

STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

For forty-eight years—IRON TRADE REVIEW

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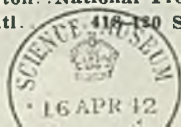
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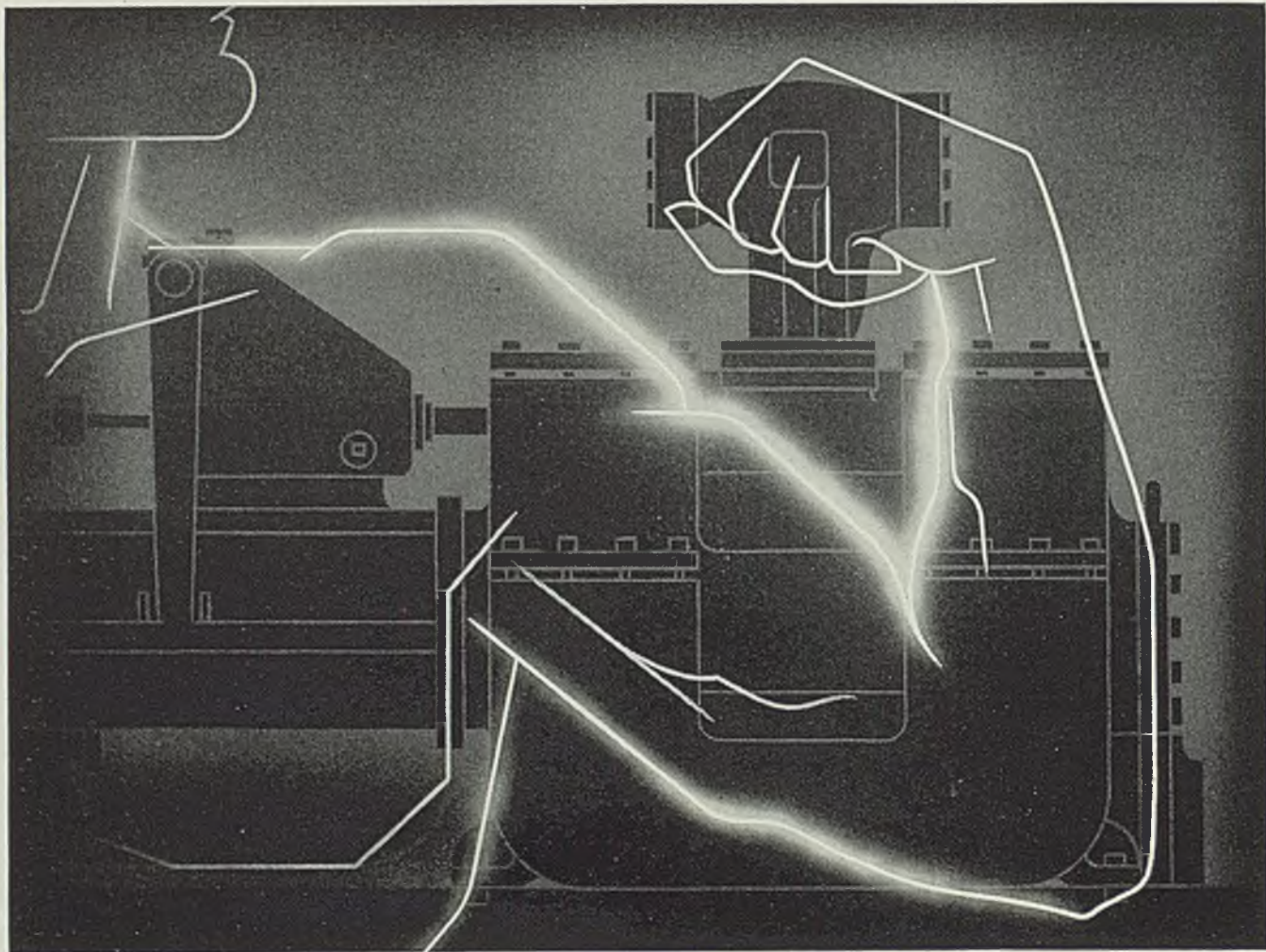
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SINEWS FOR SERVICE

If THE service is tough — so are Moly irons and steels. Take slush pumps in the oil fields . . . driven continuously and operating under severe conditions.

Since no pump is better than its parts, many pump builders use Moly irons and steels for the vital parts . . . because they have proved their capacity to withstand the toughest going.

One manufacturer, for example, uses carburized Nickel-Moly (SAE 4615) for pump cylinders. It was selected primarily because it takes a case impervious to the abrasion of well cuttings; and pressure is always constant. Minimum distortion from heat-treating was also a factor. . . . Just one of many cases where Moly steel or iron has settled a difficult prob-

lem — to the mutual advantage of the manufacturer and the user of the product. From either standpoint, Moly steels and irons will prove well worth their investigation.

Our technical books, "Molybdenum in Steel" and "Molybdenum in Cast Iron," will be found of unusual interest to engineering and production heads in any industry using or producing ferrous products. A simple request brings either or both — and, if desired, puts your name on "The Moly Matrix" monthly mailing list. Our experimental laboratory facilities are available for the study of any special problem in alloy steel or iron. Climax Molybdenum Company, 500 Fifth Avenue, New York City.

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STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

As the Editor Views the News

WHEN the executive branch of a democratic government assumes too much power over the legislative and judiciary branches, the result is a condition charged with dynamite. The action of President Roosevelt in seeking to "pack" the federal courts (p. 24), after having bull-dozed congress into virtual subjection, savors so much of the method employed by European dictators that we find it difficult to believe that the American public will sanction it. This incident seems to point clearly to one conclusion: Unless congress rejects this proposal decisively, the only remaining hope of maintaining a free, democratic form of government will be the power of sane public opinion.

• • •

Public opinion is one of the strongest forces in the nation today. Both sides in the General Motors-CIO controversy (p. 29) are striving to win and keep the support of the public. In fact, it is no exaggeration to say that the case (p. 35) is being tried in the court of public opinion. But unfortunately public opinion at times is unreliable. Right now it is condoning lawlessness. It has been influenced unduly by the wiles of demagogues. Industry's job—everybody's job—is to restore the balance of public opinion. Don't waste time on Washington. Work on the man in the street. Purify opinion at its source!

Public Has Last Word

• • •

Many readers whose early days were spent in industrial plants where the only heat available to temper the chill of winter was provided by coke or coal salamanders, will marvel at the uniformity of temperature that can be maintained by modern heating equipment. Apparently it is not difficult today to install heaters (p. 38) which will provide temperatures of within 3 degrees of 70 degrees throughout a plant. To the hardy souls of earlier generations such perfection would have been considered an extravagant luxury. Today it is looked upon as an

Heating Plants Uniformly

investment in improved working conditions, efficiency and protection of materials and equipment. . . . Applying porcelain enamel to the impellers and bowls of deep well pumps (p. 52) presents an effective new method of combatting the age-old problems of sand cutting and electrolysis.

• • •

Few persons outside of the forging industry appreciate the extent to which the technique of forgings manufacture has been refined and integrated in recent years. Due primarily to the exacting demands of the automotive industry, manufacturers of forgings (p. 42) have perfected equipment, methods and organization capable of producing forgings of almost unbelievable uniformity of quality and conforming to narrow limits of accuracy. Improvement of dies is one of many factors which has contributed to the advance in forging practice. Inserting tungsten tool steel plugs (previously cooled to 130 degrees below zero) into dies to insure a tight fit (p. 47) is a good illustration of the ingenuity forging manufacturers have invoked to serve their customers more satisfactorily.

Why Forgings Are Better

• • •

To stimulate progress in arc welding, the James F. Lincoln Arc Welding foundation last week announced prizes (p. 23) aggregating \$200,000 for the best papers on the subject. The papers will deal with arc welding as a primary process of manufacture, fabrication or construction in the following divisions of industry: Automotive, aircraft, railroads, watercraft, structural, furniture and fixtures, commercial welding, containers, welderies, functional machinery and industrial machinery. Unquestionably this contest is one of the most important in point of incentive, scope, and potential benefits that has ever been conducted in the metalworking industries. The offer of such liberal awards, ranging from not less than \$13,700 down to \$100 and available to at least 446 contestants, should bring forth a wealth of hitherto unrevealed information, ideas and experience. The resultant enrichment of knowledge on welding may provide benefits which will exceed even the high expectations of the foundation's sponsors.

Awards for Welding Ideas

E. L. Shaner

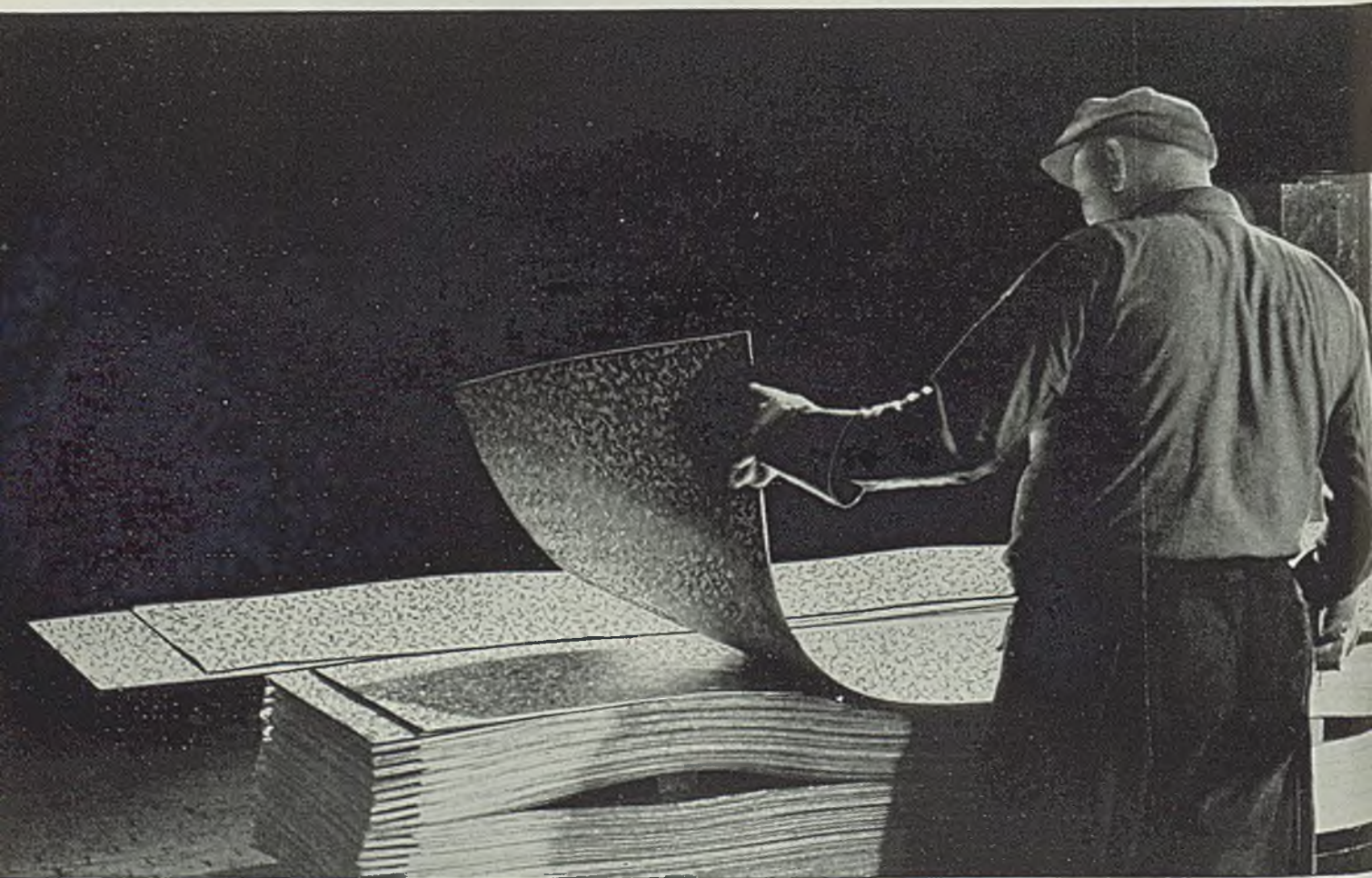
Scrapped - AN ENTIRE GALVANIZING PLANT

INLAND ENGINEERS DEVELOP NEW EQUIPMENT FOR
PRODUCING HIGHER QUALITY GALVANIZED SHEETS

● Six months ago Inland's entire galvanizing plant, which had met existing standards of quality for many years, was scrapped.

Inland now produces a new galvanized sheet that is unsurpassed. The base sheet is uniform and more easily formed. The galvanized coating is marked by large, bright, feathery spangles.

A good measure of success in the fabrication and use of galvanized sheets comes from securing the correct sheet and coating for each particular job. We urge you to explain your operations so we can produce a base sheet and galvanized coating that will exactly meet your manufacturing requirements.



INLAND STEEL CO.

Steel Mills Weeding Out CIO Organizers; Threaten "Sit-Down" in Spring

IN THE midst of his efforts in the General Motors strike last week, John L. Lewis took time to say that "coal is next" and steel's turn will come "about April 1". CIO organizers were saying publicly they plan a sit-down strike in steel plants, similar to that of General Motors.

Lewis referred to the meeting of the United Mine Workers' policy committee scheduled for Feb. 12 to formulate demands to be placed before the Appalachian soft coal producers Feb. 17, and also to the "national convention" which CIO has called to draft demands on steel.

Far from scaring the coal and steel producers, however, Lewis' statements confirmed the general belief that he is taking on too much territory.

Among coal workers Lewis is facing his own problems, having lost strength through the fact that while he obtained concessions for the miners two years ago, he did not succeed in providing work.

In the steel industry it is generally reported that the pendulum of popularity among workers has swung away from Lewis.

The General Motors strike (page 29), it is believed, will end eventually in some mild form of compromise, with little for Lewis except the prestige that he may derive from a meeting and negotiating with General Motors officials.

Reaction Unfavorable to Lewis

Ultimate reaction in the minds of steel workers—when the time and money lost by General Motors workers is reckoned—is expected to be unfavorable to him.

The coal agreement, expiring April 1, provides for a seven-hour day, 35 hours a week and base pay of \$5.50 a day. The miners are planning to demand a six-hour day, 30-hour week, with no decrease in the base rate.

Myron C. Taylor, chairman, United States Steel Corp. last week issued a statement following rumors from Washington that the Corporation was not "checking off" union dues at captive coal mines. "It is the policy of this corporation to keep its agreements," he stated.

An authorization was recently presented to the coal company signators to the mines agreement requesting an assessment of \$2 from the members, in addition to the regular monthly dues, and this was done, in accordance with the agreement—

even though the steel companies know that the money is swelling the funds which will be used to fight them.

A few steel company employe representatives who have been working undercover for the CIO have been discharged, and it is reported that mill workers have expressed satisfaction.

At Jones & Laughlin Steel Corp.'s Aliquippa mill, Pittsburgh, last week Paul Normile was expelled as a representative by ballots representing 70 per cent of those eligible to vote. Normile is chairman of CIO's Pittsburgh-Aliquippa council. His case was similar to that of Elmer J. Malloy who recently was expelled as chairman of Carnegie-Illinois Steel Corp.'s Pittsburgh district general council, when it was disclosed that he was a paid CIO organizer.

Carnegie-Illinois employe representatives in the Pittsburgh district called a meeting for Feb. 9-10 to consider numerous proposals that have been made by representatives. These include:

Minimum of \$60 per month and a maximum of \$100 per month for pensions, and monthly payments in-

stead of every 90 days; a definition of mill turn labor; new vacation plan; time and one-half for overtime, Sunday, etc.; pay day on alternate Fridays; 20 per cent increase be paid on all packs of 12 square feet per sheet or under, for roughing and finishing mills, and shear crews; a more liberal insurance plan; increase in wages for tin mill doublers; amendment to Article 5, Section 2, whereby an employe when discharged can have a fair trial; that subjects not settled through regular channels shall be arbitrated.

John P. Frey, president, metal trades department of A. F. of L. and representative of the conservative wing of the labor movement, last week denounced the CIO and sit-down strikes.

"The theory and practice of the militant minority has the hallmark of Moscow and was imported from Russia," he declared. "Workmen taking physical possession of manufacturing plants is an importation from Italy. It was this method of Italian workmen that gave Mussolini the opportunity of issuing the edicts which destroyed voluntary trade unions of that country."

Steel Scene at Homestead, by Infra Red Rays



COMPLETION of the \$2,150,000 high level bridge, containing 8400 tons of steel, over the Monongahela river at Homestead, Pa., is expected by summer. The bridge recently attracted considerable attention of some of the guests who attended the opening of Carnegie-Illinois Steel Corp.'s plate mill at its Homestead works. Because of fog and smoke the photograph was taken with infra red rays by R. H. Gallivan, Pittsburgh Press photographer

Expect Republic-Gulf States Merger To Be Ratified

MERGER of Gulf States Steel Co. with Republic Steel Corp. is expected shortly, following the announcement of terms last week. In informed quarters it was said that the sale of Gulf States to Republic, through exchange of stock, is virtually assured.

T. M. Girdler, Republic's chairman and president, confirmed the following announcement in New York by W. H. Coverdale, president of Gulf States:

"Republic Steel Corp. has made a proposition to Gulf States Steel Co. which contemplates as its main feature the sale to Republic of all the property and assets of Gulf, the assumption by Republic Steel Corp. of the outstanding first mortgage sinking fund 4½ per cent bonds and other indebtedness of Gulf States Steel Co., the distribution among the holders of common stock of Gulf States Steel Co., of common no par value, stock of Republic Steel Corp. in the ratio of 2 1/3 shares of such stock of Republic Steel Corp. for each share of Gulf States Steel Co. common stock held, and the dissolution and winding up of Gulf States Steel Co. To effect any such sale the vote in favor thereof of the holders of a majority of the outstanding common stock of Gulf States Steel Co. will be necessarily.

Agreement Being Drawn Up

"The board of directors of Gulf States Steel Co. has instructed its counsel in collaboration with counsel for Republic Steel Corp. to prepare for submission to the board and to the board of directors of Republic Steel Corp. a form of agreement along the lines indicated and containing such provision as they shall deem appropriate so that when each company completes such checking of the condition of the other as it deems necessary the proposed agreement can be immediately executed and consummated as soon thereafter as practicable."

Commenting on the announcement, Mr. Girdler said:

"Acquisition of the properties of Gulf States Steel will round out Republic's facilities in the South. It will greatly improve Republic's position in that increasingly important market."

The merger will give the combined companies total annual ingot capacity of 6,450,000 tons. Assets total about \$370,000,000 of which Gulf States contributed approximately \$30,000,000. In 1936 Republic reported net profits of \$9,586,922. Gulf States' earnings were \$660,112.

Republic has by-product coke

ovens, ore reserves and two blast furnaces with 320,000 tons capacity in the Birmingham district with heavy iron ore reserves, but no facilities for steelmaking and lacked an outlet for its pig iron. Gulf States had more steelmaking capacity than it could furnish with pig iron. It makes wire, nails, staples, galvanized sheets and other products. Its basic steel capacity is 450,000 tons and hot-rolled finished steel capacity is 297,600 tons. Gulf States is engaged on a modernization program involving expenditure of \$2,500,000.

Resignation of Henry K. Bourne, Julius Kahn and W. W. Hancock from Republic's board of directors became known last week through notice filed with the New York stock exchange, and though no official announcement was made it was presumed that this is preliminary to representation by Gulf States interests on the Republic board.

New Capacity

A NEW open-hearth furnace will be in service at the Aliquippa, Pa., works of Jones & Laughlin Steel Corp., Pittsburgh, later this year, and other improvements are likely to include a new rod mill and extensions to the tin mill, according to H. E. Lewis, chairman.

Mr. Lewis outlined the plans to employ representatives at their annual banquet. No formal statement has been issued by the company yet.

The open hearth will have an approximate monthly capacity of 7000 tons. Its cost, including the enlargement of open hearth ladles, will be about \$750,000. Taking into consideration appropriations already made, as much as \$7,000,000 may be spent on the Aliquippa plant, it is understood.

An extensive addition may be made to the Jones & Laughlin tin mill, while the new rod mill is likely to cost about \$3,000,000.

The improvements are believed to be part of the \$30,000,000 program announced last year, of which the chief enterprise was the new continuous strip mill being built along Second avenue, Pittsburgh. This new mill, which has been pushed rapidly toward completion, will be the first in 1937 of the five strip-

sheet mills under construction at the start of this year. It will have an annual capacity of 720,000 tons.

The new open hearth at Aliquippa probably will be the first new capacity for making steel ingots to be completed in the steel industry this year. Equipment in the steel department at present includes four tilting basic open hearth furnaces; three bessemer converters and two mixers.

Apollo Steel Co., Apollo, Pa., will erect a new hot strip mill, three open hearths and soaking pits, at a cost of more than \$2,250,000, in North Apollo, according to President A. M. Oppenheimer, who said preliminary estimates already have been obtained.

The strip mill will be of the two-stand reversing type. The company's present rolling mill capacity will be increased by approximately 40 to 50 per cent. Complete plans for the mill are in the hands of Warren Worthington, Pittsburgh engineer, and will be submitted to the stockholders for their approval within two months. Additional stock would be issued to cover the construction cost.

Apollo Steel Co. started operations in June, 1913, with six sheet mills with a capacity of 35,000 tons a year.

D. O. Wolf, Pittsburgh sales manager, has been elected vice president in charge of sales.

United Engineering Acquires Interest in British Firm

Davy Bros. & United Engineering Co. Ltd., Sheffield, England, has been formed to acquire the business and assets of Davy Bros. Ltd., manufacturers of rolling mill machinery in England since 1880, it is announced by United Engineering & Foundry Co., Pittsburgh.

K. C. Gardner, vice president of United Engineering & Foundry Co., has been elected a director of Davy Bros. & United Engineering Co. Ltd. George W. Knotts, manager of United's Youngstown plant has been named alternate director.

The new company will have a capitalization of 1,000,000 shares of £1 par value. Shares of the old company have been listed on the London stock exchange. Davy Bros. & United Engineering Co. will proceed immediately with the construction of substantial additions to its plant in Sheffield, installing new machinery and equipment to make the plant both the largest of its kind in England and in any country outside of the United States. It will build rolling mills based on designs of the United Engineering & Foundry Co.

Under construction at present is a

substantial part of the hot and cold strip mills for Richard Thomas Ltd. The new English company also has received a contract for merchant mills to be installed in Turkey.

United Engineering & Foundry Co., recently received an order through Mitsui & Co. Ltd., New York, for a 43-inch continuous hot strip mill to be located in Japan on the island of Kyushu at Shimomoseki, about 900 miles southwest of Tokyo.

This mill, of approximately 450,000 tons annual capacity, will be a duplicate of the recently completed hot strip mill of Carnegie-Illinois Steel Corp. at McDonald, O., which was built by United Engineering. The Japanese steel plant at Shimomoseki will utilize the output of the new mill to the extent of 350,000 tons for sheets while about 100,000 tons will be used for rolling tin plate by the cold reduction process.

Malleable Iron Castings Show Gain, Census Shows

Production of malleable iron castings in the United States in 1935 amounted to 433,407 tons, valued at \$50,470,408, representing increases of 44.9 per cent in quantity and 43 per cent in value over 1931, the last preceding year for which comparable figures are available, according to the bureau of census. These figures refer to production for sale.

Welded Steel Reconstructs Prehistoric Reptiles



LIFE-SIZE models of prehistoric reptiles are being reconstructed in the Black Hills region of South Dakota—where their bones have been found—as a memorial to the Mesozoic Age. The frames of the brontosaurus and stegosaurus, in the picture, were made of 2-inch steel pipe bent and welded into the general outline. Small steel reinforcing bars were added to support the metal lath covering the bodies, and cement was used to form the hide, subsequently painted true to experts' ideas of the natural color. Photo courtesy Linde Air Products Co.

Navy Asks Exemption From Walsh-Healey Act

THE navy department, through Assistant Secretary of the Navy Charles Edison, has asked Secretary of Labor Perkins to allow the department to purchase steel without requiring bidders to observe the Walsh-Healey act.

Washington representatives of several steel companies believe that at least an emergency order to this effect will be granted.

Secretary Edison has been in touch with various steel manufacturers for some weeks in an effort to obtain steel, because the 1936-1937 shipbuilding program is practically at a standstill for want of material.

It is reported that Portsmouth (N. H.) navy yard may be forced to suspend construction operations on submarines being built there.

Assistant Secretary of Labor McGrady has communicated with John L. Lewis, but it is reported that Lewis is insisting that the labor department shall not grant an exemption to the steel industry. Despite this attitude there is a general feeling in Washington that Miss Perkins will make a favorable decision. McGrady also is to confer with Wil-

liam Green and John P. Frey, of the A. F. of L. to get their opinions.

A total of 25,000,000 pounds of steel has been advertised for by the navy department since Dec. 4 for submarines and destroyers and bids have been received on only 7,000,000 pounds. None of the latter was acceptable to the department.

The Walsh-Healey act requires firms contracting with the government in amounts of \$10,000 or more to observe a 40-hour week, pay "prevailing wages" and observe other requirements. The navy's requirements represent a relatively light tonnage, yet acceptance of this tonnage would impose conditions far beyond its scope. (STEEL, Dec. 28, p. 20.)

Senator Bone, of Washington, offered an amendment last week to an appropriation bill which would make it obligatory for the government to build all its ships in government shipyards. The Amendment was voted down.

Canadian Steel Output Gains; Pig Iron Declines

Steel ingot and casting production in Canada in December was 103,952 tons compared to 98,534 tons in November, and 98,888 tons in December, 1935. For 1936 output was 1,114,550 tons against 941,527 tons in 1935. A blast furnace at Port Colborne, Ont., was blown out in December, leaving five with a capacity of 2175 tons a day in blast in Canada Jan. 1.

Pig iron production declined from 74,337 tons in November to 68,499 tons in December. Output in 1936 totaled 678,672 tons, an increase over 1935 total of 599,875 tons.

Production of ferroalloys was 6775 tons in December, compared with 5950 tons in November. In 1936 a total of 74,065 tons was produced, against 56,616 tons in 1935.

Minneapolis-Honeywell Acquires Regulator Co.

Minneapolis-Honeywell Regulator Co., Minneapolis, manufacturer of temperature control equipment, has acquired business and assets of the National Regulator Co., Chicago, maker of pneumatic control systems for buildings.

January Iron Output Gains 3 Per Cent Despite Floods

FLOODS in the Ohio river valley during the last half of January interrupted operations of at least nine blast furnaces but even with this handicap the country's production of coke pig iron for the month showed a 3 per cent gain over December. The nine furnaces affected by high water lost a total of 54 days, or about the equivalent of two months' output for one furnace. Seven of the nine stacks resumed after losing from six to eleven days each; the other two were still banked at the close of the month.

Average daily production for January was 103,863 gross tons, which, compared with the 100,813 tons made in December, was an increase of 3050 tons. This was the best daily rate since May, 1930, with

highest number since May, 1930, with 180. Active units on Jan. 31, 1936, numbered only 118. During the month, three steelmaking or nonmerchant furnaces were blown out or banked and none were blown

AVERAGE DAILY PRODUCTION

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

MONTHLY IRON PRODUCTION

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

104,564 tons. In January, one year ago, iron was being produced at the rate of 65,461 tons per day. January, incidentally, was the sixth consecutive month to show gain.

Total output in January amounted to 3,219,741 gross tons, this being an increase of 94,549 tons over the 3,125,192 tons made in December. Both January and December were 31-day months. This showing was the best since May, 1930, with 3,241,477 tons. In January, 1936, production totaled only 2,029,304 tons.

Relating production to capacity, operations in January were the rate of 76.1 per cent, as compared with 74.2 in December and 34.2 in January, a year ago.

Active blast furnaces on Jan. 31 totaled 169, one less than the 170 in operation on Dec. 31. Bearing in mind that two furnaces were forced to bank on account of the flood, the total would otherwise have shown a gain of one stack. The 170 furnaces active in December was the

in; of the merchant class, two resumed and none went out.

Furnaces resuming in January were: In Ohio: Hubbard No. 1, Youngstown Sheet & Tube Co. In Virginia: Reusens, Lavino Furnace Co.

Stacks blowing out or banking were: In Ohio: Portsmouth, Wheeling Steel Corp. In Pennsylvania: Bethlehem B, Bethlehem Steel Co. In Kentucky: Ashland, American Rolling Mill Co.

With the dismantling of two blast furnaces, the total number of potential units in the United States is reduced from 245 to 243. American

JANUARY IRON PRODUCTION

	No. in blast last day of		Total tonnage	
	Jan.	Dec.	Mer- chant	Non- merchant
Ohio	36	36	95,927	594,041
Penna.	59	60	127,866*	962,886*
Alabama ...	15	15	105,791	114,939
Illinois ...	13	13	70,565	219,098
New York ..	13	13	79,859	151,257
Colorado ..	2	2		
Indiana ...	15	15	23,263*	506,881
Maryland ..	5	5		
Virginia ...	1	0		
Kentucky ..	0	1		
Mass.	0	0		
Tenn.	0	0		
Utah	1	1	14,480	152,888
West Va. ...	3	3		
Michigan ...	4	4		
Minnesota ..	2	2		
Missouri ...	0	0		
Total ..	169	170	517,751*	2,701,990*

*Includes ferro and spiegeleisen.

Rolling Mill Co. is dismantling its West stack in Columbus, O. This furnace was built in 1900-01 and re-modeled in 1925; its annual capacity was 129,300 tons of basic, malleable and foundry iron. The remaining stack at this plant, the East furnace, also is being dismantled preparatory to moving and reconstructing it in Hamilton, O., at the plant of the company's subsidiary, the Hamilton Coke & Iron Co. (See STEEL for Jan. 11, page 17).

Youngstown Sheet & Tube Co., is dismantling No. 2 furnace at its Hubbard plant, Hubbard, O. The remaining stack, No. 1, is operating at present. No. 2 furnace was built in 1872 and last rebuilt in 1915; its annual capacity was 162,000 tons of foundry and malleable iron. The company has started repairs on one of its Brier Hill furnaces at Youngstown, O., idle since 1930, and also has begun a survey of a long idle coke plant at the same location.

Foreign-Trade Zone Opens, May Develop New Markets

The first foreign-trade zone in the United States, where foreign goods

RATE OF OPERATION (Relation of Production to Capacity)

	1937 ¹	1936 ¹	1935 ²	1934 ³
Jan.	76.1	48.2	34.2	28.3
Feb.		46.6	41.4	32.5
March		48.5	41.0	37.5
April		59.1	40.0	41.4
May		63.1	40.2	47.5
June		63.6	37.2	46.3
July		61.5	35.2	28.4
Aug.		64.3	40.7	24.5
Sept.		66.9	42.5	21.5
Oct.		71.0	45.8	22.1
Nov.		72.3	49.5	22.8
Dec.		74.2	49.0	23.7

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

can be held for trans-shipment or rehandling without payment of import duties, was opened on Staten Island, N. Y., last week, under act of congress. Development of new trans-shipment, re-export and consignment markets as well as enhanced opportunity for American shipping is expected to result from establishment of the free port.

Salem Engineering Moves

Salem Engineering Co., Salem, O., has removed its offices to larger quarters at 521 East State street. The company also maintains offices in Welland, Ont., and London, England.

Production

INGOT production last week recovered from the effects of general suspensions in the Ohio river valley, rising 3½ points to 79½ per cent.

Chicago—Continued at 78 per cent. With mill capacity largely sold out for the balance of this quarter, steel-making appears assured of holding at the present level or on a higher basis for at least the next 60 days. Blast furnace operations are unchanged.

Birmingham—By changing from a smaller sized to one of the larger open-hearth furnaces last week, the steelmaking rate is now around 78 to 80 per cent.

Pittsburgh—Up 1 point to 82 per cent, with the leading interest starting off the week at 82 per cent, the leading independent at 83 per cent, and other mills at comparable high levels. Steelmakers at present anticipate no decline in the next two weeks.

Wheeling—Open-hearth production has been recovering rapidly from the temporary disruptions caused by high water. At present the district is operating at 77 per cent, an increase of 36 points over last week.

Central eastern seaboard—Up fractionally to 53½ per cent, with higher production indicated.

St. Louis—Increased from 80 per cent to 82, a new high for the recovery period.

Buffalo—Down 1 point to 85 per cent. Bethlehem Steel Co. has three open hearths in its new battery in operation and expects to have a fourth unit ready about the middle of the month.

Detroit—Held at 90 per cent, with two furnaces still down for repairs.

Cincinnati—Averaged 22 per cent, up slightly. Resumption of sched-

District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended		Same week	
	Feb. 6	Change	1936	1935
Pittsburgh	82	+1	40	44
Chicago	78	None	58	67
Eastern Pa.	53½	+½	36½	31
Youngstown	81	+4	61	58
Wheeling	77	+36	81	90
Cleveland	75½	-½	61½	82
Buffalo	85	-1	32	45
Birmingham	79	+2½	63	32
New England	74	-9	83	63
Detroit	90	None	88	100
Cincinnati	22	+1	80	†
St. Louis	82	+2	†	†
Average	79½	+3½	53	54½

†Not reported.

ules by American Rolling Mill Co. with 16 open hearths at Middletown, O., and Ashland, Ky., this week will raise the rate to 72 per cent. Other facilities are expected to resume in two or three weeks.

Youngstown—Averaged 81 per cent, up 4 points. Youngstown Sheet & Tube Co. added a ninth open hearth at Brier Hill, a tenth is nearly ready and the remaining two are being prepared. Republic Steel Corp. added one to its active list, to operate 14, while Carnegie-Illinois Steel Corp. dropped one at its Farrell works. Sixty-nine open-hearth furnaces and three bessemers are now making steel, the most since 1929.

Cleveland-Lorain—Down fractionally to 75½ per cent, as Otis Steel

Co. dropped one furnace the latter part of the week to operate 7. National Tube Co., Lorain, scheduled 10 open hearths and four blast furnaces, and Republic continued with 12 on.

New England—Dropped 9 points to 74 per cent, due to furnace repairs. A rise to about 80 per cent is indicated for this week.

Car, Locomotive Backlog Largest in Seven Years

More freight cars and locomotives for class I railroads were on order Jan. 1, this year, than on any corresponding date since 1930, according to the Association of American Railroads. Totals include equipment under construction in railroad shops, which may be built partly of reclaimed materials.

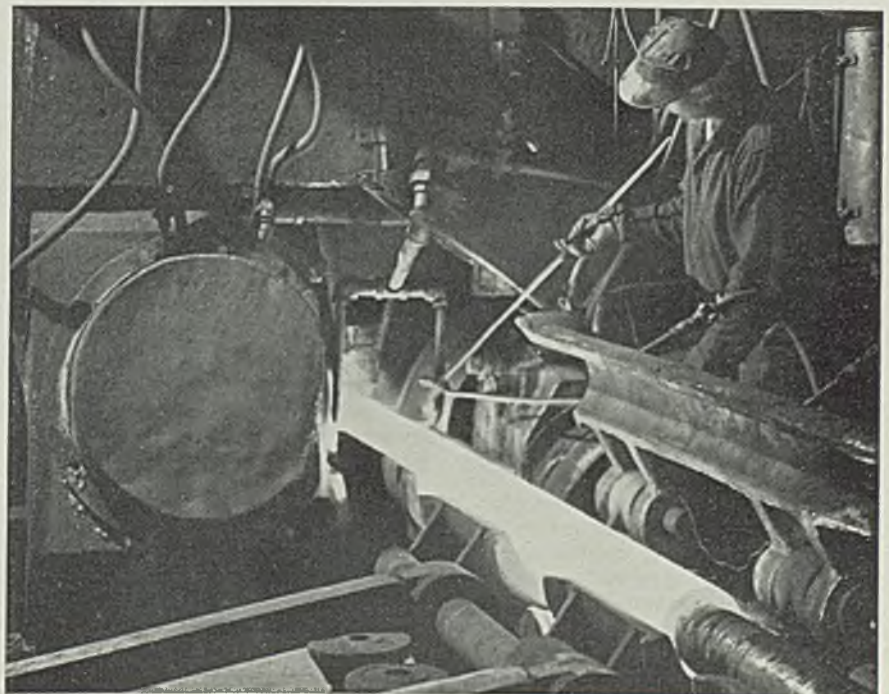
Freight cars on order Jan. 1 numbered 25,592, compared with 12,805 a year previously and 628 two years ago. Jan. 1, 1930, 34,581 freight cars were on order.

Steam locomotives on order at the beginning of the year numbered 297. Jan. 1, 1936, there were five on order, and on the same date in 1935, seven. New locomotives on order on Jan. 1, 1930, totaled 431.

Class I railroads in 1936 installed 43,941 freight cars, the largest number to be put in service in any calendar year since 1930, when 76,909 were installed.

Steam locomotives installed in 1936 totaled 87, the largest number for any calendar year since 1931.

Piercing Stainless Steel; Tubes with Mirror-Like Finish



◆

STAINLESS steel tubes, product of modern metallurgy, are solving many problems in oil, chemical and food packing industries. Before piercing—as illustrated—round bars are turned on the outside to remove surface defects, this requiring an unusual amount of power due to the alloy's toughness. After cold-drawing, tubes for use in the food industry are polished both inside and out, to obtain mirror-like surfaces that can be kept bacteriologically clean. Photo courtesy

US STEEL NEWS

Fear "Packing" of Supreme Court in Judiciary Proposal

STRONG opposition to President Roosevelt's proposal for re-vamping the federal judiciary, as submitted to congress last week, is expected as the full implications of some of its features become more apparent.

While evidently representing an attempt at compromise with the elements which would amend the constitution to permit drastic federal regulation of industry, nevertheless it was viewed generally as containing dangerous possibilities.

The President proposed that he be "allowed" to appoint new judges in any federal court where an incumbent is at least six months past retirement age of 70. Some observers saw in this a flexibility which in future might tend to "packing" the Supreme Court.

What Powers Would Involve

Such powers would enable him to replace Chief Justice Hughes and Associate Justices Vandevanter, McReynolds, Brandies, Sutherland and Butler, or to appoint six additional justices who would serve with the present court. The bill would not compel retirement of any federal judge, but would require appointment of another judge to whom an incumbent would either yield his place or share his post.

The President recommended that all cases involving constitutional questions be appealed directly from district courts to the Supreme Court and that these cases be given precedence on the Supreme Court calendar.

Charging that private litigants were able to postpone the effective date of congressional enactments, in procuring injunctions in proceedings to which the government was not a party, the President suggested that a law be passed providing that no decision, injunction, judgment or decree on a constitutional question be promulgated by any federal court without previous and ample notice to the attorney-general, and an opportunity for the United States to present evidence and be heard.

He said that if congress adopts his judicial reorganization "we may be relieved of the necessity of considering any fundamental changes in the powers of the courts or the constitution of the government—changes which involve consequences so far-reaching as to cause uncertainty as to the wisdom of such course."

Additional judges appointed to dis-

trict, circuit or Supreme Court positions would hold permanent positions under the President's plan, even though the failure of present incumbents to retire resulted in an increase in the size of these courts.

The President would limit the size of the Supreme Court to 15 members, however, and not more than two additional members would be appointed to any circuit court of appeals. District court judges would not be more than doubled in any instance.

New lower court justices would not necessarily have fixed jurisdictions but would be subject to assignment to any part of the country where dockets were congested.

The President proposed the appointment of a new Supreme Court official to be known as proctor, who would under the supervision of the Chief Justice assign lower court judges to posts where litigation accumulated.

Speaker Bankhead referred the Presidents' message to the house judiciary committee, headed by Repr. Sumners, Democrat, Texas.

In reply to questions the speaker said that revival of the NRA and the AAA is not tied in with this proposal.

Financial

LUKENS STEEL CO., Coatesville, Pa., in its report for the fiscal year ending Oct. 17, disclosed sharply improved sales and earnings, with a net profit of \$112,206 against a net loss of \$307,725 in the corresponding period a year ago.

Improvements in the close of the year include extension to the 84-inch and 112-inch mill buildings, additional furnaces for these mills, a soaking pit in the 140-inch mill and other important improvements for more efficient operations.

Ingot production during the year was the highest since 1930, with output totaling 369,919 gross tons.

REPUBLIC'S YEARLY NET DOUBLE THAT OF 1935

Net income of Republic Steel Corp., Cleveland, after all charges including provisions for surtax on undistributed profits, amounted to \$9,586,922 last year. This is more than double the \$4,455,735 reported in 1935 and equals \$1.74 a share on the 4,127,264 common shares out-

standing. Expenditures for plant improvement during the year totaled \$30,000,000, including the new strip mill under construction in Cleveland.

RUSTLESS DOUBLES 1935 NET

Rustless Iron & Steel Corp., Baltimore, had net profits of \$350,707 for 1936, more than double that of \$166,133 in 1935. The fourth quarter with earnings of \$152,434 provided nearly one-half of the yearly net profits.

Common stock of the Rustless Iron & Steel Corp., Baltimore, now outstanding totals 844,197 shares, compared with 732,707 on Dec. 31, 1935, according to a statement by the corporation last week. American Rolling Mill Co., Middletown, O., has acquired a substantial stock interest in the Rustless corporation, but owns about 48 per cent of the outstanding common instead of 55 per cent as widely reported in financial quarters.

EARNING STATEMENTS

Blaw-Knox Co., Pittsburgh, reports for 1936 largest earnings since 1930. Net profits for after depreciation, and federal and state tax of \$1,548,173, was equivalent to \$1.17 a share on 1,322,395 shares of capital stock. This compares with net profit of \$565,230 or 43 cents a share in 1935. In the last six months of 1936 net profit was \$872,880.

Pittsburgh Steel Co., Pittsburgh, reports net income of \$571,114 for the six months ending Dec. 31, 1936, equal to 57 cents a share on 354,900 common shares, compared with a deficit of \$516,067 in the similar period 1935.

Van Dorn Iron Works Co., Cleveland, reports net profit of \$39,964 last year, before depreciation and bond interest. Unfilled business as of Dec. 31 last amounted to more than \$900,000, a new high for more than five years.

Apollo Steel Co., Apollo, Pa., has net income of \$139,871 or \$1.10 a share in 1936. This compares with the net income of \$135,875 or \$1.06 a share in 1935.

A. M. Castle & Co., Chicago, steel warehouse, had a net income of \$559,377 in 1936, compared with \$348,407 in 1935.

Canning Machinery Sales Highest on Record

Sales of canning machinery and equipment at the recent convention of the Canning Machinery and Supplies association in Chicago were the highest on record. The total is estimated at \$2,500,000, an increase of 150 per cent over last year and 67 per cent ahead of the previous peak, attained in 1929.

Lincoln Foundation Offers \$200,000 In Prizes for Papers on Welding

ONE of the richest awards ever established for competition in the field of mechanical science has just been announced by the James F. Lincoln arc welding foundation, Cleveland.

To stimulate intensive study of arc welding \$200,000 will be distributed among winners of 446 prizes for papers dealing with this subject as a primary process of manufacture, fabrication or construction, in 11 major divisions of industry.

The principal prize winner will receive not less than \$13,700. Other prizes range from \$7500 to \$100, the latter sum to be awarded each of 178 contestants who receive no other prize, but whose papers are worthy of honorable mention.

To assure equal competitive opportunity, similar prizes are offered in each of the following 11 divisions: Automotive, aircraft, railroad, watercraft, structural, furniture and fixtures, commercial welding, containers, welderies, functional machinery and industrial machinery.

Wide diversification of awards is effected by further dividing each major industry into various sub-classifications, with the entrant re-

quired to select in advance the particular sub-classification to which his paper will relate.

When accepted by the jury of awards as properly classified, each paper will be in competition, in its particular sub-classification, for five initial prizes established for that group. These are worth \$700, \$500, \$300, \$200 and \$150.

From among these sub-classification winners four papers will be selected in each major industry to receive additional prizes of \$3000, \$2000, \$1000 and \$800. Thus these 44 semifinalists will be awarded a total of \$74,800.

Main Prizes Up To \$10,000

In addition, the semifinal winners in the various divisions will be considered as possible recipients of the four main prizes. These range from \$10,000 to \$3500, with the winner of the grand prize receiving not less than \$13,700 for his paper.

Analysis of the complete prize offering shows the following: Automotive, railroad, structural, 24 prizes valued at \$14,200, in each; aircraft, watercraft, furniture and fixtures, commercial welding, containers, welderies, 14 prizes valued

at \$10,500 in each; functional machinery and industrial machinery, 54 prizes valued at \$25,300, in each.

It is necessary that submitted papers describe either the redesign of an existing machine, structure, building, etc., so that arc welding may be applied to its manufacture; or that they present a design, either in whole or in part, of a machine, structure, building, etc., not previously made, the description to show how a useful result, which was impractical with other methods of construction or could better be done by arc welding, is obtained.

Prospective entrants should communicate with foundation secretary, A. F. Davis, postoffice box 5728, Cleveland, for details of rules covering awards.

American Welding Society has announced acceptance from J. F. Lincoln, president of the Lincoln Electric Co., Cleveland, of the Lincoln gold medal, to be presented to the author of the best paper on any phase of welding published in the *Journal of the American Welding Society* in the year from October, 1936, to October, 1937.

Steel Wages Up since 1923, Finished Steel Prices Lower

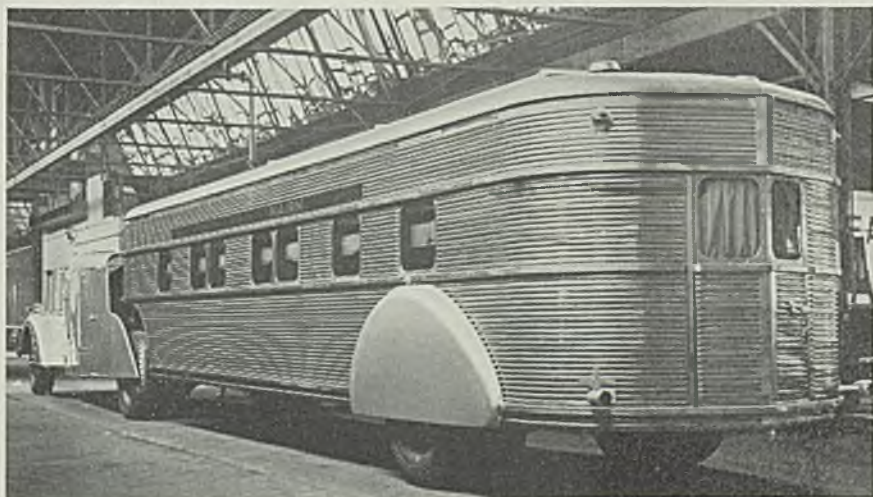
Average hourly wages of steel employes have increased 23 per cent since 1923, during which period the composite selling price of finished steel products has decreased 16 per cent, according to the American Iron and Steel institute.

Average earnings of steel wage earners in 1923 amounted to 59.6 cents per hour, from which level they steadily advanced until the full force of the depression began to be felt. In 1933 the average hourly wage paid was 52.4 cents per hour; in every year since then the average wage has increased until currently it exceeds 73 cents per hour—the highest in any year for which data are available.

