

# STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

For forty-eight years—IRON TRADE REVIEW

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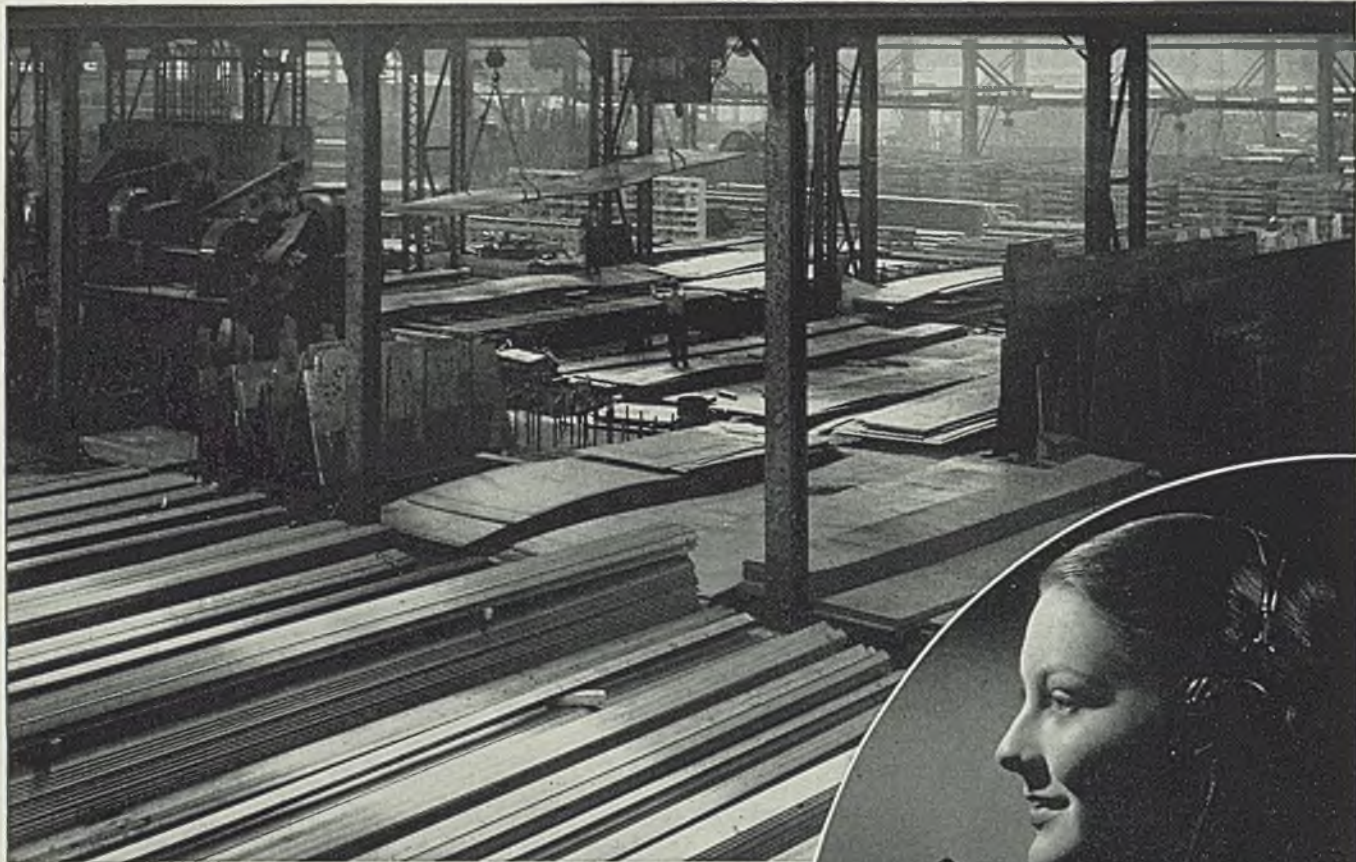
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# STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

## As the Editor Views the News

**N**OW that the election is over, business men are devoting much of their time to adjusting themselves to the situation created by the tremendous demonstration of public confidence in the new deal. In the great majority of cases, executives who have disagreed with many policies of the present administration are disposed to accept the decisive verdict at the polls at face value and to attempt to conduct the affairs of their companies in accordance with the national policies which the majority of voters has approved. To do this successfully (p. 39), industry will need all the resources of statesmanship it can muster.

• • •

**A Time for Moderation**

In the quiet, bloodless revolution that has been taking place in the past few years, the opportunities for pressure groups to enforce demands upon the employing and tax paying elements of society have been expanded tremendously. There is grave danger that these pressure groups will interpret the Nov. 3 election result as a mandate from the public to make more drastic demands, some of which unquestionably will impose burdens greater than the economic structure can bear at the present time. Very soon, we may find the re-elected President of the United States and industrial executives faced with the common problem of resisting or modifying these demands.

• • •

**Representation Plan Tested**

The necessity of dealing fairly with requests of this kind is illustrated by the situation which led to the general advances of wages in the steel industry (p. 22), announced last Friday. For many weeks management and employes have been considering the wage problem through the negotiating machinery of employe representation plans. The increases which go into effect Nov. 16 are the outcome of these negotiations and the fact that a delicate situation has been handled satisfactorily is a tribute to the employe representa-

tion idea. This achievement should encourage employers and employes alike to further develop and refine the system assiduously to the end that it may serve even more effectively in the future. The verdict of Nov. 3 points definitely to the need of high standards in the employe relations activities of industry. The importance of the representation plan in this connection cannot be overestimated.

• • •

**Should Know Public Better**

The decisive vote last Tuesday also suggests that industry should change some of its public relations policies. Criticism of new deal legislation by industrial interests will be discounted more heavily by the public than before the election. Industry must exercise its right to protest against ill-considered bills, but it must find a more effective method. Perhaps the approach lies through a more realistic understanding of the reactions of the public. Probably industry needs to tell its story to more of the people than heretofore and in simpler language. The problem is one that should receive the immediate attention of industry's ablest public relations experts. After last Tuesday's vote, it is evident that industry faces a difficult job in winning the sympathetic understanding of the voting public.

• • •

**Oxyacetylene Process Gains**

In this issue, special emphasis is placed upon the oxyacetylene process of welding and cutting. This is in recognition of the importance to the iron, steel and metalworking industries of the forthcoming thirty-seventh annual convention of the International Acetylene association at St. Louis, Nov. 18-20. No one can read the report of progress in the utilization of the oxyacetylene process (p. 98) or visualize the scope of the convention program (p. 118) without realizing that the operations of welding and cutting with gas have become one of the most essential services in our modern industrial world. Flame hardening, also is assuming a more important role, for which reason STEEL is pleased to present an authoritative article (p. 42) dealing with the applications of this distinctive method of heat treating.

*E. L. Shaner*



# Steel Bases Pay Raise on Living Costs; Makes Wage Agreements for Year

**W**AGE increases announced late last week by leading iron and steel producers and expected to spread throughout the industry by Nov. 16, the effective date, will add about \$70,000,000 a year to payrolls.

