, closed by a strike of the U. A. W. This, apparently, was the first instance of open hostility between the C. I. O. and the A. F. of L. Representatives of the former were nonplussed at the action of the latter and seemed at a loss to know what to do about it. The formal demand, transmitted to the manager of the plant, contained among others this significant statement: "The policy of the American Federation of Labor is negotiation, conciliation and,

above all, to settle all disputes at the conference table while production goes on, if possible with no loss either to the workers or to the employer. The strike is a sacred weapon and only used as the last resort."

**HYP**OID gears in rear axles have been adopted by a number of the new cars and while they do permit elimination of the driveshaft tunnel in bodies, engineers are expressing some concern over the matter of proper hypoid lubrication.

By their design, the hypoid gears are subject to high tooth loads and require the use of a lubricant of the E. P. (extreme pressure) type. These lubricants are corrosive in nature, and form an oxide film on the teeth of the gears which prevents seizing of the teeth in operation. Hypoid gear lubricants are supplied by several of the oil companies, but it has been found impossible to mix two different brands, since they are built up on different bases and when two varieties are mixed there is danger of interaction with the liberation of free acid and the building up of a thick sludge.

The problem can be overcome, of course, by proper standardization of hypoid gear lubricants, and undoubtedly this will be done. This type of gear on the lower-priced cars has not been in operation long enough for any serious complaints to develop.

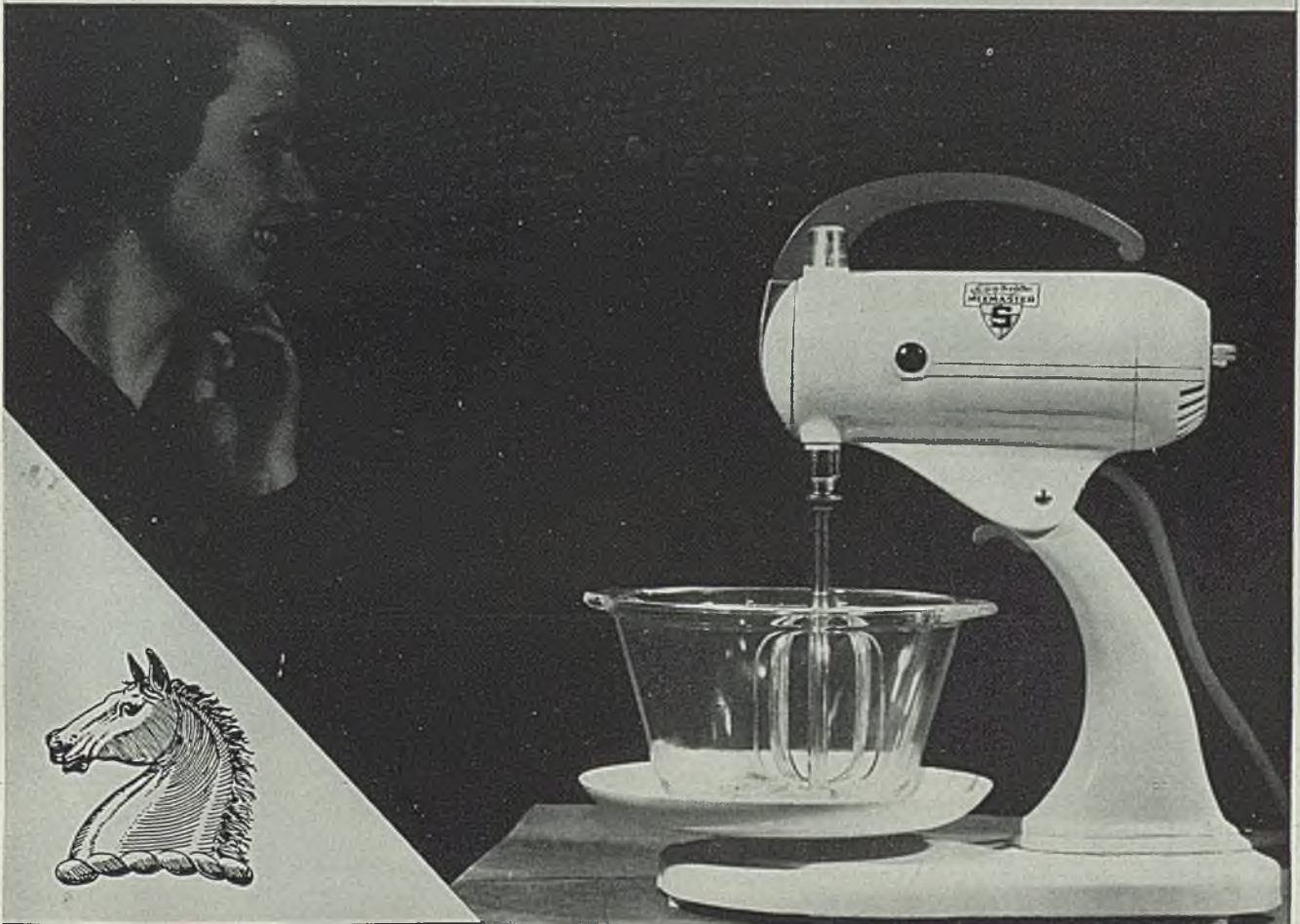
This recalls to some the epidemic of "hard starting" in new cars experienced about three years ago this winter. The difficulty was traced to the use of closer tolerances on pistons with a consequent need for a thinner oil of the 10W or 20W types now available. At that time, these thinner oils were not used, and the cold weather, thick oil and tight fitting pistons combined to make the hard starting.

**T**HE 1936 adjourned annual meeting of Hupp was held in Richmond, Va., last Thursday. H. H. Smith and A. A. Anderson were re-elected directors. Archie M. Andrews, former president of Hupp whose term as director had expired, was not re-elected. Resolution was adopted recommending to stockholders a plan for reorganization and recapitalization of the company, to permit it "to proceed with the pro-

(Please turn to Page 74)

# ZINC ALLOY DIE CASTINGS

—their place in the Major Industries



Automotive • Machinery • Household Appliance • Electrical  
Radio • Hardware • Business Machine • Small Tool • Toy

## THE MODERN TOUCH —in a Kitchen Appliance

The market for household appliances is a critical one. Appearance and mechanical perfection must unite their forces for combined sales appeal when the manufacturer takes his new appliance to market. The competitive sales factor begins at the drawing board and leans heavily on the design and selection of materials and processes—modern, economical processes such as ZINC Alloy Die Casting.

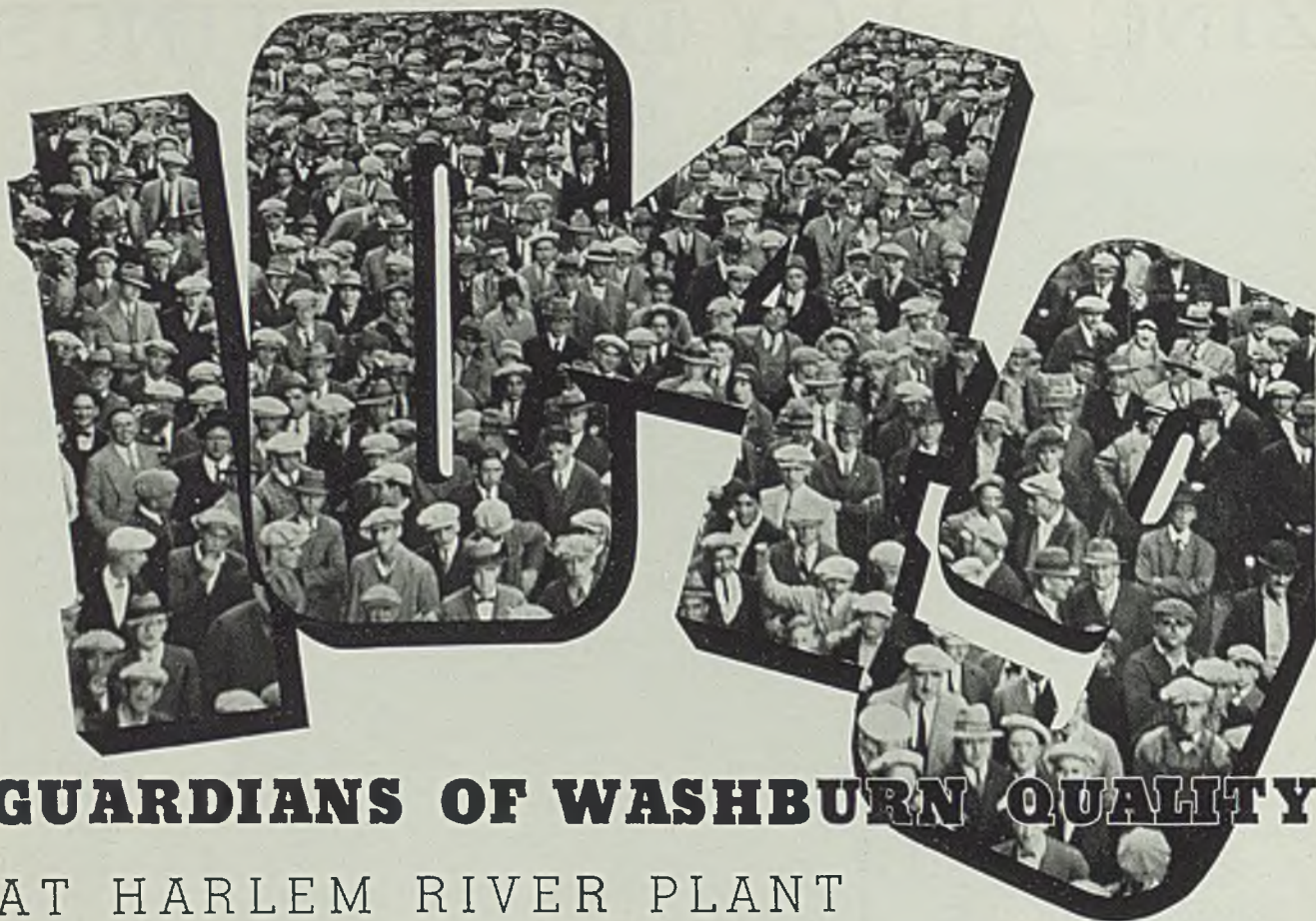
Design engineers have built up an amazing acceptance for ZINC Alloy Die Castings in the household appliance industry. Appliances such as the attractive electric kitchen mixer illustrated here owe much to

this metal and process for smart appearance and mechanical perfection. Rapid production, exceptional strength, clean cut detail, smooth finished appearance, greater economies—these are the advantages that ZINC Alloy Die Castings place in the engineer's hands.

Any commercial die caster will be glad to inform you of ZINC Alloy Die Castings and their possible application in *your* products—or write to this Company for additional information.

THE NEW JERSEY ZINC CO.  
160 Front Street New York

The Research was done, the Alloys were developed, and most Die Castings are specified with  
**HORSE HEAD SPECIAL** (<sup>99.99+%</sup> UNIFORM QUALITY) **ZINC**



## **GUARDIANS OF WASHBURN QUALITY**

AT HARLEM RIVER PLANT

**T**HE New York City plant at Harlem River and 118 Street employs over 1000 skilled steel workers, who take personal pride in their craftsmanship. Behind them is staunch New England wiremaking, rooted in a tradition nearly a century old. This army of guardians watch over your orders and hold them true to old quality standards.

Every operation in making Washburn Wire is governed by standards of accuracy as notable for their precision as for the steadfast insistence with which they are applied.

Choose well when you buy. Look for the Washburn trade-mark, a safeguard of quality. Write for samples and quotations.



WASHBURN WIRE CO., PHILLIPSDALE, R. I. WASHBURN WIRE CO., Inc., NEW YORK CITY

# W A S H B U R N

CLEAN, UNIFORM BILLETS—STRIP—RECTANGULAR, ROUND, FLAT RODS  
TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

# WINDOWS of

# WASHINGTON

**WASHINGTON**  
**C**ONGRESS is here. Both of the houses are now organized and the way is cleared for some swift and important legislation. Inasmuch, however, as congressional sessions start nearly a month later than they used to, under the recent amendment to the constitution for "lame ducks," it is not expected that the members will get away until mid-summer.

As this issue reaches the desks of its readers they will already know what the President had to say "on the state of the union" in his personal appearance before the joint session of congress and also the contents of the budget message. Well, there will be many more messages during the present session and they will each deal with more specific matters.

There is a general feeling on Capitol Hill that this is a much better way to deal with legislative questions, than under the old method of a President trying to say at the outset of a session everything that he wants in the way of legislation. That was one of those old style methods which appears to be outmoded and it is probable that in the future the new Roosevelt practice will be adopted. It is much easier both for the President and congress.

One thing is certain and that is during this present session of congress some legislation will be passed which will deal with child labor, with maximum hours of labor and minimum wages.

## HEARINGS ON FREIGHT RATE INCREASES GET UNDERWAY

Hearings were begun here last week before a division of the interstate commerce commission, under the chairmanship of Clyde B. Aitchison, a member of the commission, in connection with general freight rate increases.

These hearings are to continue until Jan. 15 when they will be adjourned to a later date. Of course, shippers appearing before the commission are arguing against any further increases, now that the

emergency surcharges have been taken off. Guesses are being made even this early in the hearings, that some of the rate increases asked will be granted but the same people were guessing a couple of weeks ago that the commission would allow a temporary extension of the surcharges. They were wrong.

Dr. Julius H. Parmelee, director of the bureau of railway economics of the Association of American Railroads, on the stand before the commission on behalf of the roads declared that because of increased prices the annual cost of materials and supplies of all kinds, including fuel, used by the railroads is now approximately \$140,865,000 more than it was in May 1933. This estimate takes into account, he said, increases in the prices of iron and steel articles which have become effective within the past month.

In this connection, he said that iron and steel products have increased 19 per cent although for certain iron and steel materials which the railroads buy in great quantities, the increase in cost compared with May, 1933, ranges from nearly 25 per cent up to 42 per cent.

## INDUSTRY'S VIEWS ON TRADE AGREEMENTS WILL BE HEARD

Owing to complaints which have been received from time to time by the state department on conditions of American industry and various trade agreements, the department has announced that in the future the committee for reciprocity information will receive presentations by industry on all aspects of the trade agreement program, whether it be with reference to agreements already in effect or new ones.

The official announcement on this subject states that "with a view to providing a convenient and effective arrangement by which interested persons may submit views or information regarding the operation of trade agreements which have already been concluded with foreign countries, or with reference

to any other aspect of the trade agreement program, it is prepared to receive presentations relating to any question which may arise in connection with that program. All of the views and information thus present will be brought to the attention of the entire interdepartmental trade agreements organization."

The statement further sets forth that hearings can be granted if necessary.

## CLARIFIES DETAIL ON WALSH-HEALEY BIDS

All kinds of interesting questions are arising almost every day in government purchasing offices concerning application of the Walsh-Healey government contract act.

In a recent case, the Northwest Motor Co., which is a local agent for the Ford Motor Co., inserted in its contract a provision that it was to be exempted from the act. As a matter of fact the amount involved was under \$10,000 and therefore the acting comptroller general, Mr. Elliott, held that the clause was meaningless and the government could go ahead and award the contract, if it was low, regardless of the exemption clause inserted in the bid.

The Northwest company inserted the following in its bid:

"It is expressly understood and agreed by the parties hereto that the manufacturer of the articles described in this contract, where the manufacturer is a corporation or a person other than the bidder herein, shall in no degree or manner be bound by the terms and conditions thereof."

Pointing out the fact that the act applies to contracts only for \$10,000 and over and that the purchase in question was under \$10,000 the acting comptroller general held:

"Where contracts awarded are not in excess of \$10,000 in amount there is no requirement that the statutory stipulations of the Walsh-Healey act be included in the contract. In such cases, the stated reservation in the bid of a dealer is superfluous and does not give the

bidder any competitive advantage over other bidders or vary the obligations of the contract from those which otherwise would have been incurred. Hence the reservation is wholly immaterial in such cases and provides no basis for the rejection of a bid otherwise acceptable."

This company has several times bid on government business recently but up to this time no contract has been awarded to it—possibly because of its attitude on the new law.

#### **QUOTA FOR TIN PLATE SCRAP EXPORTS ANNOUNCED**

Word has trickled out from the state department during the past six months that demands for exports of tin plate scrap were not sufficient even to cover the quota allowed during the period from July to January. If that was the case during the past six months, it is apparently not so now because last week in announcing the quota for the coming year, effective Jan. 1, allotments totaling 18,609 long tons were assigned to 39 producers of that commodity for export. On the other hand the department announced that applications had been received for allotments totaling 27,752 long tons, some of which had to be reduced to accord with the allotment actually made.

The department in making public its allotment last week said that applications for license to export tin plate scrap between Jan. 1 and Dec. 31, 1937, may still be submitted by any producer who has been assigned an allotment or by any person authorized by a producer to export scrap under his own allotment.

#### **DRAPER SUGGESTS REVIEW OF ANTITRUST LAWS**

Ernest G. Draper, assistant secretary of commerce, stepped out from the crowd of government officials last week with a discussion of the antitrust laws and with a suggestion that industrial interests look into the situation and see what can be done about it. In this connection it was announced that some 1800 questionnaires had been sent out to industrialists on the matter of antitrust laws. The two were tied up together. It is reported that Mr. Draper had a hand in getting out the questionnaires although they were broadcast purely as a personal matter by outside interests having nothing to do with governmental activities.

"One of the pressing problems of 1937," said Mr. Draper, "is the need for clarifying the laws affecting competition. It seems to me personally that this subject should receive the careful and sympathetic attention of all business executives

representing both small and large concerns.

"Briefly," he continued, "there is an insistent desire that the rules of business procedure be made clearer, more definite and more effective. Much of the potential benefit of industrial co-operation is blocked by fear of the antitrust laws. With nearly 50 years of judicial decisions, the best legal minds cannot interpret these laws exactly, and many of the provisions of those laws are almost completely outdated by changes in economic conditions. The average business man is lost in a maze of doubt and uncertainty. Court determination involves heavy expense, long delays and punitive publicity that is often undeserved. The decision in each instance applies only to the facts in that particular case."

#### **COMMERCE DEPARTMENT MAY BE SHEARED OF POWER**

All kinds of back-stair gossip in connection with the reorganization plans which are being made by the two committees studying the reorganization of government departments for the President and congress, respectively, are heard here.

One of the most persistent of the rumors is that officials of the department of state, including both Secretary Hull and Assistant Secretary Carr, are most anxious that the state department take over all of the foreign service activities of the department of commerce.

If this is done, and it is not beyond the realm of possibility, it would cause considerable change in the department of commerce, which for many years has been looking out for the commercial interests abroad of the American exporters.

It is pointed out in some quarters that foreign business representation could not be undertaken very well by the state department because it is so vitally interested in the diplomatic side of various questions that it would not be in any position to insist on commercial contacts, especially if pressure were brought to bear by foreign diplomats.

At this time, of course, all government officials will say is that the question of individual bureau or division changes is not being studied—just the general question of reorganization. However, department of commerce officials are very interested and anxious about the situation.

#### **BERRY AGAIN ASKS INDUSTRY TO COME TO AID OF COUNCIL**

Maj. George L. Berry again is making a desperate effort to get the business and industry of the country behind his organization, the council for industrial progress, by

trying to make industry believe that the President is following the suggestions of his organization in the labor situation. Also, that his organization is the proper channel to be used as a go-between for industry and the administration.

He has sent a letter to members of his council, which has also been broadcast to nonmembers of the organization, in an effort to get their support. The major certainly is barking up the wrong tree, for the industry of this country never will back a union president as heading up a semi-governmental organization such as his claims to be.

In his communication to industry Berry says in part:

"The council for industrial progress has offered for the past year, and continues to offer to business men, a medium through which their views may be laid before the administration, and a work shop in which they may have a part in framing the legislative program. There is no question whatsoever but that industries which co-operate in developing the legislative plans will be in the best position to secure sound and constructive laws applicable to their problems."

#### **LABOR BOARD TO RESUME STEEL HEARINGS JAN. 11**

The national labor relations board last week made its first annual report to the congress and the President. However, the report was for the fiscal year ending last June 30 and contained nothing of current interest. It merely is a resume of court and other action taken since the organization of the board. Of course, there are reviews of some of the steel cases, all of which, however, are past history.

As this is written the board is ready to go ahead on Jan. 11 with hearings on complaints against the United States Steel Corp. and the Carnegie-Illinois Steel Corp. It will be recalled that hearings were held here in this case a couple of weeks ago and adjourned until then. No one will even guess at this time just how long the hearings will continue.

#### **W. A. AYRES MADE FEDERAL TRADE COMMISSION HEAD**

William A. Ayres member of the federal trade commission since June 30, 1934 when he resigned from the house of representatives to accept appointment to the commission, has been designated chairman for the present calendar year, effective Jan. 1. This is in line with the regular procedure of the commission for rotation in office.

Mr. Ayres succeeded Mr. March who served as chairman during 1936. Mr. Ayres went to the commission after having served in the house. His home is Wichita, Kans.

# Editorial

## Steel Industry Should Profit From Experience of G. M. C.

**W**HILE few industrialists have commented publicly upon the statement issued last Tuesday to employes of General Motors Corp. by Alfred P. Sloan, Jr., president, we believe that the great majority of industrial employers agrees that in general the position stated is sound.

The most pertinent points in the statement are contained in two sections of the text. The first, outlining General Motors' conception of the real issue, reads as follows:

"Will a labor organization run the plants of General Motors Corp. or will the management continue to do so? On this issue depends the question as to whether you have to have a union card to hold a job, or whether your job will depend in the future, as it has in the past, upon your own individual merit. In other words, will you pay to a private group of labor dictators for the privilege of working, or will you have the right to work as you may desire. Wages, working conditions, honest collective bargaining, have little, if anything to do with the underlying situation. They are simply a smoke screen to cover the real objective."

The second pertinent section deals with the position of the management of General Motors:

"1. General Motors will not recognize any union as the sole bargaining agency for its workers, to the exclusion of all others. General Motors will continue to recognize, for the purpose of collective bargaining, the representatives of its workers, whether union or non-union.

"2. Work in General Motors plants will continue to depend on the ability and efficiency of the worker—not on the membership or non-membership in any labor organization whatsoever. This means that you do not have to pay tribute to anyone for the right to work.

"3. General Motors will continue to pay the highest justifiable wages in the future, as it has in the past, and just as it is doing at present. It believes in high wages. It is justly proud of its record in that respect.

"4. General Motors' standard work week will continue to be 40 hours. Time and a half will be paid for overtime.

"5. Seniority rights will be observed under the rules laid down by the Automobile Labor board appointed by the President of the United States in March, 1934. These rules are recognized as fair and just to all workers and permit no discrimination against any worker on account of any organization membership."

Taken in its entirety, the paragraph relating to the real issue is excellent. However there is one slight flaw in editing which other employers threatened

by CIO should note for future reference. Mr. Sloan and his advisors, probably under the necessity of drafting a statement on short notice, declare that the real issue is, "Will a labor organization run the plants of General Motors Corp. or will the management continue to do so?"

When read in conjunction with the remainder of the paragraph, this sentence is readily understandable. But professional labor union spokesmen were quick to see the advantage of singling out this sentence and of attacking it without its context.

Taken alone, the interrogative sentence can be discounted. Fair minded neutrals do not believe that professional labor leaders really want to "run" General Motors plants. They do not think that even the most ambitious labor executives desire to assume the responsibilities of operation borne by management.

### Steel Industry Has Breathing Spell To Plan Means To Protect Its Workers From Labor Union Tyranny

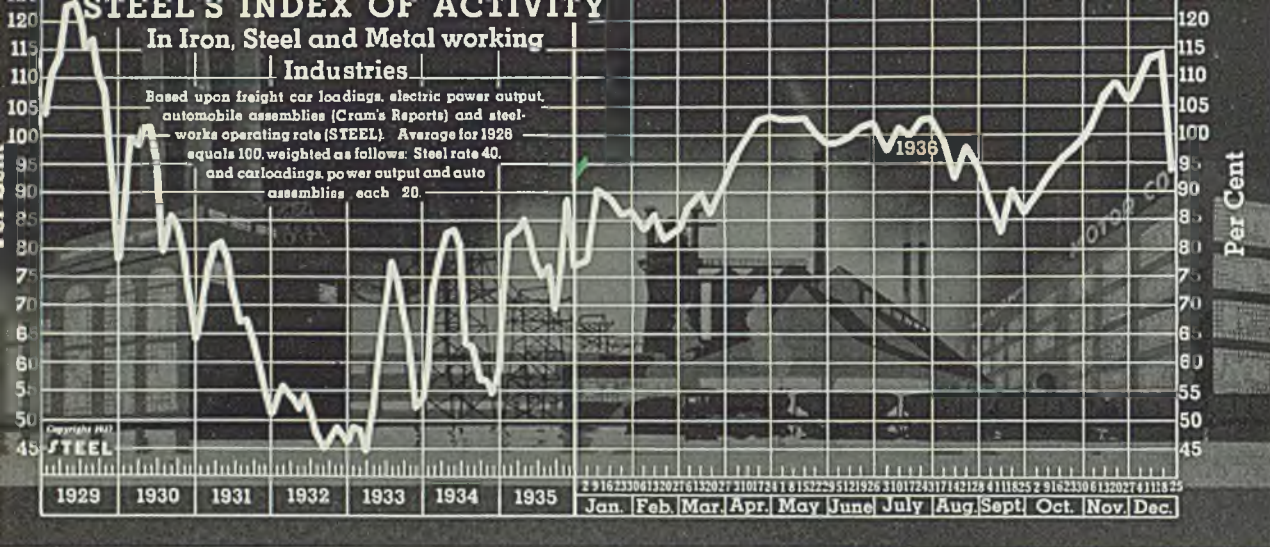
Therefore, considering the effect upon public opinion, we think that it would have been better if the sentence to read "Will a labor organization impose restrictions so drastic as to interfere with successful operation of the plants of General Motors, or will management continue to bear the responsibility of efficient operation?" This, or similar editing, would have deprived union labor spokesmen of a point which they scored in some newspapers.

Of course the most important issue involved is the one touched upon in Paragraph 1 of General Motors' statement of its position. It will not recognize any union as the "sole bargaining agency . . . to the exclusion of all others." This is fundamental, and the avidity with which junior union labor leaders sought to attack it shows that it is the key point.

Here government policy is involved. Admittedly the Roosevelt administration is committed to assisting the labor movement. Its spokesmen have been frank enough to say that they are out to help the professional unions. But even so, it is doubtful whether the President can afford to sanction a racketeering monopoly to CIO over the claims of A. F. of L., of employe representation plans, and of the millions of employes who desire no formal agency for collective bargaining.

We have a hunch that monopoly, in the long run, will be as distasteful in labor relations as it is in trade practices, and that sooner or later the President will be forced to turn a cold shoulder to the overly ambitious Mr. John Lewis.

In the meantime, the steel industry is enjoying a temporary truce while CIO is pointing its heavy guns at the citadel of motordom. We hope steel company executives are taking notes, and preparing to profit from the valuable experience of the automobile situation.



THE

STEEL'S index of activity gained 2.3 points to 95.6 in the week ending January 2:

Week ending	1936	1935	1934	1933	1932	1931	1930	1929
Nov. 21	109.9	90.9	54.4	55.4	44.5	54.8	71.0	87.8
Nov. 28	105.2	86.0	51.9	49.7	45.3	51.4	66.9	80.9
Dec. 5	108.4	91.7	56.8	52.6	46.6	52.9	69.2	85.0
Dec. 12	113.9	91.8	60.6	56.0	49.3	53.1	68.2	83.4
Dec. 19	114.8	91.9	64.4	58.0	46.9	52.3	67.3	79.7
Dec. 26	93.3	77.3	60.8	53.7	42.9	46.8	52.3	64.9
	1937	1936	1935	1934	1933	1932	1931	1930
Jan. 2	95.6*	78.2	65.4	53.6	45.3	48.8	58.5	74.3

\*Preliminary.

## Activity Index Starts 1937 20% Above Level Year Ago

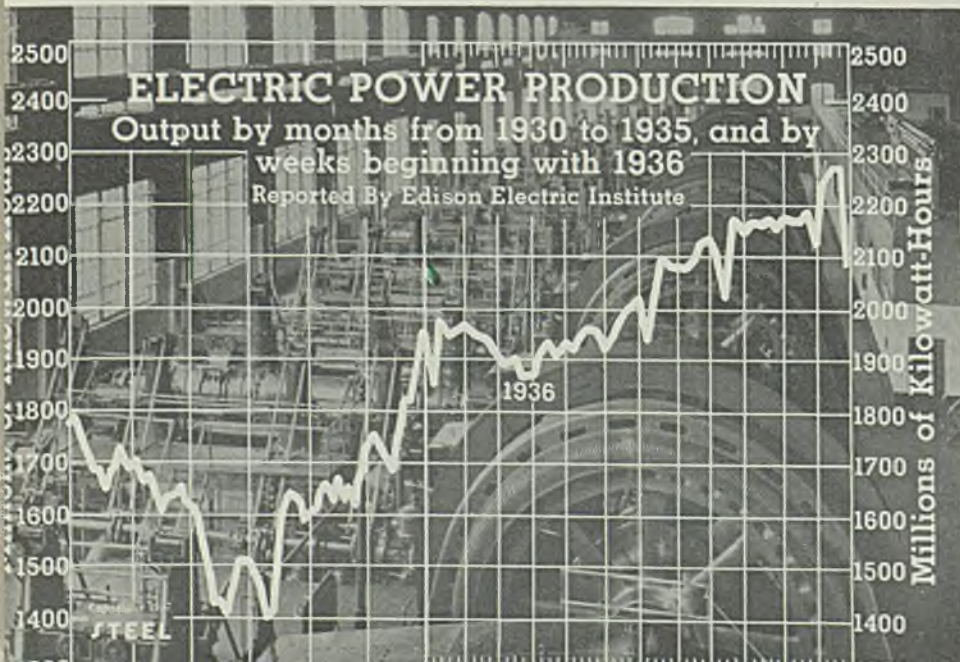
ACTIVITY in the iron, steel and metalworking industries, while confronted with the effect of labor trouble in addition to the usual interruption of the year-end holidays, enters the first week of 1937 at a rate substantially higher than that of a year ago. STEEL'S index for the week ending Jan. 2, 1937, stands at 95.6, as compared with 73.2 in the week ending Jan. 4, 1936.

This relatively good showing, in spite of the grim aspects of the labor situation, is accounted for largely by the continued high rate of steelworks operations and a steady heavy consumption of electric power. Automobile output, of course, is down sharply, and

revenue freight car loadings—always noticeably reduced by holiday interruptions—are off about 17 per cent from pre-holiday levels.

The evidence of stability in steelmaking is due to the accumulation of a comfortable backlog of orders from widely diversified consumers. When stop orders began to arrive from strike-handicapped automobile and parts companies, the mills, with a few exceptions, were able to shift part of their facilities to the task of catching up on bookings from other customers.

While the attack of CIO on General Motors conceivably can affect general industrial activity drastically if the stoppage of motor car production is prolonged, nevertheless the influence would be considerably less pronounced today than if the trouble had occurred six months or a year ago. The recent rise of activity among the capital goods industries has reduced the degree of general industry's dependence upon motordom.