The composite of steel prices, however, declined \$20 per ton from 1923 through 1933, from \$67.71 per ton to \$47.41. The decline was interrupted only in 1929 when the composite for the year showed a 2 per cent advance over the preceding year. Though steel prices have risen since 1933, they still are 4 per cent below the average in the seven years preceding the depression.

By comparison, the increase of approximately 20 per cent in the composite price of steel products over a recovery period of four years is less than the percentage increase in prices of various nonferrous metals, in unfinished form, during the past six months.

Lightweight Steel Sleeper Trailer Built for Desert Run



EMBODYING the same principles of "Shotweld" construction used in lightweight steel trains, this 14-passenger air-conditioned sleeper trailer has been delivered by the Edward G. Budd Mfg. Co., Philadelphia, to the Nairn Transport Co. Ltd. for use on the 600-mile run across the Syrian desert between Bagdad and Damascus. Pulled by a 150-horsepower diesel tractor built by the Van Dorn Iron Works, Cleveland, the unit has a top speed of 65 miles an hour. Air-conditioning and interior finish equipment was installed by Fitz Gibbon & Crisp, Trenton, N. J. Weighing less than 28,000 pounds, the unit has an overall length including trailer and tractor of 57 feet, 6 inches

Men of Industry

C F. PIFER, formerly president, Fostoria Pressed Steel Co., Fostoria, O., has been elected chairman of the board. Other changes in personnel follow: R. J. Carter, formerly secretary-treasurer, has been elevated to president, treasurer and general manager; C. W. McDaniel, vice president, secretary and in charge of sales; E. P. Bates, of Borton, Bates & Co., Cleveland, re-elected a vice president and a director; George E. Schroth, of Tiffin, O., a director. E. L. Frase, purchasing agent, is now in charge of the newly formed steel scaffolding division. R. L. Hill, formerly assistant treasurer, is now purchasing agent, and Fred Penske is factory manager.

E. A. Steif, New York district sales manager, Otis Steel Co., Cleveland, sailed last week for a month's visit in Europe.

Eugene P. Farris has been appointed manager of specialty sales, Emerson Electric Mfg. Co., St. Louis, succeeding H. L. Parker Jr., resigned.

Harry L. Myers has been made general superintendent of the West Leechburg, Pa., division, Allegheny Steel Co. He succeeds Noble Jones, resigned.

Conrad L. Ott, for the past ten years research and executive engineer, Landis Tool Co., Waynesboro, Pa., has resigned to join his father's company, Ott Machinery Sales Inc., Detroit, dealer in used and rebuilt metalworking machinery.

Ralph S. Jenkins has been appointed vice president in charge of manufacturing of all divisions, Gar Wood Industries Inc., Detroit. Mr. Jenkins resigned as general manager, St. Paul Hydraulic Hoist Co., Minneapolis, to become associated with Gar Wood.

W. R. Smith has been appointed by the Lincoln Electric Co., Cleveland, to the sales staff of its Los Angeles office. Mr. Smith has been engaged in the welding field for ten years and for three years he was employed on the Boulder dam project as a foreman.

Charles B. Veith has been appointed sales manager, Wright Mfg. division, American Chain & Cable Co. Inc., York, Pa. S. J. Woodworth becomes district manager of the division, with headquarters in the New York Central building, 230 Park avenue, New York. Both have

been associated with this division for a number of years.

A. G. Witting has been appointed assistant to general superintendent, Gary works, Carnegie-Illinois Steel Corp. He has served for the past 38 years as chief engineer of the Gary works.

S. M. Jenks has been named chief engineer at the Gary works, succeeding Mr. Witting. He former-



A. G. Witting

ly had been located in Pittsburgh as chief engineer of the company's construction engineering department. This department has now been placed under the jurisdiction of the company's chief engineer at Pittsburgh, and will confine its activities to that district.

George L. Anderson has been named sales engineer, Patterson Foundry & Machine Co., Philadelphia. Mr. Anderson is a chemical engineer and has for 20 years specialized in the design, application and sales of process equipment in chemical, food and other industrial plants in the process industries.

C. M. Houck, formerly manager of the inspection division, Pittsburgh Testing Laboratory, Pittsburgh, has been elected vice president. He succeeds A. R. Ellis, who recently was elected president. Mr. Houck has been with the Pittsburgh organization for the past six years.

E. K. Waldschmidt, associated with the metallurgical department, Jones & Laughlin Steel Corp., Pittsburgh, since 1928, has been transferred to the district sales office at Detroit. He will continue to represent that department in the Detroit area. He

is a member, American Society for Metals, and American Welding society.

F. U. Harris, superintendent, Bessemer, Ala., rolling mill of Tennessee Coal, Iron & Railroad Co., has been transferred to the Fairfield works as superintendent of the plate and structural mills. C. H. Baumgardner, assistant superintendent at the Bessemer mill, has been made superintendent, and V. C. Sims has been named assistant superintendent.

Leslie L. Andrus, for the past two years, assistant sales manager, American Foundry Equipment Co., Mishawaka, Ind., has been appointed general sales manager in charge of all sales, service and advertising. Following graduation from Purdue university, and prior to his present connection, he was associated with Sargent & Lundy Co., Chicago, consulting engineering firm.

Dennis A. Merriman, vice president, director and general sales manager, American Steel & Wire Co., Chicago, and a member of the advisory board, Hardware Merchants' and Manufacturers association, Philadelphia, was presented with the gold medal and scroll by the jury of award of the Hardware association on the occasion of its fifty-first annual banquet. This award is made annually to an outstanding individual connected with the hardware industry, who by his activities has reflected credit upon the industry.

Charles H. Roberts has been promoted from general auditor to comptroller, Johns-Manville Corp., New York; Arthur Olsen, who joined the company Jan. 1, has been made treasurer; Vandiver Brown has been advanced from assistant secretary to secretary, and W. I. Waite has been made secretary of the officers' board. These appointments, effective immediately, were made following the resignation of E. M. Voorhees as secretary and treasurer, to accept the position of vice-chairman of the finance committee and a director, United States Steel Corp.

Robert C. Stanley, president, International Nickel Co. of Canada Ltd., Copper Cliff, Ont., has been elected chairman of the board, succeeding the late Charles Hayden. He will continue his duties as president. Other changes are: R. Samuel McLaughlin, president of General Motors of Canada Ltd., Oshawa, Ont., and Britton Osler, of Toronto, have been elected to the executive committee; Donald MacAskill, vice president of the company and general

manager of Canadian operations, Copper Cliff, Ont., has been elected a director; and Dr. John F. Thompson, associated with International Nickel since 1906, and executive vice president since March, 1936, has been made a member of the advisory committee.

A. J. Wadhams, vice president, International Nickel Co. Inc., New York, and manager of the development and research division, announces the following additions to the technical staff: Charles H. Lindsley, physical chemist, will specialize in the application of physico-chemical methods to the study of corrosion. Donald J. Reese, foundry engineer, and formerly employed by the Whiting Corp., Harvey, Ill., will carry on research work on cast iron at the company's research laboratory. Frederick G. Sefing, formerly assistant professor of metallurgy at Michigan State college, will also be employed on research work in cast iron at the Bayonne laboratory. Richard F. Barnes Jr. will be available to the industry for technical service on problems involved in the utilization of mill products. Carl Rolle will be available to the industry for consultation on mill product fabrication problems.

Died:

WILLIAM E. DAVIS, 73, chairman, Denman & Davis, iron and steel distributors, North Bergen, N. J., in that city, Feb. 1. He had long been identified with the steel industry, his first affiliation being with the Jersey City Steel Works, Jersey City, N. J., at the age of 13. He formed the partnership with Mr. Denman in 1888. He retired from active direction about four years ago due to failing health.

Frederic A. Muller, 83, consulting engineer, Singer Mfg. Co., Elizabeth, N. J., for 35 years, in that city Jan. 31. He invented many mechanical devices.

Ferdinand Barnickol, president and general manager, Indianapolis Drop Forging Co., Indianapolis, in that city, recently.

Peter J. Pinter, 64, general manager, C. I. Banker Wire & Iron Works, Milwaukee, in that city Jan. 27.

George F. Collister, 53, general manager, Par-Brook Mfg. Co., Cleveland, manufacturer of sheet metal products, in Lakewood, O., Jan. 26.

Herman P. Peterson, 50, assistant manager, Minneapolis-Moline Power Implement Co. plant, Hopkins,

Minn., in Ottumwa, Iowa, Jan. 24, while on a business trip. He had been connected with the company and its predecessor for 31 years.

Arthur James Bazeley, 65, mechanical and designing engineer, National Malleable & Steel Castings Co., Cleveland, in that city, Jan. 30.

Charles Rosenfeld, 65, retired vice president, Dickey-Grabler Co., marking devices, metal stampings and dies, Cleveland, in Cleveland, Jan. 26.

William D. Bennett, 51, rail mill superintendent, Carnegie-Illinois Steel Corp., South Chicago, Ill., in Chicago, Jan. 28. He had been associated with the company 30 years.

Edward F. Howard, 63, superintendent of construction, Johns-Manville Corp., Cleveland, in that city, Jan. 27. He had been employed by Johns-Manville for the past 40 years.

Manley H. Chase, 51, assistant treasurer, Cleveland Hardware Co., Cleveland, in that city, recently. He had been associated with the company for 35 years and was also assistant to the sales manager.

Dr. Charles E. Briggs, 65, associated with the Phelps Dodge Corp. since his retirement from the practice of surgery in 1922, in Cleveland recently. In addition to serving on the Phelps Dodge board, he was also a director of the Eaton Mfg. Co., Cleveland.

William H. Hill, 69, vice president and a director, American Radiator Co., and chairman of the board of the company's affiliate, the Fox Furnace Co., in New York, Jan. 29. He was one of the founders of the American company in 1892 and before that was connected with the Michigan Radiator & Iron Co., Detroit.

Joseph J. Worker, 76, identified with various steel companies in Illinois, in Chicago, Feb. 1. He was superintendent, Solvan Steel Co., Moline, Ill. until 1908 when he went to Chicago to help direct building of the Calumet Steel Co. plant, later serving as general manager. Recently he had been employed by Youngstown Sheet & Tube Co. at Indiana Harbor, Ind.

J. Wilson Troupe, 49, for the past six years affiliated with the Mc-Feeley Brick Co., Pittsburgh, selling refractories to steel mills, in Homestead, Pa., Jan. 29. Mr. Troupe formerly had been connected with the steel industry in Cleveland for a number of years, first with Bourne-Fuller Co., now a part of Republic Steel Corp., and next with Otis Steel Co.

Meetings

HOT DIP GALVANIZERS WILL CONDUCT ANNUAL MEETING

Annual meeting of the American Hot Dip Galvanizers' association will be held at the Commodore hotel, New York, Feb. 11. Directors and officers will be elected. The association's policies for 1937 will be determined. Stuart J. Swensson, 903 American Bank building, Pittsburgh, is secretary.

ROBERT S. HAMMOND ELECTED FOUNDRY EQUIPMENT HEAD

Holding its annual meeting in Cleveland, Feb. 2, Foundry Equipment Manufacturers' association elected Robert S. Hammond, Whiting Corp., Harvey, Ill., president, and H. S. Hersey, C. O. Bartlett & Snow Co., Cleveland, vice president. Arthur J. Tuscan, 632 Penton building, Cleveland, was re-elected secretary-treasurer. New directors include Mr. Hammond, Mr. Hersey and O. A. Pfaff, American Foundry Equipment Co., Mishawaka, Ind.

Special attention was given to customer relations for defining means by which equipment manufacturers can render maximum service.

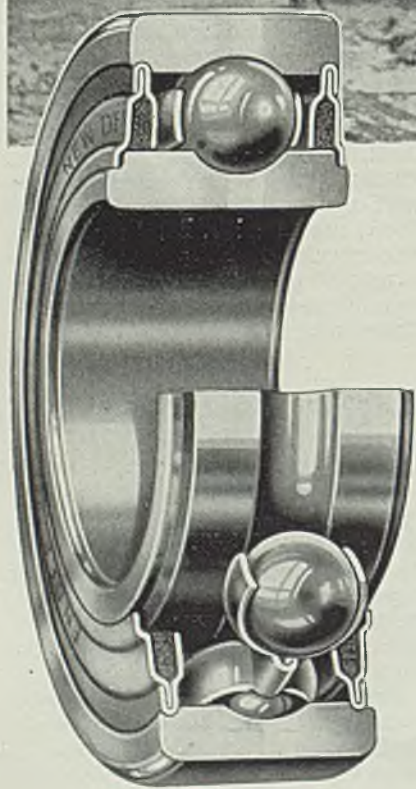
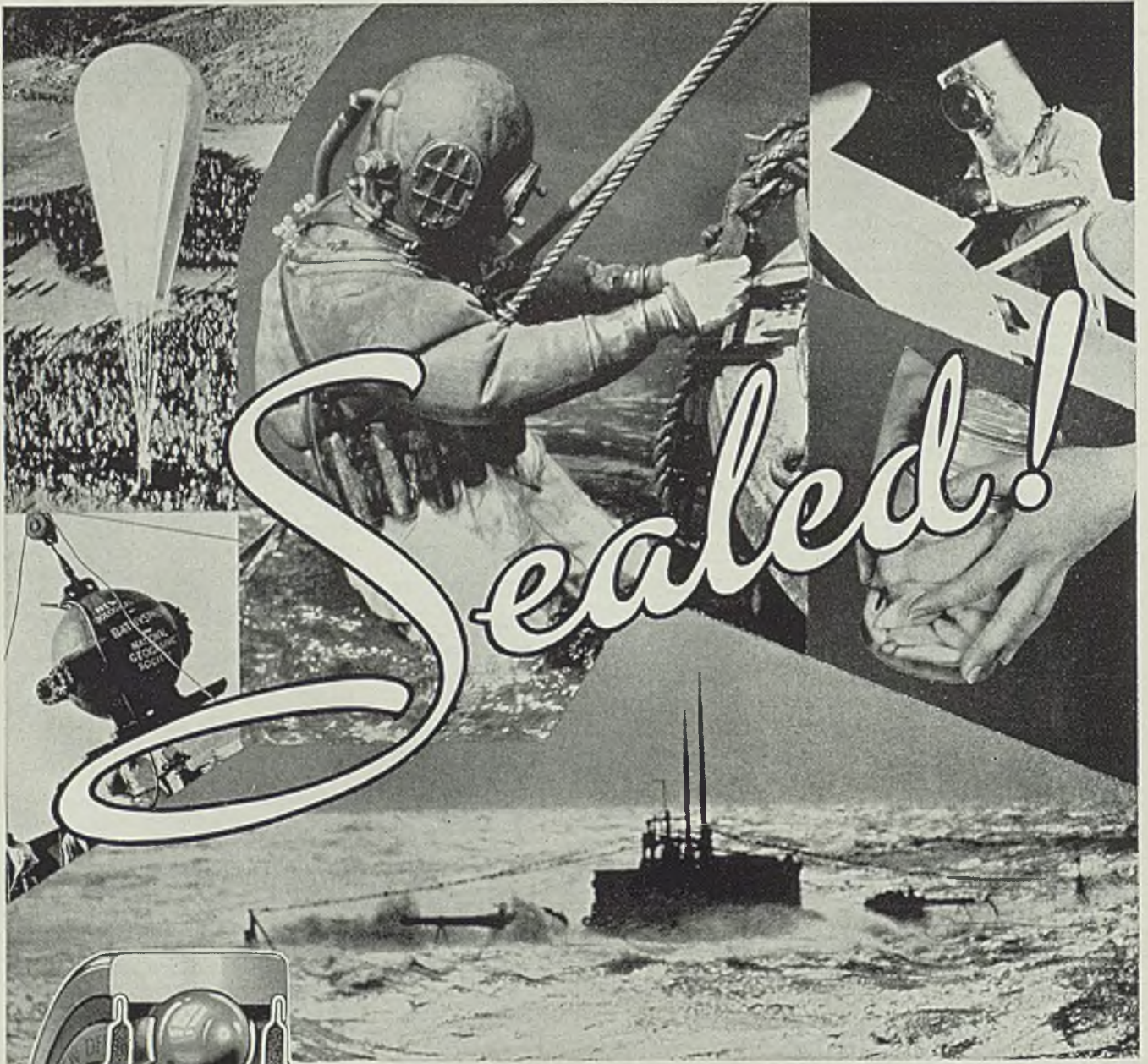
BLAST FURNACE AND COKE OVEN OPERATORS MEET

Eastern States Blast Furnace and Coke Oven association conducted its annual winter meeting in Pittsburgh, Feb. 5, with approximately 175 blast furnace and coke oven operators attending. Speakers included Dr. W. C. Rueckel, ceramic chemist, Koppers Co., Pittsburgh; Dr. A. W. Guager, director, mineral industries research division, Pennsylvania State college, State College, Pa.; B. W. Winship, superintendent, coke plant, Bethlehem Steel Co., Lackawanna, N. Y.; O. R. Rice, Freyn Engineering Co., Chicago; Guy Wehr, superintendent of blast furnaces, Wheeling Steel Corp., Steubenville, O.; Fred Denig, vice president, Koppers Co., Pittsburgh; and Earl Smith, chief metallurgist, Republic Steel Corp., Cleveland.

2000 Invited To Attend Marion Plant's Opening

Defiance Pressed Steel Co. has invited more than 2000 representatives of metal trades industries to inspect its new Marion, O., plant during "open house" days, Feb. 11-13. Feb. 12 has been designated customers' and suppliers' day. Feb. 13 will be citizens' day.

Several departments of the new plant, which was built to replace one destroyed by fire at Defiance, O., have been in operation for the past several weeks.



. . . and Lubricated for Life

Seven million N-D-Seals have been put into use since New Departure originated the self-sealed bearing nine years ago . . . New Departure's experience and creative engineering still give the most effective seals. New Departure, Division General Motors Corporation, Bristol, Connecticut; Detroit, Chicago and San Francisco.

another new departure by

NEW DEPARTURE

PIONEER OF SELF-SEALED BEARINGS . . .

N-D-Seals

2506



MIRRORS OF MOTORDOM

DETROIT

AFTER a second major flare-up of violence in Flint, Mich., between sit-down strikers and out-of-town pickets on the one side and nonunion employes and company guards on the other, and after the scene of negotiations was relocated here, progress toward adjustment of differences between General Motors and the United Automobile Workers was being pushed speedily late last week.

Governor Murphy of Michigan, professedly acting at the request of the President, had succeeded in bringing together William F. Knudsen of General Motors and John L. Lewis of the CIO to thrash matters out. State militiamen, 3500 strong, made practically an armed camp out of the 80 acres of 12 Chevrolet plants in Flint, although martial law was not declared.

The injunction granted by Circuit Judge Paul V. Gadola, ordering strikers to evacuate the two Fisher Body plants and forbidding picketing of any sort, appeared to be tied up in a mass of legal red tape for a time, as no attempt was made to enforce it. Incidentally the injunction carried a stipulation that failure to comply would involve a possible levy of \$15,000,000 against the "lands, goods and chattels" of the UAW, their attorneys and other associates.

Just a "Slip of Paper"

Attitude of union organizers toward the injunction is seen in the statement by one Powers Hapgood, CIO organizer, who said: "Injunctions are slips of paper as far as we are concerned . . . don't you men take it seriously. We will continue to run this strike."

A disturbance was started Monday evening at Chevrolet No. 9 plant where work had been partially resumed. As the night shift prepared to go to work, a group of about 50 started a snake dance in the plant, swarmed around Arnold Lenz, assistant manufacturing manager, shouted threats and protested over discharge of three union workers (for breaking company rules, incidentally).

After a short battle, in which a few shots were discharged, non-union employes and company guards ejected the disturbers. Meanwhile outside, urged on by impassioned pleas from union sound trucks, a crowd of 350, including 50 women, provided with freshly-made clubs, attacked the plant windows and demolished all within reach (see cut below).

As an example of how organizers spurred on these demonstrators from the comfort of well protected sound trucks, at one time a loud speaker bellowed forth the cry: "Your buddies are being killed inside! They're shooting them down like rats!" (Actually, seven men received slight injuries). Another old

trick used was the carrying of an American flag by the outside group which was bent on nothing but destroying property.

The entire move was regarded by some authorities as simply a subterfuge to call attention away from Chevrolet main motor assembly plant No. 4 where simultaneously a group of several hundred, aided by large numbers of outsiders who had climbed factory fences, started a sit-down strike. The plant was immediately shut down and those who had been able to obtain at least a few hours of work were again out of luck.

At Chevrolet Gear & Axle plant, where 5000 men pushed their way through 300 union pickets to start

Puzzle: Find the Police



FLAUNTING law and order, a group of 350 union sympathizers, mostly non-employes and including 50 women with red berets, stormed the windows of Chevrolet plant No. 9 in Flint, Mich., last Monday and with clubs started to smash all windows within reach. Inside a group of 50 unionists attempted to prevent the night shift from going to work and were ejected from the plant after a fight with guards and workers. Acme photo



MIRRORS OF MOTORDOM

work Monday, things moved along peacefully until a group of over 100 in the welding department walked out. They were quickly hurried out of the plant by guards and production continued.

Want Day Off To Picket

In Toledo, about 500 men on the day shift at City Auto Stamping requested permission for the day off to go to Flint and help union pickets. Under heavy pressure for production, the management denied this request, but the men left anyway, an act which certainly constituted a breach of contract by the union. The men returned Wednesday, disillusioned and ready to resume work.

Over at Spicer Mfg. Corp. in the same city, a group of MESA union members started what they called a "slow-down" strike—deliberate attempts to delay work in progress. UAW members in the same plant did not like the move. Net result was that the men resumed normal speed after a day of slowing down, when they realized their tactics would affect their wages through the group bonus plan in effect.

At Kelvinator in Detroit, MESA union members started a sit-down strike Tuesday noon which tied up production. Employment manager of the plant stated that out of 2500 employes, only 285 were members of the union and only 98 occupied the plant. One woman press operator became so angered when the power was turned off her machine that she picked up a wrench and let it fly at one of the strikers. She was escorted to safety by a plant executive.

TO RETURN a moment to the General Motors situation, it appears that of the 69 plants operated by the corporation, 44 are closed by lack of materials, 18 by strikes, and 7 remain open, including the Guide Lamp plant at Anderson, Ind., which is operating with a full force. Of the 135,000 plant employes on company payrolls, estimates indicate that somewhere in the neighborhood of 90,000 continue out of work. General Motors production last week was only 1400 cars, representing West Coast assemblies. This compares with the Ford total for the week of 29,750, and the Chrysler output of 26,575, the latter up

about 2000 units from the week previous. Total production for the week by the entire industry was placed at 72,295.

Conferences were started Wednesday between Knudsen and Lewis, with their "seconds" and Governor Murphy also on hand. The governor was in telephone communication with President Roosevelt who was reported to have instructed the governor to tell the parties at the conference to adjust their difficulties speedily and end the 40-day strike. Late Thursday C. E. Wilson, GM vice president in charge of statistical research, was hurriedly called into the conference.

It is not known whether union officials and GM representatives are sitting at the same table in the discussion; it will be recalled at the last Lansing conference pictures indicated this was the case, although later it developed this scene was specially posed and the two factions did not meet together. A well-known ruse of union organizers is to assume the moment an employer sits down with them to discuss matters the union is officially recog-

nized. Such strategy is used to enroll new members.

GM officials were an hour and a half late at the Friday morning conference, the explanation probably being that they waited until their attorneys had succeeded in obtaining writs of attachment from Judge Gadola, empowering the Flint sheriff to evict sit-down strikers in the two Fisher plants. The sheriff wired the governor asking whether he would permit the national guard to aid in evacuating the plants. Gov. Murphy delayed his answer which gave rise to the report that settlement of the strike was imminent. The sheriff could have deputized civilians to enforce the eviction order, but efforts were being made to avoid further violence.

Mobilization of civilian vigilantes proceeded in Flint Thursday, under direction of the police chief who indicated that a force of 1000 was ready "to cope with any situation." Flint's city manager, John M. Barringer, declared the men were prepared "to shoot it out if necessary to repossess Flint for the forces of law and order." Carloads of armed union men and hundreds of sympathizers from other cities and states were roving through Flint and the situation was growing worse hourly.

DRIVER of an American car in a German military reservation was perplexed when his Pontiac for no apparent reason sputtered and came to a stop. Shortly two German officers approached and explained his motor had been stopped by an electric ray which paralyzed the generator field. The ray was broadcast by guards who spotted the car in a "verboten" area. . . . Maharaja of Indore, 28-year-old millionaire Indian prince, has bought 14 Chrysler-built cars for his royal garage. Two of the models are station wagons for use on the "shikar" or tiger hunt. . . . Manufacturers of engine governors are watching safety legislation closely for any movement to require general installation of these speed regulators, many of which are now in use on trucks and taxicabs. . . . Hudson has introduced a new line of 3/4-ton commercial cars, tagged "Big Boy" because of their 124-inch wheelbase. . . . Sears, Roebuck is reported about ready to enter the tractor field, with Graham a likely builder of the machines. Ford is also conducting experimental work which may indicate his re-entry into the tractor business. Sale of tractors, it is said, calls for extensive servicing facilities as well as provision for trade-ins, which may cause Sears some difficulty. Estimates show 8 out of 10 tractor sales are made on the farm after a demonstration has been made.

Automobile Production

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

	1935	1936	1937
Jan.	300,335	377,306	*344,000
Feb.	350,346	300,874	.....
March....	447,894	438,992	.....
April....	477,059	527,726	.....
May....	381,809	480,571	.....
June....	372,085	469,355	.....
July....	345,297	451,474	.....
Aug....	245,075	275,951	.....
Sept....	92,728	139,785	.....
Oct....	280,316	229,989	.....
Nov....	408,550	405,702	.....
Dec....	418,317	519,132	.....
Year....	4,119,811	4,616,857	.....

†These totals have been revised to include figures for Canadian production, inasmuch as the bulk of Dominion assemblies is from parts supplied by car builders in this country. Weekly figures below also include Canadian assemblies.

*Estimated.

Calculated by *Cram's Reports*

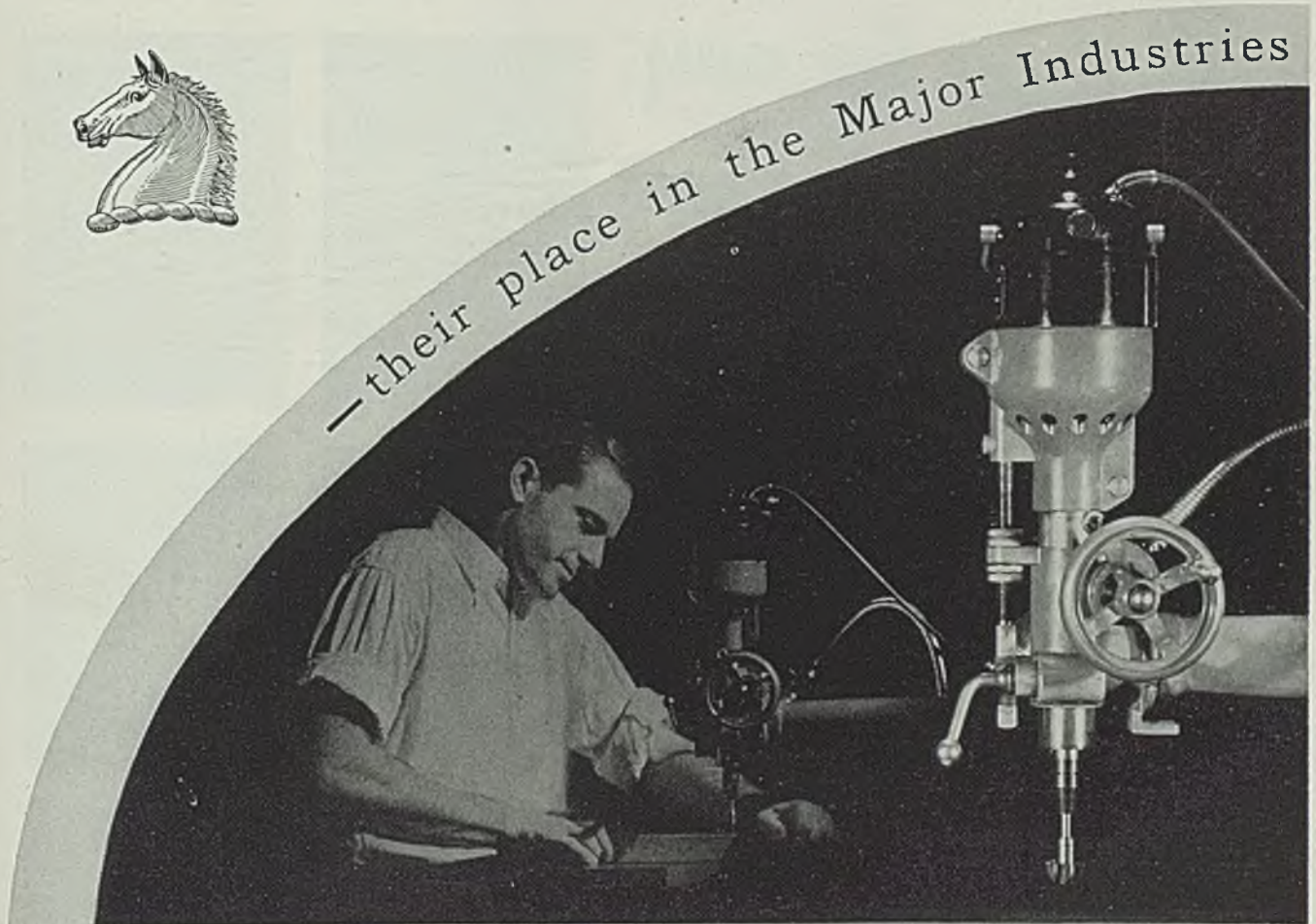
Week ended:	
Jan. 9.....	96,780
Jan. 16.....	91,685
Jan. 23.....	81,395
Jan. 30.....	174,148
Feb. 6.....	72,295

†Revised.

ZINC ALLOY DIE CASTINGS



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“Home owners represent a constantly growing market for small tools—a market demanding not only efficiency and durability—but appearance as well.” This statement, by the manufacturer of a popular line of power tools, sums up the reasons for the extensive use of ZINC Alloy Die Castings in this field.

The router unit pictured here was selected as an example of the intelligent use of ZINC Alloy Die Castings in small tool manufacture. This unit, which is interchangeable on several home workshop tools, has a die cast motor bracket, spring return cap, assembly bracket and control wheel. Die casting these

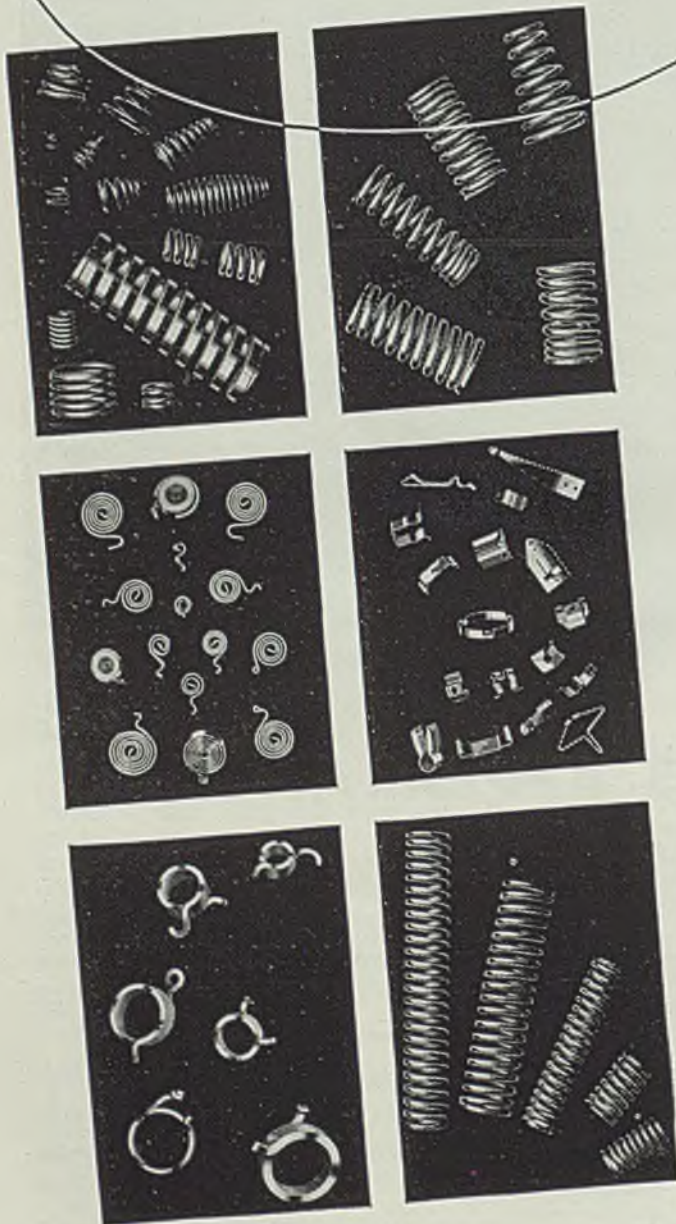
parts not only saves in machining and assembly costs, but also economically produces a fine surface finish that can be attractively lacquered to give the unit the maximum in sales appeal.

Any commercial die caster can tell you about ZINC Alloy Die Castings and their possible application in *your* products—or write to this Company for additional information.

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DETROIT, MICHIGAN

← TWO PLANTS →

ANN ARBOR, MICHIGAN



WINDOWS OF WASHINGTON

A *WASHINGTON* SPECIAL committee of the United States chamber of commerce looking into some of the legislative bills, last week came out strongly in favor of leaving the basing point system as it is.

The report dealt particularly with the Wheeler bill of the last session of congress, which would have prohibited the use of the basing point in the steel and other industries, and the Patman bill, which would have required the abandonment of the method of quoting prices used in many wholesale trades.

The committee found that the basing point and other systems of delivered pricing are the most practical means yet devised for preserving competition in the case of industries in which production and markets are widely separated and transportation costs constitute a large proportion of the delivered price.

Plan Enhances Competition

"Their operation," the committee says in its report, "depends not merely upon close proximity to sources of their essential raw materials but upon a wide distribution of their products. Such distribution is possible only if they are able to meet competition, not merely in territories immediately adjacent to their plants but also in territories in which competing plants are located."

The opinion was expressed by the committee that the alternate method of price making, based upon the mill or shipping point, would result in advantage to some sellers and disadvantage to others, unevenness in prices with corresponding handicaps for purchasers that buy for use in further manufacture. "The whole tendency," the report stated further, "would be to replace influences promoting stability in operation with influences causing confusion and instability both in operations and prices.

"Basing point and other systems

of delivered or partial delivered pricing find their greatest justification in the advantage they give to buyers. Under present methods of distribution purchasers far removed from sources of supply are free to buy from more than one source, with complete and accurate knowledge of the cost of goods to them, at their destination. The smaller retailers do most of their buying on this basis, having choice sources of supply. Any plan which prevented the seller from absorbing any part of the transportation costs would frequently compel a purchaser to buy from the nearest source of supply, thus eliminating competition for the purchaser's business and at the same time restricting his buying opportunities.

"By extending selling areas delivered pricing systems ensure to purchasers the benefits which flow from competition among sellers and, in so doing, operate to keep down and reduce rather than raise price levels. And, above all, they serve as an effective barrier to the building up of monopolies in important markets by working against the dominance in any section of the country of any seller or group of sellers."

Senator Wheeler of Montana, chairman of the powerful senate committee on interstate commerce, has stated that during this session of congress he will reintroduce his antibasing point bill of the last session.

He says that he will amend the bill somewhat before introduction, to include certain suggestions made by steel executives during the several weeks of hearings at the preceding session. However, apparently nothing that the steel industry said during those hearings has dissuaded him from the belief that the basing point system in that industry should be abolished.

QUIESCENT CONGRESS SHOWS ODD LACK OF INITIATIVE

Members of the present session of Congress are apparently trying to

emulate the sit-down strikers. In the opinion of old timers here this session has been slower getting into action than any Congress of recent years.

The members seem to have stagnated. They are not initiating any legislation at all. Just waiting for the master to speak so they can jump through the hoop.

Of course it is a fact that most of the present members of Congress rode into power on the coat tails of Mr. Roosevelt and they apparently feel, therefore, that they should just sit around and rubber stamp his desires. That seems to be the present attitude, because some of the subcommittees have not even been organized in spite of the fact that Congress has now been in session for a month, surely time enough at least to have formed committees and buckled down to work.

While literally thousands of bills have been thrown into the legislative hopper, few have even been set for hearing. Of course, action has been taken on some few bills, but only those that have the sanction of the President. It remains now to see how long Congress can juggle away its time.

MOTOR STRIKE BRINGS NO GLORY TO MADAME PERKINS

There has been more backstairs gossip in Washington recently in connection with the General Motors strike situation than about almost any event during recent years.

It all dealt with the way in which Madam Perkins of the labor department was trying to handle the situation. It was said here that she was near a nervous collapse over the whole matter and probably she is sorry now she did not hand the hot potato to Edward McGrady, the efficient assistant secretary of labor, who has been the trouble shooter in labor matters for the administration for several years. However, the story is that she wanted and insisted on handling the matter herself.

A situation developed where Pres-

ident Sloan of General Motors would not even talk to her on the telephone, it is reported, and the only way she could contact him was through a third party. The story goes that this was because she insisted on reading into such conference as Sloan had with her, things which he apparently had no idea of at the time of the conference. Anyhow, their statements did not agree in many essential points.

Of course there has been talk here for months that Madam Perkins was about to resign but nothing ever came of it. That talk was renewed here last week. It is a well known fact that John Lewis does not get along with Madam Perkins in any sense of the word but she is inclined to veer toward the Lewis organization and that has kept Lewis from any kind of an open break with her.

Perkins Request an Innovation

Just what the President thinks of all of this hustling and bustling cannot be learned. In view, however, of the fact that he came out practically favoring a subpoena power for the labor department in strike situations such as the General Motors, it is probable that Miss Perkins' appeal to congress was something in the nature of a trial balloon.

Members of Congress last week were outspoken in their condemnation of the way in which Madam Perkins had asked for this subpoena legislation. The majority leader of the house stated frankly to newspaper men at a conference that this was the first time he could remember in which a member of the cabinet had made a direct request for legislation, going over the head of the President, as it were. Which recalls to mind the fact that someone tried to do this during the Wilson administration and Vice President Marshall refused to accept the communication insisting that it come through the White House. It develops now, however, that Miss Perkins may have done this at the request of the White House just to see what would happen.

GREEN FOR CHARTER BILL; MANUFACTURERS OPPOSE

William Green, president of the A. F. of L., appeared last week before the senate judiciary committee in favor of the O'Mahoney bill to provide for a federal system of charters and licenses for corporations.

"In the eyes of organized labor," said Green, "this proposal is one of the most fundamental in purpose and far-reaching in importance ever considered by Congress.

"It is important because it is based upon a correct diagnosis of our

economic ailment because it prescribes a treatment which is sound, which does not threaten our economic growth, our democratic institutions, and which does not contravene or contradict a single requirement of our constitution."

President Green called attention to the fact that the bill does not propose to vest the government with power to stipulate the manner in which all business is to be conducted. On the other hand he points out that rules established by the bill "do clearly establish, however, lines which corporations must not overstep, minimum standards below which they must not go. These lines are drawn because adherence to them is essential to protect public interest and to promote and safeguard the welfare of investors, consumers, and of labor."

At the same time that Green was giving his testimony the National Association of Manufacturers was warning its members that the bill is "unsound in policy, invalid in law," and would re-establish "unlimited and unfettered" federal control over "individuals as well as every other form or method through which business may be done."

Validity Is Questioned

In connection with the warning the association states that "the compulsory features of the act * * * * are drastic and far reaching. They are in no sense voluntary. They involve control of matters not within the term 'commerce' but as to which the courts have uniformly held congress has no regulatory authority. They would adopt as part of this measure the one-sided and arbitrary provisions of the national labor relations act, but without repealing that act. In the field of local employment relations they would create new and indefinite offenses punishable with drastic penalties. The federal trade commission would be given a dual and conflicting jurisdiction with that of the national labor relations board in this field."

ECONOMIC BUREAU SEEMS LIKELY TO BECOME FACT

Secretary of Commerce Roper, Assistant Secretary Draper and a number of division heads of the commerce department appeared before the appropriations committee of the house last week trying to get more money with which to carry on their various business surveys and for other expenses.

One of the chief new appropriations asked for by the secretary was for \$300,000 to begin work on a new bureau of industrial economics, which would be to business what the bureau of agricultural economics for years has been to the farm interests.

The proposed new bureau has the backing of the President and the bu-

reau of the budget has declared in favor of this additional appropriation, and that in spite of the fact that the administration is now trying to hold down its normal expenditures.

Commerce officials started this movement by asking for \$1,500,000 for this new division and they have now whittled the appropriation down to the sum named. It is expected, however, that the \$300,000 will allow them to start the work with the idea that next year the appropriation may be increased. Such business men as have gone into this matter with commerce department officials seem enthusiastic about its possibilities.

ROPER ADVISORY COUNCIL HAS NEW ENERGY INJECTED

Questions of hours, wages, and child labor in industry, of strikes and other pertinent questions will be undertaken immediately by the Roper business advisory council, which met here last week, elected a new chairman and started to get under way for this year.

It looks as though the council may go some place this year. W. Averill Harriman, chairman of the board of the Union Pacific railroad, was elected chairman, taking the place of George Mead of the Mead Corp., Dayton, O. The latter has always been publicity shy and therefore the council did not get into print often. On the other hand Harriman, who took an active part during the latter months of the old NRA, became quite publicity minded during his stay with the blue eagle. Besides he is a much younger and more energetic man than Mead and is evidently starting in right.

In accepting the chairmanship Harriman said that the council "feels that its opportunity and obligation to the administration is to present the progressive viewpoint of business on matters on which our advice is requested. We also believe there is an opportunity to convey to business a clearer understanding of the objectives of the administration to the end that there can be developed sound co-operation of business with government. Through such a policy we believe a real contribution can be made which will have a favorable effect on the social and economic life of the nation. I feel the best interests of all will be served through these co-operative efforts."

DELAY FREIGHT RATE CASE

Announcement was made last week by the interstate commerce commission that hearings in the general freight rate increase case would be postponed until March 23. The railroads, it is understood, have finished their main presentation of arguments.

Editorial

Trying Labor Disputes in Court of Public Opinion

ONE beneficial effect of the national attention that is being focused upon the General Motors-CIO controversy is the emphasis it places upon the power of public opinion. Employers everywhere should take note that the reaction of the man in the street, as it is reflected in editorial comment in newspapers, in letters to the editor and in the comments of observing publicists and laymen, is exerting a powerful influence upon the actions of the principals involved in the case.

Proof of this is found in the eagerness with which each side presents its arguments for public consumption. General Motors issues statements which are published as paid advertising in numerous newspapers. Mr. Lewis and his many lieutenants are furnishing the press with a steady stream of statements, charges, interviews, etc. Thousands of employes—strikers and disemployed alike—are writing to the editors of newspapers to set forth their convictions in regard to the strike. In brief, this case is being tried in the court of public opinion to a greater extent than many of the major labor disputes of the past.

If this is to be the accepted procedure for the settlement of labor difficulties in the near future, it is important that industry master the technique of public relations at the earliest possible moment. Fortunately, the heads of many companies already have taken steps to improve their position in this respect. Marked progress has been made during the past few years.

Frankness in Sending Out Testimony on Both Sides Of Argument Wins Confidence of Press

A striking example of how large corporations can benefit by pursuing an enlightened public relations policy is furnished by a recent service which was inaugurated by the United States Steel Corp. When hearings were being conducted by the national labor relations board, looking into certain phases of employee-representation in plants of the Carnegie-Illinois Steel Corp., arrangements were made by the public relations staff of U. S. Steel to have verbatim reports of all of the testimony printed and distributed widely to newspapers throughout the country.

It is important to note that these reports covered the testimony presented by both sides—not just the part which was favorable to Carnegie-Illinois. This service was deeply appreciated by the fourth estate.

Favorable comment on the attitude of the Corporation in disseminating unbiased information relative to the hearings has appeared in the editorial columns of numerous newspapers.

Only a few of the larger corporations face the necessity of conducting national public relations activities. The great majority of industrial concerns are of moderate or small size. In most cases their contact with the public is limited to the communities in which their plants are situated. Their public relations job is local rather than national.

But restricted though it may be, the task is just as important as that confronted by the larger corporations. If the management of each manufacturing establishment would assume the responsibility of maintaining good public relations in its respective community, the need of high-pressure national campaigns would be lessened considerably.

Establish and Maintain Good Public Relations in Community and National Problem Will Be Solved

In an eastern state are two industrial towns of about equal size only 15 miles apart. In City A, the officers of the half-dozen industrial companies play important roles in the civic life of the community. The local government is good. The schools are excellent. Labor conditions are satisfactory. No strikes have occurred and none are likely. The entire community respects and values its industries.

In City B, the local government is in the hands of racketeers. Taxes are high, schools are mismanaged, the officers of the industrial concerns are careless about their civic duties, labor conditions are deplorable and strikes are frequent. The community in general does not think well of its industries.

The contrast shows quite clearly one approach to the general public relations problem of industry. Multiply the situation existing in City A by 10,000 and the national problem can be reduced to routine proportions.

Trade associations, local boards of trade and other similar agencies can help considerably in seeking out the localities where public relations are deplorable. Concentrated effort on a few sore spots like City "B" would quickly clear the situation.

Obviously all of the industrial companies in a community like City B are not guilty of neglecting public relations. Possibly a few companies are responsible. If this is the case, it is the duty of the civic-minded elements of the town to turn the heat on the culprits.

Public relations is industry's No. 1 job. It really outranks labor relations because it provides the key to the labor relations problem. It is a job in which every company—large or small—can participate effectively.