Net profit of integrated steel companies for the first nine months this year—as indicated in STEEL's compilation of earnings reports (Nov. 2 issue, page 22)—amounted to approximately \$92,800,000, so that the industry is adding to its payroll at one sweep a sum about equal to three-fourths of this profit.

In general, the adjustments provide for an advance of 10 per cent, and in the case of the United States Steel Corp. subsidiaries the agreement with employe representatives is a term arrangement, effective for a full year from Nov. 16, with provisions for extensions.

The agreements announced by Steel corporation subsidiaries are believed to be the first of such general character to be made by Corporation companies, except for the captive mine agreement in 1933.

They all have a similar clause providing for adjustment of wages in accordance with fluctuations in the cost of living, as reported in the government's labor index.

The wage increases generally announced by the iron and steel producers bring the hourly rates to the highest level ever paid. A series of announcements were made, starting with Columbia Steel Co., San Francisco, Pacific coast subsidiary of the Steel corporation, and spreading within a few hours throughout the country, including Bethlehem Steel Co., Inland Steel Co., the Steel corporation subsidiaries, and others.

Carnegie-Illinois Steel Corp. announced that its basic common labor rates in the Pittsburgh district, now 47 cents, will be raised to 52½ cents, and mill turn, common labor, now 48½ cents will be increased to 54 cents. Other rates are adjusted to accomplish an increase of approximately 10 per cent in the total wage earners payroll. In the adjustment of rates other than common and the mill turn labor, consideration has been given to any inequalities which had existed in those occupational rates.

The agreement provides that "the

newly established rates, which are approximately 10 per cent over those now prevailing, shall be considered to compensate employes in advance for a 10 per cent increase in the cost of living over the July 15 base. Should the index of the cost of living continue to rise beyond this 10 per cent increase provided for, then wage levels will automatically be increased by 5 per cent when the index has risen to that extent. Similarly, a fall in the cost of living of a full 5 per cent would automatically bring about a downward adjustment of the wage level to the same extent."

## Plans Vary Somewhat

Bethlehem Steel Co.'s announcement stated that it would raise base labor rates "5½ cents per hour with equitable adjustments in other rates of pay". Inland Steel Co. said it was advancing rates of employes receiving less than \$5000 a year. Employes in the lower wage brackets will receive increases of over 10 per cent, while those in the higher brackets are advanced on a graduated scale ranging under 10 per cent of present wages.

Columbia Steel Co. said that its common labor will get the largest share of its increase, while the higher paid workers are advanced

less than the 10 per cent average for all employes. Those in the lower brackets are increased from 38½ cents to 48 cents an hour, and workers receiving 41 cents will get 50 cents an hour.

The previous wage adjustment for the steel industry was effected April 1, 1934, and amounted to 10 per cent. It was understood that this brought the common labor rate to 44 cents an hour, the same as in 1929, though there have been adjustments since and common labor rates now vary considerably between districts. On Aug. 1 this year the industry announced the re-establishment of the basic eight-hour day, providing for time and a half for all time over eight hours. Although in relatively few instances so far have employes benefited from this rule, presumably it will continue in effect.

The number of the industry's employes and the extent to which payrolls will be raised were indicated last week by a summary issued by the American Iron and Steel institute. These showed that all high employment records in the industry were broken in September, with a total of 526,700.

This is an increase of 23 per cent over September a year ago, when 429,200 were employed, and com-



*DISPLAYING* great interest in the various operations, thousands of families visited plants of the Carnegie-Illinois Steel Corp. in the Pittsburgh district recently to see their relatives at work. A few years ago a scene such as this, outside the Shenango works, would have been unusual at the gates of a steel mill. The visitors are being counted by an "electric eye" as they pass through the gate

pare with 522,400 in August this year.

Payrolls in September amounted to \$65,611,000, against \$45,893,000 in September last year and brought the total for the first nine months to \$540,779,000, against \$557,794,000 for all of last year.

Of the 97,500 employes added to steel payrolls during the past year, approximately 91 per cent represented wage earners, 7 per cent clerical department employes, and 2 per cent administrative and sales employes.

In 1929 the census of manufacturers reported 419,500 wage earners in the steel industry, a record exceeded in every month since April of this year, although in none of these months has output reached the 1929 level.

Wages payrolls increased 48 per cent between September, 1935, and the corresponding month this year, while salary payrolls advanced 23 per cent.

### Discuss Price Advances

In its quarterly financial report the Steel corporation stated the number of its employes in the first nine months this year was 216,709, and its total payroll was \$242,635,540. The Steel corporation's shipments of finished steel in the first nine months amounted to 7,867,707 tons.

These figures would indicate \$30.80 a ton as its payroll factor for finished steel.

In some sales offices last week there was talk of an advance of \$1 to \$2 a ton on finished steel prices for first quarter.

Carnegie-Illinois Steel Corp. early

## "Election Is Over; Let's Pull Together"

*NO TIME was lost last week by iron and steel producers to impress on employes the fact of continuing good will—despite the outcome of the election.*

*Managers of some plants called in employe representatives, said the election result was to be accepted by all in friendly spirit, as an expression of the will of the majority; that there were no bitter feelings. They were to pass the word along to employes.*

*In some plants letters from the management were posted on bulletin boards, in substance: "The election is over; let's pull together for the good of the country and our industry."*

last week made known that as a result of recent negotiations with its employe representatives it agreed to the following:

Grant a full review of his case to any worker suspended or discharged as a result of disciplinary action.

Obligate itself to discuss all matters of mutual interest with employe representatives in advance of decisions or announcements thereof.

Recognize workers' seniority rights and promote the man longest with the company, other qualifications being equal.

Take steps to disregard breaks, in service caused by shutdowns or

illness in the granting of vacations and pensions.

The corporation refused to:

Extend the company's insurance plan to cover pensioned employes, because of prohibitive cost.

Abolish incentive rates giving bonuses to employes for better performance of their work.

Increase vacations to a week annually for employes with two years' service and up to two weeks for workers of more than two years' service.

The management asked time to reconsider other points, such as more liberal pensions and placing girl clerks on a piece work basis who now receive less than common labor rate.

Organized labor lost no time in taking credit for the re-election of President Roosevelt. While steel employes were adopting a conciliatory course, brusque statements came from John L. Lewis and the CIO headquarters as to what will be done to the "steel barons."

It became known last week that a special agent of the LaFollette senatorial committee has been sent to Weirton, W. Va., to investigate charges of steel company "terrorism" against employes, and organizers of the CIO.

On the eve of the meeting of the CIO scheduled in Pittsburgh Nov. 7 and 8, John A. Brophy, CIO director, said:

"This will be one of the most important labor conferences in years. Many vital issues affecting the whole labor movement will be settled. A policy is to be determined that may affect the forthcoming Federation of Labor convention."

Recommendations to congress for "drastic legislative changes," were said by Mr. Brophy to be one of the subjects to be considered.

