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STEEL

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PRODUCTION • PROCESSING • DISTRIBUTION • USE

January 8, 1940

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STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

As the Editor Views

The News

■ STEEL mills start the year (p. 57) in a better position than usual. As a whole, the industry can see near-capacity operations during the entire first quarter and in some cases through most of first half. Steel production last week (p. 13) rebounded 11 points to 86.5 per cent of ingot capacity, only 4 points below the pre-holiday rate. Current conditions might be taken to indicate that we are due for a reversal of the trend which characterized the decade just ended; it was the first in history in which American steel production (p. 11) failed to gain greatly over the preceding ten years. Much depends on what is done at Washington this year.

• • •

Business is not certain to what lengths congress will go at this session to ameliorate laws and federal policies that hamper business. It feels hopeful no further serious brakes will be placed on business—and that we will stay out of war. Remembering that this is a presidential election year, business does not take very seriously the proposals for reduced government spending. For the same reason it does not expect immediate material increases in federal taxes. . . . Charles Edison, new navy secretary, wants the President empowered (p. 19) to commandeer plants, materials, resources, determine "reasonable" prices, under a national emergency proclamation.

New Powers For F. D. R.?

Supreme Court last week (p. 15) upheld NLRB in three cases. In one, it ruled the federal courts have no right to review board's certification of bargaining agents or its orders for elections. . . . A new bill in congress (p. 20) would apply a license system to iron and steel scrap exports. . . . Lake Superior iron ore prices for 1940 are reaffirmed (p. 71) at same level as for three preceding years. . . . Retooling by the auto-

Ore Prices Reaffirmed

mobile industry on a large scale this year (p. 23) seems unlikely. . . . A new electric storage battery is said (p. 24) to have double usual life. . . . Chicago scrap is going to Pittsburgh (p. 28) in river barges. . . . American Iron and Steel institute (p. 56) will meet in New York, May 23.

• • •

Today, removal of 20 or 30 pounds of metal per minute per cutting tool is common in machining operations, says Guy Hubbard, STEEL's machine tool editor who (p. 32) sees wide possibilities in vacuum exhaust systems and built-in conveyors for chip removal. . . . Almost half the motors in the steel and metalworking industries are not exactly suited to their jobs. They (p. 34) run up power costs due to low efficiency, poor power factor, excessive repair bills. . . . Zinc alloy die castings (p. 36) again find many applications on 1940 model automobiles. . . . Several novel features will be included (p. 26) in a new cold strip mill for Acme Steel Co.

Rapid Cutting

With swinging-roof, top-charge electric furnaces, a Chicago steel foundry has cut charging time (p. 38) from 40 to 3 minutes. . . . Correcting the power factor offers a means of cutting welding costs, returning up to 50 per cent annually (p. 42) on money invested. . . . An interesting system of piping interconnections permits four blowing engines to serve four blast furnaces (p. 45) in any combination. . . . A new anti-scaling compound is available (p. 52) for application to plain carbon steel parts subjected to high temperatures. . . . Chicago's prohibition against all-steel houses and other structures appears to be headed for investigation (p. 27) by a federal grand jury.

Charging Time Cut

EC Kreutzberg



You Inland Men Save My Time

"It's refreshing, in a job like mine, to find men who really study my problems—who contribute so much toward solving them. You Inland men work like members of our own staff—always on the alert for ways to improve our quality or reduce our costs. I find that the time I spend with Inland sales representatives, metallurgists and executives is time spent to the advantage of our business."

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SHEETS STRIP TIN PLATE BARS PLATES FLOOR PLATES STRUCTURALS PILING RAILS TRACK ACCESSORIES REINFORCING BARS

Deferred Buying in 30s Brightens

Prospects for Present Decade

United States Steel Production Fails To Record Gain for First Time in History. Rest of World Moves Forward To New Peak, Increases Output by 42 Per Cent

■ THE DECADE just ended was the first in which the American steel industry failed to record a substantial production gain over the preceding ten years. This was despite a fairly normal population gain and the extension of steel uses into new products.

Production of ingots and steel for castings in the 30s was slightly more than 20 per cent lower than peak 20s output. The record since 1890:

	Gross Tons
1890-99	59,667,000
1900-09	171,767,000
1910-19	334,955,000
1920-29	426,896,000
1930-39	337,926,000

Pose against these figures United States population gains:

1890	63,056,000
1900	76,129,000
1910	92,267,000
1920	106,543,000
1930	123,091,000
1940*	131,300,000

*Estimated.

Consider that the continuous rolling mills came into their own in the 30s, making available better steel products at lower costs; that new alloys enabled new products; that research brought tremendous technological improvement all along the line.

Does the decrease in production reflect a period of economic and political turmoil and mean that we have a large pent-up demand as we enter the 40s? Or does it indicate we are reaching economic maturity and have completed our great expansions?

Some economists have argued for many years that America and other nations have reached economic maturity. Witness the official report of the United States commissioner of labor, dated 1886:

"The nations of the world have overstocked themselves with machinery and manufacturing plants far in excess of the wants of production. This full supply of eco-

nomie tools to meet the wants of nearly all branches of commerce and industry is the most important factor in the present industrial depression.

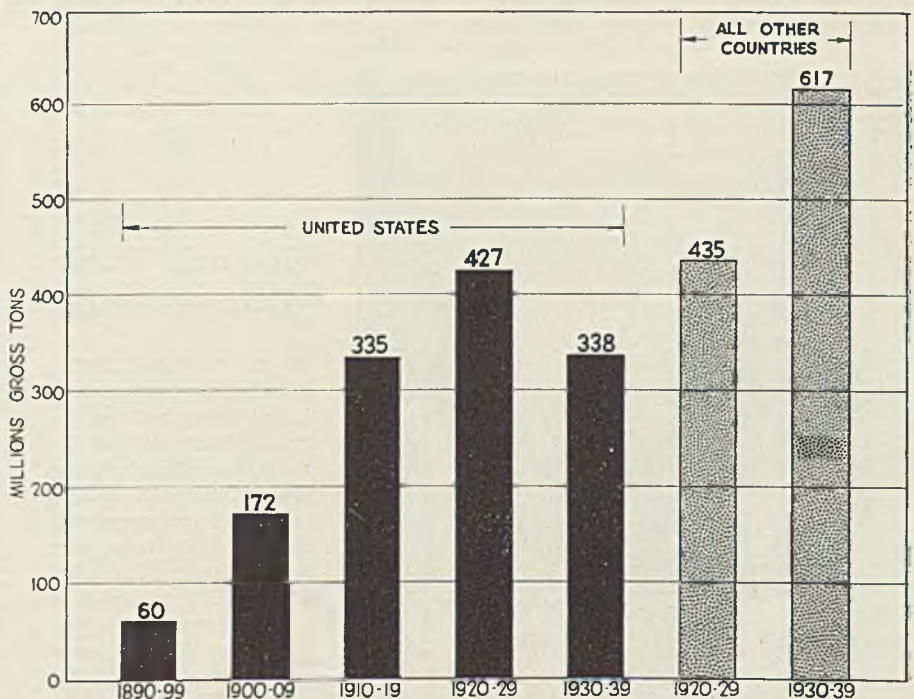
"Though the discovery of new processes of manufacture will undoubtedly continue, and this will act as an ameliorating influence, it will not leave room for marked extension such as has been witnessed during the past 50 years, or afford employment to the vast amount of capital which has been created during that period. The day of large profits is probably past."

Since this gloomy prediction was made 54 years ago, steel and other industries have enjoyed periods of unparalleled prosperity, interspersed with depression periods.

In contrast to the decline in United States production, that of other countries in the world collectively increased 42 per cent in the 30s over the 20s. In part, this was due to armament programs, especially by totalitarian powers and, at the close of the decade, by the western democracies. A larger part was due to the quicker recovery from the 1930 depression in practically all foreign countries, France excepted.

United States and France have shared two similarities in their depression records. Both have followed programs of managed economies in which the government has left unchanged the capitalistic structure of business while imposing progressive regulation over its operations, meanwhile incurring huge

Steel Ingot, Castings Production 1890-1939



■ While the rest of the world was increasing steel production 42 per cent in the past decade, United States output took its first long-term backward step, fell 20 per cent below production in the 20s

deficits to finance subsidies and relief programs. Both have witnessed a large reduction of investment of private capital in business enterprises. In both, has industry been besieged by labor trouble.

Assuming (as most businessmen believe) that the poor showing in the 30s was due to a decade of deficits, to increasing government regulation, to government competition with business, to a 150 per cent rise in the national debt, to burdensome and coercive taxes, and to the fright caused private capital by all the foregoing, what may the metals industries expect in the 40s?

To Build More Express Highways

Automobile production for the past ten years totaled 32,127,569 (United States and Canada), a 13 per cent decrease from the 37,207,600 made in the 20s. With a population approximately 25,000,000 larger at the beginning of the present decade than in 1920, there appears to be no insurmountable obstacle to a commensurate increase in automobile demand.

New express highways, affording easy and rapid ingress and egress to metropolitan centers, may become realities in the next ten years. Building such highways would not only afford a market for millions of tons of steel, but also would stimulate automobile sales.

Construction has been far below the 20s. According to F. W. Dodge Corp. reports, the total for the past ten years was \$25,750,757,000, or only 80 per cent of the total for the five years from 1925 to 1929. A better decade to come seems assured.

Many steelmen believe steel resi-

dential housing will don its long trousers during the next ten years. The groundwork has been laid; refinements in design and the breaking down of sales resistance remain to be accomplished.

One leading steel manufacturer has predicted the next ten or 15 years will see steel houses with movable walls to permit the housewife to change the shape or location of rooms just as she now moves the furniture.

Railroads have been disappointing customers through most of the past decade. Outlook for better carloadings and the need for new and improved equipment presage at least moderately better buying by the carriers if they are to continue to operate.

Railroad ownership has shrunk 600,000 freight cars and 14,000 locomotives since 1929. Deferred maintenance at the end of 1938 was estimated at \$283,000,000 by the interstate commerce commission. A survey by STEEL indicated deferred steel purchases amount to 7,500,000 tons, in addition to normal annual needs.

The machine tool industry, which in the past decade went through a decline in business until it almost reached the vanishing point, still produced a greater dollar volume in the 30s than in the 20s. Now operating near practical capacity and booked well into the current year, the industry's outlook is bright.

If war continues in Europe, foreign demand should hold up. If the war ends suddenly and the belligerents divert tools now making armaments to manufacture of peacetime

products, a stiff trade war may develop. The only way domestic producers, paying high wage rates, could hope to compete with cheap-labor foreign products would be to employ more modern and efficient machine tools.

The nation's thirst shows no signs of abating, and beer continues to go to market in cans. Housewives still buy food in tins.

Ships already awarded in American yards assure the busiest next three or four years for ship steel suppliers since the World war. The destruction of heavy tonnages in the war at sea promises large replacement needs by European neutrals and belligerents, in which American steelmakers will share to some extent.

Miscellaneous Uses Grow

The depression decade has witnessed a remarkable growth in use of light steels for miscellaneous products, especially household appliances, furniture, hospital and other institutional equipment. Due partially to the better steels developed and partially to better fabrication methods, "miscellaneous" now ranks as a first-flight consumer.

As research enables better alloys at lower costs, the extension of these and similar uses appears a certainty. Hospital equipment alone offers a potential market for 17,000 tons of stainless sheets, strip and light plate.

In general, while no tremendous new expansion in steel usage, like the railroad building in the industry's early days on the more recent widespread use in construction, now is in sight, the industry should refine and extend its market during coming years. Research will open new markets; present major consumers will account for goodly tonnages, provided, of course, general business conditions are satisfactory.

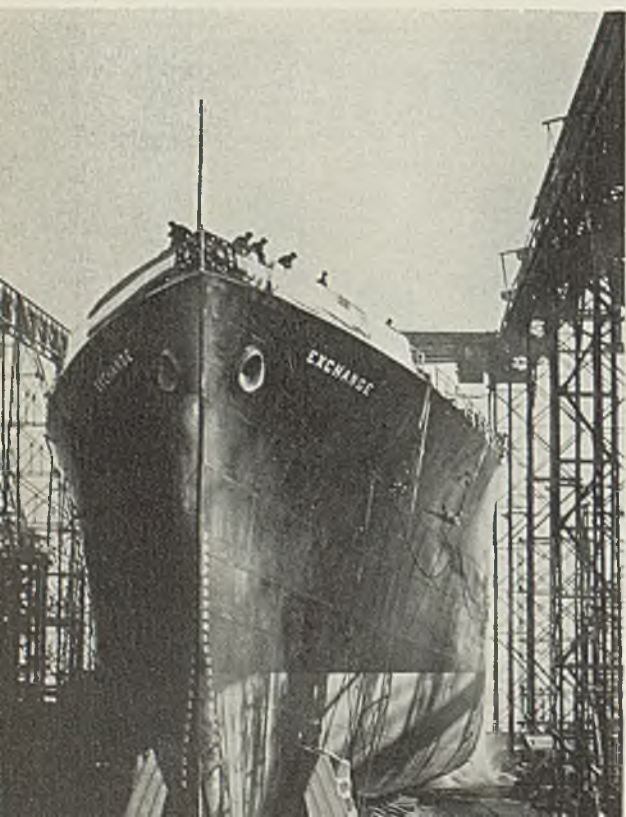
Greatest factors in the turn of general business now are the war in Europe and the course of governmental policies relating to business.

War, it is generally agreed, will have a stimulating effect while in progress, with an added bulge resulting from the reconstruction programs that must follow. Just as generally agreed: A later hang-over.

Domestic problems loom larger to most. The past decade brought a greater interest in political affairs by business men, and the trend toward industrial statesmanship probably will be accentuated during the coming period.

The late 30s showed an unmistakable shift toward conservatism, an insistence to reform some of the reforms instituted by the New Deal. As of Sept. 1, 1939, prospects for a more conservative administration in

(Please turn to Page 73)



Launch Third Express Liner

■ S. S. EXCHANGE, third of four fast express liners being built at the Fore River yard of the Bethlehem Shipbuilding Corp., Quincy, Mass., going down the ways during recent launching ceremonies. The EXCHANGE is expected to be delivered to the American Export Lines Inc. early this year.
NEA photo

Steel Ingot Production Reduced in December

■ Steel ingot production in December amounted to 5,164,420 gross tons, representing 85.57 per cent of capacity, compared with 5,462,616 tons and 93.26 per cent of capacity in November, according to the American Iron and Steel institute. It was the third largest monthly production in 1939, exceeded only by October and November. With these exceptions, it was the largest monthly production since May, 1929.

Production for all 1939 totaled 45,768,899 tons at 64.29 per cent of capacity, compared with 27,742,225 tons at 39.65 per cent in 1938. In 1937 total production was 49,502,907 tons at 72.3 per cent.

Weekly output for December was 1,168,421 tons, compared with 1,273,337 tons in November, and 1,217,567 tons in October. In December, 1938, the weekly rate was 708,314 tons. Average weekly rate for 1939 was 877,080 tons; in 1938, 532,072 tons.

Pictures How Steel Serves the Farmer

■ How modern steel farm implements and equipment have increased the farmer's production, lightened his task and raised his standard of living are portrayed in the American Iron and Steel institute's new picture booklet, *Steel Serves the Farm-*

District Steel Rates

	Percentage of Ingot in Leading Districts		Capacity Engaged in Districts	
	Week ended Jan. 6	Change	1939	Same week 1938
Pittsburgh . . .	89	+19	44	25.5
Chicago	90.5	+ 9.5	53	24.5
Eastern Pa. . .	82	+ 5	34	31
Youngstown . .	85	+11	50	24
Wheeling	89	+13	64	26
Cleveland	85	+17	54	26
Buffalo	67	- 7.5	44	23
Birmingham . .	94	+19	77	63
New England . .	83	+ 8	70	19
Cincinnati . . .	91	+16	72	...
St. Louis	78.5	+ 1.5	45.5	21
Detroit	90	+ 5	91	33
Average	86.5	+11	51.5	26

er. Illustrated is the development of farm tools from early Egyptian and Babylonian days to today's efficient machinery.

Typical example: Grain was first harvested with sickles with which by hard labor one man could reap half an acre a day; today's modern harvester cuts and binds 40 acres a day, or the huge new combines cut and thresh the grain as it travels.

■ Twenty-third open-hearth conference of the American Institute of Mining and Metallurgical Engineers is to be held at the William Penn hotel, Pittsburgh, April 24-26.

PRODUCTION

STEELMAKING REGAINS MOST OF HOLIDAY LOSS

■ STEELWORKS operations last week regained nearly all the holiday decline, rising 11 points to 86.5 per cent. Eleven districts rebounded and one showed a loss because of repairs. Last year the rate was 51.5 per cent; two years ago 26 per cent.

Cincinnati—Recovered 16 points to 91 per cent.

Birmingham, Ala.—Advanced 19 points to 94 per cent, the preholiday level.

St. Louis—Up 1½ points to 78½ per cent as result of slight changes in several plants.

Pittsburgh—Rebounded 19 points to 89 per cent. A slight further rise is expected this week.

Wheeling—Operated at 89 per cent, an increase of 13 points.

Chicago—Rose 9½ points to 90½ per cent, with most mills back at preholiday level, two attaining the highest rate since the fall peak.

Cleveland—Increased 17 points to 85 per cent.

Central eastern seaboard—Gained 5 points to 82 per cent, with 2 or 3 points additional indicated for this week.

Buffalo—Drop of 7½ points to 67 per cent was due to holiday idleness and repairs.

New England—Added open hearths to operate at 83 per cent, a rise of 8 points. Little change is indicated for this week.

Youngstown, O.—Resumption of production on a full week basis advanced the rate 11 points, to 85 per cent. This week a decline of 2 to 3 points is anticipated, as Carnegie-Illinois Steel Corp. will take off two open hearths and Youngstown Sheet & Tube Co. one, the latter probably adding one furnace late in the week.

Detroit—Advanced 5 points to 90 per cent.

Canada's Steel Output Slips; Pig Iron Higher

■ Canada's production of steel ingots and castings in November was slightly under that of October but far in excess of November, 1938. November output of pig iron and ferroalloys was larger than in October and in November, 1938.

Eleven months' output in all three products was greater than in the corresponding period in 1938. Comparisons:

	Steel ingots	Pig iron castings	Ferroalloys
Nov., 1939	147,182	87,822	7,285
Oct., 1939	149,890	85,758	6,357
Nov., 1938	90,120	46,216	5,999
Eleven mo., 1939	1,234,765	661,562	64,740
Eleven mo., 1938	1,077,381	651,718	50,512

Steel Ingot Statistics

	Calculated Monthly Production—All Companies		Weekly production, all of companies, gross tons	Number of months in				
	Open Hearth—Per cent of capacity	Bessemer—Per cent of capacity			Total—Per cent of capacity			
1939	Reported by Companies which in 1938 made 98.67% of Open-Hearth and 99.90% of Bessemer.							
Jan.	3,026,710	54.96	147,642	27.26	3,174,352	52.48	716,558	4.43
Feb.	2,792,267	56.15	196,382	40.16	2,988,649	54.72	747,162	4.00
March	3,210,481	58.30	194,889	35.99	3,405,370	56.30	768,707	4.43
April	2,768,269	51.91	205,977	39.28	2,974,246	50.78	693,297	4.29
May	2,752,549	49.98	170,326	31.45	2,922,875	48.32	659,791	4.43
June	2,937,622	55.08	187,666	35.78	3,125,288	53.35	728,505	4.29
July	2,932,924	53.38	229,610	42.49	3,162,534	52.40	715,505	4.42
Aug.	3,516,219	63.85	247,199	45.65	3,763,418	62.22	849,530	4.43
Sept.	3,933,885	73.94	297,425	56.84	4,231,310	72.41	988,624	4.28
Oct.	4,988,416	90.58	405,405	74.86	5,393,821	89.17	1,217,567	4.43
Nov.	5,057,655	94.83	404,961	77.22	5,462,616	93.26	1,273,337	4.29
Dec.	4,848,702	88.24	315,718	58.43	5,164,420	85.57	1,168,421	4.42
Total	42,765,699	65.98	3,003,200	47.12	45,768,899	64.29	877,080	52.14
1938	Reported by Companies which in 1938 made 98.67% of Open-Hearth and 99.90% of Bessemer.							
Jan.	1,634,224	30.28	99,941	18.27	1,734,165	29.17	391,459	4.43
Feb.	1,572,009	32.26	125,443	25.39	1,697,452	31.63	424,363	4.00
March	1,846,517	34.21	157,687	28.82	2,004,204	33.72	452,416	4.43
April	1,786,942	34.19	132,100	24.93	1,919,042	33.34	447,329	4.29
May	1,669,455	30.93	131,422	24.02	1,800,877	30.30	406,519	4.43
June	1,513,715	28.96	119,128	22.48	1,632,843	28.36	380,616	4.29
July	1,846,319	34.29	127,998	23.45	1,974,317	33.29	446,678	4.42
Aug.	2,340,363	43.36	196,739	35.96	2,537,102	42.68	572,709	4.43
Sept.	2,440,192	46.80	206,937	39.15	2,647,129	46.09	618,488	4.28
Oct.	2,882,827	53.41	223,158	40.78	3,105,985	52.25	701,125	4.43
Nov.	3,357,167	64.23	201,196	37.97	3,558,363	61.81	829,455	4.29
Dec.	2,971,834	55.19	158,912	29.11	3,130,746	52.79	708,314	4.42
Total	25,861,564	40.71	1,880,661	29.20	27,742,225	39.65	532,072	52.14

Percentages of capacity operated for 1939 are calculated on weekly capacities of 1,243,153 gross tons open-hearth ingots and 122,248 gross tons bessemer ingots; total, 1,365,401 gross tons; based on annual capacities as of Dec. 31, 1938, as follows: Open-hearth ingots, 64,817,994 gross tons; bessemer ingots, 6,374,000 gross tons.

Percentages of capacity operated for 1938 are calculated on weekly capacities of 1,218,342 gross tons of open-hearth ingots and 123,514 gross tons of bessemer ingots; total, 1,341,856 gross tons; based on annual capacities as of Dec. 31, 1937, as follows: Open-hearth ingots, 63,524,356 gross tons; bessemer ingots, 6,440,000 gross tons.

December Pig Iron Rate Down 2 Per Cent; Stacks Unchanged

■ FIRST dip in the rate of coke pig iron production since the upturn began last June was registered in December. Since the drop amounted to only approximately 2 per cent, it seems likely that the reversal can be attributed more to slackened operations over the Christmas holiday than to any break in the demand for iron.

Active blast furnaces Dec. 31 remained the same as on Nov. 30 at a total of 191. Of three stacks blowing out, two were reported as being relined; of three stacks resuming, one had gone down in November for relining.

Average daily production of iron

Gross Tons				
	1939	1938	1937	1936
Jan.....	70,175	46,608	103,863	65,461
Feb.....	73,578	46,655	107,857	63,411
March...	77,201	47,426	111,951	66,004
April...	68,511	46,267	113,354	80,316
May....	55,404	40,675	114,360	85,795
June...	70,647	35,358	103,843	86,551
July....	76,001	39,131	112,947	83,735
Aug....	85,823	48,242	116,676	87,475
Sept....	95,802	56,103	113,932	90,942
Oct.....	117,012	66,694	93,259	96,509
Nov.....	124,003	76,222	66,901	98,331
Dec.....	121,535	71,378	48,499	100,813
Ave.....	86,375	51,752	100,573	83,832

MONTHLY IRON PRODUCTION

Gross Tons			
	1939	1938	1937
Jan.....	2,175,423	1,444,862	3,219,741
Feb.....	2,060,183	1,306,333	3,020,006
March....	2,393,255	1,470,211	3,470,470
April....	2,055,326	1,388,008	3,400,636
May.....	1,717,522	1,260,937	3,545,180
June....	2,119,422	1,060,747	3,115,302
July.....	2,356,036	1,213,076	3,501,359
Aug.....	2,660,513	1,495,514	3,616,954
Sept....	2,874,054	1,683,097	3,417,960
Oct.....	3,627,384	2,067,499	2,891,026
Nov.....	3,720,100	2,286,661	2,007,031
Dec.....	3,767,605	2,212,718	1,503,474
Total...	31,526,823	18,889,663	36,709,139

in December was 121,535 gross tons, as compared with 124,003 tons in November. This was a loss of 2468 tons per day, or 1.99 per cent. The December rate stands as the second highest for any month in 1939, the November figure being the highest, and, incidentally, the best for any month since May, 1929, with 125,753 tons. In December, a year ago, production averaged only 71,378 tons per day.

Total output in December amounted to 3,767,605 gross tons, against 3,720,100 tons in the preceding month. This was an increase of 47,505 tons, or 1.27 per cent. In view of the drop in daily rate, the small gain was due to the fact that December was a one-day longer month than November. The December production was the best on record for that month and the best for any month since July, 1929, with 3,782,511 tons. Output in December, 1938, was 2,212,718 tons.

Iron production for 1939 aggregated 31,526,823 gross tons, against 18,889,663 tons in 1938. The gain amounted to 12,637,160 tons, or 67

per cent. The 1939 output was the highest since 1937 which recorded a total of 36,709,139 tons.

Relating production to capacity, operations in December averaged 88.5 per cent. This compares with 90.3 in November, 85.2 in October, and 51.4 per cent in December, a year ago.

During December, three blast furnaces resumed and three were blown out—all of the nonmerchant or steelworks classification. The total in blast at the end of the month, 191, was the same as on Nov. 30, and compared with 188 on Oct. 31, and 115 on Dec. 31, 1938. The figure of 191 stacks has not been equaled since August, 1937, and is one less than the 192 total for July of the same year. Since April, the low point of 1939 with 102 furnaces active, 89 have resumed operation.

Furnaces resuming operation in

	No. in blast		Total tonnage	
	last day of	Dec. Nov.	Mer-	Nonmer-
			chant	chant
Alabama	18	18	106,762*	163,174
Illinois	14	14	85,086	237,114
New York	11	11	42,258	196,446
Ohio	43	44	92,254	771,796
Penna.	65	65	119,591*	1,080,226*
Colorado	3	3		
Indiana	17	16	3,457*	625,813
Maryland	6	6		
Virginia	1	1		
Kentucky	2	2		
Mass.	1	1		
Michigan	5	5		
Minnesota	2	2		
Missouri	0	0	21,108	222,520
Tenn.	0	0		
Utah	1	0		
West Va.	2	3		
Total	191	191	470,516*	3,297,089*

* Includes ferromanganese and spiegel-eisen.

December were: In Indiana: Madeline No. 1, Inland Steel Co. In Pennsylvania: Eliza No. 5, Jones & Laughlin Steel Corp. In Utah: Provo, Columbia Steel Co.

Stacks blown out were: In Ohio: Lorain No. 2, National Tube Co., for relining. In Pennsylvania: Cambria J, Bethlehem Steel Co. In West Virginia: Riverside, Wheeling Steel Corp., for relining.

Port Henry blast furnace No. 2 of Witherbee Sherman Corp., Port Henry, N. Y., and the Standish furnace of Chateaugay Ore & Iron Co., Standish, N. Y., are being scrapped by Republic Steel Corp. which during the past year leased the ore mining and concentrating properties of the two companies. With removal of these two stacks, total potential furnaces in the United States is reduced from 235 to 233.

Built in 1922-23 and last operated in 1934, Port Henry No. 2 furnace had an annual capacity of 180,000 gross tons of basic, foundry, mal-

RATE OF FURNACE OPERATION (Relation of Production to Capacity)

	1939 ¹	1938 ²	1937 ³	1936 ⁴
Jan.....	51.0	33.6	76.6	48.2
Feb.....	53.5	33.6	79.5	46.4
March....	56.1	34.2	82.5	48.5
April....	49.8	33.4	83.7	59.1
May.....	40.2	29.4	84.3	63.1
June....	51.4	25.5	76.6	63.6
July.....	55.0	28.2	82.9	61.5
Aug.....	62.4	34.8	85.7	64.3
Sept....	69.7	40.5	83.7	66.9
Oct.....	85.2	48.0	68.4	71.0
Nov.....	90.3	55.0	49.3	72.3
Dec.....	88.5	51.4	35.6	74.2

¹Based on capacity of 50,198,920 gross tons, Dec. 31, 1938; ²capacity of 50,606,400 gross tons, Dec. 31, 1937; ³first half on capacity of 49,512,737 tons, Dec. 31, 1936—second half on capacity of 49,727,737 tons, June 30, 1937; ⁴capacity of 49,777,893 tons, Dec. 31, 1935. Capacities by American Iron and Steel Institute.

leable and low-phosphorus pig iron. Port Henry No. 1 furnace, built in 1872-73 and last rebuilt in 1921, was partially dismantled in 1937 and subsequently abandoned and removed from the list in June, 1939. It had an annual capacity of 108,000 gross tons. The Standish furnace was built in 1886, last rebuilt in 1921, and last operated in March, 1939. It had an annual capacity of 100,000 gross tons of low-phosphorus pig iron.

Swedish Boats Carrying Ore to Baltimore Sunk

■ Two Swedish freighters carrying iron ore to Baltimore were sunk last week. Two other Swedish ore boats destined for Baltimore have been sunk within past ten weeks.

LABOR

111,000 ADDED TO STEEL INDUSTRY PAYROLLS IN YEAR

■ STEEL companies added 111,000 employes to payrolls from November, 1938, to November, 1939, an increase of almost 25 per cent, according to the American Iron and Steel institute. November employment, 561,000, was 16,000 more than in October.

November payrolls totaled \$86,682,000, compared with \$83,421,000 in October and \$61,054,000 in November, 1938. Wage-earning employes averaged 84.7 cents an hour in November, 84.6 cents in October, 83.5 cents in November, 1938. Average work week was 39.5 hours in November, 38 hours in October, 34.2 hours in November, 1938.

SUPREME COURT UPHOLDS NLRB IN THREE CASES

United States Supreme Court in three decisions last week ruled the national labor relations board is supreme in that the federal courts have no right to review the board's certification of bargaining agents or its orders for elections.

In a case involving the Falk Corp., Milwaukee, the court held a federal district court had no power to modify a board order directing an em-

ploye election to select a bargaining agency, and disestablishment of a company union. The district court had granted enforcement of the order but had amended it so that the local union could be placed on the ballot. Board argued in its high court appeal that amendment of the order changed its intent and purpose.

Another decision certified validity of the board's action in designating a CIO union as exclusive bargaining agency for all longshoremen on the Pacific coast. High court appeal was by two AFL longshoremen's unions.

Third decision upheld the board in a case involving the proper type ballot to be used in an employe election for the Consumers Power Co. of Michigan.

REDUCES ACCIDENTS WHILE ADDING 2700 TO FORCE

American Rolling Mill Co. in 1939 established the best safety record of its history, according to C. H. Murray, director of personal relations.

"The severity of accidents was greatly reduced, while the number of accidents declined to one of the lowest levels the company has ever experienced," he said. "During the year, more Armco men were injured in automobile accidents and in accidents at home than were injured at work."

The Middletown, O., plant with

4500 men last fall went 66 days continuously without a lost-time accident. Some 2700 employes were added to the force in the various plants of the company during the past year.

WEIRTON STEEL EMPLOYES ELECT REPRESENTATIVES

Unusually heavy balloting marked the seventh annual election of employes' representatives at Weirton Steel Co., Weirton, W. Va., plants. Of 10,074 employes eligible, 9531, or 94.6 per cent voted. To be eligible employes had to have been on payrolls 60 days before nominations. Supervisors and executives were ineligible under the rules of the plan.

Thirty-three of the 45 representatives elected had served in 1939. Six were elected for the seventh consecutive year.

Norman K. Moore, who has been a representative since inception of the system, was elected general chairman. C. D. Beagle was re-elected general secretary.

UNEMPLOYMENT ADVANCES 5 PER CENT IN NOVEMBER

United States unemployment rose 391,000 in November, the first increase since July, and reached a total of 8,511,000, or about 1,000,000 less than in November, 1938, estimates the National Industrial Conference board, New York.

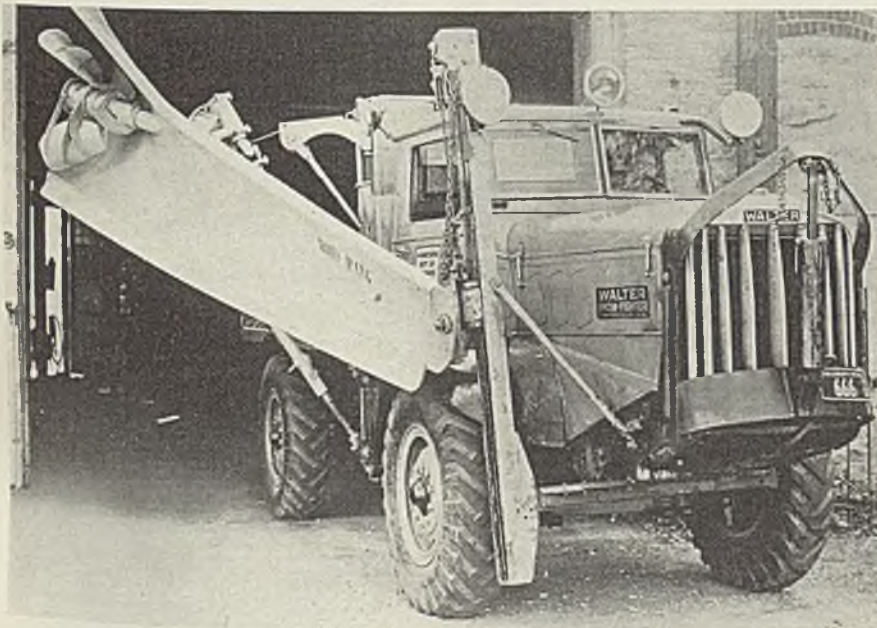
Rise in number of jobless was due almost entirely to a seasonal decline in employment of 625,000 agricultural workers. Manufacturing employment continued to increase with a contraseasonal gain of 56,000 new workers.

Court Upholds Group Tax For U. S. Steel Affiliates

■ Minnesota's supreme court last week upheld the right of United States Steel Corp. to file a single consolidated income tax return for all subsidiaries in which it owns or controls 90 per cent of the voting stock. Decision reversed a district court ruling.

In a companion decision, the state's high court ruled Minnesota railroads are exempt from the corporate income tax under constitutional provisions which provide for a gross earnings tax against railroads in lieu of all other taxes. Ruling was a victory for the Duluth, Missabe & Northern railway and several affiliated roads in the iron ore mining section. The case directly involved a \$569,000 corporate income tax levy against the first road for 1933, and indirectly involved more than \$3,000,000 for subsequent years.

Cuts Weight of Snow Plow 43 Per Cent



■ By using No. 12 gage USS Man-Ten high tensile steel in the moldboard, and 3/16-inch USS Man-Ten bracing back of the wing, the Roto Wing Co., Mound, Minn., reported it saved 1000 pounds in dead weight without sacrificing strength in this new rotary snow plow widener. The unit weighs less than 1300 pounds as

against a former 2300 pounds when made from structural quality plates. Propeller type rotor picks up the snow as it moves along the blade, accelerates and discharges it through the rotor over full 360 degrees. This permits sloping of banks beyond the ditch line rather than leaving a vertical bank.

November Iron, Steel Imports Off 14 Per Cent

Imports of iron and steel products, excluding scrap, totaled 14,379 gross tons valued at \$1,005,774 in November, compared with 16,884 tons valued at \$1,147,656 in October

U. S. FOREIGN TRADE IN IRON AND STEEL, INCLUDING SCRAP

	Gross Tons		Gross Tons	
	1939	1938	1939	1938
	Exports	Imports	Exports	Imports
Jan.	362,672	27,664	586,294	29,631
Feb.	359,690	19,149	460,640	19,589
March	474,360	25,369	526,883	11,827
April	394,008	44,083	489,202	21,237
May	532,641	28,142	540,639	20,814
June	588,856	32,587	312,021	15,887
July	513,664	30,851	263,699	14,728
Aug.	477,078	28,328	242,139	20,041
Sept.	575,613	29,874	346,068	27,958
Oct.	591,856	19,189	425,431	26,445
Nov.	.....	.....	469,596	27,627
Dec.	.....	.....	490,095	28,767
Total	.....	.....	5,152,707	264,551

and with 22,878 tons valued at \$1,402,221 in November, 1938, according to the metals and minerals division, department of commerce. This is a decrease from October of 14.8

UNITED STATES IMPORTS FOR CONSUMPTION OF IRON AND STEEL PRODUCTS

	Gross Tons		
	Nov. 1939	Oct. 1939	Jan. thru Nov. 1939
Pig iron	2,774	5,077	37,274
Sponge iron	172	256	1,703
Ferromanganese	2,465	3,115	32,130
Spiegelisen	3,233	2,364	32,795
Ferrochrome	.....	.....	129
Ferrosilicon	96	289	1,494
Other ferroalloys	3	66	281
Steel ingots, blooms, etc.	.....	1	12
Billets, solid or hollow	154	166	588
Concrete reinforce. bars	15	.....	2,365
Hollow bar and drill steel	71	107	1,256
Bars, solid or hollow	582	711	16,557
Iron slabs	.....	.....	.....
Iron bars	92	82	752
Wire rods	917	1,152	9,634
Boiler and other plate (including skelp)	3	1	27
Sheets, skelp, saw plate	18	8	1,404
Die blocks or blanks, etc.	6	2	88
Tin plate, taggers' tin and terneplate	15	14	80
Structural shapes	530	420	38,398
Sashes and frames	.....	.....	5
Sheet piling	.....	.....	462
Rails and track material	1,480	1,434	7,769
Cast-iron pipe, fittings	104	.....	1,582
Mall, iron pipe fittings	.....	29	144
Welded pipe	.....	82	4,462
Other pipe	320	383	25,741
Cotton ties	.....	.....	7,126
Other hoops and bands	363	185	16,280
Barbed wire	174	100	14,924
Round iron and steel wire	166	286	2,241
Teleg. and telephone wire	.....	.....	7
Flat wire and steel strips	226	273	2,818
Wire rope and strand	121	54	1,558
Other wire	45	18	1,473
Nails, tacks, and staples	162	73	7,139
Bolts, nuts, and rivets	9	10	105
Horse and mule shoes	.....	.....	324
Castings and forgings	63	76	1,100
Total	14,379	16,884	272,227
Iron and steel scrap	837	2,305	28,225
GRAND TOTAL	15,216	19,189	300,452

(1) Manganese content; (2) chrome content; (3) silicon content; (4) alloy content.

ORIGIN OF NOVEMBER IMPORTS

	Gross Tons			
	Iron ore	Pig iron	Manganese ore	Ferromanganese
Sweden	74,930	161	.....	.....
Canada	8,885	1,272	54	.....
Mexico	89	.....	.....	.....
Cuba	21,500	.....	6,109	.....
Chile	176,400	.....	.....	.....
West Africa	5,020	.....	.....	.....
Newfoundland	7,000	.....	.....	.....
Brazil	9,800	50	2,175	.....
British India	.....	1,290	2,277	.....
Denmark	.....	1	.....	.....
France	.....	.....	5	.....
Soviet Russia	.....	.....	4,790	.....
Gold Coast	.....	.....	11,401	.....
Norway	.....	.....	.....	2,226
Netherlands	.....	.....	.....	239
Total	303,624	2,774	26,811	2,465

	Gross Tons		
	Sheets, skelp and sawplate	Structural steel	Hoops and bands
United Kingdom	3	.....	23
Canada	2	4	9
Sweden	13	.....	284
Belgium	.....	525	256
France	.....	1	10
Total	18	530	582

per cent in quantity and 12.3 per cent in value.

For 11 months in 1939 total imports were 272,227 tons valued at \$16,265,584 against 217,851 tons valued at \$13,594,779 in the corresponding period, 1938.

Canada with 6215 tons was the largest supplier in November, principal items being 3226 tons of spiegelisen, 1462 tons rails and track material and 1272 tons pig iron. Sweden's total, 2485 tons, included: Wire rods, 890 tons; bars, 284 tons; pipe, 271 tons and steel strip, 225 tons. Norway contributed 2226 tons of ferromanganese and 3 tons of other ferroalloys.

In tonnage spiegelisen was the most important import in November, 3233 tons, virtually all from Canada. Pig iron imported totaled 2774 tons, British India sending 1290 tons and Canada 1272 tons.

November scrap imports fell to 837 tons valued at \$4817, from 2305 tons valued at \$32,182 in October. In November, 1938, scrap imports of 4749 tons were valued at \$50,789. Imports for 11 months, 1939, totaled 28,225 tons valued at \$286,040, compared with 17,932 tons valued at \$204,591 in the 1938 period.

Farm Equipment Exports Off 11 Per Cent in 1939

Valued at \$4,070,133, United States exports of farm implements and machinery in November were slightly below those in November, 1938, which totaled \$4,165,283, the machinery division, department of commerce reports.

Shipments during the first 11 months of the year totaled \$63,724,600, a reduction of 11 per cent compared with the January-November 1938 shipments which amounted to

\$71,712,519. Most types of farm equipment have shared in the decline.

November exports of harvesting machinery were valued at \$143,319 compared with \$153,950 for November, 1938.

Despite a 54 per cent gain in the November exports of wheel tractors, the trade in all types of tractors and parts during the month was slightly lower than a year ago, \$3,049,230 compared with \$3,182,586. Wheel tractor shipments totaled \$1,538,896 against \$998,218 for November, 1938. Exports of tractor parts and accessories declined 24 per cent from the corresponding month last year.

Industrial Machinery Foreign Sales Larger

United States exports of industrial machinery in November totaled \$21,830,008, an increase of 11 per cent over \$19,629,659 in November, 1938. According to the machinery division, department of commerce, larger shipments were made in most types of equipment, except petroleum well and refining.

Power-driven metalworking equipment gained 7 per cent, from \$8,044,476 in November, 1938, to \$8,604,263. Power generating equipment, except automotive and electric, rose to \$1,245,141 in November, compared with \$1,089,348 in November, 1938. This was due mainly to larger exports of internal combustion engines.

Construction and conveying equipment increased 5 per cent, from \$1,396,215 to \$1,464,916. Miscellaneous industrial machinery in November totaled \$4,483,537, compared with \$3,354,907 in the corresponding month, 1938.

Continued Advance in Appliance Sales Seen

Household appliance sales will continue to increase through 1940, manufacturers predict. Joseph R. Bohnen, secretary-treasurer, American Washer and Ironer Manufacturers' association, Chicago, expects a 10 to 15 per cent increase in washers and ironers and that 1940 will be one of the industry's best years.

"I think it is a conservative estimate that 1,540,000 washers and 175,000 ironers will be sold in 1940."

Next year will be the vacuum cleaner industry's sixth more-than-a-million-unit year in succession, according to C. G. Frantz, executive secretary, Vacuum Cleaner Manufacturers' association, and president, Apex Electrical Mfg. Co., Cleveland.

"Our manufacturers produced and sold 1,400,000 cleaners in 1939, compared with 1,300,000 in 1938. This advance will continue."

MEN of INDUSTRY

■ HERBERT J. WATT, formerly assistant general manager of sales, Jones & Laughlin Steel Corp., has been named manager of sales for the central area of Carnegie-Illinois Steel Corp. He will co-ordinate sales activities at Pittsburgh, Cleveland, Cincinnati and Detroit, and will have headquarters at the general offices of the corporation in Pittsburgh. In 1912 he joined the Philadelphia office of Carnegie Steel Co. and in 1917 was transferred to the Washington office of United States Steel Corp. subsidiaries.



Herbert J. Watt

Ernest T. Weir, chairman, National Steel Corp., Pittsburgh, sailed Dec. 30 for Bermuda.

Samuel L. Shober Jr. has resigned as eastern manager, Hickman, Williams & Co. Inc., Philadelphia.

Harry Glaenger, vice president in charge of engineering, Baldwin Locomotive Works, Philadelphia, has resigned, due to ill health.

John W. Finch has resigned, effective Jan. 31, as director, bureau of mines, Washington, to resume practice as a mining engineer.

S. D. Williams has resigned as director of sales, Steel & Tube division, Timken Roller Bearing Co., Canton, O.

John Findlay, well known in Canadian engineering circles, has been named sales engineer, John Inglis Co. Ltd., Toronto, Ont.

William S. Saylor has been appointed manager of sales, Boston district, Carnegie-Illinois Steel Corp., succeeding Wilbur S. Locke, who

retired Jan. 1 upon completing 47 years of service in the corporation's Boston office. Mr. Saylor, heretofore assistant manager of sales at Buffalo, has been with the United States Steel Corp. subsidiary since 1919. Prior to going to Buffalo in March, 1936, he was with the firm's Cleveland district sales office.

C. W. Barnes has joined W. W. Sly Mfg. Co., Cleveland, maker of dust control systems and blast cleaning equipment, in charge of sales promotion and advertising.

George S. Case Jr., general manager, Birmingham, Ala., plant of Lamson & Sessions Co., Cleveland, maker of bolts and nuts and allied products, has been elected a director, to take the place of the late Chester C. Bolton.

Harry W. Schuetz has been appointed assistant to the president

and general manager of Pittsburgh Screw & Bolt Corp.'s Colona division. He joined the company 15 years ago.

John R. Williams has retired as president, Electric Storage Battery Co., Philadelphia. He had been with the company 45 years. R. C. Norberg, vice president and general manager, has been elected president and general manager.

T. R. Higgins has joined American Institute of Steel Construction, New York, as engineer in the New York district. The past eight years Mr. Higgins has been chief engineer, New England Structural Co., Everett, Mass., prior to which he was structural engineer six years for Stone & Webster Engineering Corp.

A. C. Childs, formerly manager of sales, sheet and tin plate division, Weirton Steel Co., Weirton, W. Va., has been promoted to district sales manager, New York, succeeding W. M. Rector, who has been given a leave of absence due to ill health. R. S. Meighen, formerly assistant sales manager, has been made manager of sales, tin plate division.

W. B. Moore, associated with Timken Roller Bearing Co., Canton, O., in various sales capacities for 20 years, has been appointed director of sales, Steel & Tube division. Since 1933 he was manager of industrial sales. S. C. Partridge, assistant manager of industrial sales, succeeds Mr. Moore as manager of industrial sales. He has been with the company since 1921.

C. N. Johns, a vice president, American Chain & Cable Co., Bridgeport, Conn., has been placed in



William S. Saylor



Harry W. Schuetz



C. N. Johns

charge of operations of the company's 14 plants, taking over duties of C. G. Williams, resigned.

George C. Moon, a vice president, has been appointed general manager of sales. He will continue active supervision of wire rope sales and his headquarters will remain at 230 Park avenue, New York.

William D. Kirkpatrick, general manager of sales, American Chain division, has been elected a vice president. His headquarters will continue to be at York, Pa.

Russell G. Ford has been appointed general purchasing agent, central office, Chevrolet Motor division, Detroit, succeeding the late Donald P. O'Keefe. He joined Chevrolet in 1922 in the central office standards department, and in 1928 was named buyer for the purchasing department. When the division opened its commercial car body plant in Indianapolis, he was transferred there



Russell G. Ford

as general purchasing agent, and in 1934 returned to the central office purchasing department.

Howard Dingler, associated with Chevrolet since 1916, has been named assistant to Mr. Ford. Until 1929 he was in the traffic department and at that time was promoted to materials supervisor.

James Carney, assistant materials supervisor, will succeed Mr. Dingler; and William Wilson, materials supervisor for the St. Louis plant, has been transferred to Detroit succeeding Mr. Carney.

John A. Dillon has resigned as vice president in charge of eastern sales, New York, for Pittsburgh Screw & Bolt Corp., Pittsburgh, Mr. Dillon was associated with the corporation more than 20 years.

Richard D. Baker, formerly sales manager, has been elected a vice president and general manager of sales. Howard L. Keally continues



Howard Dingler

as vice president and assistant general manager of sales.

G. W. Van Syoc, General Motors building, Detroit, has been named president, Federal Fabricating & Steel Corp., Mineral Ridge, O., and also will serve as board chairman. He is well known in the automotive industry, having been associated with General Motors Corp. a number of years.

O. J. Ryder, for several years active with various motor companies and an authority on resistance welding, has been named vice president and general manager and will supervise all plant operations.

Died:

■ AMBROSE N. DIEHL, 63, former president, Columbia Steel Co., San Francisco, United States Steel Corp. subsidiary, Jan. 3, of bronchial pneumonia at his home in that city. After receiving his bachelor of science degree in 1898 at Pennsylvania State college, Mr. Diehl was employed in the laboratory of the former Carnegie Steel



Ambrose N. Diehl

Co. He served successively as assistant blast furnace superintendent, blast furnace superintendent, assistant general superintendent, Duquesne steelworks and blast furnace; assistant operating vice president; general superintendent, Duquesne works; vice president and director. In 1930 he became vice president of the Steel corporation, and two years later was transferred from New York to the Pacific coast to take charge of the corporation's interests there. In June of 1932 he became president of Columbia Steel. He was a member, American Institute of Mining and Metallurgical Engineers and American Iron and Steel institute.