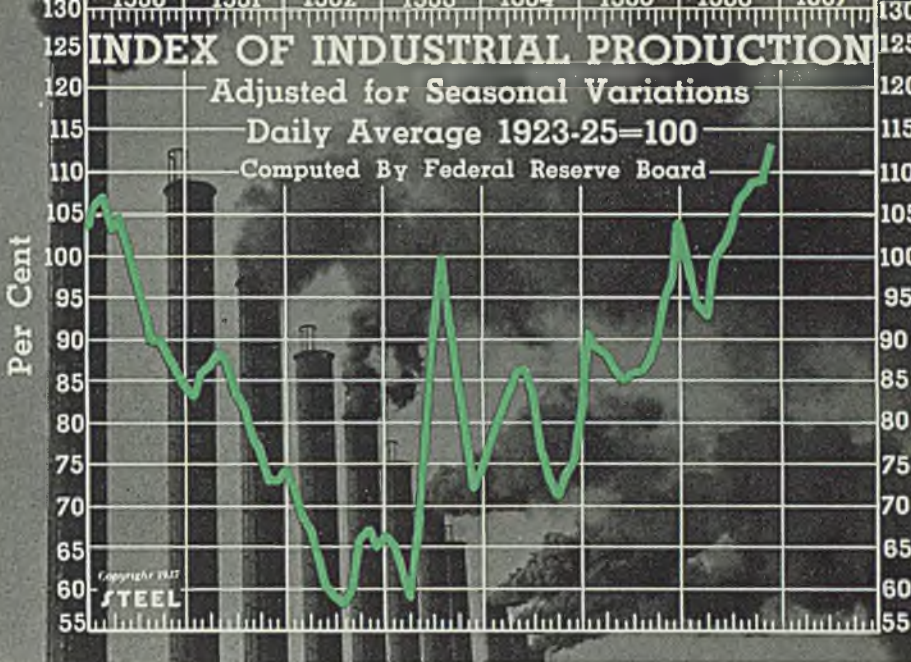
	1937	1936	1935	1934
Jan. 2	2069	1854	1668	1564
	1936	1935	1934	1933
Dec. 26	2080	1847	1650	1539
Dec. 19	2274	2002	1787	1657
Dec. 12	2278	1983	1767	1644
Dec. 5	2243	1969	1743	1619
Nov. 28	2133	1876	1683	1554
Nov. 21	2196	1953	1705	1608
Nov. 14	2169	1938	1691	1617
Nov. 7	2169	1913	1675	1617
Oct. 31	2175	1897	1669	1583
Oct. 24	2166	1895	1677	1621
Oct. 17	2170	1863	1667	1618
Oct. 10	2168	1867	1658	1656
Oct. 3	2169	1863	1659	1646



# BUSINESS TREND

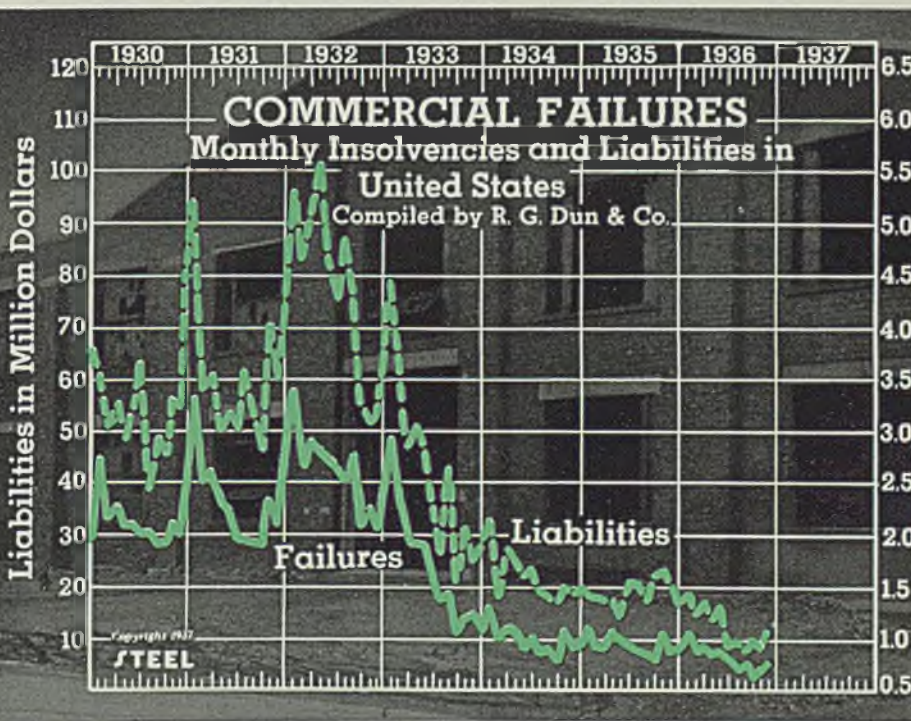
## Industrial Production Index Highest Since 1929

	1936	1935	1934	1933
January	98	91	78	65
February	94	89	81	64
March	93	88	84	60
April	100	86	85	67
May	101	85	86	77
June	103	86	84	91
July	107	86	75	100
August	108	87	73	91
September	109	89	71	84
October	109	95	73	77
November	114	98	74	73
December	104	86	75	



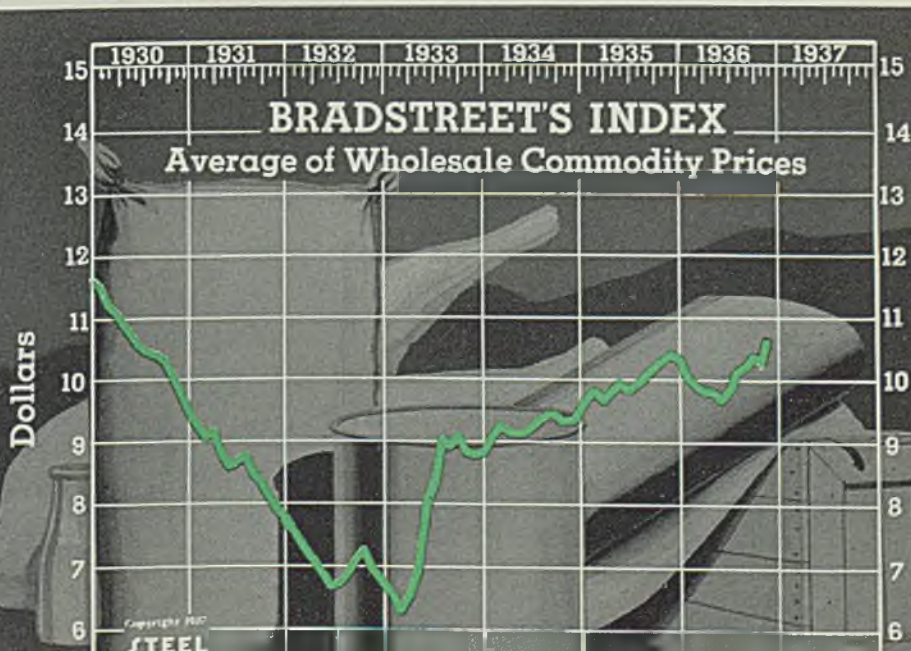
## Commercial Failures and Liabilities Gain in November

	Failures, Number		Liabilities, Dollars (000 omitted)	
	1936	1935	1936	1935
Jan.	1,077	1,146	\$18,104	\$14,603
Feb.	856	956	14,089	15,217
March	946	940	16,271	15,361
April	830	1,083	14,157	16,529
May	832	1,004	15,375	14,339
June	773	944	9,177	12,918
July	639	902	9,904	16,523
Aug.	655	884	8,271	13,266
Sept.	586	787	9,819	17,002
Oct.	611	1,056	8,266	17,185
Nov.	688	898	11,532	14,384
Dec.	....	910	....	15,686



## Bradstreet's Price Index Registers Sharp Gain

	1936	1935	1934	1933
Jan. 1	\$10.36	\$9.49	\$9.01	\$6.53
Feb. 1	10.02	9.78	9.26	6.53
Mar. 1	9.92	9.79	9.17	6.54
Apr. 1	9.85	9.66	9.16	6.98
May 1	9.81	9.79	9.14	8.02
June 1	9.73	9.90	9.24	8.34
July 1	9.85	9.84	9.32	9.01
Aug. 1	10.14	9.91	9.48	8.99
Sept. 1	10.19	10.00	9.45	9.05
Oct. 1	10.27	10.17	9.27	8.84
Nov. 1	10.22	10.28	9.29	8.81
Dec. 1	10.78	10.40	9.49	8.83



# Precision Operations Used in Making Large Roller Bearings

BY FRED B. JACOBS

**S**OLID cylindrical roller bearings, so-called because the rollers are true cylinders, are made in a number of sizes and varieties, from small units weighing only a few ounces to massive bearings of several hundred pounds. They are produced in two types, radial and thrust. Some of the more important manufacturing operations, which apply particularly to the larger sized units, are described and illustrated in this ar-

ticle which deals with the methods in use by Rollway Bearing Co. Inc., Syracuse, N. Y.

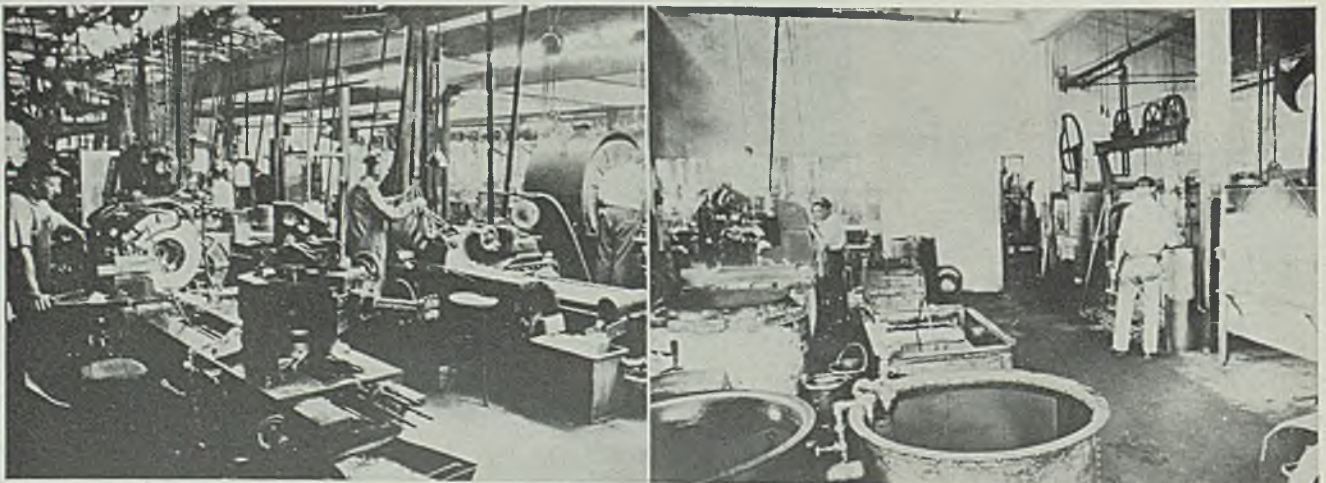
Material from which the bearings are made is a high quality chromium steel. A constant check is kept on the analysis of all steel and test pieces from all steel shipments to the factory are sent to the laboratory where they are subjected to a rigid microscopic and chemical inspection before being pronounced satisfactory for the manufacturing department. Further to eliminate errors, all parts are subjected to a minute inspection after each manufacturing operation and in this manner errors are eliminated before faulty parts pass on.

In the manufacture of compara-

tively small bearings the stock can be bar material or tubing and automatic screw machines can be used in machining outer and inner races and rollers. With the larger bearings, the components are made from ring forgings. As the large bearings cannot always be made in substantial quantities, their production necessitates the employment of highly skilled mechanics who are capable of producing accurate work when engaged in making comparatively large units.

In Fig. 1, showing a partial view of the production department in the plant, the operator at the left is machining a plate for a thrust bearing in a heavy-duty turret lathe. Outer and inner races for large ra-

**FIG. 1** (left)—Machining a plate for a thrust bearing in the production department. Fig. 2 (right)—In the heat treating department, parts are heated in gas-fired furnaces and quenched in oil



dial bearings often are turned and bored in vertical boring mills. In these initial operations it is often impossible to make use of special fixtures so that many of these large bearings are practically custom built.

Retaining rings for radial and thrust bearings are made from special alloy bronze castings and turned in a vertical turret boring mill generally, one piece having a shoulder that fits into a depression turned into the other piece to receive it. After the rollers are inserted, the two sections are electrically riveted together. Tolerances on this work can be somewhat liberal inasmuch as the function of the parts is to retain the rollers only. Retainers for thrust bearings are turned in a vertical boring mill and then the seats for the rollers are machined in a milling machine fitted with an indexing device. An outer ring slips over the outer diameter to hold the rollers in place.

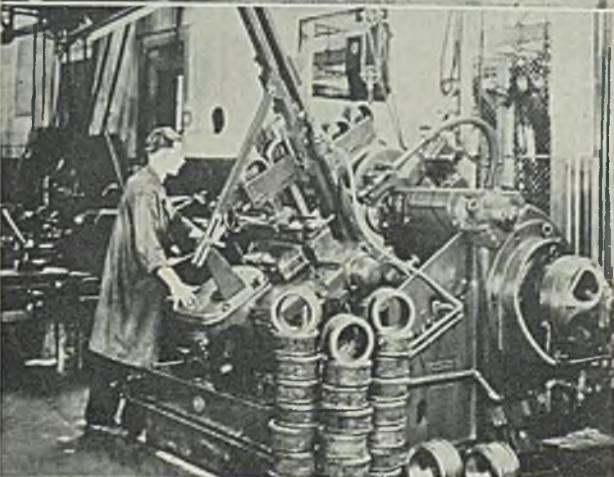
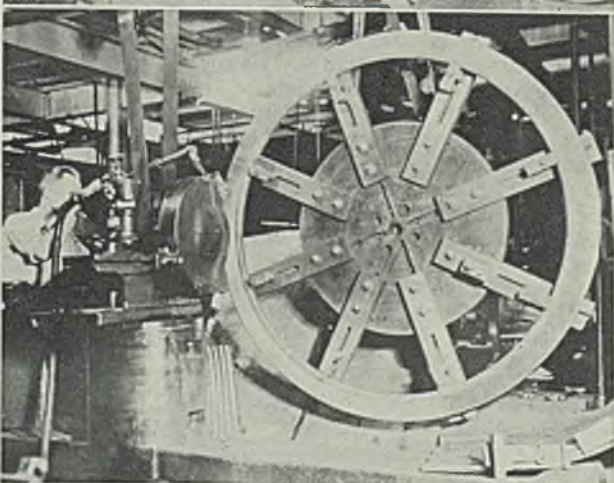
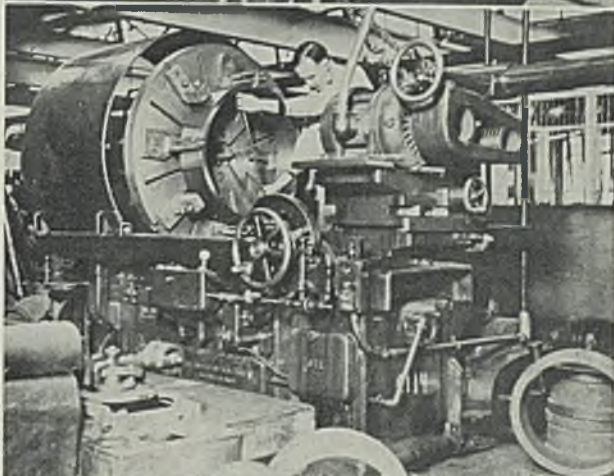
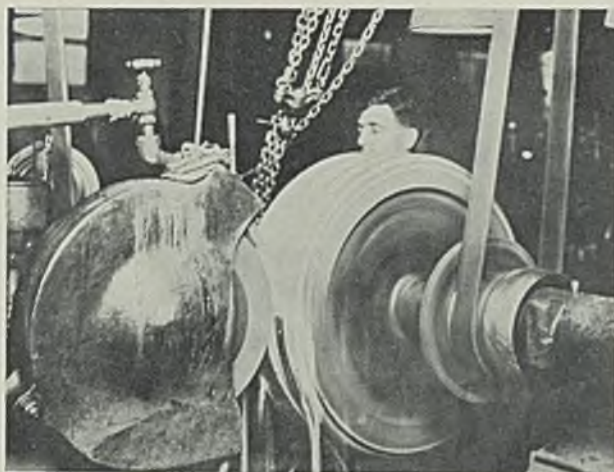
After bearings are turned they go to the heat treating department. Here the parts are heated in gas fired furnaces and generally quenched in oil. The furnaces and baths are pyrometer controlled so all guess work is eliminated. Bearings heat treated today will be alike in temper to those hardened a year ago, or a year hence. This factor of heat treatment is of the utmost importance for incorrect heat treating would result in failure of bearings in service. A small percentage of the smaller bearings are alloy machine steel and are case hardened but this method never is followed with the large bearings to which this article is devoted.

#### Procedure Used in Finishing Races

In finishing the outer and inner races for large radial bearings the grinding procedure varies, but with a typical part the operations can consist of rough grinding the sides, rough grinding the bore, finish grinding the sides, finish grinding the bore and finish grinding the outer diameter. Thus strains which are set up when the scale is removed do not warp the work.

The rough and finish grinding of the sides is done on Blanchard or similar machines, the work being located directly on the magnetic chuck. This is a simple surface grinding operation. In Fig. 3 is shown an outer race set up for grinding in a Landis machine. This particular piece is 29½ inches outer diameter, 27 inches bore and 7 inches face. The work is held in a special grinding fixture between two retaining plates. The wheel used is manufactured alumina, 18 inches in diameter with 3-inch face. The grit used for roughing is 46 K grit, M grade, while 80 is used for finishing. The wheel rotates at a surface speed of 6000 feet per minute while the work speed approximates 75 feet per minute. A job of this kind cannot be hurried inasmuch as considerable metal must be removed and accurate results are demanded. It is not uncommon to finish such pieces with an error of less than 0.0005-inch.

In Fig. 4 is shown an ingenious setup for internal grinding on a Greenfield machine. This race is of the



**R**EADING from top to bottom—Fig. 3—In grinding the outer race, work is held in a special fixture. Fig. 4—Four straps hold the work against the faceplate for internal grinding. Fig. 5—Grinding oversize thrust bearing plate in standard grinding machine. Fig. 6—Finishing outer diameter of work between two shoulders. Machine is fitted with special loading and unloading devices

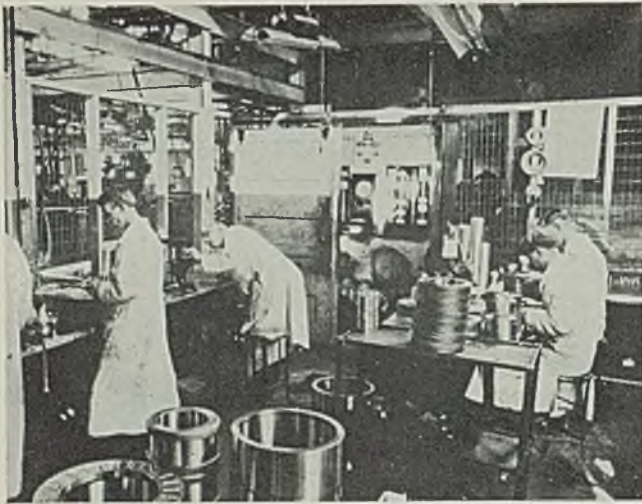


FIG. 7—Bearing parts are inspected before assembly and assembled parts are given final inspection

same diameter as shown in Fig. 3. In Fig. 4 the work is held back against the faceplate by four straps against blocks located on the faceplate for that purpose. These blocks are provided with shoulders against which the work rests. This is to provide wheel clearance in the internal grinding operation. Also there are provided four angle-iron stops, each fitted with an adjusting screw so it is possible to locate the work with an indicator, making sure the surface used for locating runs true. As the illustration shows, the wheel spindle is driven by V-belts from an individual motor. The wheels used on this operation vary in size with the work and may be from 6 to 12 inches in diameter, with 1 or 2-inch face. They are manufactured alumina. Generally 36 grit, L grade, is used for roughing and 3860 grit, K grade, for finishing. This machine is heavy in design, necessary on work of this kind as the least tendency to chattering would ruin the pieces.

#### Handling Oversize Work

The operation shown in Fig. 5 involves an interesting setup as it shows how ordinary equipment is utilized to handle work of over capacity. The work in this case is a thrust bearing plate 61 inches in outer diameter, 53-inch bore, and the grinding involved consists of finishing the sides. This machine is a Landis grinder fitted with riser blocks to increase the swing to accommodate this large piece. The wheel is the same diameter, grit, and grade as used on the machine shown in Fig. 3. Referring to Fig. 5 it is shown that a special faceplate is fitted with eight arms which carry the straps that hold the work in place. Wheel speed is normal at 6000 surface feet per minute while a work speed of about 30 feet per minute is employed.

An external grinding operation in-

volving special equipment is shown in Fig. 6. This machine is a Cincinnati centerless grinder and is used in this instance for finishing the outer diameter of pieces 10 inches in diameter, 7-inch bore and 3-inch face. Referring to the two finished parts on the floor it is seen that the ground portion is between two shoulders. The machine is fitted with a special work loading and unloading device. The work is loaded at the back and conveyed to the grinding position, then fed upward in the chute at the front to the discharging position. The entire setup was designed and built for this job and represents the first machine of this type to be put into practical operation on work of this kind. The grinding operation is divided into roughing and finishing. The wheels used are manufactured alumina, 80 grit, L grade, for roughing and 120 grit, L grade, for finishing. Centerless grinding machines also are used to quite an extent for finishing the bearing rollers, both for radial and thrust bearings. In some few instances, however, comparatively large rollers are finished in center-type machines.

#### Final Inspections Important

Final inspection plays an important part in the manufacture of the bearings. In reality there are two final inspections, one before and the other after the parts are assembled. Inspection consists of making sure that all parts are of correct sizes and of the required degree of hardness. Of course each part is rigidly inspected for surface imperfections also. Inspection is an important operation which cannot be slighted. It can be entrusted only to men of long experience; men who are thorough in their work and possessed of that degree of patience necessary in looking after minute details constantly.

Large bearings are comparatively

expensive since their manufacture involves high-priced stock, expensive equipment and a large amount of skilled manual labor. Also, due to the fact that these bearings often must be made a few at a time, the cost of setting up the various machines for given operations always is a major factor.

## Practice Recommendations On Hacksaw Blades in Print

Division of simplified practice of the national bureau of standards has announced that printed copies of Simplified Practice Recommendation R90-36, containing recommendations for use in production of hack saw blades, are now available. Revision supersedes the original recommendation, which became effective July 1, 1929, and lists the length, width, thickness, number of teeth per inch and other dimensions of tungsten alloy steel blades, double hardened blades, high speed steel blades and special alloy blades.

This recommendation is effective from October 1, 1936 and is subject to regular review by a standing committee of the industry. Copies may be obtained from the superintendent of documents, government printing office, Washington.

## Solid Woven Belting Now Available in Wide Measure

Installation of one of the widest solid woven belting looms in the world, a 20-ton loom that will weave cotton belting in widths up to and including 84 inches, has been completed by Victor Balata & Textile Belting Co., Easton, Pa.

This new and unusual loom will supplement other equipment for the manufacture of a complete line of belts for driving, conveying, and elevating, including another large loom installed in 1935, a loom producing belting having a maximum width of 63 inches.

## Develops Heavy Duty Brake

Rockwell Products Co., 436 Capitol avenue, Hartford, Conn., has developed a new hydraulic power brake system for use on heavy duty vehicles such as buses and trucks. It includes such safety features as automatic stopping of wheels if the brakes fail, maintenance of a constant braking force and separate controls for front and rear wheel brakes. Power for the brake is supplied by a battery operated electric motor which maintains fluid in an accumulator at pressure of 500 pounds per square inch, the motor starting at lower pressures.

# A.S.M. Symposium Broadens Knowledge on Plastic Working of Metals

## Part III

**C**OLD rolling of mild steel sheets and strip and the properties of this material for deep drawing purposes constitute a most important phase of plastic working. Likewise, the auto-frettage process of cold working hollow cylinders deserves consideration under this subject. For these reasons, these topics were given extensive time in the four-session symposium on the plastic working of metals conducted by the American Society for Metals during its eighteenth annual convention in Cleveland, Oct. 19-23. Reports on the early parts of this symposium were presented in the Nov. 23 and Dec. 7 issues of STEEL.

### Deal with Cold Rolling

Theoretical and practical aspects of cold rolling of mild steel sheets and strip were discussed at length in a paper by Anson Hayes and R. S. Burns, director and research engi-

neer, respectively, research laboratories, American Rolling Mill Co., Middletown, O. Subjects dealt with were types and applications of equipment, reasons for their use, flow of metal, fiber and grain size, and these same features for cold straightening processes.

Viewed from the standpoint of structural effects of the rolling process, the authors proposed the following definition for cold rolling: "Rolling at temperatures sufficiently low as to result in essentially no change due to annealing of the deformed structures which result from the reduction of gage by rolling."

### Effects Are Enumerated

Some of the more important effects of various percentages of cold rolling and of box annealing temperatures on the material after box annealing are as follows:

1. There is a degree of strain which is critical in its effect on grain size and physical properties for each box annealing temperature. Results

of this critical strain, with that of the box annealing temperature, are to produce large grain size with low yield point, low Rockwell hardness, low tensile strength and lower elongation.

2. Beyond the critical strain region, the grain size is reduced as the percentage of cold reduction increases for a given box annealing temperature. This decrease in grain size is accompanied by increase in yield point, increase in yield point elongation, increase in tensile strength and increase in total elongation.

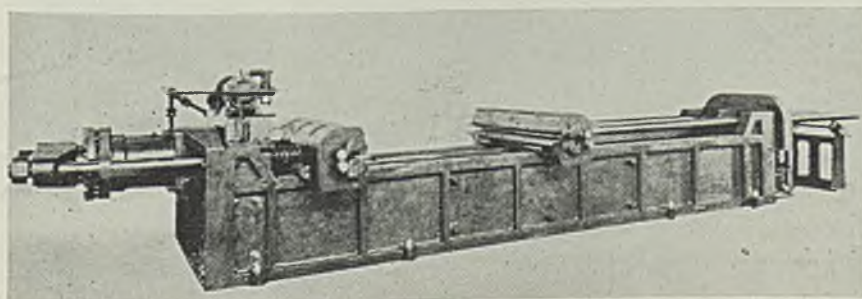
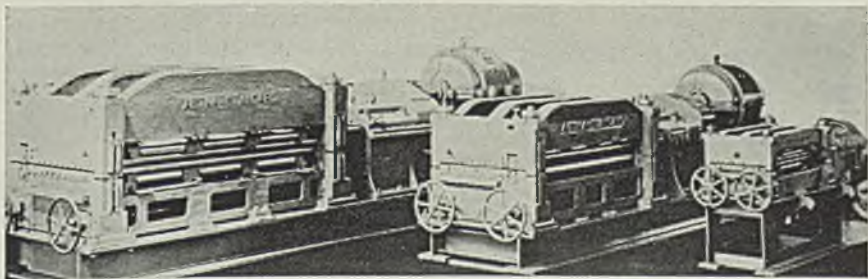
3. For the 1100 degrees Fahr. anneal, Rockwell hardness, yield point, and tensile strength have a tendency to increase with percentage of cold reduction, up to the critical strain region. At 1350 degrees Fahr. this effect is not pronounced, but seems to be present.

### How Deformation Occurs

In actual testing of dead-soft mild steel test bars, usually the first plastic deformation occurs near the shoulders—after which deformation progresses from these two points toward the middle section of the test bar, said Messrs. Hayes and Burns. The reason for the initiation of deformation at these places is that stress concentration occurs here, because of the rather sharp variation in width of section. The reason for the continuous progress of plastic deformation from the region near the shoulders toward the center is that concentration of stresses occurs at these points where rather abrupt changes in thickness of section has taken place.

It is obvious that if localized deformation has reduced by, say 6 per cent, the cross sectional area of the test piece at one point, a considerable amount of work strengthening

**FIG. 10 (Right)**—Shown here are three sizes of equipment used in roller leveling. **Fig. 11 (Below)**—Stretcher leveling of sheets and strip is accomplished on this stretcher leveler. From paper of Anson Hayes and Robert S. Burns



must occur in this reduced section if the stress value rises high enough to start plastic deformation in the unchanged area. This behavior has some important consequences as follows:

1. If elongation by tension is stopped before all portions of the metal are reduced enough, inequalities in thickness of section and in surface level remain. This condition is usually known by stamping

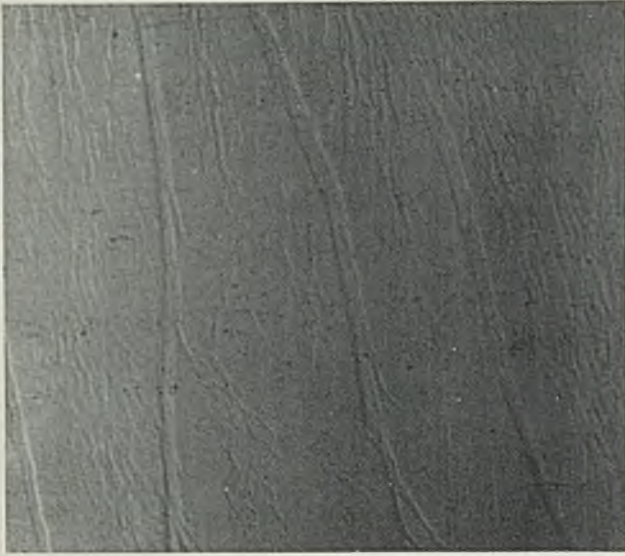


FIG. 12 — Portion of stamping showing stretcher strains. From paper of Joseph Winlock and Ralph W. E. Leiter

producers as stretcher strains or "worms."

2. In the process of making a stamping, a wide range of elongation exists for different portions of the stamping. Consequently, stretcher straining occurs if any considerable elongation at the yield point is present as the steel goes into the press.

3. If the piece is elongated by an amount equal to or greater than the yield point elongation, all parts of the test section are essentially equal and the surface has to a considerable extent returned to a smooth condition. Stretching through the yield point elongation region is usually known as "pulling through the stretcher strains."

4. In the manufacture of stampings, steel sheets or strip must have the yield point elongation removed if satisfactory surface is to be obtained.

5. Strain aging may cause yield point elongation to occur after tempering.

#### Yield Point Is Increased

In commercial cold rolled steel fully annealed, the yield point elongation may range from about 3 per cent up to as much as 50 per cent of the total elongation. Usually in sheets or strip of acceptable drawing properties untreated for stretcher strain, the yield point elongation will be within 3-7 per cent.

The method used to prevent stretcher strain, asserted the authors, consists of subjecting the material to small cold reduction (from 0.5 to 2 per cent) by rolling on a temper mill. Elimination of stretcher strain by this method consists in effecting reduction by sufficient cold rolling to eliminate the yield point elongation.

Following are the more important facts in regard to effects of types of temper mills and metallurgical

characteristics of stock on the amount of temper rolling necessary to eliminate strain:

1. The smaller the grain size of the steel, the greater the yield point elongation; and the greater the amount of temper rolling necessary.

2. Sheets with polished or smooth surface with the same yield point elongation require more temper rolling than do sheets with dull surfaces.

3. The smaller the rolls for tempering, the smaller the amount of reduction necessary.

#### Cold Rolling Vs. Stretching

Some facts in connection with elimination of strain by cold rolling versus stretching should be mentioned, Messrs. Hayes and Burns pointed out. Stretching must be carried to a point which takes up all of the elongation at the yield point, if stretcher straining is to be avoided. This would mean that stretcher leveling must be carried through elongations from about 3 to 8 per cent. Stretcher leveling is never used to eliminate strain; but to obtain flatness. Equipment for roller leveling and stretcher leveling are shown in Figs. 10 and 11.

If a material which shows, for

example, 4 per cent elongation at the yield point in the tensile test is elongated by cold rolling as little as 0.80 per cent, all the elongation at the yield point will have disappeared. Tensional stretching of this same material must have been carried to at least 4 per cent to have eliminated yield point elongation.

This wide difference in values by cold rolling and tension is due to the fact that in the tempered material it is not necessary for the work strengthening process to make up the weakening effect of the reduction of section, which would have resulted in case yield point elongation were removed by stretching only. Stated in another way: It is only necessary to deform the material plastically by cold rolling to a point where the rate of work strengthening has risen to a value greater than that of weakening, due to reduction in cross section. The failure to obtain stretcher strains in low percentages of cold rolling is because in cold rolling all parts of the material are reduced to the same cross sectional area as they pass through the rolls.

#### Other Requirements Involved

Experience shows that there are certain other requirements in sheet and strip products as they come to the stretcher leveling operation if flatness is to be obtained. In general, only certain types of nonflatness can be corrected by stretcher leveling. Some materials which are distinct more out-of-flat than others, can be flattened satisfactorily by stretching.

The authors showed clearly that if elongation at the yield point is over 5 per cent, a relatively large reduction by cold rolling is necessary to prevent occurrence of stretcher strains in the finished stamping. Joseph Winlock, chief metallurgist, Edward G. Budd Mfg. Co., Philadelphia, stated it had been his experience that yield point elongations of over 5 per cent are not unusual with steels of small grain size such as are frequently encountered in

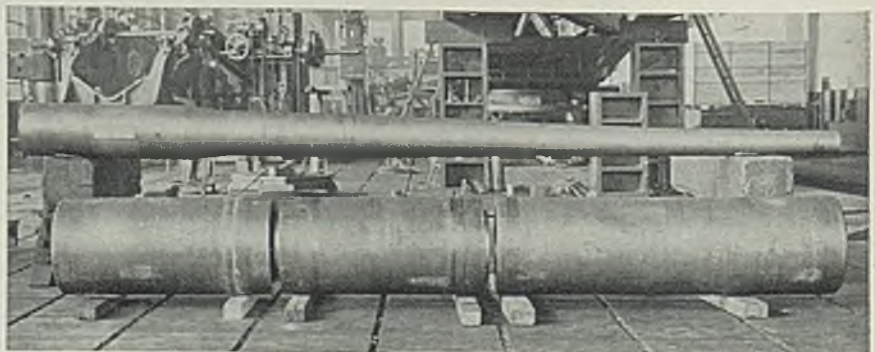


Fig. 13—The gun shown here was manufactured by the cold working process. The container used to limit the amount of enlargement also is shown. From paper of Norman E. Woldman

cold reduced strip which has been box annealed only.

E. A. Matteson, Aetna-Standard Engineering Co., Youngstown, O., reported that recent demand for good drawing sheets with stretcher leveled flatness has produced a slightly new method. It is well known that when a sheet is stretched to the 1—1¼ per cent necessary for flatness, it has lost much of its drawing quality. To overcome this, the sheet, when given a severe roller leveler pass, will stretcher level with practically no elongation, that is, by simply pulling taut without hydraulic pressure, and will satisfactorily meet the foregoing mentioned demand. The two operations must be consecutive for best results, Mr. Matteson contended.

In studies of the metallurgy of steel for deep drawing purposes, Joseph Winlock and Ralph W. E. Leiter, chief metallurgist and research metallurgist, respectively, Edward G. Budd Mfg. Co., Philadelphia, have found that progress toward obtaining the most ductile steel is hindered by the necessity of effecting a compromise between the section of two phenomena which produce diametrically opposite results on the physical properties of the steel.

#### Ductility Is Lowered

These two phenomena are (1) that the annealing necessary to impart the greatest ductility to the steel also puts the metal in a condition in which Luder's lines—known in the shop as stretcher strains—occur on the surface of the metal during the deep drawing operation, and (2) that the cold rolling of the steel as a final operation in its manufacture made necessary to prevent stretcher strains from occurring, lowers its ductility substantially. An excellent example of stretcher strains in a stamping is shown in Fig. 12.

Cold rolling as a final operation also makes the steel more susceptible to aging. As is well known, the result of aging is a spontaneous increase in hardness and a spontaneous decrease in ductility.

The purpose of the paper by Messrs. Winlock and Leiter was to discuss the progress which has been made in an attempt to throw some additional light upon some of the factors influencing the formation of Luder's lines. It is manifestly clear that such studies are extremely important because if their occurrence could be controlled more accurately, or if they could be prevented in fully annealed steel, the difficulty of obtaining and maintaining the maximum ductility in the material would be lessened materially.