## Amalgamated Loses in Vote for Representatives

Employes at the two Coraopolis, Pa., plants of the Standard Steel Spring Co. balloted Nov. 1 for employe representatives, as provided under a strike settlement agreement. In this election the Union lodge of the Amalgamated Association of Iron, Steel and Tin Workers lost by a vote of 433 to 193.

## Record for Open Hearths

Cigars were passed around to the open-hearth crews last week at the Corrigan-McKinney division of Republic Steel Corp., Cleveland, in celebration of a new all-time monthly tonnage record for that plant. For October, with an average of 12 open-hearth furnaces in operation, production totaled 92,604 tons.



**WORKMEN**, foremen, superintendents and other officials played hosts to the crowds which went through the Carnegie-Illinois plants, offering their services as guides and passing out explanatory pamphlets. "We want everybody in town to know what goes on inside the gates," said one official. Some of the visitors are shown above examining ingot molds

# Financial

**A**MERICAN ROLLING MILL CO. reports consolidated net earnings of \$2,063,603 for the third quarter after deductions for depreciation, interest and federal taxes, but not including provisions for the federal undistributed profits tax.

This is equal, after provision of \$31,258 for preferred dividends, to 89.2 cents a share on the average number of 2,279,950 common shares outstanding.

Third quarter earnings compare with \$552,137, equal to 30 cents a share on the average number of shares outstanding in the third quarter of 1935; with \$743,903, equal to 34.5 cents a share, in the first quarter of 1936; and with \$1,561,161 equal to 68 cents a share, in the second quarter of 1936.

For the 12 months ending Sept. 30, consolidated net earnings after depreciation, interest and taxes were \$5,669,548 equal, after deduction of \$118,215 for preferred dividends, to \$2.62 a share of common stock on an average of 2,113,903 shares.

In issuing a call for redemption of its 4½ per cent convertible debentures due in 1945, the company announced that \$1,923,000 of the approximately \$12,700,000 of debentures outstanding have been already submitted for conversion under a plan approved by directors Oct. 27.

The bonds are to be redeemed on and after Dec. 5 at 102½ and accrued interest but bondholders have the right to convert their holdings into common stock on or before the redemption date on the basis of 40 shares for each \$1000 debenture.

Bonds converted on or before Nov 14, the record date for the 75 cent special dividend, entitle the holder to receive accrued interest to the date of conversion and to the full 30 cent regular dividend and 75 cent special dividend, minus the portion of each dividend accruing from Oct. 15 to the conversion date.

## PLANT EXPANSION REDUCES GRANITE CITY'S SHOWING

Granite City Steel Co.'s third quarter net profit was \$84,633, comparing with \$44,226 in the preceding quarter and \$102,824 in the third quarter last year.

Earnings were equal to 22 cents a share on common stock, against 11 cents in the second quarter and 40 cents in the September quarter a year ago.

Net profit for the first nine months this year amounted to \$190,076 after depreciation, federal income taxes, etc., and was equal to 49 cents a common share, of which there are 382,488 outstanding.

In the nine months last year net profits amounted to \$415,198, or

\$1.62 a share on 254,992 common shares then outstanding.

Extension improvements recently made by the company reduced this year's net.

## OTIS STEEL'S THIRD QUARTER UP

Otis Steel Co., Cleveland, reports for third quarter earnings of \$495,110, equivalent to 34 cents a common share, after allowing 7 per cent dividend requirements on the preferred, on which there is an accumulation of unpaid dividends of \$36.75 a share. In the second quarter the company had a net profit of \$751,674. The third quarter last year resulted in net loss of \$27,367. Nine months' net profit this year is reported as \$1,395,459, equal to 94 cents a common share, and slightly higher than the \$1,360,488 in the similar period last year.

## EASTERN ROLLING MILL REPORTS PROFIT

Eastern Rolling Mill Co., Baltimore, report third quarter earnings of \$13,195 after depreciation and federal taxes, but without allowance for surtax on undistributed

profits. This is equal to 6 cents a share, a loss of \$68,760 was reported for the period last year. Net earnings for the nine months ended Sept. 30 are \$8985, compared with net loss of \$178,423 in the corresponding period last year.

## Contract Awarded for Diesel Plant Extension

The Electro-Motive Corp., LaGrange, Ill., a subsidiary of the General Motors Corp. and builder of diesel locomotives, has awarded a contract to Austin Co., Cleveland, for a 504-foot extension to the main erection and machine shop bays. This will complete the original plan for this part of the plant, development of which had been held up pending operating experience in the initial unit which was finished in January, and provides 84,000 square feet of additional plant capacity.

Approximately 1400 tons of structural steel required for the extension will be shop-welded and shipped to LaGrange in prefabricated state to facilitate speed in erection.

## Gain in 52 Consumers' Earnings Is 58 Per Cent

**N**ET earnings of 52 identical companies among equipment manufacturers and other leading consumers of iron and steel, for the first nine months of 1936 average 58 per cent higher than in the corresponding period last year. STEEL's tabulation, Nov. 2, page 23, included 23 companies; while the

subjoined table lists a total of 29.

It is apparent from the great majority of financial reports that consumers' earnings have increased substantially, although in almost every instance provisions have not been made for surtaxes. All figures are net earnings, except where asterisk denotes loss.

	Third Quarter		Nine Months	
	1936	1935	1936	1935
Hoskins Mfg. Co., Detroit	\$141,826	\$95,599	\$393,160	\$293,677*
Yale & Towne Mfg. Co., Philadelphia	266,319	107,325	675,454	169,163
Briggs & Stratton Corp., Milwaukee	299,378	242,996	892,605	919,996
Cutler-Hammer Inc., Milwaukee	406,759	.....	980,533	.....
Evans Products Co., Detroit	135,186	37,584	412,642	1,294,337
L. A. Spring & Wire Co., Detroit	192,120	135,251	1,358,472	1,202,836
Allis-Chalmers Mfg. Co., Milwaukee	1,492,212	819,964	3,580,812	1,419,403
Murray Corp. of America, Detroit	.....	.....	1,210,963	1,129,200
Truscon Steel Co., Youngstown, O.	312,041	53,027*	632,257	214,565
Budd Wheel Co., Philadelphia	140,036	43,048	658,728	559,598
Edw. G. Budd Mfg. Co., Philadelphia	547,400*	31,344	774,404	310,327
International Business Machines Corp., New York	5,738,406	5,304,844	2,261,905	2,001,729
Fansteel Metallurgical Corp., North Chicago	39,013	190,638	117,932	.....
Marion Steam Shovel Co., Marion, O.	74,376	47,785	110,155	143,030*
Square D Co., Detroit	252,768	179,320	593,823	448,246
Motor Wheel Co., Lansing, Mich.	374,132	40,205	1,387,870	545,581
Federal Screw Works, Chicago	11,470*	70,563*	14,362*	106,290*
Atlas Tack Corp., Fairhaven, Mass.	86,212	.....	82,212	58,743
Spicer Mfg. Co., Toledo, O.	217,127	76,674	911,843	330,263
Minneapolis - Honeywell Regulator Co., Minneapolis	1,075,350	786,656	1,750,150	1,057,826
Bridgeport Mach. Co., Wichita, Kans.	.....	.....	349,581	131,130
Sullivan Machinery Co., Chicago	73,735	31,663*	178,610	95,998*
Apex Electric Mfg. Co., Cleveland	180,416	81,930	432,534	178,201
Ex-Cell-O Aircraft & Tool Corp., Detroit	151,387	10,646	285,264	217,927
Mullins Mfg. Corp., New York	136,276	71,243	409,304	324,542
Maytag Co., Newton, Iowa	836,813	695,832	2,184,099	1,928,000
Seagrave Corp., Columbus, O.	10,915	24,574*	27,188*	27,594*
Reliance Mfg. Co., Alhambra, Cal.	383,912	180,387	821,179	128,899
Savage Arms Corp., New York	129,056	76,674	130,104	27,893
National Supply Co., Torrance, Calif.	1,047,311	76,483*	2,889,843	85,297
Kelsey Hayes Wheel Corp., Detroit	42,140	.....	990,278	1,437,225