BUSINESS TREND

December Building Awards Register Slight Drop

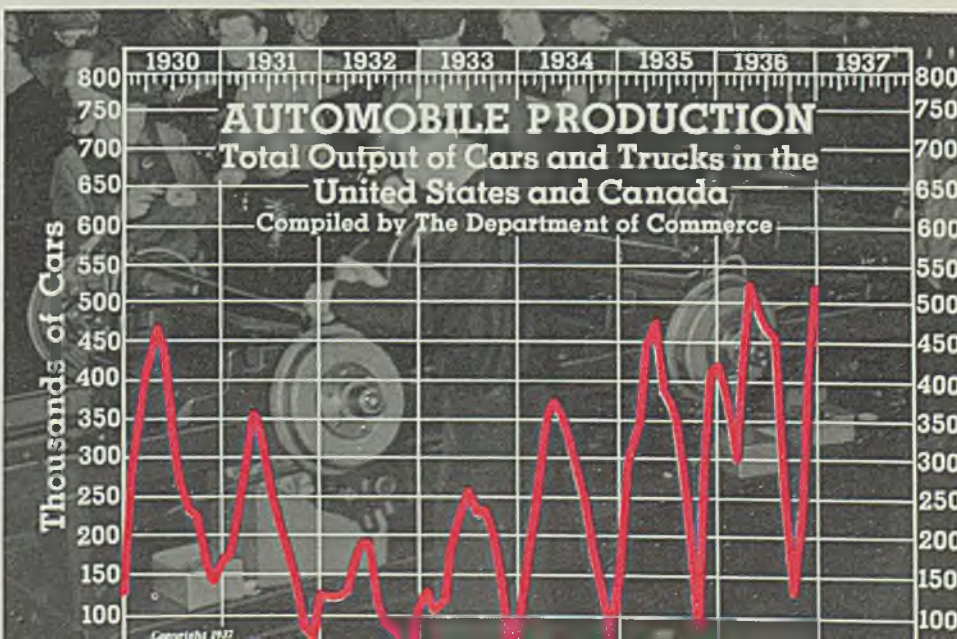
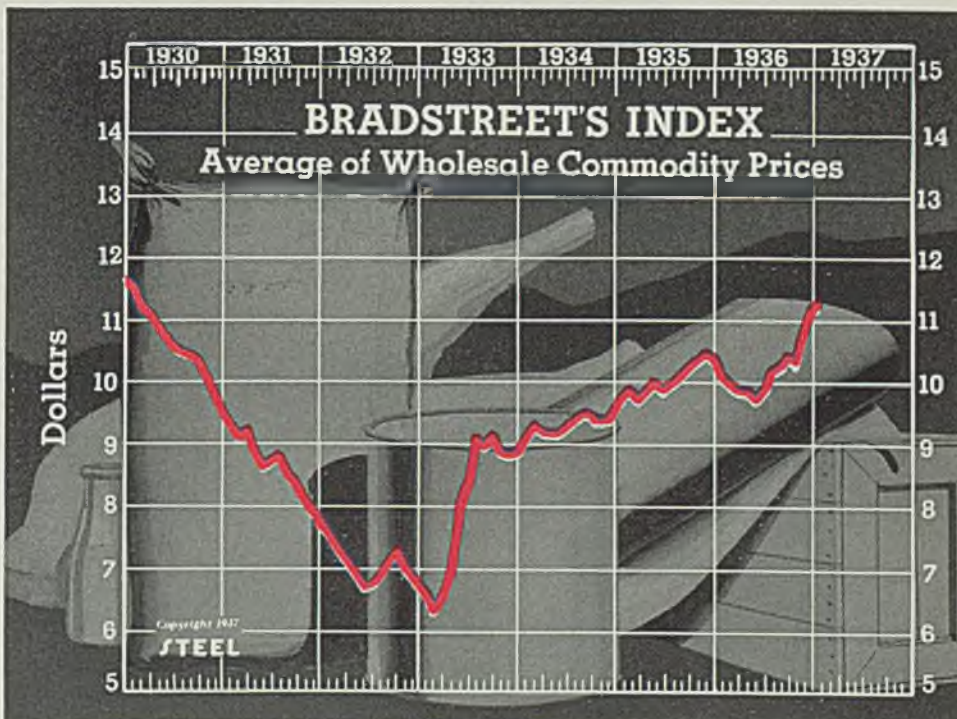
	Square Feet		
	1936	1935	1934
Jan.	27,053,300	11,245,100	9,568,700
Feb.	20,856,700	9,670,300	8,176,300
Mar.	31,308,100	15,845,300	14,788,900
Apr.	37,490,200	19,917,300	14,207,100
May	36,362,100	22,276,200	14,664,400
June	36,883,900	22,878,800	13,986,500
July	38,762,500	21,565,900	13,250,000
Aug.	40,285,100	21,545,400	14,259,000
Sept.	35,448,000	21,365,700	12,510,300
Oct.	36,718,900	27,775,900	15,098,100
Nov.	34,947,500	24,120,700	12,780,800
Dec.	33,632,600	33,441,900	9,188,700

Bradstreet's Commodity Index Continues Upward Trend

	1937	1936	1935	1934
Jan. 1.....	\$11.13	\$10.36	\$9.49	\$9.01
Feb. 1.....		10.02	9.78	9.26
Mar. 1.....		9.92	9.79	9.17
Apr. 1.....		9.85	9.66	9.16
May 1.....		9.81	9.79	9.14
June 1.....		9.73	9.90	9.24
July 1.....		9.85	9.84	9.32
Aug. 1.....		10.14	9.91	9.48
Sept. 1.....		10.19	10.00	9.45
Oct. 1.....		10.27	10.17	9.27
Nov. 1.....		10.22	10.28	9.29
Dec. 1.....		10.78	10.40	9.49

Automobile Production Up Sharply in December

	1936	1935
January.....	377,306	300,325
February.....	300,874	350,345
March.....	438,945	447,888
April.....	527,726	477,059
May.....	480,571	381,809
June.....	470,887	372,085
July.....	451,474	345,178
August.....	275,951	245,092
September.....	153,785	92,863
October.....	229,989	280,356
November.....	405,702	408,555
December.....	519,132	418,303



Circulating Unit Heaters Reduce

Reasons behind the widespread adoption of these new devices for space heating and air circulation in metalworking and steel producing plants are set forth by Mr. Merish

HEATING systems exert an important influence on the profit and loss statement of any industrial plant. An obsolete heating system may offset the advantages of modern machinery, efficient management, skilled artisans and a profitable market for the product. This is particularly the case in many plants where heat is thrown off by processing operations. In

many plants, for example, where drying ovens operate at 600 degrees Fahr., temperatures in the adjoining spaces frequently drop to 40 degrees or lower in winter because the ovens are well insulated. In the steel producing industry, heat given off in processing operations passes upward with the result that the air near the floor frequently is cold and damp. Obviously it is

dangerous for men to work in low temperatures, and particularly so when they work with hot units while standing on cold floors and in cold air.

Research over the past few years has shown that circulating unit heaters are extremely efficient in creating and maintaining healthy plant atmospheres. In the heating of large floor areas it is not how much heat but how it is delivered that counts. Heating is an air moving job. Ideal and economic heating conditions are approached in accordance with the speed with which air is warmed and placed where it is needed. The unit heater of the circulating type puts heated air where it is wanted, when it is wanted, almost instantaneously, an impossible feat with obsolete types of heating systems found in many steel mills and metalworking plants.

A notable illustration of the re-

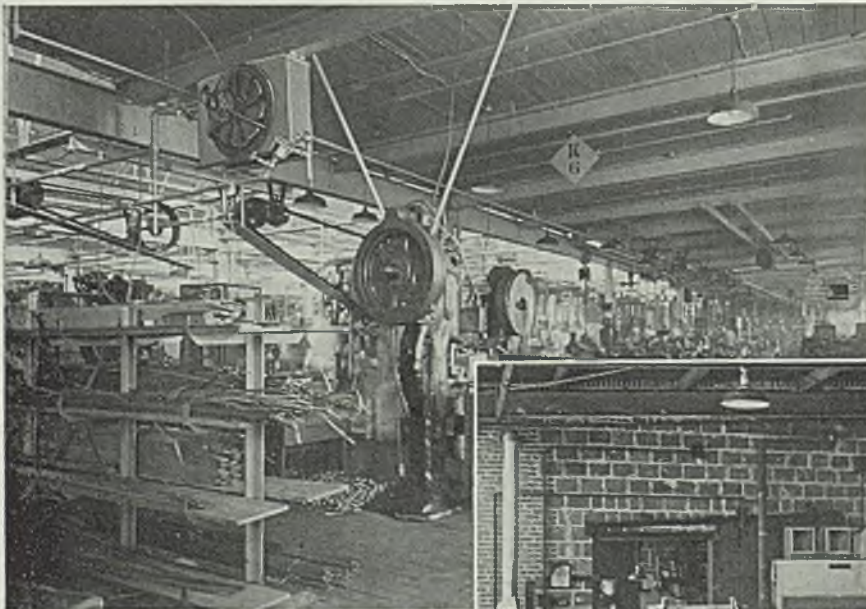
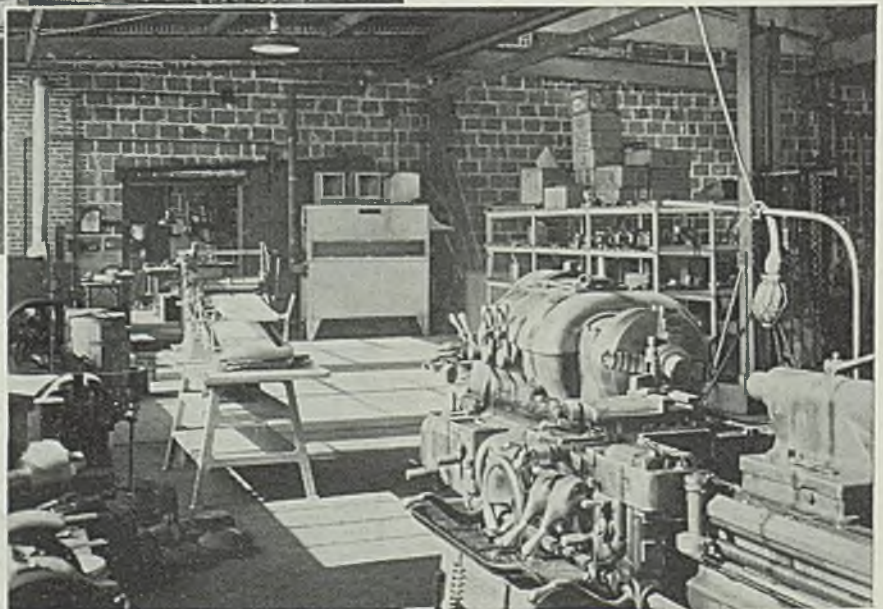


Photo courtesy Buffalo Forge Co.

TWO different methods of installing the unit heaters in metalworking plants are shown in these illustrations. Above view shows the heaters hanging from the ceiling, while the larger model shown at the right has been built up from the floor to an effective height



Production Costs in Metal Plants

BY FRED MERISH

sults that can be obtained by a correct solution of the heating problem is reflected by the experience at a New Jersey plant devoted to cold rolling and drawing of steel bars, drill rods and similar products. The plant was heated by overhead coils and some floor radiation, with the results that the temperatures in winter frequently dropped to lower than 40 degrees Fahr. Conditions were particularly bad in one of the buildings covered by corrugated steel sheets. In an attempt to correct this condition the company last winter installed a modern unit heating system of the circulating type. This system, comprised of 30 units, provided an even temperature of approximately 70 degrees inside the plant irrespective of the intensity of the outside cold. Because of the many benefits, the management reviewed the entire system and has completed it this winter by install-

ing eight additional units.

The chief benefit with this system is a great reduction in the amount of time lost through sickness and because of men knocking off work every now and then to hug the radiators. Formerly the men wore sweaters and coats which impeded their movements. Now they work in their shirt sleeves. Hardly any colds have been reported in this

plant since the unit heating system was installed. There have been no prolonged sick leaves and few days off on account of illness. Also, the plant now is considered by the men as a desirable one in which to work.

Still another benefit has been obtained in this plant which was not originally expected. Steel stocked where air is damp or humid will rust quickly. Since the installation

Photo courtesy Young Radiator Co.

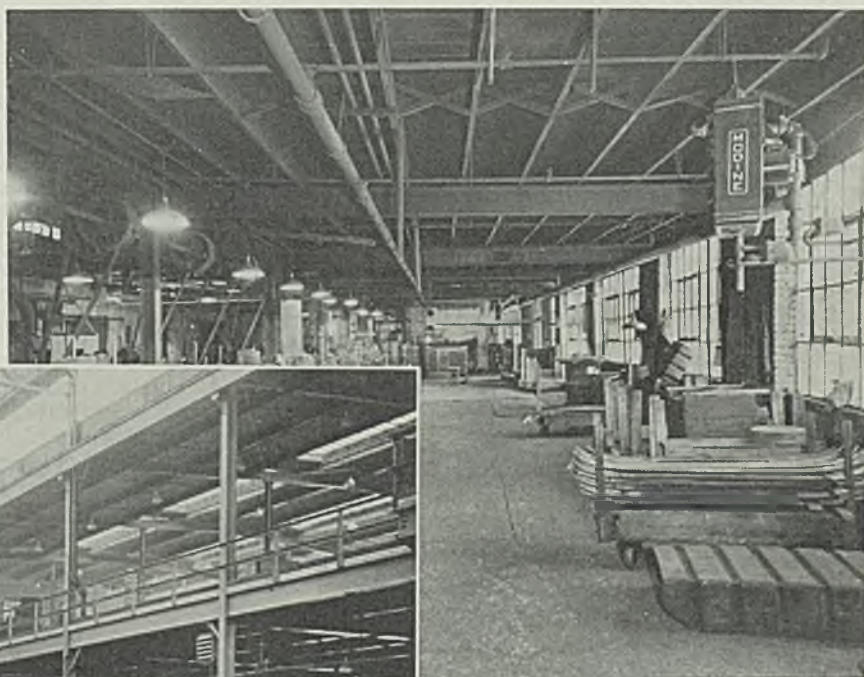


Photo courtesy Modine Mfg. Co.



HIGH or low ceilings in the plant make little difference in the effectiveness of space heating. Stratification of the air is broken up by the near-ceiling mounting above and by the heater at right at a level of approximately ten feet above the floor line

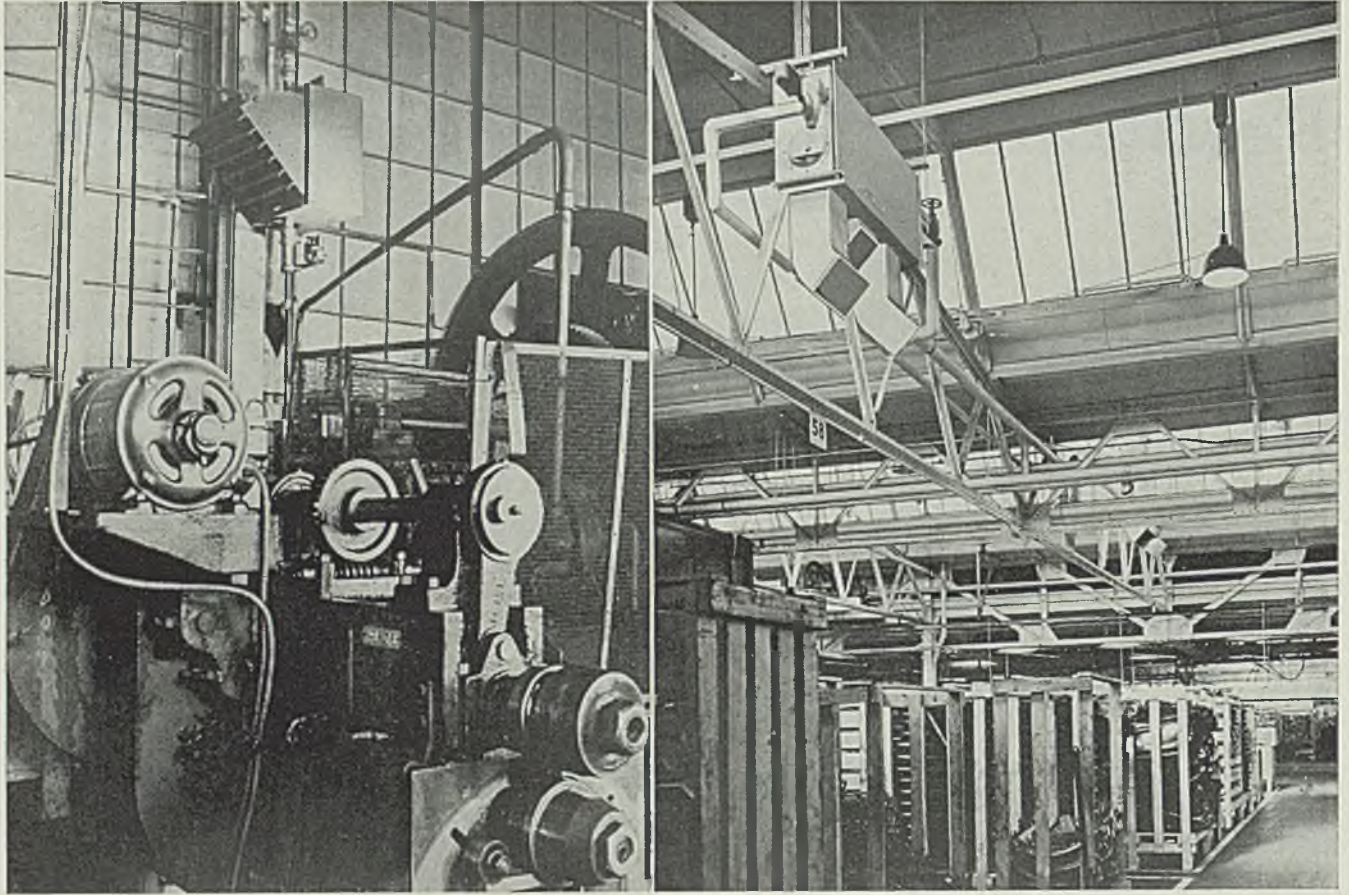


Photo courtesy Fedders Mfg. Co.

Photo courtesy Buffalo Forge Co.

of the unit heater system the company has had no further trouble due to rusting of steel. The unit heaters, of course, are equipped with humidistats which maintain humidity of the correct percentage, so that there is neither too much nor too little moisture in the air. The stock room at this plant now is completely equipped with unit heaters.

The above example is one of many recent cases where circulating unit heaters have replaced obsolete pipe coils, radiation and central blast systems that were modern a generation ago and which never did function with the efficiency of the modern circulating unit systems.

The draft is a health hazard which exists widely in the steel producing industry, as well as in many metal-working plants. Many plants are drafty because obsolete heating systems do not distribute the heat evenly. Recent plant inspections revealed temperature variations of 25 degrees or more according to the location of doors, outside walls and passageways. In many such

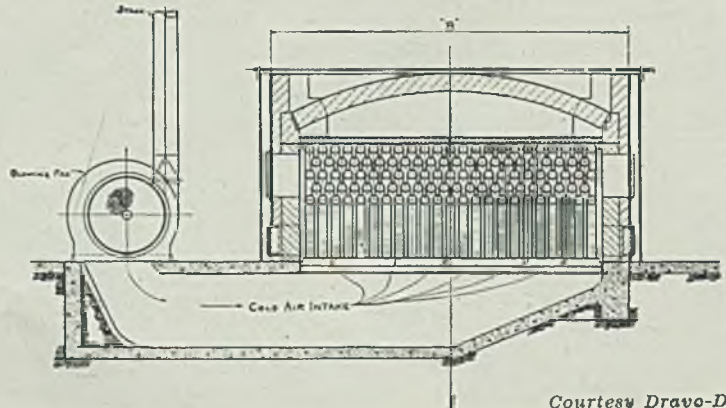
IN the press room pictured at left above, the unit heater is installed near the windows to blanket the presses in this relatively colder area, contributing to dependable operation of clutches and other parts where lubrication is affected by cold. Downward currents of warm air are concentrated by the pipes on the larger units shown at right. More effective heating of a larger building such as the warehouse shown is claimed for this method

plants workers perspiring from close proximity to heated units were subject to dangerous temperature changes as they moved from place to place. The results of installing modern unit heaters in some of these plants have been amazing. In

some cases there actually has been an increase of 35 per cent in production. The modern circulating unit heaters are so designed as to eliminate drafts despite unusual structural conditions or the opening of doors and to provide a healthy heat under all conditions.

In most plants it is found that a unit heating system is an admirable supplement to radiator heat. In one case a building that was exposed on three sides and the ceiling was equipped with radiators along the entire walls, yet the employes could not keep warm. Sick leaves because of colds and other ailments brought about by working in this inadequately heated department ac-

DIAGRAMMATIC structure of the unit shown on the top of the following page, which demonstrates the workings of these heaters. This operates on the same general theory as a majority of heaters, although it is a larger unit



Courtesy Dravo-Doyle Co.

tually demoralized production at times. Operations had to be shut down on cold days. A single unit heater suspended above the radiators changed this condition entirely. On the coldest days this winter, the temperature in this building has been maintained within 3 degrees of 70 degrees Fahr. The circulating unit picks up the heat of the radiators and whisks it evenly around the shop. No absences because of colds have occurred since the installation of this unit heater. Production has increased substantially.

Stratification Removed

In many plants equipped with obsolete heating equipment, the difference in temperature between ceiling and floor is considerable. Where ceilings were high a difference of 1 degree per foot of elevation and sometimes more was found. Balconies often were 10 degrees warmer than main floors. In some of these plants the temperature along the walls was as high as 85 while that in the center of the buildings was around 60, due to location of radiation around the walls. When modern circulating unit heaters were installed, this unhealthy stratification of air around ceilings or walls was broken up and it was found, on an average, that temperature variations over an entire building did not exceed 3 degrees.

High ceilings and great wall exposures have created real problems in the heating of many plants, particularly after stoppage of operations overnight or after shutdowns. In the early morning employees often work in subnormal temperatures because the buildings have not been warmed up sufficiently. This condition, of course, does not exist where circulating unit heaters are used. By means of the fan or blower in each unit the air is forced across the heating element and moved down to the working level within a few seconds after the steam has been turned on. Tests have shown that the entire cubical

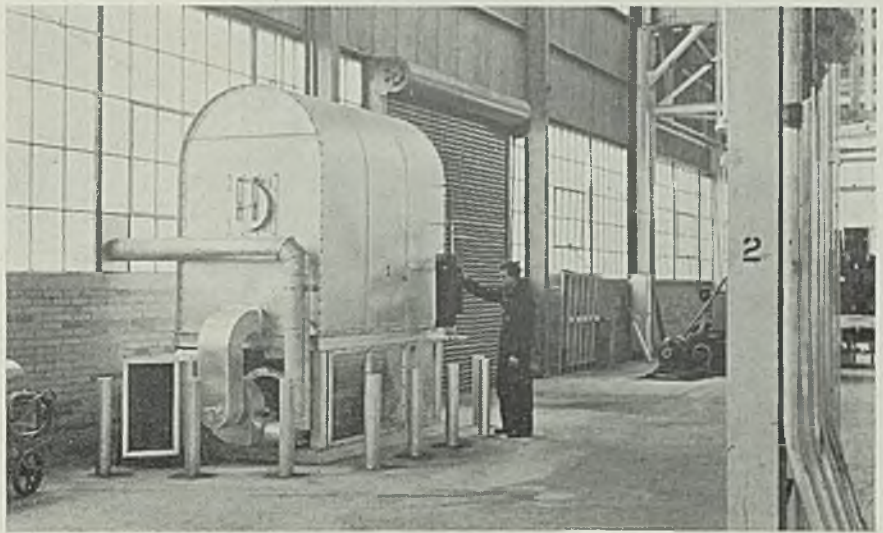


Photo courtesy Dravo-Doyle Co.

air content of an interior is turned over six times in 1½ hours by unit heaters of the circulating type. Our observations show that the cubical air content turns over about once an hour with older types of heating.

Air Motion Is Beneficial

Because unit heating keeps the air in motion, it dries up wall and ceiling condensation, dissipates fogs raising from pickling vats in steel mills and metalworking plants and corrects noxious gas conditions that are injurious to health and that decrease working efficiency.

Effects of summer heat on working conditions and production are largely eliminated where circulating unit heaters are installed. A certain cooling differential is obtained by simply operating the blower in a unit heater and thus circulating the air without heating it. Where wells are available well water may be pumped through the coils. City water also may be used but it is seldom cold enough; to get an appreciable cooling effect the water must be 50 degrees or colder. Of course, there is no condition which cannot be solved since water temperature may be reduced by passing it through an ice bunker before flowing it through the coils.

Installation of unit heaters is simple. They are easily hooked into steam piping about 10 feet above the floor level. They may be spotted at strategic points in the same way that lights are spotted to give best results. They may be swiveled in any direction by loosening a nut and making the desired turn in po-

SMALLER unit, back view, showing the tube and fan assembly. This model connects into the factory steam line and uses the steam for both heat and power to run the fan

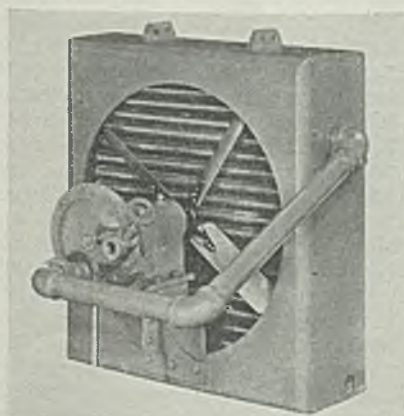


Photo courtesy Murray Iron Works Co.

LARGER space heaters similar to this one have proved effective in heating high buildings with large amounts of open space. This model produces its own heat, not relying on outside steam sources

sition. They require no floor space whatever. It is a fact that fuel always is wasted where distribution of heat is uneven; because unit heaters eliminate cold spots and spread the heat uniformly they reduce fuel cost in many cases by as much as 25 per cent. Because of the flexibility in placement, unit heaters are adaptable to any plant, regardless of size and structural condition, whether one or more walls are exposed, whether large or small or whether subject to unusual draft conditions.

Metallurgy Reduced to Vest Pocket Volume

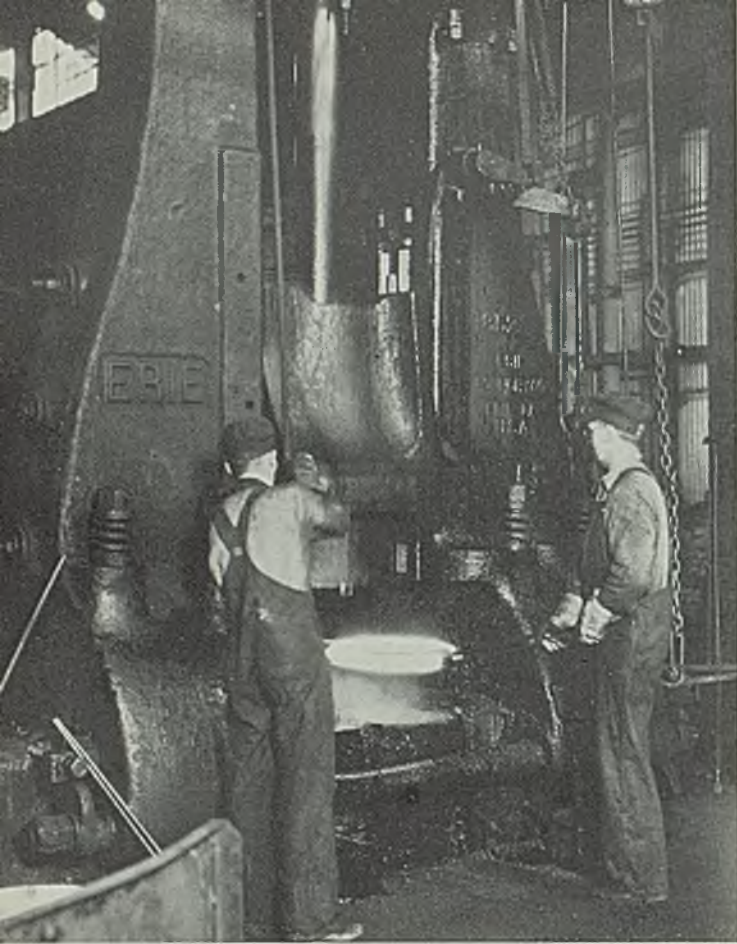
Metallurgy (Metallurgie), by R. Cazaud; fabricoid, 391 pages, 3¾ x 5½ inches; published by Dunod, Paris, France; supplied by STEEL, Cleveland; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

This small volume, which is in French, is a vest pocket compendium of metallurgical data. It is divided into five sections of which the first deals with metallurgical agents such as combustible materials, and their application; reducing and oxidizing agents, and refractory materials. Various types of furnaces and other equipment employed in metallurgy also are described. The second section is devoted to methods of analysis of metals including mechanical, thermal, corrosion and microscopic. Part III is entitled "Thermal and Thermochemical Treatments." Part IV is devoted to metallurgy of iron, Part V to nonferrous metallurgy.

Modern Forging

BY R. W. THOMPSON

Sales Engineer, Transue & Williams
Steel Forging Corp., Alliance, O.



FORGING a large ring
gear on a 10,000-pound
steam hammer

DISCOVERY of forging as a means of shaping metal runs parallel to that of iron, since the usefulness of iron began with the shaping and forming of iron ore into tools and later into weapons of war. History of forging shows an evolution from the protective to the ornamental. Many examples of beautiful grille and scroll work standing as monuments to forging art are found in the great cathedrals of England, France, Italy and other foreign countries.

The advancement of civilization naturally created a demand for heavier and larger forgings than could be produced by hammering the metal by hand, and this brought on the development of the power hammer. Through many generations the forging of small pieces was performed on foot power hammers, and of larger pieces on "helve" hammers, until the advent of the first steam hammer in 1838. In this hammer, the steam was utilized to raise the ram, or hammer, to the height of the stroke, after which it dropped upon an anvil. Naturally operators of the first steam hammers were hampered in the forging of large sections by the loss of falling distance of the ram, limiting the effectiveness of the blow.

About 1888 the first double acting steam hammer was produced, and this development increased the scope

of forging sizes by utilizing the steam in forcing the ram and die downward as well as for lifting it upward.

Up to this time all forging work was done between plain dies with the exception of a few pistol parts forged during the Civil war. It was not until several years later when the board drop hammer principle was introduced, cavities or impressions in the dies were used as they are today. This necessitated a differentiation of terminology to distinguish between the two classes or types of forgings. The forgings produced between impression dies having the finished forging shape became known as drop forgings, whereas those made between plain dies, with or without subsidiary hand tools, are known as hammer forgings.

Autos Lend Impetus

Probably no one singular product of manufacture has contributed more to the advancement of drop forging than the automobile, and inversely it may be said that without drop forgings it would have been impossible to have the present fast, powerful cars of lightweight construction. The average automobile has about 100 forgings, the most important of which are connecting rods, crankshafts, spindles, axles, steering arms, and the various gears

that make up the transmission and differential assembly.

Since drop forging presents so many interesting and intricate designs, the diversity of which requires a wide range of equipment, it may be interesting to consider this phase of the forging industry.

It is not an easy task for the mechanical engineer to lay out a drop forging design with tolerances and physical specifications which represent the most economic product for a particular application. The engineer knows those desirable mechanical and physical qualities in a drop forging which provide the strength and ductility necessary for the satisfactory performance of a given part. He has certain metallurgical knowledge or access to competent metallurgical advice within his own organization which permits him to select a type of steel or combination of analyses, which, with proper heat treatment, will provide the desired physical strength. Yet, he does not know that his design will be forged properly without danger of cold shuts, laps or surface imperfections. Neither does he know that, possibly by certain changes in the contour, the flow fibers will be kept unbroken within the piece, eliminating this weakening effect which was not calculated in his original considerations. Nor does he always know what deterrent aspect of his de-

Practice Is Well Integrated Technique

THE average automobile today uses in its construction about 100 different forgings; which in part explains the many improvements and refinements made in forging equipment and practice since the first double-acting steam hammer appeared in 1888. In the accompanying article Mr. Thompson takes the reader on an inspection trip through an up-to-date forge plant. The material is from a paper which he presented recently before the Cleveland chapter of the American Society for Metals

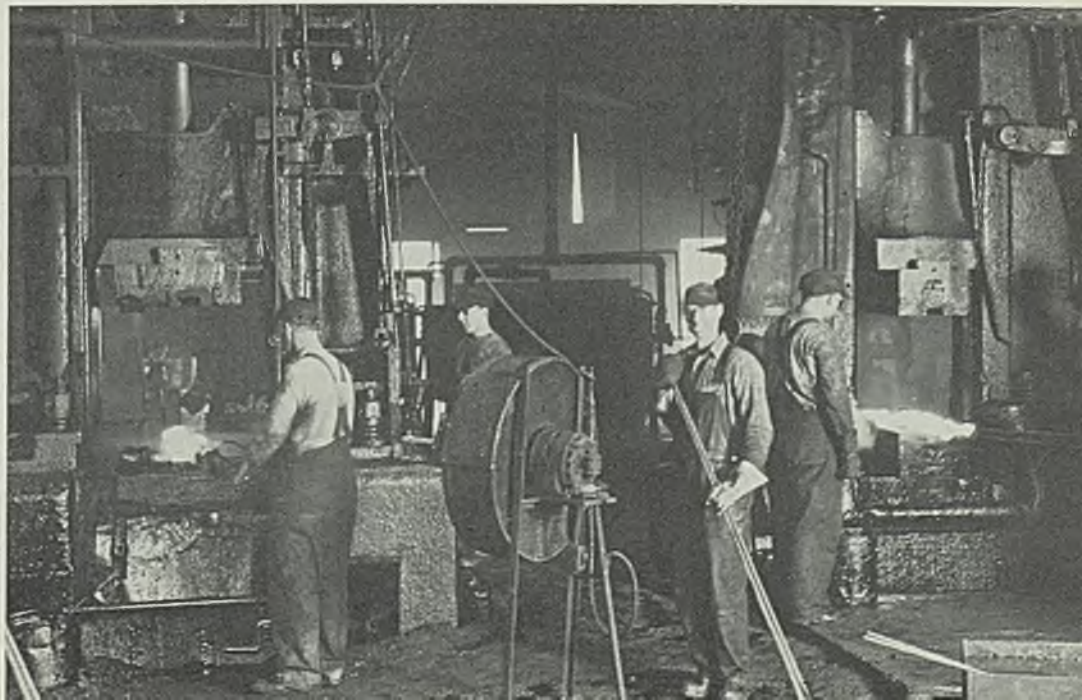
sign is responsible for rapid die checking or washing, or likewise the particular features which induce die breakage. These costly intangibles reflect themselves in the cost of each forging, and often could be eliminated without materially changing the design.

It is the business of the drop forger to know the correct die design which will give the required mechan-

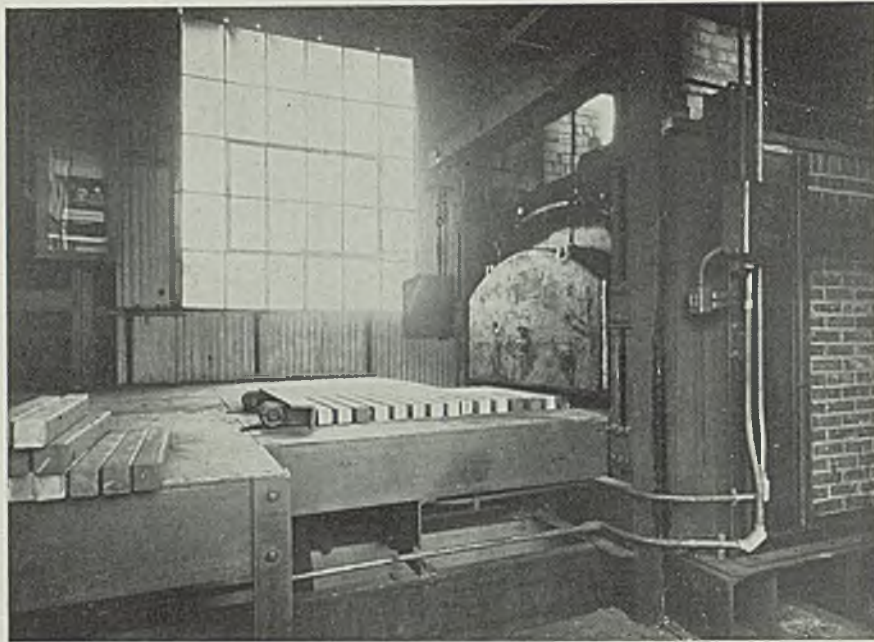
ical working to a bar or billet in order to produce a finished forging shape with a minimum of internal stress. The number of operations necessary to control the reduction of the metal and provide a dense homogeneous product of proper grain fiber direction is a subject that merits detailed consideration. However, it will suffice to say that dies for all highly stressed forging parts

should be designed to maintain the grain fibers inherent in the original bar or billet within the forging, and if possible at right angles to the direction of stress or shock in its service application. Drop forgings in which grain fiber control is extremely important are steering arms, knuckles, crankshafts, gears, connecting rods and axles.

Control of grain fibers is of equal



BLOCKING and finishing hammers of crankshaft unit. Hammer on left is the 5000-pound blocking hammer and that on the right a 6000-pound hammer for finishing the forging



CHARGING end of continuous billet heating furnace which supplies stock for the two hammers shown on the preceding page. Automatically controlled, this furnace has a capacity of 8000 pounds of crankshaft steel

importance to the control of grain size for the prevention of distortion and quenching cracks in the heat treated forging. To maintain the specified grain size in the finished forging, the forger must again have accurate control of his fabricating operations. High finishing temperatures cause grain growth and low temperatures, with the resultant cold working effect, produce a further refinement of grain structure. However, a random check of grain size of a number of forgings is more apt to show an increase in grain size rather than a reduction in size. This is principally true in the high grade gear alloys which are usually of fine grain classification and require long time soaking heats at relatively high temperatures for successful forging. Therefore, while it is sometimes found that the McQuaid-Ehn rating after forging is coarsened from one-half to one in rating in the classification chart, it is usually because the particular design will not lend itself to the lower corrective finishing temperatures.

An interesting story of the part played by the drop forger in improving machinability and the prevention of warpage in the finished product is contained in several articles written by Messrs. Sanders and Cedarleaf.* In their work on this subject it was found that unfilled drop forgings (those not filled out to complete contour in the die)

*Paper presented before Machine Shop Practice division of American Society of Mechanical Engineers, June, 1932.

always produced a torn machined surface, whereas the filled forgings produced a smooth surface. It was also found in the case of gear forgings, that if correct forging practice was employed and a refined dense structure and well filled contour was produced, the machinability was increased from 50 per cent to 400 per cent, depending upon the operation. In addition to this, the tool life was correspondingly increased in like proportions.

Limitations on Weight

Besides supplying the forging user with improved machinable drop forgings derived by the aforesaid inherent qualities, further demands for economic machining must be met by close dimensional tolerances and exacting weight limits. Any number of forging specifications today demand a limit of plus or minus 0.005-inch in thickness. It is also not uncommon to be required to furnish connecting rod forgings within a weight limitation of plus or minus one ounce.

The modern forging plant is equipped with a diversity of up-to-date equipment arranged to promote a successive progression of fabricating operations from the storage piles of bar stock through the final inspection and to the loading docks ready for shipment.

While there are still any number of forging designs requiring only the use of the drop hammer and trimming press, each year finds more complex designs developed which are impossible to produce in any one type of forging equipment. Consequently the modern drop forging plant is equipped with drop hammers, forging presses, forging rolls, upsetters, bulldozers and coining presses. All must have sufficient

rigidity of structure to provide the accurate die alignment necessary for attainment of the most exacting specifications.

Forging hammers are named according to their design or method of operation. The terms used in describing them are steam drop hammers, air drop hammers, board drop hammers and open-frame hammers. The air drop hammer is identical in construction to the steam drop hammer with the exception of the valve mechanism, and derives its power from compressed air instead of steam. In the board drop hammer the ram is lifted by means of several boards keyed in the ram, which pass between two rollers operating in opposite directions. Mechanical release of the boards when the desired height of drop is reached permits the ram to drop.

The open-frame hammer is so named because its frame is cast in a single unit in the shape of the letter "C." This type hammer is operated by air or steam, and by virtue of its construction permits the forging of long sections.

Role of Forging Press

Advantages of the forging press for the production of steel forgings is somewhat limited and confined principally to those simple designs which are uniform in section and symmetrical in shape. These are usually upset parts made by placing the cut blank or slug on end in the die and squeezing it to fill the impression. Other parts which have previously been rough forged or in the shape of rolled blanks are often finished in this type of equipment. Forging presses are of the mechanical, friction, steam or hydraulic type, usually equipped with mechanical ejectors which serve to raise the forging from the die on the back stroke of the ram. This knockout arrangement makes it possible to eliminate the usual necessary draft angles in the forging design.

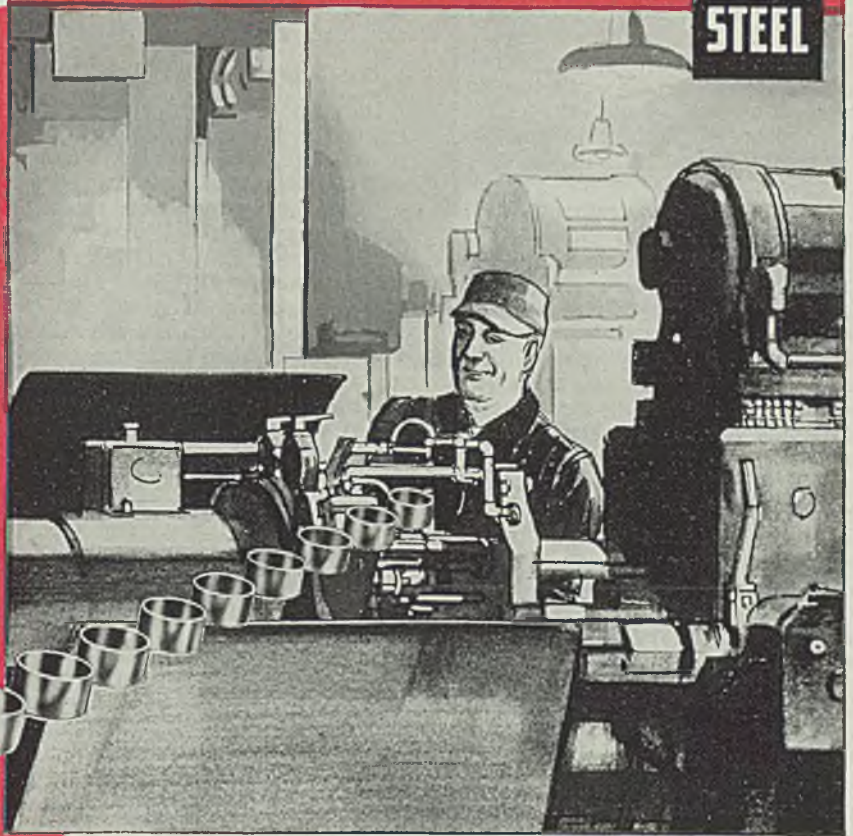
Forging rolls, like the forging press, may be considered as auxiliary to other types of forging equipment. While they are also used to forge certain parts such as rear axle drive shafts, they have a distinct advantage in preparing blanks for finishing operations in the drop hammer or forging machine. This advantage is due to the gradual reduction in working which is always in a longitudinal direction—thus producing blanks with an ideal continuity of fiber. Most all connecting rods made to certain grain fiber specifications are drop forged from blanks produced in forging rolls.

Probably no production unit in the forging industry is more interesting than the forging machine or upsetter. These machines operate in a horizontal position under the terms upsetting, heading, or machine forg-

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ing. The bar of stock, heated on one end, is placed between the gripping dies, one of which is movable and the other stationary. As the foot treadle is depressed, the gripping dies come together, gripping the bar and holding it tightly while the ram moves forward against the end of the hot bar, upsetting it and also forcing the hot metal to fill the shape of the impression in the gripping dies. As the ram returns to its original position, the gripping dies open, permitting the operator to remove the forging. In more complex upsetting forging, this cycle is repeated, making use of several impressions in the gripping dies which correspond to the number of impressions in the sliding die. The operator, by moving the bar from one impression to another in successive operations, accomplishes the completion of the forging.

The saving in material, correlated with considerably reduced machining costs, have promoted an increased demand for forgings produced by the forging machine method. It is no wonder this should be the case since it is possible in the modern machine, by displacing the internal stock, to provide the machinist with certain forging designs in which from 25 to 60 per cent of his machining work has been eliminated. Particular reference in such cases applies to those parts made by piercing or by the punch-off method and include a variety of cluster gears, hubs, drag links, tractor rollers, ball forgings for car connections and many others.

High Production Possible

In order to cope with the demands of increased production, particularly in the forging of small pieces such as side gears, where the proper degree of upset and metallurgical structure can be obtained with but a single blow, the upsetting machine is designed to accommodate a closed die. The bar is heated its entire length and as it is fed into the machine, the proper length of slug is cut off, carried over in front of the die and upset as the sliding die comes in contact with the stationary die.

Productive possibilities in this machine are from 40 to 50 forgings per minute. However, the main handicap in this type of forging operation is the inability of the dies to withstand the almost constant effect of the heat. Considerable research has been conducted at the writer's company in the development of a die analysis and heat treatment for use in this type of machine, and while the results show a marked improvement in die life, it is felt that by no means have the possibilities to be attained in the productive value of this machine been exhausted.

Application of the bulldozer to modern forging practice is limited

and therefore it is used chiefly for bending or twisting operations. These are power driven machines having a movable head which operates in a horizontal motion.

Combined in Production Units

In order to effect increased economies in the fabrication of certain production parts, the aforementioned equipment often is arranged and grouped in production units in which the combined use of hammers, upsetters, bulldozers and heat treating furnaces provide a continuous arrangement of operations. Connecting rods, axles and crankshafts are often finished complete without an interruption of operations in such localized units. The heated billet length required for a connecting rod is passed through six to ten impressions in the forging rolls to obtain a proper blank which is finished in the hammer, trimmed and then re-struck in a press without the necessity of any additional reheating. Crankshaft billets after proper heating are blocked, forged, trimmed, re-struck and the head flange upset. The forging is permitted to cool to below the lower critical while being conveyed to the normalizing furnace where it is straightened on the normalizing heat in a hammer or press as it is discharged from the furnace. Heat treating operations often are coupled with forging pro-

duction as in the case of front axles. After the axle is forged, it is reheated in a heat treating furnace for quenching, stretched to the desired length as it leaves the furnace and quenched in the stretching fixture, which also serves to hold its alignment. The subsequent drawing heat is not high enough to cause distortion and straightening is practically eliminated.

While it is true a delay due to equipment failure in any one production center of the unit is exceedingly costly in view of the lost time imposed upon each component of the unit, the economies effected by the elimination of reheating and re-handling the part are great and if the modern heavier equipment is installed, delays due to equipment failure are infrequent.

Selection of Die Blocks

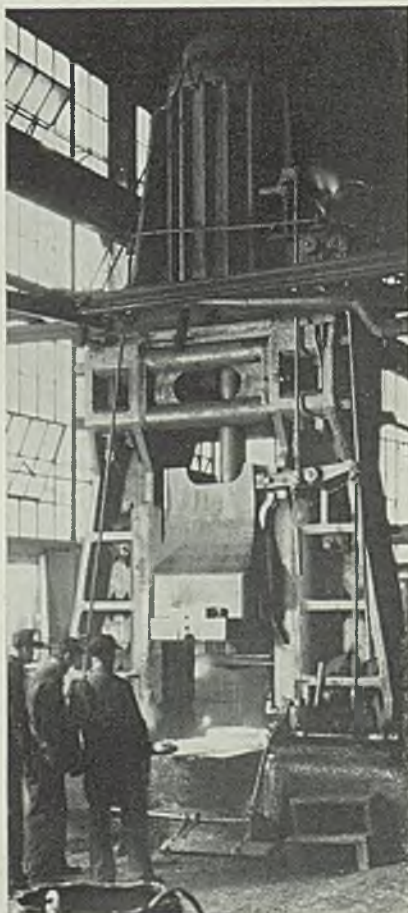
It has been stated previously that the influence of proper die construction enters materially into the economics of forging costs. To this may be added the selection of the type of die and tool steel with the proper hardness that will suit a particular job.