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R. L. Kenyon, supervising research engineer, American Rolling Mill Co., Middletown, O., pointed out that the yield point behavior of mild steel

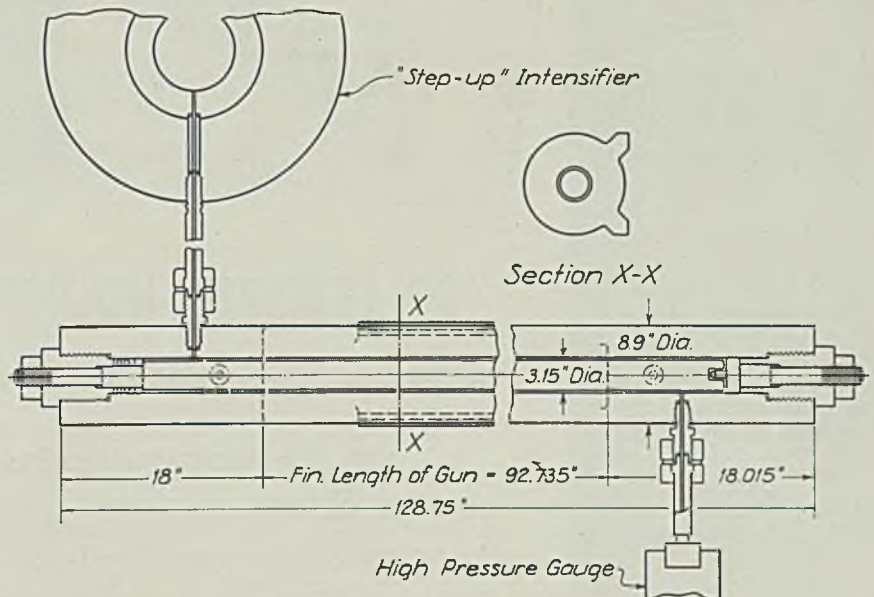


Fig. 14—Sketch showing general arrangement of forging for auto-frettage. From paper of Norman E. Woldman

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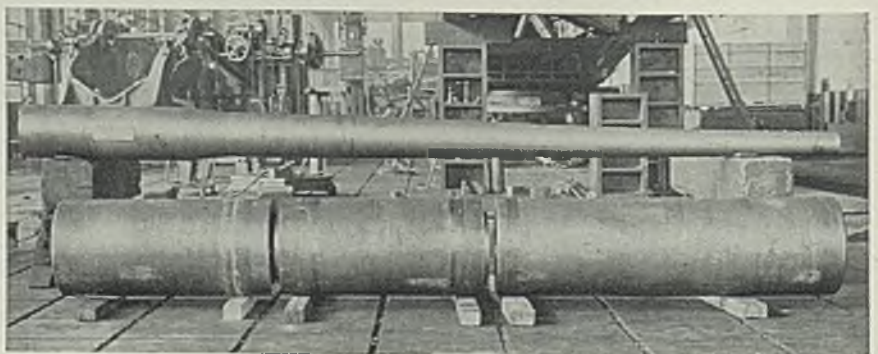
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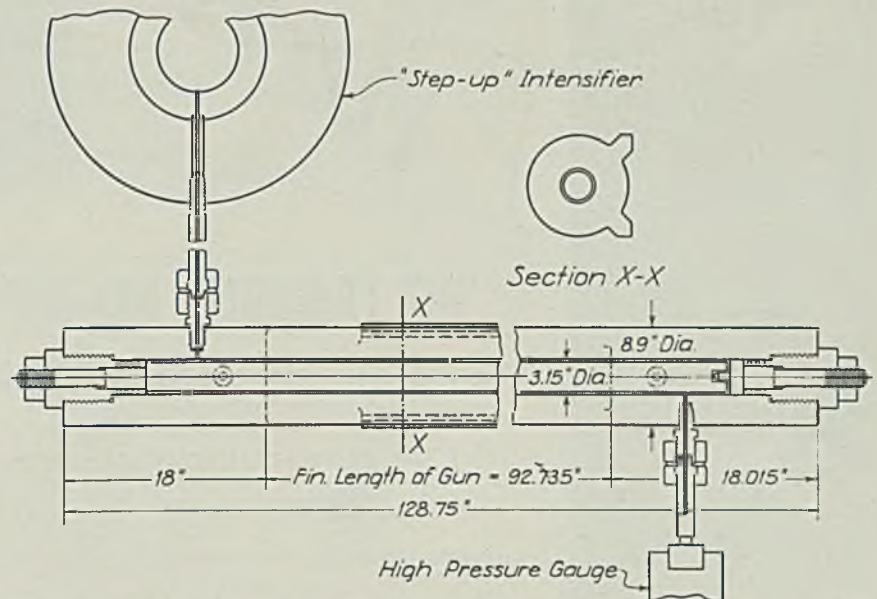


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# Materials

# Handling

## Seek Smooth Handling in Building Rail Cars and Automobile Bodies

**W**HEN one has had an opportunity to thoroughly inspect one of the new Zephyr trains, which have been on exhibition at various railroad terminals in recent months, and when one then has the privilege of inspecting the plant where the cars on those trains are manufactured, is difficult to escape the conviction that insofar as the materials handling operations are concerned the assembly of the cars is as smooth and as streamlined as the finished trains themselves.

This was the impression gained in a recent visit to the plant of the Edward G. Budd Mfg. Co., Philadelphia. If the writer had not inspected several departments of the plant in addition to the rail car department, he might have come away with a wrong impression of the entire operations. Strangely enough, assembly of the new Zephyrs looks like a simple materials handling job compared to the intricate system of parts and finished products transportation in the automobile body building departments.

### Methods Not Standardized

The explanation for this is probably that the rail car manufacture is still in its infancy. Each succeeding train seems to be an individual job with improvements that distinguish it as an advance from its predecessor on the line. Naturally in an industry pioneering in a revolutionary type of transportation unit, there is at present little standardization of design. There is probably more of the technique of

the old craftsmanship era. Modern tools to help the men, but not very much of the practice that comes when mass production becomes advisable.

Edward G. Budd Sr., head of the company, answering questions about the various stages of development of his company and his reliance on modern handling methods in manufacture, made this pertinent comment: "Well, you know, we have a lot of smart fellows all through our organization. We're never entirely satisfied. We know other organizations also have some smart men and so we always have to try to be a step ahead."

### Plant Covers Much Ground

The Budd plant in Philadelphia today occupies approximately 42 acres of ground area. It includes 18 buildings with a total manufacturing floor space of 1,912,000 square feet. The size of the plant alone

would indicate the enormity of the materials handling problems. However, other factors emphasize this to a greater extent. For example, one of the main buildings is a six-story structure, forming one end of a U-shaped group of units of lesser heights and interconnected with several other units. A switch track of the Pennsylvania railroad serves the receiving and shipping department, while on another side of the plant runs a Reading railroad track.

### Hoists Handle Strip Coils

The rail car assembly department is located in Building R. Coiled strip is delivered from the receiving or storage departments by tractors and trailers. These coils are deposited in one corner of the shop where they are picked up as needed, as shown in Fig. 3, by a manually-controlled electric hoist, which deposits the coils on a draw bench which pulls the strips out to the proper length and shapes them for the car sheathing. Dies in this operation are interchangeable so that different sizes and shapes of sheathing may be handled.

Down the center of the department is a long pit so that workmen

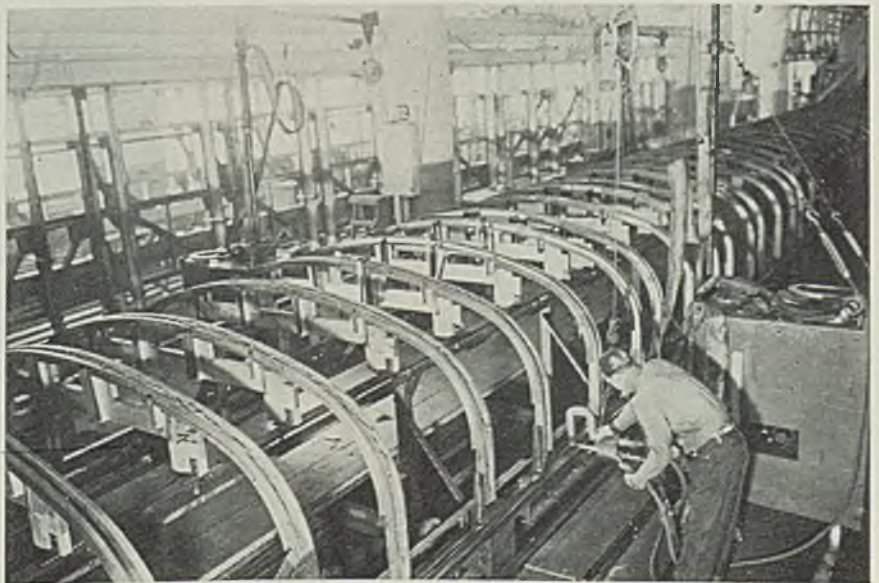


FIG. 1—Safety balancers swing from jibs placed at each of the four corners of the roof in the rail car department. These balancers serve to hold the shotwelding tools in safe and easy position for the operators

# MATERIALS HANDLING

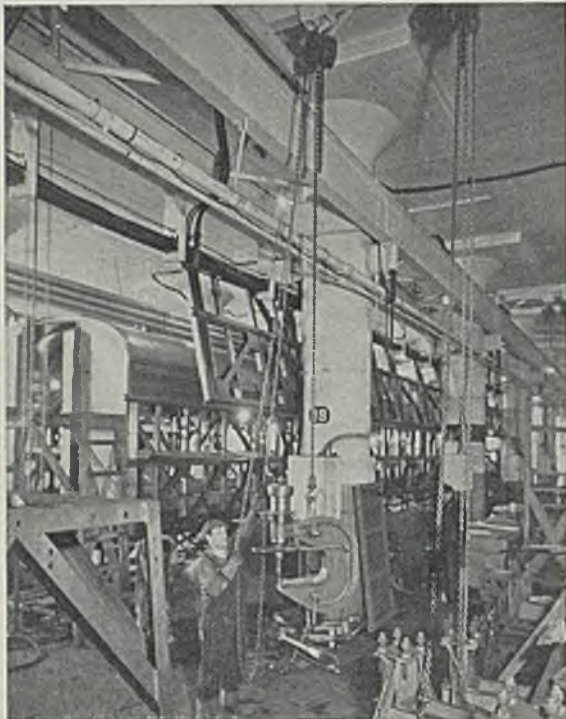


FIG. 2—Chain hoists are plentifully supplied to fill in at various locations for spot handling jobs. The rail car shop is equipped also with electric overhead cranes and hoists. One of the new streamlined cars for the Santa Fe may be seen on the assembly line

have ample room for assembly work on underneath parts of the cars. Adjacent to this are the roof jigs, large wooden members on which the roof and side members of the car are assembled. A tram-rail with a 1-ton electric hoist serves each car, and near each of the four corners of each car jig is a jib, attached to which is a safety balancer, shown in Fig. 1, for holding the welding tools in a safe position for the operators, for the Budd car assembly is fabricated by the shot weld process.

## How Units Are Assembled

The strips for sheathing are transported from the draw bench on floor trucks, and are bolted to the side frames. The side frames themselves are fabricated on jigs, bolted into place and then shot-welded to the underframe. By means of a 1-ton overhead hoist operating on a tramrail the roof is swung from the top of the roof jigs, and after this has been attached to the side frames, the car is lifted by a 5-ton crane onto the car trucks and it then is supported on its own car wheels while the Budd craftsmen do the work of interior finishing and attachment of floors, doors, windows and the other hundreds of parts.

Naturally, the necessity for supplying larger sizes of roofs and

other parts has made the press departments of the Budd plant literally beehives of activity. Something of the problem may be imagined from the fact that the die storage department has in use a 15-ton and 25-ton electric overhead

cranes for changing of dies, one of the real heavy-duty handling jobs in any such press shop.

It may be interesting at this point to record that throughout the Budd plant, there are three main types of materials handling equipment. The first comprises the cranes and hoists. The writer counted dozens of these in various sizes. He was informed that there are no less than 54 in use at the present time, and that two more have been ordered for early installation.

The second includes continuous overhead conveyors, and most of these are used on conventional handling jobs, such as carrying parts through from one department to another, through oil baths and for other similar operations; also for certain handling jobs to and from the shipping platforms.

## Over 3000 Trailers

The third, and by no means the least important class of equipment, is that known generally as floor handling types. Due to the rapid expansion of the Budd manufacturing activities and the distances that have to be traveled, in addition to the infinite number of parts of various sizes and styles that must be handled, there are at present employed, almost without let-up, nearly three score of powered in-

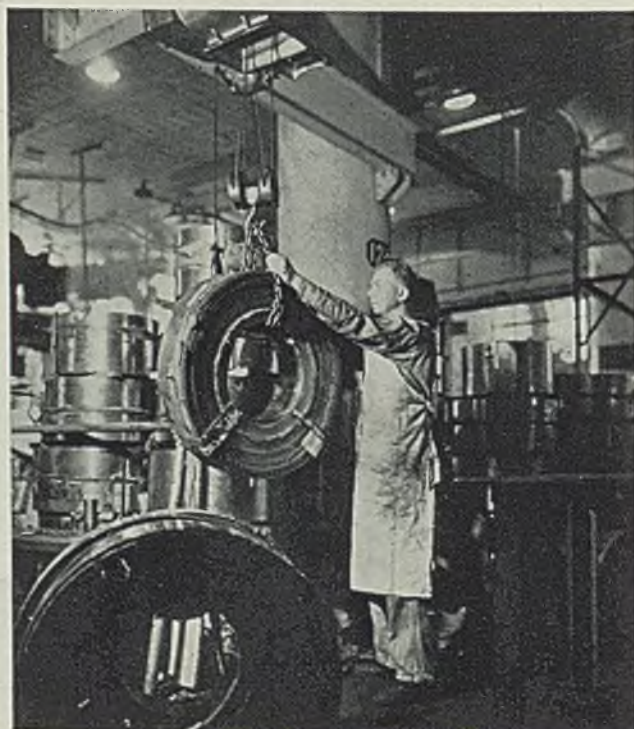


FIG. 3—Coils of strip steel for sheathing new rail cars are stored at a point close to the beginning of straightening and drawing operations. A manually-operated electric hoist makes easy handling of heavy coils



## Hundred Horsepower Hands!

● Only one pair of hands; but placed on the controls of a YALE Electric Truck—they match the power of a hundred horses!

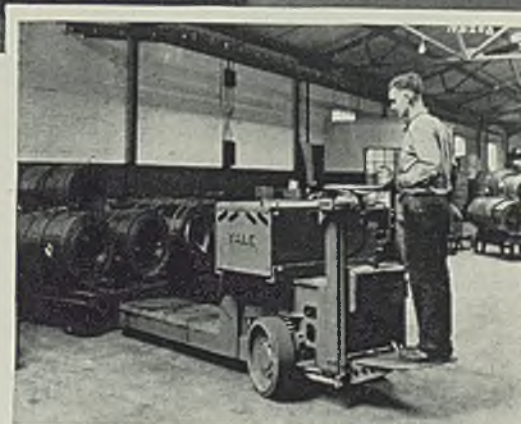
You can't wring profits from today's highly competitive markets with haphazard methods. It takes high-g geared efficiency at low-g geared cost to put the black ink in your ledgers... the kind of efficiency that a YALE Electric Trucking System throughout your plant will give!

Sturdy... Saving... Safe... YALE Electric Trucks are the busy bees of American industry. Step into almost any successful plant\* and you'll find them economically going about their business of Lifting... Hauling... Stacking... Storing! Powerful profit makers—that's what they are!

Made in all sizes, types and capacities—there's a YALE Truck to fit your every need. Designed and built by YALE engineers to give lasting economical service, you'll find them the answer to your materials handling problems.

Let a YALE representative show you how you, too, can give your workmen Hundred Horsepower Hands.

\* WE'LL BE GLAD TO SEND YOU NAMES OF INDUSTRIAL LEADERS EVERYWHERE WHO ARE SAVING TIME AND MONEY THE YALE TRUCK WAY



STEEL—lifting and hauling steel in fabricated forms is "all in the day's work" for Yale Electric Trucks. Top photo—Yale Low Lift Truck handling coiled strip steel; below—Yale High Lift Trucks transporting castings.

**SPEED  
ECONOMY**



**SAFETY  
EFFICIENCY**

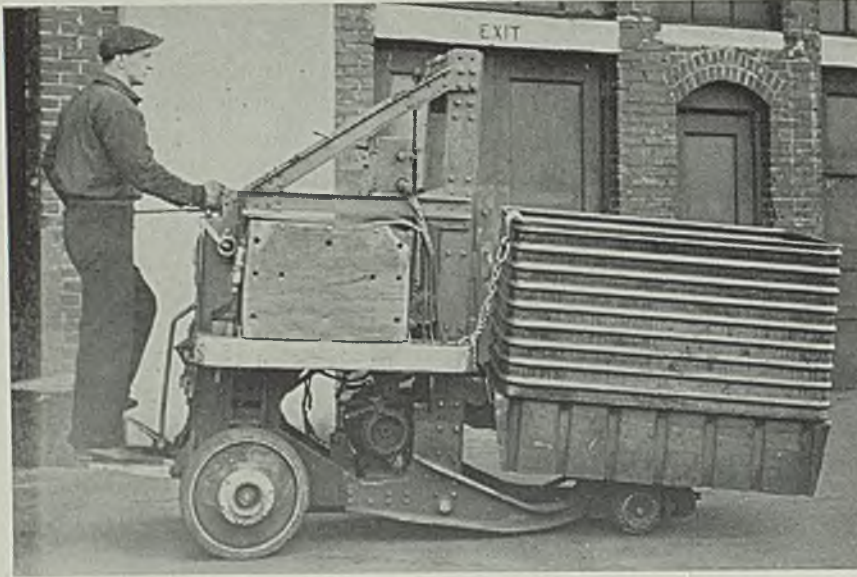


FIG. 4—Forty-two electric industrial trucks perform a variety of operations such as transporting skid boxes, hauling trailers, loading and unloading freight cars and motor trucks and servicing the plant restaurant

dustrial trucks and tractors, and in conjunction with these are utilized a total of approximately 3000 trailers and floor trucks, to say nothing of the corrugated steel shop boxes and box skids. There are 42 electric industrial trucks and tractors, at least 10 small gas-powered tractors, and two gas-electric machines, in addition to four larger gas-powered units. Two types of this equipment are shown in Figs. 4 and 5.

#### Co-ordination Is Sought

Mr. Budd's earlier assertion that the company is never entirely satisfied is attested by the fact that several months ago W. Dinse was appointed to head the department of methods and equipment, and he has been given the job of trying to improve the co-ordination of production and materials handling. Mr. Dinse already has made considerable progress in his attempts to smooth out handling at some of

the bottleneck points throughout the plant, but much remains to be done, as many of the handling operations are involving growing difficulties, due to constant improvement of models, not only of the automobile body lines which constitute the main portion of the plant production, but also of the new rail cars. Among the recent improvements in materials handling facilities, in addition to two new electric cranes, one of them a 25-ton unit, are new type of cradles for handling bar stock on trailers.

Experimental work never ceases in the Budd plant, whether in the handling of materials or in the development of new models and new methods of production. Typical of this is the experimental department

located on the west side of the fourth floor of one of the factory buildings, to which this department was moved recently in order to provide better working facilities and more light for the workmen. This is devoted largely to building customers' samples. In a recent issue of the Budd employes house organ, *Budgetette*, the work done is reported to be a source of pride to the entire organization. Operation of this department is of interest.

The engineering department makes full-size drawings of the various parts required to make an automobile body. Blue prints are then made and forwarded to the experimental department. The craftsmen are assigned to produce the various parts of the body. Arrangements are made for the building of soft wood hammer forms for the roof, cowl, inner door panels, outer door panels, turn-under templates and other templates to produce the given shape so that the sheet metal craftsmen can begin shaping the metal over them. Steel of various gages and qualities is then requisitioned from the steel stores and the sample building commences.

#### Parts Are Welded Together

It is often necessary to make an automobile roof in five separate parts; top, right and left sides, front and back sections. This is because the stamping for the roof of a car is so large. These five parts are then seam welded into one piece. Steel pins are placed by the craftsman in the soft wood model which will be used for gaging and holding the steel in the same location after each trial during the fitting process. Blanks of paper are cut out and placed on the steel where it in turn is cut to size.

The first operation is the rough forming of the metal by means of

(Please turn to Page 58)

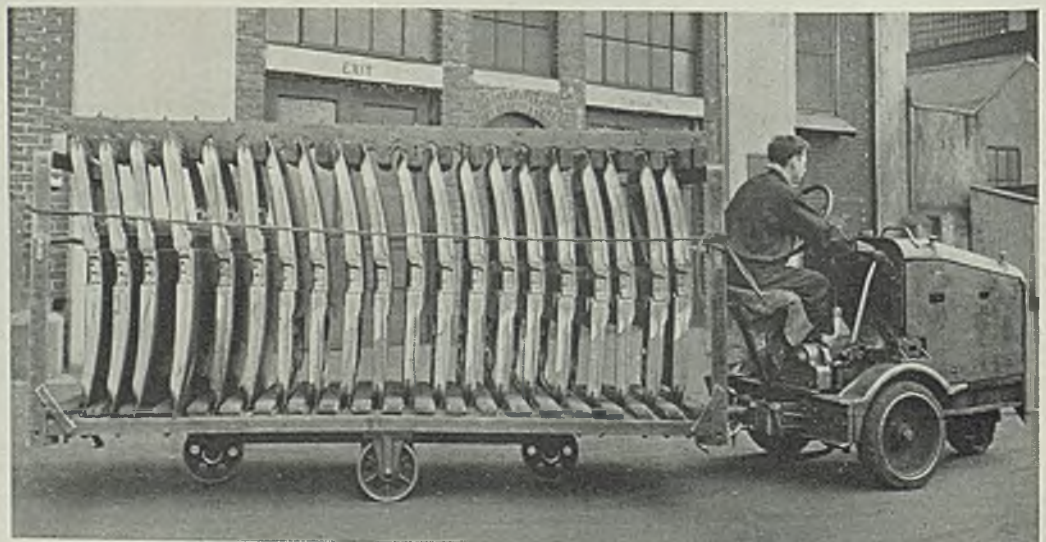


FIG. 5—Gas-powered tractors and trailers are used for many of the plant transportation jobs around the automobile body departments. This trailer has a load of 20 doors

# SURFACE TREATMENT

# AND FINISHING OF METALS

## Improved Synthetic Finishing Materials Meet Rigid Requirements

**I**MPORTANT improvements in synthetic finishes for metals are claimed by Roxalin Flexible Lacquer Co., Inc., Elizabeth, N. J., as a result of a development in rubber-base raw materials. The improvements apply over a wide range of commercial applications.

One of the new products is a non-silking, drierless, roller coating material which is always clean and free from nibs of oxidized or polymerized particles. Because of its peculiar structure greater production can be obtained in shorter baking time. It does not skin in the container or in production, is available in all colors, as well as in black and white and is applicable to tin, brass, aluminum and other metals without the use of a size coat. Metal sheets can be put through a wide range of forming operations without damage to this finish.

### Forms Lustrous Base Coat

A new base coat or ground coat material has been developed for use under wood grain reproductions, and particularly for application to flat metal sheets prior to forming. A short force-dry or a low temperature bake is required, after which the wood graining is applied. There is also a clear top coat or protecting coat which may be applied in the roller coating machine or to small parts by dipping or spraying. After baking, the system may be buffed in the sheet to a highly lustrous wood effect finish with excellent depth and then blanked and formed into the necessary shapes. Even where the metal is subjected to considerable deformation, says the company, the adhesion and toughness are such as to prevent marring of the finish.

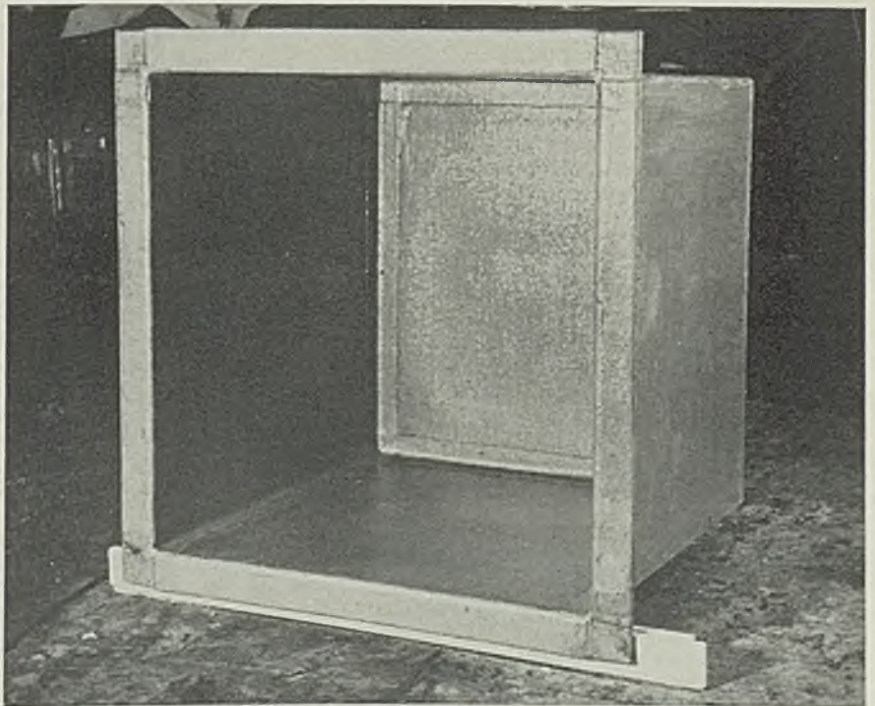
Another development is a system

especially applicable to air conditioning units where constant cycles of cold, heat, humidity, brine, fumes of refrigerants, alkaline washes and other corrosive agencies have caused difficult finishing problems in the past. In this application the

new coating is said to result in long lived, fully flexible finishes thoroughly adherent to all metals without priming coats. This system should find many applications.

Complete resistance to pure alcohol and a number of other agents is claimed for a new clear finish for machine coating or spray application. When coated on nitrocellulose, alkyd synthetic or oleo-resinous base coats it improves the resistance to such agents. At the same time it bonds well with these base coats and sheets thus finished

### Tank Lining Resists Nitric and Hydrofluoric Acids



**S**YNTHETIC rubber-like material, known as Koroseal, finds use as lining for tanks handling severe corrosives. This material, manufactured by B. F. Goodrich Co., Akron, O., will resist nitric, chromic and mixtures of nitric and hydrofluoric acids. It adheres well to steel, wood and concrete. Lining can not be applied to riveted tanks, but welded constructions are satisfactory. It is thermoplastic and is not recommended for service where temperatures exceed 150 degrees Fahr. While this material is susceptible to physical damage, when unprotected by sheathing, repairs are simple and easy to make

are easily blanked and formed.

Another development is a new type of synthetic with perspiration resistance which sets in air almost as fast as lacquer. It is said to produce a flexible finish with high lustre and to have excellent adhesion to practically all metals including zinc die castings. It is particularly adapted to high production work with automatic spray equipment.

## Etching Agent Provides Bond For Metal Protective Finish

An etching agent, known as Marks bond, which is claimed to produce a uniformly etched surface on steel and afford an effective anchorage for a subsequent protective finish is now being marketed by Bonding Process Corp., Detroit.

Solution strength is determined by a simple titration with sodium hydroxide using phenolphthalein as an indicator. Solution strength is maintained by additions of a prepared reagent in accordance with the results of the analysis.

Metal processed by this method should be free from grease or other coating. After processing, the metal should be washed thoroughly with hot water, rinsed in hot water and dried.

## Hard Tripoli for High Speed Production Work

Hanson-Van Winkle-Munning Co., Matawan, N. J., has developed and now offers to the trade a new line of hard, firm tripoli compositions which it is claimed, give maximum results in high speed production, finish and low costs.

These new compositions, Grades 2-D-20, 2-M-125 and 2-M-128 are designed for general buffing on brass, aluminum, copper and die castings. They are particularly recommended for high speed hand buffing and for automatic machine work.

## Rubber Paint Prevents Calcium Chloride Corrosion

Although calcium chloride has come into popular use by municipal and state highway departments to melt ice and snow on streets and highways, its continuous use during a long hard winter eventually has an injurious effect on the enamel finish of automobile fenders and other sheet metal parts.

J. H. Otis, Pontiac Motors parts and accessories manager, announces that all Pontiac dealers in the ice and snow country soon will have at their disposal a rubber paint which can be sprayed or brushed onto the

under sides of fenders and sheet metal aprons thus filling the pores of the finish and providing a surface which calcium chloride will not attack.

He points out also that paint seals the filler strips between fenders and body where the calcium chloride usually seeps and eventually does its worst damage.

With calcium chloride being used in ever increasing quantities, the rubber paint should become an important factor in preserving the luster and finish on motor cars.

## British Paint and Varnish Publications Announced

Announcement is made of two British publications issued by the Research Association of British Paint, Color and Varnish Manufacturers. *The Preservation of Iron and Steel by means of Paint* by L. A. Jordan and L. Whitby deals with modern theories of corrosion of iron and steel and practical methods of combating it. It can be obtained from The Paint Research Station, Waldegrave Road, Teddington, Middlesex, England. (2/10d post free abroad) *Review of Current Literature Relating to the Paint, Color, Varnish and Allied Industries* is now available to the general public at an annual subscription rate of two guineas (£2-2-0d) for the six bi-monthly issues and index from Messrs. Chorley and Pickersgill Ltd., Amberley House, Norfolk Street, Strand, London, W. C. 2., England.

## Immersion Type Cleaning Tank Requires No Heat

Developed originally for removing heavy accumulations of oil and grease from airplane engines and parts, the hydro-degreaser has been found particularly adapted for economical operation in large industrial plants. This type of degreaser requires no heat or steam for its use.

Designed for use with a cleaning solvent known as "Gunk," the apparatus is divided into two compartments. Oil coated and greasy parts are immersed in a cold solution of the solvent which is contained in the first compartment. After soaking for a few minutes, the parts are removed to the second compartment where they are sluiced off with a water hose which quickly emulsifies and removes the treated grease.

If air line agitation is used to create turbulence in the solvent bath, the time of immersion is reduced to a minute or two. The rinse section of the degreaser is connected directly to a sewer drain and carries off the dissolved oils and greases in a

safe emulsion form. The cleaning solution is rated as a safety solvent by the Underwriters' laboratories and has the additional safety feature of being nonirritating to the skin.

It is said that the solution is unusually successful in removing waxes and buffing compounds from aluminum, magnesium and other soft metals without injury to the metal.

Plans for the construction of the hydro-degreaser cold immersion cleaning tank may be obtained from the Curran Corp., Malden, Mass.

## Continuous Porcelain Enamel Frit Smelters Announced

Development of continuous smelters for the production of porcelain enamel frits is announced by Porcelain Enamel Manufacturing Co., Baltimore. After five years of experiment and research this company now has three continuous smelters in operation. They are claimed to be the only successful continuous frit smelters in operation today.

According to the manufacturers, porcelain enamel ground and cover coat frits produced in these furnaces have a uniformity impossible to produce in batch-type smelters. Production in the factory, it is claimed, may be positively controlled by mechanical and scientific means to the most minute tolerances.

It has been said that the continuously smelted frits have been tested under every condition and found to be so satisfactory that manufacturers using these frits require technical service and advice only in problems arising from difficulties encountered in their factories, and not due to frit variations.

## White Brass Electroplated Without Use of Anodes

A process to electroplate white brass has been announced by Alrose Chemical Co., Providence, R. I. The deposit is claimed to be as white as silver, nontarnishing and can be plated over any metal surface.

This process, known as the Wite-Brass process, requires a steel tank to hold the solution. The tank also serves as the anode. The bath, which is replenished by special chemicals, operates at a temperature of 140 to 175 degrees Fahr. at a current density of 25 amperes per square foot. The brass deposit is bright and no after-buffing of plated work is required.

The deposit is said to be suitable for all types of metal novelties, flatware, optical goods, reflectors, metal stampings and many other articles.



# WELDING, etc.

by Robert E. Kinhead

## Future of Welding Told by Metal Piled in Scrap Yard

IF A MAN pulled aside the curtain which hides the present of the steel and welding industries from the future, he might spend his time most profitably among the metal salvage yards where metals are collected after their useful service life has been expended. There is the future of steel and of welding written in letters a mile high for the man who can visualize.

The metal in these yards arrived there by various routes, but the causes for the end of its service life are relatively few. Corrosion accounts for a considerable percentage of the scrap. Waste from manufacturing operations in the form of ends, corners and sides is an important factor. Obsolescence accounts for hundreds of thousands of tons of metal which has been replaced by equipment which gives better service at lower cost. The old Packards and Cadillacs are in for breaking up in spite of the fact that most of the metal in them is as good as it ever was. Their service life is over because the same manufacturers will furnish a better car for one third to one half the price paid for the cars now in the scrap yard. Breakage and service failures arising from deformation account for most of the remaining scrap.

Whether one or more of the above

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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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stated causes put the metal in the scrap yard, the whole matter can be reduced to an engineering problem of first cost or cost of use. Every single solitary soul in this world profits when manufacturers reduce the initial cost or the cost of use of anything made of metal. The future of the steel and the welding industries lies along that path. To say one industry has more responsibility than the other is fatuous. This in spite of the fact that it usually costs more to put metal together into a useful assembly than the metal itself costs; more, by from 200 to 1000 per cent in a majority of cases.

## Engineering Welding Jobs

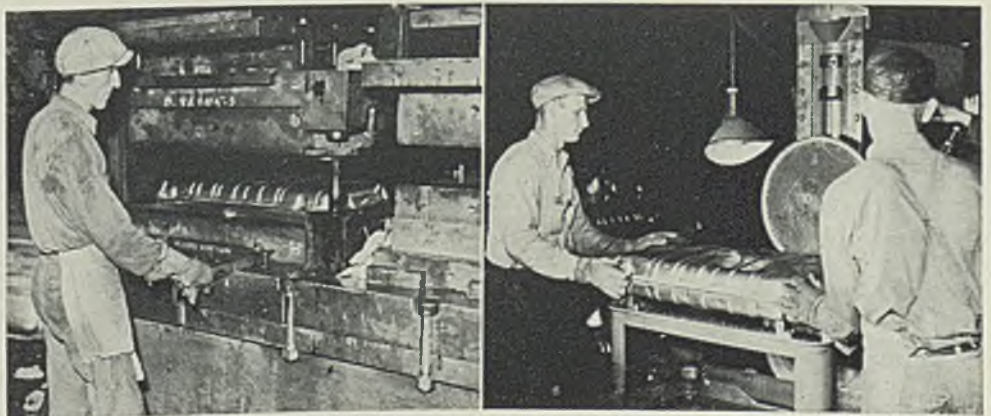
COST reduction is the governing factor in the design and production of welded assemblies. Engineers should be responsible for seeing that the design and production set-up will produce a good job every

time or if that cannot be done, provide a means of selecting the jobs that are acceptable. The most expensive thing that can happen is to have field failures. All of which is, of course, simple right angle thinking. Most manufacturing is not carried on with such precision. Some manufacturers require X-Ray inspection of steel castings and welds, but most of them rely on what passes for common sense in the matter of getting the job out with a minimum probability that it will fail in service. Here is where the most brilliant practical engineering work is done. Any engineer smart enough to read a telephone book and understand what salesmen say can make an installation of apparatus which is claimed will do the job at the lowest cost. But it requires brilliant engineering talent, in most cases, to make it "work" to accomplish that end.