# Production

**S**TEELMAKING operations held at 73 per cent last week for the third consecutive week. Gains in the Pittsburgh, Wheeling, Cleveland, Birmingham, New England and Detroit districts were balanced by losses at Youngstown, eastern Pennsylvania, Buffalo, Cincinnati and St. Louis. Details follow:

**Youngstown**—Averaged 74 per cent, down 2 points, due largely to high ingot stocks and easing demand. Youngstown Sheet & Tube Co. resumed blowing its bessemer converters last Tuesday. Preliminary schedules indicate a drop of several points at this week's opening.

**Cleveland**—Gained 2½ points to 79½ per cent, as Otis Steel Co. resumed operations in the furnace it dropped the week previous, making a total of eight melting. Corrigan, McKinney division of Republic Steel Corp. continues with 12, and National Tube at Lorain with 11.

**Detroit**—Up 5 points to 100 per cent, based on ingot melting in all 21 basic open-hearth furnaces.

**Pittsburgh**—Up 1 point to 70 per cent, based on steelmaking operations by United States Steel Corp. subsidiaries at 67 per cent, and independents at 78 per cent. Over the past week the Corporation's rate has moved up a few points while that of the independents has shown a fractional decline. Out of 60 steelworks blast furnaces, 42 are active, a gain of one, as Bethlehem Steel Co. has blown in a sixth furnace at Johnstown, Pa.

**Cincinnati**—Declined 5 points to 91 per cent, when one open hearth was taken off leaving 22 producing.

**Central eastern seaboard**—Slightly easier at 47 to 48 per cent, although producers look for relatively little change before the holidays.

**New England**—Up 13 points to 88 per cent, with indications that this rate will continue this week.

**Chicago**—Continued at 76 per cent. Despite a slackening in demand for heavy products, mills look to relatively steady operations during the remainder of the quarter. Twenty-five of 38 stacks are active.

**Buffalo**—Down 3 points to 84 per cent, and will remain at that level this week. Thirty-one open hearths are melting.

**Birmingham**—Gained 5½ points to 67 per cent, with 15 open hearths in production. Tennessee Coal, Iron & Railroad Co. has 11 active, and Gulf States Steel Co., 4.

**Colorado**—Held at 38 per cent for the fifth consecutive week.

**St. Louis**—Down 3 points to 65 per cent last week.

**Wheeling**—Up 3 points to 89 per cent, with active schedules for 33 out of 37 open-hearth furnaces.

## District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended		Same week	
	Nov. 7	Change	1935	1934
Pittsburgh	70	+ 1	44	20
Chicago	76	None	55½	30½
Eastern Pa.	47½	— ½	39	20½
Youngstown	74	— 2	63	31
Wheeling	89	+ 3	84	39
Cleveland	79½	+ 2½	69	43
Buffalo	84	— 3	37	26
Birmingham	67	+ 5½	58	25
New England	88	+13	70	40
Detroit	100	+ 5	88	48
Cincinnati	91	— 5	†	†
Colorado	38	None	†	†
St. Louis	65	— 3	†	†
Average	73	None	53	27½

†Not reported.

Weirton Steel Co. has blown out one of its two blast furnaces at Weirton for repairs.

### CANADIAN OUTPUT GAINS

Production of steel ingots and direct steel castings in Canada in September totaled 86,077 gross tons, which was 7 per cent higher than the 80,164 tons of August, and 5 per cent lower than the 90,952 for September last year. For the first nine months of the year, production totaled 813,734 tons, against 647,704 a year ago.

Production of pig iron during Sep-

tember was 51,892 gross tons, compared with 38,570 tons in August, an increase of 35 per cent. Tonnage produced during September, 1935, was 55,360 tons. For the nine months ending in September, 1936, the total was 465,785 tons, contrasted with 419,064 tons in the same period last year.

## October Ingots in 5 Per Cent Gain

**P**RODUCTION of steel ingots in October was at the daily rate of 168,333 gross tons, compared with 160,043 tons in September, a gain of 8290 tons per day or 5.17 per cent, according to figures by the American Iron and Steel institute. Average daily production in October, 1935, was 116,398 tons, giving a gain of 44.61 per cent in October, 1936, over the same month in 1935.

Total calculated production for 10 months of 1936 is 38,150,305 tons, compared with 27,194,171 tons in ten months of 1935 and 33,417,985 tons for twelve months of 1935.

In October of this year capacity was engaged at 76.70 per cent, compared with 72.92 per cent in September and with 52.58 per cent in October, 1935. Average per cent of capacity engaged for ten months of 1936 is 66.59, compared with 47.65 for ten months of 1935.