Charles H. Erickson, 60, vice president and general superintendent, Cleveland Wire Spring Co., Cleveland, of a heart attack at his home in Shaker Heights, O., Dec. 24. Born in Sweden, Mr. Erickson entered the wire spring business at the age of 14, employed by Washburn & Moen Co., Worcester. In 1900 he was engaged by American Steel & Wire Co. to establish a plant at Waukegan, Ill., later returning to Worcester. Subsequently he joined the Cleveland Wire Spring Co. as superintendent, and in 1918 was elected vice president and made general superintendent.

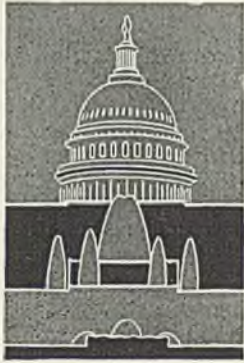
Charles K. Ernst, 73, president, Charles K. Ernst Inc., Buffalo, manufacturer of iron specialties, in Buffalo, Dec. 28.

Michael Schiavone, president, Michael Schiavone & Sons Inc., New Haven, Conn., in that city Jan. 2. He founded Schiavone & Co., New York, in 1898, and Schiavone-Bonomo Corp., Jersey City, N. J., one of the largest international houses specializing in scrap iron and steel, is the direct outgrowth of the foundations which he laid in 1898. He established his own business in New Haven in 1936.

J. Z. Collier, 53, formerly assistant general manager in charge of operations, Jones & Laughlin Steel Corp., Pittsburgh, in New York, Dec. 27. Recently he had been associated with Crucible Steel Co. of America. A graduate of Georgia Tech, his previous affiliations included Atlantic Steel Co., Whitaker-Glessner Co., parent company of the present Wheeling Steel Corp., and Central Alloy Steel Co.

Edwin W. Allen, 60, since 1926 vice president, General Electric Co., Schenectady, N. Y., Jan. 1 in Johns Hopkins hospital, Baltimore. He had been with General Electric since 1901, serving successively as engineer in the central district, manager of engineering department, and vice president.

Windows of WASHINGTON



By L. M. LAMM
Washington Editor, STEEL

WASHINGTON
■ PRESIDENT ROOSEVELT notified the third session of the seventy-sixth congress he was asking it to levy sufficient additional taxes to meet the emergency spending for national defense, backed to the limit the trade agreement program of Secretary of State Hull asking for its renewal when it expires in June, discussed the unemployment situation.

Only important increase in any part of the budget, he said, "is the estimate for national defense." Practically all other important items show a reduction.

"Therefore, in the hope that we can continue in these days of increasing economic prosperity to reduce the federal deficit."

The Chief Executive's request for tax legislation did not cause as much of a stir as was anticipated because Washington observers who have had their ears close to the ground for the past few weeks have been saying that he would ask for additional taxes.

Bearing on Hanes' Resignation?

The story in Washington is that John W. Hanes, under secretary of the treasury, resigned because he learned this and he is opposed to higher taxes now. The very fact Daniel W. Bell was announced as his successor indicates the President wants someone as under secretary of the treasury who will not oppose the President's own ideas. Regardless of Mr. Bell's ability, he will unquestionably be a "yes" man for the President.

Last November Senator Harrison, Mississippi, chairman of senate finance committee, had a tax conference with the President and the senator was allowed to make his own statement. Senator Harrison said as a result of the conference it had been definitely decided taxes would not be increased. The Presi-

dent made no denial, but the Corcoran-Cohen-Eccles group immediately got busy on the President with the result that at a roadside press conference at Warm Springs, Ga., the President suggested a \$500,000,000 tax program for defense might be necessary.

In his budget message sent to congress Thursday, the President asked for action on what he termed national defense taxes.

"I am confident that specific tax legislation should be enacted to finance the emergency national defense expenditures. Although these expenditures appear unavoidable, they will not increase the permanent wealth producing capacity of our citizens. I believe it is the general sense of the country that this type of emergency expenditure be met with a special tax or taxes. Moreover, this course will make for greater assurance that such expenditures will cease when the emergency has passed.

"I strongly recommend to the congress, therefore, that additional taxes be imposed to yield in the fiscal year 1941 at least enough to cover the emergency national defense expenditures in the fiscal years 1940 and 1941. In seeking additional sources of revenue, I hope that the congress will follow the accepted principle of good taxation of taxing according to ability to pay and will avoid taxes which decrease consumer buying power."

Just before the President addressed congress on state of the union, Charles Edison, new navy secretary, asked that the President be vested with vast powers to commandeer and sequester ships, materials and resources under a national emergency proclamation.

Mr. Edison proposed the Chief Executive be empowered to order ships or war materials to meet the nation's needs as defined by the Presi-

dent. Compliance with such orders would be obligatory and would take precedent over all previous orders and contracts. If a manufacturer refused or failed to give such preference, the President could take immediate possession of the plant.

The President could also require factory owners which make war materials or ships to put their facilities at the President's disposal.

INDUSTRY GIVEN REPORTS ON STEEL PRODUCTS

Justice department Saturday sent first reports on its study of certain steel products to steel companies which had answered its questionnaires. Questionnaires were sent to some 50 companies and asked information on nine products. The department has completed its report on four—hot-rolled sheets, heavy shapes, plates and hot-rolled strip.

The report which is being sent to the industry includes 20 tables. Report will not be made public until presented to the temporary national economic committee when that body resumes its hearings Jan. 22.

Report has been made to TNEC regarding identical bids received by the government during the 12-month period ended November, 1938, by the procurement division of the treasury. It indicates identical bids were received on nearly a quarter of the items on which bids were opened.

THURMAN ARNOLD EXPLAINS ANTITRUST CAMPAIGN

Department of justice has declined to dismiss indictments under the anti-trust law during the past year on mere promise to obey the law in the future, Thurman Arnold, assistant attorney general in charge of the anti-trust division, stated in his annual report. He said use of consent decrees to condone past offenses has been abandoned.

Mr. Arnold further stated the de-

partment has consistently emphasized that "trust-busting" is not an end in itself and that its objective is not an attack on the efficient side but the freeing of the channels of commerce. "Every combination, to a certain extent," he said, "restrains trade."

"It can be justified, therefore, only if it is reasonable. Size is not the criterion. The antitrust law is equally applicable where a large industry seeks to eliminate competition to achieve a position of arbitrary control over prices, and where a group of small organizations attempts to boycott the cheap standardized product of a large concern.

"The rule of reason in the antitrust laws provides a case-by-case method to determine in each particular industry what practices and what organizations are actually required in a machine age, and to eliminate those which are blocking the production and distribution of goods. Therefore, the emphasis of the law is not on making small industries out of big ones, but rather on abolishing restraints of trade.

"The beneficial results of putting the emphasis on restraints of trade rather than 'trust-busting' for its own sake is apparent in the investigations we are now conducting. For example, the effect of our investigation of building may well be to create and maintain a structure in that industry which will pass on to consumers the economy of increased volume. In the past the restraints of trade have been such that the building boom of 1936-37 caused prices to rise as much as 25 per cent in some cities."

CARRIERS' SCRAP RELOADING CHARGE IS AUTHORIZED

Interstate commerce commission has ruled railways in western trunk line and southwestern territories are authorized to file tariffs, publishing charges of \$4 per car for rearranging and 40 cents per ton for transferring from one car to another shipments in open-top gondola cars of improperly-loaded iron and steel scrap. The decision was in I. & S. docket No. 4596, while the decision also embraces I. & S. No. 4611.

In the syllabus in this decision, the commission said: "Proposed tariff rules relating to loading of scrap iron in carloads, found not justified, but without prejudice to the filing of new schedules in conformity with suggestions contained in report. Suspended schedules ordered canceled and proceeding discontinued."

The tariffs in this decision were filed with the object of enforcing the rules for the safe loading of iron and steel scrap which were promulgated by the Association of

American Railroads several years ago.

These rules, which the commission says "have never been rigidly enforced," make shippers responsible for safe loading and protection of equipment, and provide among other things that shippers must pay for installing wooden uprights to increase the capacity of cars. The necessity for the latter, the report points out, "arises from the circumstance that many of the cars used do not have sufficient capacity to enable shippers to conveniently load unprepared scrap to the minimum of 75,000 lbs."

Protesting scrap dealers asserted the railroad proposals would materially reduce the quantity of scrap shipped from points located substantial distances from points of consumption. Nevertheless the commission found that "an incentive or penalty is essential to induce shippers to load safely and afford adequate protection for carriers' equipment."

51,000 FREIGHT CARS PURCHASED IN 1939

In anticipation of a substantial increase in carloadings, Association of American Railroads members have agreed to reduce without delay the number of freight cars and locomotives in need of repair and to purchase such new equipment as might be needed, J. J. Pelley, president, said last week.

In reference to the equipment situation, Mr. Pelley said: "As a result of an intensive equipment repair program the number of freight cars in need of repair has been reduced by approximately 75,000 cars in the past four months. At the same time locomotives awaiting repairs have been reduced approximately 1600.

"This speeding up of equipment maintenance work as well as the increase in freight movement has materially increased employment on the railroads. In October, the railroads had 1,055,164 employes, the greatest number in any month since November, 1937, and an increase of nearly 80,000 above October last year. Of the total number in October, 511,358 were engaged in maintenance work, an increase of 53,612 compared with one year ago.

"Because of the increase in traffic, Class I railroads in 1939 purchased approximately 51,000 new freight cars. Since the first of the year, they have placed in service 20,085 new freight cars and on Dec. 1, the latest date for which reports are available, there were 36,198 new freight cars still on order. For the most part these are expected to be delivered early in 1940. In 1938, the railroads put 18,517 freight cars in service.

"Class I railroads in 1939 also

put in service 94 new steam locomotives and 216 electric and diesel locomotives, compared with 165 steam and 111 electric and diesel locomotives in 1938. On Dec. 1, the railroads had 44 steam and 71 electric and diesel locomotives on order.

"In addition to this program dealing with repair of existing equipment and the installation of new cars and locomotives, the railroads in 1939 attained a new high record in general operating efficiency. Not only was the average speed of freight trains between terminals the highest on record, but the average load per train also was the greatest. At the same time a new record in fuel efficiency of freight locomotives was established, the railroads for each pound of fuel consumed having moved 8.9 tons of freight and equipment one mile, compared with 5.8 tons in 1920."

NEW SCRAP LICENSE BILL INTRODUCED IN CONGRESS

A bill has been introduced in the house by Representative Smith, Connecticut, "to provide for the protection and preservation of domestic sources of iron and steel. Identical bill was offered in the senate by Senator Maloney, Connecticut.

It provides that in the interest of national defense "it is hereby declared to be the policy of congress and the purpose and intent of this act to protect, preserve and develop domestic sources of iron and steel, to restrain the depletion of domestic reserves of iron and steel scrap and to lessen the present danger of shortage of materials for the domestic iron and steel industry of the United States."

Bill provides that there shall not be exported from this country "after the expiration of 60 days from the enactment of this act any iron or steel scrap, except upon license issued by the President of the United States. The President is authorized to grant licenses upon such conditions and regulations as he may find necessary to insure in the public interest fair and equitable consideration to all producers of this commodity."

Further provision is made in the proposed law that "any violations of the provisions of this act shall be a misdemeanor and shall be punished by a fine of not more than \$500 or by imprisonment of not more than one year, or by both fine and imprisonment."

ALL TIN PLATE SCRAP EXPORTS GO TO JAPAN

In November tin plate scrap exports amounting to 564 tons valued at \$10,705 went to Japan, according to the state department. For the 11 months ended November, 10,314 tons valued at \$193,600.52 were exported, all going to Japan.

AVIATION

PUBLIC ACCEPTANCE SPURS TRANSPORT PRODUCTION

■ SUPPLEMENTING demand for military aircraft, orders placed with Douglas Aircraft Co. Santa Monica, Calif., for commercial transports in the United States and foreign nations broke all records in the last six months of 1939. These included 82 modern airliners valued at approximately \$10,000,000. Most of them are 21-passenger transports.

Better general business and a consequent increase in the volume of commercial travel was partially responsible for the increase. More important, however, was the strengthening of public confidence in flying, resulting from the safety record established in 1939 by the commercial air lines. In nine months they flew close to 650,000,000 passenger miles, without accident.

Plans Nonstop Service

Last week United Air Lines requested permission from Civil Aeronautics Authority to operate the first nonstop air mail express and passenger planes between Cleveland, Boston and Hartford, Conn. Approval of this application also would give the line the first direct through service between New England and the Pacific coast. According to W. A. Patterson, president of United, the service would be operated with the latest type twin-engined Douglas "Mainliners".

Aviation production has been covered as a separate industry under the census of manufacturers in the past, but for the first time a distinction will be made between military and nonmilitary planes when aircraft plants are canvassed under the sixteenth decennial census in 1940.

Specific questions cover number,

seating capacity and type of planes produced; value of all work begun and completed in 1939, and value of all other projects underway in years overlapping 1939; cost of raw materials purchased, power and fuel; expenditures for plant machinery and equipment.

Manufacturers are to report number, type and horsepower rating of all engines built. This also applies to makers of parts and equipment.

In its monthly bulletin CAA states that work on the 5000 miles of new airways which will be added to the federal airways system under the current \$7,000,000 program for the fiscal year 1940 was, at the end of October, about 40 per cent completed. In addition \$2,000,000 worth of airway equipment is being ordered to start the 1941 program. This, if present plans are realized, will add another 3000 miles to the system. Combined 1940-41 programs will bring total mileage of the system to 32,000 when completed.

A co-operative plan has been worked out between United Aircraft Corp., Hartford, Conn., and Underwood Elliott Fisher Co., New York, business machine and typewriter makers, whereby the former will employ certain surplus personnel of Underwood.

Underwood does not anticipate increased business early in 1940 because of war conditions while United is increasing employment as rapidly as possible to fill a record backlog. The plan has been in operation less than two weeks but already United has employed 50 trained workers. This selective process will continue until a substantial number of surplus employes have been absorbed.

Lockheed Aircraft Corp., Burbank, Calif., has filed a registration statement with SEC covering 225,000 shares of common stock. No major expansion of factory or working

equipment is planned. According to Robert E. Gross, president, the new building program contemplated with part of the proceeds will consist of additions to existing hangars at Burbank, and possible erection of an experimental laboratory.

Industrial Inventories 14% Above 1936 Average

■ Despite recent sharp rises in production and new orders in manufacturing industry there is as yet no evidence of any abnormal rise in manufacturers' inventories, reports the National Industrial Conference board, New York, in presenting its new indexes on inventories and new orders.

The indexes show that industrial stocks are about 14 per cent above the average 1936 level, but are relatively low in comparison with the present volume of business activity; that new orders advanced by about 72 per cent in September; and that while orders in October declined from the September level, they still remained above shipments, so that backlogs continued to increase.

Over the 11-year period analyzed, inventories reached their peak—either on an actual basis or in relation to the volume of manufacturing output—in the last half of 1937 and the first quarter of 1938. During the same period new orders have followed rather closely the trends in production, except in such crucial months as December, 1936, and September, 1939, when the increase in orders was far greater than the rise in production.

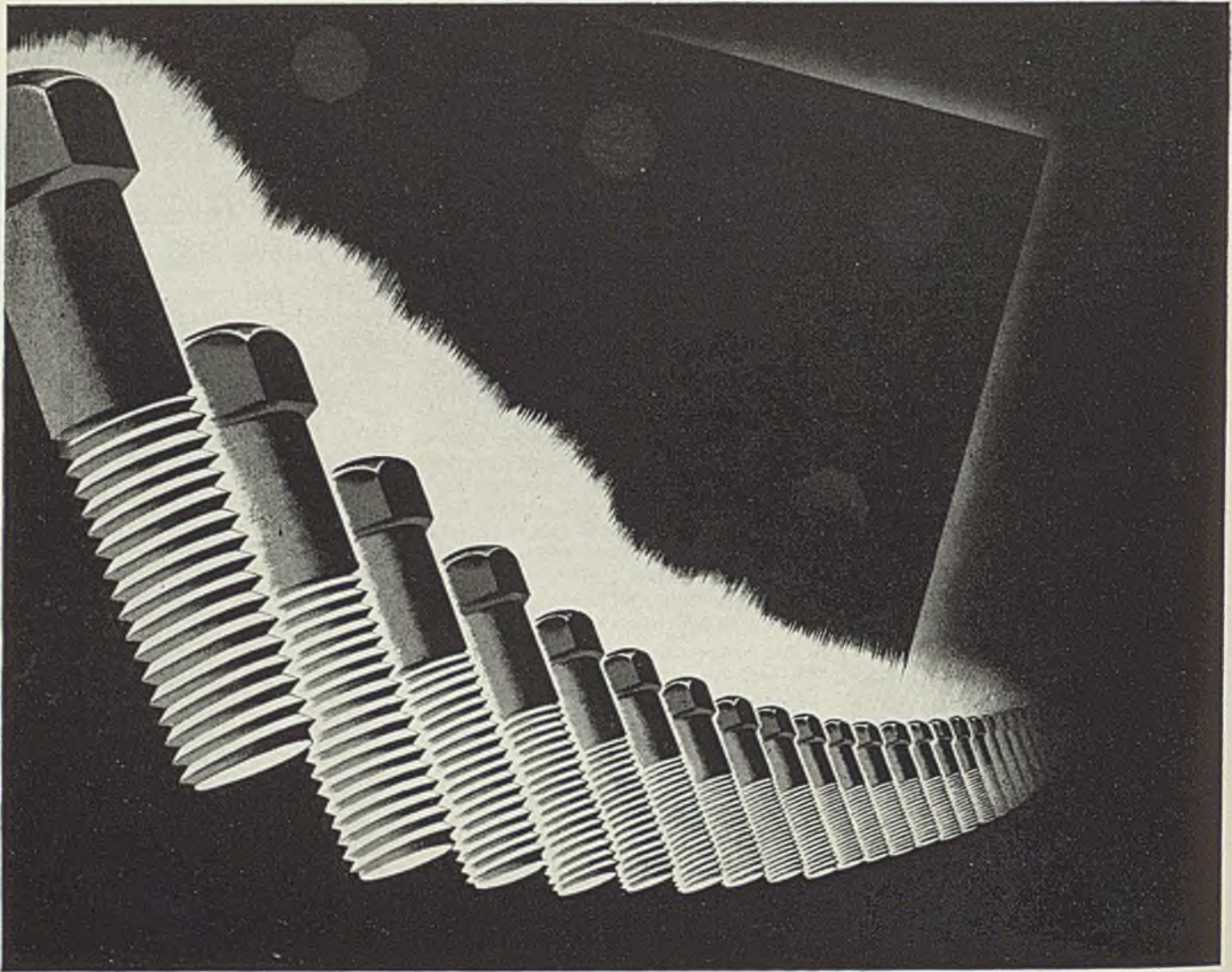
■ A vast array of new equipment will be included in the road show, International Amphitheatre, Chicago, Jan. 29-Feb. 2, during the convention of the American Road Builders' association. It is expected that 40,000 will attend the show.

Twenty-Seven-Ton, 73-Foot Refinery Absorber Trucked 75 Miles



■ Ready for a 75-mile trailer trip to an oil refinery at Kilgore, Tex., is this 54,000-pound absorber fabricated by the I. B. Beard Corp. at Shreveport, La. This refining vessel has an inside diameter of 5 feet, and is 73 feet long. The shell

is made of 11/16-inch firebox quality steel plate. In the absorber are 22 trays made of steel plate with cast iron bubble caps. Designed by the Hudson Engineering Co., Houston, Tex., it was built by Beard for Hercules Gas Co.



QUALITY UP—COSTS DOWN

When a change in material specifications reduces fabrication costs, and at the same time turns out a better product, there's something for everybody to cheer about.

Molybdenum steels are doing just that in many instances. Many manufacturers, for example, standardize on Chrome-Moly (SAE 4140) for bolts. Easier machining brings economies in tool expense and machining time—not much per bolt but a big saving in

the aggregate. And the better physical properties of the steel bring better service performance in the product.

There may be places in your own specifications where the use of Molybdenum steel will simplify production, improve the product or both. Our booklet, "Molybdenum in Steel", is filled with practical data which will help you recheck your specifications. It is sent free on request to interested production engineers and executives.

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MOLY

Mirrors of MOTORDOM

By A. H. ALLEN
Detroit Editor, STEEL



DETROIT

■ SHAKING off the customary grogginess of the past two holiday weeks during which schedules generally suffered by one or two days, the auto industry is getting back into high gear again, keeping a weather eye on sales records which normally recede slightly at this time of the year. There have already been a few signs of a let-down—not serious—from the high levels prevailing in December, and with the exception of Chrysler divisions the industry will find some of the intense pressure to turn out cars removed for a while.

A good first quarter is in prospect, *Ward's Automotive Reports* estimating output at around 1,200,000 units, approaching the peak level in 1937 of 1,302,108. Chrysler dealers are reported to have sufficient orders on books to insure the present rate of production for a minimum of two months. Ford will continue on the basis of around 4600 cars per day plus about 200 tractors per day. Independent manufacturers probably will show an approximate 10 per cent reduction from December levels.

Few Body Changes

First inquiries for 1941 model requirements are beginning to trickle out to local tool and die shops, warehouses and other suppliers. It is still too early to get any kind of picture about next year's creations, but within the next six to eight weeks some die business should be released. Present activity is largely confined to experimental or trial orders.

One thing seems fairly certain. The reception accorded the new style bodies introduced in a limited way last fall by Buick, Olds, Pontiac and Cadillac-LaSalle indicates they will be extended broadly throughout the General Motors line. In other words, look for a fairly

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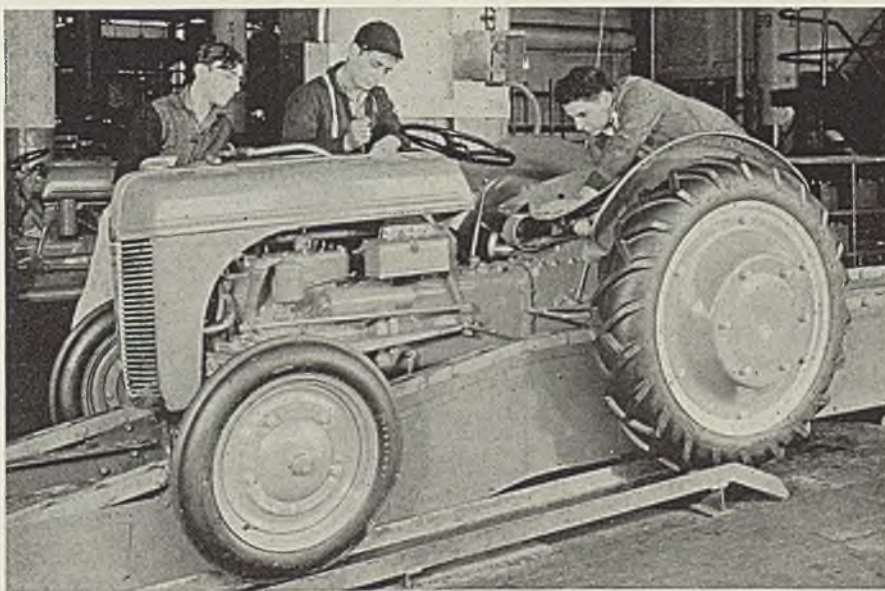
widespread "Torpedo-ing" of General Motors cars for 1941. And look also for some close patterning of other cars along the lines of these new models.

Otherwise it appears that 1941 will be the off-year for major style changes in motor cars, and if the restrained interest in new machine tool installations among car builders is any indication there will not be many significant mechanical changes either. With machine tool

deliveries so protracted, builders' books crammed with foreign orders and the possibility always in the offing that the government might in an emergency have to step in and demand exclusive attention from tool builders, it is going to be difficult for automotive manufacturers to accomplish any widespread retooling this year. However, there will continue to be the usual interest in consolidation of machining operations to the end of reducing costs and eliminating manual labor.

■ FLURRY of activity in new plant construction and expansion has been noted here in recent

Ford Planning 400 Tractors Per Day



■ Final assembly line for tractors, recently installed at the Ford Rouge plant, soon will be delivering about 400 completed units daily. As each tractor nears the end of the line, its 4-cylinder engine is started and it is driven away to the shipping dock. Built of steel castings, tractor features a hydraulic system which controls attached implements

weeks. Among the latest proposals are an addition to the Ford Motor Co. tire plant at Dearborn, and a new metal shop and rear axle building for Buick at Flint. Two single-story buildings for the Buick-Olds-Pontiac assembly plant at Linden, N. J., are being engineered and will involve 80,000 square feet of extra space for parts storage and oxygen and acetylene storage. A small addition, 2000 square feet, is to be made to the General Motors plant at Southgate, Calif. Proposals are being considered to build an overhead connecting bridge between the General Motors building and the corporation's research building in Detroit.

Three small plants have been completed near the outskirts of the city to house Progressive Welder Co., Martin Electric Co. and Hydro Mfg. Co., affiliated organizations active principally in the welding field. Congress Tool & Die Co. has authorized a new and larger plant. Timken-Detroit Axle Co. has made an addition to its plant. Further expansions have been made in plant facilities of Ex-Cell-O Corp. here.

Other important plant expansions may be announced shortly, pending acquisition of suitable land sites and similar details.

■ COINCIDENT with recent comment in this department anent the need for improved means of storing power from automobile generators has come announcement by Electric Auto-Lite Co. at Toledo, O., of a new type of storage battery which is claimed actually to grow stronger with usage. Credit for the improvement is given to a new battery oxide—active—which is reported to have electrical capacity in excess of previous standards, plus the use of fiber-glass sheeting over the plates.

Fiber-glass is pure, spun glass, porous enough to permit passage of electrolyte through it, but so finely woven that no oxide particles can penetrate it. The fiber-glass is applied over the active-covered plates and it is claimed that oxide "shedding," a common cause of battery failure, is virtually prevented. The company mentions tests which show the new battery to outlast conventional equipment two to one.

In a few weeks the reorganized Reo Motors Inc., Lansing, Mich., is scheduled to resume operations, rising from the figurative ashes of the old Reo Motor Car Co. A court scramble for control of Reo has been in process for several months and now appears to have been settled. A large volume of production machinery formerly used in passenger car manufacture only recently was auctioned off to satisfy creditors' claims. Some pre-

liminary orders for parts requirements in a new line of six truck models have been drawn up and present employment of 300 is to be expanded shortly to around 700. The six models will range in capacity from 1 to 11 tons and several additional export models will be offered. Dealerships both in this country and abroad are reported to be in good shape and anxiously awaiting appearance of the new trucks.

Chief drawback to resumption of production is a \$3,000,000 RFC loan which as yet has not been granted. When this is received, additional private capital will be available and material releases can go out. An interesting sidelight is the scotch-

mobile worker is through at the age of 40, H. J. Klingler, general manager of Pontiac, points out that men between the ages of 45 and 60 now draw the highest annual earnings, and over half of the men past 40 working in automobile plants were over 40 when hired. At Pontiac, 25 per cent of the entire wage earning force is on the shady side of 40; nearly 300 have seen 60; nine have passed 70. Of the men working on jigs, fixtures, tools and dies, about 40 per cent were hired after their fortieth birthday.

And the auto worker continues to be safer at his job than at home. In the first nine months of 1939, Pontiac experienced only nine lost-time accidents, compared with 21 in all of 1938. In the latter year, 121 of 140 departments went through the year with no lost-time accidents. Pontiac employment at the end of December stood at 8691. Payrolls increased 41.35 per cent in dollars and cents over 1938 and 40.83 per cent in number of hours of employment. Sales of cars during the year increased approximately 60 per cent over 1938.

Looking ahead three months, Mr. Klingler of Pontiac sees production by his division of 65,000 cars, compared with 44,000 in the first quarter of 1939 and 16,000 in 1938. If this level can be achieved, the plant will work five days a week steadily through the period.

Builds 25,000,000 Cars

Buick statisticians proclaim the division has just rung up one of the most successful years in its history, production, including export and Canadian shipments, exceeding 235,000 cars, of which 111,000 were 1940 models. It is interesting to note this volume was achieved through 2830 dealerships, or an average of 83 cars per dealer, which is high for the industry. At the moment the Buick organization is holding a number of sales meetings to develop plans for invigorating winter sales and counteracting seasonal influences usually met at this time of the year.

About 11 a. m. on Thursday of this week the 25,000,000th car built during the history of General Motors Corp. will slip off an assembly line at Flint, Mich. To mark the occasion, the corporation is celebrating with musical festivities in Detroit's Masonic temple, and special tribute is being paid to veteran employees who were associated with building of the first General Motors' cars in 1908. Participating in the occasion will be about 50 high-ranking executives of the corporation. Five thousand guests have been invited to attend the celebration, to be known as the "March of Men and Motors."

Automobile Production

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

	1937	1938	1939
Jan.....	399,186	226,952	356,950
Feb.....	383,900	202,597	317,517
March....	519,022	238,447	389,489
April.....	553,231	237,929	354,263
May.....	540,377	210,174	313,214
June.....	521,153	189,402	324,235
July.....	456,909	150,450	218,478
Aug.....	405,072	96,946	103,343
Sept.....	175,630	89,623	192,672
Oct.....	337,979	215,286	323,017
Nov.....	376,629	390,405	370,194
11 mos....	4,669,088	2,248,211	3,263,372
Dec.....	347,349	406,960	.....
Year.....	5,016,437	2,655,171	.....

Estimated by Ward's Reports

Week ended:	1939	1938†
Dec. 9	115,488	100,705
Dec. 16	117,805	102,905
Dec. 23	117,705	92,890
Dec. 30	89,865	75,215
Jan. 6	87,510	76,685

†Comparable week.

	Week Ended	
	Jan. 6	Dec. 30
General Motors	38,090	38,675
Chrysler	22,165	22,100
Ford	20,640	20,660
All others	6,615	7,930

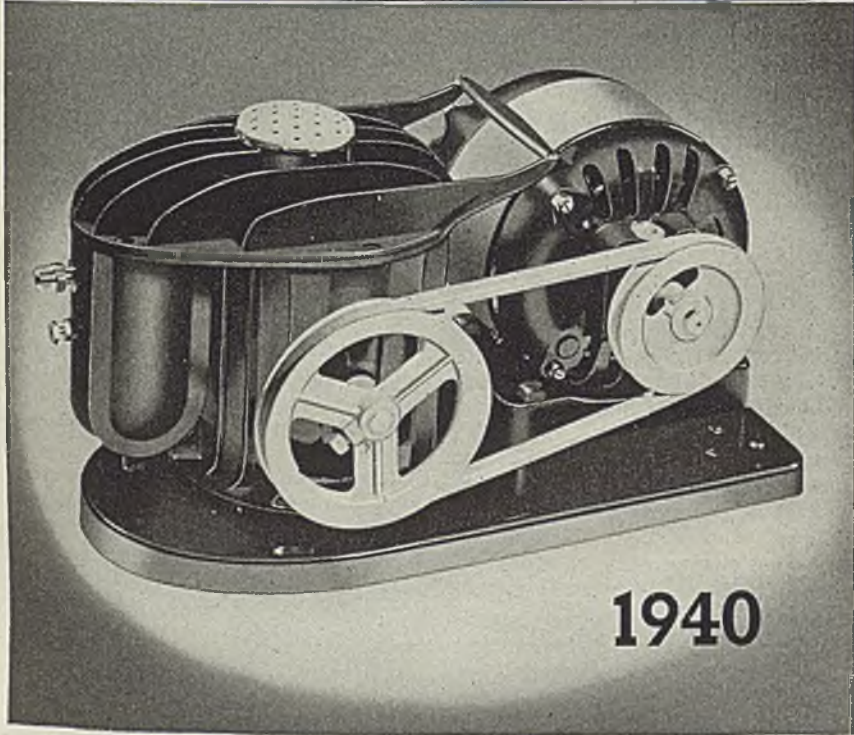
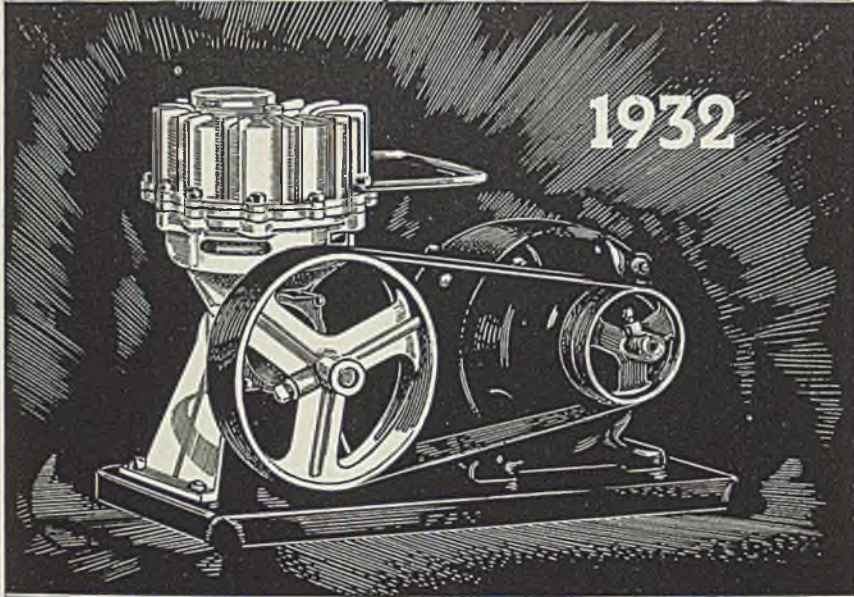
ing of a plan to sell equipment in the Reo press plant and place stamping business on the outside. It is said this idea was killed by a union representative on the present board of directors. The plant has capacity for around 10,000 trucks a year, but as yet no production schedules have been set.

Innovation in spot welding practice will be revealed by a local manufacturer within the next month or two. Steel up to 1 inch in thickness can be spot welded with conventional types of equipment, it is understood, the process involving the proper combination of pressure and current to effect the weld. A demonstration of the process and equipment now is in preparation.

Blasting the legend that the auto-

EXPERIENCE

—Die Casting's Best Salesman



● The 1940 paint spray air compressor pictured here was produced of the same metal—by the same method—as the outmoded 1932 unit. Eight years of practical experience in the production and use of portable paint spray equipment has convinced this manufacturer that ZINC Alloy Die Castings present the most satisfactory method of production.*

Every new application for ZINC Alloy Die Castings means a permanent step forward for this versatile metal and method—because, seldom, if ever, does the user revert to former materials or methods of manufacture. Can there be any stronger endorsement of the suitability of an engineering material?

If you are not thoroughly informed on the physical and economic advantages offered with ZINC Alloy Die Cast parts, we suggest that you consult a commercial die caster—or write to The New Jersey Zinc Company, 160 Front Street, New York City.

*With the exception of the motors, both the 1932 and 1940 units are almost wholly composed of ZINC Alloy Die Cast parts. The 1932 model is still being sold.



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What's New at Pittsburgh . . .

By R. L. HARTFORD, Pittsburgh Editor STEEL

■ COMMERCE on the Ohio river in the Pittsburgh district in 1939 was the heaviest on record. Shipments totaled more than 13,800,000 net tons, of which 1,800,000 tons were steel products. This is the heaviest tonnage of steel ever shipped on the Ohio, which normally carries the heaviest load of steel in this district.

Totals for other rivers in this district are not as impressive, although showing substantial gains over 1938. The coal strike last spring cut heavily into tonnage on the Monongahela, and to a lesser degree into that on the Allegheny. The former totaled more than 20,700,000 net tons for the year, bettered only by 1928-1930 and 1936-37 tonnages. Nearly 950,000 tons of steel moved down the Monongahela. The Allegheny carried 2,700,000 tons, of which 79,800 were steel products.

Nineteen-forty may see a larger volume of steel on the rivers than any previous year. Activity started early, with the steamer HENRY A. LAUGHLIN leaving New Year's day from the Aliquippa plant of Jones & Laughlin with 12 barges of steel for Memphis.

American Barge Line, Union Barge Line and the Campbell Transportation Co. also started tows southward last week. Carnegie-Illinois Steel Corp.'s steamer MONONGAHELA left Jan. 2 with 20 barges in tow.

Higher scrap prices have made it profitable to ship scrap from one consuming point to another by barge. Recently the second large scrap shipment to arrive here from the Chicago district was unloaded on the Monongahela after a 1500-mile haul via the Illinois, Mississippi and Ohio rivers. Additional shipments are reported to be ready, and will arrive here soon. This demonstrates one method of eliminating scrap shortages here when there is a plentiful supply at Chicago, a condition which occurred last fall.

Claims Increase in Checkoff

Closed shop campaign which SWOC is pushing has been making steady headway, according to David McDonald, international secretary of the union. He estimates nearly one-fourth of the 638 contracts now held by the union contain either the checkoff, closed shop, or both.

No major companies in the steel industry have yet signed up on this basis. Last year there was an abortive attempt by SWOC to install the "shop-steward" system of collecting

dues. It was placed before some steel companies who held contracts with the union, but was rejected.

McDonald stated that under the Utah state labor laws, Columbia Steel Co., United States Steel subsidiary, is governed by these provisions while the basis of the union agreement is the main contract signed with the Corporation, which contains neither of these clauses.

Several small plants here have signed up on these conditions within the past few months. A drive is under way to revise all existing contracts, as they expire, to include one or both provisions. Most recent signers are Central Tube Co., Ambridge, Pa., and Pittsburgh Tube Co., Monaca, Pa.

United Books Mill Order

United Engineering & Foundry Co., Pittsburgh, reports an order from Acme Steel Co., Chicago, for a complete cold strip mill. It will be a four stand four-high tandem unit, with an unusual range of speeds, a feature required because of wide variation in gages of steel to be rolled.

There will be a number of additional features not usually installed on a cold strip mill, including a new method of entering strip and for guiding its lateral displacement across the face of the rolls regardless of the strip's width, resulting in uniform wear on the rolls and minimizing maintenance. The tension reel at the delivery end will be equipped with a belt wrapper arranged to receive narrow stock regardless of its position in the mill.

Change gear units are incorporated in the drives of the first two stands with all stands having a 3 to 1 speed reduction from the driving motor.

Old Ohio Iron and Coal Company Dissolved

■ Brier Hill Iron & Coal Co., Youngstown, O., one of the oldest incorporated industrial companies in Ohio, passed out of existence Dec. 21 when it was dissolved formally by the Tod, Stambaugh and Butler families. Its assets of stocks, cash and bonds amounted to \$13 a share which will be distributed among shareholders.

The original company was formed by Youngstown's early leading citizen, David Tod who was Ohio's "war governor," and a friend and supporter of President Lincoln. It

first was known as the Akron Mfg. Co., with a foundry at Akron, O., and a blast furnace located between Akron and Youngstown. The Akron company was organized in 1838 to "manufacture iron, steel, nails, stoves, pig iron and castings of all kinds." The original capital was \$250,000.

The company moved to Youngstown in 1859 where it erected two blast furnaces and changed its name to the Brier Hill Iron Co. When its charter, originally granted for 30 years, was about to expire the name was changed to the Brier Hill Iron & Coal Co. Its incorporators were David Tod, William Pollock, Nelson Crandall, John Stambaugh Jr., and Henry Tod. Its capital was \$432,000. When its president, David Tod, died John Stambaugh became president. Later the company built a third stack known as Tod furnace which still stands. In 1912 the company became the parent of the Brier Hill Steel Co. which in 1922 was merged into the Youngstown Sheet & Tube Co.

R. C. Steese, vice president when the company was dissolved, joined it 50 years ago. John Tod, grandson of David Tod, was the last president, and the secretary-treasurer was J. Paul Suter.

Forecasts 20% Gain in Industrial Building

■ Twenty per cent or more increase in industrial construction during 1940 is predicted by George A. Bryant Jr., executive vice president, the Austin Co., Cleveland engineers and builders.

"Long delayed readjustments are being pressed," says Mr. Bryant. "If the work required to eliminate bottlenecks, nonproductive handling operations and other economic factors in the operation and maintenance of many plants is carried forward, this alone would take care of the increase.

"The fact is that if available new machinery and today's advanced production methods were to be applied generally in modern plants, the cost of many manufactured articles could be cut materially, and in some cases enough to permit a one-third reduction in the selling price and still leave the manufacturers a good profit."

■ Fifty-four employees of Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., were awarded United States Steel Corp. service medals during the last quarter of 1939. Medals were presented to employees with 25 or more years of service. Longest period recognized was that of Joe Pool, colored, who received a 40-year medal.

Current Events In Chicago . . .

By J. F. POWELL, Chicago Editor, STEEL

■ BUILDING costs and labor union activities here have been a bit out of line, and the government proposes to find out why.

Last week the federal grand jury turned its attention from gambling to the building trades. It expects to hear 500 witnesses in the next five months, and may bring to light some items of particular interest to steel men, structural fabricators and others in the metalworking industry.

There is the matter of the pre-fabricated steel house (STEEL, Aug. 29, 1938, p. 17). Although Chicago is one of the largest steel producing centers in the country, the city building code prohibits erection of the all-metal type of house, filling station, or commercial structure. Building experts in drafting the code in the summer of 1938 included a section providing for such structures. The section was opposed in the council, however, and was thrown out with shouts of "Tin houses!"

Steel Industry May Benefit

Representatives of concerns interested in steel construction reportedly were on hand to defend such structures. Little was said by opponents as to why such construction should be barred, thus leaving interested parties to form their own conclusions. These revolved about a suspicion of building trade monopolies and political intrigue. Structures

of all-steel exterior, it is understood, are "undesirable," because their erection is so simple that it cuts deeply into the man-hours of labor, a fact which the trade unions did not overlook.

Possibly the matter will be clarified. At least, the local steel industry may benefit by the investigation bringing about increased construction through lowered building costs, as federal inquiries in some other centers have done.

Despite certain building trade practices, building permits in Chicago in 1939 totaled 3191, with a value of \$42,280,687, an increase of 65 per cent in number and nearly 100 per cent in value.

Warehouse Facilities Expanded

Expansion of steel warehouse facilities recently have been notable. Included is the new warehouse for A. M. Castle & Co., for which ground was broken late in November. The structure will cost approximately \$125,000. Construction is proceeding at a rapid pace and may be completed the latter part of this month.

Chicago Steel Service Co. announced plans to build a \$300,000 warehouse this spring. Its present building is at 3912 South Ashland avenue, and although the site for the new building has not yet been selected, it is expected to be in that

vicinity. Describing 1939 as the most successful year in its history, the company has awarded 53 office and sales employes a bonus, amounting to one week's to a month's salary. This is the second bonus in the year, the first having been paid in July.

Foundation Has \$110,000 Welding Research Plan

■ Welding Research committee of the Engineering Foundation, New York, will carry out a \$110,000 welding research program this year. More than 70 individual projects now in progress in universities and research laboratories throughout the nation will be continued, according to William Spraragen, committee's technical secretary.

Research sponsored, Mr. Spraragen points out, aims to assist the steel industry by creating new markets.

Forty-seven reports dealing with advancement of welding procedures and applications were issued by the committee during the past year. Close contact has been maintained with 70 universities which offer welding research courses.

Dr. Comfort A. Adams, E. G. Budd Mfg. Co., Philadelphia, former dean of the Harvard Engineering school, is chairman of the committee.

Climax Molybdenum Will Observe Moral Embargo

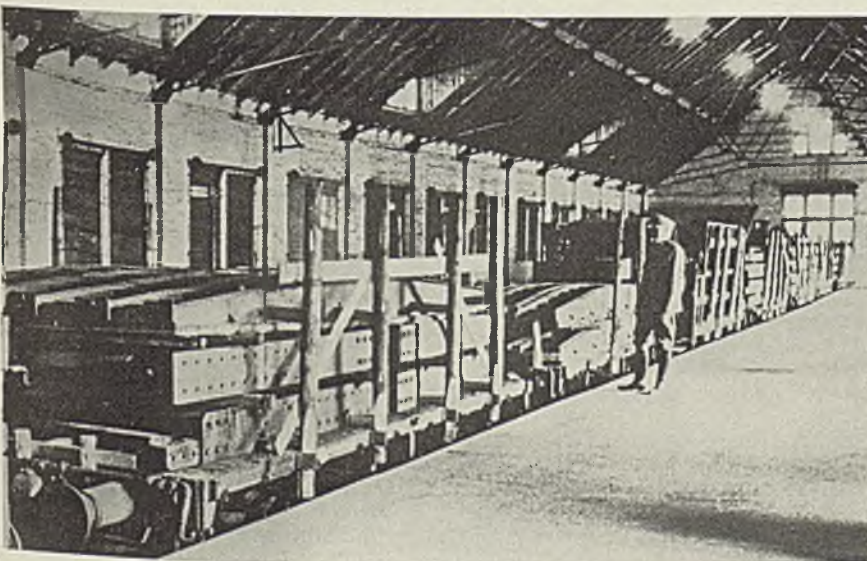
■ Climax Molybdenum Co., New York, has informed the state department it will observe a "moral embargo" on molybdenum exports to nations which bomb and machine gun civilians.

Climax has contracts with Germany but has made no shipments to that country since war started, according to Max Schott, president. Company reports all sales to Russia, Japan, Germany were 57.8 per cent of its total in 1939; 72.11 per cent in 1938; 53.02 per cent in 1937; 54.89 per cent in 1936; and 52.97 per cent in 1935.

"Our domestic sales showed an upward trend during 1939, both actually and in proportion to our total business," said Mr. Schott. "It is safe to estimate that not more than 1 per cent of all molybdenum consumed in the world during the past three years has gone into aircraft of all types, commercial and military."

■ To create a job in the steel industry requires an initial investment averaging \$10,000 per employe the American Iron and Steel institute has estimated. After the job is established, an average of \$4500 more is spent annually to maintain it.

Germans Ship Knock-Down Bridges to Western Front



■ Steel bridges in knock-down form, ready to be quickly assembled for emergency use, are packed in freight cars close behind German lines on the western front. Bridges of this type have been employed in Poland to replace spans destroyed last fall. NEA photo

A Job for the Construction Industry

■ ON NEW YEAR'S day the Gillmore-Carmichael-Olson Co., Cleveland, did something highly unusual for a general contractor. It carried a full-page advertisement in the Cleveland newspapers, making use of the space to state that the company likes competition and believes the high standards of manufacturing and living in this country spring directly from competition. "We welcome opportunities to figure on construction," concluded the advertisement, "whether for new structures or modernizing present buildings."

The fact that such advertising is most unusual for a construction company well might raise the question as to whether that industry has overlooked its best selling argument. That is, that many companies pay for new plants, in the form of inefficient operations, without having them.

You Pay for New Buildings: Why Not Have Them?

The machine tool industry is among those that fully understand the value of such an approach in selling. An intelligent machine tool salesman constantly is on the alert to discover obsolescence in equipment at customers' plants. He stimulates sales by pointing out to the user that his obsolescent equipment is costing him money and should be replaced with machines that will do the work better and at lower cost. The machine tool industry has a slogan of a sort: "You pay for modern machine tools; why not have them?" This slogan well might be paraphrased by the construction industry.

Perhaps it is the backwardness of the construction industry that to a considerable degree is responsible for the fact that many manufacturing operations, despite impressive building modernization here and there, are carried on in plants which are

not conducive to maximum efficiency. This is true even in the case of many companies that pay attention to obsolescence of equipment; they just take their old buildings for granted, as an inviolable heritage, as it were.

There is no valid reason to prevent the construction industry from establishing the concept that owners of obsolete or unsuitable buildings pay for new buildings without having them. An industrial building is merely a shell within which manufacturing or other operations are carried on. Seldom in industry is the value of a building so great as to prohibit its replacement or renovation in order to obtain operating benefits.

This is borne out by the fact that in the steel industry the cost of buildings represents approximately 10 per cent of total plant investment. It varies in the metal-working industries in accordance with the nature of the operations. In the machine tool industry it averages 10 to 15 per cent.

More Industrial Construction Would Bring Vast Benefits

This is a subject in which industry as a whole is interested. The volume of building construction is an important economic factor. When building activity is on a large scale the beneficial effects spread out in all directions.

The construction industry could contribute on a larger scale to our economic health by uniting in a promotional job aimed at increasing the volume of industrial building construction. This can be done by convincing manufacturers that there is nothing sacred about a building and that it often may be profitable to replace it with a new one that will yield lower production costs, better working conditions and stimulate employe morale.

The BUSINESS TREND



Industrial Activity Well Sustained at Year-End

The year 1939 closed with industrial activity well sustained despite year-end influences. In most instances business indicators recorded less than the normal seasonal decline as large order backlogs forced many industries to maintain a high level of operations.