The final measure of engineering achievement in welding is found in a dollar balance sheet. On the one hand is the pitfall wherein the engineer recommends too large an expenditure to accomplish the purpose and finds that his costs can never come down to the estimate; and on the other hand, the pitfall of too little expenditure to assure a constant quality leads to field failures and financial disaster. It is the final net results that count—not the amount of ballyhoo at the beginning.

## Production Welding On Gas Tanks

GAS tanks for Pontiac automobiles are made of two stampings welded together. Left is shown trimming operation after the stampings are ready to weld, right is the welder where the seams are passed between two revolving disks which serve as electrodes



# By-Product Coke Capacity Shows Increase

**B**Y-PRODUCT coke ovens of various types in the United States at the beginning of 1937 totaled 13,331. This number is 45 below the full complement as of Jan. 1, 1930. Iron and steel companies accounted

for 10,024 and commercial or gas plants for 3207 ovens of those available for operation. The 10,024 ovens operated by iron and steel concerns are designed to carbonize 72,410,025 tons of coal annually for a total

yield of 52,899,000 tons of coke. This is 184 more ovens than were in possession of iron and steel producers in 1930 and their output is higher by 4,570,420 tons.

Commercial or gas plants at

## Iron and Steel Company By-Product Coke Plants

Name of Company	No. of Ovens	Kind of Oven	Annual Capacity, Net Tons Coal	Annual Capacity, Net Tons Coke
Ashland By-Products Coke Co., Ashland, Ky. ....	108	Semet-Solvay	803,000	602,000
Bethlehem Steel Co.:				
Bethlehem, Pa. ....	424	Koppers	2,502,080	1,787,520
Steelton, Pa. ....	60	Koppers	404,320	288,960
Sparrows Point, Md. ....	360	Koppers	2,446,080	1,747,200
Lackawanna, N. Y. ....	61	Koppers-Becker	353,000	247,100
Johnstown, Pa.:	171	Koppers-Becker	1,439,200	1,028,160
Rosedale ....	60	Semet-Solvay	442,400	315,840
Franklin ....	120	Cambria-Improved	658,560	470,400
Central Iron & Coal Co., Holt, Ala. ....	88	Semet-Solvay	696,640	497,280
Colorado Fuel & Iron Co., Minnequa, Colo. ....	77	Koppers-Becker	537,600	383,040
Columbia Steel Corp., Provo, Utah ....	77	Koppers-Becker	570,000	399,000
Donner-Hanna Coke Corporation, Buffalo ....	60	Semet-Solvay	290,000	220,000
Ford Motor Co., Dearborn, Mich. ....	120	Koppers	860,000	600,000
Gulf States Steel Co., Alabama City, Ala. ....	31	Koppers-Becker	273,000	191,000
Hamilton Coke & Iron Co., Hamilton, O. ....	56	Koppers-Becker	613,000	400,000
Inland Steel Co., Indiana Harbor, Ind. ....	150	Koppers	1,000,000	700,000
Interlake Iron Co.:	51	Koppers-Becker	351,000	245,000
Duluth, Minn. ....	120	Semet-Solvay	840,000	630,000
Erie, Pa. ....	120	Wilputte	985,000	739,000
South Chicago, Ill. ....	122	Koppers-Becker	1,100,000	770,000
Toledo, O. ....	37	Koppers	263,370	186,138
Ironton By-Product Coke Co., Ironton, O. ....	45	Koppers-Becker	416,000	291,200
Jones & Laughlin Steel Corp., Pittsburgh ....	66	Koppers	450,000	300,000
Allquippa, Pa. ....	74	Koppers-Becker	620,900	434,650
Otis Steel Co., Cleveland ....	59	Koppers-Becker	571,225	399,857
Pittsburgh Crucible Steel Co., Midland, Pa. ....	41	Koppers-Becker	457,000	300,000
Rainey-Wood Coke Co., Swedeland, Pa. ....	41	Koppers-Becker	350,000	245,000
Republic Steel Corp.:	37	Wilputte	300,000	210,000
Massillon, O. ....	120	Semet-Solvay	700,000	525,000
Canton, O. ....	110	Koppers-Becker	1,000,000	700,000
Youngstown, O. ....	94	Koppers	560,000	392,000
Thomas, Ala. ....	85	Semet-Solvay	650,000	440,000
Cleveland, O. ....	60	Wilputte	438,000	306,600
Warren, O. ....	300	Koppers	2,000,000	1,400,000
St. Louis Gas & Coke Corp., Granite City, Ill. ....	122	Koppers-Becker	1,100,000	770,000
Sloss-Sheffield Steel & Iron Co., Birmingham, Ala. ....	81	Koppers-Becker	852,000	596,400
United States Steel Corp.:	100	Semet-Solvay	475,000	356,250
American Steel & Wire Co.:	70	Koppers-Becker	630,000	441,000
Cleveland ....	100	Koppers	667,000	446,900
Duluth, Minn. ....	110	Koppers	800,000	560,000
Carnegie-Illinois Steel Corp.:	41	Koppers-Becker	281,000	196,700
Clairton, Pa. ....	49	Koppers-Becker	438,000	290,000
Gary, Ind. ....	62	Koppers	365,700	256,000
Joliet, Ill. ....	100	Koppers	667,000	466,900
National Tube Co.:	104	Koppers-Becker	957,500	670,000
Lorain, O. ....	204	Koppers-Becker	720,500	504,350
Tennessee Coal, Iron & R. R. Co.:	64	Koppers	1,300,000	1,000,000
Fairfield, Ala. ....	80	Koppers	366,000	414,000
Weirton Steel Co., Weirton, W. Va. ....	120	Roberts	750,000	525,000
Wheeling Steel Corp., East Steubenville, W. Va. ....	94	Semet-Solvay	1,000,000	750,000
Portsmouth, O. ....	51	Koppers	346,750	242,725
Wisconsin Steel Co., South Chicago, Ill. ....	108	Semet-Solvay	770,000	559,000
Woodward Iron Co., Woodward, Ala. ....	88	Wilputte	578,000	404,600
Youngstown Sheet & Tube Co.:	45	Koppers-Becker	363,000	254,100
Youngstown, O. ....	168	Koppers	1,051,200	735,840
Indiana Harbor, Ind. ....	60	Wilputte	371,000	259,700
Total ....	306	Koppers	2,000,000	1,400,000
Total ....	70	Koppers-Becker	740,000	518,000
Total ....	120	Semet-Solvay	893,000	620,000
<b>Total</b> .....	<b>10,024</b>		<b>72,410,025</b>	<b>52,899,000</b>

present account for 3207 of the total number of ovens in this country for making by-product coke. These are capable of carbonizing 20,175,728 tons of coal for a total yield of 14,372,603 tons of coke. In 1930 there were 329 more ovens available than at present and these afforded an annual production of coke of 14,630,803 tons or 257,200 tons in excess of the capacity of this class of ovens at the opening of this year.

During the last six years many obsolete by-product ovens have been replaced by more modern units. Despite the fact that there are 45 less ovens in this country at present than in 1930, these are capable of carbonizing 92,585,753 tons of coal, an increase of 2,570,690 tons, for a total production of 67,271,603 tons of by-product coke. This is an increase of 4,412,220 tons over the 1930 potential capacity of all by-product ovens in this country of 62,859,383 tons. A list of all by-product coke ovens in the United States giving their location and potential annual coal carbonizing and coke capacities is presented in the two tables which accompany this article.

## Broadens Knowledge on Plastic Working of Metals

(Concluded from Page 39)

this radial pressure, but hydraulic methods have proved most successful.

Auto-frettage may be defined as the process of automatically setting up the effects of shrinking a number of infinitely thin tubes or hoops over one another to make up the wall thickness of a cylinder or tube in such a manner that the inner layers are in states of residual compression and the outer layers in states of residual tension.

These effects, stated Mr. Woldman, are produced in a monoblock cylinder or tube by the application and release of a radial pressure on the bore, which pressure, during its application, sets up an overstrain in some or all of the layers in the wall. In other words, the condition of auto-frettage is produced by the application and release of a high liquid pressure in the bore, which in turn sets up a positive permanent deformation in some or all of the layers in the metal walls of the cyl-

inder or tube. The internal hydraulic pressure expands the cylinder until practically all the metal has been stressed beyond its elastic limit.

The metal at the bore is deformed the most, and having yielded plastically, attempts to maintain its permanent set, but those outer layers, which have been stressed within the elastic range, attempt to return to their original dimensions, thereby compressing the inner layers. The outer layers retain part of their tangential tension, while the inner layers take on a tangential compression. The greatest compression is at the bore, the greatest tension is at the outer surface, and somewhere near the middle of the wall, there is metal free from tangential stress.

Cylinders of uniform exterior and bore diameter may be auto-frettaged in one loading. With tapered outside and uniform bore, it is necessary to expand one portion of the length, then expand a second length, and so on for all sections of different wall thickness, until the cylinder is expanded its length.

Fig. 13 shows a gun manufactured by the auto-frettage process and Fig. 14 shows the schematic arrangement of equipment used in the process.

## Commercial or Gas Plants

Name of Company	No. of Ovens	Kind of Oven	Annual Capacity, Net Tons Coal                      Coke	
Alabama By-Products Corp., Tarrant, Ala. ....	100	Koppers	669,000	468,300
	49	Koppers-Becker	500,000	350,000
Battle Creek Gas Co., Battle Creek, Mich. ....	18	Koppers-Becker	88,700	62,100
Brooklyn Union Gas Co., Brooklyn, N. Y. ....	90	Koppers-Becker	800,000	560,000
Central Illinois Elect. & Gas Co., Rockford, Ill. ....	21	Koppers-Becker	105,000	73,500
Central Indiana Gas Co., Muncie, Ind. ....	22	Klonne	40,000	28,000
Citizens Gas & Coke Utility, Indianapolis, Ind. ....	41	Semet-Solvay	224,475	168,356
	120	Wilputte	1,080,000	760,000
Connecticut Coke Co., New Haven, Conn. ....	61	Koppers-Becker	416,000	291,200
Consolidated Gas Co., Hunt's Point, N. Y. ....	111	Koppers-Becker	960,000	672,000
Consumers Power Co.:				
Flint, Mich. ....	29	Koppers-Becker	135,500	100,050
Jackson, Mich. ....	26	Koppers-Becker	85,000	63,700
Saginaw, Mich. ....	19	Koppers-Becker	72,000	65,550
Diamond Alkali Co., Alkali, O. ....	46	Koppers-Becker	431,430	303,021
Domestic Coke Corp., Fairmont, W. Va. ....	60	Koppers	400,000	280,000
E. I. du Pont de Nemours & Co., Belle, W. Va. ....	92	Wilputte	670,000	470,000
Empire Coke Co., Geneva, N. Y. ....	46	Semet-Solvay	146,000	102,200
Hudson Valley Coke & Products Corp., Troy, N. Y. ....	55	Foundation	540,000	380,000
	31	Koppers-Becker	266,000	186,000
Indiana Consumers Gas & By-Prod. Co., Terre Haute, Ind. ....	60	Koppers	400,000	280,000
Laclede Gas Light Co., St. Louis ....	56	Koppers	320,000	224,000
	8	Plette	40,000	28,000
Lynn Gas & Electric Co., Lynn, Mass. ....	11	Koppers-Becker	54,000	37,800
Michigan Alkali Co., Wyandotte, Mich. ....	39	Koppers-Becker	324,000	226,800
Milwaukee Coke & Gas Co., Milwaukee ....	80	Semet-Solvay	343,000	240,100
	100	Koppers	679,000	475,300
Koppers Gas & Coke Co., St. Paul ....	65	Koppers	400,000	280,000
Eastern Gas & Fuel Associates ....	200	United-Otto	325,000	228,000
	55	Wilputte	372,000	260,610
	149	Koppers-Becker	1,117,000	800,000
North Shore Coke & Chemical Co., Waukegan, Ill. ....	31	Koppers-Becker	165,000	115,500
Northern Indiana Public Serv. Co., Fort Wayne, Ind. ....	19	Koppers-Becker	94,300	65,000
Peoples Gas, Light & Coke Co., Chicago ....	5	Koppers-Becker	800,000	600,000
	100	Koppers		
Public Serv. Elect. & Gas Co., Camden, N. J. ....	37	Koppers-Becker	205,000	142,000
	37	Koppers	205,800	144,100
Philadelphia Coke Co., Philadelphia ....	74	Koppers-Becker	728,000	509,600
Philadelphia Suburban Gas & Elect. Co., Philadelphia ..	25	Roberts	165,000	120,500
Providence Gas Co., Sassafras Point, R. I. ....	40	Koppers	240,000	168,000
	25	Koppers-Becker	188,000	131,600
Rochester Gas & Elect. Corp., Rochester, N. Y. ....	60	Koppers-Becker	274,000	191,800
	37	Koppers-Becker	164,000	114,800
Koppers Gas & Coke Co., Kearny, N. J. ....	165	Koppers	1,200,000	840,000
Seattle Lighting Co., Seattle ....	20	Klonne	70,000	42,350
Semet-Solvay Co.:				
Detroit ....	216	Semet-Solvay	1,423,000	1,081,000
Buffalo ....	120	Semet-Solvay	1,053,000	795,000
Ensley, Ala. ....	240	Semet-Solvay	730,000	547,000
Tennessee Prod. Corp., Alton Park, Tenn. ....	24	Semet-Solvay	175,000	125,000
Utica Gas & Electric Co., Utica, N. Y. ....	42	Koppers-Becker	200,000	110,000
Wisconsin Public Serv. Co., Sheboygan, Wis. ....	15	Koppers-Becker	45,000	31,500
Worcester Gas Light Co., Framingham, Mass. ....	15	Koppers-Becker	47,523	33,266
Total .....	3,207		20,175,728	14,372,603

# POWER DRIVES

## Makes Photomicrographs of Belting Under Tension Through Glass Cylinder

**E**NGINEERS have known that certain belts grip a pulley better than others, but by the ingenious use of a Zeiss Contax camera and a glass cylinder, H. V. Schieren of the Charles A. Schieren Co., New York, has been able to observe the gripping quality of belts microscopically.

A glass cylinder was substituted for the pulley over which the belt to be observed normally ran and then one side of the cylinder was broken out. With an extension tube over the lens, the camera was able to come as close as necessary to the under side of the belt. Normal tension of 36 pounds was placed on a 1-inch belt, and observations were made.

Photographs effectively demonstrate, according to Mr. Schieren, that when under tension the pores in the leather, normally deep and

close together, become shallower and farther apart. The areas in between, called hummocks, are forced up against the pulley, gripping it like a vacuum cup. As a result of this work, Mr. Schieren believes flexibility and clean pore structure are the important elements contributing to the gripping power of a belt.

♦ ♦ ♦

### Organize Spare Equipment

Storage of spare equipment in many plants is simply an accumulation of miscellaneous parts thrown into piles. To find a needed piece of equipment requires sorting and measuring, with no knowledge of probable success. Since spare parts are usually wanted in a hurry such sorting causes needless delay.

When anything is put in storage

chalking the size on it requires only a minute. When this is done it is easy to check over a pile of pulleys, for example, to see if the size wanted is available.

A better and more complete plan is to keep a card record of such stock on hand. These cards carry quantity on hand, all dimensions, type, style, make, and any other data which will identify the item. Where storage shelves or bins are not available the equipment may be arranged in neat piles which also simplifies search. If storage shelves or bins are installed and the stock is large the location is also entered on the cards.

In large plants stocks of repair and replacement parts are often carried on perpetual inventory records similar to the method of handling general stores. It is advisable to keep repair parts for a type of equipment grouped closely together; to do so simplifies checking and finding.

Even the "scrap pile" of obsolete and tentatively junked equipment may be organized and recorded in the same manner with similar time saving advantages.

♦ ♦ ♦

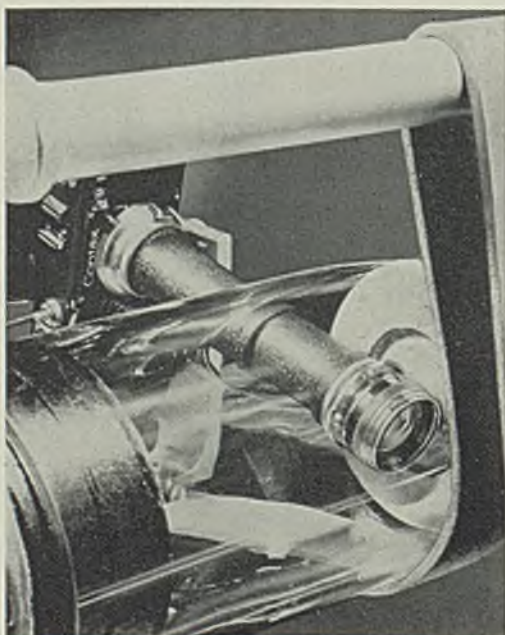
Adjustable rims for fiber pulleys permit quick change of pulleys for adjustments in speed. The hub with a flange remains keyed to the shaft. Loosening of four bolts permits removal of the rim, much similar to the quick change of an automobile wheel instead of removing only the tire.

♦ ♦ ♦

Punch presses and other equipment with large diameter flywheels or pulleys may be provided with fiber pulley lagging, either solid or split. This increases the diameter of the flywheel, but most such pulleys will operate better with this change.

♦ ♦ ♦

Quality and regularity of servicing is necessary with even the most suitable lubricants to keep maintenance costs low.



**M**ICROPHOTOGRAPHS of under side of leather belting under tension were made in this manner, using a glass cylinder

# PROGRESS IN STEELMAKING

## Instrument Measures Temperature of Steel Billets while in Motion

IN ROLLING mill operation, temperature has a direct bearing on the physical and metallurgical properties of the steel and on the cost of production. Control of temperature within tolerable limits is based almost wholly upon accurate measurement. An instrument recently developed provides mill attendants adequate means of measuring rolling temperatures accurately.

The device includes three components, namely, a thermophotronic tube, a potentiometer amplifier and a recorder. For rolling applications the thermophotronic tube is focused on the hot steel billets. The photronic cell reacts to the thermal spectrum of the steel by generating a small electromotive force, which is measured, amplified, and recorded in terms of temperature.

The photronic cell is affected by the thermal spectrum only. It follows variations in radiant flux instantaneously, thus obviating any lag at the cell. It differs from the optical pyrometer and pyrometers that depend upon radiation in that there is no mass of metal, however small, to change in temperature and thus introduce lag between the temperature change and its effect on the sensitive part of the instrument.

### Current Is Amplified

The current generated by the photronic cell is measured potentiometrically and then amplified. The potentiometric system employed maintains continuous balance and supplies an amplified current directly proportional at all times to the value of the applied voltage, with no energy drawn from the photronic cell. While the amplifier is truly a potentiometer, it contains no standard cells, and its accuracy is dependent entirely upon standard resistors placed in its measuring circuit. With the exception of the mirror galvano-

meter there are no moving parts, no motors, no cams or bearings.

The recorder is a direct marking milliammeter with its scale and chart calibrated directly in units of temperature based on the spectral response of the photronic cell located in the thermophotronic tube. It has a specially adapted high-speed cobalt magnet movement, designed to give the highest torque and speed of operation consistent with proper damping characteristics. A relay built into the instrument serves to stop the clock mechanism when the indication reaches the lower limits of the scale.

The instrument, known as the Instagrapher and shown in the accompanying illustration, is made by the Bristol Co., Waterbury, Conn.

## Gage Indicates Oil Supply

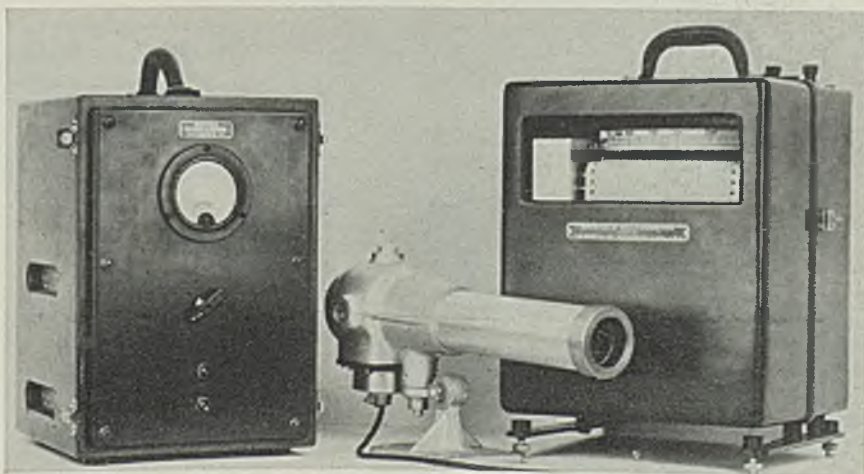
Consumers of fuel oil will be interested in a remote reading gage which has just been marketed for

use on fuel-oil tanks. The device consists of a tank unit with a float, an instrument case and an exterior signal light. The instrument case, mounted inside the building is equipped with a dial on which a reading of the number of gallons of oil then in the tank appears when a switch is turned on. A neon glow bulb also is provided which automatically lights when the contents of the tank reach a predetermined low level. This light remains lit until the supply of fuel oil has been replenished. The signal light on the exterior is provided for the purpose of warning when the storage tank is full.

♦ ♦ ♦

## Tight Joints Are Effected

Finely divided metallic lead now is being marketed for use on all types of pipe threads, nuts, flange joints, studs and gaskets. By its application a lead gasket is formed as well as an effective seal under all necessary pressure and temperature conditions. The product will not gall under high temperature. Joints may be broken apart easily months later. The material may be used on acid, oil, gas, air, steam, ammonia and alkali lines at iron, steel and by-product coke plants.



Components of the temperature measuring system include the potentiometer amplifier (left), the thermophotronic tube (center) and the recorder (right)

# NEW EQUIPMENT

## Double Seamer—

E. W. Bliss Co., Brooklyn, N. Y., is offering to the canning trade a new and improved high speed double seamer with a nonspill can feed and marking device. The new machine is designed to handle the range of sizes from No. 1 to No. 3 cans and is arranged with a V-belt motor and drive. As furnished, this machine closes tops on filled one-quart cardboard body oil cans. The speed of the seamer is dependent upon how fast the fillers can supply filled bodies through it and can be operated as high as 175 to 200 per minute on this work. In seaming the bottoms of empty tin bodies, this seamer is being operated at a speed of around 300 per minute while for seaming the bottoms of empty cardboard bodies, the speed is around 250 or better.

• • •

## Elevating Trucks—

Baker-Raulang Co., Cleveland, has just announced the production of a complete line of gasoline-powered elevating platform trucks in capacities of 3, 4, and 5 tons. The engine is the Hercules type IXB developing 46½ horsepower at 3200 revolutions per minute with Electric-Autolite starting and ignition equipment and

**Baker gasoline-powered elevating platform truck with capacity up to 5 tons**



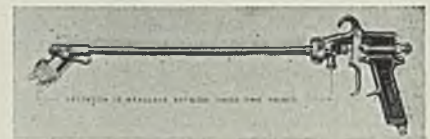
a Zenith carburetor which is fitted with an automatic governor. An air cleaner and flame arrestor is provided on the carburetor and an oil filter is used in the lubricating system. The clutch is a standard automotive type 3 inches in diameter and the transmission provides 2 speeds in both directions. From the transmission a short propeller shaft with two needle bearing universal joints leads to the regular Baker worm drive axle which is fully sprung to eliminate road shock. Frames are of high carbon steel strongly riveted and arc welded and having ample cross bracing to give a high factor of safety without excess weight. A single trailing axle is provided on the 3-ton truck while the 4- and 5-ton trucks have dual trailing axles which are fully compensating and articulated

in both longitudinal and transverse directions to permit smooth running over rough floors. Steering operates on all wheels and is actuated by a vertical hand wheel and all the steering rod clevises have needle bearings to give easy steering under full load on all types of flooring.

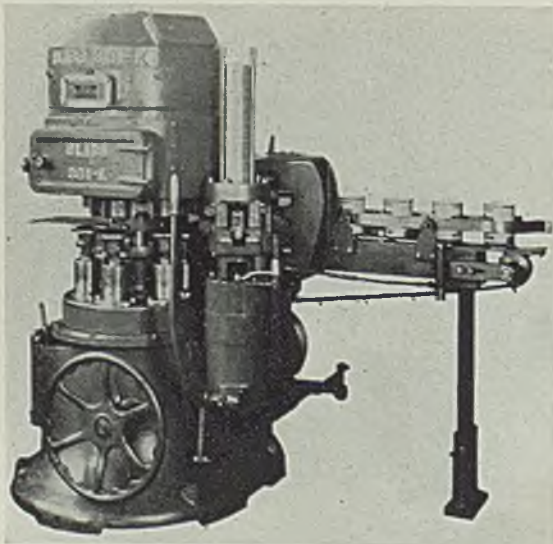
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## Extension Spray Gun—

Binks Manufacturing Co., 3114 Carroll avenue, Chicago, is now offering the Thor Model 7 spray gun with a variety of extension arms. The purpose of this new device is to make accessible places where standard production guns will not



**Binks extension for spray guns is designed to enable operators to insert the nozzle in inaccessible locations**



**Bliss high speed double seamer designed for closing tops of cans**

reach. Extensions vary in lengths from 12 to 30 inches. Where longer extensions are needed, special models will be made up to order. Standard models are offered in five different styles: Straight, 45 degrees, 90 degrees, internal and external atomization type and a circular extension spray for spraying the inside of pipes, barrels and the like. Extension heads may be swiveled in any desired direction. Needle valve

seats in material nozzle are the same as on standard production guns.

♦ ♦ ♦

**Locomotive Crane—**

Industrial Brownhoist Corp., 4403 St. Clair avenue, Cleveland, has recently announced a heavy-duty crane with capacity of 40 tons in free-running order and 50 tons with outriggers in place. Included in the features of this new Industrial Brownhoist machine are a two-speed hoist mechanism; four travel speeds with top speed of 15 miles per hour; means of disengaging crab when

back from the thrust of the cut. Boring heads are furnished with blades of high speed steel, stellite or tipped with cemented carbide fitted into housings of forged and heat treated alloy steel. The shape of the blade makes it particularly economical for cutters with stellite blades.

♦ ♦ ♦

**Drilling Machine—**

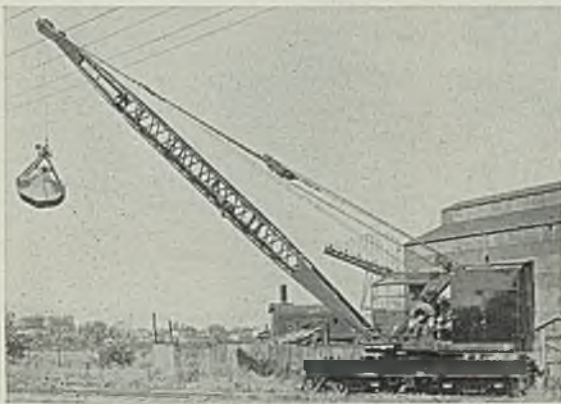
Barnes Drill Co., Rockford, Ill., announces a new specialized unit for piston pin hole drilling, reaming and boring. The tool illustrated herewith is the No. 201 1/4 standard ma-

has a built-in base and receptacle for the hand indexing rotating table, surrounded by a coolant and chip channel with a chip sweeper, which constantly pushes the chips around to the rear where they drop into a receptacle underneath the column and are accessible from the rear of the machine. There is a 4-station fixture so that during the machining operations on the 3-spindle head the operator loads the spare station in front. Fixtures are made so they will take in more than one diameter of pistons, chucking on the recess in the skirt and against the point center of the piston. The machine is equipped with six changes of gear speeds and six changes of feed speeds. Coolant pump is attached directly to the end of the drive shaft with a jaw clutch for engaging or disengaging as desired. The standard machine has a swing of 20 inches and a capacity of 1 1/4-inch high speed twist drill in mild steel.

♦ ♦ ♦

**Locating Device—**

Fisher Research Laboratories Sales Co., 45 Rockefeller Plaza, New York, announces a new instrument for the purpose of locating buried pipes, cables and other objects made of metal. The device also measures their depth and permits mapping under-ground metallic systems with their branches in supplementary equipment. The instrument is known as the M-Scope and it is



**Industrial Brownhoist No. 9 heavy duty crane of 50-ton capacity**

crane is traveling; oil-type cases enclosing travel gears under car; one-piece steel casting for crane crab and engine mounting; helical worm gear drive mounted on anti-friction bearings and running in oil bath.

♦ ♦ ♦

**Core Drills—**

Ingersoll Milling Machine Co., Rockford, Ill., announces its ray blade is now applicable to boring tools either in core drills or in ream-

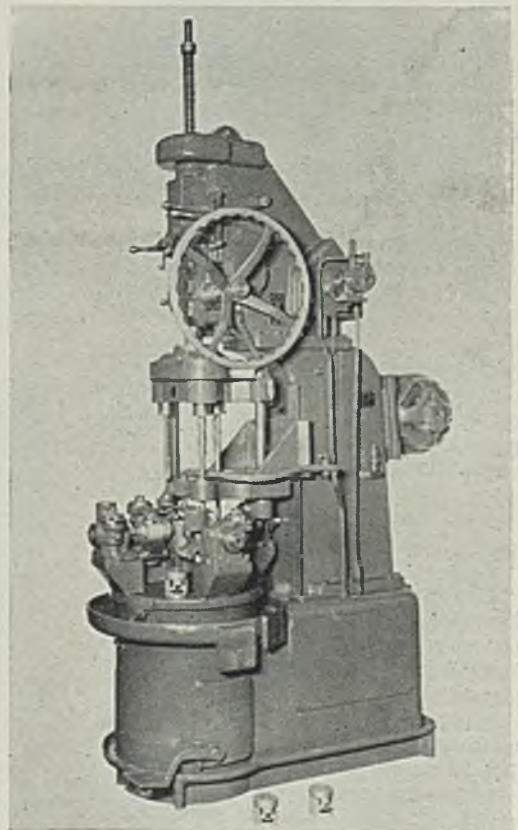


**Ingersoll ray blade core drills and reamers made with solid shank or shell type**

chine equipped with a gooseneck column for greater swing. Spindle is fitted with a special auxiliary head with three spindles. The machine

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**Barnes special drill for piston pin drilling, reaming and boring is a conversion of the new standard model recently announced by that company**

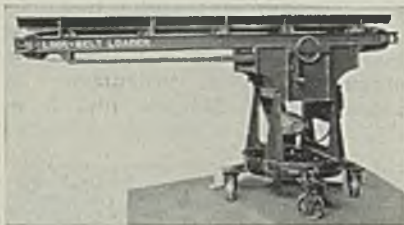


ers, made with solid shank or of the shell type. The double tapered ray blades are positively locked against the thrust of the boring cut. When worn they are easily reset any amount outwardly or forward. Blades are locked in the cutter housing with a compensating serrated wedge. Blade is tapered along its length so it will not push down or

claimed that with this instrument, surveys can be made readily, records checked and errors corrected. Lost lines, valves, manholes and the like can be located; unrecorded and illicit connections can be discovered and stealing of water, gas and oil can be detected and stopped, according to company claims. The device consists essentially of two specially designed radio units, a transmitter and a receiver. Practically all parts of the device are standard radio equipment and can be repaired or replaced by any competent radio man. Energy for the units is supplied by standard dry cells which last several months in normal service. The complete equipment in a carrying case weighs about 22 pounds.

#### Box Car Loader—

Link-Belt Co., 2045 W. Hunting Park avenue, Philadelphia, announces the development of a new type box car loader for handling bulk material with a minimum of dust in the loading operation. An anti-friction belt conveyor constitutes the loading element of the machine. It is supported on a hori-



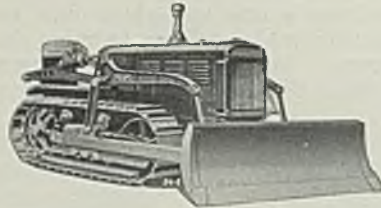
Link-Belt box car loader handles bulk materials with a minimum of dust

zontal boom which is arranged so it can be racked back and forth or rotated 360 degrees by hand. The conveyor is operated at a comparatively slow speed, and has a discharge height of 5 feet. The machine is mounted on four large swiveling casters, and it is possible for three men to move the machine in and out of the cars.

#### Bulldozer—

Bucyrus-Erie Co., South Milwaukee, Wis., has recently placed on the market a new bulldozer and bulldozer. These machines are designed for efficient work in dirt moving performance on varied jobs such as in grading highways, working in mines and quarries, building airports and working on large dam projects. The machine illustrated herewith is the bulldozer which is

a double purpose unit used for either grading or bulldozing. The blades may be angled quickly to the right or left for continuous side casting or it may be set straight across for bulldozing. The blade may also be tilted for filling, terracing or establishing a grade. A box-welded frame eliminates the need for a rubbing plate, according to the company, and transmits the

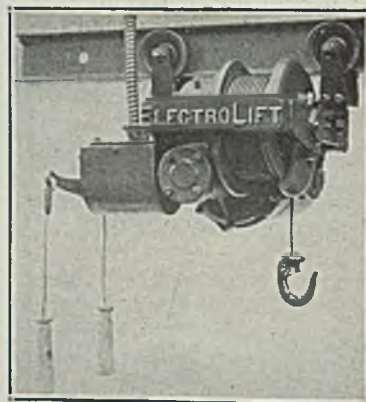


Bucyrus-Erie bulldozer is equipped with a versatile blade which can be set in any position

full load from the blade to the tractor frame at the two-points designed to take it. Twin hydraulic cylinders power the blade action of the machine and operate at an oil pressure of 350 pounds maximum. The blade is controlled by a single lever, conveniently placed for the operator. Blade travel speed is 32 inches in 3 seconds, and automatic release ports cut off power when the blade reaches its maximum or minimum position.

#### Close Headroom Hoist—

Electro Lift, 30 Church street, New York, has recently announced a new high speed, close headroom, junior type hoist which has a hoisting speed of 60 feet per minute and is built in sizes of 250 pounds and 500 pounds. This new hoist is particularly useful for handling all loads in volume production. The hoist has worm drive with worm and wheels running on tapered roller bearings, fully enclosed within the



Electro Lift close headroom junior type for high speed operation

geared case and operating in a bath of oil. The motor has ball bearings and is directly attached to the hoist frame, giving a compact arrangement. This hoist has close headroom between hook and overhead track. The control may be either rope type or push-button type, the latter giving accurate control of the lead by jogging.