## Steel Ingot Statistics

	Monthly Production—Complete for Bessemer; Open daily pro- Hearth, Calculated from Reports of Companies duction, Making 98.03 per cent all						Number of panies of (gross working days	
	—Open Hearth—		—Bessemer—		—Total—			
	Gross tons	Per cent of capacity	Gross tons	Per cent of capacity	Gross tons	Per cent of capacity		
1936								
Jan.	2,849,557	53.73	196,389	31.54	3,045,946	51.40	112,813	27
Feb.	2,761,973	56.25	202,445	35.11	3,964,418	54.03	118,577	25
March	3,157,579	61.83	185,040	30.86	3,342,619	58.58	128,562	26
April	3,637,479	71.23	304,775	50.83	3,942,254	69.09	151,625	26
May	3,744,161	73.32	302,092	50.38	4,046,253	70.91	155,625	26
June	3,649,948	71.47	334,897	55.85	3,984,845	69.83	153,263	26
July	3,596,125	70.42	326,606	54.47	3,922,731	68.74	150,874	26
Aug.	3,844,570	75.28	350,560	58.47	4,195,130	73.52	161,351	26
Sept.	3,858,060	75.55	303,048	50.54	4,161,108	72.92	160,043	26
Oct.	4,227,291	79.71	317,710	51.03	4,545,001	76.70	168,333	27
10 mos.	35,326,743	68.91	2,823,562	46.90	38,150,305	66.59	146,169	261
1935								
Jan.	2,630,303	49.70	239,858	34.99	2,870,161	48.02	106,302	27
Feb.	2,549,935	54.21	224,336	36.82	2,774,271	52.22	115,595	24
March	2,634,482	51.70	230,810	34.97	2,865,292	49.78	110,204	26
April	2,408,686	47.27	231,916	35.14	2,640,602	45.88	101,562	26
May	2,378,865	44.95	254,796	37.17	2,633,661	44.06	97,543	27
June	2,048,177	41.80	210,487	33.17	2,258,664	40.81	90,347	25
July	2,043,371	40.10	224,456	34.01	2,267,827	39.40	87,224	26
Aug.	2,682,569	50.69	223,361	34.05	2,915,930	48.78	107,997	27
Sept.	2,591,267	52.88	233,737	36.83	2,825,004	51.04	113,000	25
Oct.	2,872,040	54.27	270,719	39.50	3,142,759	52.58	116,398	27
10 mos.	24,839,695	48.68	2,354,476	39.26	27,194,171	47.65	104,593	260
Nov.	2,898,246	56.87	252,163	38.20	3,150,409	54.73	121,170	26
Dec.	2,945,013	58.06	228,392	35.99	3,073,405	55.53	122,936	25
Total	30,582,954	50.17	2,835,031	35.91	33,417,985	48.54	107,453	311

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

# October Iron Output Up 9.7 Per Cent; Furnaces Gain 6

**E**XPANDING blast furnace operations in October lifted the average daily coke pig iron production rate for the month to within striking distance of 100,000 tons a day, a level which has not been attained since early months of 1930 at the beginning of the depression. With a net increase of six more furnaces during the month, the active total on Oct. 31 was raised to 162.

Average daily production in October was 96,509 gross tons, this being a gain of 5567 tons, or 6.1 per cent, over the 90,942-ton daily rate of September. This showing has not been equaled by any month since

naces on Oct. 31 compared with 154 on Sept. 30 and 148 on Aug. 31. The October total has not been equaled since June, 1930, which also had 162 active units. In October of 1935,

## AVERAGE DAILY PRODUCTION

	Gross Tons			
	1936	1935	1934	1933
Jan. ....	65,461	47,692	39,537	18,348
Feb. ....	63,411	57,675	45,385	19,752
Mar. ....	66,004	57,120	52,438	17,484
Apr. ....	80,316	55,719	57,873	20,786
May ....	85,795	55,986	66,370	28,784
June ....	86,551	51,949	64,563	42,165
July ....	83,735	49,043	39,630	58,108
Aug. ....	87,475	56,767	34,199	59,137
Sept. ....	90,942	59,009	29,969	50,264
Oct. ....	96,509	63,818	30,689	43,824
Nov. ....	.....	68,876	31,930	36,124
Dec. ....	.....	68,242	33,161	38,456
Ave. ....	80,680	57,694	43,774	36,223

## MONTHLY IRON PRODUCTION

	Gross Tons		
	1936	1935	1934
Jan. ....	2,029,304	1,478,443	1,225,643
Feb. ....	1,838,932	1,614,905	1,270,792
Mar. ....	2,046,121	1,770,990	1,625,588
Apr. ....	2,409,474	1,671,556	1,736,217
May ....	2,659,643	1,735,577	2,057,471
June ....	2,596,528	1,558,463	1,936,897
July ....	2,595,791	1,520,340	1,228,544
Aug. ....	2,711,726	1,759,782	1,060,187
Sept. ....	2,728,257	1,770,259	899,075
Oct. ....	2,991,794	1,978,379	951,353
Tot. 10 mo.	24,607,570	16,858,694	13,991,767
Nov. ....	.....	2,066,293	957,906
Dec. ....	.....	2,115,496	1,028,006
Total .....	21,040,483	15,977,679	

June, 1930, with 97,817 tons. In October, one year ago, the daily rate was 63,818 tons.

Total production for October was 2,991,794 gross tons, which, compared with the 2,728,257 tons of September, was an improvement of 263,537 tons, or 9.7 per cent. Part of this increase was attributable to the fact that October was a one-day longer month than September. The October output was the best for any month since May, 1930, which recorded 3,241,477 tons. The production for October, 1935, was 1,978,379 tons.

For the ten months of 1936, production has amounted to 24,607,570 tons, against 16,858,694 tons in the corresponding period of 1935. The increase of 7,748,876 tons is equivalent to 45.9 per cent. Only 13,991,767 tons was made in the ten months of 1934.

Relating production to capacity, operations in October were at 71.0 per cent, as compared with 66.9 per cent in September and 64.3 per cent in August. In October, a year ago, the rate was 45.8 per cent.

The total of 162 active blast fur-

only 116 stacks were making iron. During the month, eight nonmerchant or steelworks furnaces resumed and two were blown out or banked. Of the merchant class, three were made active and only one blew out.

Blast furnaces resuming in October were: Lorain No. 5, National Tube Co.; Anna, Struthers Iron & Steel Co. In Pennsylvania: Bethlehem D and Cambria L, Bethlehem Steel Co.; Donora No. 2, American Steel & Wire Co.; one Eliza, Jones & Laughlin Steel Corp. In Indiana: Madeline No. 3, Inland Steel Co. In New York: Harriet Y, Wickwire Spencer Steel Co. In Alabama: Ensley Nos. 4 and 5, Tennessee Coal.

## OCTOBER IRON PRODUCTION

	No. in blast last day of		Total tonnage	
	Oct.	Sept.	Mer- chant	Nonmer- chant
Ohio .....	38	36	96,558	632,084
Penna. ....	55	52	86,082*	879,208*
Alabama ....	13	10	91,779	72,856
Illinois ....	12	12	52,266	212,575
New York ...	14	13	46,827	181,183
Colorado ...	1	1		
Indiana ....	13	12	11,603	444,633
Maryland ...	5	5		
Virginia ...	0	0		
Kentucky ...	2	2		
Mass. ....	1	1		
Tenn. ....	0	1		
Utah ....	1	1	26,099	158,041
West Va. ...	2	3		
Mich. ....	4	4		
Minnesota ...	1	1		
Missouri ...	0	0		
Total .....	162	154	411,214*	2,580,580*

\*Includes ferro and spiegeleisen.

Iron & Railroad Co.; Woodward No. 3, Woodward Iron Co.

Stacks blowing out were: In Pennsylvania: Bethlehem G, Bethlehem Steel Co. In West Virginia: Weirton No. 1, National Steel Corp. In Tennessee: Rockdale, Tennessee Products Corp.

With the scrapping of two more blast furnaces, the total number of potential units in the United States is reduced from 247 to 245.