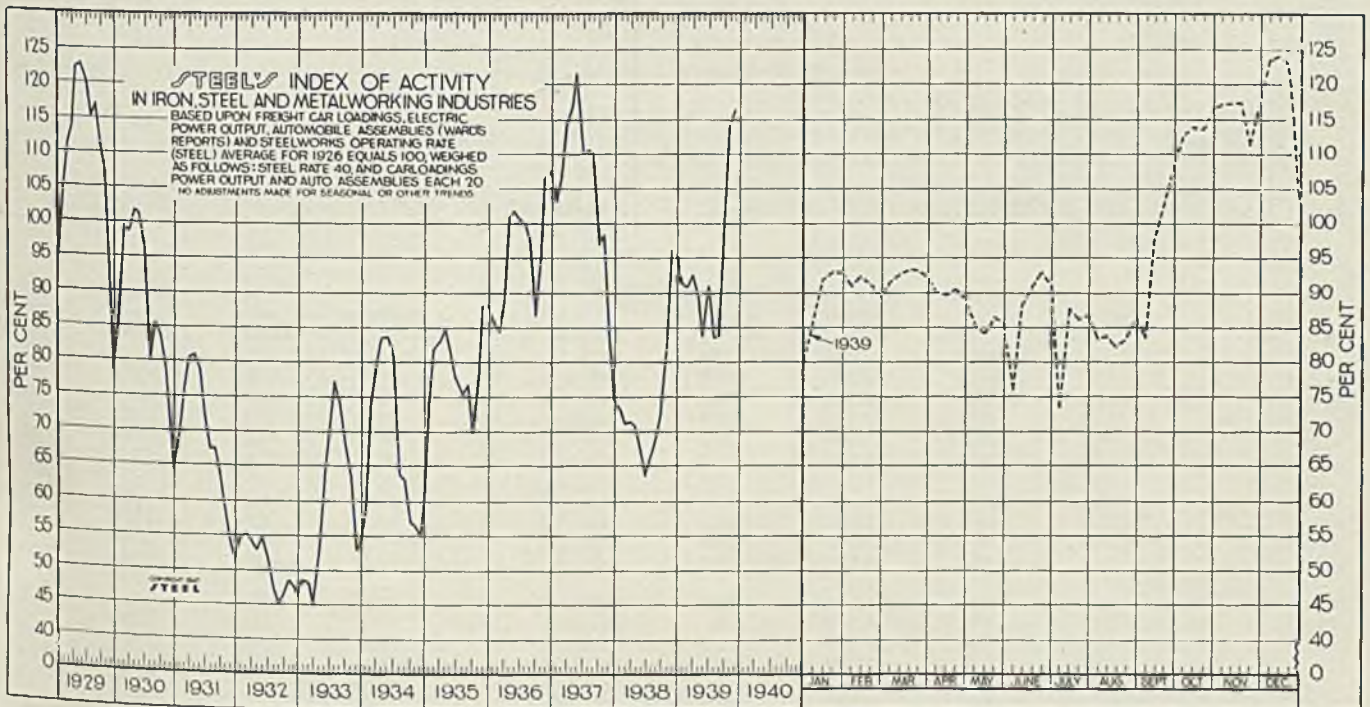
Business naturally reflected the Christmas and New Years day interruption, but the rebound of industrial activity in each instance was

gratifying and offers encouragement for the near term outlook.

Reflecting the holiday interruption during the week ended Dec. 30, STEEL's index of activity declined 19.5 points to 103.9. In the corresponding week in 1938 the index stood at 79.9, in 1937 at 69.5 and in 1936 at 93.3. The peak last year recorded by the index was 124.2. This exceeded the highest level of 123.9 attained during the 1937 boom-

let, but fell short of equaling the peak reached in 1929 of 125.3.

Despite the sharp decline recorded in the final week of the year, STEEL's index average for December of 118.9 exceeded the November figure of 116.2 and was well above the 95.1 average for the comparable 1938 period. While the index during the closing months of last year surpassed the peak recorded in 1937, the average for the full year of 94.8



STEEL'S index of activity declined 19.5 points to 103.9 in the week ended Dec. 30:

Week ending	1939	1938	Mo. Data	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
Oct. 21.....	113.6	88.7	Jan.....	91.1	73.3	102.9	85.9	74.2	58.8	48.6	54.6	69.1	87.6	104.1
Oct. 28.....	116.2	91.4	Feb.....	90.8	71.1	106.8	84.3	82.0	73.9	48.2	55.3	75.5	99.2	111.2
Nov. 4.....	117.1	93.4	March.....	92.6	71.2	114.4	88.7	83.1	78.9	44.5	54.2	80.4	98.6	114.0
Nov. 11.....	117.2	95.9	April.....	89.8	70.8	116.6	100.8	85.0	83.6	52.4	52.8	81.0	101.7	122.5
Nov. 18.....	117.3	100.4	May.....	83.4	67.4	121.7	101.8	81.8	83.7	63.5	54.8	78.6	101.2	122.9
Nov. 25.....	111.4	93.9	June.....	90.9	63.4	109.9	100.3	77.4	80.6	70.3	51.4	72.1	95.8	120.3
Dec. 2.....	117.9	100.1	July.....	83.5	66.2	110.4	100.1	75.3	63.7	77.1	47.1	67.3	79.9	115.2
Dec. 9.....	123.9	100.7	Aug.....	83.9	68.7	110.0	97.1	76.7	63.0	74.1	45.0	67.4	85.4	116.9
Dec. 16.....	124.2	99.8	Sept.....	98.0	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3	83.7	110.8
Dec. 23.....	123.4	94.8	Oct.....	114.0	83.6	98.1	94.8	77.0	56.4	63.1	48.4	59.2	78.8	107.1
Dec. 30.....	103.9†	79.9	Nov.....	116.2	95.9	84.1	106.4	88.1	34.9	52.8	47.5	54.4	71.0	92.2
			Dec.....	118.9	95.1	74.7	107.6	88.2	38.9	54.0	46.2	51.3	64.3	78.3

† Preliminary.

January 8, 1940

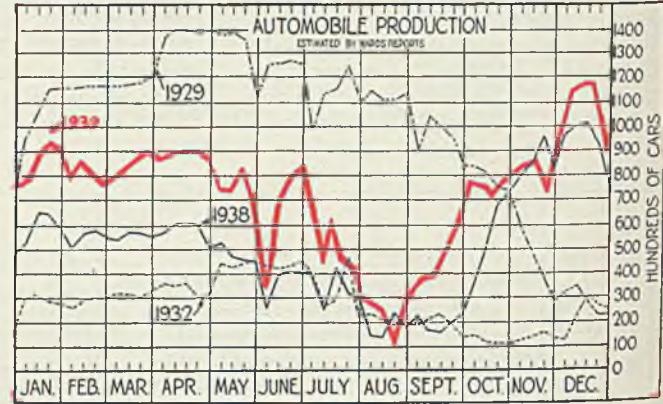
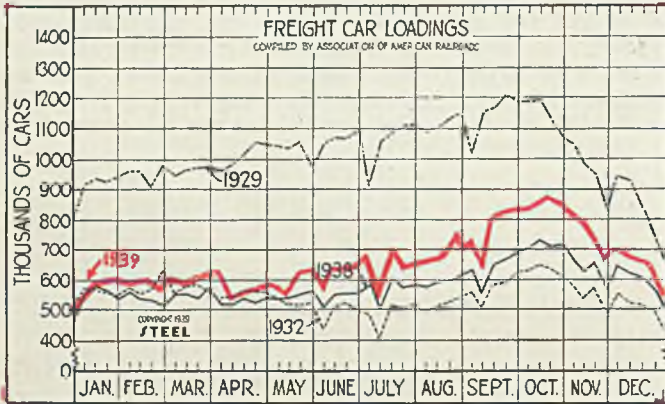
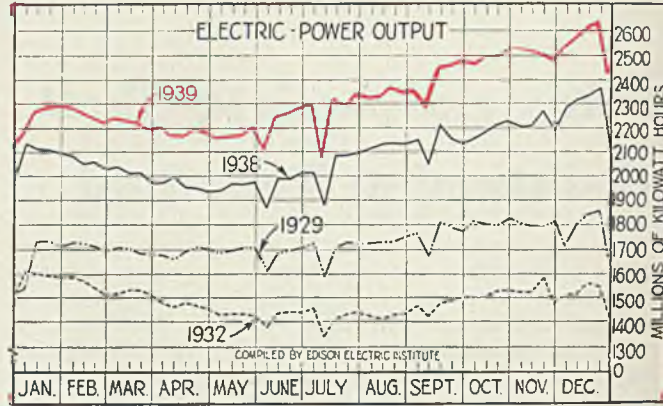
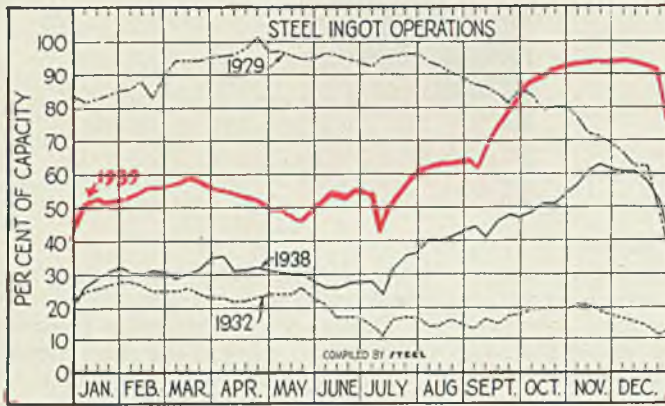
was substantially below the 1937 average of 104.1 and also the 109.5 average recorded in 1929. During 1938 the index averaged 74.9.

Steelmaking operations declined 15 points during Christmas week to 75.5 per cent, but most steel producers resumed operations following the one day interruption at approximately the pre-holiday levels.

The high rate of steelmaking at this time is encouraging in view of the near capacity levels maintained throughout the fourth quarter.

The Christmas holiday interruption was also reflected in the other business indicators composing STEEL'S index. Automobile production declined to 89,365 units, compared with 117,705 in the preceding

period and 75,215 in the corresponding 1938 week. Preliminary estimate of revenue freight carloadings indicate a less than seasonal decline to 545,000 cars, while electric power output also receded less than seasonally to 2,404,316,000 kilowatt-hours from the all-time high of 2,641,458,000 kilowatts consumed in the preceding week.



For week ended	National steel rate (%)	Freight car loadings 1000 cars	Electric power output million KWH	Auto-moblie output 1000 units	For week ended	National steel rate (%)	Freight car loadings 1000 cars	Electric power output million KWH	Auto-moblie output 1000 units
Jan. 7	51.5	531	2,169	76.7	July 8	42.0	559	2,078	42.8
Jan. 14	52.0	587	2,270	86.9	July 15	50.5	674	2,324	61.6
Jan. 21	51.5	590	2,290	90.2	July 22	56.5	656	2,295	47.4
Jan. 28	51.5	594	2,293	89.2	July 29	60.0	660	2,342	40.6
Feb. 4	53.0	577	2,287	79.4	Aug. 5	60.0	661	2,325	28.3
Feb. 11	54.0	580	2,268	84.5	Aug. 12	62.0	665	2,333	24.9
Feb. 18	55.0	580	2,249	79.9	Aug. 19	63.5	674	2,368	13.0
Feb. 25	55.0	561	2,226	75.7	Aug. 26	63.5	689	2,355	17.5
Mar. 4	56.0	599	2,244	78.7	Sept. 2	64.0	722	2,357	25.2
Mar. 11	56.5	592	2,238	84.1	Sept. 9	62.0	667	2,290	26.9
Mar. 18	56.5	595	2,225	86.7	Sept. 16	74.0	806	2,444	41.2
Mar. 25	55.5	605	2,199	89.4	Sept. 23	79.5	815	2,449	54.0
Apr. 1	54.5	604	2,210	86.0	Sept. 30	84.0	835	2,470	62.8
Apr. 8	53.5	535	2,174	87.0	Oct. 7	87.5	835	2,465	76.1
Apr. 15	51.5	548	2,171	88.0	Oct. 14	89.5	845	2,495	75.9
Apr. 22	50.5	559	2,199	90.3	Oct. 21	91.0	861	2,494	70.1
Apr. 29	49.0	586	2,183	86.6	Oct. 28	92.0	834	2,539	78.2
May 6	49.0	573	2,164	71.4	Nov. 4	93.0	806	2,537	82.7
May 13	47.0	555	2,171	72.4	Nov. 11	93.0	786	2,514	86.2
May 20	45.5	616	2,170	80.1	Nov. 18	93.5	771	2,514	86.7
May 27	48.0	628	2,205	67.7	Nov. 25	93.5	677	2,482	72.5
June 3	52.0	568	2,114	32.4	Dec. 2	94.0	689	2,539	93.6
June 10	53.5	635	2,257	65.3	Dec. 9	94.0	687	2,586	115.5
June 17	52.5	638	2,265	78.3	Dec. 16	92.5	681	2,605	118.4
June 24	54.5	643	2,285	81.1	Dec. 23	90.5	655	2,641	117.7
July 1	54.0	666	2,300	70.7	Dec. 30	75.5	545†	2,404	89.4

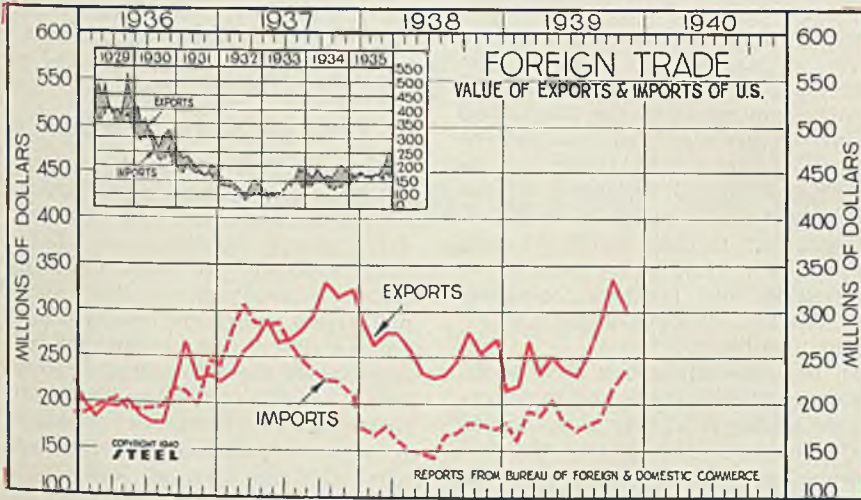
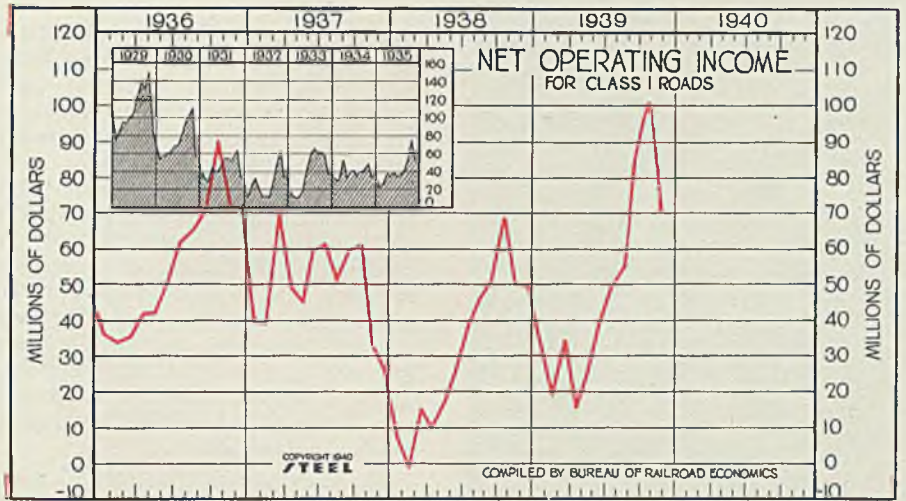
† Preliminary.

**Class I Railroads
Net Operating Income**

(Unit: \$1,000,000)

	1939	1938	1937	1936
Jan.	\$32.89	\$7.14	\$38.87	\$35.73
Feb.	18.59	1.91*	38.78	33.56
Mar.	34.32	14.73	69.88	35.15
April	15.26	9.40	48.36	41.49
May	25.10	16.67	44.24	41.80
June	39.10	25.16	59.35	50.26
July	49.01	38.43	60.99	61.72
Aug.	54.59	45.42	50.76	64.64
Sept.	86.43	50.36	59.62	70.10
Oct.	101.62	68.57	60.86	89.81
Nov.	70.35	49.67	32.44	72.33
Dec. ....	....	49.37	25.99	70.52
Average	\$31.02	\$49.18	\$55.63	

* Indicates deficit.



**United States
Foreign Trade**

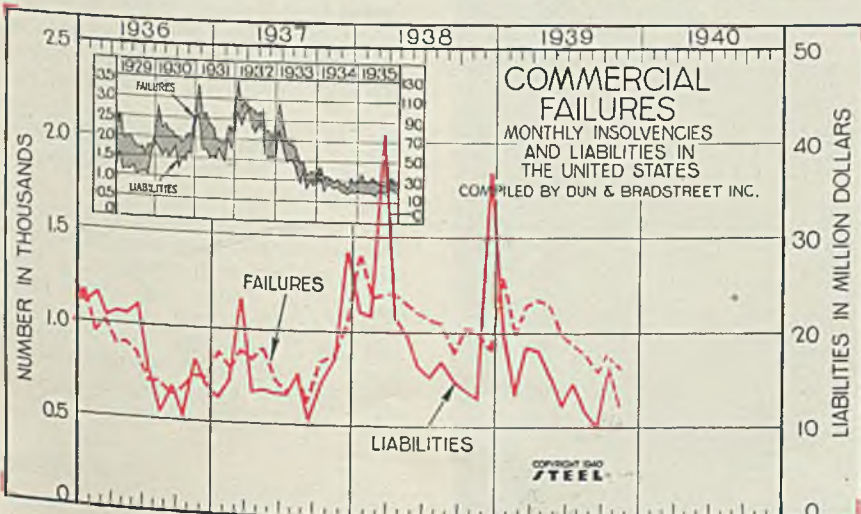
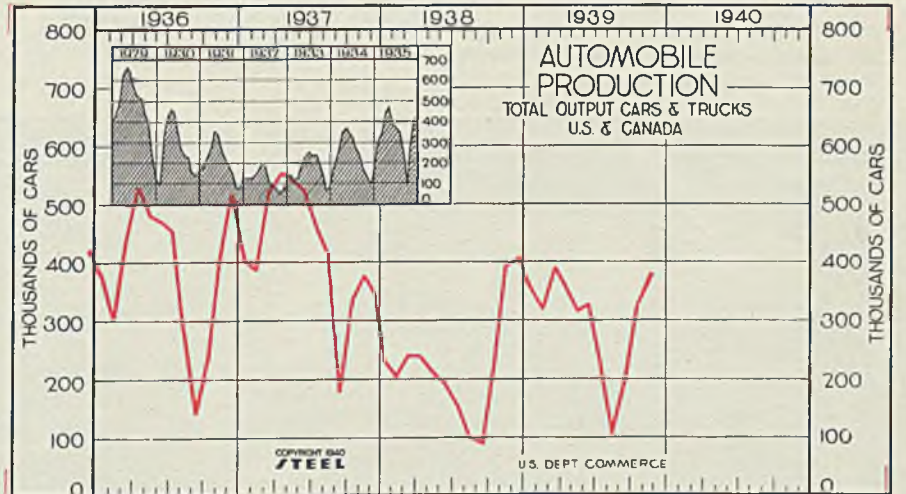
(Unit: \$1,000,000)

	Exports		Imports	
	1939	1938	1939	1938
Jan.	\$212.9	\$289.1	\$178.2	\$170.7
Feb.	218.6	261.9	158.0	163.0
Mar.	267.8	275.3	190.5	173.4
April	231.0	274.5	186.3	159.8
May	249.5	257.3	202.5	148.2
June	236.1	232.7	178.9	145.9
July	229.6	227.5	168.9	140.8
Aug.	250.8	230.8	175.8	165.5
Sept.	288.6	246.3	181.5	167.6
Oct.	332.1	277.7	215.3	178.0
Nov.	292.7	252.2	235.4	176.2
Dec. ....	....	268.6	....	171.5
Total	\$3093.9	....	\$1960.6	....

Automobile Production

(Unit: 1000 Cars)

	1939	1938	1937	1936
Jan.	357.0	227.1	399.2	377.2
Feb.	317.5	202.6	383.9	300.8
March	389.5	238.6	519.0	438.9
April	354.3	238.1	553.4	527.6
May	313.2	210.2	540.4	480.5
June	324.2	189.4	521.1	469.4
July	218.5	150.4	456.9	451.2
Aug.	103.3	96.9	405.1	275.9
Sept.	192.7	89.6	175.6	139.3
Oct.	323.0	215.3	338.0	230.0
Nov.	370.2	390.4	376.6	405.8
Dec. ....	....	407.0	346.9	519.1
Average	221.3	418.0	384.7	



Commercial Failures

	Failures Number		Liabilities (Unit: \$1,000,000)	
	1939	1938	1939	1938
Jan.	1,263	1,377	\$19.12	\$21.42
Feb.	963	1,149	12.79	21.03
Mar.	1,123	1,167	17.92	40.33
April	1,140	1,172	17.49	21.15
May	1,122	1,123	14.76	19.14
June	952	1,073	11.61	15.92
July	917	1,038	14.15	14.76
Aug.	859	1,015	11.26	16.38
Sept.	758	866	9.40	14.34
Oct.	916	997	16.14	13.22
Nov.	886	984	11.88	12.30
Dec. ....	....	875	....	36.53
Total	12,836	....	\$246.52	....

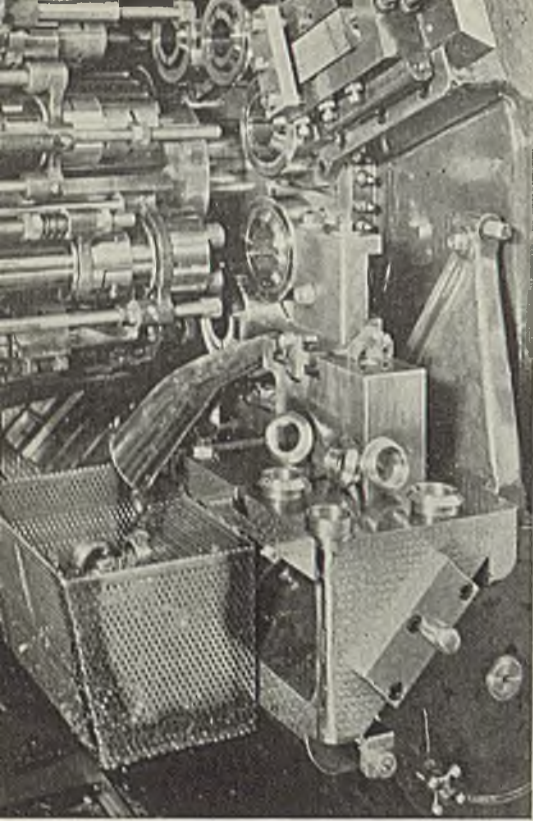
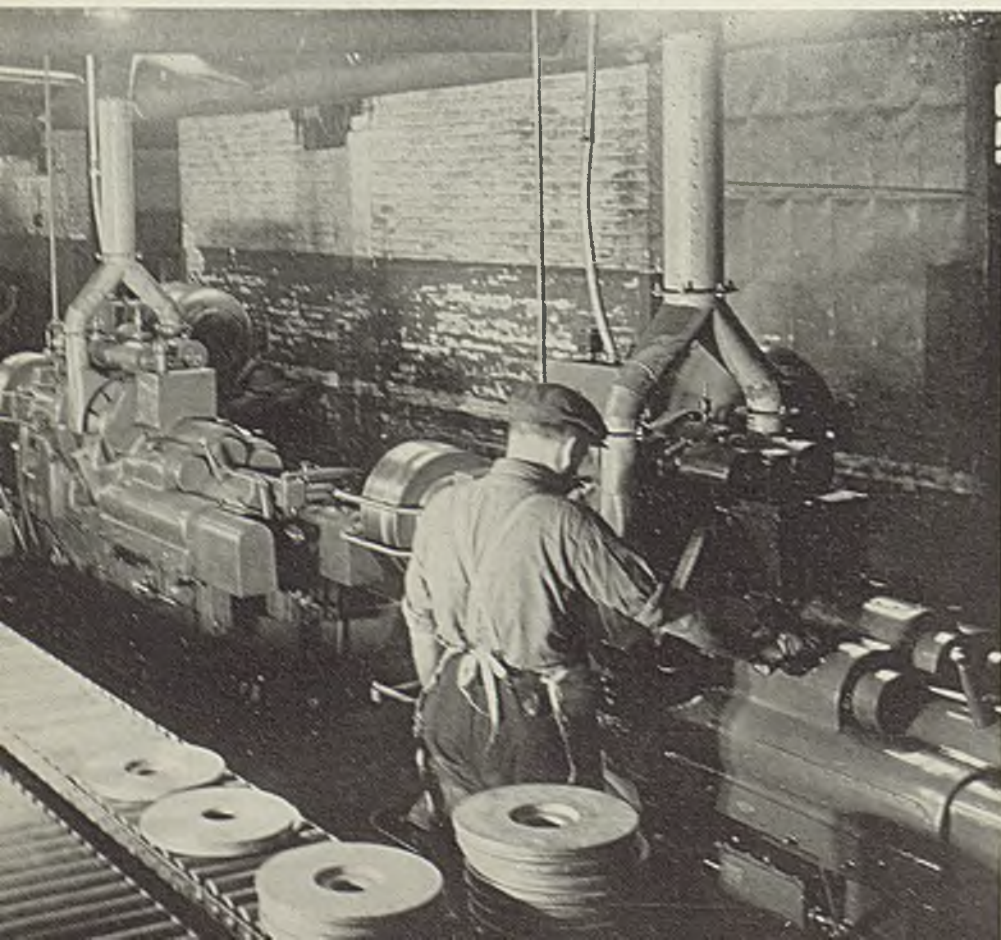


Fig. 1—Chute at cutoff position diverts work into drain basket on this 8-spindle Acme-Gridley automatic while a conveyor built into the bed provides continuous chip disposal

Fig. 2—Vacuum exhaust system is applied to this battery of radial type Simplimatics turning cast iron flywheels on automotive production



UCH HAS been written of late regarding basic changes which have been brought about in machine tool design through general adoption of modern high speed cutting materials. This applies particularly to considerations of changed conceptions of strength, rigidity, bearings and power requirements. Not so much has been written, however, in regard to new engineering problems involving chip disposal, which have been brought to the fore as a result of superspeed machining methods.

To be convinced that chip disposal has become a major problem in connection with modern production metalworking, one needs only to note the number of times it was mentioned by recognized authorities in their comments in the Machining review in STEEL'S "Yearbook of Industry" (Jan. 1, 1940 issue, pages 229-236). As usual, engineers of the machine tool industry have taken this problem in their stride. Already they have worked out a number of interesting and practical solutions and further developments are actively underway.

In the days of carbon steel tools, which by their nature had to be operated under relatively slow speeds and light feeds, the volume of metal removed per minute was extremely small as compared to what it is today using stellite, improved high speed steels and the cemented carbides. In the old days removal of

3 to 5 pounds of metal per minute was "good going". Today, removal of 20 or 30 pounds of metal per minute per tool is common enough.

Many readers will recall the notable demonstrations of Warner & Swasey turret lathes, where in one case a 60 horsepower machine removed 140 cubic inches of 200 brinell alloy cast iron per minute, and where in another case a tough steel forging was reduced at the rate of 50 cubic inches per minute in a 100 horsepower machine.

In the old days most machine tools had open beds and the chips were simply allowed to fall on the floor. Chip disposal was effected through periodic visits by a sweeper—usually a superannuated veteran and something of a character, whose rounds of the shop were social as well as in line of duty.

Evolution of The Chip Pan

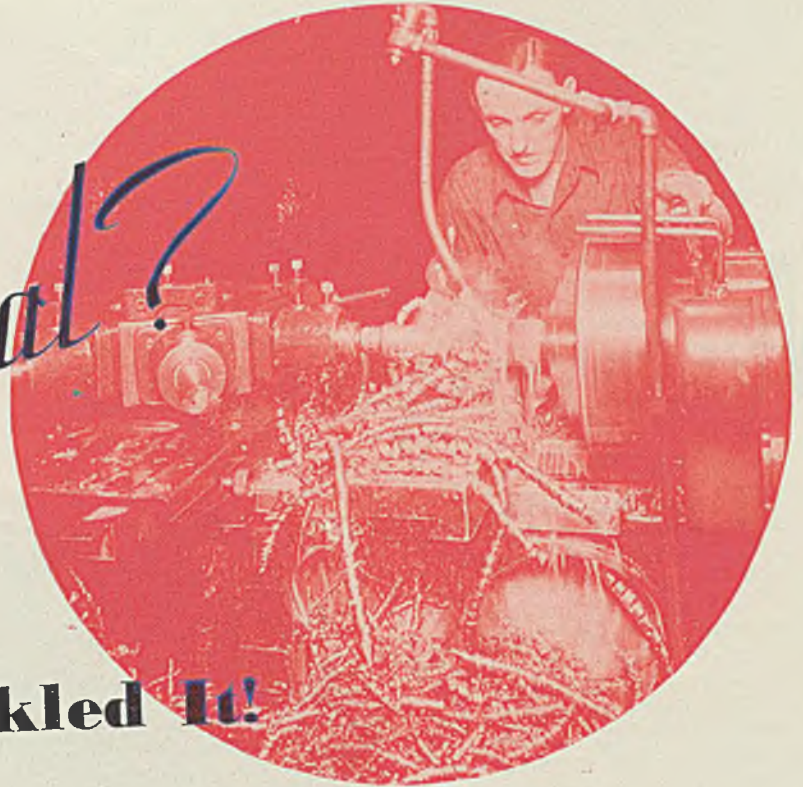
The adoption of the chip pan originally came about more through increasing use of cutting oil than it did through consideration of the chip problem. It was originally either a separate, shallow, sheet-metal pan under the machine or a narrow trough cast around the bed. Apparently the chip pan as we know it today, came into being when small turret screw machines graduated from work benches onto floor-type legs of their own—at which time shallow pans were introduced between their short bench legs and their floor pedestals. That family resemblance still can be detected in many large, modern turret lathes with big capacity "chip pans".

Multiple tooling, as well as high speed tools have contributed heavily toward creating chip disposal problems. In fact they began to do so even before general introduction of high speed steel—with introduction of the automatic screw machines, especially those of multiple spindle type. Today these machines, with their 4, 5, 6 and 8 spindles, and employing some times as many as 25 or 30 tools as in the case of the Acme-Gridley machine depicted in Fig. 1—are tremendous chip producers. It is in connection with them that some of the ingenious solutions are now being worked out.

The trend in automatic screw machine chip pans over a period of 25 years has been from a supplementary element to the actual foundation of the machine. Originally shallow pans located above a base, they were in the course of the years dropped to the floor and their sides were increased in height to hold more chips. Today they are in most cases the actual bed of the machine and are designed for ease of "hoing out" without interrupting production. This is made possible through generous openings at rear ends of

Chip Disposal?

Certainly They've Tackled It!



By GUY HUBBARD
Machine Tool Editor

the machine, with ramps leading up to them.

It is worthy of notice that the old practice of allowing the work and chips to fall into the pan together, for future sifting out, is now being done away with. In many cases this is accomplished through the simple expedient of troughs at the cutting-off position, set to catch the work as it drops off and slide it into a drain basket out of the way of the great mass of chips. This technique is clearly illustrated by the Acme-Gridley 8-spindle setup in Fig. 1.

Among various suggestions for "community" chip disposal put forward from time to time, the pneumatic system is a frequently mentioned possibility. It may not be recalled offhand, but nevertheless it is a fact that this system actually has been in very wide use for many years—in the form of suction exhaust from grinding machines. The reason it is not generally thought of as "chip disposal" is that it is not generally realized that grinding wheels actually do remove metal in the form of chips—albeit minute chips.

That this system is not confined

to grinding machines, is proved by Fig. 2. This shows a battery of Gisholt radial type Simplimatics used in the manufacture of cast iron automobile flywheels. Turning out as they do a flywheel every 1.4 minutes this would be an extremely dirty operation were it not for the suction hoods which surround the air-operated chucks. Through these is exhausted not only the dust and grit but also most of the heavier

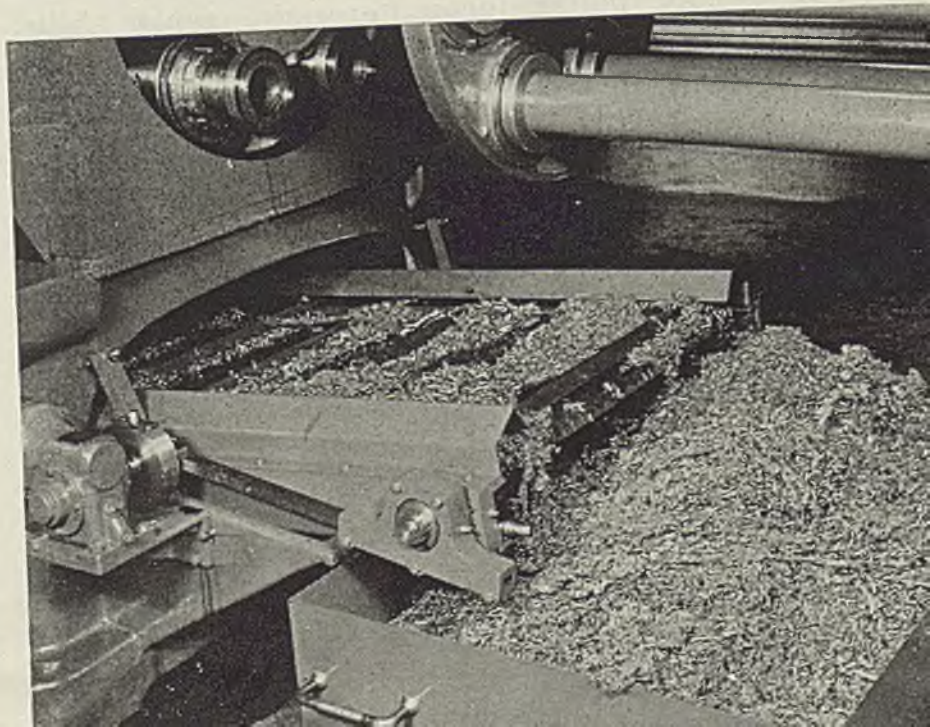
chips as well. On the basis of what is being done in cases such as this, as well as in woodworking establishments, it would seem that wide possibilities lie ahead in the metalworking industries for the application of vacuum exhaust systems.

At the moment the liveliest interest probably centers around the use of built-in conveyors in the bases of large volume chip producing machine tools. A number of companies are now offering equipment of this kind—including National Acme, New Britain and Cone Automatic.

(Please turn to Page 41)

Fig. 3—In circle, above—Elliptical tunnels in bed deflect chips to rear of pan on Gisholt turret lathe

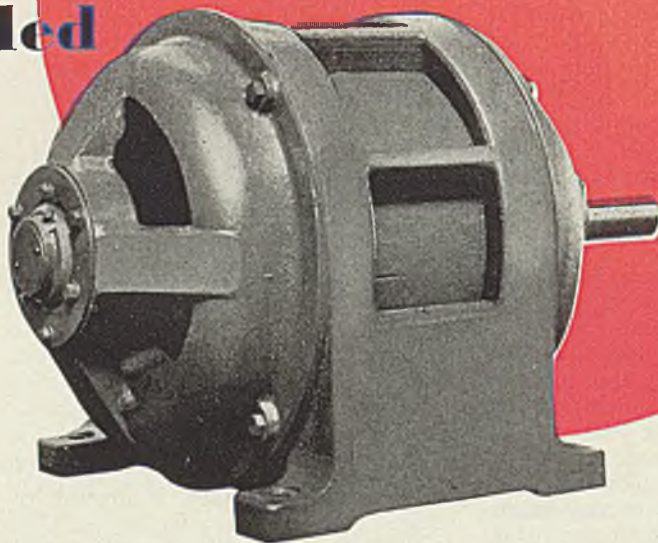
Fig. 4—Below—Discharge end of continuous chip conveyor which is built into bed of 3½-inch Conomatic machine of 6-spindle type



Motor Modernization Badly Needed

By FRED MERISH

Pompton Lakes, N. J.



A study reveals almost half of electric motors in steel and metalworking industries are not exactly suited to their job. Such motors run up power costs due to low efficiency, poor power factor, excessive repair bills.

■ THE MOTOR is the heart of mechanical production in the steel and metalworking industries. When it stops, production falters or goes completely dead. Delayed production is costly and the performance adequacy of the electric motors used will govern breakdown frequency.

Recently we made a survey of eastern steel mills and metalworking plants at the request of STEEL and must conclude, after an analysis of our survey work sheets, that approximately 45 per cent of the motors used were obsolete or inadequate in one way or another in the plants reviewed.

Forty per cent of the deficient electric motors inspected were more than five years old, 25 per cent more than eight years old and 35 per cent more than ten years old. These

veterans were all right in their younger days but they are costly misfits now. To get best results with motors, they must fit varying requirements. Five or ten years ago it was not possible to get motors to fit every operation or machine precisely because motors had not been developed with the necessary characteristics as to starting torque, starting current, maximum torque, etc. Then, a plant superintendent often had to fit a square peg in a round hole. Today's motors are so diversified that users can easily obtain just the right unit to give maximum service at minimum cost no matter how specialized the job.

On this field study, motors in many plants were found operating on equipment for which they are not ideally suited. Such plants are paying a heavy penalty in repeated

shutdowns, poor power factor, high motor repair bills, low motor efficiency, high machine-hour costs and poor quality of work. Most of these motors were old and had been switched around from time to time to satisfy changes in mechanical setup or plant and production layout. Many of these changes had been made without due regard to suitability of the motor to the job it was supposed to perform. Too many old misfits were found in use.

Old Motors Harder To Repair

Many old motors are complicated affairs and likely to break down easily. When they do, it takes longer to fix them. Modern methods of design and construction have made the electric motor of today one of the least complicated and most dependable forms of machinery in existence. Hence, where modern motors are used in steel mills and metalworking plants, maintenance men reported low operating and upkeep costs. Cost of maintenance and repairs dropped as much as 80 per cent after motor modernization in the plants surveyed. Before modernization, breakdowns and main-

tenance had been headaches. Replacement with modern motors was the aspirin.

Dirt, fumes, abrasive dusts and water are the four horsemen that ride many motors in this industry to destruction, that are causing plenty of grief through breakdowns, delayed production and substandard output. Dust-tight, explosion-proof, splash-proof and drip-proof motors should replace present equipment in many of the plants visited, motors enclosed or otherwise protected against these hazards. A comparatively few years ago, it was impossible to get as great efficiency out of an enclosed motor as an open motor but manufacturers have corrected this deficiency with adequate ventilating and enclosing devices so they operate with tiptop efficiency in dirty, dusty or wet locations.

Abrasive dusts, the constant barrage of metallic dust common to the metalworking industries, the sand storms that blow continually in grinding departments of steel mills, these are bad actors, wearing out moving parts and windings, shortening motor life sometimes to a matter of weeks or months. Many of these abrasive particles are current-carrying substances or conducting dusts and will short-circuit windings. Then there are acid substances in a gaseous state around plating departments or pickling lines. These will attack windings and corrode motors. Free steam, vapor, splashes of water will short-circuit or corrode motors. On this survey for STEEL, all of these conditions were found prevalent to the detriment of production and operating costs.

Some plants were using remedial measures to overcome these problems, enclosing the motor in an airtight box, installing it in a separate room, erecting a special building to house one or more motors, constructing the motor with a frame substantially airtight and cooling by means of air piped from the outside. These methods may serve the purpose after a fashion but they are costly from the standpoint of investment, maintenance, space and reduced efficiency.

Relocation Expensive

Moreover, a number of superintendents reported that because of these methods, they found it impossible or expensive to relocate machinery and motors when plant layout was to be changed. The modern solution is a motor built with protective devices against all destructive outside agents. Just as cost-conscious mill superintendents are having corrosion-proof rubber lining applied to metal equipment from lead-in rolls to drip pans to form a

nonporous moisture-tight seal against leaks and seepage, so are these progressives installing motors that are corrosion-proof, moisture-proof and dust-proof.

Heat is common to many departments of the steel industry. Reason for excessive breakdowns in certain plants was found due to excessive ambient temperatures surrounding the motors. Normal ambient temperature is assumed to be not more than 40 degrees Cent. Remember that motor windings are hotter than the temperatures surrounding the motors. Where ambient temperatures are excessive, motors specially constructed to withstand the greater heat should be installed. Obviously, such installation reduce fire hazards and maintenance costs.

Motors get severe tests driving run-out table rollers in steel mills. In one plant, they were averaging two breakdowns a month at considerable loss in output, even though water from cooling sprays above the rollers was constantly splashing over the motors below. Modern fan-cooled motors were installed to eliminate these "hot spots" and in the 11 months since installation, no breakdowns were reported. In other plants, where fan-cooled motors had been installed, the managements stated that they were low-cost insurance against lost production, delayed shipments, excessive maintenance and rewinding expense. Fan-cooled motors in plants where temperatures are high last longer and require less attention because windings stay clean and air gaps clear.

Losses Are Hidden

Our field studies disclose that misfit motors are costing the steel and metalworking industries substantial sums yearly, and in too many cases, nothing is being done about it because the losses, just as with inadequate heating systems, do not appear "in the flesh" on the profit and loss statements.

Just as the man at the lathe must have the best tool steel to do a good job or quality snagging wheels to do high-grade work on snagging operations, so must the machine be equipped with the most suitable motor, whether it is handling sheared skelp at high speeds, or operating an automatic blast-furnace charging-control system. After inspecting a wide range of machine tools on this survey, among them milling and shaping machines, bolt heading machines, grinders, drilling machines, gear lapping machines, nut-making machines, bar, tube and wire machines, wire drawing machines and other units used in turning, milling, drilling, boring, grinding, shearing, blanking, drawing and forming

sheet metal and plate, polishing and finishing, we can report a real need for motor modernization because it will lower costs of operation and improve production.

Machine tool performance starts when the tool meets the metal. Machine and tool must be tops. Many plant superintendents will acknowledge this readily but they fail to realize that there is a third party to this pact, the motor, and unless it is equally efficient, the quality of the product, speed of operations and operating costs will be out of line. Rejects will be high. Plants reported up to 65 per cent reduction in rejects after motor modernization.

Quality of Work Improved

On cutting operations, the suitability of the motor is particularly essential. Cutters making wide cuts need plenty of smooth power to pull through and plenty of mass to prevent vibration. After motors were modernized in some of the plants reviewed, we made queries concerning cutting operations and got reports of savings up to 20 per cent on production due to better motor control, speedier performance and better accuracy of cut. Where old, misfit motors were used on roll-grinding operations, the mirror finish so necessary for rolling sheet of uniform gage was not up to the standard obtained in mills where modern motors, accurately built for such work and perfectly balanced, were in use.

Superintendents reported that production was speeded up as much as 25 per cent after old motors were replaced with modern units. One reason given is that, in combination with improved drives, the modern motor stops more quickly and gets under way faster, which speeds up production and cuts power bills. Modern motors are made to reduce armature speeds at the air gap by reducing armature diameters, thus maintaining full horsepower capacity but decreasing inertia.

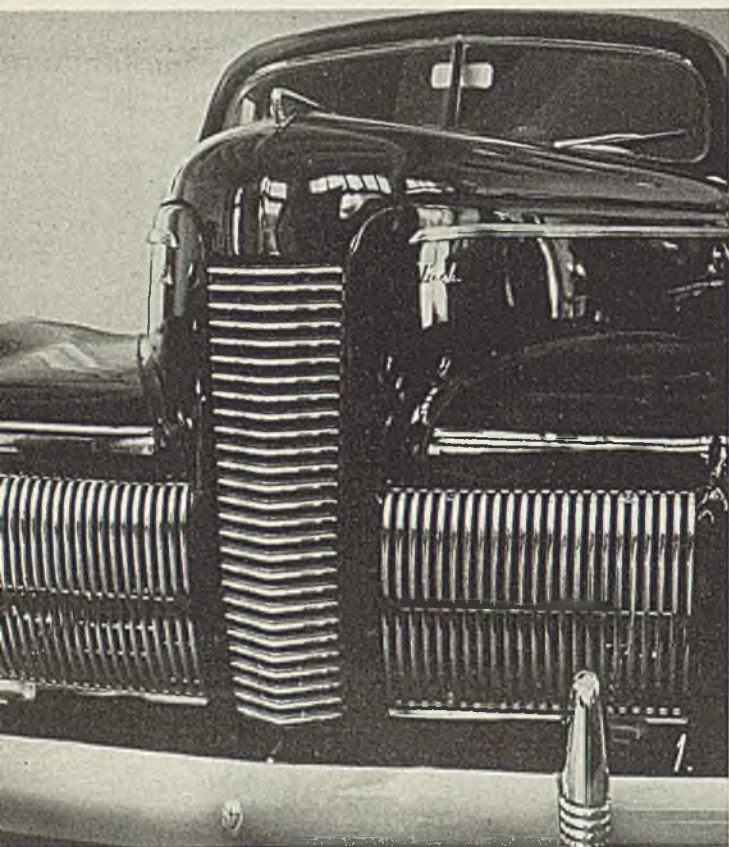
Overloaded and underloaded motors were found responsible for much inefficiency. Motors operating at extreme overloads or extreme underloads waste power and money. These losses can be determined readily with an instrument check. Every plant of any size should have an analyzer for periodical check of loads on motors and all plants, large and small, should call in competent electrical men from time to time to make further tests for adequacy.