Die blocks may be cast or forged, and are usually of a nickel-chromium-molybdenum analysis, although a number of carbon steel blocks are used for forgings requiring shallow impressions of more or less uniform thickness. The hardness required in such blocks is from 60 to 75 scleroscope and naturally they are heat treated after sinking.

Alloy die blocks are most generally purchased in the heat treated state to a specified hardness, dependent upon the size of the block and the nature of the impression to be sunk therein. The fact they are plain blocks of steel which permit a more drastic quench and deeper penetration of hardness finds favor with the forger, as they can be prepared for the hammer without the liability of warpage which is apt to occur if heat treated after sinking. With the modern die shop equipment and machine tools in use today, it is possible to machine these heat treated alloy blocks at hardnesses up to 60 scleroscope.

Cast die blocks are purchased with the keyways, fullers and edgers cast therein and if the forging design is not too intricate, the blocking and finishing impressions are also cast. The same limitations in the choice of carbon steel blocks pertain to cast blocks.

The drop forger, wherever possible, will consider the use of insert dies which contain the finishing im-



HAMMER crew of four is required in handling this large rear axle forging for a motor truck. The steam hammer is rated at 16,000 pounds

pressions, and are keyed into holders which also serve to produce the preliminary steps in making the forging part. Since the finishing impression is the deciding factor in die life, the inserts can be discarded when worn out and a new insert die placed in the holder.

Many ingenious methods for prolonging die life are developed, one of which is the insertion of small plugs in the die bearing the impression of that part of the die which is checked or worn unfit for further production. The value of the plug is greatly enhanced by the fact that a tungsten tool steel can be used, imparting more resistance to abrasion and temperature. In order to obtain a tight fit for these plugs in the die and prevent a perceptible mark on the forgings, advantage is taken of the contraction of steel at sub-zero temperatures. The plugs are subjected to a temperature of 130 degrees below zero which will produce a shrink of 0.0035-inch. From this temperature they are immediately inserted in the die in which allowance has been made for this contraction.

Heavy Service Demands

Brief mention may be made of steels used in upsetter operations. Probably no one type or grade embodies all the requirements necessary for long die and tool life in all applications of the upsetting machine. Consequently a selection of any of the well-known trade brands must be made with an idea of sacrificing one or more of the qualities necessary for good production in this method of forging. Without going into considerable detail, it may be said these tools should be resistant to pressure, heat checking, abrasion, impact and besides maintaining their hardness and strength at elevated temperatures, they must resist the effect of water which is used as a coolant and for removal of scale.

Trimming of drop forgings is performed in a crank press and may be done either hot or cold. Cold trimming is ordinarily employed on all small forgings, unless the contour involves a delicate die and punch or where the analysis of the piece presents the hazard of small stress cracks as in most alloy steels.

Most trimming dies are designed with a raised cutting edge, which is ground down as the die becomes dull or by reason of a flaking-off of the edges. Where one section of the die is known to wear excessively, a bead of Stellite is often used to impart more abrasive resistance to that particular section. For long production runs, it is sometimes considered an economic advantage to have the entire raised cutting edge built up of Stellite.

In the past five years there has

been a definite trend toward forgings of closer tolerances as a means of reducing, minimizing or eliminating machining operations. Powerful hydraulic or mechanical presses having a capacity of up to 1200 tons are used for coin pressing drop forgings to meet these modern requirements of the product.

Furnace Controls Refined

A long standing criticism of the drop forging industry was the lack of proper and adequate heating methods and control. The modern forging plant can look with pride upon the development of this important phase of operation. With a complete realization that proper heating is essential to the successful forging of a quality product, modern furnaces of ample hearth surface to insure a uniform heating without a sacrifice of production have been installed. The temperature is controlled automatically by thermocouples located at the level of the forging billets so that a true temperature of the steel is registered. In addition to this mechanical control, heat supervisors are employed who understand fuel atomization and regulate the rate of heating and the duration of the soaking period.

Continuous heat treating units with precise control of furnace temperature and atmosphere provide with a certainty a duplication of quality standards. The assurance of the attainment of the prescribed physicals and uniformity is further made possible by heat treating the forgings made from each heat or melt in individual lots. To make this possible the forging dies are stamped with the mill heat number or a code letter identifying same. This identification, if placed on an unmachined section of the forging, is permanent and besides permitting close control in the heat treating operations, also serves as an index for check of fabrication in case of subsequent failure of the part.

Metallurgical Staff Needed

It may be said no one individual in the forging organization is more responsible for the quality of the product than the metallurgist. It is therefore necessary that the forging plant maintain its own chemical and metallurgical laboratory under the supervision of competent chemists and metallurgists who know the exact analysis of the materials being forged and have complete knowledge of their proper heating and fabrication.

Etch tests of the billets must be made before proceeding with forging in order to check density, segregation and surface qualities. It is also necessary that tensile, torsion, and impact tests be made of a certain number of representative forgings to insure their suitability for

satisfactory service. Microscopic examinations are indispensable for checking grain size and the quality of heat treated structures.

Practically all drop forgings are cleaned for the removal of scale and to facilitate the final inspection. The pickling method is most predominant while other methods such as sand or shot blasting and tumbling are often employed.

It is easy to understand why the inspection department is an important factor in forging routine. In order to check correctly the extremely close tolerances required in present day specifications special gages are provided the inspector for this purpose. In some forgings as many as seven separate gages are used to insure the forging manufacturer that his product will meet the specifications of the customer.

West Coast Machinery Firm Sponsors Equipment Show

Exhibit and demonstration of representative machine tools from 20 builders is being sponsored by Herberts Machinery Co., Los Angeles, this week at the company's showrooms and warehouse on Santa Fe avenue. Several carloads of drills, lathes, shapers, keyseaters, turret lathes, grinders, bandsaws, riveting machines, power presses, shears, pipe cutting and threading machines, hand and power press brakes, and measuring instruments will occupy the two acres of floor space in the Herberts headquarters, most of the equipment arranged to be in operation. The show will continue through Feb. 14, with factory demonstrators on hand to assist local representatives.

Companies participating in this Pacific Coast display include American Tool Works Co., Cincinnati; Baker Bros. Inc., Toledo, O.; Bardons & Oliver Inc., Cleveland; Bryant Chucking Grinder Inc., Springfield, Vt.; Ex-Cell-O Aircraft & Tool Corp., Detroit; International Machine Tool Co., Indianapolis; William Laidlaw Inc., Belmont, N. Y.; Linley Bros. Co., Bridgeport, Conn.; Niagara Machine & Tool Works, Buffalo; Oster Mfg. Co., Cleveland; Oliver Instrument Co., Adrian, Mich.; Racine Tool & Machine Co., Racine, Wis.; Reed-Prentice Corp., Worcester, Mass.; Rockford Machine Tool Co., Rockford, Ill.; Rivett Lathe & Grinder Co., Boston; Sebastian Lathe Co., Cincinnati; Sundstrand Machine Tool Co., Springfield, Mass.; Van Norman Machine Tool Co., Springfield, Mass.; Whitney Metal Tool Co., Rockford, Ill.; Allsteel Press Co. Inc., Chicago; and Carl Zeiss, New York.



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Materials Handling

Air Shipments of Metal Products Increase Use of Steel Strapping

UNTIL finished products are packed and properly stowed in freight cars, motor trucks or other agencies of transportation, materials handling operations cannot be considered as completed. In a broader sense, completion of the task is achieved only after the commodities arrive at the customer's receiving department. That is why there remains a real problem of further co-ordination of handling practices throughout industry.

Changes in methods of shipment of steel and metal products during the past few years, necessitating new methods of packaging and stowing and a greater reliance on mechanical handling equipment at the shipper's plant, have resulted in correspondingly efficient methods of handling in plants of consignees. Customers' preferences as to how goods shall be prepared for shipment often seem unnecessarily impractical to those on the shipping end, but often are determined by ability to unload at least expense. The correct answer to handling problems cannot be ascertained unless this factor of shipping is considered carefully.

One phase of this important branch of materials handling may become more important for "rush

shipments" in the near future. Recent announcement of a plan for freight carrying planes emphasizes this probability. Products of the steel and metalworking industries even today are moving frequently by air transport; soon there may be a substantial increase in such shipments by reason of further development of facilities.

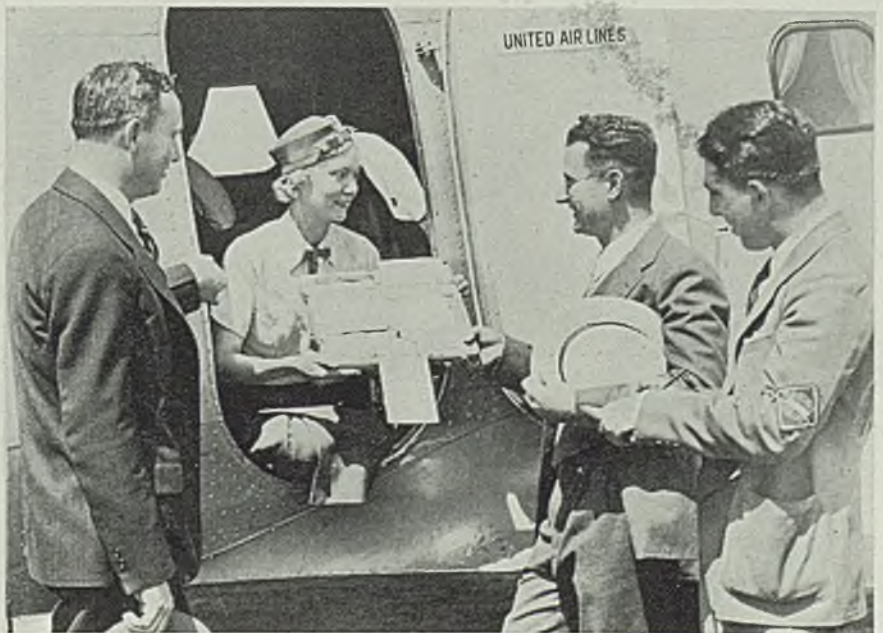
Planes Prevent Costly Delay

Recently, the mail steamer RANGITANE of the New Zealand Shipping Co. Ltd. found that it had urgent need of a replacement machine part of its operating mechanism. The ship was off the west coast of Panama. The part weighed approximately 1800 pounds. It was shipped from England, and on arrival in New York was placed im-

mediately on a Miami-bound plane. At that Florida city, the part was transferred to a Pan-American Airways seaplane and carried to the Canal Zone. Thus, many weeks of costly delay were saved.

About this same time Armco International Corp., Middletown, O., shipped several plates of such size as to permit their passage through a 3 x 5½-foot hatch for stowage in an airplane. These were destined for a penstock used to regulate flow of water deep in the wilds of British Honduras. An airplane provided the only suitable means of transportation to this site in the jungle, and the consignee, the New York & Honduras Rosario Mining Co., saved months of delay by this method of handling.

While the foregoing are only two instances of what has become fairly common practice in handling rush shipments, many competent traffic men believe that in the near future even larger shipments will be made in the course of routine handling, as well as for such emergency purposes. With Pan-American Clippers flying the Pacific, and similar ships



CEREMONY of foreign-bound shipments today will give way to routine of tomorrow, but need for protection of packages will be even greater. Here is shown a wire-bound package of machine parts being delivered to a plane in Chicago for air express to Havana. Binding with steel wire or strapping reduces packing material and cuts down on weight

MATERIALS HANDLING

doing regular duty over the coastal areas of South America and the West Indies, plus agreements with British and Russian companies for interchange, the future of materials handling in the air is looming larger.

With the increase in this method of shipment, there is certain to be a sizable expansion of the use of steel strapping and of wire tying of packages, to promote rigidity and to provide reinforcement. Torsional strains on shipments by air are not nearly so great as they are by railroad train, steamer, mule or llama back, nevertheless, there is need for protection, and for a variety that will also decrease packing and handling costs.

Wire Binders Reduce Weight

A package of machine parts was sent to Havana by air express from Chicago. Corrugated board covered the kraft-paper wrapped parts, and the latter were Parkerized before packing. An outer sheet of 30-inch, 60-pound kraft served as cover. Three wire binders completed the packing job. The board, paper and wires weighed slightly over 5 ounces, the strapping itself being between one-half and three-quarters of an ounce. Had this reinforcement been absent, additional wrappings of paper and board would

have been necessary, and the parcel would have had additional weight sufficient to bring it into the next

higher rate of air express transport. The wire binding is said to have cost less than one-third of a cent.

Truck Manufacturer Places Increased Emphasis on Engineering and Design

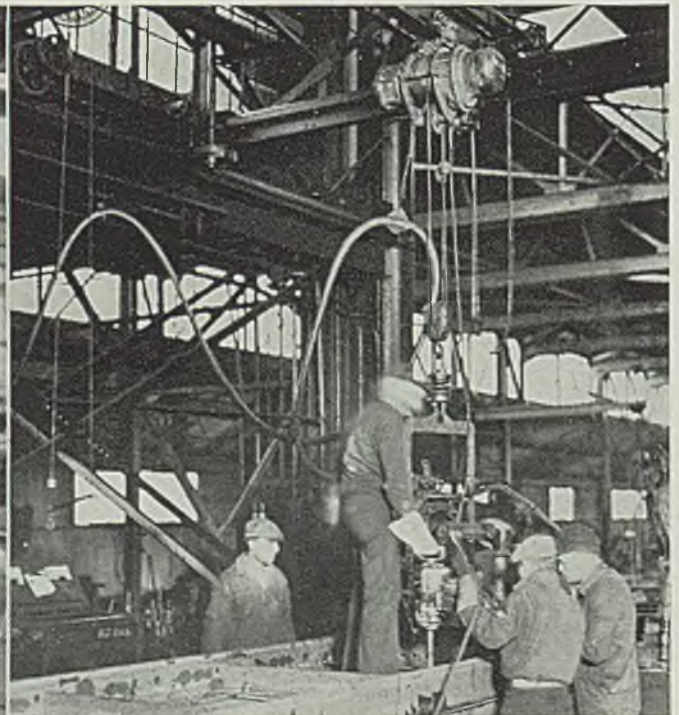
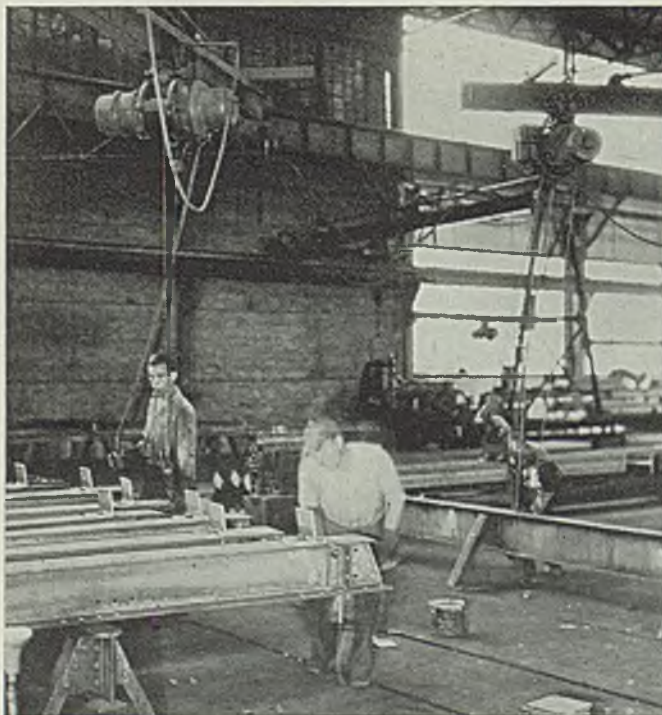
REGARD for safe limitation of the rate of travel of mobile materials handling equipment and the need for uncluttered aisles and runways have been factors in an increasing demand for heavier capacity industrial trucking equipment. C. B. Cook, sales promotion manager, Elwell-Parker Electric Co., Cleveland, emphasizes this distinguishing characteristic of some present-day practices in industry. He furthermore indicates that these and other changes in buying habits and in handling methods have increased

the importance of engineering and design work.

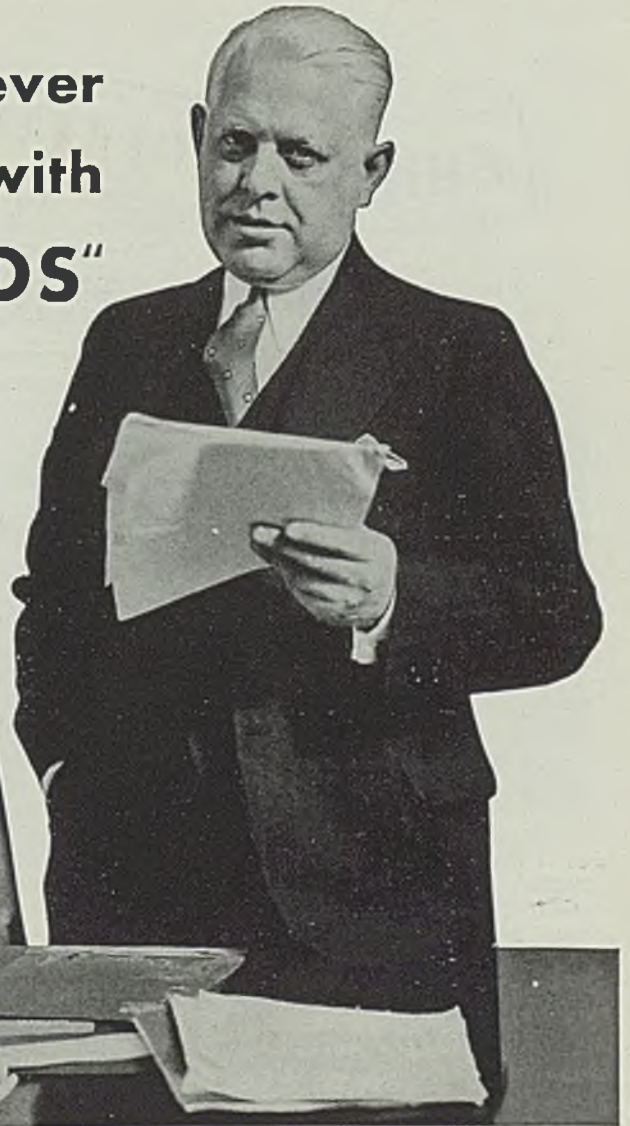
As a typical example of what has been taking place in his particular branch of the materials handling industry, Mr. Cook states that during the past year the Elwell-Parker company, in addition to expanding its manufacturing space and equipment, increased its engineering staff 50 per cent and revamped its administration and production systems.

Enlarging upon this theme, Mr. (Please turn to Page 69)

A DIFFICULT materials handling problem was solved efficiently by a large eastern steel plant by installation of several 1-ton electric hoists mounted on jib cranes, as shown at the left. Production was stepped up considerably by saving time previously lost in waiting for crane service. An interesting adaptation of materials handling equipment is used in a large midwestern steel plant (right) of a ¼-ton electric hoist for supporting and transporting the riveting machine in fabricating bridge girders. Photos courtesy Harnischfeger Corp.



"In 12 years, we have never had a battery failure with EXIDE-IRONCLADS"



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



"IN 1924 we purchased two electric industrial trucks equipped with four 12 MVM-19 Exide-Ironclad Batteries to be used in twenty-four hour service. These batteries were renewed in 1929 with new Exide-Ironclads of the same size after they had given an average life of sixty-one months. Last year, we again renewed three of these Exide-Ironclads that had given an average life of seventy months.

"During this long term of service, we did not have a single battery failure nor any repair expense on the batteries."

These are the comments made by a prominent user of electric industrial trucks. Such experiences are by no means unique, for the Exide-Ironclad Battery consistently delivers this type of long and faithful service, requiring at all times only a minimum of maintenance.

In material handling and cargo handling, where the service must be continuous, speedy and utterly dependable, you will find that Exide-Ironclads can improve your service and cut costs. Write for free booklet, "In Selecting Any Motive Power Battery Be Sure."



Truck illustrated made by Mercury Manufacturing Co.

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

SURFACE TREATMENT

AND FINISHING OF METALS

Porcelain Enamel Protects Cast Iron Pumps Against Corrosion, Sand Wear

THE problem of combatting electrolysis and sand cutting has confronted users of deep well pumps since the inception of this type of water raising mechanism. A manufacturing problem has existed in that it has been difficult to furnish pump runners with an absolutely smooth wear resisting surface, not merely on the exterior, but throughout the runners and bowls including the most inaccessible interstices.

Interesting progress has been made in the application of a porcelain enamel finish, identical to that used in the manufacture of plumbing materials, to impellers and bowls. The Johnston Pump Co., Los Angeles has perfected this process and now offers a full line of porcelain enamel protected

pumps. Before describing this interesting development it is well to consider certain operating characteristics which are controlling factors.

Some water wells produce a small amount of sand continuously, while others may produce sand only for the first few minutes after the pump is started. If sand is continuously pumped, it has a disastrous effect on the pump. Electrolysis is frequently produced by the natural salts found in many waters which shortens the life of the pump despite the many protective measures taken in an attempt to reduce this action to a minimum.

A most peculiar condition is encountered in the case of cast iron pumps which is not confined to any particular territory. The iron in

cast iron pump cases is removed by electrolysis leaving behind a hard chalky form of graphite. No satisfactory explanation is known for this galvanic action but it results in the cast iron parts being reduced to a chalky substance which may be chipped off in flakes or powder form which the aid of a pocket knife. In wells where such conditions existed the only remedy was to make the pump parts from non-ferrous metals.

When iron impellers are used, rapid oxidation is encountered due to the whirling action in the water. This causes them to pit and thereby lower the efficiency of the pump. For this reason bronze impellers are extensively used.

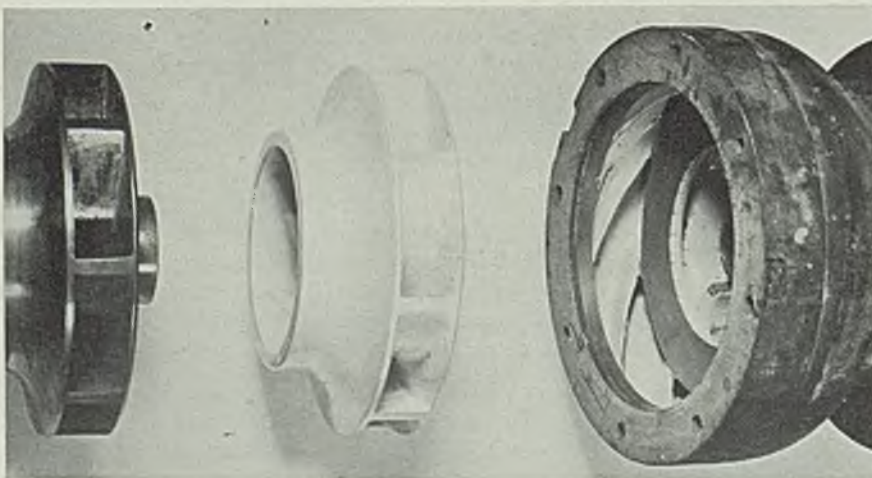
Fine metal patterns have been developed to produce castings which are as smooth as possible to reduce friction. However, it has been found almost impossible to reach inside the pump cases, including the impellers and bowls, and obtain a smooth surface. Filing has been tried to smooth imperfections but this has not resulted in a completely satisfactory job.

Smooth, Hard Coating Required

The solution appeared to lie in the application of a coating which would form a smooth, hard, more or less acid resisting surface on the impellers and inside of the pump bowls. If this could be accomplished, a great increase in efficiency and life of the pump reasonably could be expected. The engineering department of this company, accordingly, decided to experiment with porcelain enamel.

Many technical difficulties were encountered in the production of a coating of uniform thickness over all the recessed surfaces. However the process has been developed to the point where it is now possible to supply porcelain enameled pumps as standard equipment.

The efficiency of a given type and size of pump has been increased over 5 per cent by the use of porcelain enamel to replace the raw



Shown here (left to right) are deep well pump impeller, uncoated; porcelain enameled impeller and porcelain enameled pump bowl. Application of uniform coating of enamel over the many contours presented a difficult engineering problem

Henry Hudson

HAS LONGEST PLATE GIRDER ARCH AND LONGEST HINGELESS ARCH



Built for the Henry Hudson Parkway Authority. Madigan & Hyland, Consulting and Supervising Engineers. Robinson & Steinman, Consulting Engineers on Design. Aymar Embury II, Consulting Architect.



Opening at the crown, controlled by jacks, ready for the insertion of the 2 ft. 6 in. "keystone" piece which closed the arch.

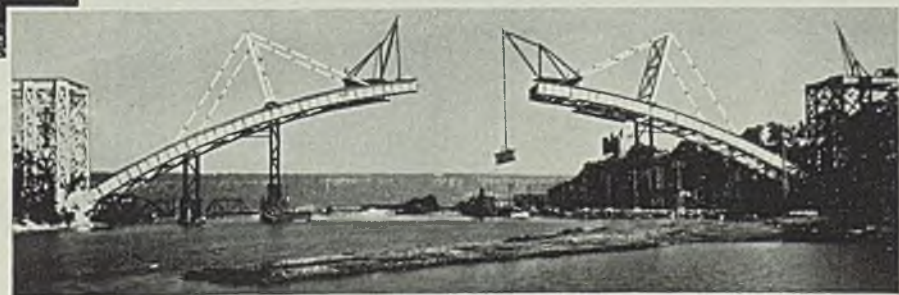
The Palisades of the Hudson in the distance set off this huge hingeless arch as it nears completion. Temporary toggles were utilized for the cantilever erection of the center 420 feet of the arch.

YOU can now drive up Riverside Drive on the west side of Manhattan and pass over this bridge, across the Harlem River at Spuyten Duyvil, to go northward on state highways into Westchester County.

Of particular interest in this 1530 ft. structure is the 800 ft. hingeless arch, the world's longest, spanning the New York Central tracks and the Harlem River, a testimonial to practically perfect fabrication and erection; requirements of major importance in arch structures of this

type. Each arch rib, of silicon steel, consists of box girders 12½ ft. deep spaced 50 ft. on centers. The roadway deck is supported on spandrel columns and carries a 42 ft. road and 4 ft. sidewalk. On each end is a viaduct approach 365 ft. long.

All structural steel on this bridge was fabricated by American Bridge Company from structural shapes rolled by Carnegie - Illinois Steel Corporation. The superstructure including the roadway was erected by American Bridge Company.



AMERICAN BRIDGE COMPANY

General Offices: Frick Building, Pittsburgh, Pa.

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

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



UNITED STATES STEEL

iron surface. Approximately half of this increase in efficiency was found to be due to the increase in hydraulic efficiency of the pump case evidenced by an increase of head for a given capacity. This was definitely established by first testing the ordinary cast iron pump case without the porcelain enamel and using bronze impellers. The cases were then porcelain enameled and again tested with the same bronze impellers. Following this, cast iron porcelain enameled impellers were installed in the same case and it was found that the horse power required for a given head and capacity was lower than that required by bronze impellers with smooth machined shrouds and hand-dressed blades.

It was next desired to see if the porcelain enamel would flux and adhere to the impeller and the inside of the pump cases when pumping water with a heavy sand content. To make this test, a three stage 12-inch pump was constructed with cast iron impellers and pump cases. Vitreous enamel was applied to the inside of the cases and over the entire exterior surface of the impellers. The discharge from the pressure end of the pump was connected to a 6-inch gate valve and from the gate valve around back to the suction end of the pump with 5½-inch casing. The pump end connections had a capacity of 41 gallons by careful measurement.

Laboratory Test Made

Into this system was introduced one quart of fine gravel which would pass through a ½-inch mesh screen but not through a 1/12-inch screen, and one quart of "Corona" sand, which is a sharp white silica sand and screens through a 1/32-inch screen. The total weight of the two quarts of sand was 5 pounds, 11 ounces. The sand content by volume was 1.22 per cent of the total and it was assumed that 1 per cent was passing at all times while the pump was running. From a previous test in the laboratory it was found that this pump would deliver 500 gallons per minute at 41 pounds pressure when turning at 1450 revolutions per minute. Under these conditions the impeller has a peripheral velocity of 52.5 feet per second and an absolute velocity of 43.4 feet per second. The quantity 500 gallons per minute was used as this produced sufficient velocity in the connecting piping to carry the sand and still have a reasonable pressure in the pump.

With the above set-up the pump was run for 124 minutes, thereby pumping 62,000 gallons of sand and water, of which 620 gallons was sand, having a total weight 7050 pounds. The pump was then taken

apart and inspected and it was found that the pump cases were in as good condition as when the test was started. The impellers were also in good condition with the exception of the top stage impeller which had the porcelain enamel worn off the blades for approximately one inch back from the tips. This was a uniform wear and no flaking or chipping of the enamel was in evidence at any place either on the impellers or in the pump case.

Enamel Not Harmed by Sand

The pump was then reassembled without repairs of any kind and subjected to a sand test in the same manner in which 6 quarts of the "Corona" sand only was used. This gave a sand content of 2.7 per cent and in this test it was assumed that 2.2 per cent was flowing at all times. The pump was run for 243 minutes, pumping at the rate of 500 gallons per minute as before. During this time the pump handled 2670 gallons of sand having a total weight of 30,350 pounds. The pump was taken apart again and inspected. It was found that the porcelain enamel had not been affected by this last test but the iron at the impeller tips, exposed by the last test, had begun to pit in the same manner as ordinary iron impellers under the same conditions.

A peak efficiency of 79.7 per cent was obtained when porcelain enam-

eled impellers and pump cases were used as compared to a peak efficiency of 74.5 per cent when smooth, hand-dressed bronze impellers were used in conjunction with plain cast iron pump cases without the porcelain enamel coating.

Porcelain enameled deep well pumps have been used in the field for a sufficient length of time to confirm laboratory results and prove them to be of practical commercial value.

Practical Electroplating Course Offered at Columbia

Two courses designed to give the practical electroplater an advanced study of ways and means to obtain better deposits by applying the latest scientific methods of electrochemistry to electroplating will be offered during the spring session by Columbia university, New York.

These courses, which will be offered at night, are open to all at a reasonable fee and will be conducted by C. B. F. Young, Ph. D., prominent authority on electroplating. Full information concerning these courses may be obtained from the Director of University Extension, 561 West 116th St., New York.

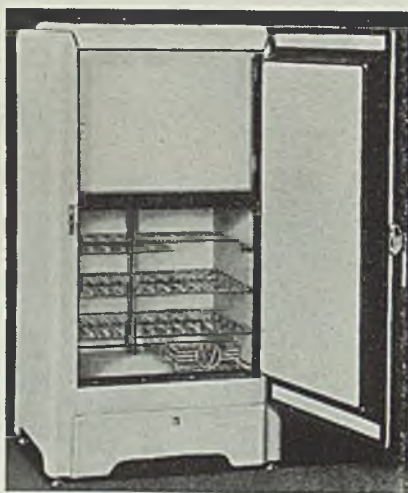
Trade Bulletin Explains Use Of Bright Zinc Solutions

Grasselli chemicals department of E. I. du Pont de Nemours & Co., Wilmington, Del., has just issued a trade bulletin explaining the use of "Zin-O-Lyte," their process for bright zinc plating direct from the bath without bright dipping. The process operates with equal success in still plating or in barrel plating and is applicable to almost all types of iron and steel products except some types of castings.

Zinc deposits produced by this process possess those qualities required for the greatest rust protection. The deposits are ductile and firmly adherent. Molybdenum, in small amounts, co-deposited with zinc, produces a brilliant finish without bright dipping, a polished surface direct from the bath.

The company has developed a process for the control of the corrosion of the zinc anode whereby the anode current efficiency is approximately the same as the cathode current efficiency, making it possible to hold the zinc content within normal limits. This, it is claimed, overcomes the difficulty formerly experienced with the gradually increasing zinc content of the electrolyte because of excessive anode corrosion.

Modern "Ice Box"



A FAR cry from the old ice box is this modern ice refrigerator manufactured by Ice Cooling Appliance Corp., Morrison, Ill. Improved design, welded steel construction and 3-inch insulation throughout are featured in this model. The shell is bonderized and finished with three coats of high bake synthetic resin enamel.



Leadership
in TESTING
methods and equipment

Practically every steel company that established a testing laboratory during the past five years purchased Southwark-Emery Hydraulic Testing Machines . . . purchased also, in most cases, Southwark Stress-Strain Recorders. It would be difficult to find a modern laboratory in which Southwark Testing Equipment is not used.

TESTING MACHINES • STRESS STRAIN RECORDERS and CONTROLLERS • EXTENSOMETERS, STRAIN GAGES • VIBROGRAPHS • TORSIOGRAPHS

BALDWIN - SOUTHWARK CORPORATION

SOUTHWARK DIVISION PHILADELPHIA

WELDING, etc.

by Robert E. Kinhead

About Welding Rod

FROM the user's point of view, the electric arc welding rod situation is satisfactory. At a price averaging around 8 cents per pound, welding rod is not a major element in the cost of welded construction. A common figure for the amount of welding rod per ton of welded steel is about 30 pounds. At 8 cents, this means \$2.40 for welding rod on a ton of steel. Labor to cut, form, fit-up etc. may amount

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.

to \$60 per ton. The steel itself will cost about \$42 per ton so that of the total cost per ton, welding rod represents only about 2½ per cent. Standardization of the quality of

welding rods by the navy department and as a result of the specifications for welds made under A. S. M. E. code and Hartford Steam Boiler Inspection & Insurance Co. requirements has been beneficial to the industrial user of the rods. To meet these requirements, the rod must be of high quality and uniformity.

As in all industries where standardization of the product is carried out to its logical conclusion, the manufacturers of electric arc welding rods have severe problems. Effective standardization has meant that in many cases the manufacturer has completely lost control of his business. The user will buy the standard rods where he can buy them for the least money. There is always someone who will find reasons which appear good and sufficient to him to cut the price; and when he cuts, he pulls the whole standardized industry down with him.

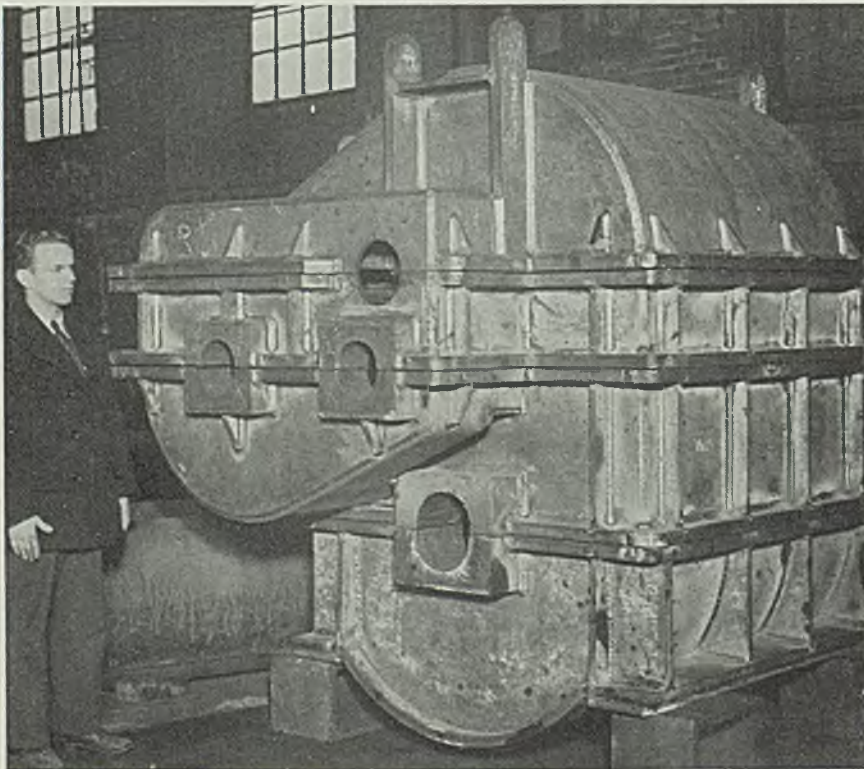
The break in the vicious circle which results in a spiral of descending prices usually comes from invention and development of a product which has sufficient merit to eliminate the possibility of price comparison with the standardized product. This is not the easy way, but it is the most certain way by which a manufacturer can regain control of his business.

♦ ♦ ♦

Gas Cylinders Made Safe

An Ohio company has provided an ingenious safety device to prevent racked oxygen and acetylene gas cylinders in the storeroom from being knocked over. The device is a U-shaped shackle hinged to the wall at each cylinder station and this is dropped over the valve caps. This idea is recommended for general use, especially when cylinders are stored along the sides of gangways where hand trucks passing are likely at times to collide with them.

Heavy Housing Welded from Steel



WELDED steel construction was used in this drive housing for a rotary slitter fabricated in the welding shop of the Bethlehem Steel Co., Bethlehem, Pa. The job called for plates ranging in thickness from ¾-inch to 1½ inches. Both plates and forgings were used for the bearing housings, and the total weight of the four sections previous to machining as shown is 13,205 pounds

When Can You DELIVER?

WEEKS BECOME DAYS *with* WELDED CONSTRUCTION

● Take for example the locomotive frame shown at the left. Formerly, more than a month was required to make the casting alone. By "Shield-Arc" Welding, it was fabricated from rolled steel complete in 90 man-hours. Moreover, because of the superiority of steel, weight was cut from 6400 lbs. to 4160. And costs were reduced 20%!

Adoption of "Shield-Arc" welded construction is easy and inexpensive, for you can change over one part at a time. The Lincoln man near you is especially qualified to show you which part is the logical starting point. Call him in. There is no obligation. Address THE LINCOLN ELECTRIC CO., Dept. Y-340, Cleveland, Ohio. *Largest Manufacturers of Arc Welding Equipment in the World.*



It used to
take more
than a
MONTH

Now—
by welding
—it takes
90 MAN-HOURS

LINCOLN SHIELD-ARC WELDING

BUILDS LIGHTER AND STRONGER PRODUCTS • FASTER • AT LESS COST



Use of Graphic Meters Discloses Causes of Power Wastes and Losses

POWER wastes or losses are hidden in the power bill and seldom show up except after careful analysis or investigation. However, when the power load at each prime mover is pictured, as is possible with a graphic meter, and the steps or cycles of operation analyzed, many previously unnoticed wastes are disclosed.

For example, in one plant the motor ran continuously even though the equipment was used infrequently and only for short periods, as disclosed by the graphic record. The reason: The starting equipment was placed inconveniently and was of an old type which the operators considered a nuisance to start and stop. The cost of improved type of starting equipment and necessary changes had been paid for several times over.

Grouping Is Important

Analysis of large group drives often shows power losses resulting from grouping equipment unrelated in operating cycles. For example, in one process plant all equipment was driven from several lineshafts by a single motor. A graphic record showed that the process work picked up slowly as the work progressed from one operation to the next, so that the full load was not reached until about 10 o'clock. From 11 till 2 the motor was overloaded except at the noon hour where only part of the equipment was kept in operation. From 2 o'clock the load tapered off as some of the machines first started were shut down. During all of this time and at the noon hour all of the lineshaft was in operation even though some equipment was idle, except for a peak period of about 2 hours.

The obvious correction of this condition was to divide the installation up into smaller groups, each with

its motor, so that each group need be operated only during the portion of the day its equipment was in actual use. In this particular installation some of the equipment was idle over 40 per cent of the day but the lineshaft had been in operation all of this time, including the noon hour.

The losses were not due to use of group drives but to incorrect planning and grouping. Although such wastes of power should be obvious, the amount of the losses can be detected only by meter readings taken over a period of time, as is possible with graphic meters.

Sometimes a record of operation for a few hours is sufficient. Usually the records should cover a full day's operation, but in some cases, where production requirements fluctuate widely from day to day, a longer record is necessary.

At the time the graph is drawn by the meter an observer notes the cause of any variations, such as machines going on or off, peak points in load, or other changes in operating conditions. Without complete notations of operation variations the engineer will have more difficulty in translating the story told by the graph.

Tight Bearings Load Motor

WHEN machinery is rebuilt or overhauled the motor may be seriously overloaded during the wearing-in period. This happened in one plant where the motor on a pump drive would not come up to speed. The electrician disassembled the motor and, as he could not locate the cause of the trouble, called for a service man.

After carefully checking and testing out the windings he found only a few connections beginning to

loosen, but not enough to cause the trouble. These were resoldered, the motor assembled and run idle to test. Everything appeared satisfactory but when connected to the pump through the clutch the motor still refused to pick up speed.

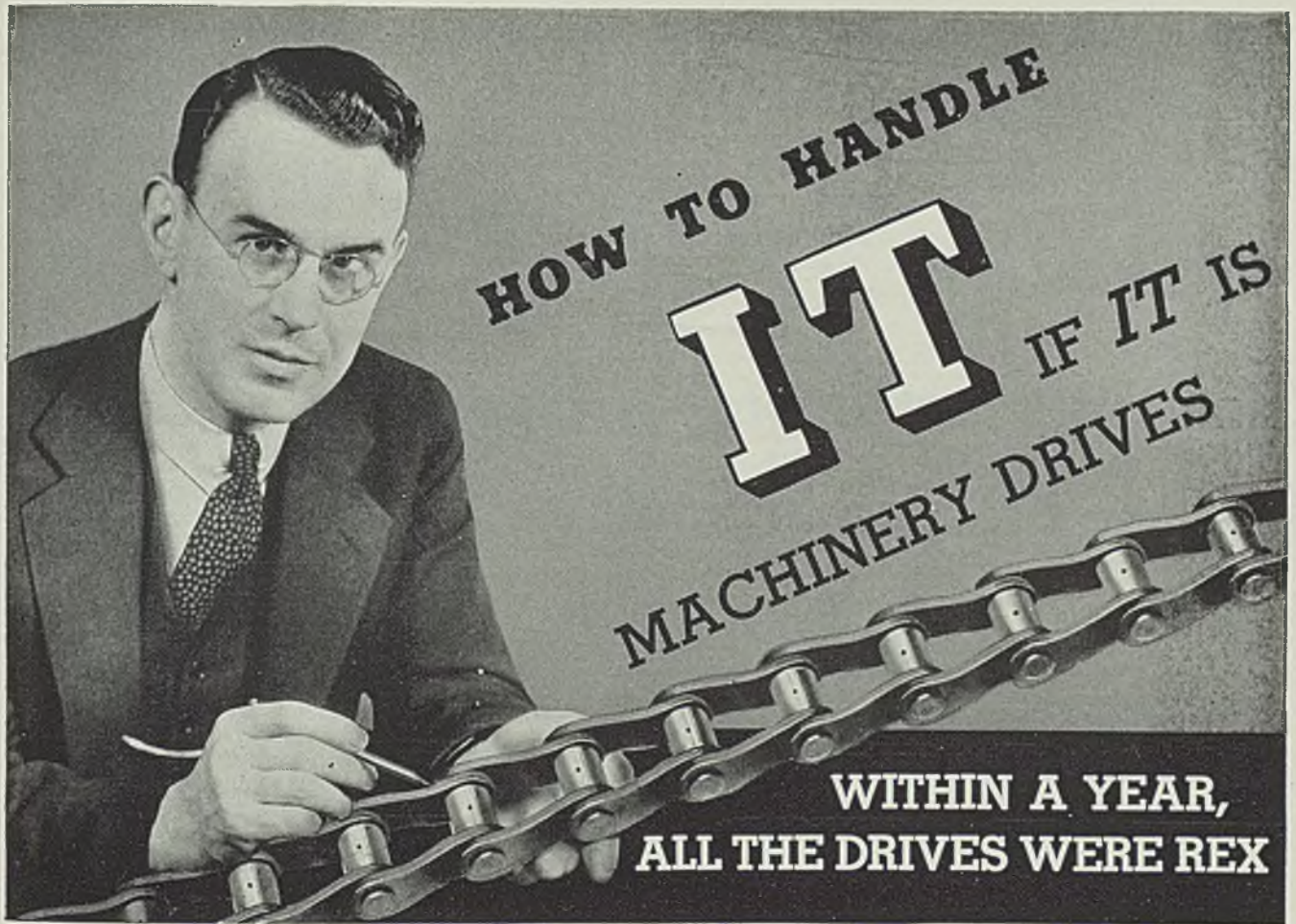
The service man then investigated the pump. Upon learning that it had been overhauled recently he asked that the bearing caps be loosened slightly before trying the motor again. When this was done, the motor operated satisfactorily.

With noisy open gears the use of a non-metallic gear prevents metal-to-metal contact. If properly applied such a gear has a life equal, and sometimes greater, than the metal unit to which it meshes. With the necessity of making contented employees elimination of avoidable noises is important, as sharp noises irritate.

How recently have speeds and feeds been checked over on production work? Some years ago a plant operated at the old speeds and feeds for over 5 years after installing high-speed drills. With the constant improvement in machine tools check up on speed and drive changes to obtain full advantages in production.

Adequate illumination on the work is a necessary and profitable part of power service. This may require the addition of only a few drop lights and extensions; generally, however, ample general illumination is more necessary and profitable. Regular cleaning of reflectors is also essential to obtain full value of any lighting system.

Mount auxiliary electrical equipment so that it can be easily and quickly removed and replaced in case of serious trouble, thereby reducing the necessary time out. Usually, if the trouble is not obvious, it is better to replace than to attempt to fix in position.



● A manufacturer took over a new line of portable machinery that was chain driven, but not by Rex Chain Drives.

Within a year, every machine had been redesigned for Rex Chain Drives. A new machine for the heaviest duty ever known in the field was added to the line. Its five heavy-duty drives are all Rex.

Rex Chabelco Steel Roller Chain is the leading chain in portable machinery drives today, because of Rex Chain Engineers. By study and experience, they have developed the skill needed in the application in design that means freedom from trouble in the field.

The services of Rex Chain Engineers are always available in working out with executives, designers and engineers any type of machinery drives. Send for these folders on Rex Drive Chains.

CHAIN BELT COMPANY
1660 W. Bruce St., Milwaukee, Wis.





CHAIN BELT COMPANY
of MILWAUKEE

Drive and Conveyor Chains

PROGRESS IN STEELMAKING

Sintering Plant Improves Blast Furnace Practice in South

BY M. F. MORGAN,
Republic Steel Corp.,
Cleveland

COMPLETION of the first iron ore sintering plant in the South was one of the significant developments in the iron and steel industry during 1936. The new unit, placed in operation June 1 at Republic Steel Corp.'s blast furnace at Thomas, near Birmingham, Ala., is of the latest Dwight and Lloyd type. Although operating conditions to date have not made it possible to check definitely the results obtained with this new machine, it can be stated that it has brought about a gratifying reduction in the fuel ratio and an accompanying increase in tonnage of iron produced by the two Thomas stacks.