Virginia Iron, Coal & Coke Co., Roanoke, Va., recently sold its last remaining unit, the Radford furnace at Radford, Va., for scrap. Roanoke Scrap Iron & Metal Co., Roanoke, Va., has the contract for demolition, the work to be completed by the end of 1937. The Radford furnace, built in 1890-92 and last operated in 1919, had an annual capacity of 80,000 tons of foundry pig iron. At one time, the Virginia company owned and operated eleven

## RATE OF OPERATION

(Relation of Production to Capacity)

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

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

blast furnaces, nine of which were in Virginia and two in Kentucky; all of these are now scrapped.

American Rolling Mill Co., Middletown, O., has purchased the property of the Marting Iron & Steel Co., Ironton, O., as reported in STEEL for Oct. 26, page 29, and the Etna blast furnace is now being razed. This furnace was built in 1875 and has been inactive since 1924. It had an annual capacity of 150,000 tons of basic, foundry and malleable iron.

## More Patman Complaints; Trade Treaties Negotiated

In Washington last week it was expected that the federal trade commission will issue several more complaints under the Robinson-Patman price control act early this week. However, it was said none will affect steel or allied industries.

President Roosevelt said at his press conference that the state department will go right ahead with six or eight foreign trade agreements, some of which are now being negotiated.





# Trailers Stage National Show; 50,000-Ton Steel Market

**T**HE HOUSE trailer, most publicized of the country's newer industries, is taking a bow along with its constant companion, the automobile, at New York this week.

Displays of 1937 motorcars at the annual automobile show find various trailer manufacturers also represented by the new models with which they hope to continue the spectacular production gains which so far have marked the relatively brief career of this industry.

Probably the most interesting feature of the new trailers is the definite trend toward steel construction. If the new designs of leading manufacturers may be taken as indicative of future practice, the house trailer will go the way of the automobile in substituting metal for wood. It may take time before the term "all-steel" is as synonymous of trailers as it now is of motorcar bodies, but the trend appears unmistakable.

It is significant that the Covered Wagon Co., Mt. Clemens, Mich., the largest builder of trailer coaches this year, has "gone steel" with the three new models it is introducing. While the design still may not be termed the all-steel type, the tendency is in that direction.

The new type chassis of this company's products is formed from No. 14 gage steel, riveted and electric welded. Side members are of Z-section, and cross members are all

box and channel sections. Spring hangers are welded to the chassis frame, and frames are underslung to a forged steel action with a 3-inch drop.

Body construction is of reinforced steel which provides a stronger and stiffer unit without a marked increase in total weight. The body shell, which replaces the former leatherette covering, is No. 30 gage galvanized sheet steel. Canvas is used for the roof covering, as formerly. New drop-type windows have inside steel finish moldings. All windows and ventilators are screened. Interior finish of the two highest price models is of mahogany throughout.

## Types of Construction

Pierce-Arrow Motor Corp., which recently entered the trailer industry, employs aluminum panels in connection with an all-steel skeleton frame. Another newcomer, the Edwards Home-mobile Corp., South Bend, Ind., claims to have the first genuine all-steel house trailer. This company is a manufacturer of truck cabs and bodies and truck semi-trailers, and recently completed the development of three trailer models. It has ambitiously provided a plant capacity of 10,000 trailers per month.

Edwards' trailers reflect the automotive influence in appearance and method of construction. Liberal

use has been made of steel for both the structural members and the body covering, one exception being the substitution of fabric for sheet steel above the belt molding. Steel body panels, backed with insulation, are employed below the molding line. The roof also is steel.

In fabricating the all-steel chassis, two twin back linear rails of new design are anchored to six Z-rail cross members having electrically welded dual dovetail laps at the points of intersection. Chrome-molybdenum steel springs are suspended in rubber. Body side sills are of Z-type and become an integral part of construction, electrically welded, after assembly. Body pillars, extending completely over the roof, are rectangular box tubing of special design. Steel body panels are welded to the outside of the pillars, while the interior wall paneling snaps into place.

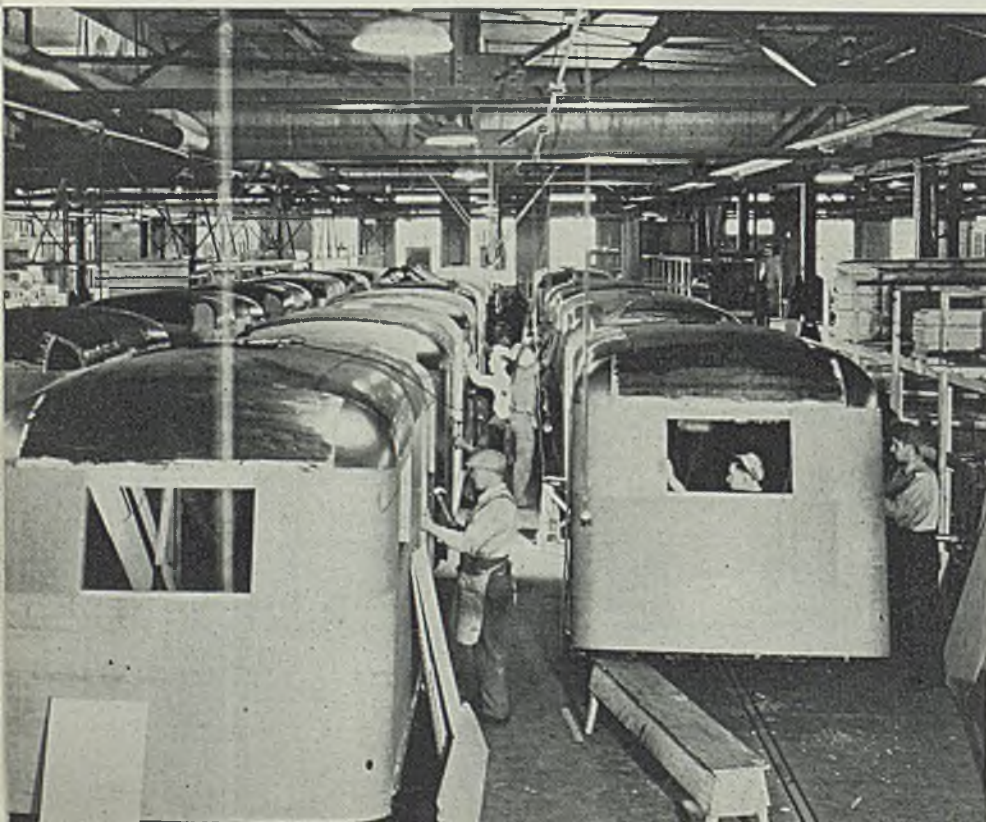
Steel also finds application in the Edwards trailer interior. Cabinets containing a stove, sink and ice box are of steel as also is a combination writing desk and chiffonier dresser.

The tendency toward increased use of steel is apparent among house trailers of other manufacturers. To a certain extent this is a natural accompaniment to the emphasis which automotive interests have placed upon all-steel bodies. The trailer builder, however, has a special problem in his attempts to hold down the weight of the coach and at the same time make it substantial and long-lived.