In this survey, frequent checks were made with an analyzer. Many motors were found running hot, indicating overloads which eventually will burn insulation, thin oil and shorten bearing life. The instru-

(Please turn to Page 51)

Automotive

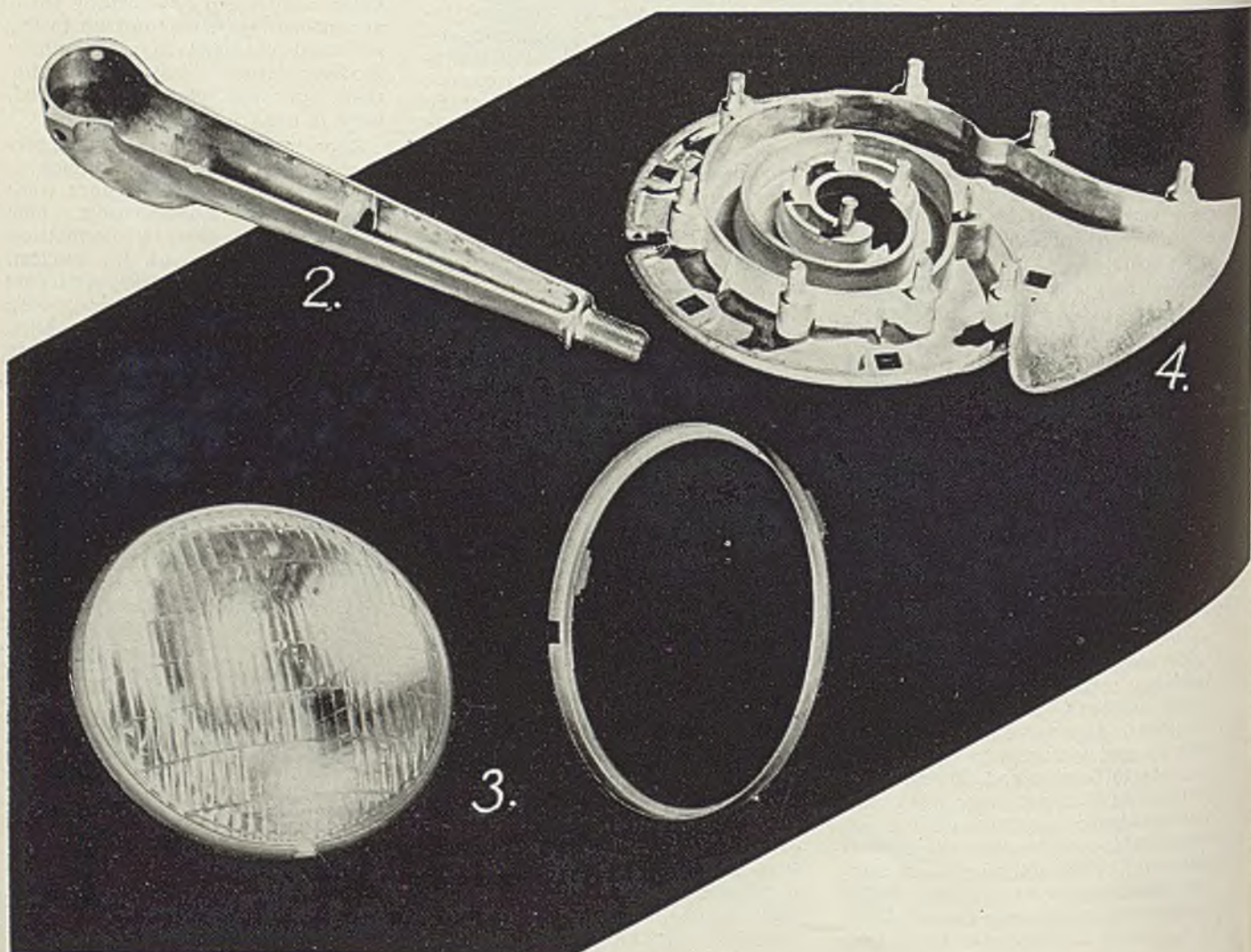
Die



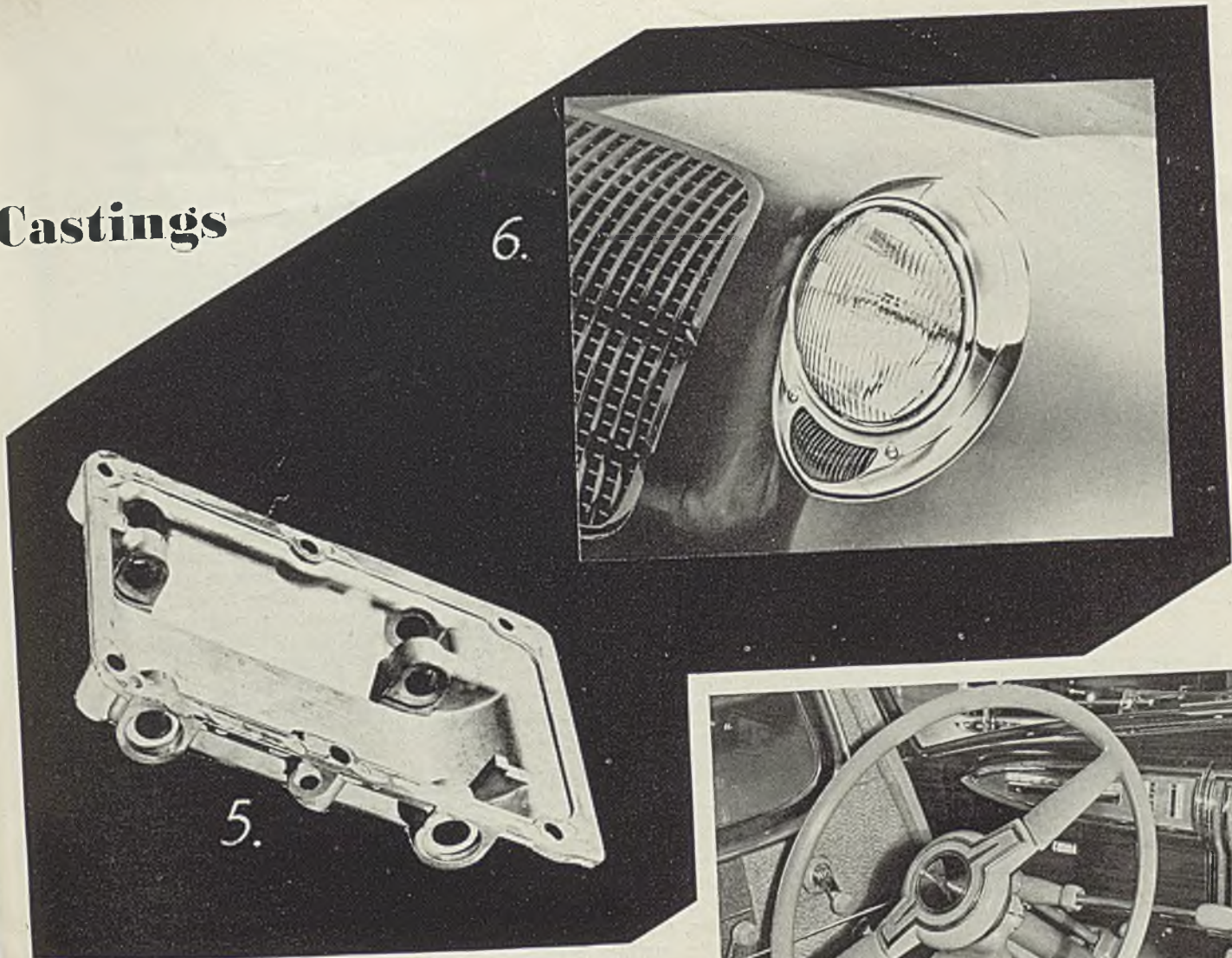
■ RADIATOR grilles of die cast zinc alloy appear on all but five makes of 1940 automobiles. The tremendous variety found ranges all the way from the 17-pound one-piece Oldsmobile grille, Fig. 8, to two small sections forming the Willys grille and weighing a total of 3¼ pounds. Midway is the Nash three-piece grille, Fig. 1, which weighs 12¼ pounds.

Featured in most all new models is use of "sealed beam" headlights with die cast bezels styled according to the designer's ideas. Fig. 6 shows a typical unit pleasingly designed to follow fender contours. Sealing prevents extraneous matter from cutting down efficiency of the reflector and insures true lamp focus. Most popular design of the new headlamp employs a die cast seal ring, at right in Fig. 3. This ring has integral locating lugs and a knife edge which permits spinning it over the glass easily, thus forming mounting ring for headlamp, Fig. 3.

Steering column gearshift levers, Fig. 2, are die cast to permit placing metal where needed for strength



Castings



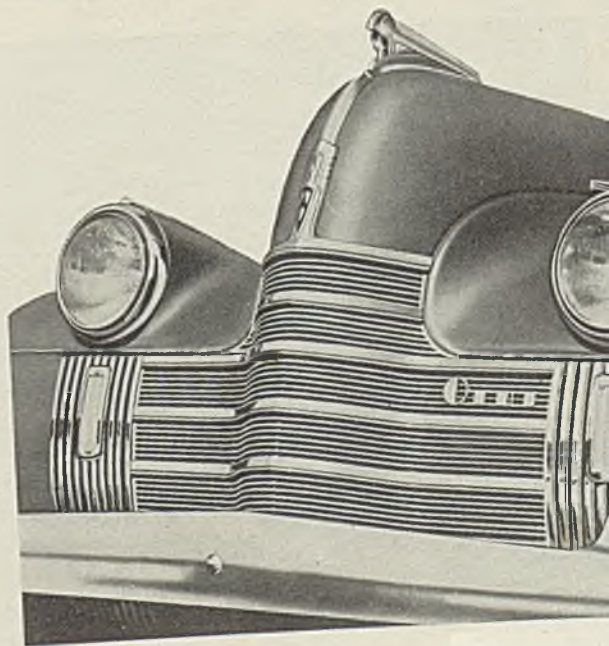
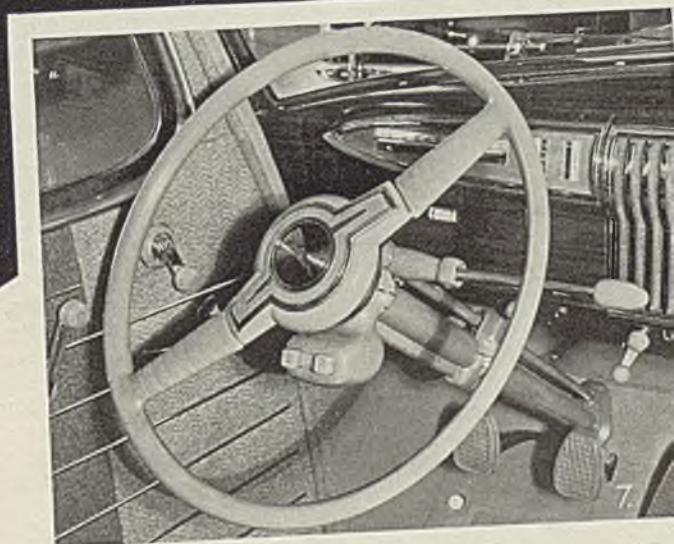
as this part may be subjected to severe abuse—particularly in cold weather. Strength precautions, however, do not affect cost or appearance.

With quality being more or less equal, choice of material for horn bodies, Fig. 4, narrows down to price. By producing in one piece such parts as that shown, die casting has the edge. Similarly, die casting saves much machine work in the transmission cover, Fig. 5. Only machining required in this piece is a simple reaming of the cored holes for the shifter pivots. Packard is the pioneer in this new application of die castings.

New, also, is the directional signal, a steering wheel unit composed of five die castings, Fig. 7, which permit number of parts to be reduced to a minimum. Drivers of 1940 Hudsons will find this device an assured method of warning both oncoming and trailing cars. Pressing the proper button flashes on lamps at both front and rear to indicate direction of turn.

There is a growing tendency on the part of designers to build up instrument panels of die cast units. A typical one is seen in part in Fig. 7. Zinc alloy die castings are used almost entirely for radio loudspeaker grilles due to their excellent acoustical properties, ease of obtaining designs desired, low cost, etc. Integral fastening elements minimize assembly problems.

In addition, 1940 brings a new wave of window moldings, new hardware, new instrument panel fittings and decorative strips, all die cast for lowest cost compatible with beautiful finish.





Steel Foundry

Swinging roofs on melting furnaces cut charging time from 40 to 3 minutes, eliminate hard handling task. New molding machines with roller-conveyor system speed "straightline" production

By H. W. MAACK

Chief Chemist and Metallurgist
Crane Co.
Chicago

■ TO TAKE advantage of the benefits made possible by the latest improved foundry equipment and to facilitate production of castings of various compositions as required by present day consumer demands, extensive changes were made recently in Crane Co.'s steel foundry. From the standpoint of handling of molds and castings, these changes facilitate progressive or "straight line" quantity production. From the standpoint of melting equipment, they greatly increase the versatility of the foundry for kinds of steel and size of melt. Capacity for production of castings also has been increased.

Beside the new furnaces described below, much other new equipment has been installed and the old rearranged for increased production

and greater efficiency. Latest design new molding machines and old units are arranged for easy handling of molds by overhead hoists and depositing on roller conveyers for accumulating, pouring off, and moving along to the shakeout adjoining the cleaning floor. The latter is flanked by the shot-blast rooms and the heat-treating furnaces.

Fig. 1 shows the molding and pouring floor for large steel castings. The ladle pouring a heat is about one-half way down the floor. Note solid lines of conveyers.

Since standard specifications for valves and fittings cover a variety of cast steels, selection of the steel to be used for castings involves consideration of corrosion and scaling resistance, strength at normal and elevated temperatures, welding characteristics, impact or shock resistance, etc. Thus orders for various quantities of castings made of one or more of several compositions are received.

Frequently orders for castings of

a certain kind of steel are insufficient to require a production size melt. A delay to wait until orders accumulate would extend unduly the delivery promise to the customer. Melting furnaces of different sizes to provide a range of capacity are the best solution of this problem. This foundry is equipped with three electric direct-arc melting furnaces, one each of 2-ton, 5-ton and 7-ton capacity, the latter two having been modernized recently. Melting capacity of approximately 100 tons of carbon and alloy steels per day is provided.

Wide Range of Capacity

With 2, 5 and 7-ton furnaces, a wide range of melting capacity is available. Obviously, furnaces of different melting capacity give greater flexibility. They will be used on several alloy compositions in addition to plain carbon steel. Changing from one kind of steel to another always introduces the problem of pickup of unwanted alloying elements due to contamination of the furnace bottom by preceding heats. With several melting furnaces available, successive heats of steel of the same composition can usually be made in each furnace. The handicap of single furnace operation when steels of several compositions are made can readily be appreciated. So-called "wash heats" are often necessary.

Perhaps hardest work in operating electric arc furnaces is charging the steel to be melted. Formerly this was done largely by hand—an extremely severe handling operation. The new 5-ton and 7-ton furnaces are swinging-roof top-charge units which eliminate the need for hand charging. A furnace of this type is charged by drop-

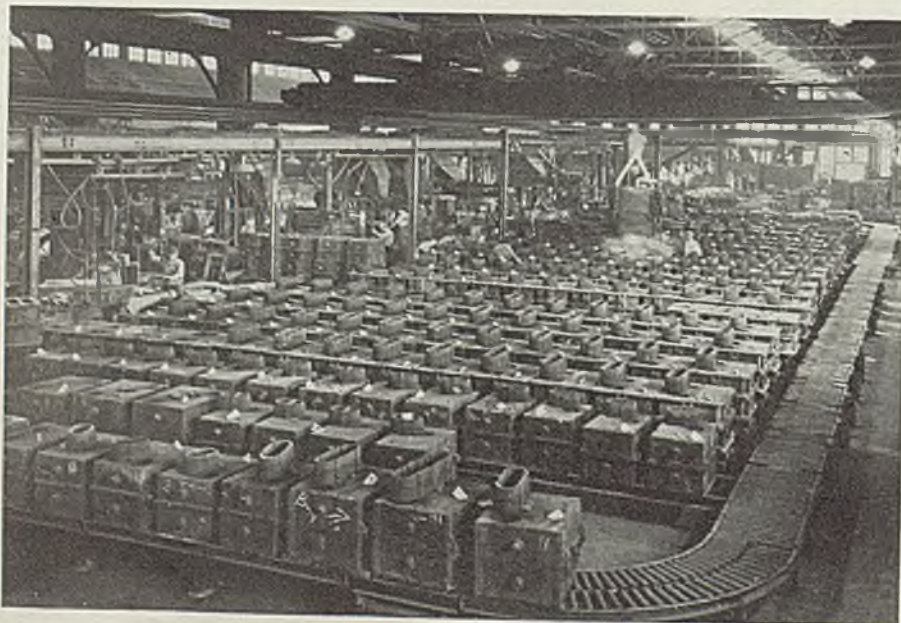
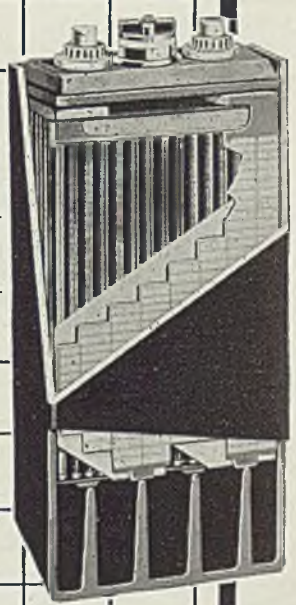


Fig. 1—Molding and pouring floor for the large steel castings. Note pouring ladle about halfway down length of room and roller conveyors to shakeout

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you pay less
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Meanwhile, the price has steadily come down, with the net result that the monthly cost to users is only a fraction of what it was when the Exide-Ironclad was first hailed as the outstanding battery value of its day. Exide-Ironclads have moved forward in other ways as well. With today's big battery electric trucks able to handle 30,000-pound loads with ease, these batteries provide the giant power needed for fast handling without interruption all day, every day. Every advance built into Exide-Ironclads has developed more fully the basic superiority of their famous positive-plate construction ... as outstanding in 1940 as it was in 1910.

Showing the exclusive Exide-Ironclad positive-plate construction, in which slotted rubber tubes retain the active material while exposing it freely to the electrolyte.

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

Fig. 2—Row of three induction melting furnaces and part of molding floor for handling small steel castings

ping the material into it from a bucket handled by an overhead crane. Separate buckets for 5 and 7-ton furnaces are kept in a pit a short distance away and between the two furnaces. These buckets hold a complete charge and are filled from specially designed, compressed-air operated buggy tippers, the buggies having been previously loaded in the basement.

To charge the furnace, the roof is raised 6 or 8 inches and swung aside horizontally by hydraulically operated roof mechanism. The bucket with its charge of metal is carried by crane over the furnace where the tie rope holding up the hinged segments of bucket bottom quickly burn off, dropping the charge into the furnace. This operation takes but 3 minutes, compared to a former average of 40 minutes, a worthwhile time saving over hand charging, besides eliminating much hard labor.

Water-Cooled Slag Skimmers

Use of new water-cooled slag skimmers makes skimming less trying. Also water-cooled skimmers last longer, thus are more economical than plain ones.

Induction furnaces are especially suitable for melting steels of a variety of compositions without contamination by unwanted elements. Their easily accessible crucible-shaped linings are readily poured free of molten metal or can be changed quickly when necessary for melting steel of a different type.

New high-frequency induction fur-



naces bring these benefits of versatility to this foundry. The melting equipment includes furnaces of 600-pound, 1000-pound and 2000-pound capacity. Powered by a 330-kilowatt motor-generator set, these afford a melting capacity of about 10 tons per day. Simplicity of operation coupled with easy and rapid melting and pouring make such furnaces desirable for the production of castings from any one of the several different steels commonly required by customers. They are particularly suitable for stainless steels which require a low carbon content for best serviceability. Fuelless melting avoids any possibility of carbon pickup.

Lines of roller conveyers for mold handling on molding floor for

small castings are shown in Fig. 2 with induction melting furnaces at right along wall. To the left is the lower portion of the conveyer equipment for molding sand, which is delivered to molding machines by an overhead conveyer. It is returned from the shakeout to the conditioning equipment by an underground conveyer.

Proper and efficient heat treatment of large tonnages of steel castings of various compositions require modern heat treating furnaces. Simple annealing is not adequate for castings made of most low-alloy compositions; normalize and draw or tempering treatments are required. Such heat treatment requires adequate mechanical handling equipment, and accurate regulation of temperature by pyrometers.

Three gas-fired heat-treating furnaces of the car-bottom type with recording pyrometers and automatic temperature regulation are used in this foundry, each having a capacity of about 15 tons of steel castings.

Extra Cars Used

Extra cars permit loading castings preparatory to heat treatment, or cooling of a load removed from one of the furnaces while another load is being heat treated. Each car is equipped with heavy heat-resisting steel grids raising the castings off the floor of the car to permit free circulation of gases under them. This facilitates rapid and uniform heating of the castings to the desired temperature in the furnace as well as uniform cooling

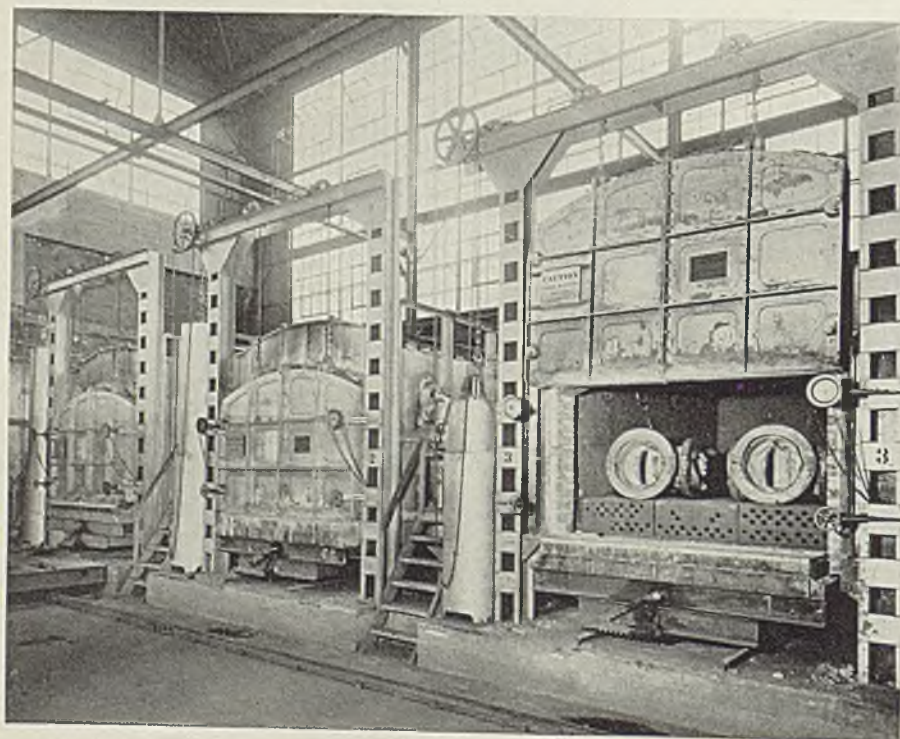


Fig. 3—Car-bottom-type heat-treating furnaces are served by set of cross rails and transfer trucks which permit transferring castings as desired

from normalizing temperature after the load has been withdrawn from the furnace.

Fig. 3 shows the three car-bottom type heat-treating furnaces. The transfer lorry for moving the cars forward or to the right or left in front of either furnace appears in the lower left-hand corner.

Test bars, poured with the castings from each heat or melt of steel, are placed on the load of castings from that melt and remain there until heat treatment is completed. Then they are cleaned by shot blasting and sent to the metallurgical laboratory where they are sawed from the test block, machined, tested and recorded along with the analysis of each melt.

Shot blasting of castings has been found most effective because it uncovers surface imperfections not otherwise revealed. This facilitates inspection, assuring soundness and surface perfection.

Chip Disposal

(Concluded from Page 33)

As a matter of fact the Acme-Gridley machine in Fig. 1 is equipped with one of these conveyors.

Operation of one of these built-in chip conveyors is made clear by Fig. 4, which depicts the installation in operation at the Cone Automatic Machine Co. During the demonstrations by the Vermont machine tool builders in October. With this device there is no accumulation of chips in the pan. They fall directly upon the conveyor and are constantly discharged into an external pan which can instantly be replaced by an empty pan without interfering with production operations.

Not the least of the problems faced by machine tool engineers has been that of providing for free fall of chips into the pan. In the case of the Cone and Acme-Gridley automatics for instance, this has entailed ingenious disposal of mechanisms away from the area immediately below the tools. To drive home how much thought has been expended on this kind of thing, one needs only to compare recent model machines with older ones.

A striking example of bed design with proper chip disposal as a basic consideration is given by the Gisholt turret lathe shown in Fig. 3 (the illustration in the circle). Cast into the bed at the principal working area of the machine are elliptical tunnels of generous size opening out at the back of the machine. These act as chutes to divert the bulk of the chips into the back of the pan, away from the operator and convenient for removal. Incidentally, this illustration gives a

truly graphic idea of the volume of chips produced under modern production conditions and so is a fitting "headpiece" for this article.

Protective Coating

■ A new method of coating and protecting light metals, known as "Colsealing," has been developed by Finishes division of Colonial Alloys Co., Colonial-Philadelphia building, Philadelphia. Using "Colseal" coating compound, the method changes the metal surface into minute mo-

lecular groups within whose spaces the coating becomes anchored and bonded. It is said to form an excellent adhesive and protective base for paints and lacquers.

Surfaces are claimed to be effectively sealed and made impervious to most severe atmospheric conditions including salt air, salt water and the high humidities of equatorial climates. A salt spray test of 1600 hours showed no cracking, flaking of surface or impairment to metal. Cost is about one-third to one-half cent per square foot.

New Antislip Material May Be Important New Outlet for Metals

■ A NEW USE for cast aluminum, brass and bronze alloys is seen in the recent introduction of an antislip material for floor plates, stair treads, door saddles and similar installations by National Bronze & Aluminum Foundry Co., Cleveland. Known as Ten-Lox and shown in the accompanying illustration, the material comprises flat walkway surfaces or plates of the cast alloy in which pieces of aloxite, an abrasive produced in the electric furnace, are imbedded at regular spaced intervals.

When furnished in the form of plates to be laid on existing floors or stairs, the metal usually is about $\frac{3}{8}$ -inch thick. In special forms for self-supporting treads, trench covers, platforms and the like, the design is adapted to the installation requirements and embodies necessary stiffening webs and flanges as well as connecting and attachment lugs.

The abrasive is in the form of irregular-shaped pieces averaging $\frac{1}{8}$ to $\frac{1}{4}$ -inch in each dimension. The pieces are spaced roughly 1 inch apart, center to center, and penetrate through the matrix from top to bottom.

Tests conducted by Underwriters' Laboratories Inc., Chicago, reveal average coefficient of friction to be 0.74 on a dry test, 0.75 on a wet

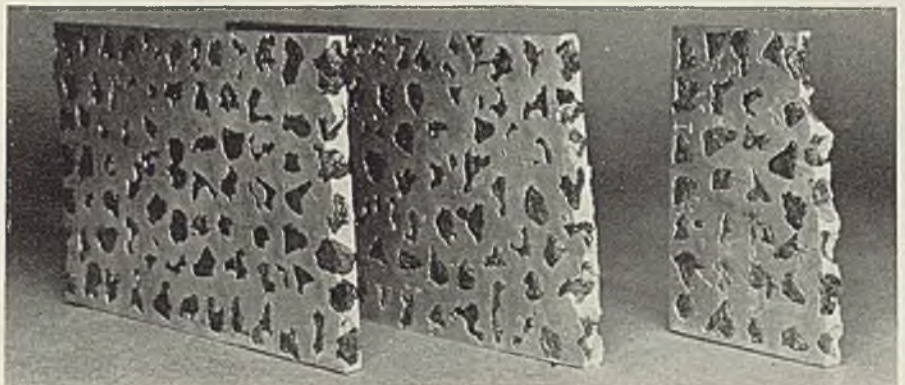
sample an 0.91 on an oiled sample. Increase of friction coefficient on the oiled sample presumably is due to suction effect produced between test shoe and surface of the material.

A test installation of the material has been in service for 11 months on a stairway of the Independent Subway System in New York at Times Square station. Observable wear appears to have been uniform. Although the abrasive was exposed to form an antislip surface, it did not project sufficiently to constitute a tripping hazard.

Where the material is installed in existing floors, a suitable cementing compound, such as bitulithic cement, is employed. Floor plates then are embedded in it, spaced a small distance apart so the cement will rise and fill the space between the plates. In some cases holes are provided at corners of the plates for counter-sunk screws or bolts.

In most instances the matrix material is SAE 33, an aluminum alloy containing 6 to 8 per cent copper, 2.5 per cent zinc, 2 per cent silicon, 1.5 per cent iron, 1 per cent impurities and the balance aluminum.

New antislip plates consists of large pieces of abrasive in nonferrous alloy matrix as shown here





Power Factor Costs

Correcting power factor offers means of cutting welding costs, returns up to 50 per cent yearly on money invested. Low "use" factor and low power factor offer opportunity for increased efficiency

By **STANLEIGH B. VINSON**
Manager
Welding Division
Ideal Electric & Mfg. Co.
Mansfield, O.

■ WITH THE upward trend of labor and material costs, it becomes increasingly important to reduce welding costs in every way possible without lowering quality. Through the correction of poor power factor, often it is possible to guarantee reductions in power costs amounting to as much as 50 per cent return on the money invested. If a bank would guarantee such a high return, it would be considered an unbelievably good investment.

While this subject is relatively new to the welding field, it is destined to become increasingly im-

portant as welding expands and business becomes more active. Already some larger industrial concerns more familiar with the power factor problem are employing several methods of correction. To understand the problem and how these savings can be effected, it is essential to know something about power factor.

Briefly, "power factor" is a figure of percentage indicating the amount of current employed in doing useful work in proportion to total line current. In any alternating-current power circuit, total line current can be divided into two components, power and reactive (magnetizing) components. Machines such as induction motors, welding transformers, magnets, etc., require a large magnetizing component which, although it does no actual work, is

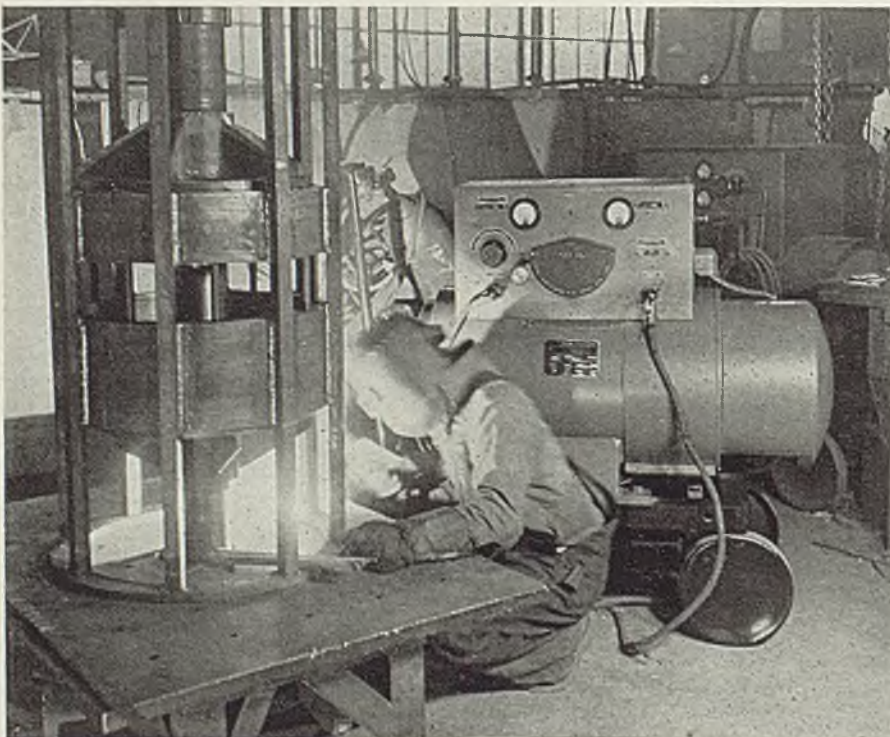
necessary for their operation. On the other hand, such equipment as lamps, resistance-type heaters, etc., which require no magnetizing current involve no power factor problems as such loads operate at 100 per cent power factor.

Magnetizing current component drawn from the line by induction motors must be supplied by the generator equipment. Yet it does no useful work. The result is that power companies must charge for this current from which the user derives no benefit. This is usually done by including demand charge or a power factor penalty clause in the power contract which increases power charges when the power factor is low. The same effect is produced on some contracts by offering a bonus for high power factor. Where such clauses are in effect, it can be shown that power factor correction will pay as high as 50 per cent return on the money invested in corrective equipment.

Low Power Factor Expensive

As business activity improves and generating equipment becomes increasingly loaded, power companies will be forced to put in more generating and distributing equipment to supply the demand and will insist on power-factor correction to cut idle current component requirements. Otherwise increased power-factor penalties will be enforced. This same situation confronts manufacturers who supply their own power through diesel-engine-driven

Fig. 1—This single-unit direct-current welding set takes leading current from the line, so supplies power factor correction to other welders and machines in the welding shop. Also it features fast voltage recovery from short circuit, high overall efficiency of 68 per cent. Current output does not change as machine warms up



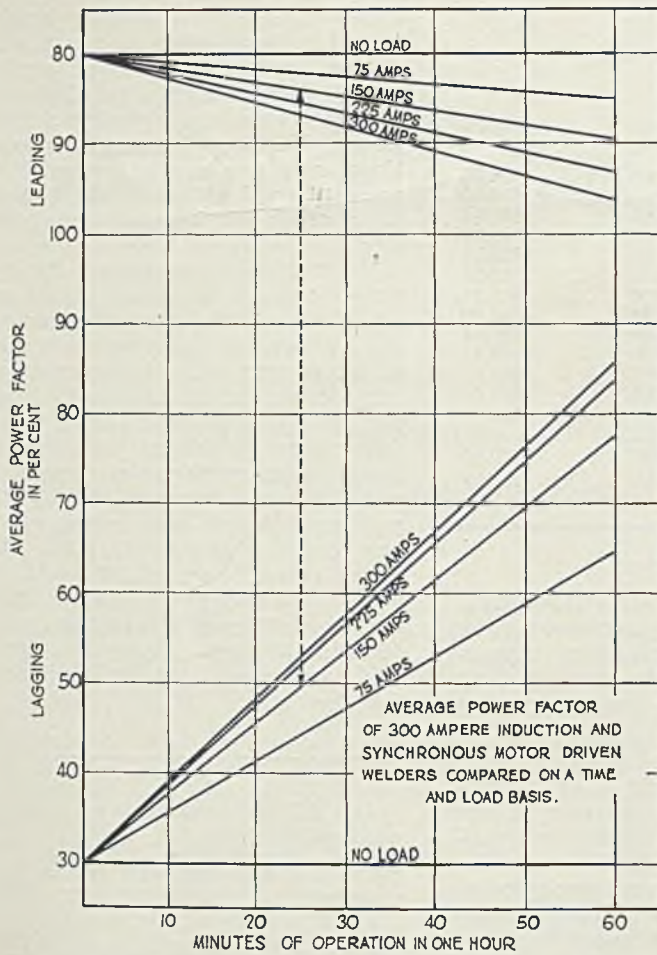


Fig. 2—This set of curves shows average power factor for 300-ampere induction-motor-driven welders and for synchronous motor-driven machines when both are operated at various loads. Power factor is plotted against actual operating time in minutes. Example: Vertical dotted line indicates difference in power factor of these two types when both operate 25 minutes out of the hour

alternators or other alternating-current systems. To be economical, any generating and distributing system should operate between 90 and 95 per cent power factor.

A standard induction motor as employed on many welding sets has a lagging power factor of about 80 per cent at full load. This drops off until at no load it is about 20 per cent. United States navy specifications for electric welding machines call for 70 per cent power factor at $\frac{1}{2}$ -load and 80 per cent at full-load on 200-ampere machines. These are about maximum values obtainable with induction-motor drives.

Notice no mention is made of no-load power factor. Yet most welding machines are seldom called upon to deliver their full rated output continuously. The average user who requires a 200-ampere welder will purchase a 300-ampere machine so the extra capacity may

be available when needed. This means it is usually operated at part load on low power factor.

To make this situation even worse, there is the problem of welding time. Welding engineers estimate that the average welding machine is furnishing current for welding less than half of the total time it is running. Remainder of time is consumed in changing electrodes, setting up work and making adjustments. During this time the machine is operating at no-load with a power factor around 20 per cent. Under such conditions the best average power factor for the working day is around 60 per cent.

Some welding machine manufacturers supply a double-horsepower motor to improve this situation. When welding at less than half load, a switch is thrown which causes the welding machine to run at half horsepower, thus approaching nearly full load for that particular setting of the machine. This, of course, greatly improves the power factor when actually welding. However, it does not help the situation when operator is changing electrodes, shifting jobs or adjusting jigs and fixtures for during that time there is no load whatever on the machine.

A second method of improving power factor is to connect capacitors of proper size across the mo-

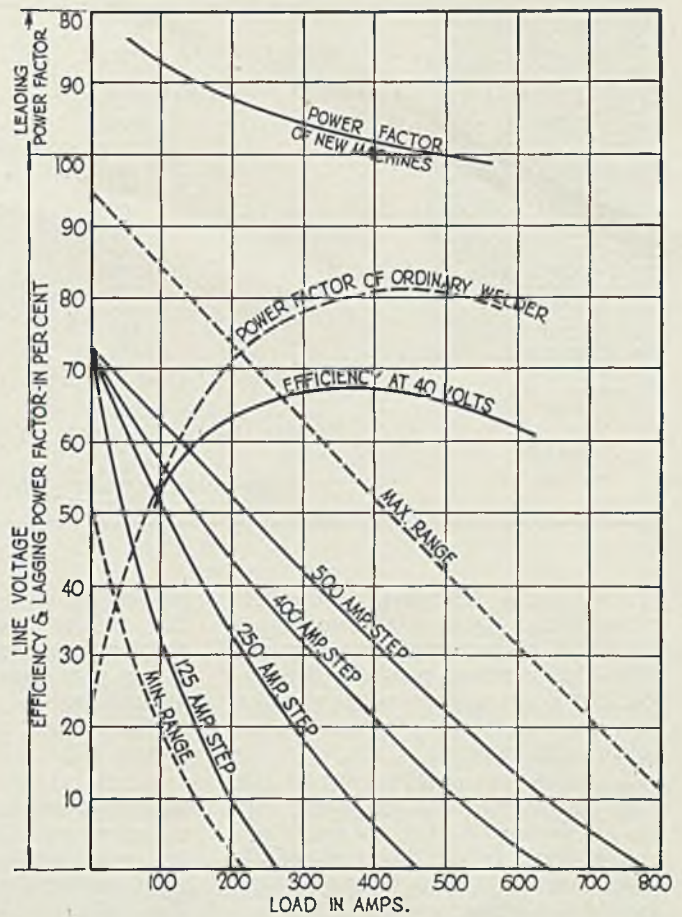


Fig. 3—Typical test curves of synchronous-motor-driven welding set, 400-ampere machine

tor terminals. Capacitors neutralize the magnetizing current component of the machine and so relieve the line from necessity of carrying this component.

To correct the power factor of a 300-ampere induction-motor-driven welder with such equipment involves approximately \$153 in capacitors if line voltage is 220 volts. If 440 volts, the capacitors will cost about \$75. Many plants use this method of correction either at the motor terminals or in banks at distribution centers at various points throughout a shop.

A third similar method of correction is through use of capacitor motors to drive the welding set. Such a motor may be built in standard induction motor sizes but employs a double stator winding. The capacitors are connected to the extra stator winding which operates at 660 volts, thus making the capacitors much less costly than those necessary to obtain the same power factor correction at 220 volts. While such a motor is slightly higher in first cost, the total cost of such a welding set compares favorably with the second method employing capacitors operating at line voltage.

In addition other advantages accrue since the power factor is corrected within the motor which im-

Table I—Power Analysis
Present Power Bills Rate "P"

Month	KVA Demand	KW Hours	Net Bill
March 1938	136	12,640	\$356.56
April 1938	154	14,880	410.84
May 1938	152	17,600	441.92
June 1938	187	18,880	509.02
July 1938	163	17,760	459.98
August 1938	203	18,240	515.26
September 1938	129	19,200	501.34
October 1938	173	24,960	564.59
November 1938	179	22,400	541.34
December 1938	182	16,640	473.72
January 1939	190	25,280	593.40
February 1939	224	21,280	582.40
March 1939	227	16,960	534.94
TOTALS	2,349	246,720	\$6,485.30
Average	181	19,000	499.00

proves motor efficiency, gives better starting characteristics and generally improves motor performance. Also this method protects the capacitors from voltage surges on the line due to damping action of the stator windings.

A fourth and possibly one of the best known methods of power factor correction is use of synchronous motors. In the larger sizes, 100 horsepower and over, they afford an excellent and economical means of correcting power factor. However, they do not appear practical on individual welder drives. The extremely large and sudden changes in load which occur in welding machines tend to pull the synchronous motor out of step, causing a stall.

However, special synchronous motors developed for welding sets have proven satisfactory. One such motor when embodied in a welding machine gives all the advantage of a standard synchronous motor including high power factor, high efficiency and constant or synchronous speed. The unit exhibits fast voltage recovery from short circuit to full load and has an overall efficiency around 68 per cent with a power factor varying from 95 per cent leading at full load to 80 per cent leading at no load. This high no-load power factor is important.

Even where power companies make no special allowances for high power factor, it can be shown that operation at a high power factor is a decidedly paying proposition. Where magnetizing current must be drawn from the line, distribution transformers and distribution lines throughout the plant also carry this excess current, causing increased line losses. Normal distribution losses run about 4 per cent of the total load and represent energy dissipated as heat.

High power factor also improves voltage regulation, which means the line voltage is held more nearly at its maximum value. This im-

proves motor operation throughout the entire plant, increases motor efficiency, lowers operating temperature and improves starting characteristics. All of these losses may total as much as 5 per cent of the power bill.

A typical example of the extra savings possible is the case of one manufacturer who wished to install ten new welding machines in his plant to handle increasing production. Already 30 welding machines were in use. The average power factor was 65 per cent, transformers already were overloaded, distribution lines fully loaded and line voltage low averaging about 215 volts instead of the 220 to 230 desired. To add ten new welding machines to this system would have necessitated purchasing new transformers and installing new distribution lines at a cost of about \$3500.

High Power Factor Welders

At this point, high-power-factor welders were suggested. Addition of such units did not necessitate addition of new transformers and distribution lines as they corrected poor power-factor conditions. After installation of these machines, old transformers were found to be no longer overloaded, the old distribution lines were not fully loaded, line voltage stood at about 228 volts and all other equipment connected to the line was operating better due to the improved power supply. The new welders, costing the same as induction-motor-driven units, had saved \$3500 in transformers and distribution lines as well as improved the plant power supply. As the new welders cost about \$5850, a return of almost 60 per cent was realized immediately upon the investment. Also they brought the plant power factor up to about 80 per cent, which afforded a direct saving on power bills due to reduced demand charges.

It is possible to determine accu-

ately the savings which can be obtained by installation of any power factor corrective welding equipment. For instance, Table I shows typical monthly tabulation of power bills. Subsequent calculations indicate a yearly saving of 46 per cent on the investment. A similar analysis can be worked out for any plant with extreme accuracy.

Working this example out, the average demand is found equal to 0.6 x 181, or 108.5 kilowatts, assuming an average plant power factor of 60 per cent, which is conservative considering the welding load. Now replace one 600-ampere and three 400-ampere welders with high-power-factor machines of same output. Assume average load is 40 per cent of full load rating, average operation per month totals 200 hours, power factor of old machines at 60 per cent lagging and new machines is 65 per cent at this load, 40-volts at arc. Kilovolt-ampere load, or demand, of old machines then becomes:

$$\frac{600 \times 40 \times .4}{.6 \times .55} + \frac{3 \times 400 \times 40 \times .4}{.6 \times .55} = 88$$

Also kilovolt-ampere load of new welders becomes:

$$\frac{600 \times 40 \times .4}{.9 \times .65} + \frac{3 \times 400 \times 40 \times .4}{.9 \times .65} = 49$$

This change of welders raises the plant power factor from 60 to 89 per cent and reduces the plant demand from 181 to 113 kilovolt-amperes.

Approximate consumption of old welders is 88 x 0.6 x 200, or 10,550 kilowatts, compared with consumption of new welders which is 49 x 0.9 x 200, or 8900 kilowatts. The saving in energy thus is equal to 10,550 minus 8900, or 1650 kilowatt hours monthly. With a monthly average of 19,000 kilowatt hours for the old welders, the new machines would thus require 19,000 minus 1650, or 17,350 kilowatt hours of energy per month.

New demand charge then is 113 x 40 x 0.05, or \$226 monthly.

Figuring the new energy charge, 40 x 113 equals 4520 kilowatt hours. Then 17,350 minus 4520 and multiplied by \$.0135 gives \$173, the monthly energy charge.

With cost of new welders at \$3415 and approximate value of old welders at \$342, net cost of new units is \$3073.

New power bill is \$226 demand charge plus \$173 energy charge minus \$17.35 discount, or \$381.65 monthly. Compared to average monthly power bill of \$499 with old welders, this is a saving of \$117.35 monthly, or \$1408.20 per year. On the net investment of \$3073, this is a return of 46 per cent, which means that the investment in new equipment would pay out in about two years.

Flexibility



Piping interconnections permit four blowing engines to serve four blast furnaces in any combination. Volume of air supplied to any furnace is shown at power house and on furnace floor recorders

By REGINALD TRAUTSCHOLD
Engineering Consultant
Caldwell, N. J.

■ FACED with the need of recording continuously at two locations the volume of air supplied to four blast furnaces serviced by a like number of blowing engines at two locations, a western steel company has installed an ingenious and eminently satisfactory arrangement of flowmeters and telemetering equipment.

Through a type of monitor-board, this hookup enables records to be maintained and posted for operators' guidance at each station for each blast furnace, irrespective of which engine is serving a particular furnace.

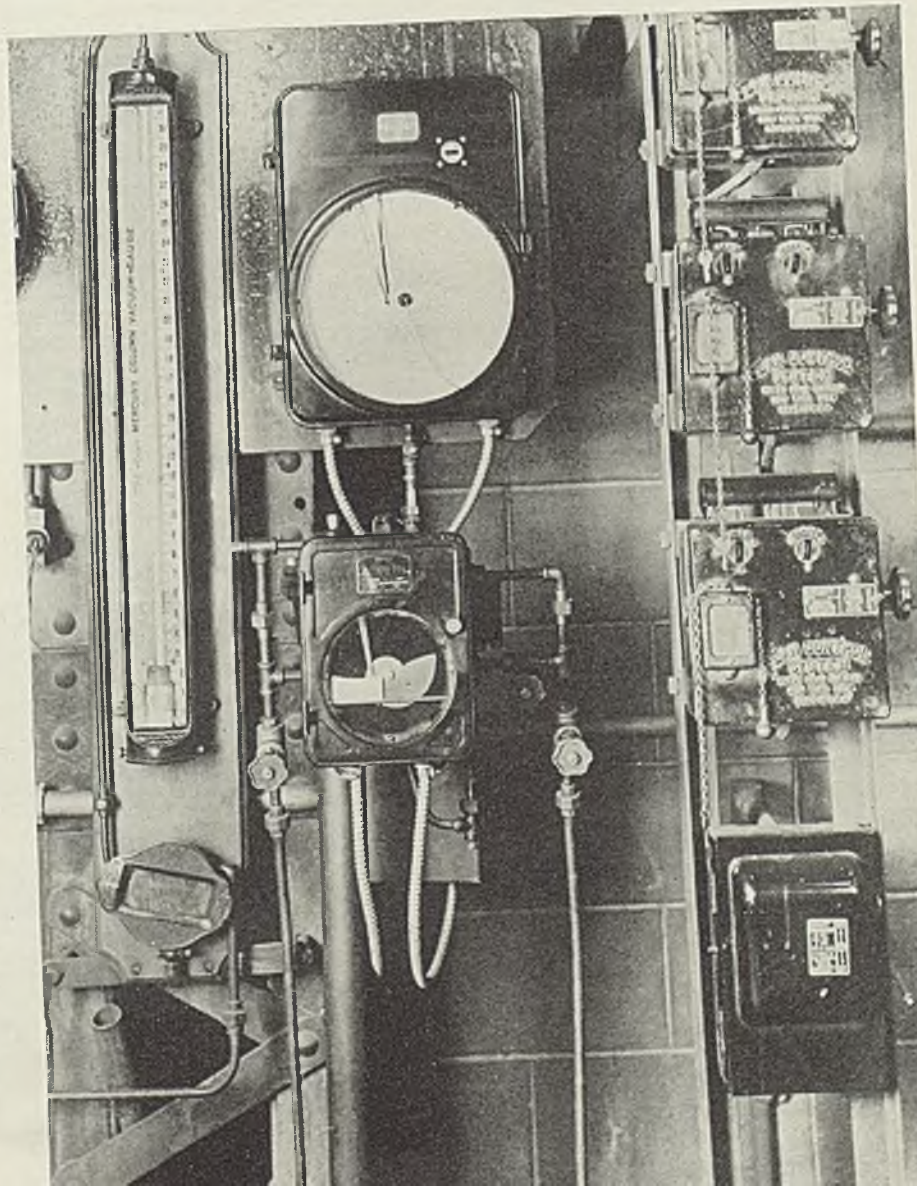
Such extreme flexibility in control is made necessary by the comprehensive piping interconnections between the various blast furnaces and blowing engines. These connections permit any one of the four blowing engines to furnish air for any one of the blast furnaces. To have the volume of air supplied to any active furnace recorded and integrated simultaneously at both station locations with the present system, it is only necessary to plug in the required instruments on a switchboard situated on the power house floor.

Measurements of air flow are made by electric flowmeters of a type that is unaffected by possible fluctuations in circuit characteristics. The instrument readings, or findings, are transmitted as functions of time and, consequently, with extreme accuracy. Readings

are taken of the rate of air flow as follows: In the discharge lines of the respective blowing engines, there are interposed orifice plates which develop a pressure differential at each of the air flow transmitter units.

Electrical impulses are setup by

the automatic opening and closing of magnetically actuated mercury switches at regular 15-second intervals. These impulses cause each transmitter unit to adjust the position of the recording pens which then post the air flow values upon the slowly rotating charts of the re-



Transmitter and receiver-recorded on blast furnace floor. Photo courtesy Bristol Co., Waterbury, Conn.