The Thomas furnaces consume red limonite ore shipped from the

company's Raimund mine located about 15 miles from Thomas. It is reduced to usable sizes by a gyratory crusher at the mine. Prior to the installation of the new sintering machine the blast furnace charge contained all ore that would pass through a 1-inch screen. Since the installation of the sintering machine the material charged is restricted to that which will pass through the 1-inch screen and which will not pass through a ¼-inch screen. The fines, equivalent to approximately 30 to 40 per cent of the total amount of crushed ore, are mixed with blast furnace flue dust and sintered.

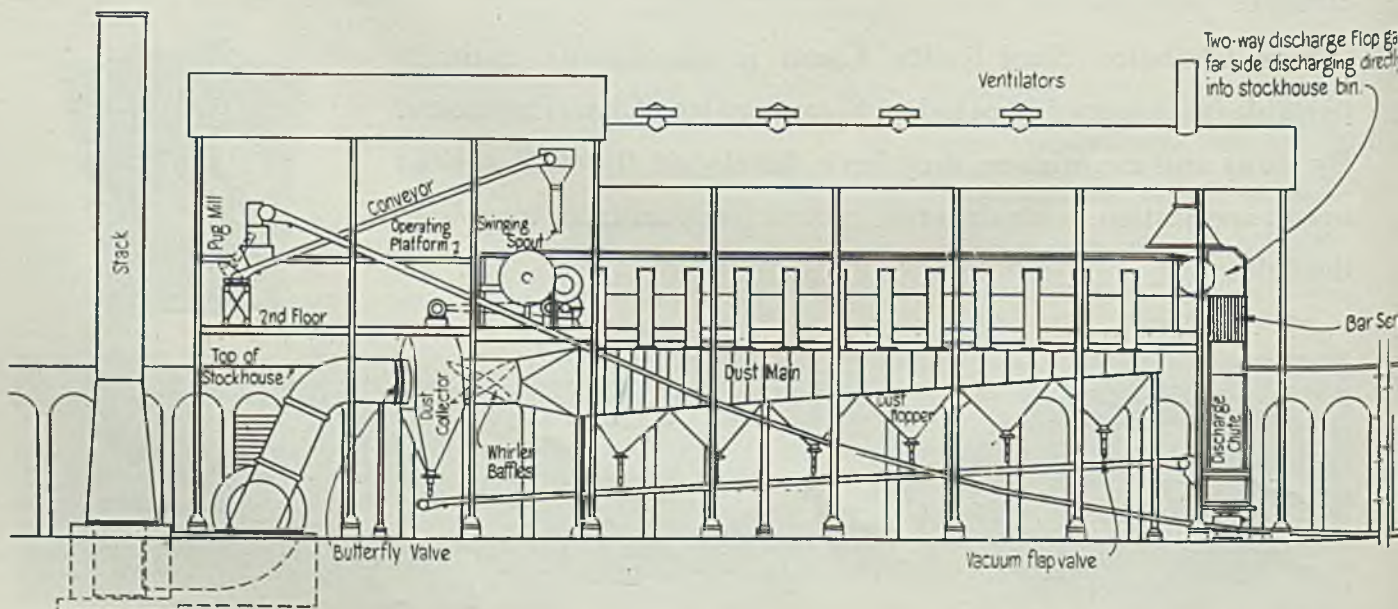
These fines are mixed with blast furnace flue dust in a ratio of about

50 per cent each of ore and flue dust by volume or 75 per cent ore and 25 per cent flue dust by weight. The mixture depends on the carbon content of the flue dust; this averages around 16 per cent but ranges all the way from 30 down to 12 per cent. The flue dust, incidentally, is obtained from a stockpile of approximately 600,000 tons accumulated during the 30-year operation of the Thomas furnaces.

Analyses involved in this sintering operation are of interest. The Raimund ore averages as follows: 32.30 per cent iron, 12.66 silica, 0.224 phosphorus, 0.18 manganese, 3.63 alumina, 18.40 lime, 0.83 magnesia. The flue dust averages 31.30 iron, 14.69 silica, 0.224 phosphorus, 0.65 manganese, 3.74 alumina, 10.30 lime, 1.30 magnesia and the average loss in ignition is 22.82 per cent. This mixture of flue dust and ore produces a sinter which averages 44 per cent iron, 15.89 silica, 0.218 phosphorus, 0.47 manganese, 0.373 alumina, 15.20 lime and 1.52 magnesia.

30 Per Cent Sinter Charged

In the present practice the blast furnace charge averages 70 per cent crushed ore containing 32.30 per cent iron and 30 per cent sinter containing 44 per cent iron. The



result is an increase in the iron content of the furnace burden from 32.30 to nearly 36 per cent.

Saving in coke consumption per ton of iron produced results not only from the increase of iron content in the burden but also from the fact that no fines are present.

Located on the stockhouse bins, the new machine has a sintering surface 72 inches wide and 76½ feet long. It is provided with 98 buggies or pallets, each 72 inches wide, 2 feet long and 10 inches deep. These are mounted on an endless chain driven by a variable speed motor, usually at 100 to 110 inches per minute. The fan for this machine is of the induced draft type, is 8 feet 10 inches in diameter and has capacity for delivering 100,000 cubic feet of air per minute at a temperature of 300 degrees Fahr. It is actuated by a 600-horsepower synchronous motor operating at speed of 720 revolutions per minute.

Storage Bins Are Provided

Raw material comes to the sintering plant in standard gage railroad cars and is stored in four raw material bins at the end of the stockhouse bins. These bins are fed by revolving disk feeders and the material is proportioned by gates in these feeders so as to get the desired mixture for sintering. This material is gathered and delivered by conveyor belts to a double shaft pug mill where the desired moisture content is obtained. It then is distributed over the sintering surface of the machine by a swinging spout. The material is ignited by an ignition furnace using coke oven gas as fuel. The sinter usually is discharged directly into the stockhouse bin although it can be discharged

into standard gage railroad cars through a flop gate.

While the plant is designed for continuous operation, it now is working 16 hours a day. Its output in sinter averages between 40 and 50 tons per hour depending on the material being sintered. It was designed and constructed following extensive tests at Ducktown, Tenn., with the ore fines and flue dust on which it subsequently was applied. Special attention was directed at a design free from all features not essential to the requirements at the Thomas furnace. The resulting machine is said to have low operating and maintenance cost. After exhaustion of the present accumulation of flue dust the company plans to use coke breeze in the sintering operation.

The new plant was conceived and carried out under the direction of C. L. Branford, assistant district manager, Republic Steel Corp., Birmingham, and was built under the supervision of J. M. Hassler, the company's chief engineer in the Birmingham district. It was designed under the supervision of E. W. Shallock, American Ore Reclamation Co., Chicago.

Nozzle Is Cleaned Easily

An efficient and simple constructed spray nozzle for descaling strip, plates and bars has been developed. The nozzle consists of a stainless steel body, a tapered self-locking spray disk made of heat treated stainless steel and a strainer of corrosion resisting material. The disk and strainer, held in place by a cap nut of stainless steel, may be removed for cleaning without disturbing the nozzle body on the spray manifold. A shutoff cap is used to effect a saving in the water consumption when narrow strip is being rolled. The one-piece disk contains an elliptical orifice designed to give uniform linear spray distribution and maximum impinging force. The nozzle is designed to discharge up to 35 gallons of water a minute at pressures up to 1000 pounds per square inch.

Lead Head Seals Nail Hole

Fastening galvanized siding and roofing sheets effectively is afforded by the use of a lead headed nail. The lead serves to seal the hole made by the entrance of the nail and to protect its head against corrosion. The nonferrous metal is applied to the head of the nail during the manufacturing process. As the lead cools

contraction causes it to tighten solidly around the head. To prevent splitting the shape of the lead head presents a small boss at the top to take the direct blows of a hammer. The lead fillet around the shank forms a seal for the hole made by the nail when driven in position.

New Type Steel Designed

Steel has been designed especially for application where an economic combination of high-temperature strength and oxidation resistance is required. In the temperature range of 1000 to 1200 degrees Fahr. the new grade of steel has about twice the strength of carbon steel. Indicated uses of the new grade lie in the field of cracking tubes, pipe still heater tubes and tubing in the manufacture of air heating equipment.

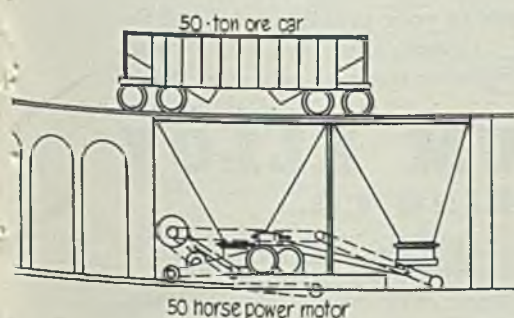
Low Pressure Being Used

According to a survey made at various iron and steel plants in the Pittsburgh district covering the use of the oxygen lance, the work has become more or less standardized in each plant. However, the lance technique and practice vary somewhat in different plants. The trend in present operating methods is toward the use of lower oxygen pressures. The survey of open-hearth work indicates that 125 pounds per square inch pressure is the average. One plant employs 115 pounds per square inch; another uses 180 pounds per square inch. The technique followed at blast furnaces includes pressures ranging from 30 to 50 pounds per square inch. At many of the blast furnaces pressures of 100 to 115 pounds per square inch are found to give satisfactory results.

Prevents Rusting of Metal

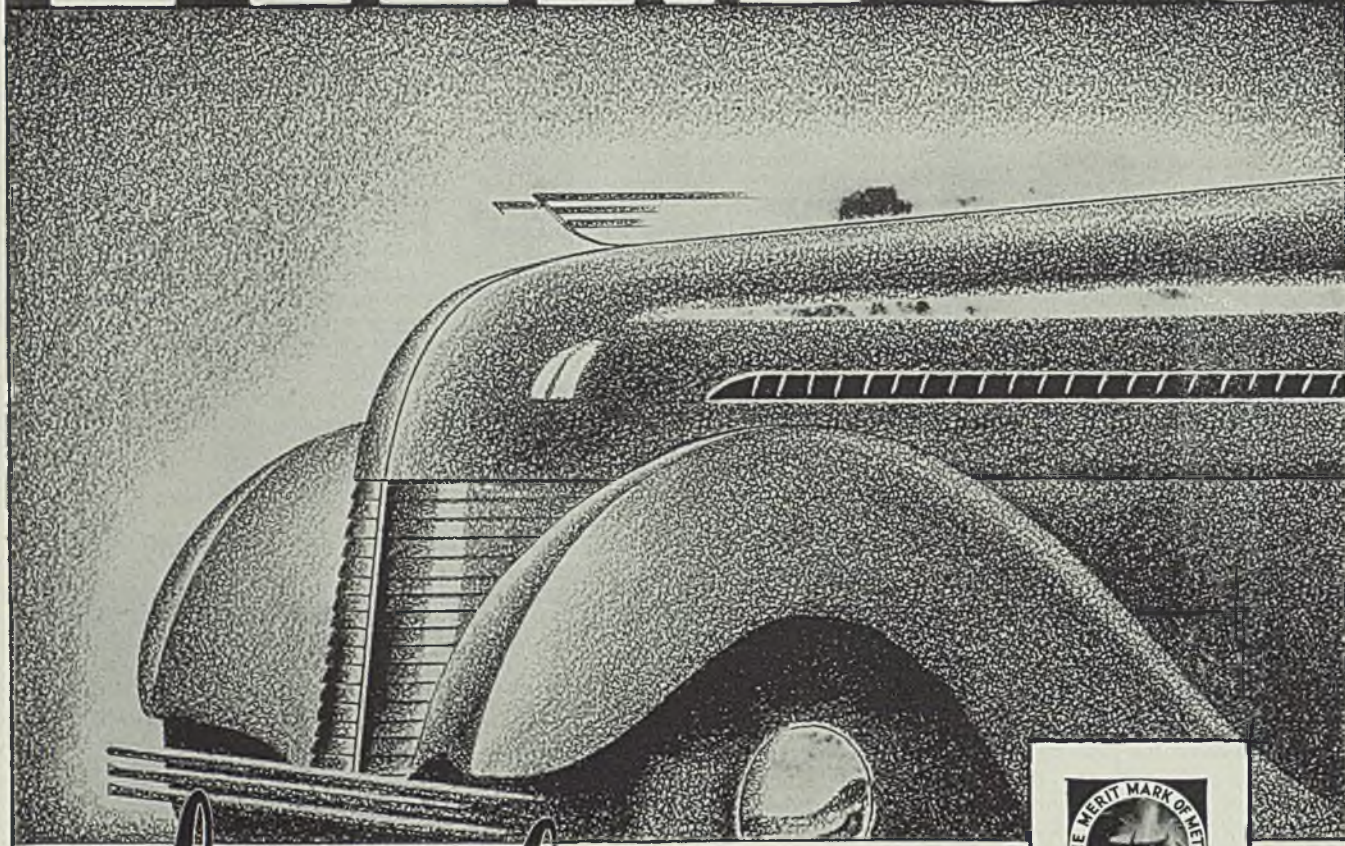
Chlorinated rubber is the base of a newly marketed priming paint which can be applied directly over a rusted surface without cleaning the rust down to the metal. The semi-transparent liquid converts the rust by chemical action into a pigment and treats the metal surface to stop further rusting. It can be applied by brushing or spraying and results in a black weatherproof coating of chlorinated rubber which withstands chemical action. Two hours is required for drying a spray coat. Approximately 500 square feet are covered per gallon. The coating is used in temperatures up to 300 degrees Fahr. in the air and 140 degrees when submerged in liquids.

This drawing illustrates the general arrangement and flow of material at Republic Steel Corp.'s new sintering machine at Thomas, Ala., the first unit of this kind installed in the South



TAMCO

Better performance thru better metals



ductility

TO MEET THE RIGID DEMAND OF AUTO BODY BUILDERS

Each succeeding year finds motor-dom evolving finer, more beautiful cars—cars combining the economies of large scale production with the grace of individualistic style. Each year, too, finds auto builders making more and greater demands of their materials of construction.

Take body stock as an example. To meet the requirements of today's streamlined designs and the cold-forming presses used in production, the body stock must be extremely ductile, capable of being shaped under pressure of the dies to complicated forms without cracking or weakening, and with a mirror-smooth surface.

TAMCO has aided in this problem by perfecting a special fluxing deoxidizer for rimming steel. It is known

as TAM Medium-Carbon Ferro Carbon Titanium No. 35, contains 3% to 5% carbon, and makes practical the production of a very soft steel—resembling ingot iron in quality—excellent for deep-drawing into auto body stock.

Other TAM Metallurgical Alloys contribute in many diverse ways toward the creating of better automobiles, as well as better products through the ferrous and

non-ferrous metal industry. TAM Alloys include TAM *Original* High Carbon FCT No. 78, TAM Medium Carbon FCT No. 35, TAM Low Carbon Ferro-Titanium (both 25% Ti and 40% Ti), TAM Foundry Ferro-Titanium, TAM Webbite (Alumino Titanium, and many others.

In the application of TAM materials to your problems, a TAM Engineer and TAM Research are ever ready to help you. Write.



THE TITANIUM ALLOY MANUFACTURING CO.

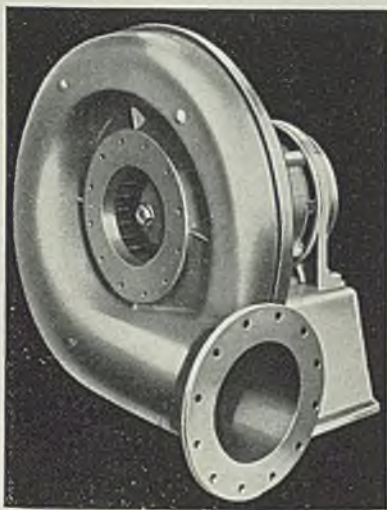
GENERAL OFFICES AND WORKS NIAGARA FALLS, N. Y., U. S. A.
EXECUTIVE OFFICES 111 BROADWAY, NEW YORK CITY

Resident TAM Development Engineers: NIAGARA FALLS, NEW YORK CITY, NEWARK, CLEVELAND, CHICAGO, ST. LOUIS, BETHLEHEM . . . Sales Representation and Warehouse Stocks: SOUTH CENTRAL AND PACIFIC COAST STATES (U. S.), CANADA, EUROPE

NEW EQUIPMENT

Motorblower—

Ingersoll-Rand Co., 11 Broadway, New York, has recently placed on the market a new motorblower, designed especially to meet the needs



Ingersoll-Rand motorblower which provides a constant pressure with greatly varying volumes of air

of the numerous services requiring air at 1 pound pressure, and in volumes from 325 to 3200 cubic feet per minute. Impeller is of one piece cast aluminum alloy and is carefully balanced both statically and dynamically. Motorblowers consume power in proportion to the volume of air handled. Motors are supplied in ample sizes to carry rated load without infringing upon the motor manufacturer's 15 per cent continuous overload capacity. No special foundation is required since the pedestal base construction permits installation of the blower directly on the floor level.

♦ ♦ ♦

Milling Machine—

Brown & Sharpe Mfg. Co., Providence, R. I., has recently announced a new vertical-spindle milling machine featuring a swiveling spindle head, spindle speeds up to 1800 revo-

lutions per minute and uniformly deep throat distance throughout the entire vertical travel. This machine is designed to handle the ordinary run of work in the average shop or tool room. Spindle head on this machine can be set at any angle to 90 degrees each side of vertical and a lever operated plunger provides for exact vertical alignment of the spindle head. Spindle is provided with an axial hand movement of 3 inches in all positions. Aluminum alloy hand wheel is easily transferred to its position at either side of the spindle head, and an adjustable dial at the top of the head permits adjustment of the spindle position to 0.001-inch. Spindle can be clamped anywhere in an axial movement by the lever at the lower front of the head. The two hardened steel stops at the front of the spindle head are attached to the spindle slide and to the head respectively, and are accurately ground on the basic surfaces. These stops enable the use of measuring blocks for high-precision set-ups for depth of cut and the like, and in addition they permit the use of step-milling, using a set of prepared measuring blocks with the knee clamp in one position. The 16

spindle speeds available range from 55 to 1800 revolutions per minute. Also available are 16 changes of longitudinal, transverse and vertical power feeds which are dependent of the spindle speeds and range from $\frac{1}{2}$ to $18\frac{1}{4}$ inches per minute.

♦ ♦ ♦

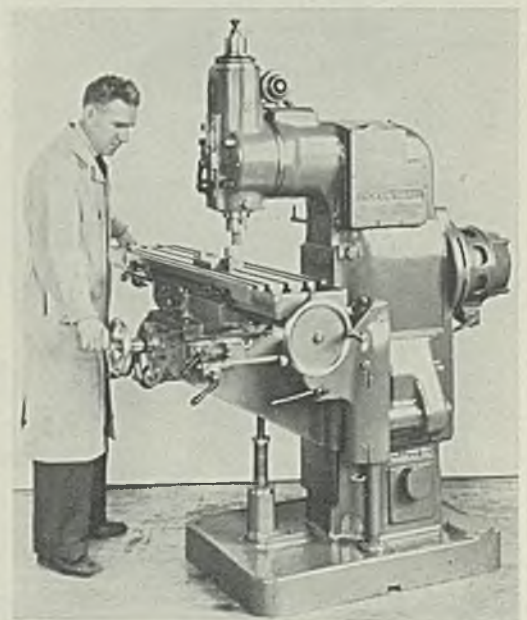
Grinders—

Chicago Pneumatic Tool Co., 6 East Forty-fourth street, New York, has recently placed on the market a new grinder designed as a produc-



Freedom from dust and heat troubles is a feature of this production grinder built by the Chicago Pneumatic Tool Co.

tion unit for general purpose grinding, wire brushing, buffing and polishing of all types of metal surfaces. Freedom from dust troubles



Brown & Sharpe vertical-spindle milling machine featuring a swiveling spindle head which may be set at 90 degrees either side of vertical

and overheating is claimed as a result of the totally enclosed fan-cooled motor used in the grinder. Motor is completely encased in a copper shield which excludes dust and conducts motor heat to the air. Switch is separately and totally enclosed. Two-row ball bearings at work end of spindle have ample capacity for all radial and thrust loads. Grinder is built to take a wheel size 6 x 1 inches. A smaller model built to take a 5 x ¾-inch wheel is also available. Both grinders can be had in 110 or 220-volt models.

♦ ♦ ♦

Milling Machine—

Cochran-Bly Co., Rochester, N. Y., has recently placed on the market a new vertical universal milling and shaping machine. This unit has been provided with a high speed spindle mounted in anti-friction bearings and having 10 right-hand speeds with a high of about 2100 revolutions per minute. The spindle is equipped with a sleeve to hold split collets from ¼ to ⅝ inches, thus eliminating the need for a high speed attachment. The spindle can be furnished either with or without power down feed with four changes applicable to any spindle speed. Feed has an automatic stop and a micrometer screw for gaging depths. The milling and shaping heads adjust at any angle right to left, or left to right from vertical to horizontal and 45 degrees front and back from center for drilling, mill-

ing, boring, shaping and slotting operations with constant power feed for milling and intermittent feed for shaping, and applying to longitudinal, transverse and circular table movement. The table can be arranged to receive a 10-inch universal dividing head.

♦ ♦ ♦

Welding Electrodes—

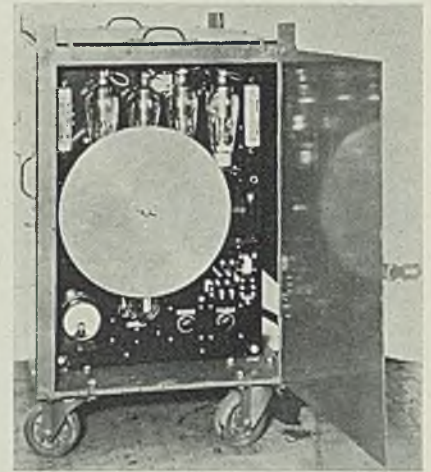
Wilson Welder & Metals Co., 60 East Forty-second street, New York, has announced a new electrode to be known as the Wilson No. 520. This new product has been designed for use with the small transformer type alternating current arc welders. According to company claims, the new electrode works equally well with alternating or direct current machines, and slag interference is reduced to a minimum, with removal simplified. The product was tested for some time by company engineers before being released.

♦ ♦ ♦

Seam Welder—

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has recently announced a new Ignitron seam welder control using Ignitron tubes. This control times power impulses in terms of a definite number of power cycles to a wheel-type electrode resistance welding machine. Among its features is an inductive timer, consisting of a synchronous driven disk rotating once per second and containing 120 holes, each

corresponding to a half cycle of welding current. Use of these new tubes permits a design utilizing no voltages higher than line voltages and eliminating the need of power contactors and transformers. Steel pins are plugged into the holes according to the timing desired. The



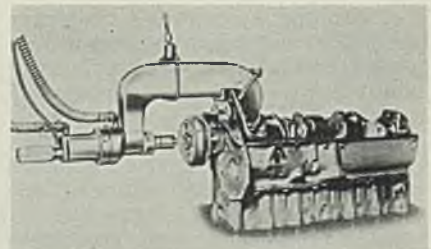
Ignitron seam welder using new tubes as a timing unit to weld seams with a wheel-type electrode

new control is especially suitable for welding heavy gage steel, demanding heavy welding current, and special metal alloys demanding accurate timing and often heavy current such as aluminum and olympic bronze.

♦ ♦ ♦

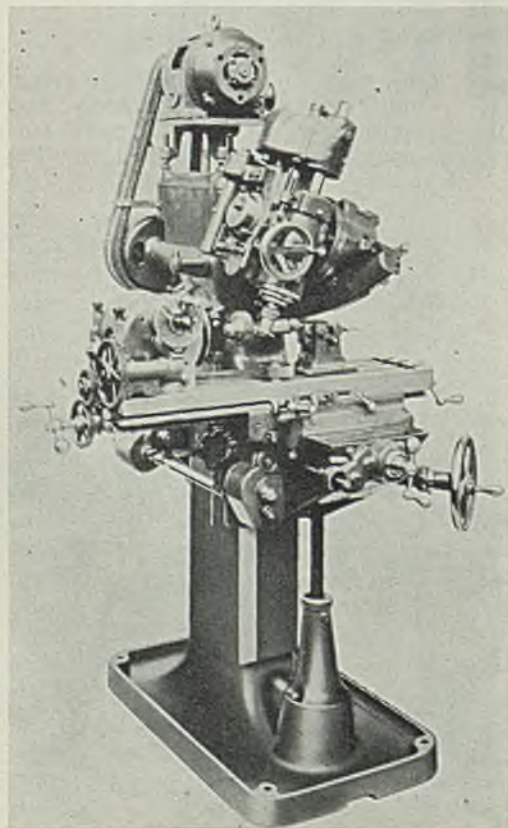
Portable Hydraulic Press—

Hannifin Mfg. Co., 621 South Kolmar avenue, Chicago, has developed a new high speed portable hydraulic press for application of timing gears



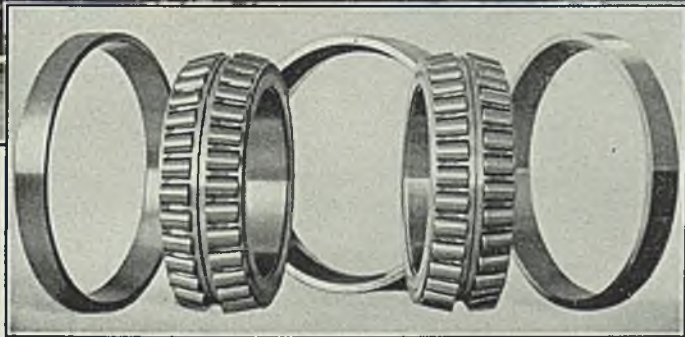
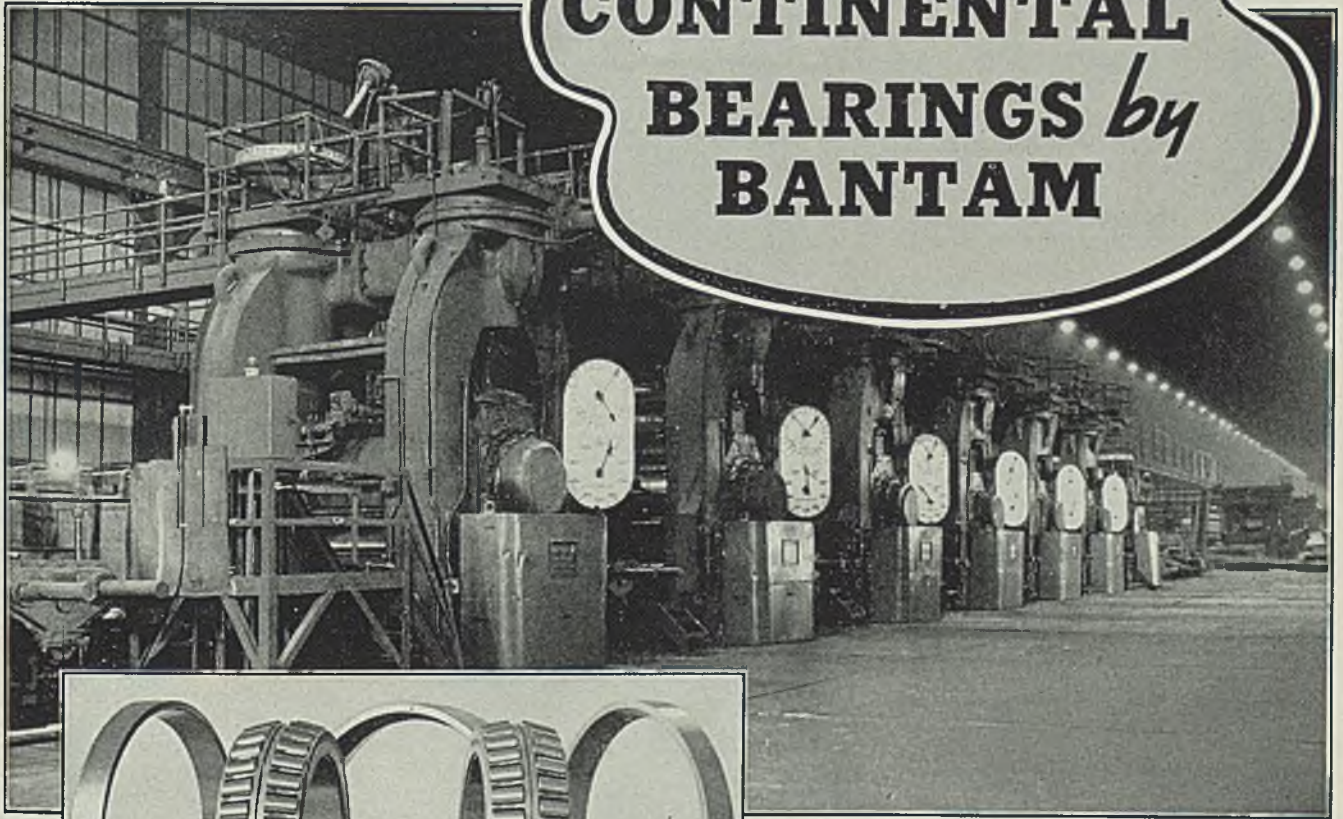
High speed portable hydraulic press developed by Hannifin Mfg. Co. for work on timing gears

in harmonic balancer unit pressed into position on automobile engine crankshafts. The press is fitted with a locating fixture which simplifies handling and alignment of the press with the work and assures starting the parts squarely on the shaft when being pressed into position. The yoke-type press weighs approximately 80 pounds and is con-



Cochran-Bly vertical universal milling and shaping machine recently placed on the market

MILL *by* CONTINENTAL BEARINGS *by* BANTAM



The BANTAM TAPERED
ROLLER BEARING shown is
46½" O.D. x 29½" I.D. x 30" Long.

● When Continental Roll and Steel Foundry Company built this Hot Mill, completed late in 1935 in the Chicago District, they chose each element with the idea of giving customer satisfaction. What more natural thing could they do than choose for the heaviest job in the mill, Bantam Bearings?

Bantam Tapered Roller Bearings were supplied as original equipment for all Backing and Working Rolls on six-4 Hi Finishing Stands 26" and 53" x 80".

Enviably production records, resulting in lower bearing cost per ton of steel rolled, are reported on each new Bantam application. Outstanding records have brought about a Big Swing to Bantam Bearings.

Your mill production will also show better results if you too take advantage of Bantam performance.

THE BANTAM BALL BEARING CO.

SUBSIDIARY OF THE TORRINGTON CO.)

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CHICAGO
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TAKE YOUR TOUGHEST BEARING JOB TO BANTAM

trolled by a push button in the handle. Power is provided by a hydraulic pressure generator driven by a two horsepower motor. Operating cycle is completed automatically upon pressing the control button which actuates the automatic electric valve unit.

♦ ♦ ♦

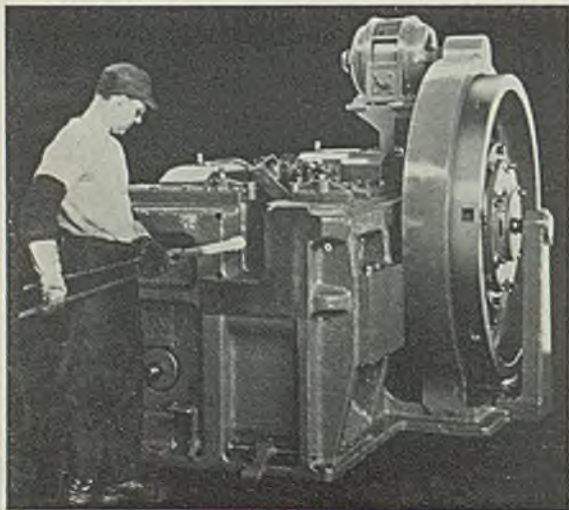
Portable Filter—

T. Shriver & Co., Hamilton street and Franklin avenue, Harrison, N. J., has recently developed a new small portable filtration unit which meets the needs of many cleaning plants for equipment which can handle a nominal quantity of clean-



Plating solutions and other similar liquids are filtered by this device developed by T. Shriver & Co.

ing solution from small tanks on a continuous basis or from larger tanks on an intermittent basis, insuring complete elimination of sediment and contamination from plating tanks. This equipment consists of a plate and frame-type pressure filter of 8 chambers, a diaphragm pump with strainer, direct connected to a 1/4-horsepower motor together with starting switch cord and electric plug, all mounted on a portable stand on roller bearing casters. The unit will filter up to 90 gallons of plating solution per hour. All parts coming in contact with the



fluid are made of hard lead, but they may be made of cast iron, rubber or other materials which may be more suitable for special plating solutions.

♦ ♦ ♦

Workshop Lathe—

South Bend Lathe Works, South Bend, Ind., has recently announced a new model 9-inch workshop precision lathe. The product is offered in seven different styles to fit a wide number of installations. The lathe features ten new improvements, including the simplified twin-gear reverse for cutting right and left-hand screw-threads of 4 to 40 per inch, a newly improved back-gear head-stock with larger spindle bearings and a new ball thrust gearing on the spindle, a new and heavier designed saddle, and a simplified gearing for threads and speeds. The lathe has a strong, rigid bed of one-piece casting, and comes in four lengths of 3, 3 1/2, 4 and 4 1/2 feet, with distances between centers of 17, 23, 29 and 35 inches re-



South Bend workshop precision lathe offered in seven different styles

spectively. Metals of all kinds can be machined including cast iron, steel, cast steel, steel forgings, wrought iron, brass, bronze, cop-

per, babbitt, aluminum and the various allied steels and metals. Six spindle speeds ranging from 39 to 630 revolutions per minute are available.

♦ ♦ ♦

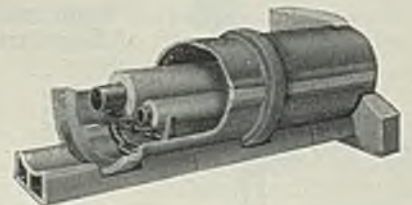
Bolt Heading Machine—

Ajax Mfg. Co., Euclid, O., has recently redesigned and placed on the market a new bolt heading and forging machine in two sizes rated at 1-inch and 1 1/2-inch capacity. In these models, the flywheel is mounted on the crankshaft and delivers ample power to drive the machine. Motor is direct connected to the flywheel, either through a fiber pinion on the motor shaft, which meshes with an integral gear on the flywheel rim or through multiple V-belts. These machines are equipped with an air clutch which controls operation of the machine. A fully automatic safety mechanism protects the machine from damage due to oversized or misplaced stock which would prevent the dies from closing. An automatic lubricating system built into the machine provides the correct and proper lubrication of all moving parts, and is operated through a double plunger pump built into an oil reservoir at the back of the machine. Bed frame is a one piece open-hearth steel casting with deep vertical and heavy horizontal ribbing to withstand the heading and gripping pressures. Integral bearing housings provide rigid support for the forged alloy crankshaft which rotates in solid sleeve type bearings. Header slide is held in alignment by an extension guide bearing supported at a mutual position in the frame. Use of this slide construction allows the entire pitman assembly to be completely accessible for inspection or adjustment.

♦ ♦ ♦

Tile Conduit—

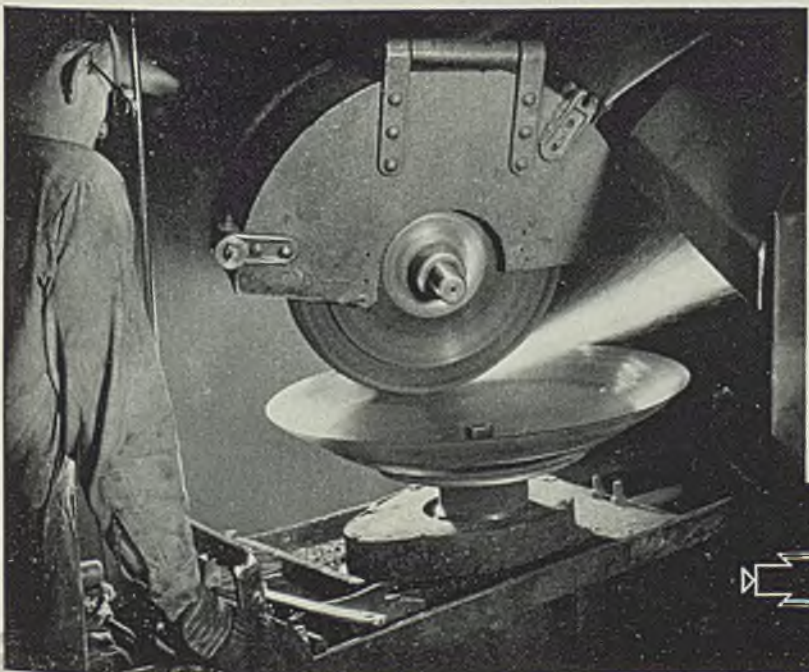
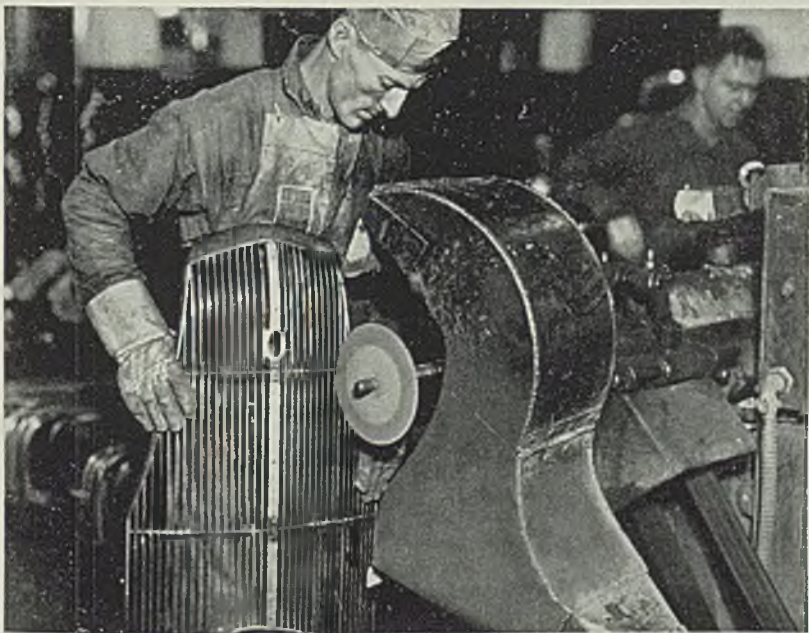
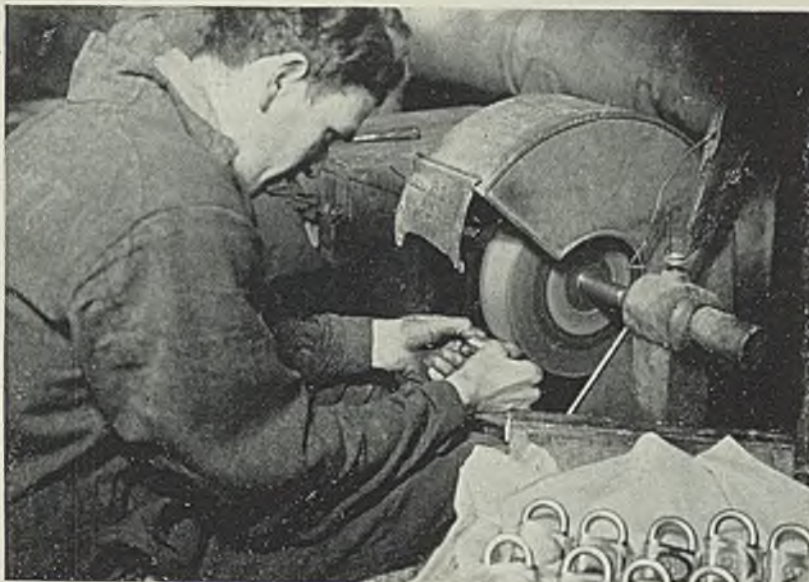
American District Steam Co., North Tonawanda, N. Y., has recently placed on the market a new type of conduit for underground steam and hot water lines. The new product consists of a substan-



New style conduit for underground steam and hot water lines marketed by American District Steam Co.

Ajax bolt heading and forging machine now built in 1-inch and 1 1/2-inch capacity and operated by an air clutch mechanism

tial base drain tile supporting a circular, salt glazed, vitrified tile con-



*"Lowest Cost per
Piece Polished"*

Depends on

4 IMPORTANT
FACTORS . . .

- 1.** Correct
Grain Size
- 2.** Correct
Grain Shape
- 3.** Correct
Grain Strength
- 4.** Correct
Grain Surface

Alundum Abrasive is correct in all four factors. Scientific research has determined what they are; modern manufacturing processes and equipment assure their uniform production.

No matter what your polishing jobs may be—fine finishing or heavy duty roughing—you can be sure that Alundum Abrasive will give you lowest polishing costs per piece.

NORTON COMPANY
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G-45

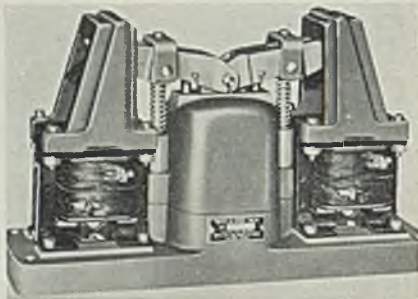
NORTON ABRASIVES

duit. The conduit is separable on the job into two halves along the horizontal center line with a resulting diagonal fracture. One or more pipes can be installed, tested, inspected and insulated with standard insulations before the top half of the conduit is replaced. Top and bottom halves of the conduit are sealed with mortar in the bell and spigot joints and between the projecting outside lips on each side of the conduit, then the trench is ready backfill. The conduit is available in various sizes to accommodate one or more pipes, with or without insulation.

♦ ♦ ♦

Air Control Valve—

C. B. Hunt & Son, Salem, O., has recently introduced a new air control valve of the 6-way double solenoid type. This device may also be used as a 4-way compound exhaust valve. It is furnished in $\frac{3}{4}$, $\frac{1}{2}$ and



Hunt 6-way double solenoid valve for air control, which may also be used as a 4-way compound exhaust valve

$\frac{3}{4}$ inch sizes. Solenoids in this valve operate independently, each having a return spring. Valves are supplied for either normally opened or normally closed operation. This valve, known as No. 1496, does not employ momentary contact in the operation of the solenoids. Solenoids are equipped with stop brackets, and valve cage and solenoids are mounted on the same plate to which the piping is fitted. This feature allows the cage or solenoids to be removed for inspection without disturbing the piping. The valving units, built of stainless steel, are inherently balanced, operate with a short travel and are so constructed that the pressure seal becomes tighter as air pressure is increased.

♦ ♦ ♦

Voltage Regulator—

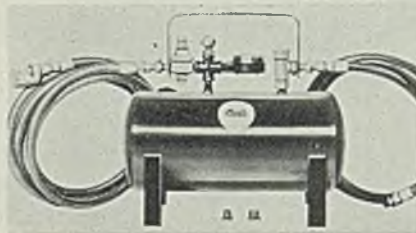
Allis-Chalmers Mfg. Co., Milwaukee, has recently placed on the market a new line of larger rocking-contact voltage regulators, designated as type J. They have been especially designed for the control of large synchronous machines where high

speed of voltage recovery, accurate voltage control and reliability are essential. In modified form, they also can be obtained to control large direct-current generators. The two main parts of the complete regulating equipment consists of the voltage control elements and the rocking contact motor-operated rheostat with high speed contactors and relays. Voltage-control element is connected to the machine to be regulated through suitable potential transformers and operates its contacts when the voltage differs from the normal value. The rocking-contact motor-operated rheostat is the means for varying the machine field current and adjusting it to the correct value to the normal generator voltage by acting in the exciter field circuit.

♦ ♦ ♦

Oil Leak Detector—

Federal-Mogul Corp., 11031 Shoemaker street, Detroit, has recently placed on the market a new oil-leak detector which consists of a small tank with hose connections at each end, control valves, pressure gage and filter. The unit is light in weight and portable. It uses the



Federal-Mogul Corp. builds this detector of oil leaks in bearings

ordinary tire-inflation air supply. In operation, the tank is filled with 5 quarts of S. A. E. No. 30 oil. One hose is connected to the air line, the other to the engine lubrication system. The air-pressure reducing valve is then set for 25 pounds. Oil, under controlled pressure in a tank, is forced through to the bearings and the leakage of each bearing can readily be determined by observation. When this leakage is between 20 and 150 drops per minute, the bearing is satisfactory. No leakage indicates either a too-tight-fitting bearing or oilway obstruction. A steady stream of oil, with no apparent halt between drops, indicates excessive clearance, cracked lining, or other trouble. Point of leakage in main oil headers or their internal oil lines also can be located.

♦ ♦ ♦

Grinder—

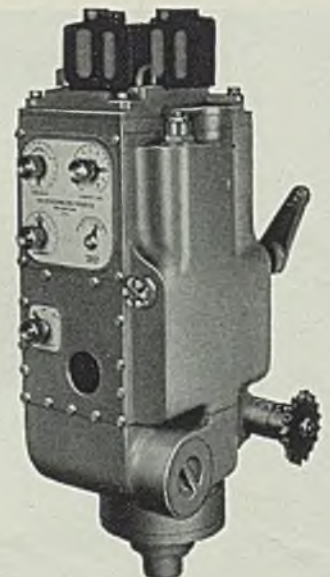
Mall Tool Co., 7740 South Chicago avenue, Chicago, has recently

added to its line a new heavy duty tri-position mounted grinder. The special mounting permits the grinder to be used in any three positions; as a bench grinder, suspended from overhead, or as a regular floor machine. This type of mounting makes the machine especially adapted for use in confined places. The grinder can be furnished with either $1\frac{1}{2}$ or 3-horsepower dust-proof motors, and is recommended by the company for heavy duty casting snagging, removing excess metal after welding, polishing stainless steel and numerous other metalworking jobs.

♦ ♦ ♦

Governor—

Pickering Governor Co., Portland, Conn., has recently produced a new oil relay governor. Any change in load imposed on a prime mover equipped with this governor causes an extremely small and momentary change in feed. Under ordinary working conditions, regulation is maintained within 1/100 of 1 per cent of the normal value, according to company claim. Governor is available with or without built in automatic shut down provisions, which are employed to protect the entire equipment against any specified occurrence such as loss of oil pressure in the lubricating system of the prime mover, hot bearings, failure of the mechanism normally used to drive the governor or any other cause or group of causes. Motorized control of the various adjustments is optional. Drive may be specified for direct connection or to gearing from a vertical or horizontal shaft or by means of chain and sprocket.



Pickering oil relay governor which provides constant feed under varying loads on the prime mover

MATERIALS HANDLING

Places More Emphasis on Engineering and Design

(Concluded from Page 50)

Cook says: "Twenty years ago 3-ton loads were beyond the range of existing designs, while today 20 to 30 tons, or as high as 50 tons are offered to industrial trucks. The solution of one problem seems to offer in turn another even more difficult one. It may not be transport alone, but manipulation of the load hauled and the general all-around problem of materials handling.