Unlike the automobile, the trailer does not have the moving parts which wear out and make replacement necessary within a few years. Sturdy construction, which will resist the shocks of travel, consequently is necessary, and in this regard steel can play an important part.

Since the cost of towing a trailer increases with its weight, wood was used liberally in building the early models. Also, many of these were hand-made, built without facilities required for steel fabrication. That substitution of steel for many wood and fabric parts does not add substantially to the total weight of the

*THE trailer industry probably will consume 50,000 tons of steel next year. Here is a group of 20 models, with all-steel bodies, on the assembly line at the Covered Wagon Co., Mt. Clemens, Mich.*



trailer, however, is indicated by the new models of the Covered Wagon Co. Compared with its predecessors, the 1937 models of this company weigh only about 100 pounds additional.

How much of a steel market is being opened by the startling growth of this industry? There is no question that house trailer building has emerged from the back yard and has taken its place among the mass production industries, but whether its growth will attain the proportions made by some forecasters is a question that time alone will answer.

The principal conclusion to be drawn from the many figures quoted this year regarding house trailer production and use is that much misinformation has been distributed. Some supposed authorities state that there are as many as 600 to 700 manufacturers of house trailers in the United States; others estimate the number as only around 200. The latter figure probably is closer than the larger total to the actual number of builders who have produced as many as one trailer monthly this year.

As in the case of most booming industries, companies have been attracted to the field rapidly, but many do not have the facilities or finances necessary to obtain heavy production. A large proportion of the output of the smaller builders has been hand-made. Now with efficient plants having larger capacity being established, competition is expected to become keener and the number of manufacturers to decline, since hand methods cannot compete in both quality and cost with mass-production practice.

Figures on the number of trailers in operation are none too reliable, and frequently exaggerated. Last year there were 733,414 trailers of all types registered, and the larger proportion of these were commercial units. Exactly how many is not known because there is no distinction in the registration. Probably not more than 150,000 were of the tourist type.

One recent survey estimates that the number of house trailers increased from 100,000 in 1935 to

more than 300,000 this year. The indicated gain of 200,000, however, is far in excess of actual output of the leading builders. Covered Wagon Co. heads the list this year, well ahead of its nearest competitor, with a production of 9000 units during the first nine months. Output of all factory builders in 1936 will do well to exceed 25,000 trailers.

The important feature of the business this year is that builders have been able to satisfy only a fraction of the actual demand and that steps have been and are being taken to enlarge 1937 capacity materially. Covered Wagon Co., for instance, which built only 1134 trailers in 1935, expects to turn out 20,000 to 25,000 units next year, estimating a potential market in the United States for 250,000 trailer coaches. Silver Dome Inc., Detroit, second leading interest, quadrupled its capacity this year but found additional expansion necessary to accommodate its projected 1937 output.

#### Is Market Overestimated?

A ten-fold gain in sales in 1937 would be spectacular enough, yet one observer recently predicted a production of 700,000 trailers next year. It is highly questionable whether the industry at present is physically capable of attaining such an output even in the event that many coaches could be marketed.

In view of the recent heavy but unsatisfied demand for trailers, however, it seems logical to expect that trailer manufacturing eventually will attain a growth undreamed of only a few years ago. If the prediction of Roger W. Babson that "half the population will be living in trailers in 20 years" is to be real-

ized, it would be necessary to build about 1,500,000 trailers annually between now and 1956.

Assuming the more conservative outlook of a 1937 production of 250,000 units, the probable steel consumption is impressive. In addition to the steel requirements for construction of the trailers, a sizable quantity is required for various fittings, such as beds, stoves, sinks, ice boxes, water tanks, and the like. That the trailer industry will account for the consumption of at least 50,000 tons of steel next year seems likely. Prospects for future years appear even more promising.

## Electric Steel Plant Started in Los Angeles

An electric furnace steel plant has been started on a site south of the Pacific Electric station at Watts, in the Los Angeles metropolitan district by California Electric Steel Mills Inc. The plant, it is reported, will cost \$200,000, including site, and employ 75 men.

The plant will be under management of A. C. Denman, formerly president and general manager of the Southern California Iron & Steel Co., which was acquired Jan. 1, 1930, by the Pacific Coast Steel Corp., subsidiary of Bethlehem Steel Co. With him are Seymour Swarts, formerly general manager of the Federated Metals Co.; Frank Anderson, formerly of the Llewellyn Iron Works, Los Angeles, and now president of the Atlas Brass Co.; John C. Denman and O. T. Johnson II.

The company will manufacture electrical steel and rolled products.

**C**ONSIDERABLE steel is used inside the trailer for the built-in sinks, ice boxes, stoves, water tanks, beds, cupboards and other fittings, as shown in this view looking rearward in a deluxe model



# Men of Industry

**W**H. BURNETT, superintendent of Clairton division blast furnaces of Carnegie-Illinois Steel Corp., Pittsburgh, has been transferred to the Ohio works as assistant superintendent. He is succeeded at Clairton by William Stewart, formerly assistant superintendent of the Edgar Thomson blast furnaces. T. G. Ayres, assistant superintendent of the Isabella blast furnaces, has been transferred to assistant superintendent of the Edgar Thomson furnaces.

Carnegie-Illinois also announces the following changes in its open-hearth personnel: R. Urquhart, superintendent of open hearth No. 3 at the Homestead works, has been made assistant superintendent of the entire open-hearth organization at the Homestead division. F. R. Smith, superintendent of the Clairton open-hearth department, has been transferred to the position vacated by Mr. Urquhart, while W. F. Davis, assistant superintendent of the open-hearth division at Clairton, will succeed to Mr. Smith's former position.

William C. Heath, president and general manager of the A. O. Smith Corp., Milwaukee, has been elected a trustee of Beloit (Wis.) college.

Sam F. Keener, president, Salem Engineering Co., Salem, O., sailed for Europe Oct. 24. He plans to visit England, France and Germany.

Aldus C. Higgins, president and general manager of the Norton Co., Worcester, Mass., has returned from a business trip abroad, where he visited London and Paris.

William M. Akin, assistant to the president, Laclede Steel Co., St. Louis, has been elected a vice president of the company, succeeding the late Joseph W. Louis.

Edward W. Hill, superintendent of No. 4 open hearth at the Homestead, Pa., works of Carnegie-Illinois Steel Corp., and widely known in steel operating circles, resigned Nov. 1.

B. E. Sivyver Jr. has been appointed branch manager of the San Francisco office of the Chain Belt Co., Milwaukee, succeeding the late G. E. Taylor.

C. M. Allen, staff supervisor of safety and training, American Rolling Mill Co., Middletown, O., has been elected a member of the executive committee of the National Safety council, Chicago. Mr. Allen now

holds three offices in the National council: Chairman of the metals section, one of the 136 directors, and an executive committeeman.

John T. Brown, works manager of the Chain Belt Co., Milwaukee, has been elected a vice president of the company. He has been associated with Chain Belt since graduation from Yale university in 1925.

Maurice McCarthy has been appointed district manager at Cincinnati for the Anaconda Wire & Cable Co., New York. He formerly was identified with the Cleveland office of the company.