Welders Operate Together Increase Flexibility

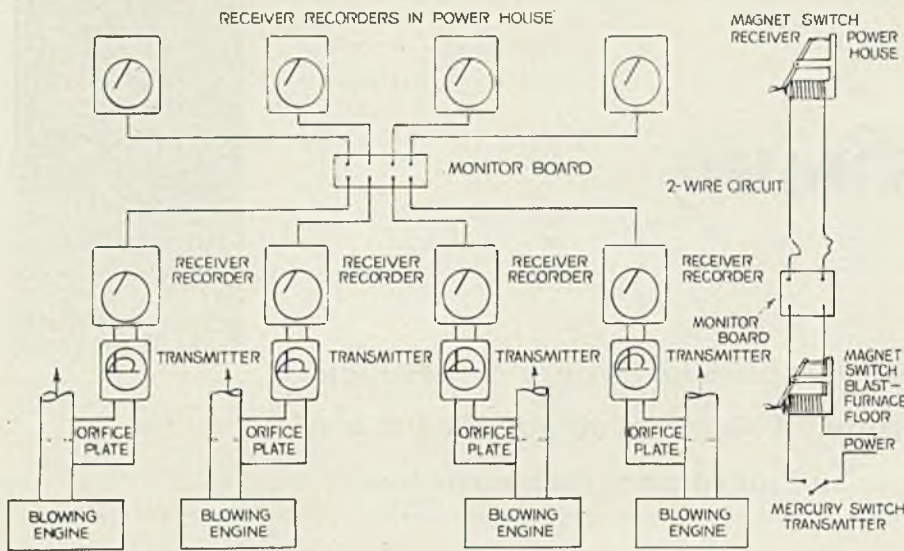
■ A rather unusual operating setup of welding equipment was recently installed at shop of Moise Steel Co., 4027 West Scott street, Milwaukee, steel fabricators. Referring to the accompanying illustration, a dual P&H-Hansen welder unit furnishes welding current for two arcs operated by two operators. With a simple flip of the wrist, however, the two units may be connected in parallel to furnish heavy welding current of twice the amperage available with only one of the units in operation.

This advantage may be particularly important in such shops as this one where, up to the present time, there had always been a "bottleneck" condition. Small work or work requiring only small welding currents quite frequently accumulated faster than it could be handled. Now, with the new arrangement, two operators can be put to work on the one machine, rapidly cleaning up the small work. Later the same equipment can be used by one operator to handle the regular heavy welding work.

The company welds most of its work with 3/16-inch electrodes or smaller — work usually requiring less than 200 amperes of welding current. Only 20 per cent of the work here is done with 1/4-inch, or heavier, electrodes.

Another advantage of this setup is that during low production periods, one of the dual units may be shut down entirely, with accompanying decreased expense of operation.

Two 200-ampere welding sets assembled into one unit give great flexibility in handling various types and amounts of welding work. Photo courtesy Harnischfeger Corp., 4411 West National avenue, Milwaukee



Diagrammatic layout for continuous recording of blast furnace air supply

ceiver recording instruments. These units are in pairs. One of each pair is mounted directly above its transmitter unit on the blast furnace floor. The other of the pair is located in the power house for guidance in blowing-engine operation.

A simple 2-wire circuit connects the motor-driven switch in each of the four transmitter units the four blast furnaces with, first, the companion receiver-recorder on the blast furnace floor and, second, the monitor-board in the power house where the receiver-recorder serving the functioning blowing engine is plugged-in. Simultaneously, then, the existing air conditions are made known to both the blast furnace man and the blowing engine operator.

Bird Cage Uses Round Wire Fused On Steel Strip

■ Round wires have been successfully fused on narrow widths of strip steel for use in the bird cages made by F. Herbst & Co., 2211 North Mango avenue, Chicago. In co-operation with Acme Steel Co., 2840 Archer avenue, Chicago, two sizes of specially finished strip in a suitable temper were manufactured for this purpose.

To avoid crevices for vermin, round wires are spaced 9/16-inch apart and solidly fused between two 3/16-inch strips. At base of each a 1 1/2-inch strip is similarly fused.

Although raw materials are coated to resist corrosion, cages are finished with silver aluminum to prevent rust and make cage heat and winter-resistant. Cages may be sterilized in scalding water without harming finish.

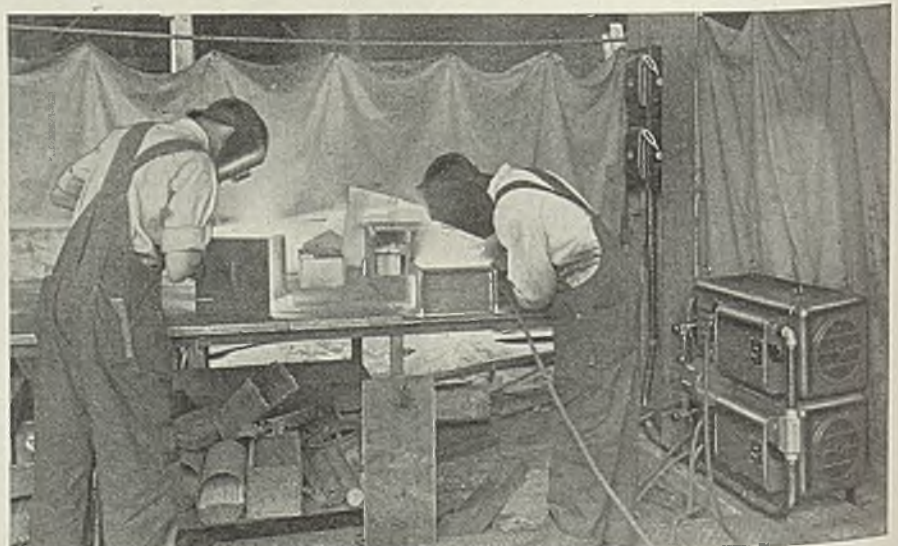
This method of construction, which is patented, seems applicable

also to other products such as fencing and novelties where flat or round wires are used in conjunction with flat strip steel.

Cemented Carbide Shapes Produced by Extrusion

■ Carboloy cemented carbide in form of tubing, spirals and round or shaped bars produced by means of an extrusion process is announced by Carboloy Co. Inc., East Eight Mile road near Van Dyke, Detroit. These bars are made in lengths up to 20 inches within a range of 0.015 to 3/8-inch outside diameter. Tubing now is available as small as 0.060-inch outside diameter by 0.030-inch inside diameter, leaving a wall thickness of 0.015-inch. A supplementary process to bend rods into various shapes also has been developed.

Limitations formerly imposed by size of mold in compressing metallic powders are said to have been overcome by this development in extrusion in which dry powder is mixed with a plasticizing medium and formed into almost any shape.



Galvanizing Steel Sash



. . . involves careful cleaning, pickling, fluxing, immersion, drainage and adequate mechanical support. Proper steel hardness essential to avoid warping. Allowance must be made for thickness

By WALLACE G. IMHOFF

President

The Wallace G. Imhoff Co.

Vineland, N. J.

■ APPLICATION of hot-dip galvanizing to steel window sash is a most logical protection method as it satisfactorily answers the requirements of the owner for ample protection, the architect's quest for the most satisfactory coating, the contractor's desire for windows easy to install, the manufacturer's requirement that the coating be one well adapted to economical production methods.

Many other hot-dipped galvanized steel objects familiar to everyone include such items as chain-link factory fences, high-tension power-line towers, telephone and telegraph hardware, steel fenceposts and railings, angle-iron supports for signs and many others. These afford numerous examples of the effectiveness of the hot-dipped galvanized coating to withstand the ravages of outdoor exposure.

Use High Quality Zinc

In all hot-dip galvanizing, it is most essential to use high-quality zinc equal to the grade "prime Western" zinc as designated by the American Society for Testing Materials if maximum life and efficiency of the coating are to be obtained. This means the lead content shall not be over 1.60 per cent and iron not over 0.08 per cent.

Prior to galvanizing, all oil, grease and other foreign materials are first removed by submerging the work in a cleaning solution. A subsequent thorough rinsing to remove all iron salts and leave a perfectly clean, bare iron surface is essential. Pickling operations then follow.

Next step is to flux the sash, various saturations of zinc ammonium chloride or other liquid flux being

preferable. Sash must be drained well and thoroughly dried before being immersed in the molten zinc bath. The liquid flux should dry to a sticky consistency or with a light glaze finish over the bare iron surface. Care may well be exercised to see that drying is not too severe, as some water of crystallization is needed as a lubricator in the fluxing reaction in the galvanizing bath.

Care also is used in the actual galvanizing operation. Sash should be submerged under the zinc surface one at a time as quickly as possible. A thick slag flux should be

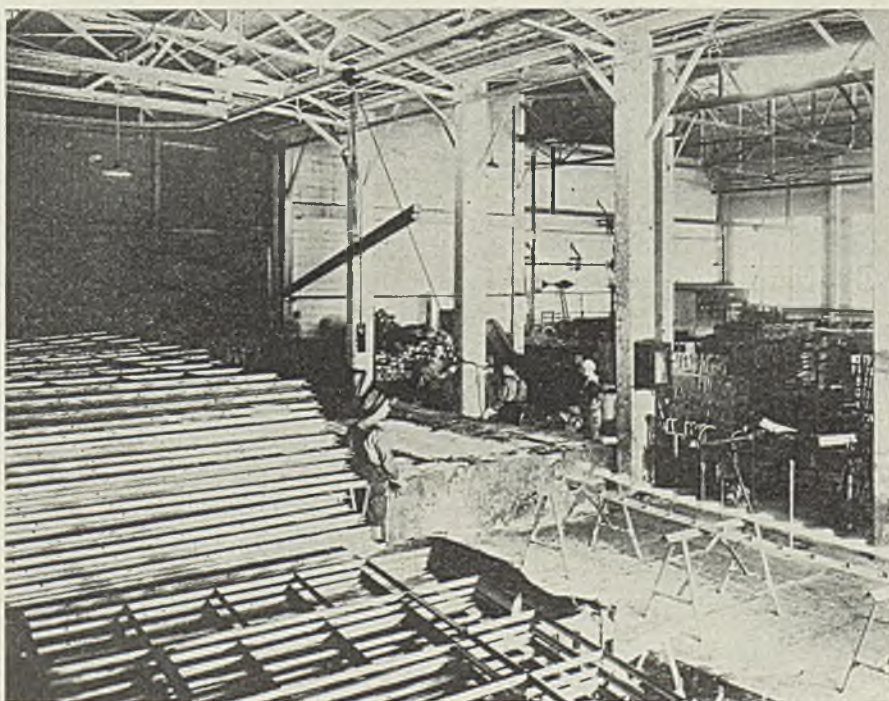
Hot-dip galvanizing of steel window sash at San Francisco Galvanizing Works, 1176 Harrison street, San Francisco. Galvanizing pot is at left. Note height of monorail over pot to permit handling of wide sash

employed on the galvanizing bath to preheat the sash before it enters the zinc below. For large sizes that have to be dipped twice, make the dips as short as possible.

Recommended temperature of galvanizing bath is about 850 degrees Fahr. with 860 degrees as a high limit. Brace the sash when necessary, and exercise care in handling them in and out of the galvanizing bath.

After immersion of sash in the zinc, withdraw them slowly and carefully so they can drain properly. This then gives a perfectly smooth coating over the entire surface. Sash should be air cooled, not water cooled.

After coating is set properly, galvanized sash are laid on an absolutely smooth, level, dry surface. Strong angles are placed underneath so any



possible sagging or pulling out of shape is prevented. Since all steel sash are more or less fragile, it is obvious that they should be handled carefully through every operation in galvanizing.

As far as corrosion resistance is concerned, the hot-dipped galvanized coating applied as above is excellent. However, to assure absolute satisfaction from other standpoints such as fit, straightness, etc., there are certain other factors that will be pointed out.

It is important to the galvanizer that the manufacturer furnish the steel sash with working parts or vents not assembled to the sash. All hardware and working parts should be handled separately wherever possible. Vents should not be assembled to the sash but should be furnished separately, also.

Proper allowance must always be made for the thickness of the zinc coating so sash will fit perfectly after galvanizing. Remember, too, that the outside dimensions of all parts are increased by the thickness of the zinc coating. This difference in size must be taken into account if proper fit and operation of the sash are to be obtained.

Pockets or any part of the sash preventing proper drainage of the molten zinc during galvanizing should have small holes drilled to allow the metal to escape readily. If this is not done, it is impossible to drain these parts effectively with the result that zinc accumulates in those parts and the sash will not operate.

Avoid Hard Steels

The manufacturer also must see that the steel from which the sash are made is not too hard. Warping or distortion in the galvanizing bath results if hard steel is used. Therefore, it is extremely important that a good soft steel be selected. Basic open-hearth steel of the following approximate chemical composition is recommended: Carbon, 0.13 per cent maximum; manganese, 0.50 per cent maximum; phosphorus, 0.05 per cent maximum; sulphur, 0.05 per cent maximum.

To prevent twisting and distortion from developing, it is advisable to make frequent checks on hardness of the steel going through. Hard frames thus can be eliminated before trouble develops in the bath. This is an important factor in galvanizing window sash successfully.

If welding is employed in fabricating the sash, it is best to use an uncoated rod. Scale and iron oxide from a coated welding rod are extremely difficult to remove.

Amount of and best method of handling stresses set up in welded steel window sash are still unsettled

questions. Welding may or may not be the cause of distortion. Some claim stresses set up by welding are relieved by the heat of the galvanizing bath, and hence the distortion is not caused by galvanizing but by release of stresses set up during welding. It has been suggested that welded sash be annealed to remove stresses before being galvanized. This may be well worth the slight added expense.

Each size of sash should be manufactured from steel of sufficient weight to brace and hold the sash properly. Too light a material, especially in the larger sizes, makes the sash too fragile for handling. This may easily be the cause of twisting and distortion. Proper weight and bracing are extremely important.

When sections are joined by slots, hammer the ends over securely to prevent the joints from pulling apart. It must be remembered that galvanizing is not a soldering process but is merely a coating process and thus cannot be relied upon to hold the parts together. Zinc forming the galvanized coating has little mechanical strength.

Proper handling facilities in fabri-

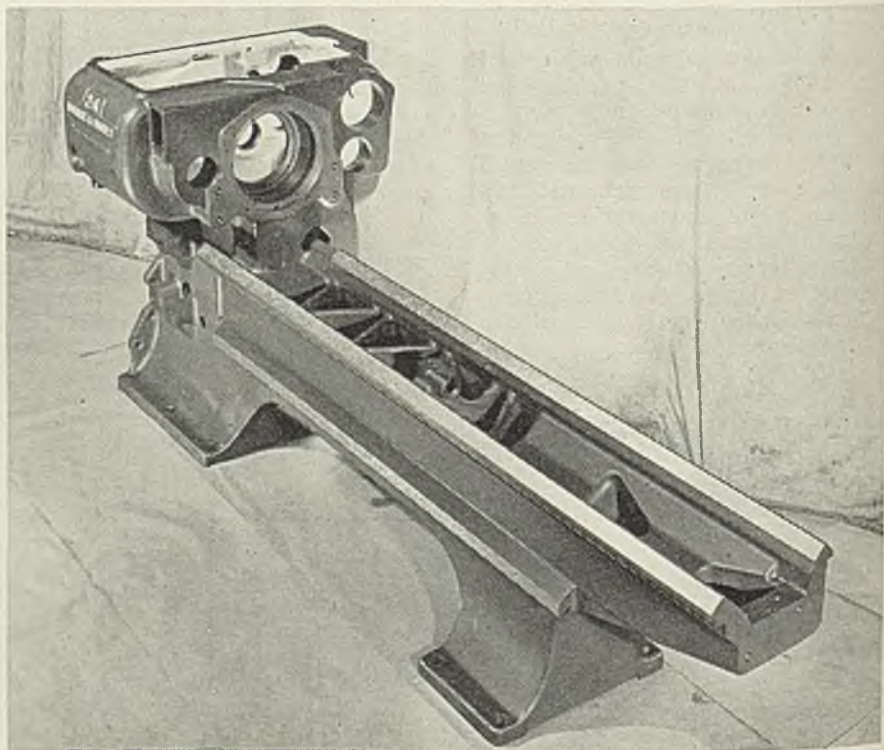
cation, storage, galvanizing and shipping are also important as sash are fragile and are pulled out of shape easily at any point in the manufacturing process.

To assure perfectly finished sash that can be installed quickly and easily, the galvanized coating must be uniform and smooth. A coating thickness at least equivalent to 2 ounces per square foot with a minimum test of 1.80 ounces per square foot is recommended. Also, the coating should pass four 1-minute tests in a copper sulphate solution under conditions of the Preece test.

Information Available

Usually the architect and owner will desire to paint the sash along with the building. Descriptive matter on the painting of galvanized surfaces is available from several sources. Circular No. 1, "Treatment of Galvanized Iron Surfaces to Prepare Them for Painting," may be obtained from American Hot-Dip Galvanizers' Association Inc., 903 American Bank building, Pittsburgh. Also available from the same source is "Tentative Standard Specifications for Hot-Dipped, Zinc-Coated Steel Window Sash," circular No. CSI7-38.

Structural Design Influences Machine Tool Castings



■ The influence of modern structural design on machine tool castings is seen in this lathe bed featuring bridge girder type diagonal ribbing. Ribbing extends into section below headstock and with an outer tie member increases headstock rigidity. Stiffening sections are on outside walls of bed for more chip clearance. Rigidity and strength have been increased 30 per cent with no increase in total weight. Photo courtesy Warner & Swasey Co., 5701 Carnegie avenue, Cleveland



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Here are the latest industrial publications reviewed for your benefit. They are yours for the asking. There is no charge or obligation. Simply fill in the convenient coupon and return.

(1)—Turret Lathes

Jones & Lamson Machine Co.—Two 25-page illustrated bulletins Nos. 39-178 and 39-179, covering models 7A, 7B, 7D, 8A, 8B and 8D saddle type universal turret lathes. General specifications are given. Features include rigidity of headstock mounting, double wall box-ribbed bed, automatic lubrication, etc. Lathe tools are covered.

(2)—Steel Fittings

Pittsburgh Piping & Equipment Co.—8-page illustrated bulletin No. S-302. List prices are given for various types of 18-8 welding and flanged fittings. Construction details and features, such as the use of light wall sections, with savings in weight and metal cost, are included.

(3)—Welding Electrodes

Page Steel & Wire Div. — 12-page illustrated bulletin No. DH-1064, describing hi-tensile "G" electrodes of the shielded-arc type, suitable for use with either motor generator or transformer type machines. High strength and ductility are features. Detailed operating instructions are given.

(4)—Steel

Union Drawn Steel Div., Republic Steel Corp.—80-page steel handbook No. 39, fourth edition. This "Steel Handbook for Machine Tool Users" contains general and specific information, including tables of cutting speeds and feeds for many grades of carbon, alloy and stainless steel.

(5)—Springs

Accurate Spring Mfg. Co.—12-page illustrated folder covering springs, wire forms and stampings. Commercial tolerances, wire specifications and third and fourth powers of wire diameters are given. Contains data which are very necessary in specifying and ordering of springs.

(6)—Alloys

Carboloy Co. Inc. — Two engineering bulletins Nos. GT-114 and GT-115, giving specific recommendations for the suggested grade of Carboloy to use under different conditions and minimum and maximum speeds, safe starting speeds and power constants for use in determining horsepower requirements in each case.

(7)—Gas Engine Compressors

Ingersoll-Rand — 8-page illustrated bulletin No. 3073. The Type LVG compressor, which may be obtained in 485 and 650 H.P. sizes, is described and its advantages including accessibility, full force-feed lubrication, large-diameter stiff crankshaft, etc., are set forth. Dimensions and specifications are given.

(8)—Motors

Allis-Chalmers Mfg. Co. — 8-page illustrated bulletin No. B-6010, describing squirrel cage induction motors, Type "E" direct current motors and Type "E" adjustable speed direct current motors and their applications. List prices are given.

(9)—Electrical Contacts

P. R. Mallory & Co. Inc.—4-page illustrated bulletin No. M-240. These silver-faced base metal backed contacts use silver or silver alloys only on the surface, where it is permanently bonded to a suitable base metal, giving contacts that cost less yet are strong, long-wearing, etc. Tables give combinations of facing and backing materials.

(10)—Hoists-Trolleys-Cranes

Wright Manufacturing Div. — 92-page illustrated catalog No. 12-B. Many different types of hoists, trolleys and cranes, including high speed hoist, army type trolley hoist, high speed hand winch, chain hoist, tapered roller bearing trolley, hand traveling cranes, etc., are discussed. List prices and dimensions are given.

(11)—Surface Treatment

American Chemical Paint Co. — 4-page illustrated bulletin No. 7-2-3. "Lithoform," which is a non-inflammable liquid chemical that coats zinc and cadmium so that peeling of all types of paint, etc., is prevented, may be applied by brushing, spraying or dipping. Process, applications and equipment are described.

(12)—Die Sections Chart

Jessop Steel Co.—Convenient oil-proof wall chart giving specifications for rolled composite die sections, used in dies for cutting sheet metal to regular or irregular shapes. End views of eight die sections are illustrated.

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(13)—Screw Stock

Jones & Laughlin Steel Corp. — 4-page illustrated bulletin No. AD-118. The new J & L Bessemer flame control cold finished screw stock and its uses and features are covered. Bessemer flame control with an arrangement of photo-electric cells and other precision instruments, gives an instantaneous record of rapid changes in Bessemer flame.

(14)—Shears

Niagara Machine & Tool Works — 16-page illustrated bulletin No. 80-C which describes foot operated squaring shears and hand operated rotary shears adapted for work in sheet metal shops where power drive is not available or required. Features and wide range of capacities and cutting lengths are discussed.

(15)—Wire Rope

Broderick & Bascom Rope Co.—96-page illustrated pocket size data book, "Wire Rope for Mining and Contracting." Provides general information on wire rope, its construction, selection, design, size, etc. Many types for various applications are covered. Trigonometric functions and other tables are given.

(16)—Flame Cleaning

Air Reduction Sales Co.—8-page illustrated bulletin No. ADG-1066, discusses the use of flame cleaning and dehydrating to halt deterioration of old steel structures by means of paint burning and surface conditioning. Apparatus, operation, regulation of speeds and specifications are given.

(17)—Thermocouples

Foxboro Co. — 36-page illustrated bulletin No. 235 describing different kinds of thermocouples, thermocouple assemblies and parts. Specifications and information as to temperature ranges, etc., are given. Diagrams illustrate methods of installation.

(18)—Turret Lathes

Gisholt Machine Co. — 8 illustrated loose-leaf data sheets, Nos. 30-37 giving case studies and performance data of 8 production jobs accomplished with Gisholt equipment. High production and ram type universal turret lathes are illustrated and described.

(19)—Dust Filter

Ruemelin Mfg. Co. — 4-page illustrated bulletin No. 24-C, covering tubular bag type dust filter and its features, including bag shaking mechanism, filter housing, etc. Applications, construction and process of filtration are discussed. Dimensions are given.

(20)—Tool Holders

Armstrong Bros. Tool Co. — General catalog No. C-39, covering complete line of Armstrong equipment, including tool holders, "C" clamps, lathe and milling machine dogs, ratchet drills, bits, blades and high speed steel, setting-up tools, machine shop specialties, etc.

(21)—Gas Burners

Tate-Jones & Co. Inc.—8-page illustrated bulletin No. B-2A. High pressure inspirator gas burners are of simple construction for use with 2 to 30 pounds gas pressure and with proper nozzles can be used for open or closed port firing. Dimensions, capacities and diagrams are included.

(22)—Arc Welder

Lincoln Electric Co. — 20-page illustrated bulletin No. 412-A, covering the self-indicating dual continuous control of the new "Shield-Arc" welder which varies the type and size of welding arc to suit every job. Features are described and illustrated.

(23)—Hoists

Shaw-Box Crane & Hoist Div. — 4-page illustrated bulletin No. 344-A. Complete line of portable electric "Budgit" hoists, which come in six sizes and four capacities is described. Specifications are given.

(24)—Shop Equipment

Atlas Press Co.—72-page illustrated catalog No. 40 presenting complete information on machine tools and equipment for 1940. New attachments and accessories are announced along with year's design improvements in lathes, drill and arbor presses and shapers.

(25)—Meehanite Metal

Meehanite Metal Corp. — 12-page illustrated bulletin No. 10. Application of Meehanite metal to pressure castings is covered. This metal provides a uniformly dense metal structure throughout, and it may be cast into intricate shapes to accurate dimensions.

(26)—Thread Grinders

Ex-Cell-O Corp.—8-page illustrated bulletin No. 14091 covering styles No. 33 and 33L precision thread grinders which can be set up for automatic operation after loading. Construction features, including grinding wheel head and drive, coolant system, etc., and operation are described and specifications are given.

(27)—Flexible Couplings

Lovejoy Flexible Coupling Co.—12-page illustrated loose-leaf catalog describing many types of L-R flexible couplings, including the Uniflex coupling Type "IA" and Double-flex coupling "IAU." These couplings operate on low or high speed and require no lubrication. List prices and dimensions are given.

(28)—Small Tools

Bonney Forge & Tool Works—92-page illustrated catalog No. 39. Covers a full line of alloy steel sockets, wrenches and small hand tools. Many new items have been added to this line of tools since the last catalog was published, and they are fully covered in the new edition.

(29)—Pebble and Ball Mills

Patterson Foundry & Machine Co.—32-page illustrated catalog No. 392, covering single and double laboratory and industrial pebble and ball mills with belt or motor drives. Operation, specifications and applications given.

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Motor Modernization Badly Needed

(Concluded from Page 35)

ment check indicated excessive current being used, obviously an extravagance. Such motors should be replaced with units of larger size, better suited to the job.

In other plants, motors were found underloaded. Such motors are equally costly. They waste current because they are operating at reduced efficiency and at a poor power factor. Such motors should be replaced with others better suited to the load or perhaps interchanged with other misfit motors in the same plant. Planned periodic testings will reveal overloaded motors, inefficient motors, misapplied motors, underloaded motors and defective insulation quickly and easily. Savings will result, not only in power consumption but through prevention of shutdowns from burned-out motors and bearings caused by overloads.

If you have not given motors much consideration in the past, a motor check-up will more than likely reveal many shortcomings. Such extensive improvements have been made to electric motors that they should be considered in connection with any other form of modernization and not left "as is" while streamlining is put into effect otherwise. Keeping an old, misfit motor in work just because it will turn a rotor is poor business. It is good policy to replace with modern units.

One essential to efficient motor operation is preventive maintenance. Some plants may have been lax in this regard. Often they keep their machines and auxiliary equipment in first class order but forget the motors. So long as they start and stop when wanted, they are satisfied. This is costly production philosophy.

In a number of mills we found that the motors were dirty through neglect. A dirty motor will overheat and increase operating costs. Manufacturers provide printed instructions for cleaning motors. Read and follow them carefully. Some maintenance men never read these directions, so important to smooth-running production.

Clean the Insulation

Insulation can be kept clean by wiping off the dirt with a dry cloth, blowing it out with air pressure, drawing it off with suction apparatus or removing it with solvents. Where the motor is small and only dry dirt has collected on the parts, cleaning with a dry cloth may be satisfactory. If the accumulation of dirt contains oil or grease, a solvent, of which there are several types on the market, may be required to remove it.

In checking the lubricants in use,

we found that too many motor users are using the wrong oil and this plays havoc with performance. Some short-sighted users buy oil on price and get what they pay for—cheap oil, burning out bearings and raising other costly mischief. For most motor bearings, a good quality lubricating oil with a viscosity of about 200 Saybolt seconds at 40 degrees Cent. is satisfactory. The oil should be free from sediment, should not sludge or gum under maximum operating temperatures as high as 80 degrees Cent. Dirt in the lubricant is one of the worst producers of wear, and cheap lubricants are likely to be dirty.

Be sure that the man who oils and greases your motors does a competent job. We saw motors copiously smeared with oil and grease on the outside instead of on the inside of bearing housings. The quantity of lubricants so wasted is unimportant but the dangerous feature is that some of this excess lubricant is carried into the motor and lodges on the windings, where it catches dirt and eventually ruins the insulation.

Modernize Fuse Equipment

Fuses and other overload devices in many steel mills and metalworking plants could stand modernization. Modern fuses will signal overloads, danger loads and excessive current consumption of motors, preventing burn-outs and reducing excessive consumption of current to a minimum. In many plants visited, the motors were over-fused, which is dangerous. Modern fuse service protects equipment against every abuse.

Motors operating normally consume about one-fourth the current needed to start them. When motors are over-fused four times to allow for momentary abnormal starting currents, they receive little or no protection during normal running operations and therefore are subject to overloads and unchecked danger loads most of the time. This may not be the condition in all plants but it pays to check fusing and switchgear with the motors.

The selection of the RIGHT motor for any given application involves a thorough knowledge of horsepower, speed, current, torque, service cycles, power transmission, voltage-reducing devices, atmospheric conditions, rules and regulations established by power companies and insurance companies, also laws enacted by local governments. The average motor buyer cannot keep himself informed on all factors, hence, the selection of the right type of motor is a task which should be delegated to an expert, an unbiased authority working with or without the co-operation of

manufacturers, jobbers and dealers in electric motors.

Only a few years ago, the prospect who wanted a motor meeting exacting requirements had to have a special one built. Today, he can obtain a standard design to serve any special mechanical operation. Motor manufacturers have in stock a wide range of types and ratings in general demand.

The modern motor is more than a medium for transforming electric energy into mechanical power. It has been developed into a highly refined and specialized "tool" to meet the exacting requirements of modern industry, in a wide range of sizes, from a fraction of a horsepower to many thousands of horsepower, and in a great variety of speeds, voltages and frequencies—all available in a broad range of service characteristics.

Plant modernization demands the utmost in motor performance and there is only one *right* motor to give economical and dependable operation for one particular application. Be sure that the right motor is operating on the right job. otherwise, regardless of the efficiency of your processing machinery and workmen, you will experience excessive breakdowns, delays, high machine hour costs and production too often off-standard. Maximum efficiency from modern machinery can be obtained only when motors and auxiliary devices are equally modern and efficient.

Antique Silver Finish

■ An antique silver finish, Heresite A-313, developed by Heresite & Chemical Co., Manitowoc, Wis., is a baked aluminum finish with a soft patina resembling tarnished silver. Coating is said to adhere to practically any surface baked at 285 degrees Fahr. Unusual adhesion and high resistance to mechanical abrasion and weathering are claimed for this finish which has successfully withstood 450 hours of continuous exposure to salt spray. Finish can be sprayed, dipped or brushed and also can be used as an air drying material on outdoor metal tanks and structures.

Paint Publication

■ "Paint Progress," published by New Jersey Zinc Co., 160 Front street, New York, is a new publication intended to report developments in paints in a nontechnical manner for the general reader.

The first issue containing eight illustrated pages has been distributed recently; the second will be available in February, 1940.

Antiscaling Compound For High Temperatures

FOR APPLICATION to plain carbon steel parts subject to high temperatures, E. F. Houghton & Co., 240 West Somerset street, Philadelphia, have introduced a new antiscaling compound. The new material appears to have interesting possibilities as a protective agent for annealing covers, carburizing boxes, cyanide pots, steel pyrometer tubes for salt bath immersion and similar metal surfaces which must stand up under high heat.

Ferritrol, as the new product is called, consists of two materials, a vehicle and a pigment, packed separately in a special container. The pigment is a mixture of nickel and chrome which is fused on the surface of the steel at high temperatures and actually penetrates the surface of the steel in much the

same way that carbon does in the carburizing process. The vehicle is a specially compounded material.

Service tests on the material are being carried out in a wide range of industrial plants at the present time, and while results are limited as yet, a few performance characteristics have been noted. For example, steel inner annealing covers in a large strip mill were treated with the compound and then subjected to 26 heats of 80 hours each at the annealing temperature of 1650 degrees Fahr. The treated covers at the end of this time appeared as good as new, while untreated covers had scaled badly.

Half of a pressed steel cyanide pot was coated with Ferritrol, the other half left with its original surface. Subjected to high heat, the unpro-

ected side eventually burned through, while the treated side retained approximately its original thickness.

Sheet steel carburizing boxes in a large automotive plant were treated with the material and after 96 hours at carburizing temperatures showed no appreciable penetration of carbon into the surface.

Where the cost of more expensive alloy pots and boxes is not warranted, possibly because of frequent changes in size of parts being handled, the preservation of plain carbon steel surfaces by treatment with this new compound would seem to be a profitable investment.

As it is essential to have the metal as clean as possible prior to application of Ferritrol, the surface of the steel should be sandblasted or pickled, to remove any dirt or grease present.

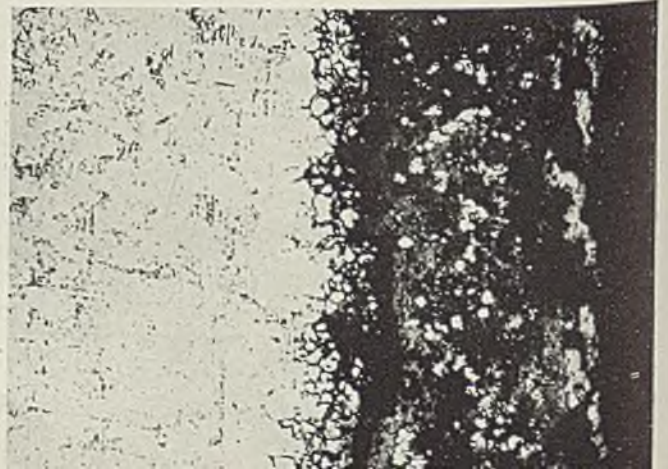
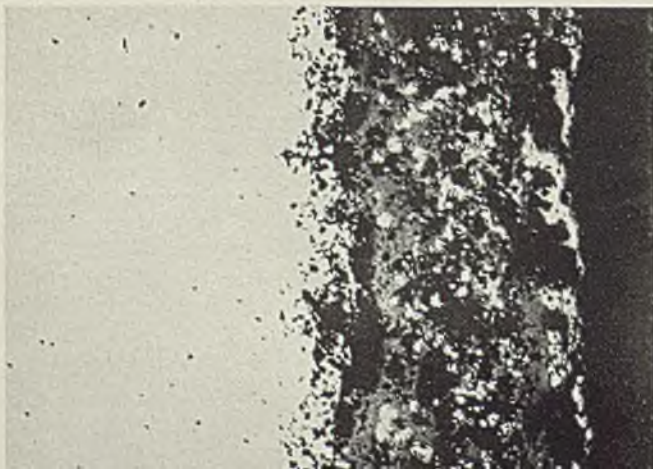
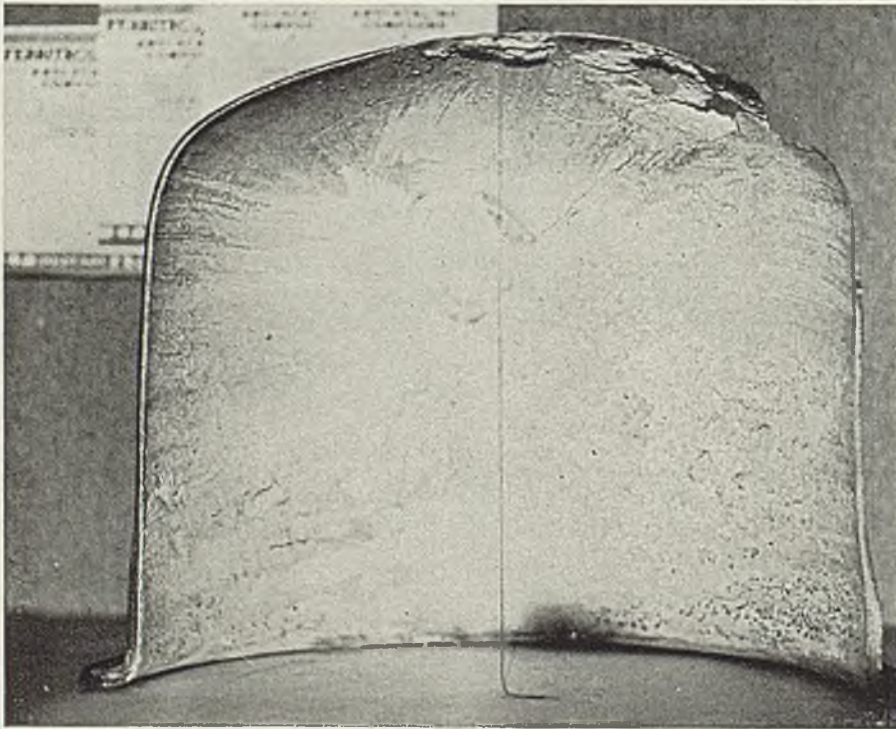
The pigment portion of the product is mixed with the vehicle in the proportion of 40 ounces of pigment to one gallon of vehicle. It is essential to stir the mixture vigorously to completely disperse the pigment in the vehicle, following much the same procedure as is used in the mixing of an aluminum paint. The completed solution then is applied to the surface of the steel with an ordinary paint brush.

Ferritrol 19C should be well brushed on for complete coverage of the steel. After application, parts should be allowed to air dry for not more than one hour. Then parts are placed in an oven or furnace and heated between 1650 and 1700 degrees Fahr. for not less than one hour. This baking fuses the coating into the metal and the parts then are ready for service.

At left is a pressed steel cyanide pot left half coated with Ferritrol. Note that right half with unprotected original surface burned through under high heat while protected half retains approximate original thickness

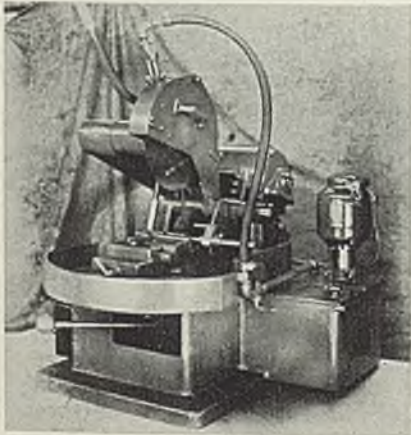
Micrographs below show penetration of coating material into surface of mild steel. At left is unetched section; that at right is etched with 5 per cent nital.

Magnification 50 diameters



Cut-Off Machine

■ Bridgeport Safety Emery Wheel Co., Bridgeport, Conn., offers No. 47-W "Abrasive" wet cut-off machine for cutting solids up to 1 inch and tubing and light sections up to 2 inches. Disks up to 12 inches in diameter, 1/16 to 3/8-inch thick with a 1-inch arbor hole can be used. Worn-down stubs of 16-inch disks from larger cut-off machines can be transferred to this model and used

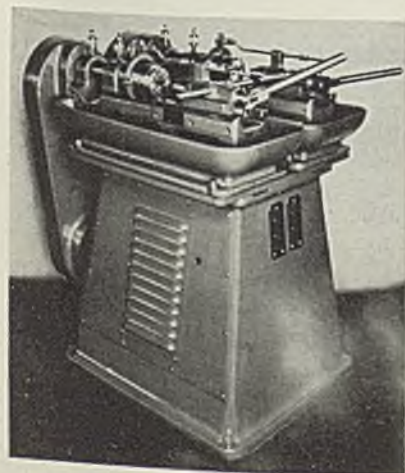


again. Machine cuts 3/4-inch cold rolled steel in 1 second, 3/8 x 1-inch machine steel in 4 to 5 seconds, 1 1/2-inch steel tubing with 3/16-inch wall in 7 to 8 seconds and 1-inch diameter SAE 1045 in 10 seconds.

To load vise, lever on front of machine is depressed allowing stock to be placed in vise. Releasing this lever clamps the piece for cutting. Angular cuts up to 45 degrees can be made.

Two-Spindle Threader

■ Eastern Machine Screw Corp., New Haven, Conn., announces a two-spindle threader for precision work such as aircraft parts. This machine has a hardened and ground spindle with roller bearings and ball thrust. Ways are hardened and ground and of rigid construction. Tail stock shown is of collet type. Machine can be equipped with a



lead screw having a sensitive take-off.

All electrical equipment, the oil pump and oil reservoir are concealed in base. Machine is streamlined and has shelf for holding gages, micrometers, etc.

Acid-Resisting Pump

■ A stainless-steel, acid-resisting pump mounted on a Vitrus porcelain enameled stand has been developed by Air-O-Line Co., Dallas, Tex. Made in three sizes ranging from 140 to 360 gallons per hour, pump has self-aligning Oilite bearings mounted in a sealed oil compartment on brackets separate from the end bells, tube outlet of pure copper plated with block tin inside and out to prevent corrosion, an impeller of die-drawn stainless steel tapped and screwed on the motor shaft with a left hand thread, rubber sound dampeners for wall mounting and cushion base for silent operation.

Motor fan pulls air up through motor, reducing motor temperature. Pump bracket is of die-drawn 16-gage steel and coated with Vitrus porcelain enamel to prevent rust. Model B-25 has a 1/100-horsepower motor and a 3/8-inch tube outlet. A



2-foot head produces 140 gallons per hour; a 6-foot head, 90 gallons per hour; and an 8-foot head, 70 gallons per hour. List price is \$10.

Photoelectric Switch

■ "Electric Eye" limit switch of Photoswitch Inc., Cambridge, Mass., is a photoelectric switch for use in heavy industries for controlling and limiting motion of heavy objects such as billets and sheet steel, cranes and hoists, red hot rods, etc., under exacting conditions of vibration, humidity and high temperature.

Type A14B limit switch and light source are supplied in weatherproof housings for any location. They serve as general-purpose limit switch for any application similar to above. Type A20C operates directly from light given off by red hot metal of any shape. It provides limiting control, operates reversing rollers, conveyors, etc., or counts ob-



jects which pass before it. Hot objects may vary within reasonable limits in their location with respect to control.

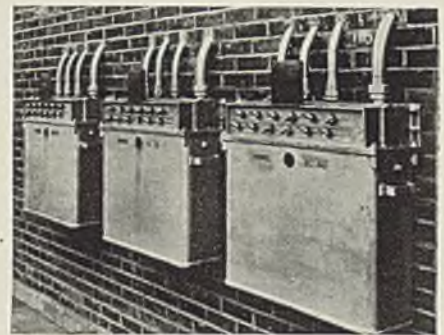
Correction

■ On page 79, STEEL of Dec. 18, 1939, under "Plastics Molding Press" it was announced that a new 20-ton "Standard" plastics molding press was being built by Standard Machinery Co., Providence, R. I. This should have been Standard Machinery Co., Mystic, Conn.

Oil-Immersed Lighting Panelboards

■ Oil-immersed panelboards using thermal trip branch circuit breakers for protection of lighting circuits in locations exposed to corrosive elements and explosion-hazardous atmospheres are announced by Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. A new thermal-trip breaker also has been developed for these panelboards to insure practically constant tripping characteristics regardless of temperature changes.

Compensating bimetal mounted outside chamber of breaker frame in which main tripping bimetal is enclosed is affected only by general temperature of oil. Its motion is transmitted to tripping bimetal



through a link, thermally and electrically insulating the two members and passing through a small clearance opening in breaker wall.

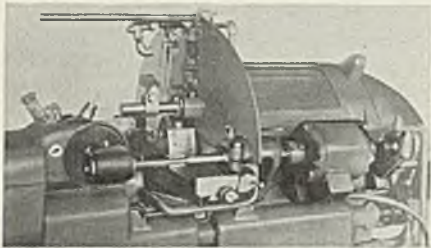
Breaker is compensated within commercial limits, permitting 0 to 10 per cent decrease in rating when oil temperature is 140 degrees Fahr., and 0 to 10 per cent increase in rat-

ing at oil temperature of 10 degrees Fahr. At 75 degrees Fahr. deviation is zero, and at intermediate temperatures limits are proportionate.

Motor Drives for Cross, Turret Drilling

■ Brown & Sharpe Mfg. Co., Providence, R. I., offers motor drives for cross and turret drilling attachments for use on automatic screw and turret forming machines (high speed) Nos. OOG, OG and 2G.

Drill spindle assemblies of cross



drilling attachments can be driven by motor attached by a bracket to rear of machine bed. Motor drives a pair of bevel gears in a case on end of bracket through flexible coupling and connecting shaft. Drive is transmitted from gears to drill spindle by another shaft assembly as illustrated. Mechanism in no way limits movement of cross slide or position of attachment spindle with relation to cross slide. Drill speed is 4950 revolutions per minute for all sizes of machines. Motors for cross and turret drilling both are 1/4-horsepower for No. OOG machine and 1/2-horsepower for Nos. OG and 2G machines.

Precision Collet Chuck

■ Erickson Steel Co., 3361 East Eightieth street, Cleveland, offers a collet-type precision chuck for drills, end-mills, etc., which is stated to possess unusual grip and



great ease and accuracy of setup even when broken drills are used. The chuck consists of a shank, shank grip-nut, collet and nose-piece. All working faces, and the concentricity of holes, bearings and angles are held to a tolerance of 0.0001-inch.

The collet is inserted in the shank and the nose-piece tightened down upon it by means of the shank grip-nut, thus avoiding all possibility of twisting the collet during the process. The hexagon on the outside of the nose-piece makes setup easy by permitting two wrenches to be used. The collet

is unusually collapsible and will grip firmly and accurately drill and end-mill shanks whose diameters differ by as much as 1/32-inch. Its construction provides an eight-point grip instead of the usual three or four point one, thus giving two to three times the resistance to loosening.

Proportioning Oil Burner

■ Proportioning oil burner of Hauck Mfg. Co., 124 Tenth street, Brooklyn, burns any grade of oil and automatically proportions primary and secondary atomizing air to oil used. One lever controls oil and air supply and simultaneously adjusts primary and secondary air orifices. Any oil-air ratio, once set, is automatically maintained with carbon dioxide readings between 13 and 15 per cent over full range of burner rating. In many cases, fuel consump-



tion is said to have been reduced 10 to 15 per cent.

High turndown ratio is due to full primary and secondary air pressure and velocity at point of atomization. Burner has indicator dials on all adjustments for duplicating burner settings.

Portable Air Compressor

■ Empire Compressor Mfg. Co. Inc., Reading, O., offers its 4-cylinder Pressure King portable air compressor with 1 3/8-inch bore and 1 5/8-inch stroke having drop forged crank shaft and bronze bearings. Compressor is air-cooled by fan-blade type flywheel and by fins in cylinder block and air conditioning unit. Stainless steel disc-type valves are heat-treated. Sheet steel base is fitted with rubber feet or heavy-duty castors.

Empire 2 (two cylinders) with 1/4-horsepower motor delivers 1.7 cubic feet of air per minute at a pressure of 30 pounds per square inch. Em-



pire 4 with 1/3-horsepower motor delivers 2.7 cubic feet per minute at 60 pounds. Four-cylinder compressor with 1/3-horsepower motor, spray gun and 15 feet of hose costs \$49.95.

X-Ray Cassette

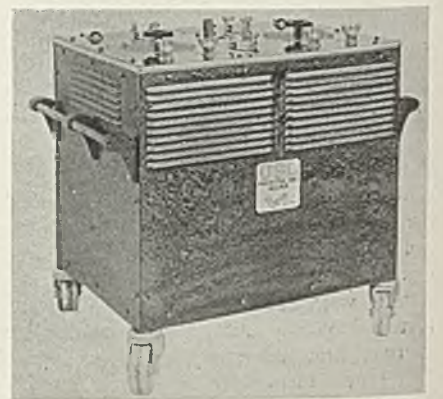
■ Economy X-ray cassette offered by St. John X-ray Service Inc., 30-20 Thomson avenue, Long Island City, N. Y., has lightweight flexible film



folder and interchangeable filter fronts to be chosen in accordance with voltage employed and thickness of metal to be penetrated. Only folder has to be taken to darkroom for loading. Low cost permits having more folders for greater speed.

Welder

■ Owen-Dyneto division of USL Battery Corp., Syracuse, N. Y., announces its new 3W 500-ampere alternating-current welder completing a new line ranging in capacity from

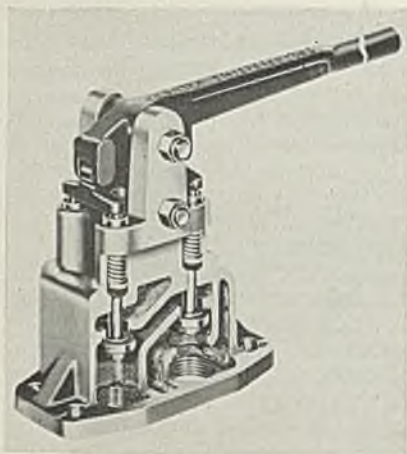


150 to 500 amperes. This welder operates on either 220 or 440 volts and can be operated from 30 to 560 amperes having a continuous 500-ampere rating.

Electrodes 1/10 to 1/2-inch in diameter inclusive can be used, making possible welding of thinnest automobile body and heaviest truck frame. Welder weighs 460 pounds.

Air Control Valve

■ Ross Operating Valve Co., 6488 Epworth avenue, Detroit, announces a poppet-type air control valve with mounting flange, uprights, lever and other parts heavier than standard valves. Special alloy lever and rock-



er arm pins of increased diameter, fitted with needle type roller bearings, larger stuffing boxes and stainless steel poppet stems and retainers are said to provide extra strength and wear. Mounting dimensions, pipe connection locations and bolt holes remain the same as in standard Ross valves.

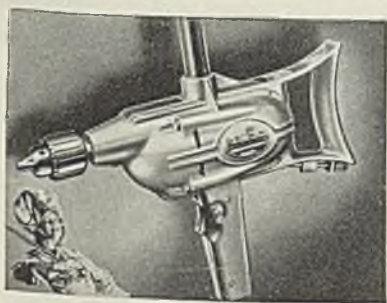
Flexible Welding Cable

■ "Major" rubber-covered superflexible welding cable of Welding Engineering Co., 264 East Ogden avenue, Milwaukee, has copper conductor of fine, bare wires covered by a separator to enable quick stripping of rubber covering for attaching to lugs. It is said the 50 per cent rubber jacket is tough, durable, waterproof, extremely flexible and has high tensile strength and maximum abrasion resistance.