#### Truck Caster—

Divine Bros. Co., Utica, N. Y., announces a new line of swivel and rigid truck casters known as the Lo-Wate series. A medium duty caster, the unit is built with a single ball race to function under the load. Offset of the wheel from center line is calculated to provide easy swivelling. Slotted bolt holes give a flexible range for attachment. Top plate and fork are smooth machine castings of alloy iron. Plain bore iron wheels have a rivet type axle bolt, while non-metallic or roller



Divine Lo-Wate truck caster, supplied in either rigid or swivel type

bearing wheels have a nut and bolt axle with steel spanner bushing. Casters are permanently rust-proofed by the Parkerizing process. Wheels are available in solid iron, canvas-cushioned steel, molded plastic or live rubber. Roller bearings or bronze bushings can be supplied.

#### Unit Heater—

Trane Co., La Crosse, Wis., announces a new quiet operating vertical type unit heater designed for special applications in factories, garages, and similar installations where heated air is to be spread over large areas. The model VS unit is available in 28 sizes and with four difuser arrangements for the wide spread of heat. It is also equipped with the cradle coil feature which eliminates expansion and contraction strains on the heating element.

#### Temperature Controls—

Jefferson Electric Co., Bellwood, Ill., has just placed on the market a line of temperature controls for industrial and domestic applications. All types incorporate the same principle of operation; a bimetallic element which actuates a mercury switch. This mercury switch is un-



breakable, the case being of metal instead of glass and completely sheathed in molded Bakelite. The new features of design assure a useful life of many millions of operations with constantly uniform regulations and extreme accuracy on close operating differentials, it is claimed. Cases are of one-piece construction finished in crackled art lacquer, with easily readable outside dials and attractively knurled regulating knobs. Air Switch, Catalog No. 634-321, is illustrated here. This type is designed for applications requiring remote control of the heating plant and regulation of the plant by room temperature, or



Jefferson temperature control, air-switch type

the temperature of any body of gas. Range of adjustment is 25 to 85 degrees Fahr. Dimensions 5 x 3 x 2 3/4 inches.

#### Tool Post Grinder—

Metallizing Co. of America, 1351 East Seventeenth street, Los Angeles, Calif., has recently developed a new tool post grinder especially designed for grinding sprayed metal coatings. The machine is also suitable for all general types of grinding, and is powered by a 1 1/2 horsepower constant duty, 40-degree, motor unit designed for operation on 50 or 60-cycle 3-phase current. Motor speed is 3600 revolutions per minute. For use with sprayed metal coatings developed by this company, special grinding wheels are applied. A diamond dressing tool is included.

#### Pressure Regulator—

Linde Air products Co., New York, has just announced the series of three new regulators providing accurate oxygen and acetylene regulation through the entire range of welding and cutting operations. All three regulators are of two-stage construction, essentially identical in basic design, and offer the utmost and precise, efficient special control, it is claimed. The R-64 oxygen regulator is designed to operate with extreme precision in all welding and cutting operations requiring oxygen

pressure up to 75 pounds per square inch. The type R-65 oxygen regulator is designed for heavy-duty cutting operations, which may require oxygen pressure as high as 200 pounds per square inch. This model can also be used for welding since sensitive adjustment is carried throughout its entire pressure range. The type R-66 acetylene regulator is companion piece for either of the oxygen regulators and will give accurate acetylene regulation for all welding and cutting operations, according to the company. Valves are stem operated and close with the

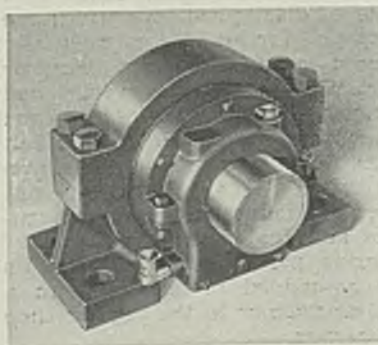


Linde regulators provide pressure regulation for oxygen and acetylene

incoming pressure. Included in these new models are sensitive rubber diaphragms and self-contained first stage valves.

#### Pillow Block—

Fafnir Bearing Co., New Britain, Conn., is now producing a special roller bearing pillow block for service involving heavy end thrust in addition to the radial load. In the new pillow block, a separate heavy-duty ball bearing to take the thrust load is included as an integral part of the assembly. Arrangement of the bearings is such that the entire radial load is taken by the roller bearing, while all the forces tending to displace the shaft axially are borne by the ball bearings. The housing is of the two-part type, which simplifies assembling. It is oil tight and equipped with a leveling device for oil lubrication.



Fafnir roller bearing pillow block equipped with ball bearing for taking thrust loads

The roller bearing itself is of the special type recently developed using an increasing number of solid rolls. Pillow blocks are now available for shaft sizes ranging from 3 5/16 to 10 inches, and with radial load capacities up to 250 tons.

#### Socket Sets—

Bonney Forge & Tool Works, Allentown, Pa., has recently added two new socket sets to its line of these tools. One set, No. D, includes an assortment of ten sockets for 1/2-inch square drive and a ratchet handle with lug. The sockets have double-hexagon openings ranging in size from 7/16-inch to 1 inch. All parts are made of chrome-vanadium steel, chromium plated and with heads buffed to a high, permanent luster. The No. D1 set is identical with the No. D set except that it is supplied with a 15-inch hinge handle instead of ratchet.

#### Taper Cutting Die Head—

Landis Machine Co., Waynesboro, Pa., has recently placed on the market a special heavy duty taper cutting die head for handling threads of large diameter, each taper an extra length. This new device augments the lines of die heads previously manufactured in sizes up to



Landmatic die head for heavy duty taper cutting work

4 inches. The head is of the 6-Chaser type and was designed for threading parts used in the oil industry, such as tool joints, drill stems and the like. The new head is a stationary type adapted for use on a heavy duty turret lathe. This die head can be supplied for cutting various diameters, tapers, and thread lengths. It was primarily designed for cutting 6-inch outside diameter threads, or pitch, 2-inch taper per foot in 5-inch length of thread. The same head can also be adapted for cutting 5 1/2-inch outside diameter threads, or pitch, 3-inch taper per foot, 4 3/4 inches long and 4 3/4 inches outside diameter thread, or pitch, 3-inch taper per foot and 4-inch long thread.

## 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.

**Materials Handling**—Cleveland Crane & Engineering Co., Wickliffe, O. Folder illustrating unusual overhead materials handling devices.

**Porcelain Enamel**—Porcelain Enamel & Mfg. Co., Baltimore, Md. Brochure containing comments of customers on savings derived from purchasing of Pemco enamels.

**Combustion Tube Furnaces**—Hevi Duty Electric Co., Milwaukee. Bulletin No. HD-1236, describing its new line of combustion tube furnaces, giving detailed specifications.

**Voltage Regulator**—Allis-Chalmers Mfg. Co., Milwaukee. Folder describing a new line of larger rocking contact voltage regulators, designated as type "J," for the control of large synchronous machines.

**Cutting Oils**—Swan-Finch Oil Corp., 205 East Forty-second street,

New York. Folder illustrating four typical uses for cutting oils and enumerating several points on which savings may be effected.

**Graphic Instruments**—Esterline-Angus Co., Indianapolis, Ind. Bulletin No. 1036, describing the methods and results of engineering a steel and wire plant with graphic instruments.

**Metal Cutting**—Texas Co., 135 East Forty-second street, New York. Booklet, volume 22, No. 11, a technical publication devoted to metal cutting and the selection of cutting fluids.

**Diesel Engines**—Busch-Sulzer Bros.-Diesel Engine Co., St. Louis. Two folders, one picturing installations of diesel engines in boats, the other in modern locomotives. Sizes range from 225 to 10,000 horsepower.

**Industrial Ovens**—Gehrich Corp., Long Island City, N. Y. Bulletin No. 103, claiming improved baking of japan, enamel, lacquer and synthetic resin finishes, employing the fuel, heating and handling system best suited for varying requirements; bulletin No. 102, covering ovens, dryers, and air heaters for industrial baking drying and heat treating operations.

**Shovels**—Link-Belt Co., 300 West Pershing road, Chicago. Booklet No. 1795, picturing the advantages of Speed-o-Matic hydraulic power control of mechanical operations of crawler shovels, draglines and cranes. Speedier operation, greater output, elimination of operator fatigue, are features claimed for the new control. Data book No. 125, on Siliverstreak silent chain drives from fractional, up to 2000 horsepower.

## Handling in Rail Car Building

(Concluded from Page 44)

a heavy forming hand hammer and a leather covered sand bag. The craftsman strikes the metal and tries it on the form until the correct shape is nearly achieved. The next step is the forming with lighter hammers and a dolly block. The piece is then taken to a trip or power hammer, where the metal is either stretched or shrunk over dies to fit the exact shape. The other sections are put through similar operations and when finished are held together temporarily by means of screws or bolts and nuts; subsequently they are joined by seamwelding. The weld line is filed and straightened until the roof has a true shape free of bumps. It is next polished with emery wheels and oiled and placed aside until required.

Side panels are made in similar manner except in the case of the rear quarter window, which is made over a hard wood form with a steel backing.

The first operation in producing the outside panel is to secure the desired blank. This is trip ham-

mered to the correct shape and taken to a beading machine turned by hand power. With the aid of rolls, made to fit the beads beforehand, the beads are formed into the panels. The window opening is next put into the panel by means of a hard wood form. Flanging of the outside edge, or clinching the flange, and the addition of lock cylinder and lock handle holes complete the operations on the panel. The flange is made over steel blocks bent to the desired shape.

Inside panels require additional operations, it being necessary to add depressions, offsets and holes for locks, remote controls, window regulators and lighting holes. To add the beads, it is necessary to have a form which is made of a piece of steel plate into which the metal is worked. Door rails are formed over a wooden hammer form. The corners are welded and finished, hinge screw holes and check strap cutout added; also bolt holes, lock formations and dove-tail offset. If any irregular surfaces are found, these are straightened and final finish is added.

Inside parts and reinforcements are assembled to the units in a similar manner to the regular shop production.

After the various units are finished, they are taken to an assembly buck where the base plate contains bolts similar to the cus-

tomers' body bolt locations. The assembly of the units then takes place. The cowl, dash pan, toeboard, header and posts are welded into a complete front end. These in turn are welded to the side panel unit. Doors are hung with great exactness, and other details are added. The roof is applied and the major units are welded together to make a complete body. Final finishing, straightening and polishing are added to make sure that there are no low spots, dinges or deep file scratches which would mar the body when painted.

Commenting on this building of experimental bodies in the old craftsmanship fashion, the Budd representative says: "It is with great satisfaction that our steel artificers have produced a body out of a flat sheet of metal, not with the aid of heavy presses, countless operations on various type machines, but by their skilled hands."

This description of the experimental work in one department is mentioned because it is fundamental in the Budd system of manufacture. It is why it is safe to say that the near future is going to see many innovations in materials handling operations to keep a free flow of materials through to the new departments, as well as to smooth out any kinks that are now bothersome in the general distribution of parts and materials.

# Steelmaking Rate Rises Despite Auto Strike

## Other Users Given

## Better Deliveries;

## Car Output Larger

**S**TEEL mills are feeling less effect than had been expected from labor troubles in the automotive industry. Due to unusually heavy backlogs and pressure for delivery of steel sheets and strip to other consumers mills are able to continue capacity operation and shift deliveries while awaiting resumption by automobile manufacturers. Only prolonged and widespread interruption of demand for automobile steel will cause reduction in steel production.

While some makers of parts have stopped production others are building up banks in anticipation of heavy demand when labor troubles are past.

In spite of adverse conditions the steel industry raised its percentage of operation from 79 to 79½ last week. Pittsburgh district increased from 77 to 80 points; Wheeling 92 to 94; Cleveland 77 to 80; Birmingham 74 to 76; Eastern Pennsylvania 52 to 53; New England 75 to 85. Buffalo, Chicago and Youngstown held unchanged and Detroit dropped from 100 to 95.

Automobile production last week totaled 96,780 units, compared with 71,800 units the week preceding. While General Motors is turning out fewer cars, due to labor trouble, others, notably Ford and Chrysler, have increased their output.

Structural lettings totaled 16,544 tons, compared with 33,736 tons the preceding week. The latter tonnage was due to closing of numerous projects seeking protection before Jan. 1. The corresponding week last year saw 20,075 tons placed. The largest tonnage was 6700 tons for transmission towers for Los Angeles, booked by Bethlehem Steel Co. Reinforcing bars accounted for 6215 tons last week, compared with 465 tons the week previous. A year ago the total was 2440 tons.

Railroads continue to furnish a comfortable tonnage to steel mills. In the past week 9016 cars, 28,000 tons of rails and 21 locomotives have been placed. Pending railroad needs include more than 6000 cars.

Reflection of world demand for steel is noted at far inland as the Youngstown, O., district. Inquiries for 5000 tons of billets for an English consumer, usually supplied by Belgian mills, and for 1000 tons of bars for delivery in Turkey, usually taking German steel, have been received but domestic needs forbid their consideration.

Scrap is reacting to the labor situation by an easier

### MARKET IN TABLOID

**DEMAND** . . . . . *Strong in all lines.*

**PRICES** . . . . . *Scrap index advances 29 cents.*

**PRODUCTION** . . *Operations rise ½ point*

**SHIPMENTS** . . . . *Steady.*



feeling in most districts, which is not strong enough to affect prices adversely, since supplies are not large. In the East where effects of automotive difficulties are felt less than in the Middle West an advance was made in steel grades. Accumulation of cast scrap to supply about 45,000 tons for tunnel segments for New York city is likely to have a strengthening effect on foundry scrap.

Steel ingot production in December was the largest for that month in the history of the steel industry, with 4,431,645 tons. Next highest is December, 1928, with 4,018,208 tons. Fourth quarter output was the largest for any final quarter in history and the largest for any three months period since third quarter of 1929. Average production for the year was at 68.52 per cent of capacity, compared with 48.54 per cent in 1935.

Foreign trade for November shows slight decrease in both imports and exports but for 11 months a slight increase. Scrap shipments abroad have declined sharply during the maritime strike. Manufactured steel in 11 months gained 222,740 tons over 1935 in the same period. Manufactured steel imports in the same period showed a gain of 123,505 tons.

Pig iron production in 1936 was 45.8 per cent greater than in 1935, at 30,682,704 tons, compared with 21,040,483 tons in 1935. December production was 3,125,192 tons, a gain of 5.9 per cent over November. These figures are the best made since 1930, going back to May of that year for a better month.

Due to an advance in Eastern Pennsylvania steel-making scrap STEEL's composite has advanced 29 cents to \$17.87, continuing the steady upward movement starting in mid-November. The same cause has advanced the iron and steel composite four cents to \$36.52. The finished steel composite remains unchanged at \$55.80.

# COMPOSITE MARKET AVERAGES

	Jan. 9	Jan. 2	Dec. 26	One Month Ago Dec., 1936	Three Months Ago Oct., 1936	One Year Ago Jan., 1936	Five Years Ago Jan., 1932
Iron and Steel ....	\$36.52	\$36.48	\$35.33	\$35.15	\$34.67	\$33.34	\$29.65
Finished Steel ....	55.80	55.80	53.90	53.90	53.90	53.70	47.28
Steelworks Scrap..	17.87	17.58	17.58	16.92	16.44	13.15	8.03

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	Jan. 9, 1937	Dec. 1936	Oct. 1936	Jan. 1936	Pig Iron	Jan. 9, 1937	Dec. 1936	Oct. 1936	Jan. 1936
Steel bars, Pittsburgh .....	2.15c	2.05c	2.05c	1.85c	Bessemer, del. Pittsburgh.....	\$22.31	21.8132	20.8132	20.81
Steel bars, Chicago .....	2.25	2.10	2.10	1.90	Basic, Valley .....	20.50	20.00	19.00	19.00
Steel bars, Philadelphia .....	2.49c	2.36	2.36	2.16	Basic, eastern del. East Pa. ....	22.26	21.8132	20.8132	20.81
Iron bars, Terre Haute, Ind. ....	1.95	1.95	1.95	1.75	No. 2 fdy., del. Pittsburgh.....	22.21	21.3132	20.3132	20.31
Shapes, Pittsburgh .....	2.05	1.90	1.90	1.80	No. 2 fdy., Chicago .....	21.00	20.50	19.50	19.50
Shapes, Philadelphia .....	2.25½	2.11½	2.11½	2.01½	Southern No. 2, Birmingham....	17.38	16.88	15.50	15.50
Shapes, Chicago .....	2.10	1.95	1.95	1.85	Southern No. 2, del. Cincinnati..	20.94	20.44	19.44	20.20
Tank plates, Pittsburgh .....	2.05	1.90	1.90	1.80	No. 2X eastern, del. Phila. ....	23.135	22.6882	21.6882	21.68
Tank plates, Philadelphia .....	2.23½	2.09	2.09	1.99	Malleable, Valley .....	21.00	20.50	19.50	19.50
Tank plates, Chicago .....	2.10	1.95	1.95	1.85	Malleable, Chicago .....	21.00	20.50	19.50	19.50
Sheets, No. 10, hot rolled, Pitts....	2.15	2.10	1.95	1.85	Lake Sup., charcoal, del. Chicago	26.54	26.2528	25.7528	25.25
Sheets, No. 24, hot ann., Pitts....	2.80	2.75	2.60	2.40	Gray forge, del. Pittsburgh .....	21.17	20.6741	19.6741	19.67
Sheets, No. 24, galvan., Pitts....	3.40	3.35	3.20	3.10	Ferromanganese, del. Pittsburgh.	84.79	82.65	80.13	90.13
Sheets, No. 10, hot rolled, Gary...	2.25	2.25	2.05	1.95	Scrap				
Sheets, No. 24, hot anneal., Gary..	2.90	2.90	2.70	2.50	Heavy melting steel, Pittsburgh..	\$18.25	\$18.55	\$18.15	\$14.50
Sheets, No. 24, galvan., Gary....	3.50	3.50	3.30	3.20	Heavy melt. steel, No. 2, east. Pa.	15.75	14.12½	13.95	11.37½
Plain wire, Pittsburgh .....	2.60	2.60	2.50	2.30	Heavy melting steel, Chicago....	17.75	17.00	16.25	13.40
Tin plate, per base box, Pitts....	5.25	5.25	5.25	5.25	Rail for rolling, Chicago .....	18.75	17.50	16.95	14.25
Wire nails, Pittsburgh .....	2.25	2.20	2.05	2.40	Railroad steel specialties, Chicago	19.25	19.00	17.75	14.45
Semifinished Material					Coke				
Sheet bars, open-hearth, Youngs..	\$34.00	\$32.00	\$32.00	\$30.00	Connellsville furnace, ovens.....	\$4.00	\$4.00	\$4.00	\$3.50
Sheet bars, open-hearth, Pitts....	34.00	32.00	32.00	30.00	Connellsville, foundry, ovens.....	4.25	4.40	4.25	4.00
Billets, open-hearth, Pittsburgh..	34.00	32.00	32.00	29.00	Chicago, by-product foundry, del...	10.25	9.75	9.75	9.75
Wire rods, No. 5 to ½-inch, Pitts..	43.00	40.00	40.00	40.00					

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

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

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

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

Reinforcing	
New billet, straight lengths, quoted by distributors	
Pittsburgh	2.25c
Chicago, Gary, Buffalo	
Cleve., Birm., Young	2.25c
Gulf ports	2.45c
Pacific coast ports f.o.b. car docks	2.45c
Philadelphia, del.	2.54c
Rail steel, straight lengths, quoted by distributors	
Pittsburgh	2.05c
Chicago, Buffalo, Cleveland, Birm., Young	2.10c
Gulf ports	2.30c

### Wire Products

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

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails \$2.25  
Cement coated nails \$2.25  
Galv. nails, 15 gage and coarser \$4.25  
do. finer than 15 ga. \$4.75 (Per pound)

Polished staples 2.95c  
Galv. fence staples 3.20c  
Barbed wire, galv. 2.75c  
Annealed fence wire 2.90c  
Galv. fence wire 3.30c

Woven wire fencing (base column, c. 1.) \$63.00

To Manufacturing Trade

Plain wire, 6-9 ga. 2.60c  
Anderson, Ind. (merchant products only) and Chicago up \$1; Duluth up \$2; Birmingham up \$3.  
Spring wire, Pitts. or Cleveland 3.20c  
Do., Chicago up \$1, Worc. \$2.

### Cold-Finished Carbon Bars and Shafting

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

10,000 to 19,000 lbs. 2.55c  
20,000 to 59,999 lbs. 2.50c  
60,000 to 99,999 lbs. 2.45c  
100,000 to 299,999 lbs. 2.42 1/2 c  
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 2.75c			
Alloy		Alloy	
S.A.E.	Diff.	S.A.E.	Diff.
2000	.025	3100	.055
2100	.055	3200	.135
2300	.150	3300	.380
2500	.225	3400	.320
4100	0.15 to 0.25 Mo.		.050
4600	0.20 to 0.30 Mo.		1.25-
	1.75 Ni.		.105
5100	0.80-1.10 Cr.		.045
5100	Cr. spring		base
6100	bars		1.10
6100	spring		.070
Cr., Ni., Van.			1.40
Carbon Van.			0.85
9200	spring flats		base
9200	spring rounds, squares		0.25

### Piling

Pittsburgh	2.40c
Chicago, Buffalo	2.50c

### Strip and Hoops

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

Hot strip to 23 1/4-in.

Pittsburgh 2.15c  
Chicago or Gary 2.25c  
Birmingham base 2.30c  
Detroit, del. 2.35c  
Philadelphia, del. 2.44c  
New York, del. 2.50c

Cooperage hoop,  
Pittsburgh 2.15c  
Chicago 2.25c

Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland 2.85c  
Detroit, del. 3.06c  
Worcester, Mass. 3.05c  
Cleve. Worces- Pitts. ter, Mass. 3.05c

Carbon  
0.26-0.50 2.85c 3.05c  
0.51-0.75 3.70c 3.90c  
0.76-1.00 5.45c 5.65c  
Over 1.00 7.50c 7.70c

### Rails, Track Material

(Gross Tons)

Standard rails, mill 39.00  
Relay rails, Pittsburgh, 20-100 lbs. 25.50-28.00

Light rails, billet qual.  
Pittsburgh, Chicago \$35.00  
Do., rerolling quality 34.00

Angle bars, billet, Gary, Pittsburgh, So. Chicago 2.70c  
Do., axle steel 2.10c  
Spikes, R. R. base 2.90c  
Track bolts, base 4.00c  
Tie plates, base 2.10c  
Base, light rails 25 to 40 lbs.; 50 to 60 lbs., inclusive up \$2; 16 and 20 lbs. up \$1; 12 lbs. up \$2; 8 and 10 lbs., up \$5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

### Bolts and Nuts

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

Carriage and Machine  
1/2 x 6 and smaller 70 off  
Do. larger 65-10 off  
Tire bolts 50-5 off

Plow Bolts  
All sizes 65-10-10 off

Stove Bolts  
In packages with nuts attached 72 1/2 off; in packages with nuts separate 72 1/2-5 off; in bulk 81 1/2 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts 60 off  
Elevator bolts 60 off

Nuts  
S. A. E. semifinished hex.:  
1/2 to 1 1/4-inch 60-20-5 off  
Do., 1/2 to 1-inch 60-20-5 off  
Do., over 1-inch 60-20-5 off

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

Square Head Set Screws  
Upset, 1-in., smaller 75 off  
Headless set screws 75 off

### Rivets, Wrought Washers

Structural, Pittsburgh, Cleveland 3.25c  
Structural, Chicago 3.35c

1/2-inch and smaller,  
Pitts., Chi., Cleve. 70-5 off

Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs. \$6 off

### Cut Nails

Cut nails, Pitts. (10% discount of size extras) \$3.40

Do., less carloads, 5 kegs or more, no discount on size extras... \$3.40  
Do., under 5 kegs, no disc on size extras... \$3.55

### Pipe and Tubing

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

### Welded Iron, Steel Pipe

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

Wrought pipe, Pittsburgh.

Butt Weld Steel			
In.	Blk.	Galv.	
1/4 and 3/8	60	44 1/2	
1/2	64 1/2	55	
3/4	67 1/2	59	
1-3	69 1/2	61 1/2	
Iron			
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	

Lap Weld Steel			
2	62	53 1/2	
2 1/2-3	65	56 1/2	
3 1/2-6	67	58 1/2	
7 and 8	66	56 1/2	
9 and 10	65 1/2	56	
Iron			
2	37	22 1/2	
2 1/2-3 1/2	38	25	
4-8	40	28 1/2	

Line Pipe Steel			
1/2, butt weld	56		
1/4 and 3/8, butt weld	59		
1/2, butt weld	63 1/2		
3/4, butt weld	66 1/2		
1 to 3, butt weld	68 1/2		
2, lap weld	61		
2 1/2 to 3, lap weld	64		
3 1/2 to 6, lap weld	66		
7 and 8, lap weld	65		
Iron			
1/2-1 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.			

12-inch, no extra.

Boiler Tubes			
C. L. Discounts, f.o.b. Pitts.			
Lap Weld Steel	Charcoal Iron		
2-2 1/4	33	1 1/4	8
2 1/2-2 3/4	40	2-2 1/4	13
3-3 1/4	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 1/4 to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and

per pound. Less-carloads revised as of July, 1, 1935, card.

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

### Seamless Tubing

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

### Cast Iron Water Pipe

Class B Pipe—Per Net Ton

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

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

### Semifinished Steel

Billets and Blooms  
4 x 4-inch base; gross ton  
Pitts., Chi., Cleve., Buffalo and Young \$34.00  
Philadelphia 39.30  
Duluth 36.00

Forging Billets  
6 x 6 to 9 x 9-in., base  
Pitts., Chicago, Buffalo 40.00  
Forging, Duluth 42.00

Sheet Bars  
Pitts., Cleve., Young, Sparrows Point 34.00

Slabs  
Pitts., Chicago, Cleveland, Youngstown \$34.00

Wire Rods  
1/2-inch incl. No. 5 to 1 1/4-inch incl. over 1 1/4 to 1 3/4-inch incl. 45.00  
Chicago up \$1; Worcester up \$2.

Skelp  
Pitts., Chi., Young, Buff., Coatesville, Sparrows Pt. 1.80c

### Coke

Price Per Net Ton  
Beehive Ovens  
Connellsville, fur. \$3.90-4.10  
Connellsville, fdry. 4.50-4.75  
Connell, prem. fdry. 5.50  
New River fdry. 6.00  
Wise county fdry. 4.45-5.00  
Wise county fur. 4.00-4.50

By-Product Foundry  
Newark, N. J., del. 10.17-10.60  
Chi., ov., outside del. 9.50  
Chicago, del. 10.25  
New England, del. 12.00  
St. Louis, del. 10.00-10.50  
Birmingham, ovens 6.50  
Indianapolis, del. 9.65  
Cincinnati, del. 9.75  
Cleveland, del. 10.30  
Buffalo, del. 10.50  
Detroit, del. 10.70  
Philadelphia, del. 9.85

### Coke By-Products

Spot. gal. Producers' Plants  
Pure and 90% benzol 16.00c  
Toluol 30.00c  
Solvent naphtha 30.00c  
Industrial xylol 30.00c

Per lb. f.o.b. Frankford  
Phenol (200 lb. drums) 15.50c  
Do., (450 lbs.) 14.50c

Eastern Plants, per lb.  
Naphthalene flakes and balls, in bbls., to jobbers 7.25c  
Per 100-lbs. Atlantic seaboard  
Sulphate of ammonia \$1.30  
†Western prices, 1/2-cent up.

## Pig Iron

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

Basing Points:	No. 2 Malle-		Basic	Besse-
	Fdry.	able		
Bethlehem, Pa. ....	\$22.00	\$22.50	\$21.50	\$23.00
Birdsboro, Pa. ....	22.00	22.50	21.50	23.00
Birmingham, Ala.†	17.38		16.38	21.50
Buffalo	21.00	21.50	20.00	22.00
Chicago	21.00	21.00	20.50	21.50
Cleveland	21.00	21.00	20.50	21.50
Detroit	21.00	21.00	20.50	21.50
Duluth	21.50	21.50		22.00
Eric, Pa.	21.00	21.50	20.50	22.00
Everett, Mass.	22.75	23.25	22.25	23.75
Hamilton, O.	21.00	21.00	20.50	
Jackson, O.	20.25	20.25	19.75	
Neville Island, Pa.	21.00	21.00	20.50	21.50
Provo, Utah	18.50		18.00	
Sharpville, Pa.	21.00	21.00	20.50	21.50
Sparrows Point, Md.	22.00		21.50	
Swedeland, Pa.	22.00	22.50	21.50	23.00
Toledo, O.	21.00	21.00	20.50	21.50
Youngstown, O.	21.00	21.00	20.50	21.50

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

Delivered from Basing Points:				
Akron, O., from Cleveland	21.76	21.76	21.26	22.26
Baltimore from Birmingham	22.58		21.46	
Boston from Birmingham	23.37		22.87	
Boston from Everett, Mass.	23.25	23.75	22.75	24.25
Boston from Buffalo	23.25	23.75	22.75	24.25
Brooklyn, N. Y., from Bethlehem	24.27	24.77		
Brooklyn, N. Y., from Bmghm.	24.05			
Canton, O., from Cleveland	21.76	21.76	21.26	22.26
Chicago from Birmingham	21.22		21.10	
Cincinnati from Hamilton, O.	20.82	21.58	21.08	
Cincinnati from Birmingham	20.69		19.69	
Cleveland from Birmingham	21.12		20.62	
Cincinnati from Hamilton, O.	21.07	21.79	20.07	
Mansfield, O., from Toledo, O.	22.76	22.76	22.26	22.26
Milwaukee from Chicago	22.00	22.00	21.50	22.00
Muskegon, Mich., from Chicago, Toledo or Detroit	23.90	23.90	23.40	24.40
Newark, N. J., from Birmingham	23.01			
Newark, N. J., from Bethlehem	23.39	23.89		
Philadelphia from Birmingham	22.38		22.26	
Philadelphia from Swedeland, Pa.	22.76	23.26	22.26	
Pittsburgh district from Neville Island				
Saginaw, Mich., from Detroit	23.25	23.25	22.75	22.75
St. Louis, northern	21.50	21.50	21.00	

Delivered from Basing Points:	No. 2 Fdry.	Malle-able	Basic	Besse-mer
St. Louis from Birmingham	†21.12		20.82	
St. Paul from Duluth	22.94	22.94		23.44

†Over 0.70 phos.

### Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., \$25.50, Phila. base, standard and copper bearing, \$26.63.

Gray Forge	Charcoal
Valley furnace	\$20.50
Pitts. dist. fur.	20.50
Lake Superior fur.	\$23.50
do., del. Chicago	26.04
Lyles, Tenn.	24.00

### Silvery†

Jackson county, O., base: 6-6.50 per cent \$24.50; 6.51-7—\$25.00; 7-7.50—\$25.50; 7.51-8—\$26.00; 8-8.50—\$26.50; 8.51-9—\$27.00; 9-9.50—\$27.50; Buffalo \$1.25 higher.

### Bessemer Ferrosillicon†

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 ferrosillicon, 2 to 3%, \$1 per ton add. Each unit over 3%, add \$1 per ton.

## Refractories

Per 1000 f.o.b. Works

Fire Clay Brick		Chester, Pa., and Baltimore bases (bags) ..	
Super Quality		\$45.00	
Pa., Mo., Ky.	\$58.90	Domestic dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags) ..	
First Quality		42.00	
Pa., Ill., Md., Mo., Ky.	\$45.60	Domestic dead - burned gr. net ton f.o.b. Chewelah, Wash. (bulk) ..	
Alabama, Georgia	\$38.00-45.00	24.00	
Second Quality		Base Brick	
Pa., Ill., Ky., Md., Mo.	40.85	Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.	
Georgia, Alabama	36.10	Chrome brick ..	
Ohio		38.00	
First quality	\$40.85	Chem. bonded chrome ..	
Intermediary	38.00	47.00	
Second quality	29.45	Magnesite brick ..	
Malleable Bung Brick		67.00	
All bases	54.15	Chem. bonded magnesite	
Silica Brick		57.00	
Pennsylvania	\$45.60	Fluorspar, 85-5	
Joliet, E. Chicago	54.15	Washed gravel, duty paid, tide, net ton ..	
Birmingham, Ala.	45.60	\$23.00	
Ladle Brick		Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail ..	
(Pa., O., W. Va., Mo.)		\$18.00	
Dry press	\$25.00	Do., for barge ..	
Wire cut	23.00	\$19.00	
Magnesite		Ferroalloys	
Imported dead - burned grains, net ton f.o.b.		Dollars, except Ferrochrome	

## Nonferrous

### METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

Copper			Straits Tin		Lead	Alumi-	Antimony	Nickel
Electro, del. Conn.	Lake, del. Midwest	Casting, refinery	New York Spot	Futures	Lead N. Y.	num St. L.	Chinese Spot, N. Y.	Cath-odes
Jan. 2	12.00	12.12 1/2	51.70	51.50	6.00	5.85	13.75	35.00
Jan. 4	12.00	12.12 1/2	51.25	51.05	6.00	5.85	13.75	35.00
Jan. 5	12.00	12.12 1/2	50.90	50.70	6.00	5.85	13.75	35.00
Jan. 6	12.00	12.12 1/2	51.00	50.80	6.00	5.85	14.00	35.00
Jan. 7	12.00	12.12 1/2	51.37 1/2	51.20	6.00	5.85	14.00	35.00
Jan. 8	12.00	12.12 1/2	51.30	51.15	6.00	5.85	14.00	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 12.00.

Conn. copper	
Sheets	
Yellow brass (high)	17.25
Copper, hot rolled	19.37 1/2
Lead, cut to jobbers	9.50
Zinc, 100-lb. base	10.00
Tubes	
*High yellow brass	20.00
*Seamless copper	20.37 1/2
Rods	
High yellow brass	15.25
Copper, hot rolled	16.12 1/2
Anodes	
Copper, untrimmed	16.87 1/2
Wire	
Yellow brass (high)	17.50

### OLD METALS

Deal. buying prices, cents lb.