"The steel industry suddenly realized the need for more strip to feed the gigantic automobile body presses and immediately dependable transport of 2 to 10-ton coils of great width were sought. A problem of engineering and design was presented. The same thing happened when it became necessary to serve the large presses with dies of great weight. Engineering and design again were called upon to work out a solution.

Combining Strength and Lightness

"The limit for trucks is floor, tire and bearing loading. So far, alloy steels have proved ample although the layman may not appreciate the engineering skill required to compress such strength in materials within such small available spaces on a power industrial truck. Heat treating skill has been developed probably to as high a degree in this product as in any other. This, in turn, has called upon the drop forging industry for flawless homogeneous forgings.

"These are but a few reasons why the industrial truck industry has increased and trained its engineering staffs during the depression. Bigness of load has not been the only mark for profitable employment of trucks. More attention is being given also to the utilization of "air-rights" in storage, and the usable cubic foot, instead of square foot, now determines the value of semi and dormant storage. Trucks are now stacking goods 15 to 20 feet high."

♦ ♦ ♦

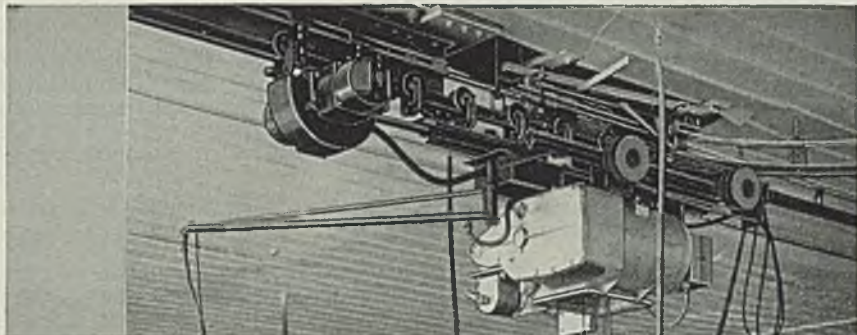
Pipe Line for Solids

A CONVEYING system, which is a virtual pipe line for solids, is being introduced to American industrial markets. This will handle rice coal, crushed soft coal, crushed

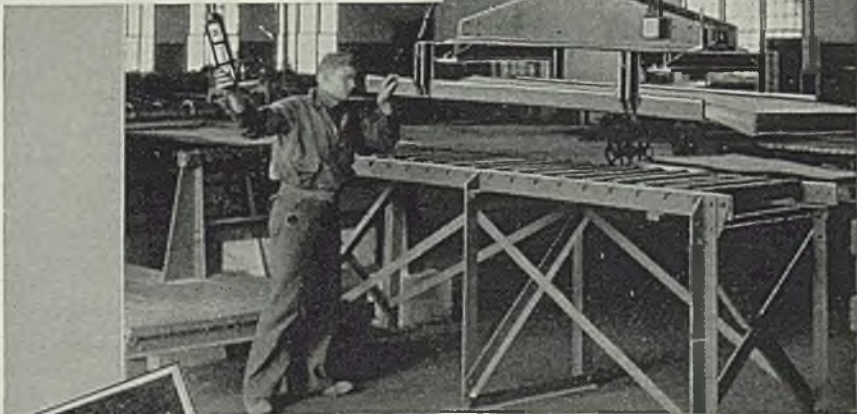
lime, chemicals and other similar materials. A tube of rubber is split into two halves so that it can be pulled apart at any point to receive or discharge. These halves fit together by means of double tongue and grooves. One half is fitted with disk-like partitions or flights which serve to pick up a full load of ma-

terial when passing through a feed hopper.

An installation of this rubber tube conveyor has been in use for nearly three years at the coke plant of the Steel Co. of Canada, Hamilton, Ont., handling spillage coal. The system is said to be noiseless, clean and free-moving. The flexible rubber tube is twisted much in the manner of a rope. It receives material to be conveyed from hoppers located at various points along its line of travel, and conveys it vertically, horizontally or in any combination of directions to points of discharge.



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13102 Athens Ave., Cleveland, O.

RECENT PUBLICATIONS

OF MANUFACTURERS

Copies of any of the literature listed below may be obtained by writing directly to the companies involved, or by addressing STEEL, in care of Readers' Service Department, 1213 West Third Street, Cleveland.

Construction Equipment—Construction Machinery Co., Waterloo, Iowa. Catalog on its types of mixers and construction equipment.

Gas Heater—Corozone Air Conditioning Corp., Cleveland. Bulletin No. 133A, describing its gas heater and winter air conditioner unit.

Milling Machine—W. B. Knight Machinery Co., St. Louis. Circular No. 140, describing and illustrating its No. 40 universal vertical miller.

Air Compressors—Union-C Machine Co., Inc., Union City, N. J. Folder describing air compressors and pneumatic accessories, either gas or diesel engine-driven.

Grinder—Mine & Smelter Supply Co., Denver. Folder illustrating its rock bit grinder for reshaping all makes and styles of detachable rock bits giving specifications and principal details.

Multi-Pointer Gage—Bailey Meter Co., 1050 Ivanhoe road, Cleveland. Bulletin No. 163, describing its new diagram-operated multi-pointer gage, with photographs of installations.

Materials Handling Equipment—Lewis-Shepard Co., 175 Walnut street, Watertown, Mass. Folder No. 321, on materials handling equipment for handling barrels, drums, carboys, cartons, cases, etc.

Development of Meehanite—Fulton Foundry & Machine Co., Morgan avenue at East Seventy-fifth street, Cleveland. Folder describing the discovery and development of Meehanite, including table of physical and engineering properties.

Die Casting Machine—Phoenix Ice Machine Co., 2711 Church avenue, Cleveland. Folder describing new features of the modern hydraulic operated H-HP2 Lester die casting machine, including detailed specifications.

Arc Welding—Hobart Brothers Co., Box FR-173, Troy, O. Catalog on new 40-volt simplified electric arc welder, illustrating the various jobs it can handle, with a complete description of the line, specifications, etc.

Pumps—Economy Pumping Machinery Co., 3431 West Forty-eighth

place, Chicago. Handbook offering new pump data for the solution of pumping problems and represents in part the experience of 25 years of building centrifugal pumping equipment.

Optical Instruments—Adolph I. Buehler, 228 North La Salle street, Chicago. Booklet suggesting application of newer methods to the daily routine for metallurgist, describing bakelite specimen mountings, new type cutting machine, low cost grinders and polishers.

Motorblower—Ingersoll-Rand Co., 11 Broadway, New York. Bulletin No. 2310, describes type CS motorblower, designed to meet needs of numerous services requiring air at one pound pressure, and in volumes from 325 to 3200 cubic feet per minute.

Portable pH Meter—Thwing Instrument Co., 3339 Lancaster avenue, Philadelphia. Bulletin No. M-361A, describing its portable pH meter especially adapted to potentiometric titrations, entirely independent of color, turbidity or suspended matter in solutions.

Rol-Top Doors—Kinnear Mfg. Co., 5000 Fields avenue, Columbus, O. Bulletin No. 12, describing Rol-Top garage doors and illustrating some of the advantages. Bulletin No. 15, illustrates the added convenience derived from use of the automatic motor operator in connection with operation of Rol-Top doors.

Beryllium Copper Alloys—Beryllium Corp. of Pennsylvania, Reading, Pa. Folder describing the properties of beryllium copper alloys, illustrating typical parts where the properties of the metal have met the need for stability and uniformity, heat resistance, high conductivity, high fatigue life and readily machinable qualities.

Fire Extinguishing System for Airplanes—Walter Kidde & Co. Inc., Bloomfield, N. J. Bulletin No. AD485, describing the Lux fire extinguishing system for airplanes. The carbon dioxide gas is stored in lightweight cylinders and discharged throughout the engine compartment by a single remote control valve on the instrument panel.

Direct Firing Pulverized Coal System—Babcock & Wilcox Co., 85 Liberty street, New York. Booklet No. 485, offering helpful suggestions for those using pulverized coal firing in power boilers and other applications. Folder No. 484, illustrating tables of grindabilities and analyses of many coals mined in United States, Canada and other countries.

Manganese Vanadium Steel—Vanadium Corp. of America, 420 Lexington avenue, New York. Booklet describing manganese-vanadium high strength steel with exceptional welding qualities for plates and structural shapes. Booklet giving characteristics of vanadium steels and iron used in, or available for use in the oil industry, giving data on chemical and physical properties.

Shovels—Speeder Machinery Corp., 1201 Sixth street Southwest, Cedar Rapids, Iowa. Booklet No. 8136, describing its model TS-40, a shovel mounted on the rear of a caterpillar tractor. Bulletin No. B5-1136, describing its complete line of light weight convertible shovels ranging from $\frac{1}{2}$ to $\frac{3}{4}$ -yard capacity. Bulletin No. AB-3-137, describing its model AB-3 convertible shovel of $\frac{1}{2}$ -yard capacity.

Trolleys—Louden Machinery Co., Fairfield, Iowa. Bulletin No. 105, describing trolleys for overhead conveying systems, applicable to tracks of 2-inch width flanges. Bulletin No. 102, illustrating cranes for overhead conveying systems. Catalog No. 10, describing industrial monorail systems for overhead lifting and carrying. Folder No. 50, illustrating many uses of overhead cranes for economical materials handling.

Thermal Overload Switch—General Electric Co., Schenectady, N. Y. Bulletin No. 2369, describing a new thermal overload switch for fractional horsepower motors, operating on line current and arranged for convenient mounting on the conduit or terminal box of the motor; bulletin No. 2525, type ICT-self-reset temperature relay for protecting alternating current machines and transformers against abnormal heating; bulletin No. 2467, giving technical and descriptive data on General Electric light-sensitive cell.

Steel Demand Surpasses Heavy Production

Pig Iron Output

Makes Gain; Export

Inquiry Growing

CONTINUANCE of General Motors labor difficulties shows no effect on steel demand and steel-makers continue to wrestle with heavy backlogs while consumers seek better deliveries. On many products producers are sold fully for first quarter and into second. In spite of a high rate of production some mills have found new business exceeding shipments and in some instances even greater than capacity.

There has been no change in General Motors' stop orders and when this tonnage is released on settlement of the strike the delivery situation will be further complicated.

Prompt recovery from effects of flood conditions is registered in the rebound of the steel operating rate to 79½ per cent, a rise of 3½ points over the preceding week, bringing production practically to the pre-flood level. Chicago at 78 per cent and Detroit at 90 showed no change. Wheeling regained 36 points to 77 per cent. Pittsburgh advanced one point to 82, Eastern Pennsylvania half a point to 53½, Youngstown four points to 81, Birmingham 2½ points to 79, Cincinnati one point to 22 and St. Louis two points to 82. Cleveland lost half a point to 75½, Buffalo is off five points to 85 and New England nine points to 74. These declines are for relining and repair.

Pig iron output in January made a gain of three per cent over December. Total production in January was 3,219,741 gross tons, at a daily rate of 103,863 tons, compared with 3,125,192 tons in December, a daily rate of 100,813 tons. This is the best month since May, 1930, when 104,564 tons were made daily. Production in January, 1936, was 65,461 tons daily.

Inquiries for freight cars have been practically all converted into orders to take advantage of price protections. Placing of 10,792 cars last week provides builders with requirements for close to 100,000 tons of steel, largely plates. A locomotive builder has been awarded 15 locomotives and 11 extra tenders. Placements of freight cars in January were 17,806, compared with 23,450 in December.

Inquiry by Ford Motor Co. for 80,000 tons of re-rolling billets and slabs has resulted in some small lots being covered but most producers of semifinished have no excess tonnage for sale.

Automotive production last week is estimated at 72,295 units, compared with 74,148 the preceding week.

MARKET IN TABLOID

DEMAND *Strong in all lines, exceeding production.*

PRICES *Scrap index moves 9 cents higher.*

PRODUCTION . . . *Operations regain flood loss, to 79½ per cent.*

SHIPMENTS . . . *Steady, some products deferred.*

The decline is entirely due to General Motors stoppage, some other builders increasing their output.

Foreign trade is increasing, December exports totaling 244,156 gross tons, compared with 203,297 in November, the increase being largely due to scrap. For 1936 total manufactured steel exports were 1,221,663 tons, compared with 959,646 tons in 1935. For the year scrap exports were less than in 1935. Imports in December were 52,584 tons compared with 61,970 in November. For 1936 they totaled 666,838 tons, compared with 470,015 in 1935.

Efforts of foreign buyers to obtain material for export to Europe, the Far East and South America are on the increase. Tin plate has been bought for this purpose at a premium and the market is being tested for prices on pig iron, semifinished material and sheets. High ocean freights and needs for domestic use tend to make the price too high for prospective exporters.

Proposals for two battleships, each requiring 30,000 tons of hull steel, one of which will be built in a private yard, offers prospect for continued plate tonnage over several months.

Following the heavy tonnage of two weeks ago, when a rush to cover before price protections expired, structural bookings reported last week dropped to 17,095 tons from 64,988 in the preceding week. The most important tonnage was 5500 tons for a manufacturing plant at Front Royal, Va.

Scrap continues strong but prices of steelmaking grades advanced only slightly last week, although supplies are far from plentiful. Export prices on the eastern seaboard are lower than for domestic delivery and dealers find difficulty in filling orders for dock delivery. On slight advances at Chicago STEEL'S composite price of scrap has risen 9 cents to 18.79. The iron and steel composite is up two cents to \$36.64 and the finished steel composite is unchanged at \$55.80.

COMPOSITE MARKET AVERAGES

	Feb. 6	Jan. 30	Jan. 23	One Month Ago Jan., 1937	Three Months Ago Nov., 1936	One Year Ago Feb., 1936	Five Years Ago Feb., 1932
Iron and Steel	\$36.64	\$36.62	\$36.59	\$36.55	\$34.65	\$33.48	\$29.24
Finished Steel	55.80	55.80	55.80	55.80	53.90	53.70	46.72
Steelworks Scrap	18.79	18.70	18.29	18.12	16.05	13.83	7.89

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

A COMPARISON OF PRICES

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

Finished Material	Feb. 6	Jan.	Nov.	Feb.	Pig Iron	Feb. 6	Jan.	Nov.	Feb.
	1937	1937	1936	1936		1937	1937	1936	1936
Steel bars, Pittsburgh	2.20c	2.20	2.05	1.85	Bessemer, del. Pittsburgh	\$22.31	22.31	20.81	20.81
Steel bars, Chicago	2.25	2.25	2.10	1.90	Basic, Valley	20.50	20.50	19.00	19.00
Steel bars, Philadelphia	2.49c	2.49	2.36	2.16	Basic, eastern del. East Pa.	22.26	22.26	21.06	20.81
Iron bars, Terre Haute, Ind.	1.95	2.10	1.95	1.75	No. 2 fdy., del. Pittsburgh	22.21	22.21	20.31	20.31
Shapes, Pittsburgh	2.05	2.05	1.90	1.80	No. 2 fdy., Chicago	21.00	21.00	19.75	19.50
Shapes, Philadelphia	2.25½	2.25½	2.11½	2.01½	Southern No. 2, Birmingham	17.38	17.38	15.75	15.50
Shapes, Chicago	2.10	2.10	1.95	1.85	Southern No. 2, del. Cincinnati	20.69	20.69	19.69	20.20
Tank plates, Pittsburgh	2.05	2.05	1.90	1.80	No. 2X eastern, del. Phila.	23.135	23.135	21.93	21.68
Tank plates, Philadelphia	2.23½	2.23½	2.09	1.99	Malleable, Valley	21.00	21.00	19.50	19.50
Tank plates, Chicago	2.10	2.10	1.95	1.85	Malleable, Chicago	21.00	21.00	19.75	19.50
Sheets, No. 10, hot rolled, Pitts.	2.15	2.15	1.95	1.85	Lake Sup., charcoal, del. Chicago	26.54	26.54	25.87	25.25
Sheets, No. 24, hot ann., Pitts.	2.80	2.80	2.60	2.40	Gray forge, del. Pittsburgh	21.17	21.17	19.67	19.67
Sheets, No. 24, galv., Pitts.	3.40	3.40	3.20	3.10	Ferromanganese, del. Pittsburgh	84.79	84.79	80.13	80.13
Sheets, No. 10, hot rolled, Gary	2.25	2.25	2.05	1.95					
Sheets, No. 24, hot anneal., Gary	2.90	2.90	2.70	2.50	Scrap				
Sheets, No. 24, galvan., Gary	3.50	3.50	3.30	3.20	Heavy melting steel, Pittsburgh	\$19.50	18.95	17.40	14.80
Plain wire, Pittsburgh	2.60	2.60	2.50	2.30	Heavy melt. steel, No. 2, east Pa.	17.75	16.40	13.75	12.00
Tin plate, per base box, Pitts.	\$4.85	4.85	5.25	5.25	Heavy melting steel, Chicago	19.00	18.25	16.50	14.30
Wire nails, Pittsburgh	2.25	2.25	2.05	2.40	Rail for rolling, Chicago	20.25	19.40	17.25	15.50
					Railroad steel specialties, Chicago	20.75	19.65	18.25	15.75
Semifinished Material					Coke				
Sheet bars, open-hearth, Youngs.	\$34.00	34.00	32.00	30.00	Connellsville furnace, ovens	\$4.00	4.00	4.00	3.50
Sheet bars, open-hearth, Pitts.	34.00	34.00	32.00	30.00	Connellsville, foundry, ovens	4.25	4.25	4.25	4.20
Billets, open-hearth, Pittsburgh	34.00	34.00	32.00	29.00	Chicago, by-product foundry, del.	10.25	10.25	9.75	9.75
Wire rods, No. 5 to ½-inch, Pitts.	43.00	43.00	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 2.95c	Pittsburgh base, cents per lb. Chrome-Nickel	Pittsburgh 2.05c
Hot Rolled No. 10, 24-48 in.	Gary 3.05c	No. 302 No. 304	Philadelphia, del. 2.25½c
Pittsburgh 2.15c	St. Louis, delivered 3.285c	Bars 23.00 24.00	New York, del. 2.30¼c
Gary 2.25c	Cold Rolled No. 10	Plates 26.00 28.00	Boston, delivered 2.43¼c
Chicago, delivered 2.28c	Pittsburgh 2.80c	Sheets 33.00 35.00	Bethlehem 2.15c
Detroit, del. 2.35c	Gary 2.90c	Hot strip 20.75 22.75	Chicago 2.10c
New York, del. 2.48c	Detroit, delivered 3.00c	Cold strip 27.00 29.00	Cleveland, del. 2.25c
Philadelphia, del. 2.44c	Philadelphia, del. 3.09c		Buffalo 2.15c
Birmingham 2.30c	New York, del. 3.13c		Gulf Ports 2.45c
St. Louis, del. 2.485c	Pacific ports, f.o.b. cars, dock 3.40c		Birmingham 2.20c
Pacific ports, f.o.b. cars, dock 2.70c	St. Louis 3.135c		Pacific ports, f.o.b. cars, dock 2.60c
Hot Rolled Annealed No. 24	Cold Rolled No. 20	Straight Chromes	Bars
Pittsburgh 2.80c	Pittsburgh 3.25c	No. No. No.	Soft Steel
Gary 2.90c	Gary 3.35c	410 430 442 446	(Base, 3 to 25 tons)
Chicago, delivered 2.93c	Detroit, delivered 3.45c	Bars 17.00 18.50 21.00 26.00	Pittsburgh 2.20c
Detroit, delivered 3.00c	Philadelphia, del. 3.54c	Plates 20.00 21.50 24.00 29.00	Chicago or Gary 2.25c
New York, del. 3.13c	New York, del. 3.58c	Sheets 25.00 28.00 31.00 35.00	Duluth 2.35c
Philadelphia, del. 3.09c	St. Louis 3.585c	Hot strip 15.75 16.75 21.75 26.75	Birmingham 2.35c
Birmingham 2.95c	Enameling Sheets	Cold stp. 20.50 22.00 27.00 35.00	Cleveland 2.25c
St. Louis, del. 3.135c	Pittsburgh, No. 10 2.60c		Buffalo 2.30c
Pacific ports, f.o.b. cars, dock 3.45c	Pittsburgh, No. 20 3.20c	Steel Plate	Detroit, delivered 2.35c
Galvanized No. 24	Gary, No. 10 2.70c	Pittsburgh 2.05c	Pacific ports, f.o.b. cars, dock 2.75c
Pittsburgh 3.40c	Gary, No. 20 3.30c	New York, del. 2.33c	Philadelphia, del. 2.49c
Gary 3.50c	St. Louis, No. 10 2.935c	Philadelphia, del. 2.23¼c	Boston, delivered 2.60c
Chicago, delivered 3.53c	St. Louis, No. 20 3.535c	Boston, delivered 2.45c	New York, del. 2.53c
Philadelphia, del. 3.69c	Tin and Terne Plate	Buffalo, delivered 2.30c	Pitts., forg. qual. 2.55c
New York, delivered 3.73c	Gary base, 10 cents higher.	Chicago or Gary 2.10c	
Birmingham 3.55c	Tin plate, coke base (box) Pittsburgh \$4.85	Cleveland, del. 2.24¼c	Rail Steel
St. Louis, del. 3.735c	Do., waste-waste 2.75c	Birmingham 2.20c	To Manufacturing Trade
Pacific ports, f.o.b. cars, dock 4.00c	Do., strips 2.50c	Coatesville, base 2.15c	Pittsburgh 2.05c
	Long ternes, No. 24 unassorted, Pitts. 3.70c	Sparrows Pt., base 2.15c	Chicago or Gary 2.10c
	Do., Gary 3.80c	Pacific ports, f.o.b. cars, dock 2.60c	Moline, Ill. 2.10c
		St. Louis, delivered 2.33c	Cleveland 2.10c
			Buffalo 2.15c

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..	2.30c
Gulf ports	2.65c
Pacific coast ports f.o.b. car docks	2.70c
Philadelphia, del.	2.54c
Rail steel, straight lengths, quoted by distributors	
Pittsburgh	2.10c
Chicago, Buffalo, Cleveland, Birm., Young....	2.15c
Gulf ports	2.50c

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.	2.42½c
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	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20
4100 0.15 to 0.25 Mo.	0.55		
4600 0.20 to 0.30 Mo. 150-2.00 Ni.	1.10		
5100 0.80-1.10 Cr.	0.45		
5100 Cr. spring	0.15		
6100 bars	1.20		
6100 spring	0.85		
Cr. Ni., Van.	1.50		
Carbon Van.	0.85		
9200 spring flats	0.15		
9200 spring rounds, squares	0.40		

Piling

Pittsburgh	2.40c
Chicago, Buffalo	2.50c

Strip and Hoops

(Base, hot rolled, 25-1 ton)			
(Base, cold-rolled, 25-3 tons)			
Hot strip to 23½-in.			
Pittsburgh	2.15c		
Chicago or Gary	2.25c		
Birmingham base	2.30c		
Detroit, del.	2.35c		
Philadelphia, del.	2.44c		
New York, del.	2.48c		
Cooperage hoop, Pittsburgh	2.15c		
Chicago	2.25c		
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland	2.85c		
Detroit, del.	3.05c		
Worcester, Mass.	3.05c		
Carbon Pitts. Worces.			
0.26—0.50	2.85c	3.05c	
0.51—0.75	3.95c	4.15c	
0.76—1.00	5.70c	5.90c	
Over 1.00	7.75c	7.95c	

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.	\$38.00
Do., rerolling quality.	37.00
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	
½ x 6 and smaller	70 off
Do. larger	65-10 off
Tire bolts	50-5 off
Plow Bolts	
All sizes	65-10-10 off
Stove Bolts	
In packages with nuts attached 72½ off; in packages with nuts separate 72½-5 off; in bulk 81½ off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.	
Step bolts	60 off
Elevator bolts	60 off
Nuts	
S. A. E. semifinished hex.: ½ to ¾-inch.	60-20-5 off
Do., ½ 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
½-inch and smaller, Pitts., Chi., Cleve.	70-5 off
Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs.	\$6 off

Cut Nails

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

Pipe and Tubing

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

Welded Iron, Steel Pipe

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

Butt Weld Steel			
In.	Blk.	Galv.	
¼ and ¾	60	44½	
½	64½	55	
¾	67½	59	
1—3	69½	61½	
Iron			
½	27	10½	
¾	32	16	
1—1¼	35	21	
2	38½	23	
Lap Weld Steel			
2	62	53½	
2½—3	65	56½	
3½—6	67	58½	
7 and 8	66	56½	
9 and 10	65½	56	
Iron			
2	32½	18	
2½—3½	33½	20½	
4—8	35½	24	
Line Pipe Steel			
¾, butt weld	56		
¾ and ¾, butt weld.	59		
¾, butt weld	63½		
¾, butt weld	66½		
1 to 3, butt weld	68½		
2, lap weld	61		
2½ to 3, lap weld.	64		
3½ to 6, lap weld.	66		
7 and 8, lap weld.	65		
Iron			
¾—1½ inch, black and galv. take 4 pts. over; 2½—6-inch 2 pts. over discounts for same sizes, standard pipe lists, 8—12-inch, no extra.			
Boiler Tubes			
C. L. Discounts, f.o.b. Pitts.			
Lap Weld Steel		Charcoal Iron	
2—2¼	33	1½	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3½—3¾	50	3	17
4	52	3½—3¾	18
4½—5	42	4	20
		4½	21

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

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

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

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

Seamless Tubing

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

Cast Iron Water Pipe

Class B Pipe—Per Net Ton	
6-in. & over, Birm.	\$41.00-42.00
4-in., Birmingham.	44.00-45.00
4-in., Chicago.	52.00-53.00
6 to 24-in., Chicago.	49.00-50.00
6-in & over, east. fdy.	45.00
Do., 4-in.	46.00
Class A pipe \$3 over Class B	
Std. ftgs., 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	
Pitts., Cleve., No. 5 to 1½-inch incl.	43.00
Do., over 1½ to 1¼-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.	10.50-11.00
Birmingham, ovens	6.50
Indianapolis, del.	9.65
Cincinnati, del.	9.75
Cleveland, del.	10.30
Buffalo, del.	10.50
Detroit, del.	10.70
Philadelphia, del.	9.85

Coke By-Products

Spot. gal. Producers' Plants	
Pure and 90% benzol.	16.00c
Toluol	30.00c
Solvent naphtha	30.00c
Industrial xylol	30.00c
Per lb. f.o.b. Frankford	
Phenol (200 lb. drums) ..	15.50c
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.	\$1.35
†Western prices, ¼-cent up.	

Pig Iron

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

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	\$22.00	\$22.50	\$21.50	\$23.00
Birdsboro, Pa.	22.00	22.50	21.50	23.00
Birmingham, Ala.†	17.38	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	21.50	22.00
Erie, 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	21.50
Jackson, O.	20.25	20.25	19.75	20.50
Neville Island, Pa.	21.00	21.00	20.50	21.50
Provo, Utah	18.50	18.50	18.00	19.00
Sharpsville, Pa.	21.00	21.00	20.50	21.50
Sparrows Point, Md.	22.00	22.00	21.50	22.50
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:	No. 2 Fdry.	Malleable	Basic	Bessemer
Akron, O., from Cleveland	21.76	21.76	21.26	22.26
Baltimore from Birmingham	22.58	22.58	21.46	22.46
Boston from Birmingham	23.37	23.37	22.87	23.87
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	23.77	24.77
Brooklyn, N. Y., from Bmghm.	24.05	24.05	23.55	24.55
Canton, O., from Cleveland	21.76	21.76	21.26	22.26
Chicago from Birmingham	21.22	21.22	20.72	21.72
Cincinnati from Hamilton, O.	20.82	21.58	21.08	22.08
Cincinnati from Birmingham	20.69	20.69	19.69	20.69
Cleveland from Birmingham	21.12	21.12	20.62	21.62
Cincinnati from Hamilton, O.	21.07	21.79	20.79	21.79
Mansfield, O., from Toledo, O.	22.76	22.76	22.26	23.26
Milwaukee from Chicago	22.00	22.00	21.50	22.00
Muskegon, Mich., from Chicago	23.90	23.90	23.40	24.40
Toledo or Detroit	23.01	23.01	22.51	23.51
Newark, N. J., from Birmingham	23.39	23.89	22.89	23.89
Newark, N. J., from Bethlehem	22.38	22.38	21.88	22.88
Philadelphia from Birmingham	22.76	22.76	22.26	23.26
Philadelphia from Swedeland, Pa.	22.76	23.26	22.26	23.26
Pittsburgh district from Neville Island	23.25	23.25	22.75	23.75
Saginaw, Mich., from Detroit	21.50	21.50	21.00	21.50
St. Louis, northern	21.50	21.50	21.00	21.50

Delivered from Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis from Birmingham	21.12	21.12	20.82	21.82
St. Paul from Duluth	22.94	22.94	22.44	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	26.54
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 Ferrosilicon†

Jackson county, O., base: Prices are the same as for silveries, plus \$1 a ton. †The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed. Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, \$1 per ton add. Each unit over 3%, add \$1 per ton.

Refractories

Per 1000 f.o.b. Works	Chester, Pa., and Baltimore bases (bags)
Fire Clay Brick	\$45.00
Super Quality	
Pa., Mo., Ky.	\$58.90
First Quality	
Pa., Ill., Md., Mo., Ky.	\$45.60
Alabama, Georgia	\$38.00-45.00
Second Quality	
Pa., Ill., Ky., Md., Mo.	40.85
Georgia, Alabama	36.10
Ohio	
First quality	\$40.85
Intermediary	38.00
Second quality	29.45
Malleable Bung Brick	
All bases	54.15
Silica Brick	
Pennsylvania	\$45.60
Joliet, E. Chicago	54.15
Birmingham, Ala.	45.60
Ladle Brick	
(Pa., O., W. Va., Mo.)	
Dry press	\$25.00
Wire cut	23.00
Magnesite	
Imported dead-burned grains, net ton f.o.b.	
Domestic dead-burned grains, net ton f.o.b.	
Chester, Pa., and Baltimore bases (bags)	\$45.00
Domestic dead-burned grains, net ton f.o.b.	
Chester, Pa., and Baltimore bases (bags)	42.00
Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk)	24.00
Base Brick	
Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.	
Chrome brick	\$47.00
Chem. bonded chrome	47.00
Magnesite brick	67.00
Chem. bonded magnesite	57.00
Fluorspar, 85-5	
Washed gravel, duty paid, tide, net ton	\$23.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	\$18.00
Do., for barge	\$18.50

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

Copper			Straits Tin		Lead		Alumi- num	Antimony	Nickel		
Electro, del. Conn.	Lake, del. Midwest	Casting, refinery	New York	Futures	Lead N. Y.	East St. L.				Zinc St. L.	Chinese Spot, N. Y.	Cath- odes
Jan 30	13.00	13.12½	12.70	49.85	49.70	6.00	5.85	6.00	*19.00	14.25	35.00
Feb. 1	13.00	13.12½	12.70	49.90	49.70	6.00	5.85	6.00	*19.00	14.25	35.00
Feb. 2	13.00	13.12½	12.70	50.50	50.30	6.00	5.85	6.00	*19.00	14.25	35.00
Feb. 3	13.00	13.12½	12.70	51.00	50.80	6.00	5.85	6.00	*19.00	14.25	35.00
Feb. 4	13.00	13.12½	12.70	50.55	50.35	6.00	5.85	6.00	*19.00	14.25	35.00
Feb. 5	13.00	13.12½	12.70	50.00	49.75	6.00	5.85	6.00	*19.00	14.25	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 13.00. Conn. copper

Sheets	
Yellow brass (high)	18.12½
Copper, hot rolled	20.37½
Lead, cut to jobbers	9.50
Zinc, 100-lb. base	10.50
Tubes	
High yellow brass	20.87½
Seamless copper	21.37½
Rods	
High yellow brass	16.12½
Copper, hot rolled	17.12½
Anodes	
Copper, untrimmed	17.87½
Wire	
Yellow brass (high)	18.37½

OLD METALS

Deal. buying prices, cents lb.

No. 1 Composition Red Brass	
New York	8.75- 9.00
Cleveland	9.75-10.00
*Chicago	9.12½-9.37½
St. Louis	9.00- 9.50
Heavy Copper and Wire	
New York, No. 1	10.50-10.75
Chicago, No. 1	10.75-11.00
Cleveland, No. 1	10.75-11.00
St. Louis, No. 1	10.62½-11.00
Composition Brass Borings	
New York	7.75- 8.00
Light Copper	
New York	8.75- 9.00
*Chicago	9.00- 9.25
Cleveland	8.75- 9.00
St. Louis	9.00- 9.50

Light Brass

*Chicago	5.87½-6.12½
Cleveland	5.25- 5.50
St. Louis	6.00- 6.25
Lead	
New York	4.75- 5.00
Cleveland	4.87½- 5.00
Chicago	5.00- 5.25
St. Louis	5.00- 5.25
Zinc	
New York	3.00-3.12½
*St. Louis	3.50- 3.75
Cleveland	3.25- 3.50
Aluminum	
Borings, Cleveland	9.75-10.00
Mixed, cast, Cleve.	13.25-13.50
Mixed, cast, St. L.	13.25-13.50
Clips, soft, Cleve.	15.00-15.25
SECONDARY METALS	
Brass, ingot 85-5-5-5, incl.	14.00
Stand. No. 12 alum.	17.50-17.75

Ferroalloys

Dollars, except Ferrochrome	
Ferromanganese, 78-82% tidewater, duty paid	80.00
Do., Baltimore, base	80.00
Do., del. Pittsburgh	84.79
Spiegeleisen, 19-20% dom.	
Palmerston, Pa., spot	\$26.00
Do., New Orleans	26.00
Ferrosilicon, 50% freight allowed, c. l.	69.50
Do., less carload	77.00
Do., 75 per cent	126-130.00
Spot, \$5 a ton higher.	
Silicomane, 2½ carbon	89.00
2% carbon, 94.00; 1%, 104.00	
Ferrochrome, 66-70 chromium, 4-6 carbon, cts.	
lb. del.	10.00
Ferrotungsten, stand., lb. con. del.	1.30-1.40
Ferrovanadium, 35 to 40% lb., cont.	2.70-2.90
Ferrotitanium, c. l., prod. plant, frt. all., net ton	137.50
Spot, 1 ton, frt. allow., lb.	7.00
Do., under 1 ton, lb.	7.75-8.25
Ferrophosphorus, per ton, c. l., 17-19% Rockdale, Tenn., basis, 18%, \$3 unitage	58.50
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% \$3 unitage	75.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80
†Carloads. Quan. diff. apply.	

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS

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

IRON BARS

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

REINFORCING BARS

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

SHAPES

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

PLATES

Baltimore	3.60c
Boston†	3.58c
Buffalo	3.47c
Chattanooga	3.81c
Chicago	3.45c
Cincinnati	3.65c
Cleveland, ¼-in. and over	3.56c
Detroit	3.65c
Detroit, ¾-in.	3.85c
Houston	3.10c
Los Angeles	4.00c
Milwaukee	3.41c
New Orleans	3.80c
New York† (d)	3.65c
Philadelphia*	3.30c

Phila. floor	4.95c
Pittsburgh (h)	3.40c
Portland	3.85c
San Francisco	3.75c
Seattle	4.05c
St. Louis	3.69c
St. Paul	3.70c
Tulsa	3.60c

NO. 10 BLUE

Baltimore	3.45c
Boston (g)	3.70c
Buffalo	3.72c
Chattanooga	3.66c
Chicago	3.35c
Cincinnati	3.50c
Cleveland	3.41c
Det. 8-10 ga.	3.43½c
Houston	3.45c
Los Angeles	4.15c
Milwaukee	3.46c
New Orleans	3.85c
New York† (d)	3.57c
Portland	3.95c
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*†	4.10c
Boston (g)	4.30c
Buffalo	3.35c
Chattanooga*	3.56c
Chicago	3.90c-4.55c
Cincinnati	4.05c
Cleveland	4.31c
Detroit	4.33½c
Los Angeles	4.35c
Milwaukee	4.16c
New York† (d)	4.22c
Philadelphia*†	4.15c
Pitts.** (h)	3.65c-4.95c
Portland	4.65c
Seattle	4.85c
San Francisco	4.65c
St. Louis	4.29c
St. Paul	4.30c
Tulsa	4.85c

NO. 24 GALV. SHEETS

Baltimore*†	4.20c
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*	4.09c
New York† (d)	4.50c
Philadelphia*†	4.80c
Pitts.** (h)	4.50c-4.75c
Portland	5.35c
San Francisco	5.25c
Seattle	5.35c
St. Louis	4.89c
St. Paul	5.10c
Tulsa	5.20c

BANDS

Baltimore	3.50c
Boston†	3.70c
Buffalo	3.52c
Chattanooga	3.91c
Cincinnati	3.75c
Cleveland	3.66c
Chicago	3.60c
Detroit, ¾-in. and lighter	3.68½c
Houston	3.35c
Los Angeles	4.30c
Milwaukee	3.71c
New Orleans	4.25c
New York† (d)	3.82c

Philadelphia*	3.55c
Pittsburgh (h)	3.50c
Portland	4.60c
San Francisco	4.45c
Seattle	4.60c
St. Louis	3.84c
St. Paul	3.85c
Tulsa	3.55c

HOOPS

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

COLD FIN. STEEL

Baltimore (c)	4.15c
Boston*	4.30c
Buffalo (h)	3.70c
Chattanooga*	4.51c
Chicago (h)	3.95c
Cincinnati	4.15c
Cleveland (h)	3.95c
Detroit	4.03½c
Los Ang. (f) (d)	6.35c
Milwaukee	4.06c
New Orleans	4.75c

New York† (d)	4.22c
Philadelphia*	4.18c
Pittsburgh	3.80c
Portland (f) (d)	5.35c
San Fran. (f) (d)	6.30c
Seattle (f) (d)	5.35c
St. Louis	4.19c
St. Paul	4.20c
Tulsa	4.80c

COLD ROLLED STRIP

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

TOOL STEELS

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

High speed	59½c
High carbon, high chrome	39c
Oil hardening	23c
Special tool	21c
Extra tool	17½c
Regular tool	14½c
Uniform extras apply.	

BOLTS AND NUTS
(100 pounds or over)

Chicago (a)	85
Cleveland	70
Detroit	70-10
Milwaukee	65

Discount

New Orleans	70-10
Pittsburgh	65-5

(a) Under 100 lbs., 60 off.
(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Quantity base; (e) New mill classif. (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less; (i) Under 3 in.; (j) Shapes other than rounds, flats, fillet angles, 3.50c.

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

†Domestic steel;
*Plus quantity extras;
**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, Feb. 4

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	£ s d	*Quoted in gold pounds sterling
PIG IRON				
Foundry, 2.50-3.00 Silicon	\$18.38 to 3 15 0 to	\$15.25	1 17 6	
Basic bessemer	20.83 4 5 0*	13.43	1 13 0	
Hematite, Phos. .03-.05	21.48 4 7 6			
SEMIFINISHED STEEL				
Billets	\$30.69 6 5 0	\$24.40	3 0 0	
Wire rods, No. 5 gage	48.49 9 17 6	41.68	5 2 6	
FINISHED STEEL				
Standard rails	\$40.51 8 5 0	\$44.74	5 10 0	
Merchant bars	2.03c 9 5 0	1.39c to 1.57c	3 15 0 to 4 5 0	
Structural shapes	2.00c 9 2 6	1.29c to 1.48c	3 10 0 to 4 0 0	
Plates, ½-in. or 5 mm.	2.23c 10 3 9	2.00c to 2.05c	5 9 6 to 5 12 0	
Sheets, black, 24 gage or 0.5 mm.	2.64c 12 0 0	2.67c	7 5 0††	
Sheets, gal., 24 gage, corr.	3.23c 14 15 0	3.41c	9 5 0	
Bands and strips	2.20c 10 0 0	1.75c	4 15 0	
Plain wire, base	2.31c 10 10 0	1.94c to 2.12c	5 5 0 to 5 15 0	
Galvanized wire, base	2.75c 12 10 0	2.15c to 2.30c	5 17 6 to 6 5 0	
Wire nails, base	2.64c 12 0 0	1.75c to 2.02c	4 15 0 to 5 10 0	
Tin plate, box 108 lbs.	\$4.85 0 19 9			

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	\$19.89 4 1 0(a)	\$17.51 375	\$21.06 625	\$25.36 63
Basic bessemer pig iron	20.25 4 2 6(a)	12.84 275	14.66 435	29.97 (b) 69.50
Furnace coke	5.28 1 1 6	5.93 127	4.62 137	7.65 19
Billets	30.69 6 5 0	27.55 590	21.57 640	38.84 96.50
Standard rails	1.82c 8 5 0	1.64c 780	1.73c 1,150	2.38c 132
Merchant bars	2.19c 9 10 0	1.68c 800	1.16c 775	1.98c 110
Structural shapes	2.01c 9 3 0	1.64c 730	1.16c 775	1.93c 107
Plates, ½-in. or 5 mm.	2.16c 9 16 9	2.12c 1,010	1.43c 950	2.29c 127
Sheets, black	2.64c 12 0 0	2.62c 1,250†	1.54c 1,025†	2.59c 144†
Sheets, galv., corr., 24 ga. or 0.5 mm.	3.08c 14 0 0	4.41c 2,100	2.85c 1,900	6.66c 370
Plain wire	2.42c 11 0 0	2.77c 1,320	2.02c 1,350	3.11c 173
Bands and strips	2.26c 10 5 0	1.92c 915	1.43c 950	2.29c 127

*Basic. †British ship-plates. Continental, bridge plates. \$24 ga. †† 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 66.85 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	SPRINGS	Buffalo	19.50-20.00	Buffalo	12.25-12.75	Cincinnati, iron ...	17.50-18.00
Birmingham	Buffalo	Chicago, leaf	20.25-20.75	Cincinnati, dealers..	9.50-10.00	Eastern Pa., iron ..	19.00
Bos. dock, No. 1, exp.	Chicago, coil	Chicago, coll	22.50-23.00	Cleveland	12.00-12.50	Eastern Pa., steel ..	23.00-23.50
N. Eng. del. No. 1 ..	Eastern Pa.	Pittsburgh	23.00-23.50	Detroit	10.50-11.00	Pittsburgh, iron ...	19.00-19.50
Buffalo, No. 1	Pittsburgh	St. Louis	24.50-25.00	Eastern Pa.	11.00-11.50	Pittsburgh, steel ...	24.50-25.00
Buffalo, No. 2	St. Louis		18.75-19.25	New York	†7.00- 7.50	St. Louis, iron	16.50-17.00
Chicago, No. 1				Pittsburgh	14.00-14.50	St. Louis, steel	18.75-19.25
Cleveland, No. 1 ..	ANGLE BARS—STEEL			Toronto, dealers ...	6.25		
Cleveland, No. 2 ..	Chicago					NO. 1 CAST SCRAP	
Detroit, No. 1	St. Louis			CAST IRON BORINGS		Birmingham	13.00-14.00
Eastern Pa., No. 1 ..	Buffalo			Birmingham	6.00- 6.50	Bos. dis. No. 1 mach.	13.75-14.00
Eastern Pa., No. 2 ..				Boston dist. chem...	†8.50- 9.00	N. Eng., del. No. 2 ..	†13.00
Federal, Ill.	RAILROAD SPECIALTIES			Boston dist. for mills	†8.00- 8.25	N. Eng., del. textile ..	16.00
Granite City, R. R. .	Chicago			Buffalo	12.25-12.75	Buffalo, cupola	16.50-17.00
Granite City, No. 2 .				Chicago, dealers ...	10.50-11.00	Buffalo, mach.	17.25-17.75
New York, No. 1 ..	LOW PHOSPHORUS			Cincinnati, dealers..	9.50-10.00	Chicago, agrl. net...	12.50-13.00
N.Y. dock, No. 1 exp.	Buffalo, billet and			Cleveland	12.00-12.50	Chicago, auto	14.75-15.25
Pitts., No. 1 (R. R.) .	bloom crops			Detroit	10.50-11.00	Chicago, mach. net ..	16.00-16.50
Pitts., No. 1 (dir.) .	Cleveland, billet,			E. Pa., chemical ...	13.00-13.50	Chicago, rail'd net. .	14.50-15.00
Pittsburgh, No. 2 ..	bloom crops			New York	†8.00- 8.50	Cincl., mach. cup...	15.75-16.25
St. Louis, R. R.	Eastern Pa., crops..			St. Louis	8.00- 8.50	Cleveland, mach.	17.50-18.00
St. Louis, No. 2 ..	Pittsburgh, billet,			Toronto, dealers ...	6.75	Eastern Pa., cupola ..	18.50-19.50
Toronto, dtrs. No. 1 .	bloom crops					E. Pa., mixed yard ..	16.00-16.50
Toronto, No. 2	Pittsburgh, sheet			PIPE AND FLUES		Pittsburgh, cupola ..	18.00-18.50
Valleys, No. 1	bar crops			Cincinnati, dealers.	9.75-10.25	San Francisco, del..	13.50-14.00
				Chicago, net	12.50-13.00	Seattle	11.00-12.00
						St. Louis, No. 1	13.50-14.00
						St. L., No. 1, mach. .	14.25-14.75
						Toronto, No. 1,	
						mach., net	10.50-11.00
						HEAVY CAST	
						Boston dist. break...	12.75-13.00
						New England, del...	15.00
						Buffalo, break.	14.00-14.50
						Cleveland, break ...	13.50-14.00
						Detroit, No. 1 mach.	
						net	13.50-14.00
						Detroit, break.	12.50-13.00
						Detroit, auto net...	14.25-14.75
						Eastern Pa.	18.00
						New York, break...	†13.50-14.00
						Pittsburgh	16.00-16.50
						MALLEABLE	
						Birmingham, R. R. .	15.00-15.50
						New England, del. .	†16.25-17.50
						Buffalo	18.50-19.00
						Chicago, R. R.	20.50-21.00
						Cincl., agrl. del.	14.75-15.25
						Cleveland, rail.	18.00-18.50
						Detroit, auto, net...	15.00-15.50
						Eastern Pa., R. R. .	18.00-18.50
						Pittsburgh, rail ...	19.50-20.00
						St. Louis, R. R.	17.00-17.50
						RAILS FOR ROLLING	
						5 feet and over	
						Birmingham	16.00-16.50
						Boston	13.25-13.50
						Buffalo	19.00-19.50
						Chicago	20.00-20.50
						Eastern Pa.	18.50-19.00
						New York	16.50-17.00
						St. Louis	17.75-18.25
						LOCOMOTIVE TIRES	
						Chicago (cut)	20.50-21.00
						St. Louis, No. 1	17.50-18.00
						LOW PHOS. PUNCHINGS	
						Buffalo	20.00-21.00
						Chicago	22.00-22.50
						Eastern Pa.	23.00-23.50
						Pittsburgh (heavy) .	23.50-24.00
						Pittsburgh (light) .	21.50-22.00

Iron Ore

Lake Superior Ore	
Gross ton, 51 1/4%	
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.	16.00
No. Afr. low phos..	16.00
Swedish low phos.	nominal
Spanish No. Africa	
basic, 50 to 60% .	15.50
Tungsten, spot sh.	
ton unit, duty pd. .	\$15.85-16.00
N. F., fdy., 55%	7.00
Chrome ore, 48%	
gross ton, c.i.f.	20.00-21.00

Manganese Ore

(Nominal)	
Prices not including duty, cents	
per unit cargo lots.	
Caucasian, 50-52%	34.00
So. African, 50-52%	34.00
Indian, 50-52%	34.00

Bars

Bar Prices, Page 72

Pittsburgh—Specifications from machinery manufacturers have been steady, railroad equipment has been taking good tonnages and some buying has been done by the automotive industry outside of General Motors. Mills are being pressed for deliveries, indicating that most of the material is desired for immediate use. Schedules are considered at a very satisfactory rate considering all developments. Carbon bars are quoted 2.20c, base, Pittsburgh.