Size 6 for 75 amperes has 950 strands, 0.415-inch outside diameter and weighs 135 pounds per 1000 feet. Size 4/0 for 550 amperes has 5095 strands, 0.925-inch outside diameter and weighs 900 pounds per 1000 feet.

Electric Drill

■ A new ½-inch capacity light-duty portable electric drill known as Thor Drill Champion announced by Inde-



pendent Pneumatic Tool Co., 500 West Jackson boulevard, Chicago, is designed for intermittent service and can be used in both wood and metal. Drill weighs 9¼ pounds and is 15¼ inches overall. It is streamlined for use in hard-to-reach places. Extra large air intake keeps motor cool. Oil-lite bearings are

used throughout except on spindle, where ball bearings are used. Standard equipment includes double-pole momentary switch fully enclosed in a dust-proof compartment in switch handle, a spade handle and removable dead handle. A handy spring clip retainer for chuck key is provided, as well as a 3-jaw Jacobs chuck and 3-conductor cable and plug. Cost of drill is \$35.

Nonglare Fixture

■ The "Protecto" diffuser announced by Goodrich Electric Co., 2900 North Oakley avenue, Chicago, for illuminating areas where precision operations require continuous good vision, has an unusually deep-skirted reflector while the globe is much smaller in size and is concealed high above the bottom of the re-



flector skirt. Because the glass globe is not in the field of vision, it is possible to use a globe of very high transmission value for increased efficiency.

Combined with the high reflection factor of the porcelain enamel finish and accurate light control, shadows are said to be softened and minute details clearly revealed. To improve general illumination, a portion of the light is directed to the ceiling through openings near the top of the reflector.

Electric-Arc Torch

■ Marquette Mfg. Co., 401 Johnson street Northeast, Minneapolis, has developed an electric arc torch for general heating; preheating; welding of aluminum, bronze, copper,



pot metal, German silver and other nonferrous metals; brazing; soldering; applying hard-surfacing paste. Ease with which torch handles hard solders makes it applicable to repair of copper, brass, monel and ferrous metals.

Torch is said to operate on less

current than when welding with metallic arc and can be used with any alternating-current machine. Torch comes with: Two 10-foot cables, two sets each of ⅜-inch and ¼-inch Marquette arc torch carbons, two ½-inch carbon adaptors and a set of two copper terminal lugs besides the two regular Marquette taper jacks, and instructions for torch operation and application to various welding jobs.

Power Control

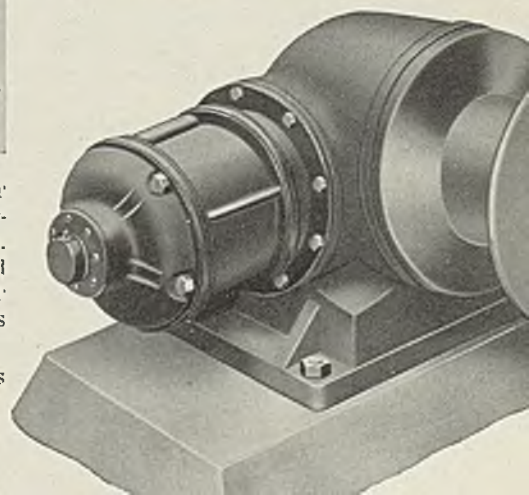
■ Reactrol system of General Electric Co., Schenectady, N. Y., is announced for automatically regulating power input to electrically heated equipment such as furnaces, boilers, superheaters and air heaters. System varies voltage impressed on heating resistors in accordance with temperature or pressure requirements. It is said to be particularly suitable for continuous processes and in treatment of materials that might be affected by slight changes in temperature.

In its simplest form, this system consists of a control panel, a temperature or pressure control instrument and a saturable-core reactor. Pressure or temperature control instrument (containing special potentiometer) feeds low-voltage current into an amplifying tube on control panel. This tube regulates flow of direct current to saturable-core reactor which, acting like a valve, regulates voltage applied and thus amount of power going to electric heating equipment.

Wire Rope Car Puller

■ No. 14 heavy-duty wire rope car puller with horizontal capstan is announced by Stephens-Adamson Mfg. Co., Aurora, Ill. This car puller, having a capacity up to 6 fully loaded cars, has heavy-duty hand-operated clutch to disengage flanged drum accommodating 500 feet of ⅝-inch wire rope. One end of the pulling rope is fastened to the drum, which winds and stores surplus rope as cars are pulled forward.

Ten-horsepower motor gives capstan speed of 13 revolutions per minute. Starting rope pull is 10,000 pounds. Total weight is 1700 pounds.



MEETINGS

STEEL INSTITUTE TO MEET IN NEW YORK MAY 23

■ FORTY-NINTH general meeting of American Iron and Steel institute will be held at the Waldorf-Astoria hotel, New York, May 23. Attendance at meeting and banquet will be restricted to members of the institute. Program will be announced later.

ASHEVILLE NAMED FOR GEAR MAKERS' ANNUAL MEETING

American Gear Manufacturers association has selected the Grove Park Inn, Asheville, N. C., for its annual convention to be held May 20-22.

ENGINEERING COUNCIL TO CONVENE IN WASHINGTON

Many problems related to the engineering profession will be discussed at the annual assembly of the American Engineering council, Mayflower hotel, Washington, Jan. 11-12.

A luncheon on the first day will deal with public works, with John M. Carmody, administrator, federal

works agency, Washington, as speaker. Conway P. Coe, commissioner of patents, Washington, will address a patents luncheon on the second day.

Principal speakers at the all-engineers dinner Jan. 12 will be Dr. Ralph E. Flanders, president, Jones & Lamson Machine Co., Springfield, Vt., and Dr. William T. Foster, director, Pollak Foundation, Boston.

FOUNDRY CONFERENCE IN MILWAUKEE, FEB. 15-16

The annual foundry conference sponsored by the Wisconsin chapter, American Foundrymen's association, and the department of mining and metallurgy, University of Wisconsin, Madison, Wis., will be conducted at Hotel Schroeder, Milwaukee, Feb. 15-16. The program provides for sessions devoted to gray iron, malleable iron, steel, and nonferrous, as well as several general sessions.

S.A.E. ARRANGES PROGRAM FOR DETROIT MEETING

Papers to be presented at the annual meeting of the Society of Automotive Engineers, Book-Cadillac hotel, Detroit, Jan. 15-19, will deal

with a wide range of topics. Twenty sessions are scheduled.

Of particular interest to the metals industry are the following papers: "Spot Welding of Automobile Grade Mild Steel," by Dr. W. F. Hess and R. A. Wyant, Rensselaer Polytechnic institute, Troy, N. Y.; "Design and Manufacture of Hobs and Hobbing of Gears," by C. R. Staub, Michigan Tool Co., Detroit; "Aluminum Aircraft Fuel Tanks," by E. H. Dix Jr. and Dr. R. B. Mears, Aluminum Co. of America, New Kensington, Pa.; and "Load Carrying Capacity of Journal Bearings," by S. A. McKee, national bureau of standards, Washington.

Principal speaker at the dinner on Jan. 18 will be William L. Batt, president, SKF Industries Inc., Philadelphia, and vice chairman, Business Advisory council. "What's Ahead for Management" is his subject.

Convention Calendar

Jan. 9-11—Institute of Scrap Iron and Steel. Twelfth annual convention at William Penn hotel, Pittsburgh. Edwin C. Barringer, 11 West Forty-second street, New York, is executive secretary.

Jan. 11-12—American Engineering council. Twentieth annual assembly at Mayflower hotel, Washington. F. M. Felker, 744 Jackson Place N. W., Washington, is executive secretary.

Jan. 15-19—Society of Automotive Engineers. Annual meeting at Book-Cadillac hotel, Detroit. John A. C. Warner, 29 West Thirty-ninth street, New York, is secretary.

Jan. 22-24—National Warm Air Heating and Air Conditioning association. Semiannual meeting at Hollenden hotel, Cleveland. Allen W. Williams, 5 East Long street, Columbus, O., is managing director.

Jan. 22-26—American Society of Heating and Ventilating Engineers. Annual meeting at Statler hotel, Cleveland. A. V. Hutchinson, 51 Madison avenue, New York, is secretary.

Jan. 22-26—Sixth International Heating and Ventilating exposition. Lakeside Hall, Cleveland.

Jan. 22-26—American Institute of Electrical Engineers. Annual winter meeting in New York. H. H. Henline, 73 West Thirty-ninth street, New York, is secretary.

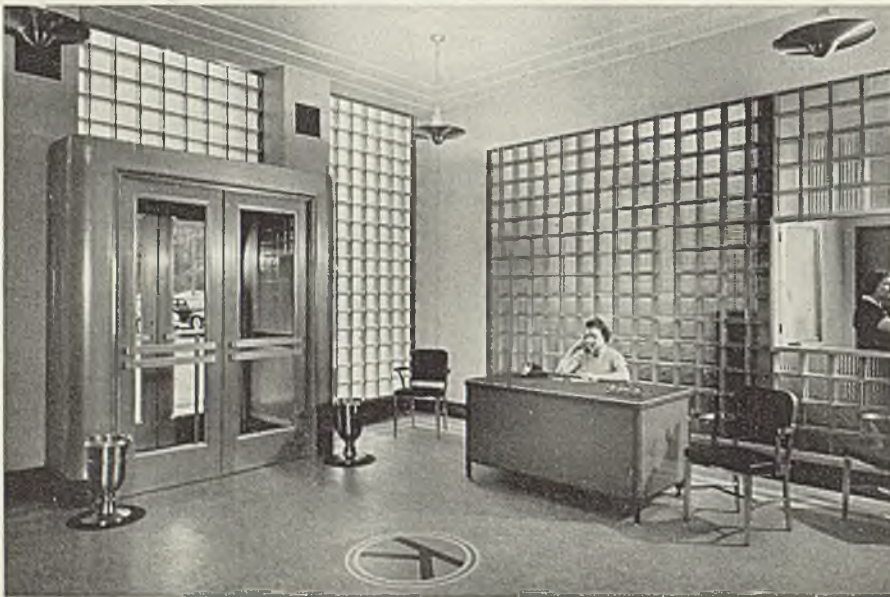
Jan. 22-26—Canning Machinery and Supplies association. Annual meeting at Stevens hotel, Chicago. S. G. Gorsline, Box 430, Battle Creek, Mich., is secretary.

Jan. 29-Feb. 2—American Road Builders' association. Thirty-seventh annual convention and road show at International Amphitheatre, Chicago. Charles M. Upham, 914 National Press building, Washington, is managing director.

Feb. 12-15—American Institute of Mining and Metallurgical Engineers. Annual meeting at Engineering Societies building, New York. A. B. Parsons, 29 West Thirty-ninth street, New York, is secretary.

Feb. 15-16—American Foundrymen's association. Third annual regional conference of Wisconsin chapter and University of Wisconsin at Hotel Schroeder, Milwaukee.

Keystone Opens New Administration Building



■ Keystone Steel & Wire Co., Peoria, Ill., held open house Jan. 5, on completion of its 267 x 53-foot three story, office building.

The removing of the offices from the plant proper and the building of new offices is a part of the general expansion program which includes increasing manufacturing and warehouse facilities and power generating capacity.

On the ground floor is a cafeteria; also private dining room for executives. The balance of the floor space is taken up with gen-

eral storage facilities for accounting, advertising, printing, etc.; receiving department, print shop and files.

On the first floor a vestibule in the center of the building opens into a large reception room, shown in the illustration. Directors' and executive offices are to the front of the building; the balance of the space being occupied by the credit, cost, engineering and purchasing departments. The second floor is occupied by the sales, traffic and other office functions.

Steelmaking Snaps Back to High Rate

Delivery Demand Holds; Renewed Buying In Prospect

■ STEEL production has regained almost all the loss caused by holiday interruption, with prospects of further quickening during January. This restores the operating rate to 86.5 per cent, only 4 points below that prevailing immediately before holiday week.

Some effects of annual inventory taking are in evidence but specifications are in good volume and producers are scheduling activities high in an effort to meet consumer needs. Backlogs are larger than in the same period last year and mills are in better position than for several years. While buying is light at the moment this is attributed largely to tonnages already covered by contracts and comfortable inventory position.

Numerous outlets for steel are expected to place specifications for larger tonnages during January, notably the automotive, railroad and shipbuilding industries. Structural demand continues at a better rate than usual for midwinter and pending projects promise additional buying in the near future, with seasonal increase in early spring.

While there is variation in tonnage of various products on books, mills as a whole can see near-capacity business for full first quarter and in some cases for practically all first half. In some products deliveries now are three to five weeks, although this interval is being reduced somewhat by heavy shipments.

A heartening feature of the situation is that consumers have not accumulated heavy inventory, early announcement of unchanged prices for first quarter contributing largely to this, and most tonnage shipped is going into production promptly. This promises steady buying to meet needs of steel users.

December steel ingots fell off slightly from the October and November figures, totaling 5,164,420 gross tons, at 85.57 per cent of capacity. It was the largest monthly output since May, 1929, except for the two preceding months. Year's total was 45,768,899 tons, at an average rate of 64.29 per cent, compared with 27,742,225 tons at 39.65 per cent in 1938.

December pig iron production at 3,767,605 tons gained 1.27 per cent over November. It was the largest monthly production since July, 1929, and the largest December on record. Due to the shorter month November showed a higher daily rate, 124,003 tons, compared with 121,535 tons daily in December. Total

MARKET IN TABLOID ★

Demand

Buying slow but prompt delivery asked.

Prices

Steady; Scrap near bottom.

Production

Up 11 points to 86½ per cent

1939 output was 31,526,823 tons, a gain of 67 per cent over 18,889,663 tons in 1938. In 1937 production was 36,709,139 tons.

Automobile production last week continued to show effects of holiday idleness, total production being reported at 87,510 units, compared with 89,365 the preceding week, and 117,705 before Christmas. Last week's output was 10,825 cars greater than in the corresponding week in 1939.

While little railroad inquiry is current the year's buying has been started by distribution of 50,000 tons of rails by the Pennsylvania and 20 locomotives by the Delaware & Hudson. Rail releases against heavy mill backlogs probably will be made within a short time, to provide for spring tracklaying. Steel for carbuilding and repairs is being specified steadily.

Steel and iron imports continue to shrink, November's total being 15,216 gross tons, 14.8 per cent below that of October, which, in turn, was 36 per cent under September. The November figure was less than half that of either June or July. However, total imports for 11 months in 1939 were 300,452 tons, well above 235,783 tons in the corresponding period, 1938.

Establishing of Lake Superior iron ore prices for the 1940 season at the same level as for the three preceding years, mark the earliest action since the 1917 prices were set in November, 1916. The earliest date in the interval was Feb. 2, 1920. In 1939 prices were announced May 24.

Composites showed little change, softness in scrap prices in Eastern Pennsylvania causing the iron and steel composite to drop 1 cent and the scrap composite 8 cents to \$17.50. The latter has been moving downward almost continuously since the first week of October, from \$22.16 at that time, a loss of \$4.66 in approximately three months.

Every producing district but one contributed to the rapid recovery of production from the holiday lull. Pittsburgh regained 19 points to 89 per cent, Chicago 9½ points to 90½ per cent, eastern Pennsylvania 5 points to 82 per cent, Youngstown 11 to 85, New England 8 to 83, Wheeling 13 to 89, Cleveland 17 to 85, Birmingham 19 to 94, Detroit 5 to 90, Cincinnati 16 to 91 and St. Louis 1½ to 78½. Buffalo showed contraction of 7½ points to 67, on account of repairs.

COMPOSITE MARKET AVERAGES

	Jan. 6	Dec. 30	Dec. 23	One Month Ago Dec., 1939	Three Months Ago Oct., 1939	One Year Ago Jan., 1939	Five Years Ago Jan., 1935
Iron and Steel	\$37.09	\$37.10	\$37.10	\$37.18	\$37.62	\$36.36	\$32.58
Finished Steel	56.10	56.10	56.10	56.10	55.90	56.50	54.00
Steelworks Scrap ..	17.50	17.58	17.58	13.88	21.45	14.77	12.03

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

COMPARISON OF PRICES

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

Finished Material					Pig Iron				
	Jan. 6, 1940	Dec. 1939	Oct. 1939	Jan. 1939		Jan. 6, 1940	Dec. 1939	Oct. 1939	Jan. 1939
Steel bars, Pittsburgh	2.15c	2.15c	2.15c	2.25c	Bessemer, del. Pittsburgh	\$24.34	\$24.34	\$24.34	\$22.34
Steel bars, Chicago	2.15	2.15	2.15	2.25	Basic, Valley	22.50	22.50	22.50	20.50
Steel bars, Philadelphia	2.47	2.47	2.47	2.57	Basic, eastern, del. Philadelphia	24.34	24.34	24.34	22.34
Iron bars, Terre Haute, Ind.	2.15	2.15	2.13	2.15	No. 2 foundry, Pittsburgh	24.21	24.21	24.21	22.21
Shapes, Pittsburgh	2.10	2.10	2.10	2.10	No. 2 foundry, Chicago	23.00	23.00	23.00	21.00
Shapes, Philadelphia	2.215	2.215	2.215	2.215	Southern No. 2, Birmingham	19.38	19.38	19.38	17.38
Shapes, Chicago	2.10	2.10	2.10	2.10	Southern No. 2, del. Cincinnati	22.89	22.89	22.89	20.89
Plates, Pittsburgh	2.10	2.10	2.10	2.10	No. 2X, del. Phila. (differ. av.)	25.215	25.215	25.215	23.215
Plates, Philadelphia	2.15	2.225	2.275	2.15	Malleable, Valley	23.00	23.00	23.00	21.00
Plates, Chicago	2.10	2.10	2.10	2.10	Malleable, Chicago	23.00	23.00	23.00	21.00
Sheets, hot-rolled, Pittsburgh	2.10	2.10	2.00	2.15	Lake Sup., charcoal, del. Chicago	30.34	30.34	30.34	28.34
Sheets, cold-rolled, Pittsburgh	3.05	3.05	3.05	3.20	Gray forge, del. Pittsburgh	23.17	23.17	23.17	21.17
Sheets, No. 24 galv., Pittsburgh	3.50	3.50	3.50	3.50	Ferromanganese, del. Pittsburgh	105.33	105.33	105.33	90.25
Sheets, hot-rolled, Gary	2.10	2.10	2.00	2.15					
Sheets, cold-rolled, Gary	3.05	3.05	3.05	3.20					
Sheets, No. 24 galv., Gary	3.50	3.50	3.50	3.50					
Bright bess., basic wire, Pitts.	2.60	2.60	2.60	2.60					
Tin plate, per base box, Pitts.	\$5.00	\$5.00	\$5.00	\$5.00					
Wire nails, Pittsburgh	2.55	2.55	2.50	2.45					

Semifinished Material

Sheet bars, Pittsburgh, Chicago.	\$34.00	\$34.00	\$34.00	\$34.00
Slabs, Pittsburgh, Chicago	34.00	34.00	34.00	34.00
Rerolling billets, Pittsburgh	34.00	34.00	34.00	34.00
Wire rods, No. 5 to 3/4-inch, Pitts.	2.00	1.98	1.92	1.92

Scrap

Heavy melting steel, Pittsburgh	\$18.00	\$18.50	\$23.15	\$15.60
Heavy melt. steel, No. 2, E. Pa.	17.00	17.60	20.00	13.25
Heavy melting steel, Chicago	16.25	16.50	19.25	13.75
Rails for rolling, Chicago	19.75	19.75	21.90	17.75
Railroad steel specialties, Chicago	18.50	19.90	21.75	16.00

Coke

Connellsville, furnace, ovens.	\$4.75	\$4.75	\$4.75	\$3.75
Connellsville, foundry, ovens.	5.75	5.75	5.80	5.00
Chicago, by-product fdry., del.	10.50	10.50	10.50	10.50

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

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

Sheet Steel

Hot Rolled	
Pittsburgh	2.10c
Chicago, Gary	2.10c
Cleveland	2.10c
Detroit, del.	2.20c
Buffalo	2.10c
Sparrows Point, Md.	2.10c
New York, del.	2.34c
Philadelphia, del.	2.27c
Granite City, Ill.	2.20c
Middletown, O.	2.10c
Youngstown, O.	2.10c
Birmingham	2.10c
Pacific Coast points.	2.60c

Cold Rolled	
Pittsburgh	3.05c
Chicago, Gary	3.05c
Buffalo	3.05c
Cleveland	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.37c
New York, del.	3.39c
Granite City, Ill.	3.15c
Middletown, O.	3.05c
Youngstown, O.	3.05c
Pacific Coast points.	3.65c

Galvanized No. 24	
Pittsburgh	3.50c
Chicago, Gary	3.50c
Buffalo	3.50c
Sparrows Point, Md.	3.50c
Philadelphia, del.	3.67c
New York, delivered	3.74c
Birmingham	3.50c

Granite City, Ill.	3.60c
Middletown, O.	3.50c
Youngstown, O.	3.50c
Pacific Coast points.	4.00c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.			
Chrome-Nickel			
	No. 302	No. 304	
Bars	24.00	25.00	
Plates	27.00	29.00	
Sheets	34.00	36.00	
Hot strip	21.50	23.50	
Cold strip	28.00	30.00	

Straight Chromes			
	No.	No.	No.
	410	430	442
Bars	18.50	19.00	22.50

Plates ..	21.50	22.00	25.50	30.50
Sheets ..	26.50	29.00	32.50	36.50
Hot strip.	17.00	17.50	24.00	35.00
Cold stp.	22.00	22.50	32.00	52.00

Steel Plate

Pittsburgh	2.10c
New York, del.	2.29c
Philadelphia, del.	2.15c
Boston, delivered	2.46c
Buffalo, delivered	2.33c
Chicago or Gary	2.10c
Cleveland	2.10c
Birmingham	2.10c
Coatesville, Pa.	2.35c
Sparrows Point, Md.	2.10c
Claymont, Del.	2.10c
Youngstown	2.10c
Gulf ports	2.45c
Pacific Coast points.	2.60c

Steel Floor Plates	
Pittsburgh	3.35c
Chicago	3.35c
Gulf ports	3.70c
Pacific Coast points	3.95c

Standard Shapes

Pittsburgh	2.10c
Philadelphia, del.	2.21 1/2 c
New York, del.	2.27c
Boston, delivered	2.41c
Bethlehem	2.10c
Chicago	2.10c
Cleveland, del.	2.30c

Tin and Terne Plate

Tin Plate, Coke (base box)	
Pittsburgh, Gary, Chicago	\$5.00
Granite City, Ill.	5.10
Mfg. Terne Plate (base box)	
Pittsburgh, Gary, Chicago	\$4.30
Granite City, Ill.	4.40

Bars

Soft Steel	
(Base, 20 tons or over)	
Pittsburgh	2.15c
Chicago or Gary	2.15c
Duluth	2.25c
Birmingham	2.15c
Cleveland	2.15c
Buffalo	2.15c
Detroit, delivered	2.25c
Philadelphia, del.	2.47c
Boston, delivered	2.52c
New York, del.	2.49c
Gulf ports	2.50c
Pacific Coast points.	2.75c

Rail Steel	
(Base, 5 tons or over)	
Pittsburgh	2.15c
Chicago or Gary	2.15c
Detroit, delivered	2.25c
Cleveland	2.15c

Buffalo	2.15c
Birmingham	2.15c
Gulf ports	2.50c
Pacific Coast points	2.75c

Iron

Chicago, Terre Haute	2.15c
Philadelphia	2.37c
Pittsburgh, refined	3.50-8.00c

Reinforcing

*New Billet Bars, Base**

Chicago, Gary, Buffalo, Cleve., Birm., Young., Sparrows Pt., Pitts.	2.15c
Gulf ports	2.50c
Pacific Coast ports	2.60c

Rail Steel Bars, Base*

Pittsburgh, Gary Chicago, Buffalo, Cleveland, Birm.	2.15c
Gulf ports	2.50c
Pacific Coast ports	2.60c

*Subject to a deduction of 25 cents per 100 lbs. in lots of 20 tons or over of one size, in lengths of 30 feet or over, for shipment at one time to one destination.

Wire Products

<i>Pitts-Cleve.-Chicago-Birm. base per 100 lb. keg in carloads</i>	
Standard and cement coated wire nails	\$2.55
(Per pound)	
Polished fence staples	2.55c
Galv. barbed wire, standard 12 1/2 gage two-point hog, 80-rod spool \$2.88; two-point cattle, 80-rod spool	\$2.70
Annealed fence wire	2.90c
Galv. fence wire	3.30c
Woven wire fencing (base C. L. column)	57.00
Single loop bale tie (base C. L. column)	56.00
To Manufacturing Trade	
<i>Base, Pitts. - Cleve. - Chicago - Birmingham (except spring wire)</i>	
Bright bess., basic wire	2.60c
Galvanized wire	2.65c
Spring wire	3.20c
Worcester, Mass., \$2 higher on bright basic and spring wire.	

Cut Nails

Carload, Pittsburgh	\$3.85
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Cold-Finished Bars

	Carbon	Alloy
Pittsburgh	2.65c	3.35c
Chicago	2.65c	3.35c
Gary, Ind.	2.65c	3.35c
Detroit	2.70c	*3.45c
Cleveland	2.65c	3.35c
Buffalo	2.65c	3.35c
* Delivered.		

Alloy Bars (Hot)

(Base, 20 tons or over)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem	2.70c	
Detroit, delivered	2.80c	
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.		1.50-
2.00 Ni.		1.10
5100 0.80-1.10 Cr.		0.45
5100 Cr. spring flats		0.15
6100 bars		1.20
6100 spring flats		0.85
Cr. N., Van.		1.50
Carbon Van.		0.85
9200 spring flats		0.15
9200 spring rounds, squares 0.40		
Electric furnace up 50 cents.		

Strip and Hoops

(Base, hot strip, 1 ton or over; cold, 3 tons or over)

Hot Strip, 12-inch and less

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, Birmingham	2.10c
Detroit, del.	2.20c
Philadelphia, del.	2.42c
New York, del.	2.46c
Pacific Coast points	2.70c
Cooperage hoop, Youngs., Pitts.; Chicago, Birm.	2.20c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland, Youngstown Chicago	2.80c
Detroit, del.	2.90c
Worcester, Mass.	3.00c
Carbon Cleve., Pitts.	
0.26-0.50	2.80c
0.51-0.75	4.30c
0.76-1.00	6.15c
Over 1.00	8.35c
Worcester, Mass. \$4 higher.	
Commodity Cold-Rolled Strip	
Pitts.-Cleve.-Youngstown	2.95c
Chicago	3.05c
Detroit, del.	3.05c
Worcester, Mass.	3.35c
Lamp stock up 10 cents.	

Rails, Fastenings

(Gross Tons)

Standard rails, mill	\$40.00
Relay rails, Pittsburgh 20-100 lbs.	32.50-35.50
Light rails, billet qual., Pitts., Chicago, B'ham.	\$40.00
Do., rerolling quality	39.00
Cents per pound	
Angle bars, billet, mills	2.70c
Do., axle steel	2.35c
Spikes, R. R. base	3.00c
Track bolts, base	4.15c
Car axles forged, Pitts., Chicago, Birmingham	3.15c
Tie plates, base	2.15c
Base, light rails 25 to 60 lbs., 20 lbs. up \$2; 16 lbs. up \$4; 12 lbs. up \$8; 8 lbs. up \$10. Base railroad spikes 200 kegs or more; base plates 20 tons.	

Bolts and Nuts

F.o.b. Pittsburgh, Cleveland, Birmingham, Chicago. Discounts for carloads additional 5%, for full containers additional 10%.

Carriage and Machine

1/2 x 6 and smaller	68.5 off
Do. larger, to 1-in.	66 off
Do. 1 1/2 and larger	64 off
Tire bolts	52.5 off

Stove Bolts

In packages with nuts separate 72.5 off; with nuts attached add 15%; bulk 83.5 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.

Step bolts	60 off
Flow bolts	68.5 off

Nuts

Semifinished hex. U.S.S. S.A.E.	
6-inch and less	67 70
1 1/2-inch	64 65
1 1/2 and larger	62 62

Hexagon Cap Screws

Upset, 1-in., smaller	70.0 off
Square Head Set Screws	
Upset, 1-in., smaller	75.0 off
Headless set screws	64.0 off

Piling

Pitts., Chgo., Buffalo	2.40c
Gulf ports	2.85c
Pacific coast ports	2.90c

Rivets, Washers

Structural, Pittsburgh, Cleveland, Chicago	3.40c
1/4-inch and smaller.	

Pitts., Chi., Cleve.	65-10 off
Wrought washers, Pitts., Chi., Phila., to jobbers and large nut, bolt mfrs. l.c.l.	\$5.40; c.l. \$5.75 off

Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Chicago delivery 2 1/2 and 1 1/2 less, respectively. Wrought pipe, Pittsburgh base.

Butt Weld Steel

In.	Bk.	Galv.
1/2	63 1/2	54
3/4	66 1/2	58
1-3	68 1/2	60 1/2

Iron

1-1 1/2	30	13
1 1/2	34	19
1 1/2	38	21 1/2
2	37 1/2	21

Lap Weld Steel

2	61	52 1/2
2 1/2-3	64	55 1/2
3 1/2-6	66	57 1/2
7 and 8	65	55 1/2
9 and 10	64 1/2	55
11 and 12	63 1/2	54

Iron

2	30 1/2	15
2 1/2-3 1/2	31 1/2	17 1/2
4	33 1/2	21
4 1/2-8	32 1/2	20
9-12	28 1/2	15

Line Pipe Steel

1 to 3, butt weld	67 1/2
2, lap weld	60
2 1/2 to 3, lap weld	63
3 1/2 to 6, lap weld	65
7 and 8, lap weld	64
10-inch lap weld	63 1/2
12-inch, lap weld	62 1/2

Iron

Bk.	Galv.
1/2 butt weld	25 7
1 and 1 1/2 butt weld	29 13
1 1/2 butt weld	33 15 1/2
2 butt weld	32 1/2 15
1 1/2 lap weld	23 1/2 7
2 lap weld	25 1/2 9
2 1/2 to 3 1/2 lap weld	26 1/2 11 1/2
4 lap weld	28 1/2 15
4 1/2 to 8 lap weld	27 1/2 14
9 to 12 lap weld	23 1/2 9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet; f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Welded

Sizes	Gage	Steel	Iron
1 1/2" O.D.	13	\$ 9.72	\$23.71
1 1/2" O.D.	13	11.06	22.93
2" O.D.	13	12.38	19.35
2 1/2" O.D.	13	13.79	21.68
2 1/2" O.D.	12	15.16	
2 1/2" O.D.	12	16.58	26.57
2 3/4" O.D.	12	17.54	29.00
3" O.D.	12	18.35	31.36
3 1/2" O.D.	11	23.15	39.81
4" O.D.	10	28.66	49.90
5" O.D.	9	44.25	73.93
6" O.D.	7	68.14	

Seamless

Sizes	Gage	Hot Rolled	Cold Drawn
1" O.D.	13	\$ 7.82	\$ 9.01
1 1/2" O.D.	13	9.26	10.67
1 1/2" O.D.	13	10.23	11.79
1 3/4" O.D.	13	11.64	13.42

2" O.D.	13	13.04	15.03
2 1/2" O.D.	13	14.54	16.76
2 1/2" O.D.	12	16.01	18.45
2 3/4" O.D.	12	17.54	20.21
2 3/4" O.D.	12	18.59	21.42
3" O.D.	12	19.50	22.48
3 1/2" O.D.	11	24.62	28.37
4" O.D.	10	30.54	35.20
4 1/2" O.D.	10	37.35	43.04
5" O.D.	9	46.87	54.01
6" O.D.	7	71.96	82.93

Cast Iron Pipe

Class B Pipe—Per Net Ton

6-in., & over, Birm.	\$45.00-46.00
4-in., Birmingham	48.00-49.00
4-in., Chicago	56.80-57.80
6-in. & over, Chicago	53.80-54.80
6-in. & over, east Idy.	49.00
Do., 4-in.	52.00

Class A Pipe \$3 over Class B Std. ftgs., Birm., base \$100.00

Semifinished Steel

Rerolling Billets, Slabs

(Gross Tons)

Pittsburgh, Chicago, Gary, Cleve., Buffalo, Young., Birm., Sparrows Point	\$34.00
Duluth (billets)	36.00
Detroit, delivered	36.00

Forging Quality Billets

Pitts., Chi., Gary, Cleve., Young., Buffalo, Birm.	40.00
Duluth	42.00

Sheet Bars

Pitts., Cleveland, Young., Sparrows Point, Buffalo, Canton, Chicago	34.00
Detroit, delivered	36.00

Wire Rods

Pitts., Cleveland, Chicago, Birmingham No. 5 to 1 1/2-inch incl. (per 100 lbs.)	\$2.00
Do., over 1 1/2 to 1 1/4-in. incl.	2.15
Worcester up \$0.10; Galveston up \$0.25; Pacific Coast up \$0.45.	

Skelp

Pitts., Chi., Youngstown, Coatesville, Sparrows Pt.	1.90c
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Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	\$4.75- 5.25
Connellsville, fdry.	5.50- 6.00
Connell. prem. fdry.	5.75- 6.25
New River fdry.	6.50- 6.75
Wise county fdry.	5.50- 6.50
Wise county fur.	5.00- 5.25

By-Product Foundry

Newark, N. J., del.	11.38-11.85
Chicago, outside del.	10.50
Chicago, delivered.	11.25
Terre Haute, del.	10.75
Milwaukee, ovens	11.25
New England, del.	12.50
St. Louis, del.	11.75
Birmingham, ovens	7.50
Indianapolis, del.	10.75
Cincinnati, del.	10.50
Cleveland, del.	11.05
Buffalo, del.	11.25
Detroit, del.	11.00
Philadelphia, del.	11.15

Coke By-Products

Spot, gal., freight allowed cast of Omaha

Pure and 90% benzol	16.00c
Toluol, two degree	25.00c
Solvent naphtha	27.00c
Industrial xylol	27.00c
Per lb. f.o.b. Frankford and St. Louis	
Phenol (less than 1000 lbs.)	14.75c
Do. (1000 lbs. or over)	13.75c
<i>Eastern Plants, per lb.</i>	
Naphthalene flakes, balls, bbls. to jobbers	6.75c
<i>Per ton, bulk, f.o.b. port</i>	
Sulphate of ammonia	\$28.00

Pig Iron

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

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	\$24.00	\$24.50	\$23.50	\$25.00
Birdsboro, Pa.	24.00	24.50	23.50	25.00
Birmingham, Ala.	19.38	23.00	18.38	24.00
Buffalo	23.00	23.50	22.00	24.00
Chicago	23.00	23.00	22.50	23.50
Cleveland	23.00	23.00	22.50	23.50
Detroit	23.00	23.00	22.50	23.50
Duluth	23.50	23.50	22.00	24.00
Erle, Pa.	23.00	23.50	22.50	24.00
Everett, Mass.	24.00	24.50	23.50	25.00
Granite City, Ill.	23.00	23.00	22.50	23.50
Hamilton, O.	23.00	23.00	22.50	23.50
Neville Island, Pa.	23.00	23.00	22.50	23.50
Provo, Utah	21.00	22.00	21.00	22.00
Sharpsville, Pa.	23.00	23.00	22.50	23.50
Sparrow's Point, Md.	24.00	24.00	23.50	24.00
Swedeland, Pa.	24.00	24.50	23.50	25.00
Toledo, O.	23.00	23.00	22.50	23.50
Youngstown, O.	23.00	23.00	22.50	23.50

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

Delivered from Basing Points:

Akron, O., from Cleveland	24.39	24.39	23.89	24.89
Baltimore from Birmingham	24.78	24.78	23.66	24.66
Boston from Birmingham	24.12	24.12	23.00	24.00
Boston from Everett, Mass.	24.50	24.50	24.00	25.50
Boston from Buffalo	24.50	24.50	24.00	25.50
Brooklyn, N. Y., from Bethlehem	26.50	26.50	27.00	27.00
Canton, O., from Cleveland	24.39	24.39	23.89	24.89
Chicago from Birmingham	†23.22	23.22	22.00	23.00
Cincinnati from Hamilton, O.	23.24	23.24	23.61	24.61
Cincinnati from Birmingham	23.06	23.06	22.06	23.06
Cleveland from Birmingham	23.32	23.32	22.82	23.82
Mansfield, O., from Toledo, O.	24.94	24.94	24.44	25.44
Milwaukee from Chicago	24.10	24.10	23.60	24.60
Muskegon, Mich., from Chicago, Toledo or Detroit	26.19	26.19	25.69	26.69
Newark, N. J., from Birmingham	25.15	25.15	24.00	25.00
Newark, N. J., from Bethlehem	25.53	25.53	26.03	26.03
Philadelphia from Birmingham	24.46	24.46	23.96	24.96
Philadelphia from Swedeland, Pa.	24.84	24.84	25.34	25.34
Pittsburgh district from Neville Island	and \$1.24 freight.			
Saginaw, Mich., from Detroit	25.45	25.45	24.95	25.95

	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis, northern	23.50	23.50	23.00	24.00
St. Louis from Birmingham	†23.12	23.12	22.62	23.62
St. Paul from Duluth	25.63	25.63	25.13	26.13

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Buffalo, N. Y., \$28.50, base; \$29.74 delivered Philadelphia.

Gray Forge

Valley furnace	\$22.50	Charcoal	Lake Superior fur.	\$27.00
Pitts. dist. fur.	22.50	do., del. Chicago		30.34
		Lyles, Tenn.		26.50

†Silvery

Jackson county, O., base: 6-6.50 per cent \$28.50; 6.51-7—\$29.00; 7-7.50—\$29.50; 7.51-8—\$30.00; 8-8.50—\$30.50; 8.51-9—\$31.00; 9-9.50—\$31.50; Buffalo, \$1.25 higher.

Bessemer Ferrosilicon†

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

Refractories

Per 1000 f.o.b. Works, Net Prices	Ladle Brick (Pa., O., W. Va., Mo.)	
Fire Clay Brick	Dry press	\$28.00
Super Quality	Wire cut	\$26.00
Pa., Mo., Ky.	Magnesite	
First Quality	Domestic dead - burned grains, net ton f.o.b.	
Pa., Ill., Md., Mo., Ky.	Chewelah, Wash., net ton, bulk	22.00
Alabama, Georgia	net ton, bags	26.00
New Jersey	Basic Brick	
Second Quality	Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.	
Pa., Ill., Ky., Md., Mo.	Chrome brick	\$50.00
Georgia, Alabama	Chem. bonded chrome	50.00
New Jersey	Magnesite brick	72.00
Ohio	Chem. bonded magnesite	61.00
First quality	Fluorspar	
Intermediate	Washed gravel, duty pd., tide, net ton	\$25.00-\$26.00
Second quality	Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail.	22.00
Malleable Bung Brick	Do, barge	22.00
All bases	No. 2 lump	22.00
\$56.05		
Silica Brick		
Pennsylvania		\$47.50
Joliet, E. Chicago		55.10
Birmingham, Ala.		47.50

Ferroalloy Prices

Ferromanganese, 78-82%, tide., duty pd.	\$100.00	bon, per lb. contained		carlots, contr., net ton	\$142.50	Silicon Metal, 1% iron, contract, carlots, 2 x 1/4-in., lb.	14.00c
Do., del. Pitts.	105.33	chrome	17.50c	Do, spot	145.00	Do., 2%	12.50c
Spiegelisen, 19-21% dom. Palmerton, Pa., spot.	32.00	Do., ton lots	18.25c	Do, contract, ton lots	145.00	Spot 1/4c higher	
Do., 26-28%	39.50	Do., less-ton lots	18.75c	Do, spot, ton lots	150.00	Silicon Briquets, contract carloads freight allowed, ton	\$69.50
Ferrosilicon, 50% freight allowed, c.l.	69.50	Car-Ton Less loads lots ton		15-18% tl., 3-5% carbon, carlots, contr., net ton	157.50	Carload, spot	74.50
Do., ton lot	82.00	2% carb.	17.50c 18.25c 18.75c	Do, spot	160.00	Less-ton lots, lb.	3.75c
Do., 75 per cent	126.00	1% carb.	18.50c 19.25c 19.75c	Do, contract, ton lots	160.00	Manganese Briquets, contract carloads, bulk freight allowed, lb.	5.00c
Spot, \$5 a ton higher.		0.10% carb.	20.50c 21.25c 21.75c	Do, spot, ton lots	165.00	Ton lots	5.50c
Silicomanganese, 2 1/2 c.	103.00	0.20% carb.	19.50c 20.25c 20.75c	Alsilfer, contract carlots, f.o.b. Niagara Falls, lb.	7.50c	Less-ton lots	5.75c
2% carbon, 108.00; 1%, 118.00		Spot 1/4c higher		Do, ton lots	8.00c	Spot 1/4c higher	
Contract ton price \$12.50 higher; spot \$5 over contract.		Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb.	0.95	Do, less-ton lots	8.50c	Zirconium Alloy, 12-15%, contract, carloads, bulk, gross ton	\$97.50
Ferrotungsten, stand., lb. con. del. cars	2.00-2.10	Calcium molybdate, lb. molyb. cont., f.o.b. mill	0.80	Chromium Briquets, contract, freight allowed, lb. spot carlots, bulk	7.00c	Do, spot	102.50
Ferrovandium, 35 to 40%, lb., cont.	2.70-2.80-2.90	Ferrotitanium, 40-45%, lb., con. tl., f.o.b. Niagara Falls, ton lots	\$1.23	Do., ton lots	7.50c	Do, less-ton lots	16.00c
Ferrophosphorus, gr. ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, \$3 unitage, 58.50; electrolytic, per ton, c. l., 23-26% f.o.b. Monsanto, Tenn., 24% \$3 unitage	75.00	Do., less-ton lots	1.25	Do., less 200 lbs.	8.00c	Spot 1/4c higher	
Ferrocrome, 66-70 chromium, 4-6 carbon, cts. lb., contained cr., del. carlots	11.00c	20-25% carbon, 0.10 max., ton lots, lb.	1.35	Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb.	\$2.50	Molybdenum Powder, 99%, f.o.b. York, Pa. 200-lb. kegs, lb.	\$2.60
Do., ton lots	11.75c	Do, less-ton lots	1.40	Do., smaller lots	2.60	Do, 100-200 lb. lots.	2.75
Do., less-ton lots	12.00c	Spot 5c higher		Vanadium Pentoxide, contract, lb. contained	\$1.10	Do, under 100-lb. lots	3.00
67-72% carloads, 2% carb., 18%, tl., 6-8% carb.,		Ferrocolumbium, 50-60%, contract, lb. con. col., f.o.b. Niagara Falls	\$2.25	Do, spot	1.15	Molybdenum Oxide Briquets, 48-52% molybdenum, per pound contained, f.o.b. producers' plant	80.00c

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets			Cold Rolled Strip	Cold Drawn Bars		
							Hot Rolled	Cold Rolled	Galv. No. 24		Carbon	SAE 2300	SAE 3100
Boston	3.98	4.16	5.16	3.85	3.85	5.66	3.81	4.78	4.86	3.46	4.13	8.63	7.23
New York (Met.)	3.84	3.96	3.96	3.76	3.75	5.56	3.58	4.60	5.23	3.51	4.09	8.59	7.19
Philadelphia	3.85	3.85	4.35	3.55	3.55	5.25	3.55	4.55	4.93	3.51	4.06	8.56	7.16
Baltimore	3.95	4.05	4.45	3.70	3.70	5.25	3.55	...	5.05	...	4.05	...	...
Norfolk, Va.	4.15	4.25	...	3.90	3.90	5.45	3.75	...	5.40	...	4.15	...	...
Buffalo	3.35	3.82	3.82	3.62	3.40	6.40	4.20	4.40	4.50	3.42	3.75	8.15	6.75
Pittsburgh	3.35	3.60	3.60	3.40	3.40	5.00	3.35	...	4.75	3.35	3.65	8.35	6.95
Cleveland	3.25	3.50	3.50	3.40	3.58	5.18	3.35	4.05	4.72	3.20	3.75	8.15	6.75
Detroit	3.43	3.43	3.68	3.60	3.65	5.27	3.43	4.50	4.84	3.40	3.80	8.45	7.05
Cincinnati	3.60	3.67	3.67	3.65	3.68	5.28	3.42	4.37	4.67	3.45	4.00	8.50	7.10
Chicago	3.50	3.60	3.60	3.55	3.55	5.15	3.35	4.30	4.85	3.50	3.75	8.15	6.75
Twin Cities	3.75	3.85	3.85	3.80	3.80	5.40	3.60	4.95	5.00	3.83	4.34	8.84	7.44
Milwaukee	3.63	3.73	3.73	3.68	3.68	5.28	3.48	4.43	4.98	3.54	3.88	8.38	6.98
St. Louis	3.62	3.72	3.72	3.47	3.47	5.07	3.38	4.32	4.95	3.61	4.02	8.52	7.12
Kansas City	4.05	4.15	4.15	4.00	4.00	5.60	3.90	...	5.00	...	4.30	...	...
Memphis	3.90	4.00	4.00	3.95	3.95	5.71	3.85	...	5.25	...	4.31	...	...
Chattanooga	3.80	3.90	3.90	3.85	3.85	5.68	3.65	...	4.40	...	4.39	...	...
Tulsa, Okla.	4.44	4.54	4.54	4.33	4.33	5.93	4.24	...	5.71	...	4.69	...	...
Birmingham	3.50	3.60	3.60	3.55	3.55	5.88	3.35	...	4.85	...	4.43	...	...
New Orleans	4.00	4.10	4.10	3.80	3.80	5.75	3.85	...	4.80	5.00	4.60	...	...
Houston, Tex.	4.05	6.20	6.20	4.05	4.05	5.75	4.20	...	5.25	...	...	...	...
*Seattle	4.00	4.00	5.35	3.40	3.50	5.75	3.95	6.50	4.75	...	5.75	...	...
Portland, Oreg.	4.25	4.50	6.10	4.00	4.00	5.75	3.95	6.50	4.75	...	5.75	...	...
Los Angeles	4.15	4.65	6.45	4.00	4.00	6.40	4.30	6.50	5.25	...	6.60	10.65	9.80
San Francisco	4.00	4.45	6.00	4.00	4.00	5.60	3.85	6.40	5.15	...	6.80	10.65	9.80

	—SAE Hot-rolled Bars (Unannealed)—				
	1035-1050	2300 Series	3100 Series	4100 Series	6100 Series
Boston	4.18	7.50	6.05	5.80	7.90
New York (Met.)	4.04	7.35	5.90	5.65	...
Philadelphia	4.10	7.31	5.86	5.61	8.56
Baltimore	4.10	...	...	...	...
Norfolk, Va.	...	...	...	...	...
Buffalo	3.55	7.10	5.65	5.40	7.50
Pittsburgh	3.40	7.35	5.95	5.50	7.60
Cleveland	3.30	7.30	5.85	5.85	7.70
Detroit	3.48	7.42	5.97	5.72	7.19
Cincinnati	3.65	7.44	5.99	5.74	7.84
Chicago	3.70	7.10	5.65	5.40	7.50
Twin Cities	3.95	7.45	6.00	6.09	8.19
Milwaukee	3.83	7.33	5.88	5.63	7.73
St. Louis	3.82	7.47	6.02	5.77	7.87
Seattle	5.85	...	8.00	7.85	8.65
Portland, Oreg.	5.70	8.85	8.00	7.85	8.65
Los Angeles	4.80	9.40	8.55	8.40	9.05
San Francisco	5.00	9.65	8.80	8.65	9.30

BASE QUANTITIES

Soft Bars, Bands, Hoops, Plates, Shapes, Floor Plates, Hot Rolled Sheets and SAE 1035-1050 Bars: Base, 400-1999 pounds, except 0-1999 pounds (hot rolled sheets only) in New York; 300-1999 pounds in Los Angeles; 400-39,999 (hoops, 0-299) in San Francisco; 300-4999 pounds in Portland, Seattle; 400-14,999 pounds in Twin Cities; 400-3999 pounds in Birmingham.

Cold Rolled Sheets: Base, 400-1499 pounds in Chicago, Cincinnati, Cleveland, Detroit, New York, Kansas City and St. Louis; 450-3749 in Boston; 500-1499 in Buffalo; 1000-1999 in Philadelphia, Baltimore; 300-4999 in San Francisco, Portland; any quantity in Twin Cities; 300-1999 in Los Angeles.