#### No. 1 Composition Red Brass

*New York	8.50-8.62 1/2
*Cleveland	8.75-9.00
*Chicago	8.50-8.75
*St. Louis	8.00-8.50

#### Heavy Copper and Wire

*New York, No. 1	10.12 1/2-10.37 1/2
*Chicago, No. 1	9.75-10.00
*Cleveland, No. 1	10.00-10.25
St. Louis, No. 1	9.50-9.75

#### Composition Brass Borings

*New York	8.00-8.25
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#### Light Copper

*New York	8.50-8.62 1/2
*Chicago	8.25-8.62 1/2
*Cleveland	8.00-8.25
*St. Louis	8.00-8.25

### Light Brass

*Chicago	5.50-5.75
Cleveland	5.00-5.25
*St. Louis	5.00-5.50

### Lead

*New York	5.25-5.37 1/2
*Cleveland	5.00-5.15
*Chicago	5.00-5.25
*St. Louis	4.75-5.00

### Zinc

New York	3.00-3.12 1/2
*St. Louis	3.00-3.50
Cleveland	3.00-3.25

### Aluminum

*Borings, Cleve.	10.25-10.50
*Mixed, cast, Cleve.	13.50-13.75
Mixed, cast St. L.	13.00-13.25
*Clips, soft, Cleve.	15.25-15.50

### SECONDARY METALS

*Brass, lngt. 85-5-5-5, 1cl	12.62 1/2
Stand. No. 12 alum.	17.00-17.50

Ferromanganese, 78-82% tidewater, duty paid ..	80.00
Do., Baltimore, base ..	80.00
Do., del. Pittsburgh ..	84.79
Spiegeleisen, 19-20% dom. Palmerston, Pa., spot ..	†26.00
Do., New Orleans ..	26.00
Ferrosilicon, 50% freight allowed, c. l. ....	69.50
Do., less carload ..	77.00
Do., 75 per cent ..	126-130.00
Spot, \$5 a ton higher.	
Silicomn., 2 1/2 carbon ..	89.00
2% carbon, 94.00; 1%,	104.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del. ....	10.00
Ferrotungsten, stand., lb. con. del. ....	1.30-1.40
Ferrovandium, 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.	

# Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

## STEEL BARS

Baltimore*	3.20c
Boston††	3.60c
Buffalo	3.10c
Chattanooga	3.71c
Chicago (j)	3.35c
Cincinnati	3.55c
Cleveland	3.25c
Detroit	3.43 1/2c
Houston	3.10c
Los Angeles	3.80c
Milwaukee	3.46c-3.61c
New Orleans	3.70c
New York† (d)	3.62c
Pitts. (h)	3.30c-3.45c
Philadelphia*	3.45c
Portland	3.75c
San Francisco	3.85c
Seattle	4.10c
St. Louis	3.59c
St. Paul	3.60c-3.75c
Tulsa	3.35c

## IRON BARS

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

## REINFORCING BARS

Buffalo	2.60c
Chattanooga	3.71c
Cleveland (c)	2.25c
Cincinnati	3.40c
Houston	3.25c
Los Angeles, c.l.	2.45c
New Orleans*	2.67c
Pitts., plain (h)	3.25c
Pitts., twisted squares (h)	3.40c
San Francisco	2.45c
Seattle	3.75c
St. Louis	3.49c
Tulsa	3.25c
Young	2.30c-2.60c

## SHAPES

Baltimore*	3.10c
Boston††	3.59c
Buffalo	3.35c
Chattanooga	3.81c
Chicago	3.45c
Cincinnati	3.65c
Cleveland	3.56c
Detroit	3.65c
Houston	3.10c
Los Angeles	3.80c
Milwaukee	3.56c
New Orleans	3.80c
New York† (d)	3.62c
Philadelphia*	3.30c
Pittsburgh (h)	3.40c
Portland (l)	3.75c
San Francisco	3.75c
Seattle (l)	3.95c
St. Louis	3.69c
St. Paul	3.70c
Tulsa	3.60c

## PLATES

Baltimore*	3.10c
Boston††	3.61c
Buffalo	3.47c
Chattanooga	3.81c
Chicago	3.45c
Cincinnati	3.65c
Cleveland, 1/2-in. and over	3.56c
Detroit	3.65c
Detroit, 3/8-in.	3.85c
Houston	3.10c
Los Angeles	3.60c
Milwaukee	3.41c
New Orleans	3.80c
New York† (d)	3.65c
Philadelphia*	3.30c

Phila. floor	4.95c
Pittsburgh (h)	3.40c
Portland	3.75c
San Francisco	3.75c
Seattle	3.95c
St. Louis	3.69c
St. Paul	3.55c
Tulsa	3.60c

## NO. 10 BLUE

Baltimore*	3.20c
Boston (g)	3.75c
Buffalo	3.72c
Chattanooga	3.66c
Chicago	3.35c
Cincinnati	3.50c
Cleveland	3.41c
Det. 8-10 ga.	3.43 1/2c
Houston	3.45c
Los Angeles	3.90c
Milwaukee	3.46c
New Orleans	3.85c
New York† (d)	3.57c
Portland	3.85c
Philadelphia*	3.45c
Pittsburgh (h)	3.25c
San Francisco	3.95c
Seattle	4.10c
St. Louis	3.59c
St. Paul	3.60c
Tulsa	3.80c

## NO. 24 BLACK

Baltimore*†	3.80c
Boston (g)	4.35c
Buffalo	3.35c
Chattanooga*	3.56c
Chicago	3.90c-4.55c
Cincinnati	4.05c
Cleveland	4.31c
Detroit	4.33 1/2c
Los Angeles	4.35c
Milwaukee	4.16c
New Orleans*	3.52c
New York† (d)	4.22c
Philadelphia*†	4.15c
Pitts.** (h)	3.65c-4.95c
Portland	4.30c
Seattle	4.85c
San Francisco	4.65c
St. Louis	4.29c
St. Paul	4.10c
Tulsa	4.85c

## NO. 24 GALV. SHEETS

Baltimore*†	3.90c
Buffalo	4.10c
Boston (g)	4.35c
Chattanooga*	4.16c
Chicago (h)	4.35c-5.35c
Cincinnati	4.65c
Cleveland	4.91c
Detroit	5.00c
Houston	4.50c
Los Angeles	4.60c
Milwaukee	4.76c
New Orleans*	4.32c
New York† (d)	4.50c
Philadelphia*†	4.80c
Pitts.** (h)	4.50c-4.75c
Portland	4.60c
San Francisco	5.25c
Seattle	5.30c
St. Louis	4.89c
St. Paul	5.10c
Tulsa	5.20c

## BANDS

Baltimore*	3.30c
Boston††	3.75c
Buffalo	3.52c
Chattanooga	3.91c
Cincinnati	3.75c
Cleveland	3.66c
Chicago	3.60c
Detroit, 3/8-in. and lighter	3.68 1/2c
Houston	3.35c
Los Angeles	4.30c
Milwaukee	3.71c
New Orleans	4.25c

New York† (d)	3.82c
Philadelphia*	3.55c
Pittsburgh (h)	3.50c
Portland	4.35c
San Francisco	4.45c
Seattle	4.60c
St. Louis	3.84c
St. Paul	3.85c
Tulsa	3.55c

## HOOPS

Baltimore	3.55c
Boston††	4.75c
Buffalo	3.52c
Chicago	3.60c
Cincinnati	3.75c
Detroit, No. 14 and lighter	3.68 1/2c
Los Angeles	6.05c
Milwaukee	3.71c
New York† (d)	3.66c
Philadelphia*	3.80c
Pittsburgh (h)	4.00c
Portland	5.85c
San Francisco	6.50c
Seattle	5.95c
St. Louis	3.65c
St. Paul	3.85c

## COLD FIN. STEEL

Baltimore (c)	3.98c
Boston*	4.15c
Buffalo (h)	3.70c
Chattanooga*	4.51c
Chicago (h)	3.95c
Cincinnati	4.15c
Cleveland (h)	3.95c
Detroit	4.03 1/2c
Los Ang. (f) (d)	6.10c
Milwaukee	4.06c

New Orleans	4.55c
New York† (d)	4.22c
Philadelphia*	4.18c
Pittsburgh	3.80c
Portland (f) (d)	6.25c
San Fran. (f) (d)	6.30c
Seattle (f) (d)	6.40c
St. Louis	4.19c
St. Paul	4.20c
Tulsa	4.80c

## TOOL STEELS

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

High speed	59 1/2c
High carbon, high chrome	39c
Oil hardening	23c
Special tool	21c
Extra tool	17 1/2c
Regular tool	14 1/2c
Uniform extras apply.	

Base  
Chicago (a)

Chicago (a)	65
Cleveland	70
Detroit	70-10

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, 3.50c.

On plates, shapes, bars, hot strip and blue annealed quantity extras and discounts as follows: Under 100 lbs., add \$1.50; 100 to 399 lbs., add 50c; 400 to 999 lbs., base; 1000 to 9999 lbs., deduct 10c; over 10,000 lbs., deduct 15c. At Cleveland, under 400 lbs., add 50c, with \$1 minimum invoice.

†Domestic steel;  
\*Plus quantity extras;  
\*\*Under 25 bundles;  
††50 or more bundles;  
‡New extras apply;  
††Base 8000 lbs., extras on less.

# Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Jan. 7

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

	British gross tons U. K. ports		Continental Channel or North Sea ports, metric tons	
	£	s d	Quoted in dollars at current value	**Quoted in gold pounds sterling
PIG IRON				
Foundry, 2.50-3.00 Silicon	\$22.23	4 10 0*	\$15.25	1 17 6
Basic bessemer	22.23	4 10 0*	13.43	1 13 0
Hematite, Pho. .03-.05	21.61	4 7 6		

## SEMIFINISHED STEEL

Billets	\$30.88	8 5 0	\$24.40	3 0 0
Wire rods, No. 5 gage	48.78	9 17 6	41.68	5 2 6

## FINISHED STEEL

Standard rails	\$40.76	8 0 0	\$44.74	5 10 0
Merchant bars	1.98c	9 0 0	1.29c to 1.48c	3 10 0 to 4 0 0
Structural shapes	1.87c	8 10 0	1.29c to 1.48c	3 10 0 to 4 0 0
Plates, 1 1/2-in. or 5 mm.	2.10c	9 11 3	1.60c to 1.84c	4 7 6 to 5 0 0
Sheets, black, 24 gage or 0.5 mm.	2.53c	11 10 0	3.22c	8 15 0
Sheets, gal., 24 gage, corr.	3.02c	13 15 0	2.94c	8 0 0
Bands and strips	2.09c	9 10 0	1.75c	4 15 0
Plain wire, base	2.31c	10 10 0	1.94c	5 5 0
Galvanized wire, base	2.75c	12 10 0	2.15c	5 17 6
Wire nails, base	2.64c	12 0 0	1.75c	4 15 0
Tin plate, box 108 lbs.	\$4.88	0 19 0		

British ferromanganese \$80 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	\$20.00	4 1 0(a)	\$17.51	375
Basic bessemer pig iron	18.57	3 15 0(a)	13.47	275
Furnace coke	5.31	1 1 6	5.94	127
Billets	30.26	6 2 6	27.55	590
Standard rails	1.82c	8 5 0	1.58c	751
Merchant bars	2.06c	9 7 0	1.68c	800
Structural shapes	2.07c	9 7 6	1.64c	780
Plates, 1 1/2-in. or 5 mm.	2.13c	9 13 9	2.12c	1,010
Sheets, black	2.64c	12 0 0 1/2	2.62c	1,250 1/2
Sheets, galv., corr., 24 ga. or 0.5 mm.	3.08c	14 0 0	4.10c	1,950
Plain wire	2.42c	11 0 0	2.50c	1,190
Bands and strips	2.22c	10 2 0	1.92c	915

\*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 66.56 per cent over paper sterling.

# Iron and Steel Scrap Prices

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

## HEAVY MELTING STEEL

Birmingham†	12.50-13.50
Bos. dock, No. 1, exp.	†14.25
N. Eng. del. No. 1.	14.00
Chicago, No. 1	17.50-18.00
Buffalo, No. 1	17.00-18.00
Buffalo, No. 2	16.00-16.50
Chicago	17.50-18.00
Cleveland, No. 1	17.50-18.00
Cleveland, No. 2	16.50-17.00
Detroit, No. 1	15.00-15.50
Eastern Pa., No. 1	17.00
Eastern Pa., No. 2	15.50-16.00
Federal, Ill.	14.25-14.75
Granite City, R. R.	15.50-16.00
Granite City, No. 2	14.00-14.50
New York, No. 1	†13.00-13.50
N. Y. dock, No. 1 exp.	†13.50
Pitts., No. 1 (R. R.)	20.00-20.50
Pitts., No. 1 (dir.)	19.25-19.75
Pittsburgh, No. 2	17.00-17.50
St. Louis, R. R.	16.00-16.50
St. Louis, No. 2	14.00-14.50
Toronto, dlrs. No. 1	9.75-10.50
Toronto, No. 2	8.75-9.50
Valleys, No. 1	18.00-18.50

## COMPRESSED SHEETS

Buffalo, dealers	16.00-16.50
Chicago, factory	16.50-17.00
Chicago, dealer	14.50-15.00
Cleveland	17.00-17.50
Detroit	15.50-16.00
E. Pa., new mat.	16.50-17.00
E. Pa., old mat.	14.00-14.50
Pittsburgh	19.25-19.75
St. Louis	12.00-12.50
Valleys	17.75-18.00

## BUNDLED SHEETS

Buffalo	13.50-14.00
Cincinnati, del.	12.00-12.50
Cleveland	13.50-14.50
Pittsburgh	17.50-18.00
St. Louis	10.00-10.50
Toronto, dealers	6.00

## SHEET CLIPPINGS, LOOSE

Chicago	11.50-12.00
Cincinnati	11.00-11.50
Detroit	12.00-12.50
St. Louis	9.50-10.00

## STEEL RAILS, SHORT

Birmingham	15.00-16.00
Buffalo	19.50-20.50
Chicago (3 ft.)	19.50-20.00
Chicago (2 ft.)	21.50-22.00
Cincinnati, del.	19.00-19.50
Detroit	17.50-18.00
Pitts., open-hearth,	
3 ft. and less	22.00-22.50
St. Louis, 2 ft. & less	17.00-17.50

## STEEL RAILS, SCRAP

Boston district	†12.75-13.25
Buffalo	17.50-18.50
Chicago	17.50-18.00
Pittsburgh	20.00-20.50
St. Louis	16.50-17.00
Toronto, dealers	9.00

## STOVE PLATE

Birmingham	8.50-9.00
Boston district	†9.50-9.75
Buffalo	13.00-13.50
Chicago	9.50-10.00
Cincinnati, dealers	10.75-11.25
Detroit, net	10.00-10.50
Eastern Pa.	14.50
New York, fdry.	10.50-11.00
St. Louis	10.00-10.50
Toronto, deal'rs, net	7.50-8.00

## SPRINGS

Buffalo	18.00-18.50
Chicago, leaf	19.00-19.50
Chicago, coil	21.50-22.00
Eastern Pa.	21.50-22.00
Pittsburgh	23.50-24.00
St. Louis	18.00-18.50

## ANGLE BARS—STEEL

Chicago	19.00-19.50
St. Louis	16.75-17.25
Buffalo	14.50-15.00

## RAILROAD SPECIALTIES

Chicago	19.00-19.50
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## LOW PHOSPHORUS

Buffalo, billet and bloom crops	20.00-20.50
Cleveland, billet, bloom crops	21.00-21.50
Eastern Pa., crops	22.00-22.50
Pittsburgh, billet, bloom crops	24.00-24.50
Pittsburgh, sheet bar crops	22.00-22.50

## FROGS, SWITCHES

Chicago	17.50-18.00
St. Louis, cut	16.00-16.50

## SHOVELING STEEL

Chicago	17.50-18.00
Federal, Ill.	14.25-14.75
Granite City, Ill.	14.00-14.50
Toronto, dealers	7.50

## RAILROAD WROUGHT

Birmingham	9.00-10.00
Boston district	†8.00-8.25
Buffalo, No. 1	16.00-16.50
Buffalo, No. 2	17.00-18.00
Chicago, No. 1, net	15.00-15.50
Chicago, No. 2	17.50-18.00
Cincinnati, No. 2	16.00-16.50
Eastern Pa.	17.50-18.00
St. Louis, No. 1	13.50-14.00
St. Louis, No. 2	16.00-16.50
Toronto, No. 1 dir.	8.00

## SPECIFICATION PIPE

Eastern Pa.	15.00
New York	†10.50-11.00

## BUSHING

Buffalo, No. 1	16.00-16.50
Chicago, No. 1	16.00-16.50
Cincin., No. 1, deal.	12.25-12.75
Cincinnati, No. 2	7.50-8.00
Cleveland, No. 2	12.00-12.50
Detroit, No. 1, new	14.50-15.00
Valleys, new, No. 1	17.25-17.75
Toronto, dealers	7.00

## MACHINE TURNINGS

Birmingham	6.00-6.50
Buffalo	10.50-11.00
Chicago	9.00-9.50
Cincinnati, dealers	9.50-10.00
Cleveland	11.00-11.50
Detroit	9.50-10.00
Eastern Pa.	11.50-12.00
New York	†8.25-8.75
Pittsburgh	14.00-14.50
St. Louis	7.25-7.75
Toronto, dealers	6.25-7.00
Valleys	11.00-11.50

## BORINGS AND TURNINGS

Boston district	†6.75-7.00
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Buffalo	11.50-12.00
Cincinnati, dealers	9.50-10.00
Cleveland	12.00-12.50
Detroit	10.50-11.00
Eastern Pa.	10.50-11.00
New York	†6.50-7.00
Pittsburgh	14.50-15.00
Toronto, dealers	6.25

## CAST IRON BORINGS

Birmingham	6.00-6.50
Boston dist. chem.	†8.00-8.50
Boston dist. for mills	†8.00-8.25
Buffalo	10.75-11.25
Chicago, dealers	9.50-10.00
Cincinnati, dealers	9.50-10.00
Cleveland	12.00-12.50
Detroit	10.50-11.00
E. Pa., chemical	11.50-13.00
New York	†7.50-7.75
St. Louis	8.00-8.50
Toronto, dealers	6.75

## PIPE AND FLUES

Cincinnati, dealers	9.75-10.25
Chicago, net	10.50-11.00

## RAILROAD GRATE BARS

Buffalo	11.50-12.00
Chicago, net	11.50-12.00
Cincinnati	10.25-10.75
Eastern Pa.	14.50-15.00
New York	†9.50-10.00
St. Louis	11.50-12.00

## FORGE FLASHINGS

Boston district	†11.25-11.50
Buffalo	16.00-16.50
Cleveland	16.50-17.00
Detroit	14.00-14.50
Pittsburgh	17.50-18.00

## FORGE SCRAP

Boston district	†6.50-7.00
Chicago, heavy	19.50-20.00
Eastern Pa.	16.00-16.50

## ARCH BARS, TRANSOMS

St. Louis	16.50-17.00
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## AXLE TURNINGS

Boston district	†9.00-9.50
Buffalo	13.50-14.00
Chicago, elec. fur.	16.50-17.00
Eastern Pa.	14.50-15.00
St. Louis	11.50-12.00
Toronto	6.25

## STEEL CAR AXLES

Birmingham	15.50-16.00
Boston district	†17.50-18.00
Chicago, net	20.00-20.50
Chicago, net	19.50-20.00
Eastern Pa.	21.50
St. Louis	19.00-19.50

## SHAFTING

Boston district	†16.50-16.75
Eastern Pa.	22.00-22.25
New York	†17.00-17.50
St. Louis	15.00-15.50

## CAR WHEELS

Birmingham	15.00-15.50
Boston dist. iron	†13.00-13.50
Buffalo, iron	17.00-17.50
Buffalo, steel	19.00-20.00
Chicago, iron	18.00-18.50
Chicago, rolled steel	19.50-20.00

Cincinnati, iron	17.50-18.00
Eastern Pa., iron	19.00
Eastern Pa., steel	21.50-22.00
Pittsburgh, iron	18.75-19.25
Pittsburgh, steel	23.00-23.50
St. Louis, iron	15.50-16.00
St. Louis, steel	17.75-18.25

## NO. 1 CAST SCRAP

Birmingham	13.75-14.50
Bos. dis. No. 1 mach.	†12.50-12.75
N. Eng., del. No. 2	†12.00
N. Eng., del. textile	14.00
Buffalo, cupola	15.75-16.25
Buffalo, mach.	16.75-17.25
Chicago, agri. net	12.50-13.00
Chicago, auto	13.50-14.00
Chicago, mach. net	15.00-15.50
Chicago, rail'd net	14.00-14.50
Cincl., mach. cup.	15.75-16.25
Cleveland, mach.	17.50-18.00
Eastern Pa., cupola	18.50-19.50
E. Pa., mixed yard	16.00
Pittsburgh, cupola	17.50-18.00
San Francisco, del.	13.50-14.00
Seattle	10.00-11.00
St. Louis, No. 1	13.25-13.75
St. L., No. 1, mach.	13.50-14.00
Toronto, No. 1, mach., net	10.50-11.00

## HEAVY CAST

Boston, dist. break	†11.75-12.50
New England del.	13.00
Buffalo, break.	13.75-14.25
Cleveland, break	13.50-14.00
Detroit, No. 1 mach. net	13.50-14.00
Detroit, break.	12.50-13.00
Detroit, auto net	13.50-14.00
Eastern Pa.	17.50
New York, break.	†13.00-13.25
Pittsburgh	15.00-15.50

## MALLEABLE

Birmingham, R. R.	14.00-15.00
New England, del.	†16.25-17.50
Buffalo	18.00-18.50
Chicago, R. R.	19.50-20.00
Cincl., agri. del.	14.75-15.25
Cleveland, rail.	18.00-18.50
Detroit, auto, net.	14.50-15.00
Eastern Pa., R. R.	17.50-18.00
Pittsburgh, rail	18.50-19.00
St. Louis, R. R.	16.50-17.00

## RAILS FOR ROLLING

5 feet and over	
Birmingham	15.00-16.00
Boston	†12.50-13.00
Buffalo	18.50-19.00
Chicago	18.50-19.00
Eastern Pa.	18.50-19.00
New York	†14.00-14.50
St. Louis	17.00-17.50

## LOCOMOTIVE TIRES

Chicago (cut)	19.50-20.00
St. Louis, No. 1	14.50-15.00

## LOW PHOS. PUNCHINGS

Buffalo	19.00-20.00
Chicago	20.50-21.00
Eastern Pa.	21.50-22.00
Pittsburgh (heavy)	22.00-22.50
Pittsburgh (light)	21.50-22.00

## Iron Ore

Lake Superior Ore	
Gross ton, 51½%	
Lower Lake Ports	
Old range bessemer	\$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess.	4.65

Eastern Local Ore	
Cents, unit. del. E. Pa.	
Foundry and basic	
56.63% con. (nom.)	8.50-9.00
Cop.-free low phos.	
58-60% (nom.)	10.00-10.50

Foreign Ore	
Cents per unit, f.a.s. Atlantic ports (nominal)	
Foreign manganifer-	

ous ore, 45.55%	
iron, 6-10% man.	13.50
No. Afr. low phos.	13.50
Swedish low phos.	11.50
Spanish No. Africa basic, 50 to 60%.	12.50
Tungsten, spot sh. ton unit, duty pd.	\$15.85-16.00
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	20.00-21.00

## Manganese Ore

(Nominal)	
Prices not including duty, cents per unit cargo lots.	
Caucasian, 50-52%	30.00
So. African, 50-52%	30.00
Indian, 50-52%	30.00



# Bars

Bar Prices, Page 60

**Chicago**—While bar sales have moderated since the turn of the year, business is heavy, considering the large forward purchasing during December. Specifications are steady except for smaller automotive demand. Farm implement manufacturers continue to take larger lots than a year ago and anticipate expanding schedules during the next several months. On new business the market is 2.25c for billet bars, 2.10c for rail steel and 2.10c, Terre Haute, Ind., and 2.15c, Chicago, for bar iron.

**Pittsburgh**—The unusually heavy backlogs of bar mills in this district have served to cushion the effect of suspension orders resulting from the automotive industry's labor trouble. A fair amount of new business at the higher prices has been received, although producers before Jan. 1 had anticipated a slowing up.

**New York**—Buying of steel bars is easier, a respite welcomed in view of heavy production schedules.

**Philadelphia**—Following the recent \$3 advance in the base price, consumers of commercial steel bars are placing little new tonnage, having previously contracted heavily at the former levels. Sellers are having difficulty meeting delivery schedules and it is believed in some quarters that shipments of tonnage booked at fourth quarter prices were extended into February. The delivered Philadelphia price, allowing for the elimination of the freight surcharges Jan. 1, is 2.49c.

Automotive labor troubles in the middle west have resulted in partial suspension of shipments of alloy bars from eastern producing plants.

**Cleveland**—Bar mills are not seriously affected by the labor tieup in auto plants, although auto part-makers have been forced to curtail production. So far producers have been able to hold their active rate of operation, by clearing up their extended backlogs from other sources.

**Youngstown, O.**—Requirements of steel bar consumers are such as to continue operations at unchanged rates. On an inquiry for 1000 tons of steel bars from Turkey, heretofore supplied by German makers, mills have had to refuse.

# Cold Finished

Cold Finished Prices, Page 61

**Pittsburgh** — Suspension orders

from the automotive industry have been extensive for cold-finished material in the Pittsburgh district, but orders from other consumers are being booked at the new prices and producers have been able to work off specifications for other consumers.

# Plates

Plate Prices, Page 60

**Philadelphia**—While a falling off in new orders is to be expected in view of the recent price advance, plate sellers anticipate substantial acceptances on identified projects which have until the remainder of this month in which to be taken up. Of this work car and locomotive tonnage is outstanding.

In addition to the \$3 advance, some plate sellers have inaugurated a schedule of quantity differentials, as follows: Applicable to the total weight of an order placed for shipment at one time for one destination, 25 cents on lots under 6000 to 4000 pounds inclusive, 75 cents, under 4000 to 2000 pounds inclusive; and \$1.25, under 2000 pounds.

Further, some mills have announced new heavy gage extras on plates of all widths over two inches thick, and also higher list schedules on spun heads, standard type, either flanged or dished, and on A.S.M.E. code elliptical types. These schedules also affect manhole and hand-hole openings and other fittings. The changes amount to an increase of 15 per cent on most items and 5 per cent on manhole fittings and saddles. Further changes appear in prospect on pressed heads and certain work involving special forming and machining.

**New York**—Acceptances of quotations made in December on identified projects is bolstering plate sales. These are expected to continue through January.

Norfolk Tank Corp., Norfolk, Va., has been awarded the steel plate work for the new plant of the Chesapeake Camp Corp. at Franklin, Va., at about \$58,000.

**Pittsburgh**—Plate mills are active although considerable work is still pending. Interests here expect that the 20 to 25 coal barges for Wheeling Steel Corp., involving 3000 tons of plates, will be closed soon. Other pending barge work involves about 2000 tons. Although considerable repairing is underway, the tonnage is small.

**Chicago**—Plate specifications continue heavy, with further improvement noted in demand from freight car builders. Mills have improved little on deliveries, which in

most cases extend more than 30 days. Good prospects for additional buying of railroad equipment point to sustained demand for plates from that source during at least the first half of this year. The outlook for tank buying remains favorable, although recent awards have been small.

**San Francisco**—Plate awards, during the last week of the year, were larger than for any week since August 15. Close to 2900 tons were placed, bringing the aggregate for the year to 128,967 tons as compared with only 52,105 tons for 1935, almost 130 percent greater than the tonnage booked in the previous year.

**Seattle** — New business is being postponed because of inability of plants to obtain materials from Eastern sources. Some contracts already awarded, based on water transportation, will not be executed until shipping by water is resumed.

**Cleveland**—Fabricators continue active, making deliveries on orders placed during the latter part of December. Some specialty manufacturers have been forced to reject additional tonnage due to their extensive backlogs. Railroad buying is noticeably absent the last 30 days, but considerable tonnage is expected to be purchased from that source within the next month.

# Contracts Placed

1700 tons, 75 to 123-inch welded steel pipe, San Gabriel dam No. 1, Los Angeles, to Western Pipe & Steel Co., Los Angeles.

300 tons, 36-inch welded steel pipe, treasury department, San Francisco Invitation 3028, to Steel Tank & Pipe Co., Berkeley, Calif.

155 tons, 21 gates, Imperial dam, Ariz., to Pacific Iron & Steel Co., Los Angeles.

# Contracts Pending

350 tons, 500,000-gallon tank and tower, Fresno, Calif.; bids Jan. 14.

310 tons, 17 radial gates, Bonneville dam, Oregon; bids Jan. 12.

# Wire

Wire Prices, Page 61

**Pittsburgh** — Wire producers report demand steady at higher prices from miscellaneous buyers, although shipments to the automotive industry have declined because of suspension orders last week.

**Chicago**—Wire specifications continue heavy and operations are not yet affected materially by slight let-downs in shipments to some automotive plants. Miscellaneous consumption of manufacturers' wire remains heavy and producers have comfortable backlogs in merchant products.

Youngstown, O.—Contrary to expectations wire rod shipments to shops of auto partsmakers continue of satisfactory volume. Miscellaneous demand for wire nails and plain wire remains fairly steady at mills in this district.

Cleveland—Wire producers report little change in operations because of the extended backlog from wire specialty manufacturers and agricultural requirements. Sales during the past year were the best since 1929, but the outlook for the next few months is one of speculation due to labor unrest.

# Sheets

Sheet Prices, Page 60

Pittsburgh—Although suspension orders from General Motors have been extensive, demand from other consumers at the new prices is steady and the material is sought for immediate use. In some instances, business being placed at the new price is exceeding the expectations of producers. On all new business, hot-rolled sheets are quoted at 2.15c, base, Pittsburgh, for

10 gage; 2.80c for 24 gage; and 3.40c on galvanized.

Chicago—Despite suspensions of shipments of automotive material, sheet mills here continue to run full. Good schedules are in prospect during the next 30 days, but it is anticipated a further recession in deliveries to motor car plants will occur within the next few weeks. Mills have been enabled to quicken deliveries to other consumers, though in some cases such buyers prefer that shipments be not advanced ahead of shipping dates previously set. On new business mills are able to make delivery within about six weeks on the average, but can substitute such tonnages for automotive material in those cases where suspensions have been received. Prices are steady on new business.

New York — Better deliveries offered by some midwestern sheet-makers on account of automotive suspensions are stimulating some new business here. In general buying is less than a month ago when users were covering before the price advance.

Philadelphia — Dislocation of schedules at some mid-western plants due to suspensions by automobile consumers affected by labor troubles has resulted in some early shipments being offered on sheets for the first time in weeks. These offers are still much the exception, and, while most buyers are well covered on their nearby requirements, these offers are being snapped up.

Buffalo—Much concern is expressed by sheetmakers over the outlook in automotive fields. As the largest single consumer of sheets from Buffalo mills these consumers play a tremendous part in the operation of district steelworks and any long shutdown of the producers of this group would have serious effect on local production rates. Other consumers of sheet steel are taking large shipments and may provide an outlet.

Cleveland—In spite of stop orders from motor plants, mills have so far been able to operate at approximately the rate reported two weeks ago, due to extensive backlogs on orders placed from other sources, particularly in household utilities, such as stoves and refrigerators. Some additional buying was also reported from this source since the first of the month for shipment during February.

St. Louis—Both new orders and specifications on sheets have receded slightly. The main influence has been the automotive labor situation. While this is less important here than at other centers, it has had a psychological effect on buyers. De-

## Behind the Scenes with STEEL

### Applause

CONGRATULATORY messages are still pouring in on the *Yearbook of Industry*. If yours is among them, please accept our thanks and appreciation of your comments. It is the sincere hope of our editors that with each succeeding *Yearbook* they may be able to give you something a little bit finer, a little bit more interesting, a little bit more worthy of your attention.

### Century Plant

THIS issue is No. 2 of Vol. 100; I we should have made some mention last week about the inaugural of Vol. 100, but being so awe-struck with our *Yearbook of Industry*, we fell down on such prosaic matters.

The first hundred Vols. are the hardest, they say, so STEEL is nearing the end of the rough going. From now on it's just a breeze. You may wonder why we have completed 99 Vols. and yet have been kicking around for 54 years (currently there are two volumes per year). This bothered us until we dusted off some of the early Vols. of *Iron Trade Review* and discovered that for a few years, all issues of a single year were included in a single volume, instead of the six months' total as at present.

We thought some of knocking off a little ditty to the tune of Hinky - Dinky Parlez - Vous, like this:

*"Ninety-nine Vols. in fifty-four years, parlez-vous, Fifty-four years with ninety-nine Vols., parlez-vous, etc."*

But that's as far as we could get, so skip the whole thing.

### Maine Marches On

PEAKING of 100 brings to mind the fact that it was just 100 years ago that a wooden-wheeled locomotive first hauled a string of converted stagecoaches over the iron-clad wood rails of the Bangor & Piscataquis Canal & Railroad Co. on a 12-mile stretch between Bangor and Old Town, Maine. You fellows who ride around the country in air-conditioned comfort these days might

be interested in knowing that on the old E. & P. C. & R. R. Co. winter passengers were locked in the coaches with the only heat available emanating from a 10-gallon can of hot water.

On one of the first runs made by this demon of the rails, the locomotive struck an errant hog and sliced him up into bacon. So incensed was the hog's owner that he smeared the rails for about a mile with fresh bacon grease. On the return trip, the train hit this stretch, the wheels spun and the train slipped to a stop. It was no go until the train crew went back to Bangor for a load of sand.

### Gutter Dept.

ONE of our demon New York representatives, a specialist at reading - the - fine - print - in - the - newspapers, sends us a clipping stating that "Sealed bids or proposals for the furnishing and delivering of underwear wipers for the Independent Rapid Transit railroad system will be received. . . . The ribaldry of this statement will not impress anyone who is at all familiar with railway maintenance work, but it has its amusing angles, if you will allow your mind to sink to the lower depths and worry around with it awhile.

### Bugs

CHICAGO warehouse of the Jones & Laughlin Steel Corp. wonders if we are "fully termite conscious" and on the chance we are not, sends us some literature which shows graphically just how frustrated a termite can feel when he tries to hibernate in an I-beam.

Reason we probably have never become acutely termite conscious is that the destructive insects are so boring.

### Headwork

LEADLINE OF THE WEEK: "Old Enough To Vote — Still Working Two Shifts"—22-year old diesel powered crane saluted by Industrial Brownholst on p. 97 of the Dec. 21 issue. Not much question about whom that crane would vote for.

—SHRDLU

liveries are somewhat more satisfactory, but still well in arrears.

**Youngstown, O.**—Sheetmakers are inclined to welcome easing pressure from auto partsmakers, due to strike suspensions as it enables them to fill orders for miscellaneous consumers.