Cleveland — Mills are operating close to capacity in an effort to clear rolling schedules before General Motors resume capacity operations. Some consumers, anticipating this, want to have their material rolled and shipped as soon as possible. Farm implement manufacturers, roadmaking equipment and steel forging concerns are expected to show greater activity over the next few months. Alloy bar divisions, while more severely affected by General Motors suspension orders, are still active; for partsmakers who have the facilities, are building up small stocks.

Chicago—Steel bar sales and specifications continue heavy and shipments are at about the active rate of the past several weeks. While deliveries to automotive interests still are curtailed somewhat by the labor situation, the movement has been aided slightly by resumption of operations at some General Motors plants. Farm implement and tractor manufacturers show moderate gains in bar requirements and schedules of these interests are expected to be increased further during the next several months. Shipments to cold bar finishers continue heavy. Prices are steady.

Boston — Deliveries on commercial steel bars have improved, although not all tonnage taken before the \$3 advance has been shipped. Alloy bar buying is active, notably to machine builders. Bars for forging also are moving well.

Philadelphia—Sellers of commercial bars are booked ahead about four weeks on an average, while those of alloy bars are booked ahead many weeks, in some cases into June, with heat treating an important factor in delay as such equipment is inadequate at most plants in meeting present heavy demands. Jobbers of alloy steel bars, in view of this situation, are being particularly pressed and are having much difficulty in replenishing their supplies. Consumers, in buying from warehouses,

are now in some cases being forced to buy over-sized bars for machining to size in their own plants, as the specifications they request are not in stock.

Alloy Bars

Standard classification of extras on hot-rolled alloy steels has been revised by all principal producers, applying to ingots, blooms, billets, slabs, bars, spring steel, bands and other forms. The new classification

will be effective on second quarter sales. In some instances the former extra is unchanged, in others the bar extra is advanced 10 cents per 100 pounds and the billet extra \$2 per ton; in some cases the bar extra is advanced 15 cents and the billet extra \$4 per ton. New extras are quoted on page 73.

Cold Finished

Cold Finished Prices, Page 73

Pittsburgh — Diversified sources

A New Booklet on Resistance Welding . . .

(Spot, Butt and Projection)

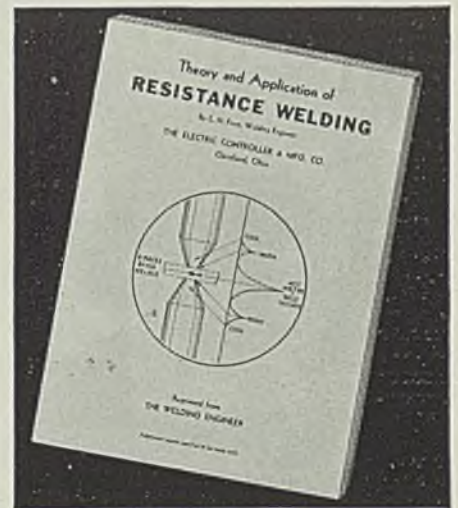
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THIS BOOKLET describes: *Welding Machines and Methods—Transformer capacity and pressure requirements—Data for butt and projection welding—Selection of electrodes and electrode material—Spot welding of coated sheets, ferrous and non-ferrous metals.*

Now available . . . in a new 16-page booklet, just off the press . . . modern, up-to-date facts and information on spot, butt and projection welding—conveniently compiled for quick reference. We know the information contained in this handy booklet will prove extremely useful and helpful to every manufacturer employing or contemplating the resistance method of fabrication. Merely fill out and mail the coupon below for your copy. Only a limited supply has been printed—be sure to mail coupon today.



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NAME
COMPANY
ADDRESS

have been taking good tonnage of cold-finished material and pressure for deliveries is still strong upon producers, who have encountered some difficulty in a few instances in obtaining shipments from hot mills. Despite the General Motors labor situation, one independent automobile producer has been ordering lately.

Shipments of bars are being taken by a few suppliers affected by the strike. Cold-finished bars continue at 2.55c, base, Pittsburgh.

Plates

Plate Prices, Page 72

Pittsburgh—Wheeling Steel Corp.'s award of 25 barges, involving approximately 2900 tons of plates, to Dravo Corp. has been the largest piece of business here in some time. Other fabricating shops are busy, however, and a number of barge projects are anticipated.

Considerable repair business may result from the recent flood, but at present this is indefinite. Plates are steady at 2.05c, Pittsburgh.

Cleveland—Plate mills remained at close to capacity operations through the first week in February. Little letup is anticipated during the month for backlogs in most cases are extended into March. New awards are confined to relatively small tonnages, for light structural work and specialty manufacturers of presses and stamping machines.

Chicago—Plate contracting for freight car building purposes has been heavy lately and mills have acquired substantial backlogs which will support production at a high rate. Most of the plates involved in railroad equipment pending recently have been placed, though buyers have until the end of March to issue specifications. Miscellaneous plate demand is well sustained. Few large line pipe projects are pending and orders remain to be placed for major construction programs under consideration in the oil industry.

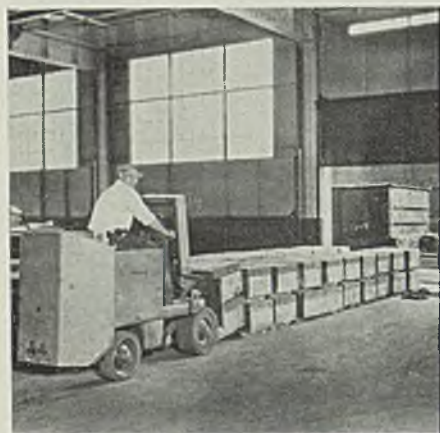
Boston — Buying of plates has slackened with less new work out for fabrication. Shipments are heavy with users pressing for delivery against specified projects figured earlier. Shipments to shipyards are important. On new business 3.45c Boston is firm with few exceptions.

New York—Following heavy commitments last month against identified work platemarkers are experiencing some letdown. Miscellaneous demand, however, is well sustained and some substantial tonnages are in sight, including ship work, and subway cars for New York and plates for the north tube of the Midtown tunnel.

Philadelphia—Plate commitments are off, following the substantial coverage of tonnage last month against identified work. However, miscellaneous business is fair and some further ship work is in sight, including two battleships, each requiring approximately 30,000 tons of plates, shapes and bars, on which the navy will open bids March 15. One of these will be built in a private yard. The navy has recently placed one destroyer with the Philadelphia navy yard and one with the Norfolk, Va., navy yard, and will build a submarine in the Mare Island yard, California. Plate deliveries at some eastern plants are available in two weeks, and less.

San Francisco — Demand for plates is by no means active and bookings so far this year aggregate only 2754 tons, compared with 34,861 tons for the same period last year. Ventura, Calif., on an inquiry for 195 tons of 24-inch welded pipe,

TOWMOTOR CLEVELAND GAS OPERATED LIFT TRUCKS *For Handling Tin Plate* **OR OTHER MATERIAL**



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TRANSPORTING



PLACING

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GAS HAULAGE EQUIPMENT SINCE 1919



purchased reinforced concrete pipe. Quantity differentials on the Pacific Coast have been advanced, effective at once and 25 cents has been added on lots of 6000 to 4000 pounds; 75 cents on lots under 4000 to 2000 pounds and \$1.25 on lots under 2000 pounds.

Seattle—With shipping resumed, new projects are expected to develop as it is known several important jobs are soon to be released. Meanwhile shops have a fair run of small orders in hand. Business pending includes 300 tons for radial gates for Bonneville dam, Star Iron & Steel Works, Tacoma, low, and an unstated tonnage for the Roza project siphons, material for which will be purchased by the reclamation bureau.

Contracts Placed

1050 tons, 3-93,000-barrel tanks, Sinclair Refining Co., East Chicago, Ind., to Chicago Bridge & Iron Works, Chicago.
225 tons, tank repairs Humble pipe line, Fondren, Texas, to Petroleum Iron Works Co., Beaumont, Tex.
100 tons, 36-in. welded steel pipe, Treasury Department, San Francisco for Oakland, Invit. 3251, to Steel Tank & Pipe Co., Berkeley, Calif.

Sheets

Sheet Prices, Page 72

Pittsburgh—Mills have been given no chance to reduce backlogs recently because of heavy demand from miscellaneous sources. Deliveries continue well extended, ranging up to at least six weeks in some large sizes. Anticipating return of General Motors to the market, some consumers are believed to have placed tonnage with the hope that they might obtain earlier deliveries. National operations of common black and galvanized mills for the week ending Jan. 29 showed a further recession as a result of the floods, but a speedy return to normal was expected. Pittsburgh base prices on sheets are steady.

Cleveland—Most sheet mills are out of the market on first quarter deliveries, but in a few instances they have accepted orders for second quarter with the definite provision that prices effective at that time shall prevail. General miscellaneous requirements, particularly from stove, refrigerator and farm equipment producers, were heavier than many expected last month. In some cases this new tonnage has more than filled the openings on rolling schedules caused by General Motors suspension of shipments.

Chicago—Sheet production is limited only by mill capacity and full operations are assured for the remainder of this quarter. Mills are

accumulating some backlogs for delivery early next quarter as consumers desire to obtain protection on supplies. Automotive shipments remain heavy despite curtailed consumption at General Motors plants and miscellaneous users are pressing mills for prompt deliveries.

Boston—Sheet buying has declined, consumers generally pressing for delivery against old orders. There are instances where new buying would be heavier, covering a broad range of finishes, if delivery was more certain. Small tank, con-

tainers and miscellaneous industrial demand holds well with delivered prices in this district firm.

New York—Demand for steel sheets is brisk with deliveries generally well extended. There appears to be some extra buying with protection sought against possible price advances for second quarter.

Buffalo—There is no evidence of reduced demand for sheets. One local works catering to the motor car producers has added an open hearth during the past week. Continued high scale production is



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planned by sheet producers here throughout the month.

Philadelphia—Cold-finished sheets and heavy gages of hot sheets, as is usual in the latter case, are available for fairly early delivery, with three weeks and less on hot sheets and three to four weeks on cold-finished. On most other grades deliveries extend five or six weeks and beyond. Shipments on lighter gages of hot sheets are weeks off in many cases. Meanwhile, fresh demand is holding up well, especially for galvanized sheets from the jobbing

trade for spring business, with deliveries in most cases at least four and five weeks off.

Cincinnati—All sheet mills in the district were affected, directly or indirectly, by the Ohio river flood. The leading interest is to go on full schedule this week, power and railroad transportation having been restored. Another mill will be down two or three weeks for rehabilitation. Backlogs assure demand for full production through the remainder of the quarter, although new business is still being accepted.

St. Louis—Producers and distributors of steel sheets report unfilled orders sufficient to hold the present high rate of deliveries well into the spring. Purchasing by railroads and car builders has reached the highest point in recent years, and recent lettings indicate further expansion in this outlet.

Birmingham, Ala.—Nearly capacity operations are assured sheet mills of the South and output is being moved promptly. Mills have long since set a record for long-time steady operation.

Behind the Scenes with STEEL

Discrimination

LUCKY passengers on United Air Lines new "Sky lounge Mainliners" will receive overnight kits before they start on their journey, according to George Mason of United's news bureau. Women will get a compact, powder puff, skin lotion and comb; men a razor, blade, comb, nail file, shaving cream, toothbrush and toothpaste.

What we'd like to know is why the women don't get a toothbrush and toothpaste. Come on, United Air Lines, give the babes a break. What do you expect them to do—gargle?

Cats Meow!

FELINES to the fore! apparently was the cry of advertisers in STEEL for Jan. 25. On page 7 Goodrich pictured a startling close-

INQUISITIVE CAMERA DEPT.—XXI



CLYDE H. BAILEY, member of the Cleveland business staff of STEEL, and associated with the magazine since 1922. An alumnus of Western Reserve University, Clyde has carried on his capable shoulders a heavy load of production and promotion detail over the past 15 years.

up of a snarling fox (don't tell us that was no fox, Mr. Goodrich) who used to chew off its leg when caught in a trap, but now finds this unnecessary because of the introduction of rubber-covered trap jaws. Further along, on page 89, Manganese Steel Forge Co. half-paged a smiling puss who ap-

peared to be tasting the last of at least a dozen fat canaries.

No one can say our advertisers are going to the dogs! Now let's have a little dissertation from some merchandising authority on "Some Notes on the Role of Animals in Advertising."

Back to the Alleys

BOWLING as a means of working down the waistline is taking a new lease on life. Probably you have read that 790 employees of United States Steel Corp. subsidiaries in the Chicago district will get together this month for their first annual tenpin tournament—said to be one of the largest industrial tournaments ever staged.

We are happy to report the Penton Publishing Co. has fallen in line and organized a bowling league which meets weekly in one of the town's better alleys. Members are being added regularly and before long a championship aggregation is anticipated. Challenges from local or out-of-town pin demollishers are invited.

Alumni News

NEWs report emanating from Detroit concerns the granting of a divorce to a woman who claimed her husband inhaled his soup from a saucer and picked up his beefsteak in his fingers when dining out with her. The judge inquired if the woman's husband did not know better than to act this way, and the divorcee replied that he should have, being a graduate of Purdue university. The judge, it appears, snorted disgustfully, for he was a graduate of the University of Michigan, no less.

Purdue Alumni, Unite! Protest this unfair discrimination against the fair name Boilermakers!

Quins Rate

HEADLINE OF THE WEEK: "Carefully Select Your Chemical 'Quins'"—Wickwire Spencer Steel Co. in the Feb. 1 issue of STEEL. That's Dionne-ly reference to the Kanadian Kids we have seen as yet in these august pages.

—SHRDLU

Transportation

Track Material Prices, Page 73

Placing of 10,792 railroad cars with builders in the past week practically clears up pending inquiries and placing of orders for the steel will add to mill backlogs. Expiration of price protections probably caused closing of most of these inquiries. Few cars remain to be placed.

Board of transportation, New York, will ask new bids on passenger cars for the independent subway system in March, at a date to be set by the board of estimate Feb. 9. The number of cars to be figured will also be decided then. The previous inquiry called for 250 though later reports indicated 500 might be purchased.

Rail mills have increased production to about 70 per cent of capacity in some instances but controlled cooling and normalizing practice tends to lower tonnage produced.

Freight car awards in December were 17,806, compared with 23,450 in December. Details for preceding months are as follows:

	1937	1936	1935	1934
Jan.	17,806	2,050	24	152
Feb.	6,900	806	19,725
March	632	0	30
April	4,427	350	800
May	8,900	2	717
June	5,220	5,151	1,835
July	7,229	500	19
Aug.	225	200	105
Sept.	1,750	875	7
Oct.	2,210	1,250	75
Nov.	1,550	100	254
Dec.	23,450	10,050	110
Total	64,643	19,308	23,829

Rail Orders Placed

Northern Pacific, 10,000 tons, to Carnegie-Illinois Steel Corp., Pittsburgh, Bethlehem Steel Co., Bethlehem, Pa., and Colorado Fuel & Iron Co., Pueblo, Colo.

Car Orders Placed

Canadian National Railways, 3000 box cars, 300 refrigerator cars, 300 gondola cars, 50 flat cars and 15 snowplows, awarded to the Canadian builders.

Chesapeake & Ohio, three passenger and

Pipe

Pipe Prices, Page 73

Pittsburgh—With January behind and the Pacific coast maritime strike ended, the effects of the flood, and possibly the automotive labor controversy, pipe producers find the outlook considerably brighter. Railroad equipment makers have been taking large amounts of boiler tubes, and most tube mills at present are operating at close to ca-

capacity. Demand for oil country goods continues to be well maintained.

Cleveland—Little change has occurred in the general pipe market. Most jobbers report a satisfactory rate of stock turnover due to numerous small requirements from the building and industrial trade. Prices remain firm.

Chicago—Normal railroad service from the South gradually is being restored and shipments of cast pipe, interrupted by Ohio river floods, are being renewed. New business is quiet, and inquiries also are re-

baggage cars, to Bethlehem Steel Co., Bethlehem, Pa.

Chicago & North Western, 150 ballast cars to the Roger Ballast Car Co., for construction by the American Car & Foundry Co., New York.

Clinchfield railroad, 1100 freight cars, including 250 gondolas and 600 hopper cars placed with the American Car & Foundry Co., New York, and 250 steel box cars with the Greenville Steel Car Co., Greenville, Pa.

Great Northern, 500 box cars each to Pullman-Standard Car Mfg. Co., Chicago and American Car & Foundry Co., New York; 500 gondolas to Pressed Steel Car Co., Pittsburgh.

Illinois Terminal, 100 gondolas and 50 flat cars to the Mt. Vernon Car Mfg. Co., Mt. Vernon, Ill.

Illinois Central, 20 baggage and express cars, to American Car & Foundry Co.

Louisville & Nashville, in addition to 900 hopper cars to Pullman-Standard Car Mfg. Co., Chicago, 500 hopper cars to Mt. Vernon Car Mfg. Co., Mt. Vernon, Ill., 400 hopper cars to the Pressed Steel Car Co., Pittsburgh, and 500 hopper cars and 300 ballast cars to the American Car & Foundry Co., New York.

Missouri-Kansas-Texas, 125 automobile cars of 40-ton capacity, 125 of 50-ton capacity and 29 passenger coaches, to American Car & Foundry Co., New York.

Missouri Pacific, 1000 box cars, to Mt. Vernon Car Mfg. Co., Mt. Vernon, Ill.; 500 hoppers, to American Car & Foundry Co., New York; 700 gondolas, to Pressed Steel Car Co., Pittsburgh; 25 cabooses, to Magor Car Corp., New York.

Northern Pacific, 500 hopper cars to American Car & Foundry Co., New York.

Car Orders Pending

Central of Brazil, 1000 freight cars, bids asked.

Erle, 80 milk cars of passenger type, bids asked.

Grand Trunk Western, 500 freight cars, including 200 automobile cars, 100 gondolas and 200 of another type.

Locomotives Placed

Pere Marquette, 15 locomotives, to Lima Locomotive Works, Lima, O.; 11 extra tenders, to American Locomotive Co., Schenectady, N. Y., shops.

Locomotives Pending

Missouri-Kansas-Texas, six diesel locomotives.

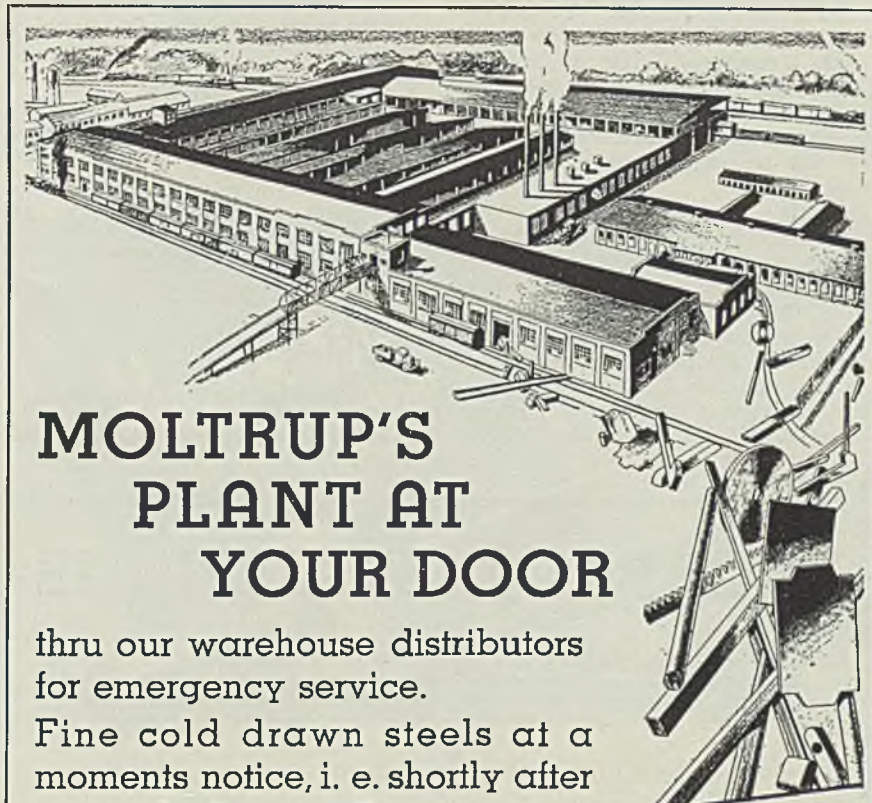
Northern Pacific, 8 locomotives, bids asked.

Buses Booked

American Car & Foundry Motors Co., New York, 23 motor coaches powered with Hall-Scott horizontal engines, booked as follows: 20 from Southeastern Greyhound Lines, Lexington, Ky., and three, Union Bus Co., Jacksonville, Fla.

Trucks Booked

White Motor Co., Cleveland: 130 heavy-duty trucks for Societe Anonyme Centrale, Teheran, Iran; 36 roadbuilding trucks for Mexican government for building government railroad line in Yucatan.



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tarded by the season. Several moderate tonnages are pending.

Boston—Merchant steel pipe buying is heavier than usual at this period. Prices generally are firm. Wrought pipe demand is moderately active, while cast pipe is seasonably dull. Demand for boiler tubes has improved.

New York—Cast pipe demand is dull with buying in small lots at firm prices. Some attractive tonnages are being prepared for early bidding.

Bartlesville, Okla. — Phillips Petroleum Co. has awarded contract for an extensive gas gathering system in the Eunice, N. Mex., field to J. F. Pritchard & Co. Forty-five miles of line will be Lindewelded.

San Francisco—Little of importance transpired in the cast pipe market and new inquiries are slow. Pending business includes 172 tons for the treasury department, Los Angeles.

Seattle—Prospects are improved, with shipping again available and deliveries by water possible. United States Pipe & Foundry Co., through H. G. Purcell, Seattle, has booked 150 tons of cast pipe for Issaquah, Wash., and a small tonnage of pipe and fittings for Bremerton, Wash. Same agency is low for 200 tons of 6 and 8 inch cast pipe for Maple-

wood, Ore. Toledo, Ore., is planning a \$100,000 water system, subject to a special election Feb. 9.

Steel Pipe Pending

3760 tons, 18-inch, for piling for west side highway extension, below Canal street, New York.

500 tons, 48 and 54-inch, electrically welded, for metropolitan district, Hartford, Conn.; Alco Products Inc., Dunkirk, N. Y., low.

Cast Pipe Placed

150 tons, Issaquah, Wash., Improvement, to United States Pipe & Foundry Co., Burlington, N. J.

Unstated tonnage, 850 feet of 30-inch, metropolitan sewerage plant, Madison, Wis., to Alabama Pipe Co., Anniston, Ala.

Cast Pipe Pending

200 tons, 6 and 8 inch, for Maplewood, Ore.; United States Pipe & Foundry Co., Burlington, N. J., low.

172 tons, 6-inch class 150, treasury department, invitation 21,069, Los Angeles; bids opened.

150 tons, McNeil Island, Wash., prison extension; bids in.

Tin Plate

Tin Plate Prices, Page 72

Pittsburgh — Operations are back

at the 95-98 per cent level with virtually all producers recovered from the temporary effects of the flood. Specifications so far this year have been unusually heavy and show no sign of slackening. Pressure has been exerted upon mills for deliveries, and in general, the situation is described as very strong. Tin plate remains quoted at \$4.85 per base box, Pittsburgh.

Strip

Strip Prices, Page 73

Pittsburgh—Pressure for deliveries in strip continues strong. Automotive manufacturers other than General Motors entered sizable specifications recently, and miscellaneous consumers are ordering steadily. Effect of General Motors suspensions has not been as drastic as anticipated a month ago. Despite the fact that backlogs are not as large as in sheets, they are far from depleted and outlook for immediate future is good. Strip continues at 2.15c, base, Pittsburgh, for hot rolled and 2.85c, base, either Pittsburgh or Cleveland, for cold rolled.

Cleveland—While there still remains room on rolling schedules for first quarter delivery, new business has exceeded expectations of producers here. Hot-rolled narrow widths are in heaviest demand, with sales last month comparing favorably with December. Sellers report little forward buying, although most consumers are anxious to have their requirements rolled and shipped before General Motors resume active operations.

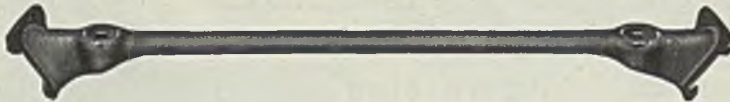
Chicago—Strip producers have fairly substantial backlogs which will insure good operations during the balance of this quarter. While cold-rolled strip consumption still is affected by reduced automotive operations, deliveries still extend about four weeks. Miscellaneous users of both hot and cold-rolled strip are making up much of the deficiency in automotive requirements. Prices are steady on new business.

Boston — Hot-rolled strip shipments are heavier. Cold strip mills continue operating at a high rate with backlogs only slightly reduced, despite some suspension to users connected with the automobile industry.

New York—Hot-rolled narrow strip is available in about three weeks but cold strip deliveries are about four weeks or more. Buying still reflects suspensions in automotive accessory plants.

Philadelphia—Narrow strip deliveries are easier at around three

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weeks for both hot and cold-rolled. While there is relatively little new buying, specifications are well maintained.

Wire

Wire Prices, Page 73

Pittsburgh—Demand for manufactured wire products in many lines has been strong and production continues at a high level. The market has been enlivened recently by recurrent reports that a price adjustment is likely, particularly where various lines are considered out of proportion.

Cleveland—New business from miscellaneous consumers keep backlogs on most wire products extended well into March. Distributors of merchant products are specifying freely for the spring trade with the result that shipments for such products should show a marked improvement during February.

Chicago—Wire sales and specifications continue heavy though distributors of merchant products have not taken the heavy shipments which they are expected to accumulate by spring. A pickup in the latter movement is looked for this month. Manufacturers' wire demand continues active and shows little effect of the curtailment in automotive consumption. Mills are being pressed for delivery and operations are at the best rate of recent years. Prices of both plain wire and merchant products are steady.

Boston — Widely diversified demand for specialties and manufacturers' wire keeps most finishing departments at high rate, despite some suspension of shipments to the automotive industry. Backlogs have not been greatly reduced. Merchant wire products are moving slowly. Plain wire is firm and unchanged at 2.80c, Worcester.

Semifinished

Semifinished Prices, Page 73

With mill operations holding at their high rate, the great demand for semifinished shows no cessation. The situation is aptly illustrated by the recent decision of one nonintegrated company to construct its own facilities in an effort to save on the cost of raw material and overcome the likelihood of any possible future difficulties in obtaining tonnage. Billets, blooms, sheet bars and slabs are quoted \$34, base, Pittsburgh; and common wire rods, \$43 and \$45.

Inquiry by Ford Motor Co. for 80-

000 tons of rerolling billets and slabs is meeting little response from steel-makers as their own requirements for finishing operations are taking capacity production of semifinished. Some small lots are understood to have been covered. One seller is said to have insisted on an equal tonnage of carbon bars being placed with the billets.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 73

New York — Bethlehem Steel Co. is low on 1900 tons of bolts for the New York tunnel authority for the Queens-Midtown tunnel. Bethlehem bid approximately \$195,000 with two other companies competing. Bayonne, N. J., will open bids Feb. 10 on 500 tons of wrought iron bolts,

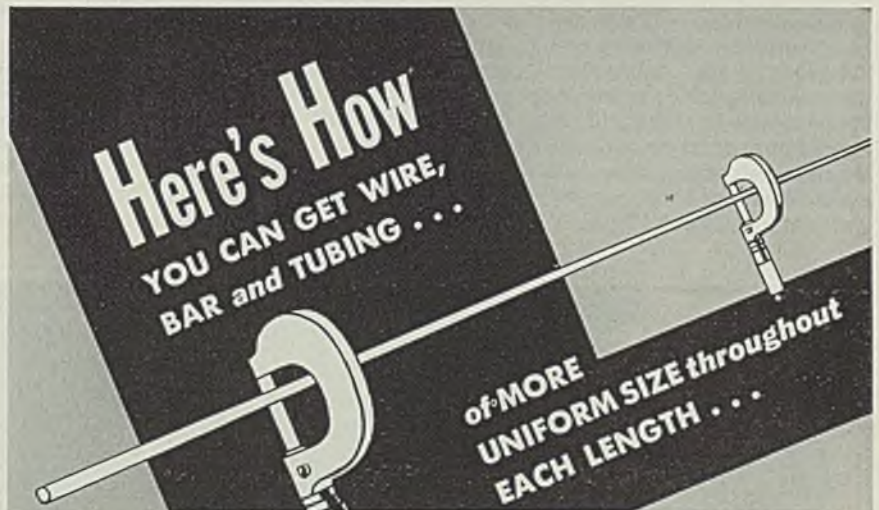
spikes and washers and 100 tons of straps for municipal docks and bulkheads.

Ferroalloys

Ferroalloy Prices, Page 74

New York—With steel production at a continued high rate, sellers of ferromanganese are in receipt of heavy specifications. Prices are firm at \$80, duty paid, Atlantic and Gulf ports. Domestic spiegeleisen shipments also well sustained, with 19 to 21 per cent material unchanged at \$26, Palmerton, Pa.

Shepard Niles Crane & Hoist Corp. has removed its New York office from 111 Broadway to 117 Liberty street.



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CARBOLOY DRAWING AND EXTRUSION DIES

Shapes

Structural Shape Prices, Page 72

New York—Inquiries have been slightly heavier, led by 6000 tons for another section of the elevated highway, New York. The steel alternate on the north tube of the Midtown tunnel is lower than cast iron bids for lining. If this goes steel about 4000 tons of shapes will be required, in addition to considerable plate requirements.

Boston—Structural awards have slumped, although inquiry is somewhat heavier, largely for bridges and engineering projects. Total pending volume in New England is not large and the bulk of private work is in the southern section of the district. Plain material is 2.43 1/2c, Boston, but comparatively little is being bought at that price for new requirements.

Philadelphia — While the close of the protective period drove in considerable work, fabricators assert that considerable tonnage is still being figured. Much of this, however, appears to be outside the immediate district. An outstanding award involves 5500 tons for the Viscose Co., at Front Royal, Va.

Pittsburgh — Awards last week were considerably lighter than in recent weeks. A state highway bridge requiring 1600 tons, in Flushing, N. Y., was placed with Bethlehem Steel Corp., Bethlehem, Pa., and 1150 tons for a University of Virginia library building, also placed with Bethlehem Steel Corp. Pending business includes 1750 tons for a garage in New York and 1600 tons for a bridge over the Missouri river at Atchison, Kans.

Cleveland—Structural fabricators report that although mill shipments have improved somewhat their operating facilities are now booked solid for 4 to 6 weeks. This is the result of numerous small awards placed during the last two weeks in January. The leading award of the past week went to R. C. Mahon, Detroit, involving 360 tons for a plant extension of Lima Locomotive Works, Lima, O. Bids are out on two state grade crossing eliminations at Akron, O., requiring 700 tons.

Chicago—Awards are lighter but fabricators and producers of plain material have moderately heavy backlogs. An increase in private building activity appears to be in the making and state bridge work is expected to be heavier with the

approach of spring. A Mississippi river dam at Winfield, Mo., involving 5000 tons of shapes, will be up for bids shortly.

Birmingham, Ala.—New business is in small tonnages but heavy backlogs and orders on hand are sufficient to warrant continued activity at fabricating shops. Several contracts for bridges, mainly highway, have been awarded recently.

San Francisco — The structural shape market was the most active one of the week. Close to 2000 tons were placed, bringing the aggregate for the year to 15,812 tons as compared with 10,402 tons in 1936. Columbia Steel Co. secured 640 tons for a race track grandstand at Santa Anita, Calif., and 636 tons for six bridges for the Southern Pacific Co., San Francisco. Plans have been completed and bids are expected to be called for within two weeks for the Union Station at Los Angeles, requiring from 4000 to 5000 tons.

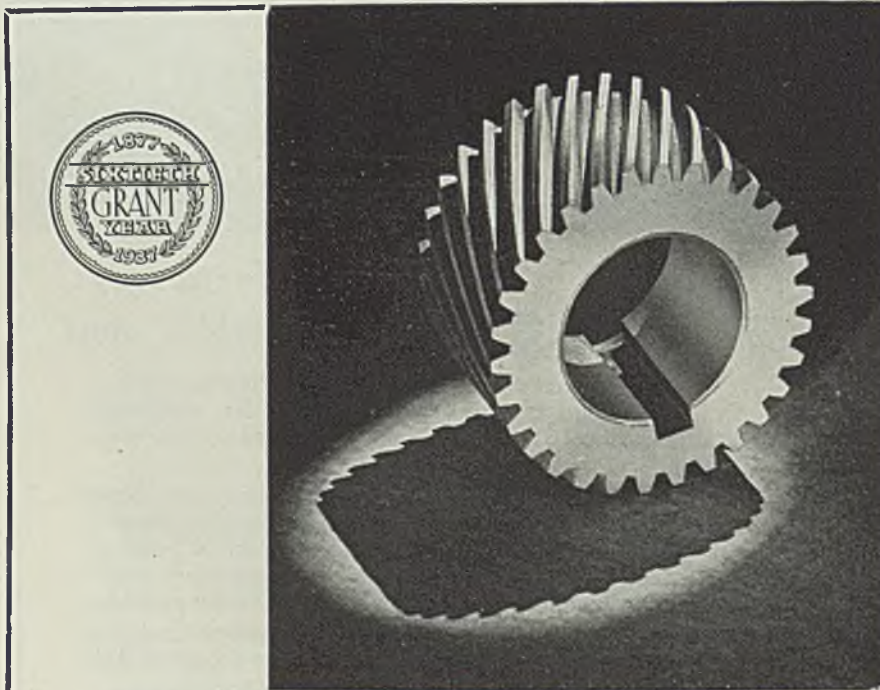
Seattle—While immediate demand was retarded by the maritime strike and unfavorable weather, potential business is of sizable proportions and should result in important lettings within 60 days. Under new governmental regulations governing transportation of oil, steel hulls are in strong demand and may result in important contracts shortly.

Shape Contracts Placed

- 5500 tons, plant for Viscose Co., Front Royal, Va., 4500 tons to Bethlehem Steel Corp., Bethlehem, Pa., and 1000 tons for power plant, to Belmont Iron Works, Eddystone, Pa.
- 1600 tons, state highway bridge WF-36-5, Flushing, N. Y., to Bethlehem Steel Corp., Bethlehem, Pa.
- 1200 tons, plant, American Can Co., New York, to American Bridge Co., Pittsburgh.
- 1150 tons, library building, for University of Virginia, Charlottesville, Va., to Bethlehem Steel Corp., Bethlehem, Pa.
- 965 tons, shops and garage, Indianapolis, Ind., to R. C. Mahon Co., Detroit.
- 800 tons, market buildings, for Central New York Regional Market authority, Syracuse, N. Y., to Gray Steel Corp.
- 640 tons, race track grand stand, Santa Anita, Calif., to Columbia Steel Co., San Francisco.
- 636 tons, five crossings over Santa Clara River and one over Tehachapi Creek, Calif., for Southern Pacific Co., San Francisco.

Shape Awards Compared

	Tons
Week ended Feb. 6.....	17,095
Week ended Jan. 30.....	64,988
Week ended Jan. 23.....	13,715
This week, 1936.....	17,093
Weekly average, 1936.....	21,764
Weekly average, 1937.....	29,239
Weekly average, January...	31,148
Total to date, 1936.....	140,890
Total to date, 1937.....	175,424



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Francisco, to Columbia Steel Co., San Francisco.
 610 tons, factory building, Alco-Gravure Inc., Hoboken, N. J., to Lehigh Structural Steel Co., Allentown, Pa.; Ballinger Co., Philadelphia, general contractor.
 360 tons, plant extension, Lima Locomotive Works, Lima, O., to R. C. Mahon, Detroit.
 350 tons, state highway bridge, Jimmy Lee crossing, Atlantic county, New Jersey, to Bethlehem Steel Corp., Bethlehem, Pa.
 305 tons, state highway bridge, Delaware county, New York, to American Bridge Co., Pittsburgh; through Robert E. Tompkins Co.
 300 tons, bridges, Santa Fe railroad, Chicago, to American Bridge Co., Pittsburgh.
 235 tons, state highway bridges, Cotopaxi and Montrose, Colo., to American Bridge Co., Pittsburgh.
 210 tons, building, Du Pont interests, Carneys Point, Pa., to Belmont Iron Works, Eddystone, Pa., which also recently booked 80 tons for the same project.
 210 tons, forge shop, American Locomotive Co., Schenectady, N. Y., to American Bridge Co., Pitts.
 200 tons, pump houses for Shell Oil Co., California, to Bethlehem Steel Corp., Bethlehem, Pa.
 200 tons, incinerator building, Rochester, N. Y., to F. L. Heughes & Co., Rochester.
 165 tons, oil heating plant equipment, for Lummus Co., Cleves, O., to Jos. T. Ryerson & Son Co. Inc., Chicago.
 165 tons, state highway bridge, Oxford-Chester highway, Orange county, New York, to Bethlehem Steel Corp., Bethlehem, Pa., through A. E. Ottaviano Inc.
 160 tons, distributing plant, Philadelphia, for H. J. Heintz Co., Pittsburgh, to Bethlehem Steel Corp., Bethlehem, Pa.
 159 tons, two crossings over Tehachapi Creek, Calif., for Southern Pacific Co., San Francisco, Calif., to Bethlehem Steel Co., Alameda Calif.
 155 tons, turbine supports, Public Utility Engineering & Service Corp., San Diego, Calif., to Minneapolis-Moline Power & Implement Co., Minneapolis.
 130 tons, bridge, Montague, Mass., to Boston Bridge Works Inc., Cambridge, Mass.
 125 tons, industrial structure for Wypenn Oil Co., Tacoma, Wash., to Pacific Car & Foundry Co., Seattle.
 120 tons, warehouse, Interboro News Co., New York, to Ingalls Iron Works, Birmingham, Ala., through Turner Cost Co.
 120 tons, addition, Revere Sugar Refining Co., Charleston, Mass., to Lehigh Structural Steel Co., Allentown, Pa.
 115 tons, building No. 59, Barrett Co., Philadelphia, to Montgomery Iron & Steel Co., Philadelphia.
 110 tons, school, Marlon, Mass., to John E. Cox Co., Fall River, Mass.
 100 tons, 196-foot viaduct, Lincoln, Neb., to Illinois Steel Bridge Co., Jacksonville, Ill.

Atchison, Kans., for states of Kansas and Missouri.
 800 tons, addition to turbine house and boiler house, for Detroit Edison Co., Detroit.
 700 tons, two state grade crossings, at Akron, O.; bids out.
 600 tons, bridges, Fordtown, Tenn.
 550 tons, two state highway bridges and one railroad bridge, Schererville and Rome City, Ind.
 500 tons, power station extension, for Gulf States Utilities Co., Beaumont, Tex.
 500 tons, building, Dearborn, Mich., for Montgomery Ward & Co., Chicago.
 450 tons, miscellaneous steel, Contracts D, E and F, for Overseas road and toll bridge district, Miami, Fla.
 400 tons, bridge, Lyme, N. H., to Thetford, Vt., for state of New Hampshire.
 359 tons, rebuilding of three subways, Cook county, Illinois.
 355 tons, New Jersey state bridge work, bids to be opened Feb. 15; three projects are involved, comprising 135-ton bridge at Elberon, 135-ton bridge at Deal and an 85-ton project in Jersey City.
 300 tons, bridge over Wabash river, Lockport, Ind., for Carroll county, Indiana.
 275 tons, state highway bridge, Great Cacapon, W. Va.
 275 tons, gates for Bartlett dam, Salt River project, Arizona; bids opened.
 260 tons, state infirmary building No. 20, Raybrook, N. Y.
 250 tons, state highway bridges, Palsade, Colo.
 250 tons, Pennsylvania state bridge in Warren county.
 200 tons, switch racks, Metropolitan water district, Los Angeles, specification 2175; bids opened.
 125 tons, bridge, Attleboro, Mass.

Unstated, spillway gates and equipment, Fort Peck dam project, Montana; general contract to McKiernan-Tierney Corp., New York.
 Unstated, drum gate mechanism and controls, Arrowrock dam, Boise, Idaho, project; bids to bureau of reclamation, Denver, Feb. 10.

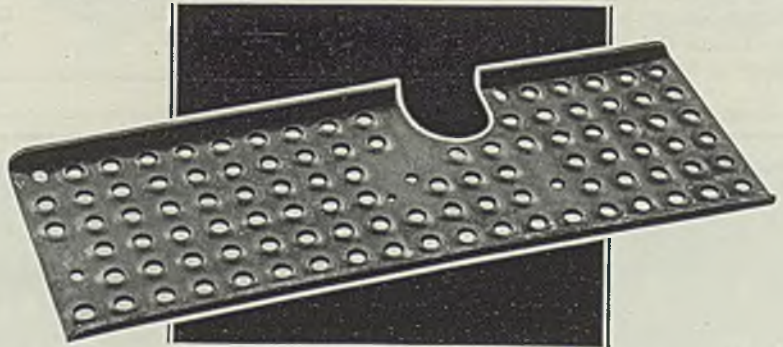
Reinforcing

Reinforcing Bar Prices, Page 73

Pittsburgh — Projects which will require considerable tonnages soon are numerous. These include the Pennsylvania railroad electrification and several apartment jobs in Washington. Bids will be taken soon on the new Banksville road project, Pittsburgh, involving 500 tons. A rubbish incinerator in Rochester, N. Y., will require 130 tons. Because of rising building costs, several federal government projects recently have either failed to draw bids or have resulted in the receipt of lowest bids which were in excess of estimates.

Cleveland—Awards are confined to small tonnages from private sources. However, mills are fairly active making shipments on orders placed through January. The largest reinforcing bar award since the

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Shape Contracts Pending

6000 tons, elevated highway, 135 to 146 streets, New York; bids due Feb. 16.
 5000 tons, Mississippi river dam No. 25, Winfield, Mo.
 4000 tons, North Tube Midtown tunnel, New York; Mason & Hanger Co., general contractors.
 4000 tons, cranes, Carnegie-Illinois Steel Corp., Pittsburgh.
 4000 tons, Union Station, Los Angeles; bids about Feb. 20.
 1750 tons, garage, for New York City Omnibus Co., New York.
 1600 tons, bridge over Missouri river,

first of the year went to Truscon Steel Co., Youngstown, O., involving 400 tons. This was a building extension for Saalfeld Publishing Co., Akron, O. Among the pending list there is a state grade crossing elimination at Rocky River, O., suburb of Cleveland, requiring approximately 200 tons. Prices are firm.

Chicago — Reinforcing bar shipments remain fairly heavy for this season, with an upward trend in prospect in view of pending and prospective building work. Sewer construction has helped support shipments, though winter weather has interfered less than usual with outdoor building. Chicago sanitary district shortly will place 1375 tons for the southwest sewage treatment works while additional tonnages are scheduled to be bought over the next several months. Private building has produced few large inquiries lately. A steadier tone is shown in prices.

Boston—Reinforcing bar demand is light with few major tonnages up for figures. Buying is mostly for small lots with prices unsteady. Bridges and engineering projects account for the bulk of pending needs—which are the smallest in several months with an early upturn expected.

New York—While reinforcing bar buying is light inquiries are heavier as tunnel and elevated highway needs total over 1000 tons. About 4500 tons of bars is active. Prices are slightly firmer.

Philadelphia — Apart from 380 tons of bars for a school here, little tonnage is being figured in the local

warehouse market. Prices on billet bars have not yet received any real test, as the principal tonnages have been rail steel bars, in which weakness continues.

San Francisco—Included among the larger lots of reinforcing bars placed were 205 tons for a building in San Francisco for Standard Brand Co., taken by Truscon Steel Co., San Francisco. To date this year only 2423 tons have been booked, compared with 39,231 tons for the same period last year. Work on the Central Valley water district, California, is under way. A heavy tonnage of bars will be required but it is understood that the bureau of reclamation will furnish all the steel material required, taking separate bids for it later.

Seattle—Cold weather has retarded construction work causing a temporary slack in the demand for reinforcing material. Both local mills are well supplied with orders running to the end of the first quarter. Business pending is not important.

The price structure is firm and indications are favorable to an improved demand within a few weeks.

Reinforcing Steel Awards

- 205 tons, building, Standard Brands Co., San Francisco, to Truscon Steel Co., San Francisco.
- 154 tons, invitation 3249, treasury department, San Francisco, to Soule Steel Co., San Francisco.
- 124 tons, courthouse and jail, Santa Cruz, Calif., to Gunn, Carle & Co., San Francisco.
- 100 tons, factory, North American Aviation Co., Inglewood, Calif., to unnamed interest.
- 100 tons, section 3, Chicago sanitary district sewer, to Concrete Steel Co., Chicago.

Reinforcing Steel Pending

- 380 tons, school, Philadelphia, McCloskey & Co., that city, low on the general contract; these contractors, as noted in a previous issue, recently placed steel for two other schools in this city; rail steel bars are required.
- 318 tons, two state bridges over Big Tujunga Wash, Los Angeles county, California; bids Feb. 18.
- 300 tons, building for Patton State Hospital, Calif.; bids opened.

Concrete Awards Compared

	Tons
Week ended Feb. 6	683
Week ended Jan. 30	3,191
Week ended Jan. 23	1,424
This week, 1936	3,162
Weekly average, 1936	6,005
Weekly average, 1937	2,716
Weekly average January	3,787
Total to date, 1936	63,581
Total to date, 1937	16,294

Pig Iron

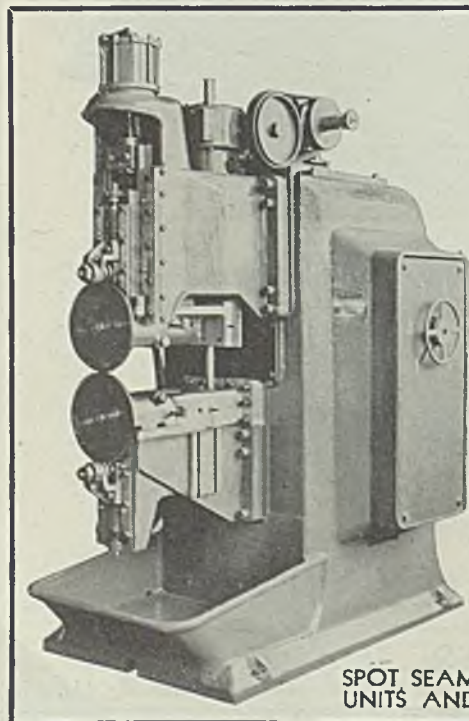
Pig Iron Prices, Page 74

Pittsburgh—Buying of pig iron at the new prices has been relatively light, but steady, and there are many indications of strength. Prices are steady.