Galvanized Sheets: Base, 0-1499 pounds in New York, 150-1499 pounds in Cleveland, Milwaukee, Pittsburgh, Baltimore, Norfolk; 150-1049 in Los Angeles; 300-4999 in Portland, Seattle, San Francisco; 450-3749 in Boston; 500-1499 in Birmingham, Buffalo, Chicago, Cincinnati, Detroit, St. Louis, Tulsa; 1500 and over in Chattanooga, Philadelphia; any quantity in Twin Cities; 750-1500 in Kansas City; 150 and over in Memphis.

Cold Rolled Strip: No base quantity; extras apply on lots of all size.

Cold Finished Bars: Base, 1500 pounds and over on carbon, except 0-299 in San Francisco, 1000 and over in Portland, Seattle; 1000 pounds and over on alloy, except 0-4999 in San Francisco.

SAE Hot Rolled Alloy Bars: Base, 1000 or 2000 pounds and over, except 0-4999, San Francisco; 0-1999, Portland, Seattle.

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, Jan. 4

Export Prices f.o.b. Port of Dispatch—

Domestic Prices at Works or Furnace—

By Cable or Radio

Last Reported

	British gross tons		Continental Channel or North Sea ports, gross tons		Fdy. pig iron, St. 2.5.	Basic bess. pig iron.	Furnace coke	Billets	Standard rails	Merchant bars	Structural shapes	Plates, 1¼-in. or 5 mm.	Plates, 1¼-in. or 5 mm.	Sheets, black	Sheets, galv., corr., 24 ga. or 0.5 mm.	Plain wire	Hands and strips	French Francs	Belgian Francs	Reich Mark	
	U. K. ports	£ s d	Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d																	
Foundry, 2.50-3.00 Si.	\$23.64	6 0 0	\$30.89	3 12 6	\$21.28	5 8 0(a)	\$17.42	781	\$24.43	725	\$25.33	63	...	...	...	...	...	...	...	...	...
Basic bessemer	...	...	19.59	2 6 0	20.00	5 1 6(a)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hematite, Phos. 03-05	24.63	6 5 0	...	...	5.76	1 9 2	5.04	225	10.45	310	7.64	19	...	...	...	...	...	...	...	...	...
Billets	\$29.06	7 7 6	\$31.95	3 15 0	33.00	8 7 6	25.36	1,132	28.98	860	38.79	96.50	...	...	...	...	...	...	...	...	...
Wire rods, No. 5 gage	44.82	11 7 6	60.71	7 2 6	1.79c	10 3 0	1.41c	1,405	2.06c	1,375	2.38c	132	...	...	...	...	...	...	...	...	...
Standard rails	\$37.43	9 10 0	\$48.99	5 15 0	2.25c	12 16 0††	1.43c	1,434	1.88c	1,250	1.98c	110	...	...	...	...	...	...	...	...	...
Merchant bars	2.16c	12 5 0	2.97c	7 16 6	2.01c	11 8 0††	1.40c	1,395	1.88c	1,250	1.93c	107	...	...	...	...	...	...	...	...	...
Structural shapes	1.96c	11 2 6	2.92c	7 13 6	2.03c	11 10 6††	1.82c	1,815	2.21c	1,475	2.29c	127	...	...	...	...	...	...	...	...	...
Plates, 1¼ in. or 5 mm.	2.09c	11 17 6	3.75c	9 17 6	2.84c	16 2 6‡	2.15c	2,154‡	2.70c	1,800‡	2.59c	144‡	...	...	...	...	...	...	...	...	...
Sheets, black, 24 gage or 0.5 mm.	2.75c	15 12 6	3.75c	9 17 6°	3.28c	18 12 6	2.85c	2,850	4.58c	3,050	6.66c	370	...	...	...	...	...	...	...	...	...
Sheets, gal., 24 ga., corr.	3.19c	18 2 6	4.70c	12 7 6	3.17c	18 0 0	2.00c	2,000	3.00c	2,000	3.11c	173	...	...	...	...	...	...	...	...	...
Bands and strips	2.16c	12 5 0	2.81c	7 8 0	2.38c	13 11 0††	1.59c	1,588	2.18c	1,450	2.29c	127	...	...	...	...	...	...	...	...	...
Plain wire, base	3.13c	19 10 0	3.04c	8 0 0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Galvanized wire, base	4.09c	23 5 0	3.61c to 3.66c	9 10 0 to 9 12 6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Wire nails, base	...	...	3.52c	9 5 0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tin plate, box 108 lbs.	\$ 6.21	1 11 6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
British ferro-manganese	\$100.00	delivered	Atlantic seaboard duty-paid.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

†British ship-plates. Continental, bridge plates. ‡24 ga. †1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. °Close annealed. ††Rebate of 15s on certain conditions. **Gold pound sterling not quoted. ‡‡Last prices, no current quotations.

IRON AND STEEL SCRAP PRICES

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

HEAVY MELTING STEEL			Buffalo	10.00-10.50	Buffalo	17.50-18.00	Eastern Pa.	23.50-24.00
Birmingham, No. 1	16.50-17.00		Chicago	10.00-10.50	Chicago	16.25-16.75	St. Louis, 1 1/4-3 3/4"	18.50-19.00
Bos. dock No. 1 exp.	16.00-16.50		Cincinnati, dealers	6.50- 7.00	Cleveland	21.00-21.50	CAR WHEELS	
New Eng. del. No. 1	16.50		Cleveland, no alloy	11.00-11.50	Pittsburgh	22.00-22.50	Birmingham, iron	19.00-20.00
Buffalo, No. 1	17.00-17.50		Detroit	7.50- 8.00	St. Louis	16.00-16.50	Boston dist., iron	†14.50-15.00
Buffalo, No. 2	15.00-15.50		Eastern Pa.	12.00-12.50	Seattle	18.00-18.50	Buffalo, steel	21.50-22.00
Chicago, No. 1	16.00-16.50		Los Angeles	4.00- 5.00	FROGS, SWITCHES			
Chicago, auto. no alloy	15.00-15.50		New York	7.00- 7.25	Chicago	16.00-16.50	Chicago, iron	17.00-17.50
Chicago, No. 2 auto	13.00-13.50		Pittsburgh	12.50-13.00	St. Louis, cut	15.50-16.00	Chicago, rolled steel	18.00-18.50
Cincinnati dealers	14.00-14.50		St. Louis	7.00- 7.50	ARCH BARS, TRANSOMS			
Cleveland, No. 1	17.50-18.00		San Francisco	5.00	St. Louis	16.50-17.00	Cincin., iron, deal.	17.00-17.50
Cleveland, No. 2	16.50-17.00		Toronto, dealers	6.50	PIPE AND FLUES			
Detroit, No. 1	†13.00-13.50		Valleys	11.50-12.00	Chicago, net	11.00-11.50	Eastern Pa., iron	20.00-20.50
Detroit, No. 2	†12.00-12.50		SHOVELING TURNINGS				Eastern Pa., steel	23.00
Eastern Pa., No. 1	18.50		Buffalo	13.50-14.00	Chicago, net	11.00-11.50	Pittsburgh, iron	19.50-20.00
Eastern Pa., No. 2	17.00		Cleveland	12.00-12.50	Cincinnati, dealers	11.00-11.50	Pittsburgh, steel	23.00-23.50
Federal, Ill.	14.00-14.50		Chicago	10.00-10.50	RAILROAD GRATE BARS			
Granite City, R. R.	14.50-15.00		Chicago, spl., anal.	12.50-13.00	Buffalo	12.00-12.50	Chicago, No. 1 mach.	†15.00-15.25
Granite City, No. 2	13.75-14.25		Detroit	9.50-10.00	Chicago, net	10.50-11.00	N. Eng. del. No. 2	17.00-17.50
Los Angeles, No. 1	16.00-16.50		Pitts., alloy-free	14.00-14.50	Cincinnati, dealers	9.00- 9.50	N. Eng. del. textile	18.25-18.75
Los Angeles, No. 2	15.00-15.50		BORINGS AND TURNINGS				Eastern Pa.	15.00
L. A., No. 1 f.a.s.	18.50-19.50		<i>For Blast Furnace Use</i>				New York	†12.00-12.50
L. A., No. 2 f.a.s.	17.50-18.50		Boston district	†6.00- 6.25	St. Louis	11.50-12.00	St. Louis	15.00-15.50
N. Y. dock No. 1 exp.	14.50		Buffalo	11.00-11.50	RAILROAD WROUGHT			
Pitts., No. 1 (R. R.)	19.50-20.00		Cincinnati, dealers	5.00- 5.50	Birmingham	15.00	Chicago, auto net.	15.00-15.50
Pittsburgh, No. 1	17.50-18.50		Cleveland	11.50-12.00	Boston district	†9.50-10.00	Chicago, railroad net	14.50-15.00
Pittsburgh, No. 2	16.50-17.00		Eastern Pa.	11.50-12.00	Eastern Pa., No. 1	19.00-19.50	Chicago, mach. net.	15.00-15.50
St. Louis, R. R.	14.75-15.25		Detroit	7.50- 8.00	St. Louis No. 1	11.00-11.50	Cincin., mach. deal.	16.50-17.00
St. Louis, No. 2	13.75-14.25		New York	†7.00- 7.50	St. Louis, No. 2	14.00-14.50	Cleveland, mach.	20.00-21.00
San Francisco, No. 1	16.50-17.00		Pittsburgh	12.00-12.50	FORGE FLASHINGS			
San Francisco, No. 2	15.50-16.00		Toronto, dealers	6.00	Boston district	†11.25-11.50	Detroit, cupola, net.	†14.50-15.00
Seattle, No. 1	14.50-15.50		AXLE TURNINGS				Eastern Pa., cupola	20.50-21.00
Toronto, dlrs., No. 1	11.00		Buffalo	17.00-17.50	Buffalo	15.00-15.50	E. Pa., mixed yard.	15.50-16.00
Valleys, No. 1	18.00-18.50		Boston district	†9.50-10.00	Cleveland	16.50-17.00	Los Angeles	15.50-16.00
COMPRESSED SHEETS			Chicago, elec. fur.	16.00-16.50	Detroit	†12.50-13.00	Pittsburgh, cupola	18.50-19.00
Buffalo, new	15.00-15.50		East. Pa. elec. fur.	17.50-18.00	Pittsburgh	16.50-17.00	San Francisco	15.50-16.00
Chicago, factory	15.50-16.00		St. Louis	10.50-11.00	Seattle	16.00-16.50	St. Louis, breakable	14.00-14.50
Chicago, dealers	14.00-14.50		Toronto	6.00- 6.50	FORGE SCRAP			
Cincinnati, dealers	13.50-14.00		CAST IRON BORINGS				Boston district	†7.00
Cleveland	17.00-17.50		Birmingham	8.50	Chicago, heavy	19.00-19.50	LOW PHOSPHORUS	
Detroit	†13.75-14.25		Boston dist. chem.	†9.00- 9.25	Cleveland, crops	22.50-23.00	Cleveland, crops	22.50-23.00
E. Pa., new mat.	18.50		Buffalo	11.00-11.50	Eastern Pa., crops	24.00	Eastern Pa., crops	24.00
E. Pa., old mat.	14.50-15.00		Chicago	9.00- 9.50	Pitts., billet, bloom,		Pitts., slab crops	24.50-25.00
Los Angeles	13.50-14.00		Cincinnati, dealers	5.00- 5.50	LOW PHOS. PUNCHINGS			
Pittsburgh	17.50-18.50		Cleveland	11.50-12.00	Buffalo	20.00-20.50	Buffalo	20.00-20.50
St. Louis	11.50-12.00		Detroit	7.50- 8.00	Chicago	19.00-19.50	Chicago	19.00-19.50
San Francisco	13.50-14.00		E. Pa., chemical	14.50-15.00	Cleveland	19.00-19.50	Cleveland	19.00-19.50
Valleys	17.50-18.00		New York	7.00- 7.50	Eastern Pa.	23.00-24.00	Eastern Pa.	23.00-24.00
BUNDLED SHEETS			St. Louis	6.00- 6.50	Pittsburgh	22.50-23.00	Los Angeles, auto, net.	14.50
Buffalo, No. 1	15.00-15.50		Toronto, dealers	6.00	Seattle	15.00	New York break	†14.50-15.00
Buffalo, No. 2	13.00-13.50		RAILROAD SPECIALTIES				Pittsburgh, break	16.00-16.50
Cleveland	13.50-14.00		Chicago	18.25-18.75	ANGLE BARS—STEEL			
Pittsburgh	16.50-17.00		St. Louis	16.00-16.50	Chicago	18.50-19.00	Birmingham	11.00
St. Louis	10.00-10.50		ANGLE BARS—STEEL				Boston district	†12.50
Toronto, dealers	9.75		Chicago	18.50-19.00	St. Louis	16.00-16.50	Buffalo	13.50-14.00
SHEET CLIPPINGS, LOOSE			St. Louis	16.00-16.50	SPRINGS			
Chicago	10.50-11.00		Buffalo	22.00-22.50	Buffalo	22.00-22.50	Chicago, net	9.50-10.00
Cincinnati dealers	9.50-10.00		Chicago, coll	19.50-20.00	Chicago, coll	19.50-20.00	Cincinnati, dealers	9.00- 9.50
Detroit	9.50-10.00		Chicago, leaf	17.50-18.00	Chicago, leaf	17.50-18.00	Detroit, net	†9.00- 9.50
St. Louis	9.50-10.00		Eastern Pa.	24.00	Eastern Pa.	24.00	Eastern Pa.	15.00
Toronto, dealers	9.00		Pittsburgh	23.00-23.50	Pittsburgh	23.00-23.50	New York, fdy.	13.00
BUSHELING			St. Louis	16.50-17.00	STEEL CAR AXLES			
Birmingham, No. 1	14.00		STEEL RAILS, SHORT				Birmingham	19.00-20.00
Buffalo, No. 1	15.00-15.50		Birmingham	17.50-18.00	Boston district	†16.00-16.50	Boston district	†16.00-16.50
Chicago, No. 1	15.00-15.50		Buffalo	22.00-22.50	Chicago, net	19.50-20.00	Chicago, net	19.50-20.00
Cincin., No. 1, deal.	11.50-12.00		Chicago (3 ft.)	19.00-19.50	Eastern Pa.	23.00-23.50	Eastern Pa.	23.00-23.50
Cincinnati, No. 2	5.00- 5.50		Chicago (2 ft.)	19.50-20.00	St. Louis	20.00-20.50	St. Louis	20.00-20.50
Cleveland, No. 2	11.50-12.00		Cincinnati, dealers	20.50-21.00	LOCOMOTIVE TIRES			
Detroit, No. 1, new	†12.50-13.00		Detroit	†20.50-21.00	Chicago (cut)	19.00-19.50	Chicago (cut)	19.00-19.50
Valleys, new, No. 1	17.00-17.50		Pitts., 3 ft. and less	23.00-23.50	St. Louis, No. 1	16.50-17.00	St. Louis, No. 1	16.50-17.00
Toronto, dealers	5.00- 5.50		St. Louis, 2 ft. & less	19.75-20.25	SHAFTING			
MACHINE TURNINGS (Long)			STEEL RAILS, SCRAP				Boston district	†18.50-18.75
Birmingham	6.00		Birmingham	15.50	Boston district	†18.50-18.75	New York	†18.00-18.50
Ores			Foreign Ore					
Lake Superior Iron Ore			<i>(Prices nominal)</i>					
Gross ton, 51 1/2 %			Manganese Ore					
Lower Lake Ports			<i>Including war risk but not duty, cents per unit cargo ton</i>					
Old range bessemer	\$3.25		North African low phos.	14.00	Caucasian, 50-52%	48.00-50.00	So. African, 50-52%	48.00-50.00
Mesabi nonbessemer	4.95		Spanish, No. African basic, 50 to 60%	14.00	Indian, 49-50%	48.00	Brazilian, 48-52%	48.00
High phosphorus	4.85		Chinese wolframite, short ton unit, duty paid	\$23.75-24.00	Cuban, 50-51%, duty free	61.20	Molybdenum	
Mesabi bessemer	5.10		Scheelite, imp.	\$24.00-25.00			lb., Mo. cont., mines	\$0.75
Old range nonbessemer	5.10		Newfoundland fdy. 55%	7.00				
			Chrome ore, 48% gross ton, c.i.f.	\$25.00-26.00				

Ores	
Lake Superior Iron Ore	
Gross ton, 51 1/2 %	
Lower Lake Ports	
Old range bessemer	\$3.25
Mesabi nonbessemer	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbessemer	5.10

Eastern Local Ore	
<i>Cents, unit, del. E. Pa.</i>	
Foundry and basic	56-63%, contract. 9.00-10.00
Foreign Ore	
<i>(Prices nominal)</i>	
<i>Cents per unit, c.i.f. Atlantic</i>	
Manganiferous ore,	45-55% Fe., 6-10% Mn. 14.00-15.00

North African low phos.	14.00
Spanish, No. African basic, 50 to 60%	14.00
Chinese wolframite, short ton unit, duty paid	\$23.75-24.00
Scheelite, imp.	\$24.00-25.00
Newfoundland fdy. 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	\$25.00-26.00

Manganese Ore	
<i>Including war risk but not duty, cents per unit cargo ton</i>	
Caucasian, 50-52%	48.00-50.00
So. African, 50-52%	48.00-50.00
Indian, 49-50%	48.00
Brazilian, 48-52%	48.00
Cuban, 50-51%, duty free	61.20
Molybdenum	
lb., Mo. cont., mines	\$0.75

Sheets, Strip

Sheet & Strip Prices, Pages 58, 59

Pittsburgh—Sheet mills have regained the preholiday rate this week, and with new orders coming in operations are expected to pass the previous high next week. Current activity is estimated at about 82 per cent of capacity. New buying has appeared from a well diversified list of manufacturers and large inquiries are expected shortly from the automotive field. Requirements for galvanized material have been fair and the galvanized sheet rate, which dropped to 61 per cent last week because of the holiday, regained its former level. Mill stocks are low, although in most cases they are better than they were Dec. 1.

Chicago — Movement from both mill and warehouse continues good, although new buying from mills has been lighter because of the holidays and consumer inventory periods. Delivery requirements in some cases are easier because of recent heavy shipments. Better releases are expected this month because of high rate of automotive production chiefly. Tractor needs also will be high. First quarter buying is expected to be steady, permitting more consistent production schedules.

New York—Most sellers of hot and cold-rolled sheets can offer deliveries within four to five weeks, although they have good backlogs, which if consolidated would carry some producers for a couple of months at least. Galvanized sheet deliveries are available in about four weeks, on relatively larger tonnages than on either hot or cold-rolled. Long ternes are not as scarce as in late November and early December, but deliveries are difficult to obtain under six or seven weeks.

District sellers expect stovemakers and electric refrigerator manufacturers to supply the heaviest releases over the next few weeks. Stovemakers are expected to reach their peak in February and refrigerator manufacturers probably in early spring.

Narrow cold strip buying has not been resumed in volume and mills are cutting into backlogs moderately. Enough volume is on books, however, to warrant high production schedules during the greater part of first quarter. Shipments are well in excess of incoming business, and, while no tonnage is being held up, pressure for deliveries has eased materially.

Philadelphia — Hot-rolled sheets are generally available in four to five weeks and cold-finished in five to six weeks, although better de-

livery can be obtained in some instances. Auto body makers are most active consumers now.

Buffalo—Buying has eased, but mills report releases call for sufficient tonnage to keep output at capacity for a customary full five-day week. The steady flow of releases is believed to be indicative of low inventories. Tapering in orders is attributed to the substantial tonnage already on books for first quarter.

Cincinnati—Sheet mill schedules are close to capacity to meet demands for deliveries, including seasonally good specifications from automobile manufacturers. Backlogs are substantial and assure high operations through February. Buying slackened during the holidays and is slow in recuperating.

Birmingham, Ala.—Sheet production remains above 90 per cent and with little decrease in current bookings, although the pressure evident a few weeks ago has eased considerably.

Toronto, Ont.—While there has been a falling off in spot sales orders are appearing for delivery late this quarter. Producers, however, are booked heavily to the end of March, although not all consumptive demands have been covered. Placing of war contracts is expected to stimulate demand. While there has been some discussion of price revisions, no definite action has been taken for first quarter although producers are taking orders at prices prevailing at time of delivery.

Plates

Plate Prices, Page 58

Chicago — Petroleum industry is furnishing fabricators with considerable tank and vessel work, leading interests indicate. Present freight car programs are prominent users. An uptrend is evident in public projects involving plates and near-future demands are expected to be heavier.

Boston—Plate demand is dull and buying is confined mostly to less than car lots, with 2.10c applying on most business. Most specifications are for shipbuilding with some improvement in railroad demand expected shortly. Structural and boiler shop requirements are slack. Miscellaneous industrial demand lags and little specified work is in sight, including tanks.

New York — Plate sellers have fairly large backlogs, deemed sufficient to maintain operations until new demand gets under way. Speci-

fications from carbuilders and shipyards are expected soon, against contracts already on books. Tank shops and other miscellaneous consumers probably will increase releases soon, after holding back for some time because of inventory.

Philadelphia—Mill shipments of plates exceed incoming orders and deliveries are easing, most district mills being able to ship within a week to ten days. Some Pittsburgh mills are able to work in small lots for delivery in two to three weeks. Platemakers still have fairly good backlogs. Ship releases may prove disappointing as yards in this district may not be able to clear their ways sufficiently this quarter to undertake much of the new work on order. Ship work outlook for the year is promising. The maritime commission is expected to issue plans about Jan. 15 for passenger liners for the Pacific trade, the exact number not being indicated. Bids are expected to be opened in March or April.

Birmingham, Ala.—Although current bookings of plates have slowed somewhat, considerable tonnage remains and there is a satisfactory volume on books.

Seattle—Local shops have practically no backlog and anticipate little interest for some time. Prospects are fair for the usual run of boiler, tank and stack jobs, involving small tonnages.

San Francisco — Interest in the plate market centers around the outcome of bids just opened by Los Angeles for 12,000 tons for a 36 to 78-inch welded steel pipe line for the San Fernando valley distributing system. Bids on an additional 6000 tons are expected to be called for early in February for replacement work on the Los Angeles aqueduct. The material, however, will not be needed for placement until September. Awards for 1939 totaled 92,339 tons, compared with 55,861 tons for 1938 and considerably below the average for the past sixteen years of slightly over 185,000 tons yearly.

Plate Contracts Placed

- 3680 tons, dam structure and liner plates, Denison, Tex., to Chicago Bridge & Iron Co., Chicago.
- 240 tons, 1,000,000-gallon underground tank, Jamaica Water Supply Co., St. Albans, Long Island, N. Y., to Chicago Bridge & Iron Co., Chicago.

Plate Contracts Pending

- 6000 tons, replacement work on Los Angeles River aqueduct, Los Angeles; bids about Feb. 10.
- 350 tons, 24-inch water pipe for Bremer-ton, Wash.; Beall Pipe & Tank Co., Portland, low.
- Unstated tonnage, two or four all-welded steel barges, 93 x 36 x 10.5 feet,

Panama, Equitable Equipment Co., New Orleans, low, bids Dec. 20, pro. 3773.

Unstated tonnage, all-welded conveyor barge for removing water hyacinths, United States engineer, first district, New Orleans, Liberty Welding & Iron Works, New Orleans, low, \$14,500, pro. 141.

Unstated tonnage, one to three steel motor tugs, Panama, Berkeley Steel Construction Co., Berkeley, Calif., low, bids Dec. 14.

Bars

Bar Prices, Page 58

Chicago — Shipments have been heavy recently. Smaller sizes of bars are moving particularly well. At least one large mill finds bars the most prominent item of present demand. Automotive, tractor and farm implement needs remain high. Freight car needs also are prominent because of present building programs.

Boston—Demand for alloy steel bars and cold-drawn stock is maintained at a brisk rate. Hot-rolled carbon bar buying, which declined during inventory period, is being resumed, warehouses balancing stocks in most instances. Deliveries are slightly improved, although little progress is being made toward reducing time on some grades and sizes of alloys. For chain-making, Boston navy yard, six bidders, all quoted \$32,764.30, delivered, on 342 tons of nickel steel bars.

New York—While specifications are light, bar sellers attribute this to continued inventory taking, which will probably extend in many cases for another week. They anticipate better buying over the last half of the month and regard prospects for the quarter as a whole as promising.

Most sellers of hot-rolled carbon bars have substantial backlogs and are unable to work in little for delivery under four or five weeks. Sellers of hot alloy and cold-drawn bars are in somewhat tighter position.

Philadelphia—Bars are in most active demand among heavy steel products. Deliveries in carbon bars run five to six weeks and on alloy bars several weeks longer. On heat-treated alloy bars it appears little can be done under three months.

Birmingham, Ala.—Largely because of orders from manufacturers of agricultural implements, and consistent demand for concrete reinforcing, bar production holds exceptionally well. Output is better than 85 per cent.

Buffalo — Unfilled orders are sufficient to maintain near-capacity op-

erations for most of the current quarter, but producers report order backlogs have been cut in recent weeks. Diversified industrial lines absorb most of current production, but increased motor buying is looked for soon.

Toronto, Ont.—Sales showed some decline during the holidays, but inquiries indicate immediate improvement. Mills report inquiries and booking fairly heavy to the end of February. Carryover from last quarter is having effect on immediate demands as many consumers still are well stocked with materials purchased immediately after war was announced.

Pipe

Pipe Prices, Page 59

Pittsburgh — Pipe tonnage backlogs are in good shape. New buying is expected shortly from construction sources and some railroad suppliers. Currently pipe mill operations are near capacity. Oil country tonnage is light and estimates for the year are somewhat pessimistic.

Boston—Early improvement in cast pipe demand for spring laying is expected. Current buying, which is light, includes 150 tons of small sizes by the procurement division, Boston. Due in part to heavy releases against blanket contracts last year and growing economies in municipal expenditures, aggregate tonnage will probably be under that of 1939. Merchant steel pipe demand is slow and spotty with resale prices in some sections mixed. Considerable corrugated galvanized metal pipe is going into Vermont highway work.

Birmingham, Ala.—Pipe production is steady at four to five days a week. Bookings are not large individually and are widely scattered.

Seattle—Only cast iron pipe project pending is for 256 tons of 4 to 10-inch for the Tongue Point, Oreg., naval air base. Public works departments are in the market for various tonnages of steel pipe. United States engineer, Portland, Oreg., received bids Jan. 2 for an unstated tonnage of black steel pipe and accessories. United States engineer, Bonneville, Oreg., opened bids Dec. 29 for 322 stanchions and 4700 feet of steel pipe. Bonneville authority opened tenders Jan. 5 for 1300 feet of black steel pipe for Ampere station. Barnett Fuel & Oil Co., Denver, is low to reclamation bureau for pipe, fittings and valves for the Coulee project.

Steel Pipe Placed

5000 tons, 18-inch pipe piling, Queens approach, Midtown tunnel, New York, through Petracea & Banko, contractors, Queens, to National Tube Co., Pittsburgh.

Unstated tonnage, 500 shore discharge pipes, 16-foot 8-inch lengths of 3/16 and 1/4-inch plates, United States engineer, Philadelphia, to Lancaster Iron Works, Lancaster, Pa., pro. 205, bids Dec. 28.

Unstated tonnage, 175 pieces, steel shore pipe, U. S. engineer, Savannah, Ga., to Gaynon Iron Works, Jacksonville, Fla., \$4,656.75, bids Dec. 26, pro. 90.

Unstated tonnage, 238,620 feet galvanized welded steel pipe, Panama, to Albert & Davidson Pipe Corp., Brooklyn, \$44,534.01, pro. 3751.

Cast Pipe Placed

825 tons, small sizes, 21,500 feet, Panama, to United States Pipe & Foundry Co., Burlington, N. J., \$42,785, pro. 3748.

265 tons, various sizes, Panama, to Lynchburg Foundry Co., Lynchburg, Va., \$13,870.56, bids Dec. 6.

150 tons, 8-inch. Revere, Mass., to Warren Foundry & Pipe Co., Everett, Mass.

Wire

Wire Prices, Page 59

Chicago—Demand was quiet last week, but prospects are cited as definitely good, as a number of consumers have indicated additional placements for first quarter needs. A consistent rate of demand is expected throughout this quarter. Not all major consumers are completely covered for first quarter needs.

Boston—Although buying is light, wire mills have substantial backlogs for high production during most of first quarter. Deliveries are improving on manufacturers' wire. Backlogs are well diversified as to products, including specialties, some of which require up to five weeks or more for mill processing. The tight situation in wire rods supplies has been relieved somewhat.

New York—Wire buying is slowly mounting. In spots consumer inventories were apparently higher than expected, but on the other hand some users are still taking less than car lot shipments against orders to secure enough stock to operate. Current production is well in excess of incoming business. Mills are gaining on the delivery situation which has been most acute in manufacturers' wire. At least one eastern producer did a heavier volume in specialties last year than in 1937.

Birmingham, Ala.—All wire products are in especially good demand, and first quarter promises to be one of the most active of recent years. Bookings are steady and fairly evenly divided among the various specifications.

Rails, Cars

Track Material Prices, Page 59

Rail buying this year has been started by allocation of 50,000 tons by the Pennsylvania, 25,000 tons to Carnegie-Illinois Steel Corp., 22,000 tons of Bethlehem Steel Co., and 3000 tons to Inland Steel Co. This is in addition to 50,000 tons ordered by this road in September.

Delaware & Hudson has placed 20 locomotives with American Locomotive Co., New York.

Rail Orders Placed

Pennsylvania, 50,000 tons; 25,000 tons to Carnegie-Illinois Steel Corp., Pittsburgh, 22,000 tons to Bethlehem Steel Co., Bethlehem, Pa., 3000 tons to Inland Steel Co., Chicago.

Locomotives Placed

Canadian Pacific, five 4-6-4-type locomotives, to Montreal Locomotive Works Ltd., Montreal, Que.

Delaware & Hudson, 20 locomotives, to American Locomotive Co., New York.

Car Orders Placed

Pullman Co., 100 lightweight sleeping cars for use on the Pennsylvania and the New York Central, to Pullman-Standard Car Mfg. Co., Chicago.

Car Orders Pending

Norfolk & Western, 100 fifty-foot six-inch auto box cars, 50 equipped with automatic loaders.

Oliver Iron Mining Co., Duluth, thirty-three 75-ton air-dump cars.

Tennessee Coal, Iron & Railroad Co., sixteen 70-ton dump cars.

War department, chief of engineers, Washington, twenty-four 40-ton box and six 40-ton flat cars; bids Jan. 11.

Shapes

Structural Shape Prices, Page 58

Pittsburgh—Construction work is largely for industrial expansion, and inquiries and placements are relatively heavy considering the season. Structural mills expect a tighter situation next month when heavier operations on rail mills are scheduled, which will divert some semi-finished from structural to rail mills.

New York—Except for a moderate increase in bridge inquiry, structural steel volume being estimated is light with indications lettings during the first weeks of the year will trail 1939. Small industrial plant expansions are coming out more actively and are expected to gain momentum as the quarter progresses.

Boston—Structural steel contracts are few and most buying is in lots under 100 tons, a Boston housing project being an exception. Pend-

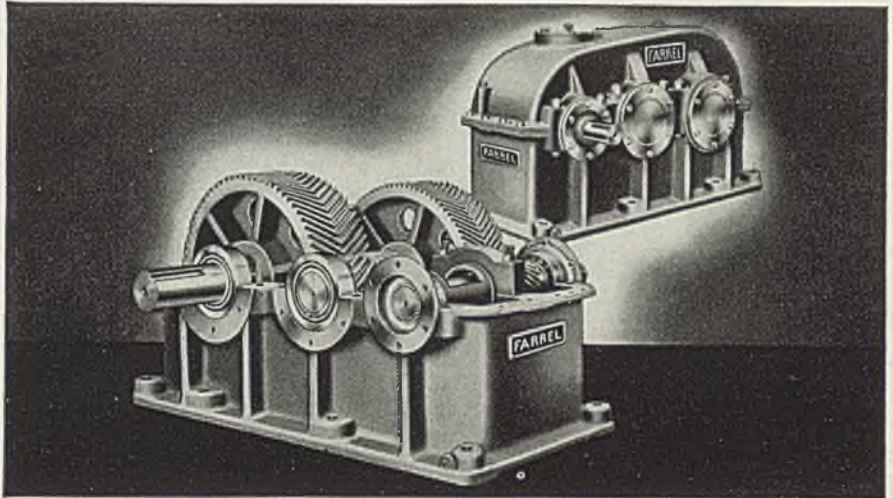
ing work is light and active bridge needs are estimated at around 800 tons, small stringer and I-beam spans for Massachusetts and Vermont. These require little shop work. Plain material prices are steady but quotations on fabricated material continue weak and irregular on the small volume of business available.

Seattle—Important projects are scheduled for early letting, the largest units being for navy air bases at Sitka and Kodiak, Alaska. Columbia Steel Co. has the award for the material and local shops

will probably receive fabrication contracts. The Seattle naval armory and Washington state Kettle river bridge are to be up for figures within a short time.

Philadelphia—Structural activity is seasonally quiet and the past week almost devoid of lettings. Shape deliveries are improving, shipments being possible in about two weeks.

San Francisco—While structural lettings were not large over 49,000 tons are now pending and the outlook for the coming year is encouraging. Awards totaled 904 tons and



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brought the aggregate for 1939 to 178,863 tons, compared with 196,524 tons for the same period in 1938. A noticeable increase is noted over the average for the past sixteen years of 155,000 tons.

Birmingham, Ala.—Shapes continue to lag somewhat behind other major products. Some slight improvement is evident over recent weeks, and output is estimated at somewhat better than 50 per cent.

Shape Contracts Placed

- 1500 tons, state hospital building, Kings Park, N. Y., to Lehigh Structural Steel Co., Allentown, Pa.
- 875 tons, gate tracks, supports, liner plates and accessories, Panama, to Treadwell Construction Co., Midland, Pa., \$320,000, bids Dec. 4.
- 850 tons, state bridge over Cheyenne river, Wasta, S. Dak., to Pittsburgh-Des Moines Steel Co., Pittsburgh.
- 600 tons, industrial laboratory unit, Albany, Calif., for United States government, to Bethlehem Steel Co., Bethlehem, Pa.
- 550 tons, state bridge, Spaulding, Ill., to Illinois Steel Bridge Co., Jacksonville, Ill.
- 454 tons, Sangamon river bridge, Illinois, to Bethlehem Steel Co., Bethlehem, Pa.
- 450 tons, Oregon state viaduct, Tillamook county, to Poole & McGonigle, Portland, Oreg., McNutt Bros., Eugene, Oreg., general contractor.
- 430 tons, bridge FAGM 816A, Jackson county, Missouri, to Kansas City Structural Steel Co., Kansas City, Kans.
- 400 tons, warehouse, Sacramento, Calif., to Palm Iron Works.
- 375 tons, industrial alcohol building, Peoria, Ill., to Joseph T. Ryerson & Son, Inc., Chicago.
- 360 tons, shop building, Kearney & Trecker Corp., Milwaukee, to Worden Allen Co., Milwaukee.
- 340 tons, grandstand roof, for Queens County Jockey club, Long Island, N. Y., to Belmont Iron Works, Eddystone, Pa.
- 330 tons, addition to building, for Hills Bros. Coffee Inc., Edgewater, N. J., to Bethlehem Fabricators, Bethlehem, Pa.
- 330 tons, store building, S. S. Kresge Co., Bay City, Mich., to Whitehead & Kales Co., Detroit.
- 300 tons, grandstand addition Aqueduct race track, New York, to Belmont Iron Works, Eddystone, Pa.; Kenney & Finerty Inc., New York, contractor.
- 295 tons, highway bridge, Shawnee county, Kansas, to George C. Christopher & Son Iron Works, Wichita, Kans.
- 260 tons, for Cincinnati Chemical Co. building, Cincinnati, O., to Bethlehem Steel Co., Bethlehem, Pa., through J. & F. Harig Co., Cincinnati, general contractor.
- 252 tons, highway bridge, Hondo, Tex., to Peden Steel Co., Raleigh, N. C.
- 240 tons, pier shed, Oxnard, Calif., to Pacific Iron & Steel Co., Los Angeles.
- 230 tons, highway bridge, Brown county, Ohio, to Fort Pitt Bridge Works, Pittsburgh.
- 205 tons, bridge FAGM 16-A (3), Kimball, Neb., to American Bridge Co., Pittsburgh.
- 200 tons, dunnage for bomb storage magazines, Arsenal, Utah, for United States government, to Denver Steel & Iron Works, Denver.
- 195 tons, overpass, three-span steel-beam

- and concrete bridge, Pennsylvania-Reading Seashore Lines at Tilton road, Galloway Township, Atlantic county, New Jersey, to Bethlehem Steel Co., Bethlehem, Pa.; Cayuga Construction Co., New York, contractor, \$116,413.99, bids Dec. 22, Trenton, N. J.
- 193 tons, bridge, Lake Fork creek, Illinois, to A. F. Anderson Iron Works, Chicago.
- 180 tons, state bridge, Monticello, Ill., to Bethlehem Steel Co., Bethlehem, Pa.
- 180 tons, factory building, for Wire Mold Co., Elmwood, Conn., to Berlin Construction Co., Berlin, Conn.
- 170 tons, case structure, for Sun Oil Co., Marcus Hook, Pa., F. M. Weaver Co., Lansdale, Pa.
- 170 tons, tin plant, for Phelps Dodge Corp., Laurel Hill, N. Y., to unstated fabricator.
- 167 tons, bridge, Du Page river, Illinois, to Bethlehem Steel Co., Bethlehem, Pa.
- 165 tons, bridge, contract 1873, Grabill, Ind., to Midland Structural Steel Co., Cicero, Ill.
- 160 tons, state bridge, King county, Washington, to Isaacson Iron Works, Seattle; M. P. Munter, Seattle, general contractor.
- 145 tons, shop building, Chicago & North Western railroad, Council Bluffs, Ia., to Gate City Iron Works, Omaha.
- 140 tons, bridge FAGM 730A (1) Jackson county, Missouri, to Builders Steel Co., North Kansas City, Mo.
- 130 tons, building No. 33, for Heyden Chemical Corp., Garfield, N. J., to F. M. Weaver Co., Lansdale, Pa.
- 100 tons, plant extension for Paramount Textile Machinery Co., Kankakee, Ill., to Bethlehem Steel Co., Bethlehem, Pa.
- 100 tons, grade crossing elimination, Quogue-Riverhead highway, Suffolk county, New York, to American Bridge Co., Pittsburgh; Gifford Construction Co., Jamaica, New York, contractor.

Shape Contracts Pending

- 11,853 tons, sheet piling, H columns and shapes, two drydocks, Pearl Harbor, specification 9100, general contract to Hawaiian Dredging Co. Ltd. and Pacific Bridge Co., 333 Kearney street, San Francisco.
- 6300 tons, sheet piling and bearing piles, Sepulveda dam, Los Angeles; Jahn-Bressi-Bevanda, J. A. Dowling and David G. Gordon, 208 West Eighth street, Los Angeles, low on general contract at \$3,121,267.
- 2000 tons, grade crossing eliminations, Pennsylvania and Erie railroads, Dunkirk, N. Y.; bids Jan. 25.
- 1800 tons, manufacturing building, for Cincinnati Milling Machine Co., Cincinnati.

Shape Awards Compared

	Tons
Week ended Jan. 6	12,021
Week ended Dec. 30	14,777
Week ended Dec. 23	23,268
This week, 1939	42,858
Weekly average, year, 1940	12,021
Weekly average, 1939	22,411
Weekly average, December	18,393
Total, to date, 1939	42,858
Total, to date, 1940	12,021
Includes awards of 100 tons or more.	

- 1665 tons, sheet piling, improvement Los Angeles river project, between Downing road and Atlantic boulevard, Los Angeles, for United States engineer office; bids about Feb. 10.
- 1600 tons, state bridges over Meramec river and Butler lake, St. Louis county, Missouri.
- 1260 tons, bridge over Eel River, Humboldt county, California, for state; bids Jan 20.
- 900 tons, naval ammunition buildings, Hawthorne, Nev.; general contract to Wm. P. Nell Co. Ltd., 4818 Loma Vista avenue, Los Angeles at \$1,132,500.
- 900 tons, trash racks, specification 891, for Marshall Ford dam, Rutledge, Tex., for bureau of reclamation.
- 850 tons, track elevation, North Western railroad and North Shore line tracks, Winnetka, Ill., bids Jan. 9.
- 800 tons, sewage disposal plant, Coney Island, New York; Stock Construction Co., New York, low, bids Jan. 4.
- 707 tons, including 187 tons of sheet piling, Smith river bridge, Del Norte county, California, for the state; bids opened.
- 700 tons, shipping and warehouse building No. 79-C, for Aluminum Co. of America, Massena, N. Y.
- 645 tons, state bridge, Stonington, Conn.
- 562 tons, industrial laboratory and auditorium, department of agriculture, Albany, Calif.; general contract to Moore & Robertson, 693 Mission street, San Francisco, at \$338,900.
- 550 tons, building, for Ford Instrument Co., Long Island City, N. Y.
- 400 tons, grade crossing elimination, Irving, N. Y.; Peter J. Knickenberg, Buffalo, low.
- 270 tons, steel sheet piling for Puget Sound navy yard; A. W. Quist, Seattle, general contractor.
- 250 tons, hangar and office building, for United Air Lines Transport Corp., Portland, Oreg.
- 250 tons, shop and laboratory building, Fort Monmouth, N. J.; bids in.
- 236 tons, underpass, Polhemus street, San Jose, Santa Clara county, Calif., for state; bids Jan. 17.
- 210 tons, Panama, pro. 3816, bids Jan. 9.
- 200 tons, extension to melting building No. 210, for Aluminum Co. of America, Arnold, Pa.
- 200 tons or more, twelve intake gates for Bonneville powerhouse; bids to United States engineer, Bonneville, Oreg., Jan. 23.
- 175 tons, alterations to exposition building, World's fair, Flushing, N. Y., for Ford Motor Co.
- 150 tons, building, for Northeastern Theatres Inc., Philadelphia.
- 110 tons, betting ring and pavilion, for Saratoga Racing association, Saratoga Springs, N. Y.
- Unstated, Oregon state bridge, Klamath county; bids at Portland, Oreg., Jan. 11.
- Unstated, two power substations for Tacoma, Wash.; bids Jan. 15.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 59

Pittsburgh — Producers report business on preholiday levels, with backlogs fair and operations expected to hold through first quarter at current levels. Some new inquiry is noted, with the automotive field

interested and heavy railroad buying promised for this month and next.

New York—Automotive specifications for bolts and nuts are expected to continue heavy but demand from jobbers and railroads is likely to be slow. Shipyard releases are expected to be no more than sustained for the next few weeks, but to be heavier toward the end of the quarter.

Reinforcing

Reinforcing Bar Prices, Page 59

Pittsburgh—Reinforcing bar contracts are few and new inquiries light. Seasonal factors have cut down on new work in many sections, and delivery difficulties are holding up many placements. Unplaced tonnage now on the market represents a fairly good volume, but because of the jam at the bar mills, there is little possibility that much of this will be placed immediately. Prices are reported firm in all sections.

Chicago—Outlook is improved because of several substantial new projects. Bids are being taken Jan. 12 on re-figuring of the city filtration plant, west substructure, in which 7500 tons are involved. Prices are reported steady.

Boston—Reinforcing bar buying lags and small-lot transactions account for current volume. Except for housing projects, taking several thousand tons, pending needs are small. Highway programs in the New England states are uncertain and little tonnage has appeared for such construction. Deliveries against contracts, which have been slow, are improved.

New York—Award of 4750 tons for the army flying base, Porto Rico, through the quartermaster's depot, Brooklyn, is the outstanding reinforcing steel award. Inquiry is slightly heavier, notably for highways and bridges. Contracts closed

are slightly more numerous. New mesh requirements for road work are again increasing.

Philadelphia—Except for miscellaneous state work in Pennsylvania and New Jersey there is little activity in reinforcing material. Improvement is expected before the end of February.

Seattle—Demand is slow but new projects are expected soon. Rolling mills still have backlogs. Bethlehem Steel Co., Seattle, continues operations at about 70 per cent. No important tonnages are pending.

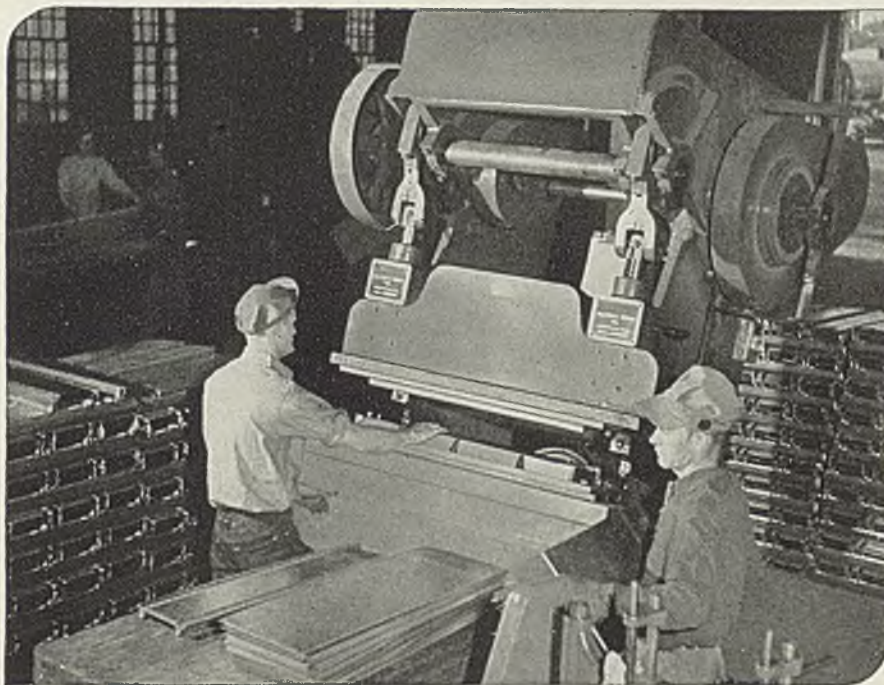
San Francisco—Awards aggregat-

ed 6707 tons and brought the total for 1939 to 170,263 tons as compared with 166,104 tons for the corresponding period in 1938. This was the second largest yearly total on record and was exceeded only in 1936, when 243,205 tons were booked and exceeds the average for the past sixteen years of 98,125 tons by over 72,000 tons, indicative of a healthy increase in the production of bars in the eleven western states.

Reinforcing Steel Awards

4750 tons, army flying base, Porto Rico, bids Dec. 21, quartermaster depot,

HAVE YOU TRIED ZINCGRIP?



ARMCO ZINCGRIP takes this severe stamping job in stride. There's no flaking or peeling of the zinc on these door slats for grain bins.

• If you use galvanized metal in your products here's a sales-boosting cost-saving tip for the new year: ARMCO ZINCGRIP sheets or coils.

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your inventory of stock sizes and cut down scrap losses. You have a choice of three base metals: open-hearth steel, copper-bearing steel or extra-durable ARMCO Ingot Iron.

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Concrete Bars Compared

	Tons
Week ended Jan. 6.....	12,149
Week ended Dec. 30.....	4,780
Week ended Dec. 23.....	6,896
This week, 1939.....	1,060
Weekly average, year, 1940...	12,149
Weekly average, 1939.....	9,197
Weekly average, December....	4,600
Total to date, 1939.....	1,060
Total to date, 1940.....	12,149

Includes awards of 100 tons or more.

ARMCO



ZINCGRIP SHEETS

GIVE FULL PROTECTION

Brooklyn, to Bethlehem Steel Co., Bethlehem, Pa.

3100 tons, filtration plant, Los Angeles, to Soule Steel Co., Los Angeles.

700 tons, Panama Canal, schedule 3775, to Republic Steel Corp., Cleveland.

600 tons, grain elevator, Enid, Okla., to Sheffield Steel Corp., Kansas City, Mo.

533 tons, Washington street bridge, San Diego, Calif., to Soule Steel Co., Los Angeles.

399 tons, Mono Craters tunnel and Grant Lake reservoir, Los Angeles, bids rejected and work to be done by force account and steel placed with unstated interests.

245 tons, second section, Piney Branch relief sewer, Washington, to Bethlehem Steel Co., Bethlehem, Pa.; Leo Butler Co., Silver Springs, Md., contractor.

240 tons, bars, highway project RC-4091, West Point, Cornwall, N. Y., to Truscon Steel Co., Youngstown, O.; Lane Construction Co., Meriden, Conn., contractor, \$757,050.25, bids Dec. 28, Albany.

200 tons, bars and mesh, highway project, New Haven, Conn., to Truscon Steel Co., Youngstown, O.; D. V. Frione & Co., New Haven, contractor.

185 tons, viaduct, Shasta county, California, for state, to Gilmore Fabricators Inc., San Francisco.

178 tons, ventilating building, Tuscarora mountain tunnel, Huntingdon county, Pennsylvania, to Truscon Steel Co., Youngstown, O.; Boyd H. Kilne, contractor.