# Pipe

Pipe Prices, Page 61

**Pittsburgh**—Demand for steel pipe is improved slightly, although it still is light. Producers are confident that tonnages will show gains in 1937 over 1936. Activity in line pipe is quiet. Seamless production is reported steady, with many consumers now taking advantage of the reduction in freight rates.

**Philadelphia**—Sellers of wrought iron pipe have marked prices about \$9 a ton. However, no changes are indicated in the prices of competitive lines.

**Chicago**—Cast pipe business still is confined to small individual tonnages. Some additional pipe remains to be placed for the Chicago sanitary district, though the major part of this program has been completed. Prices are steady. Elimination of the freight surcharge lowers Chicago delivered prices of cast pipe 40 cents to \$50 to \$51 for 4-inch, and \$47 to \$48 for 6-inch and over.

**New York**—Cast pipe inquiry is slightly heavier, buying being led by 524 tons for New York city. Inquiries include approximately 650 tons for a New Jersey utility, on which bids are in. Prices are steady. Foundries producing cast iron fittings are quoting firmer figures, notably several in the South, which in the past have taken a good part of this volume in this district.

**Cleveland**—Jobbers report an active stock turnover with little change over the identical period last month. December proved considerably better than expected, in spite of unseasonal conditions. Barberton, O., is reported to be in the market for 8000 feet of 24-inch pipe, for sewage development. Among pending work is a waterworks project, involving 250 tons, for New Washington, O., bids due Jan. 15.

**Birmingham, Ala.**—Cast pipe shops have resumed steady production, and have considerable tonnage still in hand. United States Pipe & Foundry Co. is low on 2000 tons of various sizes for extension for Montgomery, Ala., water system.

**San Francisco**—Awards of cast pipe on the Pacific coast during 1936 were slightly over 25 per cent larger

than during 1935. Included among the larger lots just placed was 996 tons for Pasadena, Calif. Salt Lake City, Utah, just opened bids on 1336 tons of 4 to 12-inch pipe.

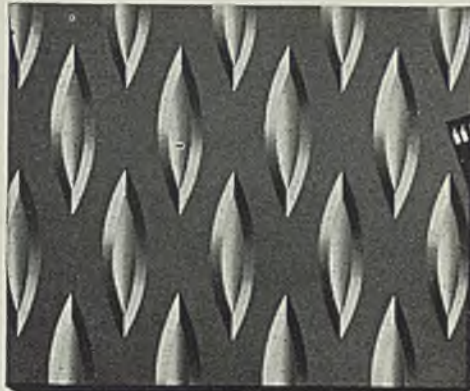
**Seattle**—Inability of dealers to obtain needed items is holding back new projects which are awaiting quotations based on water shipment. Municipal requirements are heavy and efforts to finance are meeting with improved success.

## Cast Pipe Placed

996 tons, 6 to 12-inch, Pasadena, Calif., allocated as follows: 618 tons to United States Pipe & Foundry Co., Burlington, N. J., and 378 tons to National Cast Iron Pipe Co., Birmingham, Ala.

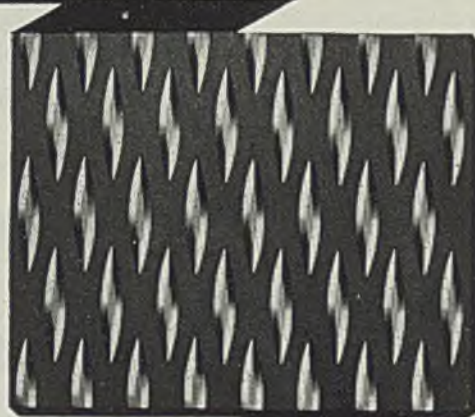
325 tons, 6 to 12-inch, Beverly Hills, Calif., to unnamed interest on contractor's letting.

524 tons, 12-inch, department of purchase, New York, to Donaldson Iron Works, Emaus, Pa., and United States



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

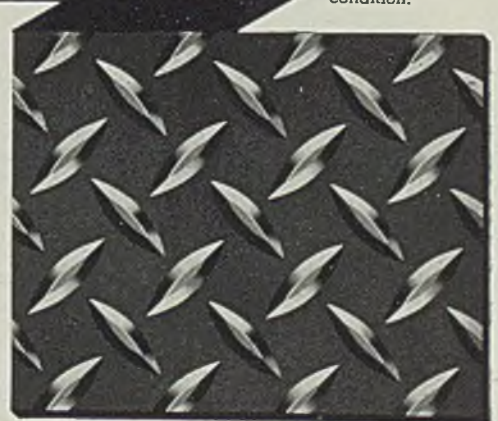
**"A.W." ROLLED STEEL FLOOR PLATE**



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

*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.



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

**ALAN WOOD STEEL COMPANY**  
CONSHOHOCKEN, PA.

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

111 YEARS' IRON- AND STEEL-MAKING EXPERIENCE



Pipe & Foundry Co., Burlington, N. J.  
216 tons, 4 and 6-inch, South Gate, Calif.,  
to American Cast Iron Pipe Co., Bir-  
mingham, Ala.  
150 tons, 2 to 8-inch, Issaquah, Wash.,  
to unnamed interest.  
132 tons, treasury department, Los An-  
geles, 1st 2029, to Pacific States Cast  
Iron Pipe Co., Provo, Utah.  
128 tons, 6-inch, class 150, East Bay Mu-  
nicipal Utility District, Oakland, Calif.,  
to Pacific States Cast Iron Pipe Co.,  
Provo, Utah.  
105 tons, 4 to 12-inch, Tucson, Ariz., to  
Pacific States Cast Iron Pipe Co.,  
Provo, Utah.

## Cast Pipe Pending

1336 tons, 4 to 12-inch, Salt Lake City,  
Utah; bids opened.  
650 tons, 4 and 6-inch, Public Service  
Corp., New Jersey, bids in.  
360 tons, Chicago sanitary district; E. J.  
Albrecht Co., Chicago, low for general  
contract.  
300 tons, various sizes, water system,  
Soyea, N. Y., state project.  
235 tons, special castings, and 250 fire  
hydrants, city of Milwaukee; bids close  
Jan. 21.  
180 tons, waterworks, New Washington,  
O.; bids Jan. 15.  
120 tons, 4 and 6-inch, Medical Lake,  
Wash.; bids in.  
Unstated tonnage, 850 feet 30-inch, Madl-  
son, Wis.; bids closed Jan. 8.

## Tin Plate

Tin Plate Prices, Page 60

Pittsburgh—Tin plate production

again is between 95 and 100 per cent, with hot tin mills' backlogs ranging from two to three weeks and cold reducing mills with a month's business ahead. The market is quoted unchanged on a net basis of \$4.85 per base box, f.o.b. Pittsburgh.

**New York**—Tin plate orders are heavy, including large business for export. Orders are coming from countries which seldom have bought here. Some process by foreign buyers are equal to quotations on domestic sale.

# Transportation

Track Material Prices, Page 61

Car buying starts the new year briskly with 9016 placed in the past week. The largest lot included 3550 freight cars and ten locomotives to its own shops. Baltimore & Ohio has placed 1500 steel gondolas and the Nickel Plate has distributed 1200 cars. More than 6000 cars and a number of locomotives remain on inquiry. The past week saw 28,000 tons of rails placed with mills and 21 locomotives with builders.

Domestic freight car orders for more than 65,000 cars in 1936 were

the heaviest since 1929, and compare with 19,308 cars in 1935 and 23,829 in 1934. Final returns for the year are expected to be announced shortly.

## Rail Orders Placed

Boston & Maine, 6000 tons, to Bethlehem Steel Co., Bethlehem, Pa.  
Maine Central, 3500 tons, to Bethlehem Steel Co., Bethlehem, Pa.  
New York, New Haven & Hartford, 5000 tons, divided equally between Bethlehem Steel Co., Bethlehem, Pa., and Carnegie-Illinois Steel Corp., Pittsburgh.  
St. Louis-San Francisco—13,500 tons, to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

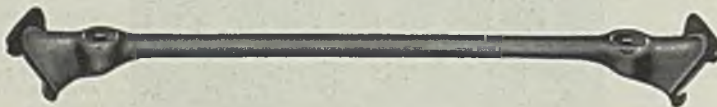
## Car Orders Placed

Baltimore & Ohio, 1500 steel gondolas, to Bethlehem Steel Co., Bethlehem, Pa.  
Boston & Maine, 20 passenger coaches, to Pullman-Standard Car Mfg. Co., Chicago.  
Chesapeake & Ohio, 10 horse express cars, to St. Louis Car Co., St. Louis.  
Chicago & North Western railway, 1025 cars: 500 hoppers to Pressed Steel Car Co., Pittsburgh; 500 box cars to Mt. Vernon Car Mfg. Co., Mt. Vernon, Ill.; and 25 chaircars to Pullman-Standard Car Mfg. Co., Chicago.  
Chicago, Burlington & Quincy, 3550 freight cars and ten 4-8-4 type locomotives, to own shops; freight car list includes 1000 fifty-ton steel frame box cars; 1500 gondola cars; 250 steel frame automobile cars; 250 all-steel hopper cars; 150 steel frame stock cars and 100 flat cars; in addition included in the general total are 300 refrigerator cars to be built by the Refrigerator Express Co., a subsidiary.  
Elgin, Joliet & Eastern, 1050 cars, to Mt. Vernon Car Co., Mt. Vernon, Ill.; includes 750 fifty-ton gondolas, 100 seventy-ton gondolas and 200 fifty-ton hoppers.  
General Chemical Co., 140 tank cars, to General American Transportation Corp., Chicago.  
New York, New Haven & Hartford, 75 flat cars, to own shops.  
New York, New Haven & Hartford, 50 de luxe coaches, five cafe cars, to Pullman-Standard Car Mfg. Co., Chicago.  
New York, Chicago & St. Louis, 1200 freight cars, of which 500 box went to General American Car Co., Chicago, 500 gondolas to American Car & Foundry Co., New York, 100 auto and furniture cars to the Ralston Steel Car Co., Columbus, O., 75 hopper cars to Pullman-Standard Car Mfg. Co., Chicago, and 25 special hoppers for dry bulk loading to American Car & Foundry Co.  
Pere Marquette, 25 cabooses, to Magor Car Corp., Passaic, N. J.; 10 baggage and express cars to St. Louis Car Co., St. Louis.  
Richmond, Fredericksburg & Potomac railroad, 6 baggage-express cars, to American Car & Foundry Co., New York.  
Southern Pacific, two streamlined trains, to Pullman-Standard Car Mfg. Co., Chicago.  
Wheeling & Lake Erie, 250 60-ton hopper cars, to own shops.

## Car Orders Pending

Chicago & Illinois Midland, 100 gondola cars; bids asked.

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BUFFALO, N. Y.

NEW YORK — CHICAGO — PHILADELPHIA — DETROIT — CLEVELAND

Clinchfield, 1250 freight cars, pending.  
Great Northern, 1500 cars and 12 coaches.

Illinois Central, in addition to 2000 freight cars noted in a recent issue is also inquiring for 20 baggage storage cars, and 1100 freight cars; its freight car list now stands: 1800 box cars; 1000 50-ton hopper cars and 300 40-ton refrigerator cars.

Louisville & Nashville, 3000 hopper cars.  
Missouri, Kansas & Texas, three dining and 25 chair cars; bids out soon.

Missouri-Kansas-Texas, 500 gondolas, 500 stock and 250 automobile cars, contemplated.

Nashville, Chattanooga & St. Louis, 500 box cars.

Phelps Dodge Corp., 25, 50 or 100 air dump cars; bids asked.

Wabash, 200 hopper cars.

## Locomotives Placed

Chicago, Burlington & Quincy, ten 4-8-4 type locomotives, to own shops.

Delaware, Lackawanna & Western, five passenger locomotives to American Locomotive Co.

Weyerhaeuser Timber Co., two locomotives, to Baldwin Locomotive Works, Eddystone, Pa.

## Locomotives Pending

Pere Marquette, 15 type 2-8-4 locomotives.

Chicago & North Western, eight passenger locomotives.

## Buses Booked

Green Bus Lines Inc., New York, \$340,242 of omnibuses, to Mack Trucks Inc., New York.

Public Service Co-ordinated Transport, subsidiary of Public Service Corp. of New Jersey, Newark, N. J., 195 all-service buses, to Yellow Truck & Coach Co., Pontiac, Mich.

## Strip

Strip Prices, Page 61

**Pittsburgh**—Orders for hot-rolled strip in moderate volume are being placed by miscellaneous consumers, but the development overshadowing all others is suspension instructions from the automotive field. Cold-rolled strip prices are scheduled for a \$5 per ton increase in the three high-carbon brackets, for effect Jan. 15. This follows a similar announcement, effective Jan. 1, on .025-.050 carbon cold-rolled strip.

**Chicago**—Strip mill operations have not suffered materially from curtailment in automotive requirements. Backlogs of orders from other consumers remain fairly heavy and will support schedules for the time being, but producers anticipate a decline in operations shortly in the event of a continuation of restricted motor car production. Prices are steady on new business, with advances of \$5 a ton becoming effective Jan. 15 on higher carbon content.

**Philadelphia**—Activity in narrow strip is increasing largely to shipments of back orders rather than to new

buying, which has been quiet for the last two or three weeks. Prices, meanwhile, are firm at its new levels of 2.44c, Philadelphia, for hot strip, and 3.14c, for cold strip.

**Youngstown, O.**—Makers here of both wide and narrow strip, while in receipt of suspension orders from some auto partsmakers, due to "sit-down" strikes, have simply shifted specifications to other customers and currently are as busy as ever. Many partsmakers, apprehensive of banked-up demand for parts later, continue to turn them out at unchanged rates.

**Cleveland**—While some partsmakers have been building up a small stock, enabling them to keep their organization going, many do not have such facilities for storage and have been forced to curtail production due to labor difficulties in auto plants. However, demand from other miscellaneous sources and extended backlogs have so far kept production at a relatively high rate.

## Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 61

Active shipments of bolts, nuts

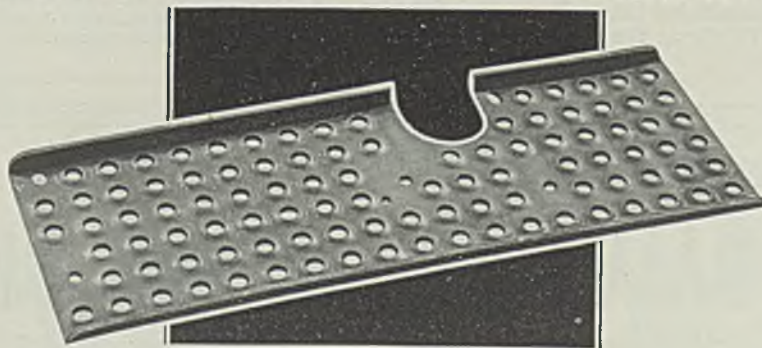
and rivets are in prospect this month, with a heavier rate than a year ago indicated. Labor trouble in the automotive industry is reflected in reduced requirements of parts manufacturers. This situation is the principal deterrent to continued good demand. Tractor and farm implement builders are accounting for substantial lots and are expected to take heavier shipments as operations expand seasonally. Railroad equipment builders and car repair shops show the largest gain in consumption compared with a year ago and are specifying more freely for bolts, nuts and rivets as a result of the recent pickup in orders.

## Semifinished

Semifinished Prices, Page 61

**Youngstown, O.**—Makers of billets, slabs and sheet bars are supplying needs of only regular customers. Several days ago they received an inquiry for 5000 tons of 4 x 4-inch billets for shipment to Manchester, England, but were forced to refuse to quote. The British billet consumers had been receiving Belgian billets.

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**R**AILROADS, as with industry in general, are looking-up to the steel stamping as a combined economic and effective method of application to their equipment or product. This freight car step—a stamping by Parish—additionally serves a major safety factor by imparting a sharp, self-cleaning tread impervious to ice, snow, grease and wet shoe soles.

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Specialists in difficult stamping design

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Pacific Coast Rep.: F. Somers Peterson Co., 57 California St., San Francisco, Cal.

# Shapes

Structural Shape Prices, Page 60

**Pittsburgh**—Awards last week were led by a contract for 6700 tons in transmission towers for the Southern California Edison Co., Los Angeles, placed with Bethlehem Steel Co. Volume of inquiry is encouraging for this time of the year.

**Cleveland**—Structural fabricators report little tonnage pending, due to the usual trend at this time of the year and to unsettled labor conditions. Some have discontinued bidding on small jobs that require early delivery, because mills are now filled well into February. The only job let locally went to American Bridge Co., Pittsburgh, involving 200 tons for the Timken Roller Bearing Co.'s plant at Columbus, O.

**Chicago**—Fabricators have the balance of this month to close on tonnages for which price protection has been extended and the large volume of business pending is expected to result in an increase in awards the next several weeks. Recent bookings have been confined principally to small tonnages.

**Philadelphia**—New structural orders have been light so far this year. Award is expected shortly on approximately 4000 tons of electrification work for the Paoli-Harrisburg division of the Pennsylvania railroad. It is estimated that electrification work on this division will eventually require 25,000 tons. Shapes are holding firmly at the new level of 2.15c,

Bethlehem, Pa., or 2.25½c, Philadelphia.

**San Francisco**—Shape awards for the last week of the year totaled 5089 tons, the largest weekly total since early in July. The aggregate for the year was nearly 35 per cent larger than 1935, when 130,554 tons were placed as compared with 173,427 tons for 1936.

**Seattle**—No important projects have developed but business in small lots has been active prior to first quarter new prices. Plants are not active because of lack of materials due to the maritime strike.

## Shape Contracts Placed

- 6700 tons, transmission towers, for Southern California Edison Co., Los Angeles, to Bethlehem Steel Co., Bethlehem, Pa.
- 1330 tons, viaduct, over New York Central railroad tracks, New York, to American Bridge Co., Pittsburgh.
- 900 tons, factory and boiler house, for Burroughs Adding Machine Co., Plymouth, Mich., to Whitehead & Kales Co., Detroit.
- 870 tons, state highway bridge, Contract 1454, Lafayette, Ind., to Vincennes Steel Corp., Vincennes, Ind.
- 540 tons, civic auditorium, for board of park commissioners, Hammond, Ind., to New City Iron Works, Chicago.
- 510 tons, highway bridge, Colonia, N. J., for Pennsylvania railroad, to American Bridge Co., Pittsburgh.
- 510 tons, Feather River bridge, Nicolas, Calif., to Judson-Pacific Co., San Francisco.
- 500 tons, addition Owens-Illinois Glass Co., Los Angeles, to Consolidated Steel Corp., Los Angeles. Reported in Jan. 2 issue as awarded to Ingalls Iron Works, Birmingham, Ala.
- 500 tons, tunnel ribs, for water and power department, Los Angeles, specification 2146, to Commercial Shearing & Stamping Co., Youngstown, O.

- 460 tons, grade crossing elimination, Lombard, Ill., to Worden Allen Co., Milwaukee.
- 400 tons, buildings for Golden Gate Exposition, San Francisco, to Judson-Pacific Co., San Francisco.
- 400 tons, grade crossing elimination, Elmhurst, Ill., to American Bridge Co., Pittsburgh.
- 375 tons, Montgomery-Ward Co. building, Salt Lake City, Utah, to Minneapolis-Moline Power Implement Co., Minneapolis.
- 370 tons, lithographing plant, for J. L. Clark Mfg. Co., Rockford, Ill., to Mississippi Valley Structural Steel Co., Decatur, Ill.
- 303 tons, Nasel River bridge, Pacific county, Washington, to unnamed interest.
- 265 tons, Rosenberg department store, Santa Rosa, Calif., to Bethlehem Steel Co., Alameda, Calif.
- 250 tons, grade crossing elimination, Villa Park, Ill., to Worden Allen Co., Milwaukee.
- 250 tons, capitol, Salem, Ore., to unnamed interest.
- 250 tons, felt and paper mill building, for U. S. Gypsum Co., Chicago, to Worden-Allen Co., Milwaukee.
- 235 tons, grandstand extension, for Metropolitan Jockey club, Jamaica, N. Y., to Berkshire Iron Works, Brooklyn, N. Y.
- 220 tons, storage warehouse, for Grand Trunk Western railroad, Detroit, to Whitehead & Kales Co., Detroit.
- 200 tons, building for Lockheed Aircraft Co., San Diego, Calif., to Bethlehem Steel Co., Los Angeles.
- 181 tons, four bridges, Grays Harbor county, Washington, to unnamed interest.
- 180 tons, plant building, Columbus, O., for Timken Roller Bearing Co., Canton, O., to American Bridge Co., Pittsburgh.
- 175 tons, Helen's bakery, Los Angeles, to Consolidated Steel Corp., Los Angeles.
- 155 tons, 9 radial gates and 12 gates, Imperial dam, Ariz., to Pacific Iron & Steel Co., Los Angeles.
- 150 tons, building, for Cleveland Crane & Engineering Co., Wickliffe, O., to Austin Co., Cleveland.
- 140 tons, building for Franklin junior high school, Long Beach, Calif., to Minneapolis-Moline Power Implement Co., Minneapolis.
- 125 tons, gymnasium for Union high school district, Anaheim, Calif., to Pacific Iron & Steel Co., Los Angeles.
- 100 tons, sheet piling, Treasury Department, Los Angeles, schedule 18,955, to unnamed interest.

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## Shape Contracts Pending

- 6000 tons, buildings for government, Sacramento, Calif.; bids about March 1.
- 3300 tons, dam No. 13, Clinton, Iowa; McCarthy Construction Co., Davenport, Iowa, low for general contract, Wor-

## Shape Awards Compared

	Tons
Week ended Jan. 9	16,544
Week ended Jan. 2	33,736
Week ended Dec. 25	27,620
This week, 1936	24,216
Weekly average, 1936	21,764
Weekly average, 1937	25,140
Weekly average, December	21,351
Total to date, 1936	44,291
Total to date, 1937	50,280

den Allen Co., Milwaukee, low for fabricated steel.  
 2100 tons, beams, etc., for Overseas Road & Toll Bridge District, Miami, Fla.  
 2000 tons, National Home and Building Center building, Chicago.  
 1250 tons, five sound stages, Metro-Goldwyn-Mayer, Los Angeles; bids soon.  
 1000 tons, factory for North American Aviation Co., Los Angeles; bids soon.  
 960 tons, bridge, Missouri Pacific railroad, Memphis, Tenn.  
 900 tons, inclinator buildings, for Wayne county commissioners, Detroit.  
 800 tons, building, for Alco Gravure Inc., Hoboken, N. J.  
 650 tons, addition to grand stand, race track, Santa Anita, Calif.; general contract awarded.  
 600 tons, buildings Nos. 1 and 2, for Goodyear Tire & Rubber Co., Jackson, Mich.  
 600 tons, state bridges, Missouri.  
 500 tons, building, for National Can Co., Maspeth, N. Y.  
 450 tons, state highway grade crossing eliminations, Sidney and Bainbridge, N. Y.  
 410 tons, Hickory street bridge, Johnstown, Pa., for state of Pennsylvania.  
 375 tons, stores and apartment building, for Springler-Van Buren Estates, New York.  
 300 tons, factory building addition, for Willson Products Inc., Reading, Pa.  
 270 tons, state highway bridge, Route 31013, Lincoln township, Pennsylvania.  
 250 tons, state highway bridge, Route 18013, Castanea township, Pennsylvania.  
 225 tons, bridge, for Erie railroad, Union, N. Y.  
 223 tons, repair Pasco-Kennebec bridge in Benton and Franklin county, Washington; bids Jan. 12.  
 205 tons, fishway frames, Bonneville dam, Ore.; King Bros., Portland, Ore., low.  
 150 tons, addition to hotel, Geary & Mason, San Francisco; bids opened.  
 135 tons, Sierra street bridge, Reno, Nev.; bids Jan. 14.  
 114 tons, state bridge, Springfield, Ill.

which bids were opened last week, little is outstanding. The new delivered price of 2.54c, Philadelphia, on billet steel bars, has so far received little test.

**Seattle**—With prices firming rapidly, the end of the year business was active at prevailing price levels. Many small lot orders were placed. While the first quarter mill price is not definitely fixed, it is likely to show an advance of \$4.00 from 2.45c to 2.65c. Local mills are operating through the holidays and backlogs are of considerable volume.

**Cleveland**—The total estimated tonnage of reinforcing bars during 1936, for private projects in northern Ohio, was 3240 tons; joist involved 1033 tons. The December figures were 435 and 103 tons respectively. The sewage development in this city was the largest single consumer of reinforcing bars, while the construction of school buildings absorbed most of the joist requirements.

**San Francisco**—Effective Dec. 24 the base price, f.o.b. Pacific Docks, on reinforcing bars was raised \$5

a ton from 2.45c to 2.70c. A close check on the situation shows that the majority of the mills have backlogs extending 3 to 4 weeks. The total for the year aggregated 237,297 tons, compared with 228,672 tons for the previous year.

## Reinforcing Steel Awards

904 tons, bureau of reclamation, Phoenix, Ariz., to unnamed interest.  
 650 tons, units 8, 9 and 14, state hospital, Camarillo, Calif., to unnamed interest.  
 500 tons, warehouse, Atchison, Topeka & Santa Fe railroad, San Francisco, to Bethlehem Steel Co., San Francisco.  
 400 tons, project 10A—11A, Laurelton-Lakehurst, N. J., to Igoe Bros. Co., Newark, N. J.; through Fred McDowell, Neptune, N. J., general contractor.  
 375 tons, section 7, route 101, Sixth avenue subway, New York, to Igoe Bros. Co., Newark, N. J.; through Arthur A. Johnson Corp.  
 343 tons, bureau of reclamation, Potholes, Calif., to Bethlehem Steel Co., Bethlehem, Pa.  
 338 tons, bureau of reclamation, invitation 44,116-A, Earp, Calif., to unnamed interest.  
 325 tons, bureau of reclamation, Casper, Wyo., to unnamed interest.  
 260 tons, Mesh highway, Chautauqua county, New York, to Bethlehem Steel Co., Bethlehem, Pa.; P. Klickenberg, Buffalo, general contractor.  
 245 tons, specification 2157, Los Angeles, to unnamed interest.  
 232 tons, bureau of reclamation, invitation A-42,156-A, Knob, Calif., to Bethlehem Steel Co., Bethlehem, Pa.  
 223 tons, bureau of reclamation, Hatch, New Mex., to unnamed interest.  
 200 tons, Washington state highway work, to Northwest Steel Rolling Mills, Seattle.  
 178 tons, schedule A, low level tunnel, Oakland, Calif., to Bethlehem Steel Corp., San Francisco.  
 176 tons, bureau of reclamation, invitation A-42,158-A, Potholes, Calif., to un-

## Concrete Awards Compared

	Tons
Weekly average, 1936 .....	6,215
Week ended Jan. 2 .....	465
Week ended Dec. 25 .....	6,795
This week, 1936 .....	9,352
Week ended Jan. 9 .....	6,005
Weekly average, 1937 .....	3,340
Weekly average, December .....	3,560
Total to date, 1936 .....	11,792
Total to date, 1937 .....	6,680

# Reinforcing

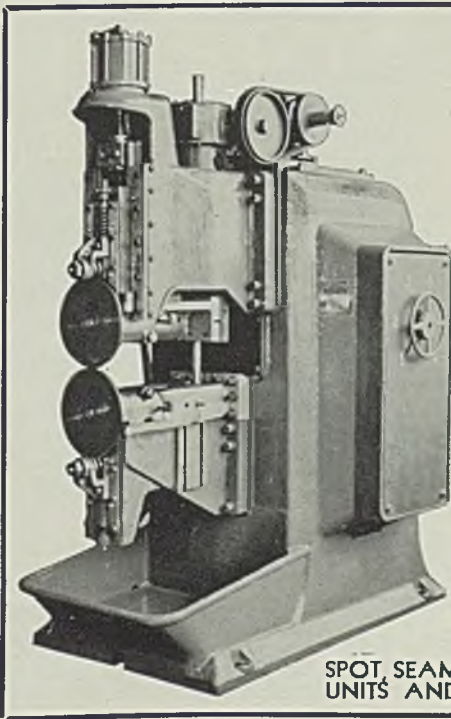
Reinforcing Bar Prices, Page 61

**Pittsburgh** — Scattered tonnages are being booked at the new prices, and pending business is fairly large. Numerous inquiries, particularly for small lots, are reported by producers. Mills have moderate backlogs, and shipments are well maintained.

**Chicago**—Steady shipments continue against old orders. Most new orders are small, but prospective business is promising. Pending orders include 800 tons for Mississippi river dams and several hundred tons for state bridge work. The higher prices have yet to be firmly established.

**New York**—On new business reinforcing bars are steady at 2.68c, delivered on the job, New York district, this including trucking. Considerable tonnage is pending with new requirements coming out for bids in substantial volume.

**Philadelphia**—Apart from two public schools in Philadelphia, on



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with direct motor driven free running rolls, operating on self-contained pre-loaded cartridge type roller bearing.

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*Welding machines which are hand, hydraulic, air or cam operated including the following types:*

SPOT, SEAM, PROJECTION, FLASH, FLUE, GUN UNITS AND SPECIAL HEATING MACHINES.

- named interest.
- 173 tons, bureau of reclamation, invitation, 21,026-A, Emmett, Idaho, to unnamed interest.
- 150 tons, Milwaukee county, Wisconsin, highway department, to R. L. Gilbertson, Milwaukee.
- 143 tons, bureau of reclamation, invitation 42,626-A, Mesa, Ariz., to unnamed interest.
- 100 tons, section 7, route 34, Laurelton, Ocean county, New Jersey, to Truscon Steel Co., Youngstown, O.; through S. J. Groves & Sons.
- 100 tons, bureau of reclamation, invitation 2273-A, Fort Sumner, New Mex., to unnamed interest.
- 100 tons, Castro Canyon bridge, Monterey county, California, to Soule Steel Co., San Francisco.
- 100 tons, three buildings for airdrome, Sacramento, Calif., to Palm Bridge & Iron Works, Sacramento, Calif.

### Reinforcing Steel Pending

- 1425 tons, steel piling for boat basins at Flushing Bay, N. Y.; rebids due Jan. 19.
- 613 tons, dam No. 13, Clinton, Iowa; McCarthy Construction Co., Davenport, Iowa, low for general contract.
- 325 tons, grade crossing elimination, over Long Island railroad, Flushing, N. Y., World's Fair project; bids due Jan. 19.
- 300 tons, mesh, highway, Geneva-Candaigua, Ontario county, New York; John Bellardino Inc., Seneca Falls, N. Y., low.
- 278 tons, tide gate and dam, Flushing, N. Y.; bids in.
- 215 tons, schedule C, Broadway low level tunnel, Oakland, Calif.; bids rejected.
- 175 tons, span for Aberdeen, Wash.; bids Jan. 13.
- 170 tons, city structure No. 5, west side elevated highway, New York; Poirier & McLane Corp., New York, low.
- 100 tons, building addition, for Yardley & Co. Ltd., Union City, N. J.
- 100 tons, bridge, Sixty-ninth road, Flushing, N. Y., World's Fair project; bids due Jan. 19.
- 100 tons, repair, Pasco-Kennewick bridge in Benton and in Franklin county, Washington; bids Jan. 12.
- 100 tons, warehouse at Tacoma, Wash.;

general contract to MacDonald Building Co., Tacoma.

## Pig Iron

Pig Iron Prices, Page 62

**Chicago**—New business in pig iron is almost entirely lacking due to prior coverage. Shipments continue heavy and as yet have not been affected to any large degree by the automotive labor situation. Producers are well booked for the balance of this quarter and shipments will be maintained at the best rate for this period in several years during the ensuing three months.

**Pittsburgh**—Pig iron buyers were well covered before the Jan. 1 price advance of 50 cents per ton, but new buying is being done at the advanced quotation. Except for small foundries, there has been little or no reaction from the automotive labor situation. Stocks of producers are depleted.

**New York**—A let-down in new orders has been noticeable since Jan. 1, at which time a further advance of 50 cents a ton became effective. Most consumers are fairly well covered for the first quarter. There is a fairly good carryover of tonnage booked at \$1.50 below current prices, but producers expect to have this tonnage delivered rather completely by Jan. 31.

**Philadelphia**—Unable to complete shipments, most pig iron sellers are being forced to carry over some tonnage at the old prices of \$1.50 under the current market. It is be-

lieved, however, that most will have this tonnage worked off by Jan. 31. New inquiry is light. Bureau of supplies and accounts is closing on a few hundred tons of foundry iron for several navy yards.

**Buffalo**—Establishment of the new prices has checked pig iron buying. However, shipments are beginning on December orders and backlogs are believed sufficient to assure current operations through this quarter. Scarcity of scrap continues to be a factor in bringing about high melt of hot iron in open hearths.

**Cleveland**—New business following the recent advance of 50 cents is encouraging in spite of labor difficulties in General Motors plants. A relatively small proportion of partsmakers have drastically curtailed production. Most have welcomed the opportunity to acquire a small stock.

**St. Louis**—Holiday conditions continue to prevail in the pig iron situation in this area. Most producers are busy taking inventory, although the melt continues at or about the high rate which marked the closing weeks of December. December shipments exceeded those of November by approximately 50 per cent. Practically all melters are well covered for first quarter.

**Birmingham, Ala.**—Shipments of pig iron are moving at the pre-holiday rate. Pipe, stove and other foundries are again in full operation, while other consumers are asking for prompt deliveries.

**Toronto**—New business has been quiet the past few weeks due to the holiday season. Stronger demand for pig iron is developing and sales are being made at more frequent intervals. A number of the larger melters have covered for first quarter needs and others are expected to close soon. Prices are firm.

## Scrap

Scrap Prices, Page 64

**Chicago**—The tone of the market here is easier, attributed largely to uncertainty arising from the automotive labor situation. Prices in the consumers' market for scrap are unchanged, but dealers and brokers have lowered bids moderately. Railroad lists also are bringing slightly lower prices. No. 1 heavy melting steel nominally continues \$17.50 to \$18, with new business lacking.

**Pittsburgh**—Inactivity in scrap during the past week is reported largely the result of the automotive strike situation which has cre-

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of the piston packing from the outside of Hannifin air cylinders means that high efficiency piston seal is maintained throughout the entire life of the packing. Friction is reduced, maximum power secured without waste of air. Write for Bulletin 34-S.

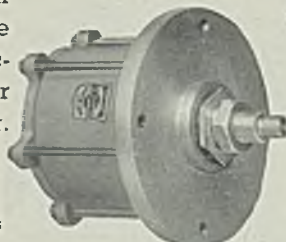
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**EIGHT** mounting types, sizes 1 to 16 inch bore, for any length stroke. Other sizes to order. Single and double acting types.