Cleveland—Producers report that tonnage booked at \$1.50 under the current market has been practically cleared up, with a few odd lots remaining. While new business at present is dull a rather marked improvement is expected toward the end of this month and in March, when books for second quarter will be opened. Although the melt has been at a peak for the last few weeks, sellers' stocks are considerably below average, due to exceptionally heavy shipments during January.

Chicago—Pig iron shipments are expected to equal or exceed those of January. Tractor manufacturers are experiencing one of the most active periods in history, while pig iron consumption by farm implement builders is the best in seven to eight years. While new business is slightly more active, buying still is retarded by forward coverage last quarter. Prices are firm.

Boston — Shipments exceed new buying, which is light. Except for a few larger users, melters have light stocks and are working off current incoming pig iron without accumulation. Some at the present rate of melt, will take more iron



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than estimated during the next six or eight weeks.

New York—While new domestic inquiry is light, demand for pig iron is enlivened by various inquiries from abroad, although apparently primarily for feeling out the market. Great Britain has sent two inquiries recently, although no definite tonnages were mentioned. Germany also has asked for prices on various grades. Scandinavia has an inquiry for 300 to 500 tons of No. 2 plain foundry; Italy and Greece for 200 tons of foundry each, and Uruguay for 100 tons of foundry iron.

Buffalo—While January failed to maintain the heavy volume pig iron shipments of December, leading merchants feel this was a seasonal condition rather than the result of any unusual economic factor. The early part of February showed a slight gain over January, in shipments and sales, and it is expected the latter half of the quarter will show a pronounced gain in sales. Twelve furnaces continue in production.

Philadelphia—Pig iron shipments are moving briskly, with foundry melt expanding and steel production fully holding its own. New orders are spotty.

Cincinnati—Pig iron shipments are still affected by the flood conditions. Specifications from foundries elsewhere in the district were normal with railroad detours presenting temporary handicaps to delivery. Spot buying was light. Most users will be on normal schedules this week.

St. Louis—January shipments of pig iron moderately exceeded those of December and were the heaviest for the month since 1929. Despite the heavy movement producers still possess large backlogs and deliveries are about equal to the daily average in January. There has been some increase in buying the past week or ten days.

Birmingham, Ala.—Pig iron market is considered strong, though purchasing is still under what it was the same time a month ago. Shipments are active, and iron which was held up by reason of the floods in the Ohio river valley are being released. Fifteen blast furnaces continue in operation.

Metallurgical Coke

Coke Prices, Page 73

With practically all available beehive ovens in the Connellsville, Pa., district in operation, demand for coke from steel mills continues unusually strong. Developments in connection with the expiration of miners' contracts are being watched closely by all operators. The United

Mine Workers will open negotiations Feb. 17 in New York with coal company executives.

Domestic consumption has shown an increase as a result of the recent cold weather but aggregate demand so far this winter from this source has been disappointing.

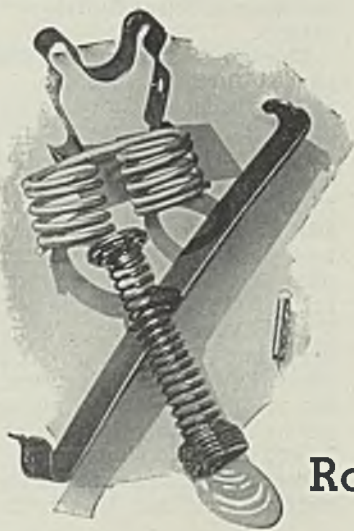
Active demand for foundry coke and a heavier call from users of domestic heating fuel are taxing by-product oven capacity and producers are able to add little tonnage to stock.

Scrap

Scrap Prices, Page 76

Philadelphia — While scrap supplies appear slightly freer, prices continue strong. Steel scrap and the two principal grades of cast are unchanged, but several other grades have been increased, while only a couple of items, stove plate and grate bars, have been marked down. Export prices on No. 1 and No. 2

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steel continue unchanged at \$18 and \$17, respectively, dock, Port Richmond. Both of these prices continue under the domestic quotations, attributed in part to the special freight rates allowed by railroads on scrap definitely designated for shipment abroad.

It is estimated by reliable sources that in excess of 20,000 tons have been accumulated here for foreign shipment. Certain leading domestic consumers continue out of the market for steel, but at least one is expected to enter the market soon.

The Budd compressed sheets, 4000 tons, were recently purchased, the Pencoyd, Pa., consumer taking 3500 tons and the leading Trenton, N. J., consumer the remainder. Prices were slightly higher than a month ago, when the Bethlehem, Pa., consumer took by far the major portion. The latest prices were around \$18.25 to \$18.35, f.o.b. Budd plant. The Budd company also disposed of 150 tons of heavy breakable cast at \$16.75 f.o.b. plant; 250 to 300 tons of heavy loose shoveling scrap at between \$18 and \$18.25; 50 tons of borings and turnings at between \$10 and \$10.25; and 75 tons of automobile chassis scrap at \$17.25 to \$17.50.

Pittsburgh—Mill purchasing of scrap has been light in this district but there are many indications that the market has considerable strength. It is rumored that steel on the Pennsylvania railroad list brought about \$20.75 and that rails brought approximately \$1 more.

Pittsburgh & Lake Erie steel is reported to have brought \$20.50. The outlook here has many complexities. For one thing, it is becoming increasingly difficult to get material into the Pittsburgh district. The spread between prices in other centers, and particularly the east because of the export situation, is narrower than in many years. At the same time, however, new open-hearth capacity is projected for this district and mills are operating at a high rate. A recent temporary development has been flood conditions, hampering barge movements to Ohio river points from the southern sector.

Cleveland—Renewed strength has been injected into scrap markets by closing of the New York Central list. Some of its heavy melting steel has gone at \$20 at Buffalo and in the valleys.

Chicago—Scrap prices have advanced further, with No. 1 heavy melting steel up 25 cents on a sale at \$19.25. This marks a new high for the past 12 years. Quotations on a number of other grades also are 25 to 50 cents above previous levels. Mill demand has been fairly heavy lately and at the same time supplies have continued none too plentiful.

New York—Prices are generally firm but the upward movement seems halted for the present. Rails for rolling have been advanced \$1 per ton. Export loading is active as are domestic shipments.

Boston—Strong demand for heavy melting steel for export has lifted

prices for dock delivery 50 cents for both grades. For New England delivery prices have been advanced 50 cents, also. Textile and heavy breakable cast have advanced \$1 per ton on active demand.

Buffalo—A sale of cupola cast at \$17 is the principal item in the scrap market. This is the highest price paid for this material in the current movement and serves to prove the declaration of dealers that strictly No. 1 cast is worth \$17.50 or more. Cast continues scarce and dealers are unwilling to sell short. Shipments are progressing steadily on orders for No. 1 heavy melting steel, sold recently at \$18.75. Much tonnage remains to be delivered, however, on contracts made at lower levels.

Cincinnati—Activities in iron and steel scrap are confined to shipments on old contracts to melters out of the high water district.

St. Louis—Iron and steel scrap continues to display strength, despite little actual buying and some backing up of material occasioned by the floods. A number of additional advances were recorded, with sheets, bundled and compressed most affected.

Birmingham, Ala.—Plenty of scrap appears available and movement is picking up some. Quotations are unchanged, heavy melting steel still being held at \$12.50 to \$13.50. Larger melter of heavy melting steel has much stock on hand but has been in the open market frequently.

Seattle—Export inquiry is slightly off due to political disturbances in Japan. This is believed only temporary and dealers expect an active Oriental market within a short time, despite the increase in freight rates. Domestic demand continues steady. Local mills buying all desirable tonnages, No. 1 melting being quoted at \$12, an advance of 50 cents in the last fortnight.

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FINE TOOL STEELS • TUNGSTEN CARBIDE TOOLS, ETC.

Warehouse

Warehouse Prices, Page 75

Pittsburgh—Warehouse sales showed a good pick-up the past week and new business was well diversified. In a few instances it was believed that difficulty encountered by some consumers in obtaining mill deliveries may have been a motivating factor. Prices are steady.

Cleveland—Warehouse distributors report a slight decline in new business over the past two weeks. This has affected all products with the result that daily average sales are considerably below those of a

month ago. Deliveries from the mills, particularly in structural plates and shapes have improved. Industrial requirements continue more active than demand from building trades. Prices are firm.

Chicago—Warehouses were relatively active in January and anticipate a continuation of recent gains compared with a year ago. Heavy products show the greatest increase in demand over last year.

Boston — Warehouses are doing a good volume, showing some improvement. Demand is well distributed as to products. Specialty steels, including alloys, are moving well in numerous small lots. Prices are firm.

Philadelphia—Iron and steel distributors are enjoying a brisk business, with the sold-up condition of the mills diverting an increasing amount of tonnage to jobbers. Prices are strong.

St. Louis—Warehouse business the past week or ten days is reported the best this year. Demand is diversified, with the general manufacturing trade accounting for the largest tonnages. Railroads are placing substantial orders for emergency track repairs as well as shop materials.

Cincinnati—Warehouses were hard hit by the recent flood but maintained service during the emergency from outside stocks. Extent of demands for rehabilitation purposes not yet estimated.

Seattle—Business is slow, due to unfavorable weather and results of the maritime strike. Items moving include heavy plates, bars, heavy angles and structurals. Materials for ship repairs are in good demand. Prices are being maintained.

Nonferrous Metals

Nonferrous Metal Prices, Page 74

New York—Consumer buying of metals increased last week reflecting sharp price advances in London. Zinc advanced \$5 per ton here due to scarcity of supplies. Copper and lead were firm but tin fluctuated widely.

Copper—Export copper advanced from around 12.65c at the end of the previous week to 13.15c, c.i.f. Heavy buying came into the foreign market from both consumers and speculators. Producers here quoted electrolytic firm at 13.00c, Connecticut.

Lead—Activity in lead gained but many consumers are still reluctant to make fresh commitments pending outcome of the automobile strike. Approximately 75 per cent of February requirements have been covered but March has only been

touched. Prices held at 5.85c, East St. Louis.

Zinc—Prime western advanced to 6.25c, East St. Louis, due to the extremely tight supply situation. Stocks were reduced further during January, according to reliable estimates. Shipments continued active.

Tin — The market was unsettled and puzzling to observers here. Straits spot fluctuated from 49.85c to 51.00c during the week. World visible supplies increased 234 tons during January. The market was quoted around 50.00c at the close.

Antimony — Both Chinese and American spot were quoted 14.25c, New York. The leading domestic producer stated that efforts are being made to keep peak prices not over 14.00c and to maintain an average price level of about 12.00c.

Escapes Flood Damage

Although swirling flood waters of the Allegheny river at one time were almost a foot deep in front of the plant and offices of the Pittsburgh Piping & Equipment Co., Pittsburgh, practically no damage resulted.

Ample warning of the rise permitted protecting factory equipment in portions of the plant reached by the water. The works are located within 100 yards of the normal bank.

Executive offices and New York sales offices of Swan-Finch Oil Corp. have been moved from 205 East 42nd street to 30 Rockefeller plaza.

Export Demand Is Becoming Factor

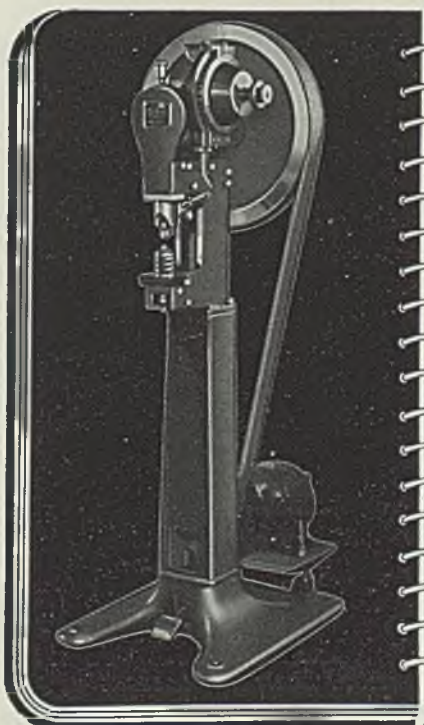
Expanding inquiry from abroad for iron and steel continues. This has resulted in general stiffening of prices and in some instances in sharp premiums. Within the past week a sale of tin plate at the equivalent of \$5.10, Pittsburgh, or \$5 above the domestic market, is reliably reported and there have been some sales as noted recently at the equivalent of \$5 Pittsburgh.

These premiums on tin plate are still the exception. However, the trend is undoubtedly upward. One lot of 10,000 cases is under negotiation for export. One mill quoted the domestic equivalent on April delivery, but for July quoted 12 cents higher and for October an additional 12 cents. The buyer is bargaining for a price comparable to the domestic market on all three deliveries.

Hence, it is a question of delivery and also, it may be added, of credits, that governs quoted prices in many instances. As noted in previous issues, tin plate inquiries are now being received from countries which seldom, if ever before, have entered the American market.

Sheet buying for export has been featured by no large orders since early December, when Russia closed on approximately 25,000 tons. Russia continues to figure, but apparently present asking prices are proving too high.

Due to the drying up of European



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supplies, South American buyers of nails and barbed wire especially have had to turn to this country, paying premiums of as high as \$5 in some instances, with even higher reported.

Premiums have been paid in some instances recently for semifinished steel and commercial bars. One order for wire rods for the Orient has gone at \$5 a ton above the domestic market, and some junk rods for Turkey have been purchased at a price said to be higher than domestic market for new material only a few months ago. These rods, it is said, are used in Turkey for reinforcing purposes.

Except for the purchase of about 45,000 tons by Japan a few weeks ago and of approximately 7000 tons of foundry iron by China more recently, pig iron inquiry from abroad appears largely for the purpose of sizing up the American market.

Scandinavia is now inquiring for 300 to 500 tons of No. 2 plain foundry, Greece and Italy are each inquiring for 200 tons of foundry and Uruguay for 100 tons of foundry.

The general belief is that American prices, plus the ocean freight rate, is too high to attract much European business. Nevertheless, in view of the growing shortage abroad, substantial European business may develop later, particularly with ocean freight rates easing off now that the Argentine grain movement is about over and bottoms appear more plentiful in the Mediterranean.

Incidentally, it is pointed out in this general connection that Japan's large order was for iron of a clean-up character, which went at concessions, and that this cheap iron now

being no longer available, may account for Japan not having made any recent purchases.

Steel Exports Top '35 by 37 Per Cent

EXPORTS of semifinished and finished steel products in 1936 reached the highest total since 1930, with 1,221,663 gross tons, valued at \$88,062,559, compared with 959,646 tons exported in 1935, with value of \$65,363,748. This is a gain of 37.8 per cent in volume and 35 per cent in value.

Exports of scrap in 1936 totaled 1,941,031 gross tons, compared with 2,103,959 tons in 1935. This was a decline of 8.1 per cent. Total exports in 1936 were 3,162,694 tons, compared with 3,063,605 tons in

FOREIGN TRADE OF UNITED STATES IN IRON AND STEEL

	Gross Tons		Gross Tons	
	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	
Dec.... 52,584	244,156	53,678	239,269	
Total ..	666,838	3,162,694	470,015	3,063,605

1935, decline in scrap tonnage partially balancing the gain in manufactured steel exports.

In the decade, 1927-1936, exports of steel, excluding scrap, reached its peak in 1929 at 2,480,813 tons and its low in 1932 at 367,151 tons. Since 1930 total manufactured steel exports were below 1,000,000 tons annually breaking over that mark for the first time in 1936.

December manufactured steel exports were 135,130 gross tons, compared with 127,255 tons in November and with 90,889 tons in December, 1935. Scrap exports in December were 109,026 tons, compared with 76,042 tons in November and with 148,380 tons in December, 1935.

Keeping pace with heavy demand for steel products and raw materials for its production, imports of iron and steel in 1936 reached 524,593 gross tons, compared with 405,282 tons in 1935. A large part of this gain was furnished by scrap imports, largely from Canada, scrap imports in 1936 being 142,245 tons, compared with 64,733 tons in 1934. This brought total imports for 1936

UNITED STATES IMPORTS FOR CONSUMPTION OF IRON AND STEEL PRODUCTS

Articles	Gross Tons		
	Dec. 1936	Nov. 1936	Jan. thru Dec. 1936
	Pig iron	10,423	10,615	165,909
Sponge iron	55	305	1,950
Ferromanganese (1)	3,675	4,684	30,396
Spiegelisen	3,860	12,819	52,018
Ferrosilicon (2)	21	15	67
Ferrosilicon (3)	50	23	526
Other ferroalloys (4) .....	.....	.....	526
Steel ingots, bl'ns	1	.....	84
Billets (5)	100	173	995
Concrete reinf. bars	254	101	3,769
Hollow bar, drill steel	125	38	1,930
Bars, solid, hollow	3,476	3,705	40,412
Iron slabs .....	.....	14	14
Iron bars	61	175	1,408
Wire rods	1,386	1,222	18,911
Boiler, other plate .....	.....	.....	421
Sheets, skelp, saw pl.	1,489	1,580	22,609
Die blocks, blanks, (5)	7	3	184
Tin plate, taggers', terneplate	46	7	234
Structural shapes	5,303	5,817	59,072
Sheet piling .....	.....	183	2,512
Rails, fastenings	597	338	7,767
Cast iron pipe, ftgs.	225	127	928
Mall. iron pipe ftgs.	32	1	199
Welded pipe	466	67	5,636
Other pipe	1,525	2,902	29,461
Cotton ties .....	.....	10	1,680
Hoops, bands	1,670	2,365	24,015
Barbed wire	1,529	480	15,237
Round iron, stl. wire	417	437	4,962
Tele. and tel. wire .....	.....	1	38
Flat wire, strips	289	214	2,886
Wire rope, strand	180	171	2,421
Other wire	259	49	2,042
Nails, tacks, staples	704	531	20,952
Bolts, nuts, rivets	23	68	516
Horse, mule shoes	61	5	426
Cast'gs and forg'gs	205	221	1,480
Total	38,514	49,466	524,593
Iron and steel scrap	14,070	12,504	142,245

GRAND TOTAL .. 52,584 61,970 666,638


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

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HANNA



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Buffalo Detroit New York Philadelphia Boston

Construction and Enterprise

Ohio

ALLIANCE, O.—City plans improvements to water supply system, at a cost of over \$100,000. W. D. Sponseller, Alliance, is engineer.

BARBERTON, O.—Sun Rubber Co. is taking bids for construction of a plant addition.

BARBERTON, O.—City is taking bids for construction of sewage disposal plant and pumping station. Fred Marvin is mayor and engineers are Barstow & Lefebvre Inc., 31 North Summit street, Akron, O.

CIRCLEVILLE, O.—City is preparing preliminary plans for construction of a sewage disposal plant costing \$75,000, and bids probably will be asked around May 1. Application has been filed for PWA aid. William J. Graham is mayor and engineer is Floyd Browne, Marion, O. (Noted Jan. 18.)

COLDWATER, O.—Village is considering construction of a sewage disposal plant, estimated to cost \$98,000. Maturity is dependent on PWA approval. Arnold H. Schoch is mayor and Burgess & Niple, 568 East Broad street, Columbus, are engineers.

DELPHOS, O.—City has made tentative plans for construction of a municipal light plant to cost \$390,000. Three generators, each driven by a separate diesel engine, two of 1050 horsepower or 730 kilowatt-hours capacity, and one of 875 horsepower or 600 kilowatt-hours capacity, will probably be installed. Carl Simon, Van Wert, O., engineer, has been authorized to prepare detailed plans and specifications. Mortgage revenue bonds to be repaid out of plant earnings will finance the construction. (Noted Steel, Oct. 12, 1936.)

HAMILTON, O.—City will take bids about Feb. 15 for construction of light plant addition to cost \$50,000. Russell P. Price is city manager, and engineer is Froelich & Emery Engineering Co., Second National Bank building, Toledo, O.

HOPEDALE, O.—Village is considering construction of water plant to cost about \$60,000. J. R. Patrick is mayor. Maturity of plans is dependent on financing.

JACKSON, O.—Globe Iron Co. plans extensive improvements and repairs to its furnace property, to include installation of a 20 x 90-foot hot blast stove and dewatering equipment. John E. Jones is president.

KENT, O.—Ferry Machine Co. plans construction of a 1-story, 40 x 170-foot factory costing around \$40,000. Architect is C. G. Kistler, 105 East Main street.

LIMA, O.—West Farm Bureau Rural Electric Co., 620 East Broad street, Columbus, is taking bids due Feb. 15 for erection of 175 miles of rural transmission lines in Auglaize and Mercer counties. REA has allotted \$175,000. Carl Frye is engineer.

MANSFIELD, O.—Local 3-story plant of Westinghouse Electric & Mfg. Co. was damaged by fire recently.

PAINESVILLE, O.—Light Alloys Co.

plans to rebuild its 1-story, 60 x 200-foot aluminum castings plant which was damaged by fire recently. Cost of renovation will be over \$40,000. Otto Harer is president. (Noted STEEL, Jan. 25.)

OHIO CITY, O.—City has extended original date of Feb. 5 for bids for construction of power and light plant, 32 x 48 feet. Bids are being taken on two 150-horsepower and one 75-horsepower diesel engines and auxiliaries. Total cost is estimated at \$44,900. M. L. Skinner is mayor and Carl J. Simon, Van Wert, O., is engineer. (Noted STEEL, Feb. 1.)

SALEM, O.—Ohio Edison Co. plans construction of a new indoor substation at Salem, to cost over \$100,000.

TROY, O.—City is taking bids due noon Feb. 16 for various light plant equipment. George L. Smith is service director, and Froelich & Emery Engineering Co., 410 Second National Bank building, Toledo, is engineer.

UTICA, O.—Village is considering construction of sewage disposal plant, and a bond issue may be submitted at the next election. W. F. Babb is mayor.

WEST JEFFERSON, O.—Village is considering installation of water softening plant and an application for WPA aid will be filed. Engineer is Jennings-Lawrence, 536 Rowlands building, Columbus.

New York

BROOKLYN, N. Y.—E. B. Stimpson Co., 70 Franklin avenue, plans to build a 2-story, 87 x 97-foot plant. Architects are Allmendinger & Schlendorf, 356 Fulton street, New York.

NEW YORK—Associated Gas & Electric System, room 2401, 61 Broadway, will spend around \$4,000,000 during 1937 for construction work in Kentucky, Tennessee and Maryland.

NEW YORK—Norma Machinery & Specialty Co. Inc. has been incorporated to operate a machine shop. Correspondent is Theodore W. Richie, 276 Fifth avenue.

New Jersey

MANVILLE, N. J.—Johns-Manville Corp., 22 East Fortlieh street, New York, manufacturer of roofing and building materials and insulation products, plans extensions and improvements in power plant at its branch works at Manville, to include installation of additional equipment. Additions may also be built to the manufacturing plant, in which motors and controls, conveyors, and other equipment would be installed. Total cost will be around \$1,000,000.

NEW YORK—New York Steam Corp., 130 East Fifteenth street, plans to build a 2-story steam power generating plant at 37 Sutton place, to cost around \$40,000, with equipment. Architect and engineer is W. H. Paine, care of the company.

WELLSVILLE, N. Y.—Moore Steam Turbine Corp. plans improvements to its plant at cost of about \$150,000.

Pennsylvania

DUBOISTOWN, PA.—Borough plans construction of a sewage treatment plant

and distribution system estimated to cost \$45,000.

EAST McKEESPORT, PA.—School district of borough is taking bids, due 8 p. m. Feb. 12, for installation of a gas-driven motor generator light plant in the high school building. Architect is Conrad C. Compton, Fourth street and Thompson avenue, Donora, Pa.

ERIE, PA.—Bucyrus-Erie Co., W. R. Elchert, general superintendent, 1202 West Twelfth street, will let contract soon for construction of a 1-story factory addition. Estimated cost is \$40,000.

PITTSBURGH—Pennsylvania Electric Repair Co., 129 First avenue, plans to build a 1- and 2-story, 175 x 175-foot plant at 1001 Saw Mill Run boulevard. Architect is P. R. Scheuneman, Magee building, and estimated cost is \$65,000.

WEST MIDDLESEX, PA.—Borough is taking bids due 8 p. m., Feb. 18, for various sewage disposal plant materials and equipment, including a chlorinator and two motor-driven vertical centrifugal pumps. Morris Knowles Inc., Westinghouse building, Pittsburgh, is engineer.

WILKINSBURG, PA.—Stainless Steel Specialties Inc. was formed recently to deal in steel sheets, rods, etc. Incorporators are Max and Jane Hirsch and Taylor H. Beech.

Michigan

ADRIAN, MICH.—Plant of F. W. Prentice Co., manufacturer of outdoor furniture, was badly damaged by fire recently.

DETROIT—Square D Co., 6060 Rivard street, will let contracts soon for construction of a 2-story factory addition to cost around \$35,000. Giffels & Vallet, Marquette building, are engineers.

EAST LANSING, MICH.—Olofsson Tool & Die Co. has been incorporated. Correspondent is Gustav A. Olofsson, 208 Kedzie street.

JACKSON, MICH.—Goodyear Tire & Rubber Co., Akron, O., will construct a multi-story plant, 150 x 650 feet, for manufacturing tires and tubes at Jackson. Motors and controls, regulators, conveyors, electric hoists and other equipment will be installed. Austin Co., Curtis building, Detroit, has general contract. Total cost will be around \$3,000,000.

NILES, MICH.—Garden City Fan Co. shop and power plant were damaged by fire recently.

WELLS, MICH.—Delta Chemical & Iron Co., G. C. Craver, general manager, plans to rebuild its plant which was recently damaged by fire.

YPSILANTI, MICH.—City plans installation of a water treatment and iron removal unit at municipal waterworks plant. Estimated cost is \$70,000.

Illinois

SPRINGFIELD, ILL.—Pillsbury Flour Mills Co., Minneapolis, will expand its plant at Springfield. General contract has been awarded.

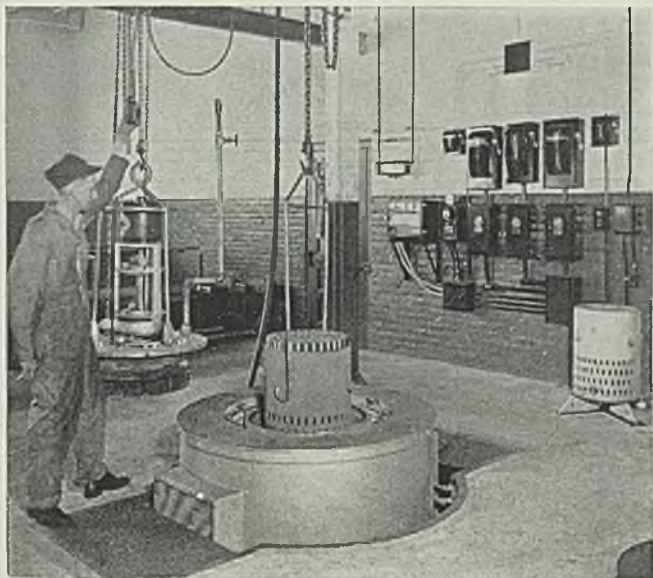
Indiana

EDWARDSPOORT, IND.—Public Service Co. of Indiana will construct an additional wing at the power plant at Edwardsport, to house two new steam generating units. Approximately \$360,000 will be spent.

Maryland

BALTIMORE—Rustless Iron & Steel
(Please turn to Page 94)

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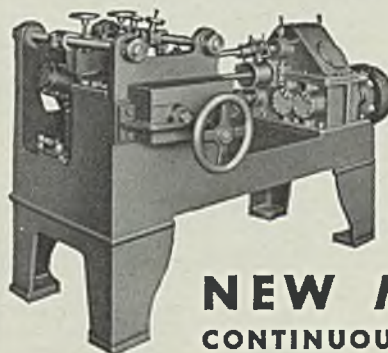
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(Continued from Page 92)

Co., 1001 Edison Highway, is receiving bids for construction of a mill building. H. A. Brassert, Chicago, is construction engineer in charge.

BALTIMORE, MD.—Glenn L. Marthin Co., airplane manufacturer, plans to install motors and controls, transformers and accessories, regulators, conveyors, electric hoists and other equipment in new plant addition in the Middle River district. Total cost will be \$2,000,000. Taylor & Fisher, 1912 North Calvert street, Baltimore, are architects. (Noted Steel, Feb. 1.)

District of Columbia

WASHINGTON—Navy department, bureau of supplies and accounts, will take bids until Feb. 12 for a gasoline engine-driven centrifugal pump, schedule 9880, for delivery Puget Sound; a motor-driven engine lathe, schedule 9892, for delivery San Diego, Calif.; and a universal milling machine, schedule 9894, for delivery Washington. The bureau will accept bids until Feb. 16 for miscellaneous motor-driven centrifugal pumps, schedule 9900, for delivery various coast points.

WASHINGTON—Bureau of supplies and accounts, Navy department, will take bids Feb. 9 for two motor-driven lathes, schedule 9934, delivery Newport, R. I.; Feb. 12 for a motor-driven turret machine, schedule 9913, delivery Brooklyn, an engine-driven electric generator, schedule 9927, and a drop forge trimming press, schedule 9910, delivery Boston; Feb. 16 for a motor-driven alligator shear machine, schedule 9908, delivery Brooklyn, and a motor-driven grinding and buffing machine, schedule 9911, delivery Mare Island, Calif.; Feb. 19 for a motor-driven boring and drilling machine, schedule 9918, and seamless steel tubing, schedule 9928, both for delivery Mare Island.

Florida

ORLANDO, FLA.—City plans to build a steam electric light and power plant costing \$600,000. Robert & Co., Bona Allen building, Atlanta, Ga., is engineer.

Kentucky

LEXINGTON, KY. — Munns Bros. will rebuild packing plant near Lexington, recently damaged by fire.

Louisiana

NEW ORLEANS, LA.—Equitable Equipment Co., dealer, 410 Camp street, is in the market for generating sets of 250 kilowatts, 300 to 350 kilowatts, and 400 kilowatts, all 2300-volt, 3-phase, 60-cycle. The company is looking for turbines of 750 kilowatts, and 600 to 750 kilowatts.

WINNSBORO, LA.—City plans construction of a waterworks plant costing \$50,000. Swanson-McGraw, Balter building, New Orleans, are engineers.

Mississippi

OXFORD, MISS.—Board of aldermen will receive bids Feb. 15 for a 750-horsepower electric generating unit with auxiliary equipment. W. T. Chandler is city

North Carolina

ENKA, N. C. — American Enka Co. is completing plans for construction of an addition to steam powerhouse at its

rayon mill. Construction will begin soon. Cost will be over \$50,000.

GREENSBORO, N. C. — Newman Machine Co. Inc., dealer, is in the market for two engine lathes, 16, 18, or 20-inch, by 10 or 12 feet; an 18 or 20-inch shaper; and a universal milling machine.

GREENSBORO, N. C. — Wilbur J. Carter plans construction of a powerhouse at a local rayon weaving mill, at a cost of \$250,000. Contract for the building has been awarded to Charles W. Angle Inc., Greensboro.

KINSTON, N. C. — City plans extensions to municipal power plant and waterworks. Cost is estimated at \$100,000.

WINSTON-SALEM, N. C. — Selected Dairies Inc., recently organized by Thurmond Chatham and T. Holt Haywood, plans remodeling building on Summit street and installing new machinery.

South Carolina

COLUMBIA, S. C.—State board of health, room 423, state office building, will receive bids Feb. 10 for construction of sewage disposal plant. Architect is James B. Urquhart, 610 Central Union building, Columbia.

HARTSVILLE, S. C. — Sonoco Products Co., manufacturer of paper and paper products, is starting an expansion program to cost between \$400,000 and \$500,000. Additions will include a two-story, 125 x 425-foot extension to present plant and a new boiler plant. Fiske-Carter Construction Co., Spartanburg, S. C., has general building contract.

ORANGEBURG, S. C.—City will receive bids about Feb. 15 for construction of a water softening plant. John Pearson is superintendent of water and light plants.

West Virginia

NEW CUMBERLAND, W. VA.—Duraloy Foundry plant was damaged by fire recently during the flood.

Virginia

ALTA VISTA, VA.—Lane Co., E. M. Lane, president, plans a \$100,000 expansion of its plant for manufacturing furniture.

FRANKLIN, VA. — Chesapeake-Camp Corp. plans installation of heavy-duty motors and controls, transformers and other power substation equipment, conveyors, electric hoists and other equipment in new pulp and board mill at Franklin. Cost will be about \$3,000,000. J. E. Sirrine & Co., Greenville, S. C., are engineers.

GLASGOW, VA.—Blueridge Co. plans installation of motors and controls, regulators, conveyors and other equipment in addition to woolen mills. Cost will be over \$250,000. The Ballinger Co., 105 West Twelfth street, Philadelphia, is engineer.

NORFOLK, VA.—Henry Walke Co., dealer, is in the market for a belt driven lathe with a 20-inch swing.

VIRGINIA BEACH, VA.—City has voted \$92,400 bonds as part of cost of proposed \$168,000 sewage disposal plant.

WYTHEVILLE, VA.—R. P. Johnson, dealer, is in the market for the following machinery: A 125 to 150-horsepower boiler; 50-horsepower stationary engine; and a gang lath machine with bolter and trimmer.

Missouri

SPRINGFIELD, MO.—Springfield Gas & Electric Co. plans to expand and improve its local steam-operated electric power plant. A new 12,500-kilowatt steam turbogenerator unit with accessories, exciter, high pressure boiler and other equipment will be installed. Cost will be close to \$650,000.

ST. LOUIS, MO.—Didion Foundry Co. has been incorporated at 7821 Alabama avenue, and will manufacture gray iron castings. Paul P. Didion is president.

ST. LOUIS, MO.—Killark Electric Co., 3940 Easton avenue, manufacturer of electric conduit fittings, will construct a 1-story addition costing \$50,000. Joseph Desloge is president.

UNIVERSITY CITY, MO.—St. Louis County Water Co., 6600 Delmar boulevard, plans to construct a \$500,000 water filter plant at Hog Hollow road, with a capacity of 36,000,000 gallons per day.

Arkansas

LITTLE ROCK, ARK.—City plans building an addition to its water filtration plant at a cost of \$150,000. PWA aid is being sought. Burns & McDonnell, 107 West Linwood boulevard, Kansas City, Mo., are engineers.

Oklahoma

TULSA, OKLA.—City plans improvements to city water system, to include installation of 20,000,000-gallon pump at Mohawk pumping station. Total cost will be around \$330,000. W. F. Graham is water commissioner, T. A. Penney is mayor.

Texas

DALLAS, TEX.—Wirt Davis, Republic Bank building, has been authorized to appoint a committee to organize a company to be known as Southland Paper Mills Inc. Construction of a \$5,000,000 plant with a daily initial capacity of 150 tons of newsprint is planned.

HARLINGEN, TEX.—Fidelity Products Co., Brownsville, Tex., subsidiary of Wescon-Oil-Snowdrift Co., Canal Bank building, New Orleans, plans construction of a cottonseed oil mill, probably powered by a diesel engine unit. Total cost is estimated at \$150,000.

Wisconsin

BEAVER DAM, WIS.—Malleable Iron Range Co., stove and range manufacturer, will build a third story addition to its plant.

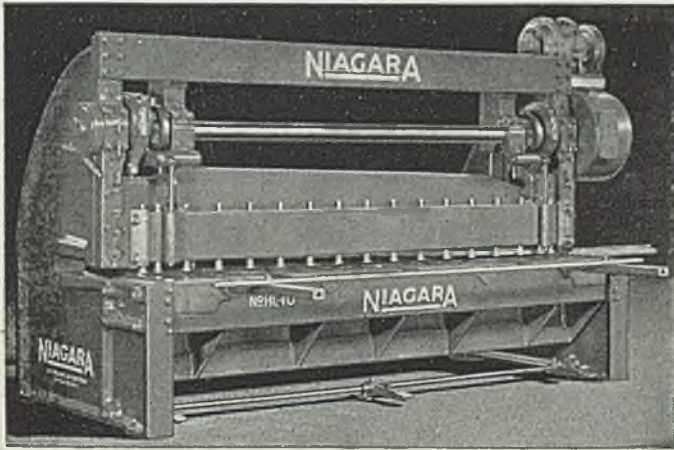
CORNELL, WIS.—Chippewa County Co-operative Electric Co. will erect rural transmission lines, and has received REA approval. If power is not leased a new diesel engine generating plant may be constructed. Banister Engineering Co., 556 North Prior avenue, St. Paul, Minn., is engineer.

MANITOWOC, WIS.—Manitowoc Shipbuilding Corp. will build an addition to the welding unit of its machine shop, at an estimated cost of \$50,000, with equipment. Wisconsin Bridge & Iron Co., Milwaukee, has the general designing and construction contract.

MAYVILLE, WIS.—Maysteel Products Inc. was organized recently, and has taken over the manufacturing plant formerly used by the Wisconsin Radiator Furniture Co. to manufacture sheet

(Please turn to Page 96)

NEW NIAGARA POWER SQUARING SHEARS



New Niagara Series HL Power Squaring Shears are modern production machines designed for accuracy, more strokes per hour, operating convenience, safety, long life and dependability. Included in their features are:—

High tensile cast iron combined with steel plate construction

flat cutting of narrow strips

14 point engagement sleeve clutch with built-in single stroke mechanism giving more strokes per hour

Niagara toggle operated steel hold-down

Triangular section steel torsion-resisting crosshead

Massive cast bed, keyed and bolted to housings

Unobstructed vision of cutting line

Enclosed drive gear train mounted on anti-friction bearings running in oil

Low crosshead slope assures

Full accessibility at rear for convenience and safety of operator

More Strokes Per Hour

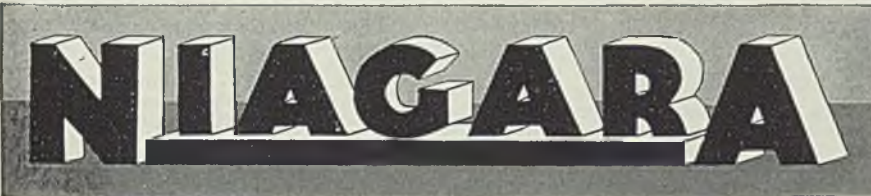
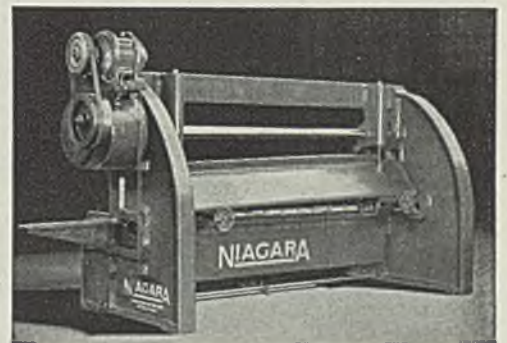
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—Construction and Enterprise—

(Concluded from Page 94)

metal products for the automotive, industrial and agricultural fields. L. P. McIntosh, formerly of Milwaukee, is president.

MILWAUKEE—General Foundries Co., 2570 North Thirty-second street, will make repairs at once to its casting cleaning room, badly damaged by fire recently.

MILWAUKEE—John Graf Co., 2137 West Greenfield avenue, will build a new 1-story plant, 100 x 155 feet, at 4100 West Greenfield avenue. George J. Meyer Mfg. Co., Cudahy, Wis., has the first machinery contract.

MILWAUKEE—Chain Belt Co., 1600 West Bruce street, will build a new machine shop unit, 100 x 155 feet, at its West Milwaukee plant, and general contract for erection of superstructure has been awarded to Selzer-Ornst Co., 6222 West State street. Total estimated cost is \$200,000.

MILWAUKEE—Milcor Steel Co., West Burnham street, plans to install motors and controls, electric hoists, conveyors, cranes and other equipment in new addition to its sheet metal products plant. Cost will be close to \$1,000,000. Milcor Steel is a subsidiary of Inland Steel Co., Chicago.

NEILLSVILLE, WIS.—Clark County Electrification Co-operative has been organized and will seek federal aid for erecting rural transmission lines.

WEST BEND, WIS.—Plant of Plick Mfg. Co., manufacturer of automotive replacement parts and accessories, was damaged recently by fire. Repairs will be made immediately. Carl Plick is president.

Minnesota

LAKE CRYSTAL, MINN.—Voters on Jan. 12 approved issuance of \$45,000 bonds to finance construction of a municipal light plant.

ST. PAUL—Atlas Mfg. Co., H. B. Hyams, manager, manufacturer of steel racks and other display equipment, has moved to a large factory at Eustis and Robbins streets, where additional machinery will be installed.

ST. PAUL—Valley Iron Works Inc., producer of gray iron castings, will construct a 1-story plant addition and install additional equipment. General building contract has already been awarded.

North Dakota

DICKINSON, N. DAK.—Pittsburgh

Coal Mining Co. plans immediate rebuilding of its new processing plant which was recently damaged by fire. New machinery was also damaged.

GRAND FORKS, N. DAK.—Northern States Power Co., South Third street and 15 South Fifth street, Minneapolis, plans to install an additional 4000-horsepower generating unit and new boilers in its plant.

South Dakota

SIOUX FALLS, S. DAK.—Northern States Power Co., 15 South Fifth street, Minneapolis, plans construction of an electric power substation to cost over \$40,000 with equipment.

Iowa

GRUNDY CENTER, IOWA—Grundy County Electric Co-operative association, Luther Brindle, secretary, will take bids soon for erection of rural electrification lines in parts of Grundy, Marshall, Hardin and Black Hawk counties. A fund of \$100,000 has been secured through federal aid.

KEOKUK, IOWA—Keokuk Electric Metals Co., producer of ferrosilicon, silvery iron, etc., plans to construct a 2-story plant addition.

Nebraska

OMAHA, NEBR.—Canada Dry Ginger Ale Inc., 122 East Forty-second street, New York, plans construction of a plant and warehouse, estimated to cost \$100,000.

ORD, NEBR.—North Loup Hydroelectric & Irrigation district, E. H. Dunmire, engineer and manager, Ord, plans construction of a hydroelectric generating plant on Loup river, Valley county. Power substations, transmission lines and switching stations will be included in the project. Total cost will be around \$2,000,000, and federal aid in financing has been secured. Black & Veatch, 4706 Broadway, Kansas City, Mo., are engineers.

Colorado

DURANGO, COLO.—City will hold election in April to vote on construction of proposed sewage disposal plant to cost \$50,000. Aid from PWA probably will be sought. J. W. McCullough, Majestic building, Denver, is engineer.

PUEBLO, COLO.—City plans new sewage disposal plant construction to cost around \$500,000, and has applied for a

PWA loan and grant of that amount. Black & Veatch, 4706 Broadway, Kansas City, Mo., are engineers.

Montana

SIDNEY, MONT.—Lower Yellowstone Rural Electrification association, Lief Erickson, secretary, Sidney, plans erection of rural transmission lines costing \$115,000, to be financed through federal aid. R. H. Miller, Montana state conservation board, Butte, Mont., is engineer.

Pacific Coast

LOS ANGELES—Liquid Carbonic Pacific Corp. Ltd., 2690 East Twelfth street, will construct a factory addition at a cost of \$30,000. Blaine Noice, 5436 Carlton Way, is engineer.

LOS ANGELES—Johnson Wire & Steel Co., Worcester, Mass., will build a new factory at Alameda boulevard and Imperial highway, at a cost of \$100,000. High-carbon steel wire for beads on automobile tires will be manufactured. C. D. Johnson is president.

MODESTO, CALIF.—Modesto Irrigation district is considering construction of a new steam-electric power plant, with a capacity of about 10,000 kilovolt-amperes. Cost is estimated at \$1,173,000. Clifford E. Plummer is electrical engineer in charge.

NEWARK, CALIF.—California Chemical Co., Newark, and Westvaco Chlorine Products Corp., 205 Lexington avenue, New York, plan construction of a \$1,000,000 chemical products plant at Newark.

NORWALK, CALIF.—Wilshire Oil Co., 2455 East Twenty-seventh street, Los Angeles, will let contracts soon for construction of a \$100,000 catalytic polymerization plant. Engineer is Universal Oil Products Co., 310 South Michigan avenue, Chicago, and 30 Rockefeller Plaza, New York.

SAN FRANCISCO—Ajax Foundry, 61 Tehama street, is constructing a foundry addition.

SAN FRANCISCO—Paul Zaft Copper Works, 398 Tenth street, has purchased property at Thirteenth and Isis streets, where remodeling and expansion will be done.

SAN FRANCISCO—Standard Brands of California, 245 Eleventh street, will construct 4-story factory on the corner of Mariposa and Carolina streets, at a cost of \$125,000. E. R. Eames, 216 Pine street, is architect.

SAN FRANCISCO—Christie Machine Works, 222 Howard street, will construct a shop building at Harrison and Main streets at a cost of \$30,000. Engineer is W. H. Ellison, Pacific building, and George Wagner, 181 South Park street, has general building contract.

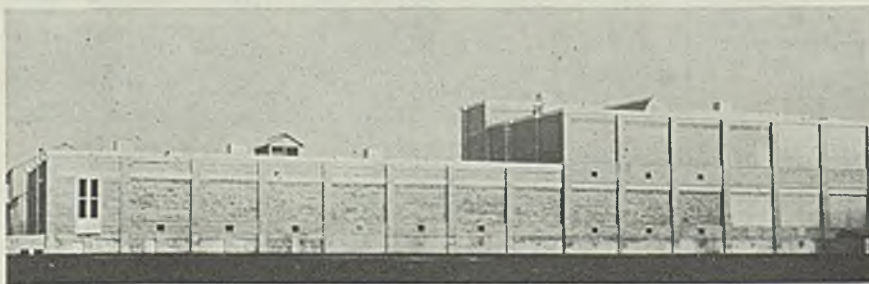
Canada

HAMILTON, ONT.—Steel Co. of Canada, R. H. Champ, president, plans to rebuild its blooming mill.

WINNIPEG, MAN.—Canada Dry Ginger Ale Inc., 122 East Forty-second street, New York, plans construction of a \$100,000 plant.

WINNIPEG, MAN.—International Harvester Co. of Canada Ltd. plans to build a 1-story, 200 x 200-foot factory as an addition to its motor truck division on Portage avenue. Estimated cost is \$100,000.

New Plant Trimmed With 18-8 Stainless Steel



MORE than 3800 pounds of stainless steel, manufactured by the American Rolling Mill Co., Middletown, O., were used on the exterior of the Cudahy Packing Co.'s new plant at Albany, Ga. All of the cornices and coping are formed of 18-8 stainless. Albany Sheet Metal Products Co. was the fabricator