150 tons, bars, state highway project RC-4085, New York, letting of Nov. 15, to Truscon Steel Co., Youngstown, O.; Lane Construction Co., Meriden, Conn., contractor.

140 tons, housing project, Hartford, Conn., to Ceco Steel Products Co., New York; Chain Construction Co., New York, contractor.

140 tons, grandstand addition, Aqueduct race track, New York, to Carroll-McCreary & Co., Brooklyn; Kenny & Flerty Inc., New York, contractor.

132 tons, state highway R-4090, Dutchess county, New York, to Truscon Steel Co., Youngstown, O.; John Arborio, contractor.

120 tons, mesh, Washington street bridge, San Diego, Calif., to Soule Steel Co., Los Angeles.

120 tons, for city of East Cleveland, O., to Patterson-Leitch Co., Cleveland; bids Dec. 18.

115 tons, for city of Cleveland, to Builders Structural Steel Co., Cleveland; bids Dec. 22.

102 tons, seaplane ramps, naval air base, Alameda, Calif., to Gilmore Fabricators, Inc., San Francisco.

Unstated, St. Vincent hospital, Portland, Ore., to unstated Portland house; Ross B. Hammond, Portland, general contractor.

Unstated, Oregon state arch bridge, Lincoln county, to unstated Portland house; Odum Construction Co., Portland, general contractor.

Reinforcing Steel Pending

7500 tons, west substructure, city filtration plant, Chicago, re-bidding Jan. 12.

3275 tons, Sepulveda dam, United States engineer's office, Los Angeles; Jahn-Bressi-Bevanda, J. A. Dowling and David G. Gordon, 208 West Eighth street, Los Angeles, low on general contract at \$3,121,267.

2096 tons, two dry docks, Pearl Harbor, Hawaii, specification 9100; general con-

tract to Hawaiian Dredging Co. Ltd. and Pacific Bridge Co., 333 Kearney street, San Francisco.

1400 tons, Sunnydale housing project, San Francisco; general contract to Barrett & Hilp, San Francisco at \$2,079,352.

1000 tons, buildings for Consolidated Aircraft Corp., San Diego; bids to be taken at once.

878 tons, including 150 tons of mesh, naval ammunition buildings, Hawthorne, Nev.; general contract to Wm. P. Nell Co., Ltd., 4818 Loma Vista avenue, Los Angeles at \$1,132,500.

870 tons, bridge, Cook county, Illinois, bids Jan. 17; two other bridges bidding same date, tonnage unstated.

713 tons, sewage disposal plant, Coney Island, New York; Stock Construction Co., New York, low, bids in.

635 tons, bridge near Redding, Shasta county, California, for state; general contract to United Concrete Pipe Corp., Box 1, station H, Los Angeles, at \$673,046.

625 tons, improvement Los Angeles river, between Downing road and Atlantic boulevard, Los Angeles; bids about Feb. 10.

520 tons, Eel river bridge, Humboldt county, California, for state; bids Jan. 24.

305 tons, Campbell Village housing project, Oakland, Calif.; general contract to K. E. Parker, 135 South Park, San Francisco, at \$381,970.

260 tons, Fox Creek sewer and seawall, Detroit.

230 tons, industrial laboratory and auditorium, department of agriculture, Albany, Calif., general contract to Moore & Roberts, 693 Mission street, San Francisco, at \$338,900.

215 tons, tie plates for Alaska Railroad; bids in at Seattle.

214 tons, bridge over Arroyo Seco at Parkway and Channel streets, Los Angeles; bids rejected and new bids just opened.

200 tons, plant, Seaman Building Co., Milwaukee.

170 tons, state bridge, Ottawa street, Toledo, O.; bids in.

130 tons, quay project Puget Sound navy yard, Washington state; A. W. Quist, Seattle, general contractor.

117 tons, gymnasium, Northwestern university, Evanston, Ill.

115 tons, state highway bridge, Stonington, Conn.; also 100 tons, steel sheet piling.

425 tons, housing project, Holyoke, Mass. Holyoke, Mass.

100 tons, Washington state projects, King county, and Buckley custodial school; Western Construction Co. and Brady Construction Co., Seattle, general contractors.

100 tons, hospital, Lincoln, Ill.

Unstated tonnage, headquarters and administration building, United States army air corps station, Chanute Field, Rantoul, Ill.

Tin Plate

Tin Plate Prices, Page 58

Pittsburgh—Tin plate operations have changed little from the level of the preholiday week. Hot mill operations are less in the district, with some units producing before the holidays now down indefinitely. New buying in heavy volume is not expected until about Feb. 1. Currently

the operating rate is about 80 per cent, which represents almost total capacity on the units still active.

Pig Iron

Pig Iron Prices, Page 60

Pittsburgh—New buying is light. Principal users are still covered and producers report little tonnage available at any price. December tonnage varied only slightly from the November high. January figures are expected to remain constant. No increase in stocks by producers is reported, and users state inventories are adequate but not too large.

Chicago—First quarter has started quietly but heavier shipping orders are expected this week. Sellers report shipments this month comparable with December and expect a good first quarter.

Boston—Considerable coverage against first quarter requirements remains to be done by New England foundries, buying having slackened materially. Shipments, however, are well maintained and releases are frequent. Foundry melt is recovering from the year-end drop and except in a few instances stocks of pig iron held by melters are not large on the basis of current consumption.

New York—Pig iron sellers anticipate improvement in specifications within another week, as inventory season comes to a close. They expect the principal early specifications to come from machine tool builders or jobbing foundries engaged in machine tool work. Little new buying will develop before the middle of next month, most sellers declare, because of the tonnage under contract, including a fairly substantial amount of iron placed late last summer before the \$2 price advance. Export demand is featureless.

Philadelphia—Pig iron specifications are improving, although practically all are against contracts, many of which were placed before the \$2 advance early last fall. Melters are sufficiently covered to delay general buying until March. Some large consumers are covered beyond first quarter on the basis of present operations.

Cincinnati—Pig iron shipments were so well sustained during the holidays that furnace interests expect heavy movement at least through January. Specifications already show recovery from the modest tapering at the year-end. Many foundries are back on heavy schedules but a few are planning brief

shutdowns this month for inventory.

Buying, blocked off by adequate contracts, may be resumed earlier than expected, tonnage on order being absorbed rapidly by the heavy melt.

Buffalo—Pig iron producers report releases in favorable volume. Decline in buying is the result of heavy orders already on books. Jobbing and malleable foundries report fair backlogs. Boilermakers and radiator manufacturers, experiencing seasonal lulls, are exceptions to active melting elsewhere.

Birmingham, Ala.—All blast furnaces are active and prospects for the year are excellent, according to merchant melters. Shipping instructions are holding up well.

Toronto, Ont.—Sales have been quiet during the past week or ten days, due to heavy booking in fourth quarter, which greatly exceeded consumptive demand. Some booking is reported for this quarter, but so far there has been no rush to cover.

grades are unchanged at recently established levels. Domestic buying is light with some heavy melting steel, No. 1 grade, moving around \$16 delivered in this district with selected material slightly higher. Export buying against old orders has declined to a low point due to the lack of ships with some accumulation of scrap awaiting vessels, one being expected at Boston this week.

Philadelphia—Scrap prices have eased on several grades recently, although the current undertone is

firmer and some interests believe the bottom has been reached for the present, particularly with steelmaking operations again moving upward and a stronger market at other centers.

Seattle — Prompt steamer space for Japan is in strong demand as exporting houses, with orders in hand, are rushing to get all commitments afloat by Jan. 26 when the trade treaty expires. No forward business is being placed, due to uncertainty of commercial relations. Local rolling mills are not buying

Scrap

Scrap Prices, Page 62

Pittsburgh — Although there is little new buying of volume, prices have indicated some signs of firmness. Cold weather has cut down supplies temporarily.

Cleveland—Readjustment in scrap prices has lowered by 50 cents per ton No. 2 busheling, cast and blast furnace borings and low phosphorus punchings. Automobile scrap is being offered in quantity but gathering and yard preparation has been hindered in this area by snow and cold.

Chicago — Prices are unchanged and several additional mill purchases of No. 1 steel were reported at the prevailing price of \$16.50. Scrap interests still are inclined to believe the market has touched bottom and indicate near-future developments may bring a reaction. Material is fairly plentiful. Most mill inventories are comfortable.

New York—Scrap prices for the most part are unchanged and the downward trend appears to have been halted with consumers marking time. Buying is light but most mills are taking moderate shipments on contracts. In some instances eastern mills have accumulated substantial reserves. Export buying against contracts is spotty, as ships become available. Japan and Italy taking most.

Boston—Declines in scrap prices appear to have halted. Forge flashings, specification pipe and stove plate, the latter for Pennsylvania delivery, are down slightly, but most



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Behind the Scenes with STEEL

The Winnah

■ After nine straight sleepless nights and eleven bromo-seltzers we have reached a momentous decision. To none other than Ralph Conder of Boston Woven Hose & Rubber Co. goes the questionable distinction of having the cleverest greeting card in our modest assortment received both before and after Christmas. Our well-laid plans for making our own always peter out miserably but Ralph not only had an idea, he actually went and did it. We hope the cut below gives you enough to tell what it's all about.



Memories

■ The article on "Construction" in last week's whopping Year-book of Industry "is a perfect picture of the fabricating industry" writes Harmon Hershey, president, Genesee Bridge Co., Rochester, N. Y. Mr. Hershey also found Timken's attractive front cover advertisement reviving memories of thirty-five years ago when he worked next door to the new Timken Roller Bearing Axle Co., originally formed a few years before as the Timken Carriage Works. Messrs. W. R. & H. H. Timken and others used to meet for lunch with Mr. Hershey and his Cleveland Axle Co. associates at the nearby home of one of the employees, but according to Mr. Hershey the

young lady with the copper colored hair was not yet a topic of discussion.

Out of Sight, Out of Mind

■ Advertising with no goods to sell may seem a bit cock-eyed but Rolls-Royce Ltd. thinks otherwise and keeps right on plugging away in the English papers. In a letter to *The London Times* they explain why: "Although Rolls-Royce are now entirely engaged upon the manufacture of aero engines and will not make any motor-vehicles during war-time, we intend to continue to advertise in order to keep the public informed of our activities and thus preserve our goodwill for the future." And yet, we'll bet every day some philanthropic advertising space peddler gets asked: *Oh, yeh, why should we waste our money? We've got more business now than we know what to do with.*

Nuts To You

■ A. C. Heffner of Bethlehem Steel offers one about five men marooned on an island with only coconuts to eat, so they all pitch in and gather up quite a sizable pile, but decide to split them up the next morning. One guy, though, decides he may get cheated, so he gets up during the night and splits the nuts into five equal piles. One nut was left over which he tossed to the monkeys and hiding his own pile he put the remainder together again. During the night each man in turn did exactly the same thing. In the morning the remaining nuts were divided into five piles and the division came out even. Now, go to work and find out how many nuts the men originally gathered. To the first correct answer goes a personal copy of that magnificent Year-book of Industry issue.

Spruced Up

■ And if you don't like our new type heads and layouts, we're very much disappointed.

SHRDLU

and probably will not before Feb. 1. Other domestic buyers are not interested.

Buffalo—The scrap market is quiet as the expected revival in buying with the start of the year has not materialized. A leading consumer is maintaining a bid below the prevailing range of \$17 to \$17.50 per ton for No. 1 heavy melting steel but dealers have refused to recognize it.

Cincinnati — The desultory iron and steel scrap market which developed during the holidays continues. Mills have fair inventories on which they are drawing to maintain a high steelmaking rate. Dealers are refusing to trim quotations. Prices may be considered nominal during a period of minor transactions.

St. Louis—With cold weather hampering yard operations of dealers and shippers the scrap market was fairly steady, with reduction of 50 cents per ton on a few grades. A sale of 2000 to 3000 tons of steel specialties to an East Side consumer was the only transaction of importance.

Toronto, Ont.—Local dealers revised price lists for the beginning of the year, reducing offering bids on heavy melting steel, flashings and dealers' steel, 50 cents per ton. Scrap pipe was marked down 25 cents per gross ton and steel turnings and cast borings were advanced 25 cents per ton. Trading was quiet for the week. Deliveries against contract are responsible for good movement to consumers throughout Ontario.

San Francisco — Movement of scrap has quieted and mills have not been active in buying. Further recessions are noted and No. 1 heavy melting steel holds at \$16 to \$16.50 in Los Angeles and San Francisco while No. 2 is quoted at \$15 to \$15.50. Compressed sheets are now quoted at \$13.50 to \$14 a gross ton both in San Francisco and Los Angeles while steel boring are listed at \$6 to \$6.50 a ton.

Steel in Europe

Foreign Steel Prices, Page 61

London—(By Cable)—British iron and steelworks begin the new year with full operations, record output and heavy commercial order backlogs. Manufactures for war purposes have been intensified and take priority. Most works are booked six months ahead. Some sheet and heavy steel tonnages have been released for export. Importation of scrap and semifinished steel is expanding.

Belgium and Luxemburg report considerable activity but are unable to meet increasing export demand.

Tendency of prices continues upward.

Canada has ordered 1,000,000 boxes of Welsh tin plate for 1940 delivery, part of a contract made a year ago with Richard Thomas & Co., Ebbw Vale, Wales, for 5,000,000 boxes for delivery over five years.

Warehouse

Warehouse Prices, Page 61

Pittsburgh—No change has been made in warehouse prices in this district, for steel products of any sort. A reduction by Detroit warehouses on some products is stated to be entirely local. It is an off season, with some smaller interests taking business at lower prices during the lull, forcing larger suppliers to meet the situation. Steelmakers here say the Detroit action has no significance as far as finished steel prices by mills is concerned.

Chicago—Holiday curtailment was far less than seasonal and a sharp upturn is expected about the middle of the month. Bars and sheets continue to be most prominent items of demand. Prospect for next three to four months is encouraging.

New York — Quantity extras on hot and cold-rolled alloys out of warehouse, per size and grade have been revised as follows: 1000 lbs. and over, base; 500 to 999 lbs., plus 50 cents per 100 lbs., an increase from 25 cents; 300 to 499 lbs., plus 75 cents per 100 lbs.; under 300 lbs., plus \$1.25. An order extra of \$1.75 per 100 lbs. is being applied to total orders under 300 lbs. in addition to the maximum item extra, making a total of \$3 per 100 lbs. for purchases under 300 lbs. Hot and cold-finished material can not be combined to make a 300-lb. order. The gage extra on No. 18-gage hot-rolled black sheets has been reduced 10 cents per 100 lbs.

Philadelphia — Sales by warehouses have held up well, the holiday decline not exceeding 20 per cent, much better than expected. Some large jobbers had better business in December than any month last year. Reflecting revisions in mill extras several weeks ago distributors put in effect Jan. 2 new quantity extras on hot and cold alloy steel bars. Extras were increased 3 cents per pound on quantities under 300 pounds and 25 cents per 100 lbs. on 500 to 999 lbs.

Detroit—Reduction of \$3 per ton on several hot-rolled products, effective Jan. 2, has been announced by local warehouses. Bars, floor plates and shapes were marked down \$3 and hot-rolled bands \$5. Slow buying the past two weeks is a season-

al condition in this market. Some inquiries have been received for experimental needs on 1941 automotive model development work.

Buffalo—While many consumers have not completed inventory adjustments, warehouse distributors report good sales volume. Belief is demand will be sustained through first quarter, though slightly under the final three months of 1939.

Cincinnati—Demand for warehouse items has not relaxed. Some tonnage was lost to year-end conditions, but far less than usual. Early January sales, chiefly for industrial needs, are comparable to the best levels in the fourth quarter. Prices are unchanged and stocks adequate.

Seattle — Jobbers report the usual seasonal letup in business, although December was up to normal. Little interest is expected within 30 days. Local houses are still following a price list below Portland on leading items.

Iron Ore

Iron Ore Prices, Page 62

Cleveland—Prices of Lake Superior iron ore for delivery during the 1940 navigation season have been established by sales of substantial tonnages at the same prices as in 1939. These are: Old range, \$5.25 for bessemer and \$5.10 for non-bessemer; Mesabi range, \$5.10 for bessemer and \$4.95 for non-bessemer. Prices are for gross tons, delivered at lower lake ports.

This is the earliest date for establishment of prices since the 1917 season, prices for which were fixed Nov. 22, 1916. The next earliest date was Feb. 2, 1920, for the navigation season of that year. For the 1939 season prices were established May 4 and for 1938, May 24.

Equipment

Seattle — Seasonal recession is evident but demand from public works projects continues, mostly for electrical items and pumping machinery. NePage Electric Co., Seattle, is low at \$105,000 to United States engineer for furnishing busses for the four generator units at Bonneville dam. I-T-E Circuit Breaker Co., Philadelphia, is low to same department for 480-volt switchboard. Bonneville authority has asked bids Jan. 6 for meters, relays and other equipment for Ampere station, Spec. 708, and Jan. 11 for eleven potential transformers, Spec. 702. Lighthouse Electric Co., Tacoma, Wash., is low to that city for furnishing substation transform-

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Thoroughly proved in actual service—and now regularly used by many plating shops—this new rack coating material has produced amazingly fine results. Reports show that some racks coated with this material have gone through over 1,000 plating cycles without any insulation breakdown.

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ers. U. S. engineer, Portland, has called bids Jan. 11 for construction of transformer station for Peninsula No. 2 pumping plant.

Kulka Iron & Metal Scraps Electric Line

■ Kulka Iron & Metal Co., Alliance, O., has bought for dismantling the Toledo & Indiana electric railroad, operating between Toledo and Bryan, O., 52 miles. The line started operations in 1903 and was abandoned during 1939. Scrapping and reclaiming will be started at once. Purchase included all the railroad property except real estate.

The Kulka company recently purchased the property of the Stark Electric railroad, which had operated from Salem to Canton, O.

Refractories

Refractories Prices, Page 60

New York—Sellers of basic brick have increased prices for this quarter, with chrome brick and bonded chrome now up \$3 a ton to \$50, f.o.b. Baltimore, Plymouth Meeting and Chester, Pa., and magnesite brick and chemical bonded magnesite up \$3, to \$72 and \$61 respectively.

Dead burned magnesite is no longer being received in this country from abroad and it is the trade opinion that little, if any, will be received during the duration of the war in Europe. Domestic dead burned magnesite is unchanged at \$22 per net ton in bulk and \$26 in bags, f.o.b. Chewelah, Wash., but none is now being received by boat in the east, it is said.

Ferroalloys

Ferroalloy Prices, Page 60

New York—As many consumers held back specifications pending inventory season, the movement of ferromanganese this month may likely exceed December shipments. On the other hand, there was a good movement in chrome alloys last month due to higher prices in effect Jan. 1 and as a result, shipments of this material will probably be less.

Ferromanganese in car lots continues at \$100, duty paid, Atlantic and Gulf ports, and domestic spiegeleisen, 19 to 20 per cent and 26 to 28 per cent, at \$32 and \$39.50, respectively.

Metallurgical Coke

Coke Prices, Page 59

Pittsburgh—Beehive coke operations have bogged down and approximately 3900 of the more than

6500 ovens available in the district are now active. At mid-December more than 5000 were producing. The change has been due largely to an over supply following the shortage in September and October. Some of the idle ovens will be relit this month after the situation has adjusted itself.

Nonferrous Metals

New York—Activity in major nonferrous metal markets was disappointing last week since most observers had expected a substantial pickup in demand immediately following the holidays. Tin prices declined steadily while those on zinc held at the 5.75-cent level established on Friday, Dec. 29, and on copper and lead at unchanged levels.

Copper — Only routine business was booked in electrolytic copper by producers at 12.50c, Connecticut, while resale and export remained quiet and steady at 12.60c and 12.50c, respectively. The trade has decided to resume publication of monthly statistics for the domestic industry only with the first report, covering the five months period during which they were suspended, expected within a week to 10 days.

Lead — Statistical position remained strong coupled with an ex-

tremely favorable outlook for consumption but buying was less active than had been expected. Prices continued steady at 5.35c, East St. Louis.

Zinc—The unexpected \$5 per ton reduction in the prime western zinc price at the close of December tended to curtail new buying. Announcement that about 2500 tons were placed 5.75c, East St. Louis, on the final two days of December forced all leading sellers to lower their quotations to the new level.

Tin—Straits spot declined steadily to 47.50c, a new low since last August. Futures were somewhat firmer at the close, however, due to rumors that freight rates might be advanced soon.

Antimony—The market remained in the doldrums with prices unchanged at 14.00c, New York, for American spot in cases and nominally 16.50c, duty paid New York, for Chinese spot.

■ Welin Davit & Boat Corp., Newark, N. J., has purchased the former plant of National Lead Co., at Market and Herbert streets, Perth Amboy, N. J. Following alterations and installation of machinery, the plant will be occupied by a subsidiary of Welin Davit & Boat Corp., Alloy Fabricators Inc., fabricator of stainless and alloy metals.

Nonferrous Metal Prices

	Electro, del. Conn.	Copper Lake, del. Midwest	Casting, refinery	Straits Tin New York Spot	Straits Tin New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot, N.Y.	Nickel Cathodes
Dec. 29	12.50	12.50	12.12 1/2	49.00	46.50	5.50	5.35	5.75	20.00	14.00	35.00
30	12.50	12.50	12.12 1/2	49.00	46.50	5.50	5.35	5.75	20.00	14.00	35.00
Jan. 2	12.50	12.50	12.12 1/2	48.75	46.12 1/2	5.50	5.35	5.75	20.00	14.00	35.00
3	12.50	12.50	12.12 1/2	48.50	46.00	5.50	5.35	5.75	20.00	14.00	35.00
4	12.50	12.50	12.12 1/2	47.50	45.50	5.50	5.35	5.75	20.00	14.00	35.00
5	12.50	12.50	12.12 1/2	47.50	45.75	5.50	5.35	5.75	20.00	14.00	35.00

*Nominal.

MILL PRODUCTS

F.o.b. mill base, cents per lb., except as specified. Copper brass products based on 12.50c Conn. copper

Sheets	
Yellow brass (high)	19.31
Copper, hot rolled	21.12
Lead, cut to jobbers	8.75
Zinc, 100 lb. base	11.25
Tubes	
High yellow brass	22.06
Seamless copper	21.62
Rods	
High yellow brass	15.23
Copper, hot rolled	17.62
Anodes	
Copper, untrimmed	18.37
Wire	
Yellow brass (high)	19.56

OLD METALS

Nom. Dealers' Buying Prices

No. 1 Composition Red Brass

New York	8.37 1/2 - 8.50
Cleveland	8.75 - 9.00
Chicago	8.75 - 9.00
St. Louis	8.25 - 8.50

Heavy Copper and Wire

New York, No. 1	10.00-10.25
Cleveland, No. 1	10.00-10.25

Chicago, No. 1	10.00-10.25
St. Louis	9.25-9.75

Composition Brass Turnings

New York	8.00-8.25
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Light Copper

New York	8.00-8.25
Cleveland	8.00-8.25
Chicago	7.87 1/2 - 8.12 1/2
St. Louis	7.25-7.50

Light Brass

Cleveland	4.75-5.00
Chicago	5.62 1/2 - 5.87 1/2
St. Louis	5.00-5.50

Lead

New York	4.85
Cleveland	4.37 1/2 - 4.50
Chicago	4.25-4.50
St. Louis	4.00-4.25

Zinc

New York	3.00-3.25
Cleveland	3.25-3.50
St. Louis	3.25-3.50

Aluminum

Mixed, cast, Cleveland	10.25-10.50
Borings, Cleveland	7.75-8.00
Clips, soft, Cleveland	15.75-16.00
Misc. cast, St. Louis	8.75-9.00

SECONDARY METALS

Brass ingot, 85-5-5-5, less carloads	13.00
Standard No. 12 aluminum	15.00-15.50

Deferred Steel Buying Brightens 40s Outlook

(Concluded from Page 12)

1941 were considered better than 50-50. War in Europe and the resultant business stimulation now make a true appraisal more difficult.

To high tax costs and high wage rates industry apparently must resign itself. Obligations already incurred and prospects for more deficits make high taxes mandatory.

Labor outlook is more promising. Wage earners probably will continue to insist on high rates. But industry is not adverse to paying high wages, provided a fair day's work is returned and provided prices are adjusted accordingly.

That labor unions' recent abuses and excesses will be curbed is definitely indicated. Public opinion has swung against the objectionable union tactics. States and subdivisions are taking action to control union activity. The Wagner act and its administration are headed for change and any change should be an improvement. Many labor unions themselves are evincing a tendency to settle down and eliminate the absurdities that were characteristic of the latter half of the past decade.

FINANCIAL

DIVIDENDS DECLARED

■ FAIRBANKS, Morse & Co., Chicago, special of 50 cents on common, payable Jan. 27 to record of Jan. 12. Dec. 27 extra of \$1 was paid, and Dec. 1 dividends were resumed with payment of 25 cents regular and 25 cents extra.

Royal Typewriter Co. Inc., New York, quarterly of \$1.75 on 7 per cent preferred and \$1 on common, both payable Jan. 15 to record of Jan. 5.

Arthur G. McKee Co., Cleveland, has declared 25 cents regular and 50 cents extra payments as initial dividend for 1940. Company reports that more than 75 per cent of 1939 business undertaken will be completed this year.

EARNINGS STATEMENTS

American Forging & Socket Co., Pontiac, Mich., reports net income of \$26,246 for first quarter of fiscal year ended Nov. 30.

Lakey Foundry & Machine Co., Muskegon, Mich., reports net profit of \$215,696, equal to 49 cents a share on 440,338 shares of capital stock, for fiscal year ended Oct. 31. In preceding year company reported

net income of \$9124 or 2 cents a share.

Black & Decker Mfg. Co., Towson, Md., reports \$595,851 net profit, equal to \$1.60 per share for fiscal year ended Sept. 30. Net income for preceding fiscal year was \$283,358 or 76 cents per share.

American Airlines Inc., Chicago, and subsidiaries reports \$1,171,412 net profit for ten months ended Oct. 31. Income is equal to \$3.88 a share. No. comparison with like 1938 period is available.

Government Iron, Steel Awards Total \$1,018,731

■ During the week ended Dec. 23, the government purchased \$489,679.78 worth of iron and steel products under the Walsh-Healey act as follows: Sheffield Steel Corp., Kansas City, Mo., \$12,346.90; Peco Manufacturing Corp., Philadelphia, \$75,118; International Chain & Mfg. Co., York, Pa., \$14,448; Republic Steel Corp., Cleveland, \$32,065.03; Chicago Bridge & Iron Co., Philadelphia, \$23,150; Carolina Steel & Iron Co. Inc., Greensboro, N. C., \$30,166.20; American Gas Accumulator Co., Elizabeth, N. J., \$51,795.

American Locomotive Co., Railway Steel-Spring division, New York, \$25,509.75; Timken Roller Bearing Co., Steel & Tube division, Canton, O., \$17,993; Carnegie-Illinois Steel Corp., Boston, \$11,064.96; Allegheny Ludlum Steel Corp., Brackenridge, Pa., \$16,722.61; American Steel & Wire Co., Cleveland, \$16,474.50; Gilbert & Barker Mfg. Co., Springfield, Mass., \$28,727.94;

Colonial Supply Co., Louisville, Ky., \$11,584.59; E. E. Souther Iron Co., St. Louis, \$10,693.32; The Frick-Gallagher Mfg. Co., Wellston, O., \$13,246.52; National Cylinder Gas Co., Chicago, \$9984 (estimated); Edward G. Budd Mfg. Co., Philadelphia, \$68,232.46; Lakeside Bridge & Steel Co., Milwaukee, \$20,367.

During the week ended Dec. 16, the purchases totaled \$529,050.92: Wire Rope Corp. of America Inc., New Haven, Conn., \$35,370; the M. K. Epstein Co., Springfield, Mass., \$13,735; the Philadelphia Drying Machinery Co., Philadelphia, \$10,303; Electro Metallurgical Sales Corp., New York, \$21,580; Lynchburg Foundry Co., Lynchburg, Va., \$13,870.56; Carnegie Illinois Steel Corp., Philadelphia, \$17,785 (estimated); MacWhyte Co., Kenosha, Wis., \$21,580.94; Beacon Devices, North Tonawanda, N. Y., \$19,500; Fair Manufacturing Co., San Francisco, \$14,189; Treadwell Engineering Co., Easton, Pa., \$36,850; A. M. Castle & Co., San Francisco, \$43,649.46; the Cleveland Chain & Mfg. Co., Cleveland, \$12,064.67; the McKay Co., York, Pa., \$14,076.43; Kerlow Steel Flooring Co., Jersey City, N. J., \$14,505; the Midvale Co., Philadelphia, \$12,998.88; Pittsburgh-Des Moines Steel Co., Pittsburgh, \$25,890; Wyckoff Drawn Steel Co., Pittsburgh, \$86,444.51; Lukens Steel Co., Coatesville, Pa., \$43,224.48; the Eastern Rolling Mill Co., Baltimore, \$9526.38 (estimated); American Chain & Cable Co. Inc., Bridgeport, Conn., \$14,446.35; Woodhouse Chain Works, Trenton, N. J., \$16,801.09; Leach Co., Oshkosh, Wis., \$12,739.35; and Tippet & Wood, Philadelphia, N. J., \$17,920.82.

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Construction and Enterprise

Indiana

FORT WAYNE, IND.—Officials of Fort Wayne Wire Die Inc., have filed papers with secretary of state showing an increase in capital stock to 250 shares having a par value of \$100 per share.

INDIANAPOLIS—Marco Iron & Metal Co., an Illinois corporation, has been admitted to do business in Indiana.

INDIANAPOLIS—Officials of Tiff Art Metal Co., an Ohio corporation, maker and seller of steel ceilings, sidewalls, roofing, spouting, sheet and art metal products, have filed papers with the state admitting the company to do business in Indiana.

INDIANAPOLIS—Iowa Wind Mill & Pump Co., Kendallville, Ind., have filed articles of reorganization, showing capital stock of 2000 shares having a par value of \$20 per share; A. H. Minor, Kendallville, state agent.

Connecticut

BRIDGEPORT, CONN. — Bridgeport Brass Co., constructing 1-story, 80 x 140-foot brick and steel garage; estimated cost \$40,000.

New York

NEW YORK—R. C. Stanhope Inc., dealer, 101 West Thirty-first street, seeks locomotives; two 7 to 8-ton, 24-inch gage, "permissible type", battery.

Pennsylvania

WYOMISSING, PA.—Bids due Jan. 16, 1 p.m. at office of public buildings administration, federal works agency, Washington, for construction of United States postoffice; appropriation, \$75,000; 1-story and basement.

Alabama

BIRMINGHAM, ALA.—W. M. Smith & Co., Forty-fifth to Forty-eighth streets, First avenue N, seeks large magnetic pulley, drag line crane, 1½ to 2-yard, caterpillar, gasoline or diesel, several trucks and trailers, large dump bodies 12 to 15-yard capacity, also two with 20 to 40-yard capacity, either dump, drop bottom or push-up hydraulic dump.

FLORENCE, ALA.—Machinery, stock and building, Robbins Tire & Rubber Co., Muscle Shoals City; fire damage; loss \$160,000.

Maryland

BALTIMORE—Board of awards receives bids Jan. 10 for furnishing and delivering cast iron pipe to bureau of sewers; George E. Finck, sewerage engineer.

DENTON, MD.—REA approved an additional \$43,000 to Choptank Co-operative to provide for building 50 miles of electric line to serve 126 members in Queen Ann's county.

Kentucky

DANVILLE, KY.—City proposes to build \$100,000 sewage disposal plant; R. C. Terrell, city engineer; H. K. Bell, 731 McClelland building, Lexington, Ky., consulting engineers.

Florida

FORT LAUDERDALE, FLA.—Solomon, Norcross & Kels, 257 Broadway, Troy, N. Y., and Fort Lauderdale, are consulting engineers for water project, costing \$192,948. Bids were opened Jan. 4.

MIAMI BEACH, FLA.—Giller Contract-

ing Co., 519 Michigan avenue, will construct warehouse, 525 Michigan avenue; 1-story; 50 x 139 feet; concrete, brick and steel; built up roof; Albert Anis, 925 Lincoln road building, architect.

PENSACOLA, FLA.—Public works officer, naval air station, soon to ask bids on gasoline system for new base field; includes steel storage tanks, supply tanks, pressure tanks, pumps, motors, compressors, piping, valves, steel and concrete service pits and pump houses.

Georgia

ATLANTA, GA.—National Cylinder Gas Co., 442 West Peachtree street N. W., plans addition to building, 657 Echo street N. W.

Mississippi

CORINTH, MISS.—Alcorn county electric power association will install white way system; estimated cost \$15,000.

CRYSTAL SPRINGS, MISS.—City voted bonds for acquiring land and erecting building for manufacturing plant; cost \$19,000.

MERIDIAN, MISS.—East Mississippi electric power association has REA allotment of \$184,000 for purchase of materials for 400 miles of rural lines in Lauderdale, Winston, Kemper, Clarke and Wayne counties.

North Carolina

BOONE, N. C.—Mountain Burley Tobacco Warehouse Corp., plans erection of second warehouse, site secured.

CAROLINA BEACH, N. C.—City, R. C. Fergus, mayor, has federal allotment for installing sanitary sewerage system; estimated cost \$188,000; \$63,000 bonds available.

South Carolina

ABBEVILLE, S. C.—City, J. A. Long, mayor, receives bids Jan. 19 for constructing approximately 17 miles of transmission lines from hydro-electric plant at Rocky river to city; furnishing and installing two substations; Wiedeman and Singleton, 1404 Candler building, Atlanta, Ga., engineers.

BENNETTSVILLE, S. C. — Marlboro Electric Cooperative Inc., H. K. Covington Jr. president, has allotment of \$100,000 for constructing 126 miles of electric line in rural districts of Marlboro county.

Tennessee

CHATTANOOGA, TENN.—City Electric Power board, L. J. Wilhott, chairman, receives bids Jan. 9 for Brainerd road and Ninth street lighting; subproject, contract No. 6-B; estimated cost \$15,000.

HOHENWALD, TENN.—General Shoe Corp., W. Maxey Jarman, president, Nashville, completed plans for erection of new unit; capacity 5000 pairs shoes daily.

KNOXVILLE, TENN.—Knox Porcelain Corp., O. A. Dorsett, president, Western avenue, receiving bids, no date set, for warehouse; 1-story; 140 x 175 feet; cost \$15,000.

KNOXVILLE, TENN.—Max C. Bartlett, general manager, electric power and water board, receives bids Jan. 10 for materials and labor for improvement of electric distribution system; contract D-2, station equipment installation, cost \$68,000; contract D-3, station structural improvements, cost \$9000; contract E-1, feeder improvements, cost

\$40,000; Burns & McDonnell Engineering Co., engineer, Kansas City, Mo.

MEMPHIS, TENN.—Expenditure of \$181,000 for improvements to municipal airport has received federal approval.

NASHVILLE, TENN.—Expenditure of \$113,000 for two new hangars and other improvements at Berry field, municipal airport, has received federal approval

Louisiana

MATHEWS, LA.—Storage warehouse, Georgia Sugar Refinery of South Coast Corp., fire damage; loss \$45,000; W. B. Gibbens, manager.

West Virginia

BLUEFIELD, W. VA.—Plans are being completed for an addition to factory building; owner, National Electric Coil Co.; will take bids at once; Alex B. Mahood, Law & Commerce building, Bluefield, architect.

Virginia

ARLINGTON, VA.—Chesapeake & Potomac Telephone Co., John S. Dunn, district manager, plans expenditure of \$160,000 for equipment for company's new building.

NORFOLK, VA.—Norfolk & Western railway plans construction of a 1100-car capacity city coal classification and storage yard and a new 200-car capacity car repair yard at Lamberts Point; expenditure involves \$500,000; classification yard will have 29 additional tracks; car repair yard 10 tracks totaling 4½ miles; new car repair yard facilities include 150-ton track scale and 7 modern buildings, oil house, paint house, air-brake house, office and locker room, storehouse, machine and smith shop, planing mill and lumber shed; additional installations include air, steam, water, sewer and power line; modernization and replacements of belt driven machinery contemplated.

RICHMOND, VA.—Directors of Chesapeake & Potomac Telephone Co. of Virginia, have authorized expenditures totaling more than \$1,000,000 for constructing telephone plant and installation of equipment; \$650,000 will be spent for work of disconnecting, moving and installing telephone equipment; \$160,000 for central office equipment at Alexandria; \$22,000 for addition to telephone cables in Danville.

WAYNESBORO, VA.—E. I. du Pont de Nemours & Co., A. W. Frame, local manager, plans installation of additional machinery and erection of storage building.

Missouri

JEFFERSON CITY, MO.—State, Robert L. Winn, treasurer, taking bids to Jan. 22, 11 a.m., on waterworks system; includes two pumps, pump and tank houses and water distribution system. Specifications available Keene & Simpson, 1005 Land Bank building, Kansas City, Mo., architects; certified check 5 per cent to accompany bid.

ST. LOUIS, MO.—H. A. Woodworth Engineering Co., 705 Olive street, seeks tower and tanks, 50,000 gallons or larger.

Arkansas

BATESVILLE, ARK.—Arkansas Power & Light Co., Pine Bluff, plans construction of 90-mile power line between Batesville and Norfolk, to serve needs of dam to be constructed by government at Norfolk.

LITTLE ROCK, ARK.—Little Rock Water Works commission, W. H. Williams, vice chairman, receives bids Jan. 10 at office, Fifth and Broadway, for gas feed pipe ammoniator.

Oklahoma

ARDMORE, OKLA.—Ben Franklin Re-



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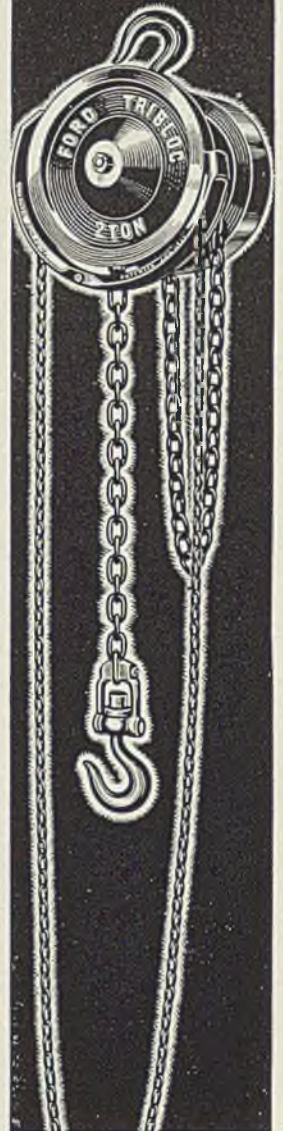
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ining Co., subsidiary Bell Oil & Gas Co., completing plans for increasing capacity of plant from 3500 to 6000 barrels daily.

OKLAHOMA CITY, OKLA.—City votes Feb. 20 on \$6,911,000 water bonds.

Minnesota

LAKEFIELD, MINN.—Village, E. B. Whitney, clerk, taking bids to Jan. 15, 2:30 p.m., on construction of sewage disposal plant; certified check 15 per cent required; specifications available from clerk or consulting engineers, Toltz, King & Day, Inc., 1509 Pioneer building, St. Paul.

TYLER, MINN.—Lyon-Lincoln electric co-operative, V. Ostergaard, president, taking bids to Jan. 8, 1:30 p.m., on construction of 250 miles of rural transmission lines in Lyon and Lincoln counties. Plans obtainable from owner or consulting engineer, United Engineering Service, 1406 West Lake street, Minneapolis.

Texas

CORPUS CHRISTI, TEX. — Central Power & Light Co., J. T. Persons, chief engineer, considering calling bids about Jan. 15 for superstructure, including mechanical work, of Nueces bay power station; Sargent & Lundy, 140 Dearborn street, Chicago, designing engineer; Lee Aiken and Walker & Hinman, Corpus Christi, contractors for foundation and substructure.

FORT STOCKTON, TEXAS — Pecos county, C. E. Casebier, county judge, plans improvements to airport; drill water well and equipping with pumping equipment, electric lights and gas.

HAMILTON, TEX.—Hamilton County co-operative association receives bids Jan. 20 for 41 miles of rural lines in Hamilton, Mills and Coryell counties; Texas Engineering Co., 110 East Tenth street, Austin, engineer.

HOUSTON, TEX.—L. M. York, York Oil Field Supply Co. Inc., Lake Charles, La., plans moving headquarters of company to Houston; will build, remodel and erect addition to building at 1100 McCarty; cost \$10,000.

LIVINGSTON, TEX. — Sam Houston Electric Cooperative Inc., J. Smith, president, receives bids Jan. 15 for constructing 254 miles of rural lines in Polk, Liberty, San Jacinto and Walker counties; cost \$223,000; William G. Morrison, 2102 Bryan street, engineer.

SAN AUGUSTINE, TEXAS—City, to release plans for bids, Jan. 15, for power plant improvements, new 300 kilovolt diesel generating units and equipment; H. B. Gleb & Co., 1109 Mercantile building, engineers.

Kansas

MAHASKA, KANS.—City passed a \$17,500 bond issue for construction of complete water system including supply from wells, tank and tower; mains and laterals to cost about \$55,000. Paulette & Wilson, Public Utility building, Salina, consulting engineers.

North Dakota

GRAND FORKS, N. D.—Nodak rural electric cooperative, P. J. Donnelly Grafton, president, will build power plant in 1940 to cost \$225,000; to service 1000 miles of rural transmission lines.

South Dakota

SIoux FALLS, S. D.—Sioux Valley empire electric association, L. W. Ellefson, president, taking bids to Jan. 10,

10 a.m., on construction of rural transmission lines in Minnehaha, Moody, Brookings, Kingsbury and Lake counties to serve 2000 customers; Buell & Winter Engineering Co., 508 Insurance Exchange building, Sioux City, consulting engineers. Certified check 5 per cent to accompany bid.

Nebraska

AVOCO, NEBR.—State railway commission authorizes Nebraska Power Co., to construct 7½ miles of rural transmission lines near here; J. E. Davidson, president, Seventeenth and Harney streets, Omaha, Nebr.

BAYARD, NEBR.—State railway commission authorized Chlmney Rock rural public power district to construct 33 miles of rural transmission lines.

BEATRICE, NEBR.—Black Bros. Mill, E. W. Kenagy, president, announces plans for construction of power house on east side of Blue river here soon.

FAIRBURY, NEBR.—State railway commission granted authority to the city to construct 11 miles of rural transmission lines between Fairbury and Jansen, Nebr.

HARTINGTON, NEB. — Cedar-Knox county rural public power district, Harold Martindale, superintendent, will construct 30 more miles of rural transmission lines; cost \$30,000; project in Cedar and Knox counties.

HEBRON, NEBR.—State railway commission has granted authority to Thayer County Rural Public Power district to construct 174 miles of rural transmission lines.

TECUMSEH, NEBR.—State railway commission granted authority to Eastern Nebraska rural public power district to construct 11½ miles of rural transmission lines near Memphis and Wann, Nebr.

Iowa

GOWRIE, IOWA—Board of electric light and power plant trustees, H. A. Hubbell, secretary, is taking bids to Jan. 17, 1:30 p.m. on one diesel engine having a capacity of between 300 and 375 horsepower; complete with generator, exciter, auxiliary equipment and piping. Plans available Stanley Engineering Co., Muscatine, Iowa, consulting engineers.

MUSCATINE, IOWA—Board of water and light trustees, Herman Zeug, secretary, receiving bids to Jan. 15, 7:30 p.m. on coal handling equipment, feedwater heaters and power plant piping as per specifications. Specifications available Stanley Engineering Co.; certified check 5 per cent to accompany bid.

PETERSON, IOWA—City, Maudie E. Richard, clerk, has completed preliminary plans for construction of a sewage disposal plant to cost between \$15,000 and \$18,000.

WOODBINE, IOWA—Harrison County Rural Electric association, Paul Bush, superintendent, granted franchise by Iowa commerce commission to construct 125 additional miles of rural transmission lines in Harrison and nearby counties.

Colorado

DENVER—United States department of interior, bureau of reclamation, taking bids to Jan. 8 at 2 p.m., on three 30,000-kilovolt ampere, unity power-factor, 6900-volt, 3-phase, 60-cycle, vertical-shaft, 94.7 revolutions per minute, alternating current generators for the Parker power plant.

FLORENCE, COLO.—San Isabel electric association, O. W. Drott, president,

preparing plans for constructing 80 miles of power line through the south Hardscrabble, Greenwood and Wetmore districts; Glenn Fickle, Temple Court building, consulting engineer.

Montana

RICHFIELD, MONT.—City, L. P. Ravenscroft, mayor, preparing specifications for improvement of its power plants; project includes new feed water heater and auxiliaries, Black & Veatch, 4706 Broadway, Kansas City, Mo., consulting engineers.

Idaho

NAMPA, IDAHO—R. P. Gibbons, oil operator, plans building modern oil refinery; capacity, 275 barrels daily.

Pacific Coast

STOCKTON, CALIF.—Plans being completed for construction of \$175,000 dock and storage terminal in the port here for Shell Oil Co.; project covers 15-acre site on Rough and Ready island, with 500-foot frontage of Stockton deep water channel.

PORTLAND, OREG.—Commission of public docks calls for bids Jan. 30 for suction system for unloading bulk grain; A. D. Merrill, engineer.

BREWSTER, WASH.—Gilmore Oil Co., plans building a distributing plant involving three underground storage tanks.

VANCOUVER, WASH.—Plans of Aluminum Co. of America, involve construction of a \$3,000,000 plant 2½ miles from city; 180-acre site purchased from Spokane, Portland & Seattle railroad; structure permanent.

WRANGELL, ALASKA—Bids for proposed \$275,000 federal building here will be opened at Washington, Jan. 19.

Canada

CAMP BORDEN, ONT.—W. P. Campbell, chairman, war supply board, Ottawa, will award contract soon for erection of airplane hangar and other buildings here.

HAMILTON, ONT.—Department of national defense, Ottawa, plans construction of airport near here. Municipal airport at eastern city limits also will undergo improvements.

HAMILTON, ONT.—Steel Co. of Canada is making extensions to its plant at cost of \$1,500,000. Program includes extensions to the sheet mill and improvements to various wire mills.

TORONTO, ONT.—City council authorized to proceed with construction of section of sewage disposal plant to cost \$5,600,000. Ralph Day, council chairman.

TORONTO, ONT.—Aeme Ruler & Advertising Co. Ltd., 337 Leslie street, plans building two story and basement, 26 x 64-foot factory addition. Harry D. Martin, 48 Rosevear avenue, East York, architect.

ARVIDA, QUEBEC—Aluminum Co. of Canada plans adding to its plant to increase capacity by 10,000 to 12,000 tons a year.

JOLIETTE, QUE.—Joliette Steel, Ltd., now receiving bids for erection of plant addition; no closing date set; estimated cost \$50,000. Perry, Luke & Little, 1405 Bishop street, architects.

LLOYDMINSTER, SASK.—J. C. Davies, town clerk, closes bids Jan. 15 for construction of sewage disposal plant and sewage lift, trunk sewer, water main construction pumping station, water pipe, hydrants and valves; pumps, engines, tanks and air compressors needed.

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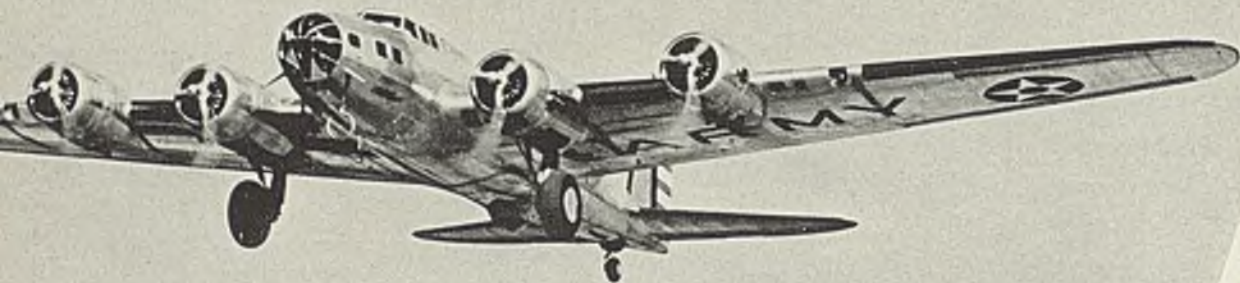
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Worthington Pump & Machinery Corp.	—
Worth Steel Co.	—
Wyckoff Drawn Steel Co.	—
Y	
Yale & Towne Mfg. Co.	—
Yoder Co.	—
Youngstown Alloy Casting Corp.	—
Youngstown Sheet & Tube Co., The ...	—
Z	
Zeh & Hahnemann Co.	—



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