**HANNIFIN** "Leak-Proof" **AIR CYLINDERS**



ated perplexities for both buyers and sellers. Prices so far have held steady. Embargoes are now in force at Monessen, Brackenridge and Butler.

The Baltimore & Ohio list which closed Jan. 4 is reported to have brought slightly above \$20 a gross ton for No. 1 steel, and specialties brought \$23.50.

**New York**—Several eastern steel mills have held up scrap shipments, due to the automobile labor situation. Demand for iron and steel scrap, however, continues active with prices strong, especially for export. Both grades of heavy melting steel for dock delivery are up \$1 a ton to \$13.50 and \$12.50, respectively. For domestic shipment dealers have advanced No. 2 a like amount, \$11.50 to \$12. No. 1 machinery cast, grate bars and stove plate are also higher.

**Philadelphia**—Scrap has again turned strongly upward, with melting steel and the heavy cast grades leading the way. Practically all grades have been increased. No. 1 steel is now holding at \$17, delivered, consuming plant and No. 2 steel at \$15.50 to \$16. Export scrap is now being accumulated here, with \$16.50 f.a.s. Port Richmond, now being quoted by dealers for No. 1 steel. No. 2 scrap is not being bought here for shipment abroad, dealers relying largely on accumulations in New England and the South. Cupola cast is being accumulated for tunnel segment work for two projects in New York. The casting of these segments will be done largely at Catasauqua, Pa., it is reliably understood, with the two jobs requiring little over 45,000 tons of scrap. This is on a basis of 45 per cent scrap and 55 per cent pig iron. Shipments will be made at the rate of around 2500 tons per month, it is believed. Dealers are paying around \$18.50 a ton, delivered, for this scrap.

**Detroit**—Lessened scrap supplies from strikebound automotive plants is met by easier sentiment on prices as dealers fear effects on consumer attitude.

**Buffalo**—Dealers are selling odd carloads of scrap at prices well above the nominal quoted ranges. Some lots of No. 1 heavy melting steel have brought as high as \$18 although there is no tonnage offer to buy at this price. The whole list is strong and material is arriving in quantities generally insufficient to meet demand.

**Cleveland**—New business in iron and steel scrap is practically nil, neither dealers nor brokers desiring to add to bookings. Prices are unchanged.

**St. Louis**—The steady rise in iron and steel scrap prices has come to a

definite halt. Dealers find it easier to acquire material for outstanding contracts. Some dealers report no change in quotations, while others give the price of No. 2 heavy melting steel, the most important grade in this market, as 25 cents lower.

**Birmingham, Ala.**—Firm quotations, fairly good supply and consumers of heavy melting steel placing inquiries have built up a steady market in iron and steel scrap. Dealers are able to get a little miscellaneous scrap and are still able to meet demand, though stock on hand is not large.

**Seattle**—Local mills are buying in volume to offset consumption and good tonnages find a ready market. Prices are firm and unchanged at around \$10.50 for No. 1 melting. Tidewater stocks are not plentiful and receipts from the country are inconsiderable.

**Toronto, Ont.**—Trading in iron and steel scrap again is swinging back to normal after the holiday season and dealers have revised prices. Advances have been made on most materials. Deliveries of steel grades against contract are increasing and some local dealers state that they have a ready market for all available material.

effective. Increases on sheets, however, principally affect larger lots, with quotations on smaller orders unchanged.

**Cleveland**—Warehouse distributors besides advancing their prices Jan. 1, to conform with the mill increases, have also adjusted their differentials, details of which will be found on the warehouse price page. New business has so far come up to expectations.

**New York**—Demand for steel out of warehouse has slackened only slightly, with higher prices now effective. Inventory is having less influence than usual.

**Philadelphia**—Following a flurry of buying at the close of last month, warehouse demand has been slow, a situation accentuated by inventory-taking at a number of consuming plants. Final returns for December indicate that business for most distributors was somewhat better than in November.

**St. Louis**—Demand from warehouse has recovered from the holiday lull, and during the past several days the volume compares favorably with the high rate in the early weeks of December. Demand is well diversified. Outstanding are light materials for repairs, sheets, and wire. Advance ordering of fencing materials is in larger volume than a year ago.

**Seattle**—Business improved last week due to the stimulus of increased prices Jan. 1. No particular item is outstanding. Portland dealers are still trying to adjust price schedules in line with Seattle territory.

## Warehouse

Warehouse Prices, Page 63

**Chicago**—Sales are holding unusually well considering the brisk buying late in December in anticipation of the higher prices, now

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## Steel in Europe

Foreign Steel Prices, Page 63

**London** — (By Cable) — British steelworks continue hard pressed by consumers and plant extensions are under way. Many works are booked for three to six months and some have retired from the market. Export trade is restricted by pressure for domestic delivery, although overseas inquiry is expanding. Domestic price of hematite pig iron is advanced 12s 6d.

The Continent reports trade active following the holiday season. This applies to domestic and export markets.

## Metallurgical Coke

Coke Prices, Page 61

**Pittsburgh**—Although coke demand has slackened slightly very strong rate of activity among producers continues. The domestic market has been somewhat disappointing so far due to mild weather in many sections. Because of the labor situation, some operators who had been planning to put additional facilities into service find themselves in a dilemma. In the Connellsville region prices are steady.

## Nonferrous Metals

Nonferrous Metal Prices, Page 62

**New York**—Undertone of the major metal markets strengthened last

week as offerings were limited due to lack of supplies. Zinc advanced \$3 per ton while copper and lead held unchanged.

**Copper**—Export copper advanced steadily to around 12.12½c, c.i.f. on resumption of speculative buying abroad. If that market continues to rise, a further price rise here is anticipated. Fabricators were unable to cover their needs fully at 12.00c, Connecticut.

**Lead**—Consumers bought moderate tonnages for February delivery due to the strong price tone abroad. Prices held at 5.85c, East St. Louis, and 6.00c, New York.

**Zinc**—Prime western advanced to 5.60c, East St. Louis, for first quarter delivery. Stocks at the end of December totaled only 38,982 tons compared with shipments of 28,736 tons for that month. Some observers look for still higher prices in the near future.

**Tin**—Prices advanced fractionally on the signing of a new agreement to control output for five years. Straits spot closed around 51.30c. Consumers again showed only light buying interest.

**Antimony**—Spot advanced ¼-cent to 14.00c, New York, on reports of higher levels in China.

## Coke By-Products

Coke By-Product Prices, Page 61

**New York**—Shipments of sulphate of ammonia to the fertilizer trade are slightly heavier seasonally. Prices are unchanged at \$26 a ton, Atlantic seaboard. Shipments

of toluol and xylol are brisk. Benzol demand is steady at 16.00c, freight allowed, in tank cars while drums are 21.00c, f.o.b. ovens, no freight allowed. Toluol and xylol prices are steady, demand slightly exceeding current production. Phenol and naphthalene are unchanged.

## Ferroalloys

Ferroalloy Prices, Page 62

**New York**—With steelmaking heavy, notwithstanding labor disturbances in the automotive industry, shipments of ferromanganese are brisk. Leading sellers here declare that so far they have had no important suspensions as a result of a backing up of orders that could be traceable to labor disorders in the automobile industry. There have been stop orders for finished steel at some plants, but this has not as yet worked back to the shipper of ferromanganese, apparently. The movement of domestic spiegeleisen also is holding well, with prices on 19 to 21 per cent material unchanged at \$26, Palmerton, Pa., per ton, regardless of the number of tons involved.

## Mirrors of Motordom

(Concluded from Page 26)

duction of models already designed for the year 1937." Special meeting of stockholders called in connection with recapitalization was adjourned due to lack of quorum to Jan. 28. . . Dr. Hugo Eckener will tell the S.A.E. about the airship and its place in modern transportation at the annual meeting of the society in Detroit this week. He will broadcast Thursday evening at 9 p. m. Provision is being made in all Chevrolet cars before they leave the factory for radio, loudspeaker, heater, safety defroster and a new radio resonator. Which calls to mind the report that the idea of using the rear compartment door for a radio aerial on one make of popular-price car was abandoned because it would have meant the additional use of 18 cents worth of wire per car. . . . General Electric has announced a complete new line of five refrigerated truck bodies, including automatic, holdover, and dry ice types. All bodies are of cold-rolled sheet steel, with galvanized sheets for inner liners. . . . Four-door locking device has been perfected by Houdaille-Hershey Corp., which can be installed either as original equipment or, at a slightly increased cost, on present cars. It is called the Lok-All-Handle.

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# Construction and Enterprise

## Ohio

AKRON, O. — City will ask bids early in February for sewage treatment plant equipment estimated to cost \$14,000, to include pumps and air compressor. W. F. Peters is service director, and Luther Larue is city sewerage engineer, City Hall.

AVERY, O. — Weaver-Wall Co., 3700 Brookpark road, Cleveland, will remodel the Hoover potato digger plant at Avery for manufacturing asphalt roofing and shingles.

BELLEVEUE, O. — Village is taking bids due noon Jan. 20 for construction of water pumping station, with installation of all necessary appurtenances. Cost is estimated at \$8000. C. A. Williams is village service director, and George Gascolgne, 1140 Leader building, Cleveland, is engineer.

CARROLLTON, O. — Village has completed plans for building \$200,000 sewage disposal plant, and buying of materials will start soon. Sam Poole is secretary of board of public affairs, Arnold, Rosch & Hartline, 116 Fair avenue, New Philadelphia, are engineers.

CLEVELAND — Brewing Corp. of America Inc., East Ninety-third street and Quincy avenue, Southeast, plans to install electric power plant equipment in a new plant addition to cost \$100,000. Ernest McGeorge, 1900 Euclid avenue, is architect and engineer.

CLEVELAND — Linderme Tube Co., 1291 East Fifty-third street, manufacturer of brass and copper tubing, plans construction of a one-story factory costing \$100,000 on East 219th street, north of Euclid avenue. Emil Linderme is president.

DELPHOS, O. — Macke Packing Co., Wapakoneta, O., has leased a former building of the Nickel Plate railroad and will remodel it and install new machinery for canning vegetables.

JACKSONVILLE, O. — Village is considering construction of waterworks plant and distribution system, with a 100,000-gallon elevated steel tank. H. D. Phillips is mayor, and Paul W. Elwell, 5005 Euclid avenue, Cleveland, is engineer. Plans will mature in the spring.

LIMA, O. — Plant of the Emerson Price Co., office supply manufacturer, was damaged by fire recently.

LOWELLVILLE, O. — Village will ask bids soon for electric power plant equipment, including a diesel engine unit, estimated to cost \$50,000. Bryan & Sigman Engineering Co., Newton Falls, O., is engineer.

MIDDLEFIELD, O. — Middlefield Retreading Co., Hubert Town, president, has leased the property on Vine street of the Middlefield Supply Co. and machinery will be installed for retreading used tire casings.

NAPOLEON, O. — Lippincott Co., tomato canner, 42 Main street, Cincinnati, is considering construction of a factory in Napoleon.

NEW ATHENS, O. — City is considering construction of waterworks plant and distribution system, with a 100,000-gallon elevated steel tank. Paul W. Elwell, 5005 Euclid avenue, Cleveland, is engineer, and J. E. McFadden is mayor. Plans will mature in the spring.

NEW WASHINGTON, O. — Village is

taking bids due noon Jan. 15 for waterworks plant equipment, including an elevated steel tank, 100,000-gallons capacity. August Rettig is mayor and Jennings & Lawrence, 538 Rowlands building, Columbus, are engineers.

OSBORN, O. — Village plans for construction of \$140,000 sewage disposal plant have been approved by PWA, and work will probably mature in the spring. M. A. Jones is mayor, and F. J. Cellarius Engineering Co., 36 East First street, Dayton, O., is engineer.

REPUBLIC, O. — Village plans construction of waterworks system costing about \$48,000, and will apply to PWA for \$22,000. Special election will probably be held to pass on bonds of \$26,000, remainder of cost. C. E. Womer is mayor, and consulting engineer is Champe, Finkbeiner & Associates, Nicholas building, Toledo, O.

SALEM, O. — Ohio Edison Co., Thomas E. Miller, district manager, South Ellsworth avenue, will start construction soon on a \$125,000 electric substation, with a capacity of 10,000 kilovolt-amperes.

SIDNEY, O. — City plans construction of additions to waterworks plant and distribution system, to include 500,000-gallon elevated steel tank and engine-driven generating set and appurtenances. Aid from PWA is being sought, but the project will be carried out even if help is not obtained. Rolla Loughlin is mayor and Floyd E. Browne, Marlon building, Marlon, O., is engineer.

TIFFIN, O. — United States Glass Co., E. E. Slick Jr., executive vice president, South Ninth street, Pittsburgh, plans to remodel glass furnaces.

WASHINGTON COURTHOUSE, O. —

City's offer of \$350,000 for purchase of Ohio Water Service Co.'s plant has been rejected and city is considering erection of new municipal plant. J. Kent Hopkins is service director, city hall, and Alvord, Burdick & Howson Co., 20 North Wacker drive, Chicago, is engineer.

## Michigan

BAY CITY, MICH. — City has obtained estimates of \$800,000 as cost of proposed municipal electric power plant. Ayres, Lewis, Norris & May, Ann Arbor, are engineers.

BAY CITY, MICH. — National Electric Welding Machines Co. plans construction of a new plant. Henry C. Weber Construction Co., Bay City, has the general contract.

BENTON HARBOR, MICH. — City plans waterworks improvements costing \$107,909, with PWA allotting \$76,909.

CIRCLEVILLE, O.—City is awaiting report on survey of waterworks system. J. E. Mavis is city service director, consulting engineer is Alvord, Burdick & Howson, 20 North Wacker drive, Chicago.

DETROIT — Aviation Parts Mfg. Co. has been incorporated to manufacture airplane parts. Correspondent is Phillip J. Williams, 1130 Majestic building.

DETROIT — Masco Screw Products Co., 2627 Magnolia street, plans construction of an addition which will increase capacity by one-third. Alex Manoglan is president.

DETROIT — Dixie Oil Refining Co., organized by officials of Dixie Fuel & Supply Co., 301 South Cavalry street, plans erection of boiler plant at new refinery near Wyandotte, Mich. A power station and a large steel storage division will also be built. Total cost will be about \$1,500,000. R. H. Montgomery and Paul R. Kemp are heading the organization.

GRAND RAPIDS, MICH. — Grand Rapids Sash & Door Co., 1453 Buchanan avenue, Southwest, has awarded the general contract for a plant addition to Owen-Ames-Kimball Co., 38 Pearl

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street, Northwest. B. W. Hertel, 1532 Hall street, Southeast is architect.

**GRAND RAPIDS, MICH.** — Grand Rapids Varnish Corp. will start construction of a plant addition within 60 days. The new building will be two-story, 60 x 100 feet, costing about \$50,000. Frederick A. Brown is vice president in charge.

**HARTFORD, MICH.** — Van Buren County Canning Co. factory was damaged by fire recently. William Traver is president.

**MIDLAND, MICH.**—City has awarded contract for construction of an addition to the water softening and filtration plant to Patterson Engineering Co., 8044 Wheeler street, Detroit. Shoecraft, Drury & McNamee, Ann Arbor, are consulting engineers.

**NILES, MICH.** — City will construct a \$407,000 municipal sewage disposal plant, aided by a \$203,500 PWA grant.

**SAULT STE. MARIE, MICH.** — Soo Brewing Co. has been incorporated and has purchased the Rheinbrau brewing plant, where new machinery will be installed. Louis E. Noel, Grand Rapids, is president and general manager.

**SPARTA, MICH.** — Delta Ray Co. has been incorporated to do general manufacturing business. T. E. McFall, Sparta, is correspondent.

**YPSILANTI, MICH.** — Board of public works is considering construction of a new iron removal plant at the municipal waterworks, which will cost approximately \$71,700.

## Illinois

**CHICAGO** — Midwest Forging & Mfg. Co., 38 South Dearborn street, has been incorporated. Correspondent is C. H. Jones.

**MOLINE, ILL.** — J. I. Case Co., Racine, Wis., manufacturer of agricultural machinery and parts, plans to install electric power equipment in a branch plant to be established in the former factory of the Velle Motors Corp. The building will be remodeled and improved at a total cost of over \$150,000.

**MORRIS, ILL.** — Fire recently destroyed local plant of Illinois Clay Products Co., fire clay products manufacturer, with headquarters on Chicago street, Joliet. The plant will be rebuilt and new electric power equipment installed.

## Indiana

**AUBURN, IND.** — Auburn Foundry Inc. has been organized to do general foundry work. Correspondent is Hubert E. Hartman, 2205 Dime Bank building, Detroit.

**BREMEN, IND.** — City will let contracts soon for engine generator units and auxiliary equipment to be installed in new 2-story municipal electric power plant. Leroy Bradley, 221 West Wayne street, Fort Wayne, is architect.

**CENTERVILLE, IND.** — Township school board plans construction of addition to school building, with installation of two horizontal tubular boilers, two automatic stokers, pumping machinery and auxiliary equipment. C. E. Werking & Son, 200 East Main street, Richmond, Ind., are engineers.

**NEWCASTLE, IND.**—City plans asking for bids soon for equipment for installation in municipal waterworks station. A 1000-kilovolt-ampere diesel engine generator unit and auxiliary equipment will be needed. F. Taylor is city engineer, city hall.

## Alabama

**DEMOPOLIS, ALA.**—Swift & Co., Union stockyards, Chicago, has acquired the plant of the Demopolis Creamery and will install additional machinery in several departments.

**PRICHARD, ALA.** — Shirley H. Cochran and associates plan construction of electric power plant costing \$100,000.

## Maryland

**BALTIMORE** — Rustless Iron & Steel Corp., C. E. Tuttle chairman of board, 1001 Edison Highway, plans \$625,000 expansion program in 1937, which will include construction of 12-inch merchant bar mill and enlargement of the melting, cold finishing and other departments.

**BALTIMORE** — Standard Wholesale Phosphate Co., Mercantile Trust building, plans to install electric power equipment in new 3-story, 112 x 450-foot addition to be built to commercial fertilizer plant in Curtis Bay district. Total cost is estimated at \$100,000.

## District of Columbia

**WASHINGTON** — Treasury department plans installation of new boiler plant in postoffice to be built in St. Louis, Mo., at a cost of \$430,000.

**WASHINGTON** — Navy department, bureau of supplies and accounts, will receive bids until 10 a. m. Jan. 15 for miscellaneous copper and nickel alloy forgings, for delivery at Washington, and for miscellaneous abrasive wheels, for delivery various east and west coast points. The bureau is taking bids due Jan. 19 for miscellaneous compound boilers, for delivery various coast points.

## Florida

**JACKSONVILLE, FLA.** — Department of public utilities, Ernest E. Anders commissioner, plans building extensions and additions to the electric power plant, to include installation of a new steam turbogenerator with accessory equipment. Cost will be \$2,375,000, with about \$1,125,000 in federal aid.

## Georgia

**ATLANTA**—J. B. McCrary Engineering Corp., 22 Marietta street building, is engineer for the following rural electrification projects in Georgia; Douglasville, 90 miles of lines; Waynesboro, 90 miles; Irwin, approximately 150 miles.

**ATLANTA, GA.** — Georgia Power Co., P. S. Arkwright, president, plans to spend \$7,000,000 for improvements and extensions to its system during 1937. Work will include transmission lines, substations and steam-electric generating plants, in Atlanta, Athens, Atkinson, Bremen, Griffin, Thomaston, Macon, Eastman, Hawkinsville, Madison and Greensboro.

**CARROLLTON, GA.**—R. D. Tisinger, attorney for Carroll Rural Electric association, will receive bids until Jan. 20 for construction of a rural transmission system. Engineer is J. B. McCrary Engineering Corp., 22 Marietta street building, Atlanta.

## Kentucky

**GLASGOW, KY.** — Plans will soon mature for construction of municipal power plant, following authorization by voters of issuance of \$200,000 bonds.

**HARTFORD, KY.** — City will receive bids until Jan. 5 for rebuilding filter plant at waterworks, and for erection

of tank and tower. Engineers are Westcott & Thornton, Cary building, Owensboro.

**WILLIAMSTOWN, KY.** — City will ask bids soon for construction of municipal power station, with generating unit and auxiliary equipment. Cost is estimated at \$72,000.

## Louisiana

**LAKE CHARLES, LA.** — Swift & Co., Union Stockyards, Chicago, is having plans prepared for construction of packing plant at Lake Charles, and will probably take bids late in January.

**NEW ORLEANS, LA.**—Falstaff Brewing Corp., 3684 Forest Park boulevard, St. Louis, Mo., will spend \$150,000 on the recently purchased plant of the National Brewing Co., 2600 Graveler street, and will install new machinery and storage facilities.

**NEW ORLEANS** — New Orleans Public Service Inc. plans spending \$2,800,000 for extensions and additions to Market street steam-electric generating plant. Proposed installations include a 37,500 kilovolt-ampere turbine and boiler, with all fixtures.

**TALLULAH, LA.**—Chicago Mill & Lumber Co., 111 West Washington street, Chicago, plans installation of motors and controls, conveyors, loaders, electric substation equipment and other equipment in connection with rebuilding of local veneer mill, recently destroyed by fire.

**WINNSBORO, LA.** — Town is having plans prepared for construction of a \$50,000 waterworks plant and system. Swanson-McGraw, Balter building, New Orleans, are architects.

**WISNER, LA.** — Voters will pass Jan. 12 on bonds of \$45,000 to finance construction of proposed municipal waterworks. Swanson-McGraw, Balter building, New Orleans, are architects.

## North Carolina

**PLYMOUTH, N. C.** — Kleckhefer Container Co., West Canal street, Milwaukee, Wis., plans construction of new plant addition, where electric power equipment will be installed.

## Virginia

**BEDFORD, VA.** — Virginia Rubatex Corp. has bought the plant of the Bedford Tire & Rubber Co. and will remodel it and install new machinery.

**FRANKLIN, VA.**—Chesapeake Corp., West Point, Va., manufacturer of kraft board and paper products, plans construction of new mill at Franklin, in which electric power equipment will be installed. Total cost will be about \$1,500,000.

**LYNCHBURG, VA.** — Lynchburg Foundry Co., Henry E. McWane president, Peoples National Bank building, plans rebuilding burned factory.

**RICHMOND, VA.** — Standard Overall Co., 701 West Pratt street, Baltimore, has acquired a building in Richmond and will remodel it for manufacturing.

**STAUNTON, VA.** — Oscar Nebel Co. Inc., Winchester, Va. and Hatboro, Pa., hosiery manufacturer, plans construction of 1-story, 110 x 150-foot knitting mill at Staunton, at a cost of \$175,000. Electric power and air conditioning equipment will be installed.

## Missouri

**CABOOL, MO.** — City plans construction  
(Please turn to Page 78)

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(Concluded from Page 76)

tion of municipal electric power plant with two 100-kilowatt diesel engine units and auxiliary equipment. Federal aid in financing will be sought.

ST. LOUIS — Ruberoid Co., B. R. Rugen superintendent, 9215 Riverview drive, will construct an addition to its plant, at a cost of \$250,000. New machinery and equipment costing \$175,000 will also be installed.

### Oklahoma

OKLAHOMA CITY, OKLA. — E. A. Liebmann, 628 Culbertson drive, plans construction of 1-story, 50 x 75-foot ice manufacturing plant at 1106 North May street. Cost is estimated at \$40,000, with equipment.

### Texas

BRENNHAM, TEX. — Council plans construction of municipal electric power plant to cost about \$310,000. Four 250-kilowatt diesel engine generating units with accessory equipment will be installed. About \$140,000 will be sought in federal aid.

HOUSTON, TEX. — Houston Machinery Co., dealer, is in the market for a marine diesel engine, 125 horsepower, with about 500 revolutions per minute.

PORT ISABEL, TEX. — PWA has approved grant of \$32,000 to help finance proposed \$72,000 waterworks system, to include new pumping plant.

### Wisconsin

EDGAR, WIS.—Voters have approved proposed construction of \$75,000 waterworks, sewerage and sewage disposal plant. W. G. Kirchoffer, 22 North Carroll street, Madison, Wis., is engineer, and A. J. Cherney is president of village board.

JANESVILLE, WIS. — Chevrolet Motor Co., 3044 West Grand boulevard, Detroit, Mich., plans construction of 1-story, 45 x 600 addition to local assembly plant, to cost over \$100,000.

MADISON, WIS. — Klipp Corp., maker of lubricating systems for machine tools and other mechanical equipment, has purchased the Four Lakes ordinance building at 3810 Atwood avenue, and expects to reconditon it. Thomas E. Coleman is president.

MENASHA, WIS. — Marathon Paper Mills, Wausau, Wis., plans construction of \$300,000 addition to paper converting plant here. D. C. Everest, Wausau, is general manager.

MILWAUKEE — John Graf Co., manufacturer of carbonated beverages, is starting construction of a new plant at South Fortieth street and West Greenfield avenue. New machinery will be installed.

WAUSAU, WIS. — Marathon Rubber Products Co., J. L. Usow president, has started construction of a factory addition, 80 x 85 feet.

WAUKESHA, WIS. — Hein-Werner Motor Parts Corp., 1200 National avenue, plans building \$60,000 addition to plant. Electric power equipment will be installed.

### Minnesota

HALSTED, MINN. — City council has authorized survey to estimate cost of building municipal electric power plant. Ealy G. Briggs, 1955 University avenue, St. Paul, is engineer in charge.

MINNEAPOLIS — Northern States

Power Co., Robert F. Pack president, will spend \$8,143,000 for new construction and improvements during 1937. Largest single item will be an expansion of the Riverside steam station in Minneapolis, where a new generating unit, with two additional boilers, will be installed. Capacity will be increased 134,000 horsepower. Other improvements will include additions to the Hlawatha substation in Minneapolis, a new substation in St. Paul, a 4000-horsepower generating unit at Grand Forks, N. Dak., a new substation at Belgrade, Minn., and another at Sloux Falls, S. Dak.

ST. JAMES, MINN. — South Central Co-operative Electric Association, E. C. Meler president, has been allotted \$210,000 by REA for erection of 432 miles of rural transmission lines.

### Kansas

EUDORA, KANS.—Voters have approved a bond issue for construction of waterworks system to include tower and tank, and to cost \$53,500. Schockley Engineering Co., Kansas City, is engineer.

VERMILLION, KANS. — City will take bids soon for erection of a 50,000-gallon steel tank and tower. Paulette & Wilson, National Reserve building, Topeka, Kans., are engineers.

### South Dakota

BERESFORD, S. DAK. — City plans construction of municipal light and power plant to cost about \$100,000. W. F. Smith is city auditor.

### Iowa

CEDAR FALLS, IOWA — City plans installation of additional turbine equipment in light and power plant, at an estimated cost of \$80,000. H. B. Philpot is city clerk.

DES MOINES, IOWA — Globe Hoist Co. has been incorporated to manufacture auto hoists, jacks and truck and wagon dumps. Fred W. Swanson is president.

IOWA FALLS, IOWA — Thel Mar Mfg. Co. has been incorporated to manufacture automobile trailers.

MARSHALLTOWN, IOWA—City council is completing plans for construction of a sewage disposal plant to cost approximately \$475,000. Aid will be sought from WPA.

ROCKWELL CITY, IOWA — Calhoun County Electric Co-operative Association, A. J. Cook president, has been granted a franchise to erect 987 miles of rural transmission lines which will cost about \$1,000,000.

WATERLOO, IOWA — Chamberlain Corp., subsidiary of American Wringer Co., will install new rubber processing equipment for the manufacture of rubber rollers for wringers.

WATERLOO, IOWA — Construction Machinery Co., manufacturer of concrete mixers and concrete carts, will rebuild and equip a foundry for making its own castings.

WATERLOO, IOWA — Plans for a \$990,000 sewage disposal plant have been approved by PWA. City clerk is Knapp Mathews, city engineer is C. T. Wilson.

WHITING, IOWA — Village plans installation of a new diesel engine in municipal light and power plant.

VINTON, IOWA — City council has authorized improvements in the municipal

light and power plant, to include installation of diesel engine.

### Nebraska

FALLS CITY, NEBR. — City plans construction of addition to electric power plant, to include installation of 1200-horsepower diesel engine unit and auxiliary equipment. Bids will be asked soon. Cost is estimated at \$80,000.

LEXINGTON, NEBR.—Dawson County Rural Power District plans construction of 252 miles of rural transmission lines in Dawson county, at a cost of \$204,000. Application has been made for a REA loan.

LINCOLN, NEBR. — City plans extensions to power plant, and Black & Veatch, 4706 Broadway, Kansas City, Mo., are now making a survey to determine costs.

### Montana

KALISPELL, MONT.—KalisPELL Malt-ing & Brewing Co. will build a second-story addition to its main plant and will install additional machinery and equipment.

### Idaho

MOSCOW, IDAHO — Electrification Association of Nez Perce, Benewah, Latah, Lewis and Clearwater counties is seeking a 600-mile extension of rural transmission lines, which are estimated to cost \$620,000. Aid from REA will be sought.

### Pacific Coast

LOS ANGELES — Liquid Carbonic Pacific Corp. Ltd., 2600 East Twelfth street, plans construction of 50 x 190-foot addition to carbonating machinery manufacturing works, and electric power equipment will be installed. Cost is estimated at \$80,000. Blaine Nolce, 5436 Carlton Way, is engineer.

SAN FRANCISCO — Connor Mfg. Co., 224 Natoma street, plans construction of plant addition, to be 25 x 70 feet.

SAN FRANCISCO — Echlin Mfg. Co., Sixteenth and Vermont streets, plans construction of a 3-story, 100 x 140-foot plant, to cost about \$500,000. Cahill Bros., 206 Sansome street, have the general contract.

BINGEN, WASH. — City plans construction of sewage disposal plant, and WPA aid will be sought.

RITZVILLE, WASH. — Ralph Streeter and Charles Sassman plan construction of a pulverizing and refining plant.

SPOKANE, WASH.—Washington Water Power Co. will spend \$1,250,000 for construction during 1937, and a new substation will be built at Orofino, Idaho.

TACOMA, WASH. — Everett Pulp & Paper Co. plans to reconditon the West Tacoma plant of the Cascade Paper Co. and install new equipment.

SILVERTON, OREG. — City plans improvements to city water system, including purchase of a diesel engine power plant.

### Canada

TORONTO, ONT. — Holdsworth Co. Ltd., 2070 Lavadr street, Montreal, Que., textile dyer and furnisher, plans installation of electric power equipment in new branch plant to be built at 349 Carlaw avenue, where a new boiler plant will also be built. Cost is estimated at about \$80,000. G. P. Holdsworth is general manager.

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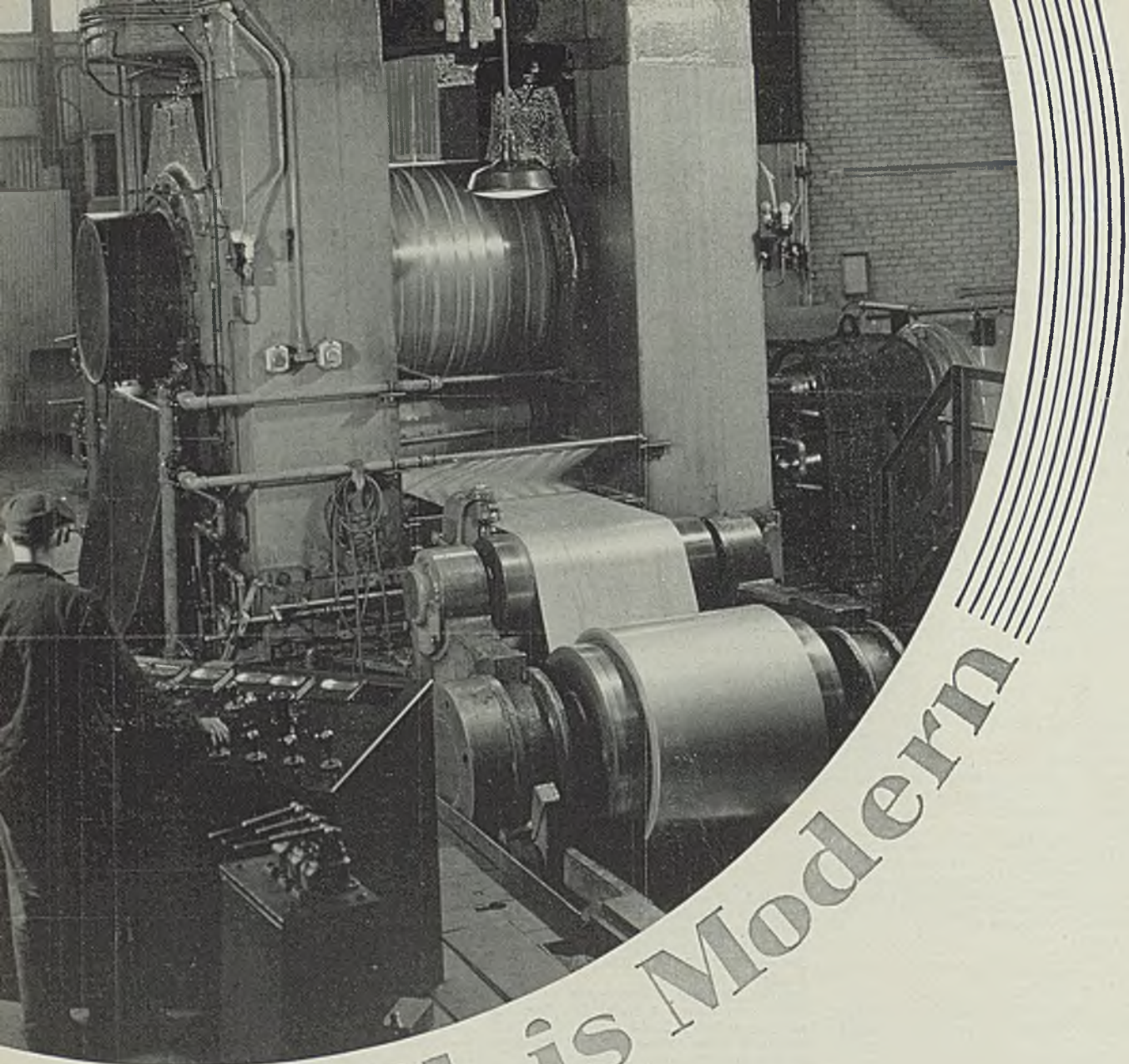
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