A. R. O'Neal has been named district manager of the new district office at Charleston, W. Va., of the Linde Air Products Co., unit of the Union Carbide & Carbon Corp., New York. He assumed his new duties Oct. 5.

Charles F. Kettering, vice president in charge of research, General Motors Corp., has been elected a director of National Cash Register Co., Dayton, O., filling the vacancy caused by the death of John C. Haswell.

J. S. Gorman has been elected vice president in charge of sales of the Signode Steel Strapping Co., Chicago, maker of tensional steel strapping. Mr. Gorman has been directing the sales of this company for the past five years.

Ray H. McMaster, formerly identified with the Sauereisen Cements Co., Etna, Pa., is now connected with the Hewitt Rubber Co., Pittsburgh, and Chicago Belting Co. in the Pittsburgh district in sales promotion work.

George B. Magrane has been elected vice president in charge of manufacturing of the Oak Screw Products Co., Hillsdale, Mich. He also has been named to the board of directors of the company. Mr. Magrane formerly had been associated with the Chrysler Corp.

W. W. Williams, formerly general sales manager, Babcock & Wilcox Tube Co., Beaver Falls, Pa., has been elected general manager of the company. T. F. Thornton, formerly sales manager of the Detroit district, has been named general sales manager.

Louis Kuehn, president, and A. J. Luedke, secretary-treasurer, Milcor Steel Co., Milwaukee, have been

elected to the board of directors of the Inland Steel Co., Chicago, which acquired Milcor last July.

Paul J. Galbreath has become associated with the Marr-Galbreath Machinery Co., Pittsburgh. Mr. Galbreath, son of M. D. Galbreath, treasurer of the company, was graduated from Carnegie Institute of Technology in June of this year. He is a member of the American Society of Mechanical Engineers.

William Rowe, heating and ventilating engineer, and former chief engineer for the American Blower Corp., has been added to the staff of the Trane Co., La Crosse, Wis., in charge of fan engineering and the application of fans to the complete line of Trane heating and cooling products.

John W. White, formerly managing director of the Cia. Westinghouse Electric Internacional, S. A., with headquarters at Buenos Aires, Argentine, has been appointed general manager of the Westinghouse Electric International Co. Mr. White will make his headquarters at 150 Broadway, New York.

Woods Sanford has resigned as advertising manager of the Harnischfeger Corp., Milwaukee to join the sales force of the Chain Belt Co., Milwaukee. He is succeeded by Edward Slackford, formerly with the Marion Steam Shovel Co., Marion, O., and more recently engaged in industrial advertising agency work.

Frederick Salditt, export manager of the Harnischfeger Corp., Milwaukee, has been elected a vice president of the firm. Mr. Salditt entered Harnischfeger works as a shop clerk in 1923, and worked through various departments until he became head of the export department two and a half years ago.

Stanwood W. Sparrow has been appointed research engineer for Studebaker Corp., South Bend, Ind., succeeding William S. James, who was recently made chief engineer. Mr. Sparrow went with Studebaker in 1926 from the bureau of standards, Washington, where he had been in charge of the automotive power plant section.

J. S. Allison Jr. has been named Chicago district manager of the refractories sales department of the Babcock & Wilcox Tube Co., Beaver Falls, Pa. He will be assisted by H. J. Shaner and R. M. Onan, who have been handling the sale of refractories in the Chicago district for several years. Mr. Allison was formerly manager of the high temperature insulation department, building products division of Armstrong Cork Products Co.

# Died:

**O** J. H. HARTSUFF, general superintendent of the Edgar Thomson works of the former Carnegie Steel Co. from 1920 to 1933, and a director of Carnegie until his retirement in 1933, at New Castle, Pa., Nov. 5. He had a 49-year continuous record of employ with Carnegie and its predecessors.

Andrew A. MacLean, 55, president, Fisher Brass Co., Marysville, O., in that city, Nov. 1.

Fred N. Raymond, 57, president, Hillside Tool & Die Co. for 17 years, in Elizabeth, N. J., Nov. 2.

Grover H. Schatz, 48, president, Waterbury Steel Ball Co., Waterbury, Conn., and vice president and secretary of Schatz Mfg. Co., and

the Federal Bearings Co., Poughkeepsie, N. Y., in Poughkeepsie, Nov. 2.

Conrad Trimborn, 70, founder and president-treasurer, Milwaukee Bridge Co., Milwaukee, in that city, Oct. 30.

Martin E. McKee, 72, retired district manager of the Republic Steel Corp., at his home in Cincinnati, Nov. 4.

Grant McCargo, 72, president of the Pittsburgh Taximeter Co., San Toy Mining Co., Steelworkers Land Co., and in 1893 founder of the Pennsylvania Lubricating Co., at Pittsburgh, Nov. 1.

Stephen R. Coleman, 85, for many years manager of the land department of Republic Iron & Steel Co., now Republic Steel Corp., in Birm-

ingham, Ala., Oct. 30. He retired several years ago.

P. William Mathews, 69, president, Mathews Plumbing & Heating Co., Niagara Falls, N. Y., in that city, Oct. 26.

Harry S. Bramen, 55, retired general superintendent of blast furnaces and steelworks, at the Campbell plant of the Youngstown Sheet & Tube Co., in Poland, O., Oct. 28.

Jacob E. Pugh, retired general superintendent of the merchant mill of the Minnequa plant, Pueblo, Colo., of the Colorado Fuel & Iron Corp., in that city, recently.

T. J. Brown, who retired a year ago after 35 years as superintendent of rolling mills of the Colorado Fuel & Iron Corp., Denver and Pueblo, Colo., in Pueblo, recently.

## Atlantic Steel Cradle of Many Top Executives



**N**INE men who rose to positions of prominence have not been forgotten by their former associates in Atlantic Steel Co., Atlanta, Ga.

They are honored in a gallery of photographs which proves that Atlantic has been the training ground for a considerable number of the iron and steel industry's leaders, even though it is a small company, as tonnage goes.

Hanging on a wall of the office of Charles F. Stone, president of Atlantic, are the pictures of these former employes and officers who since have gone to higher positions.

As shown in the cut above, they are, reading from left to right, bottom row:

Thomas K. Glenn, formerly president, but now chairman of Atlantic; a former

member of the board of directors of the American Iron and Steel Institute; now president of the Trust Company of Georgia, Atlanta.

Charles H. Elliott, district manager, Republic Steel Corp., who served Atlantic as open-hearth superintendent.

Tom M. Girdler, chairman and president, Republic Steel Corp., Cleveland, who once was general superintendent of Atlantic.

J. Z. Collier, former assistant general manager of the Jones & Laughlin Steel Corp., Pittsburgh, who served Atlantic as mechanical superintendent.

Robert Gregg, former president of Atlantic, now vice president of United States Steel Corp., New York.

Top row, reading from left to right:

Carl C. Brown, general manager of sales, Gulf States Steel Co., Birmingham, Ala., who was a member of Atlantic's traffic department.

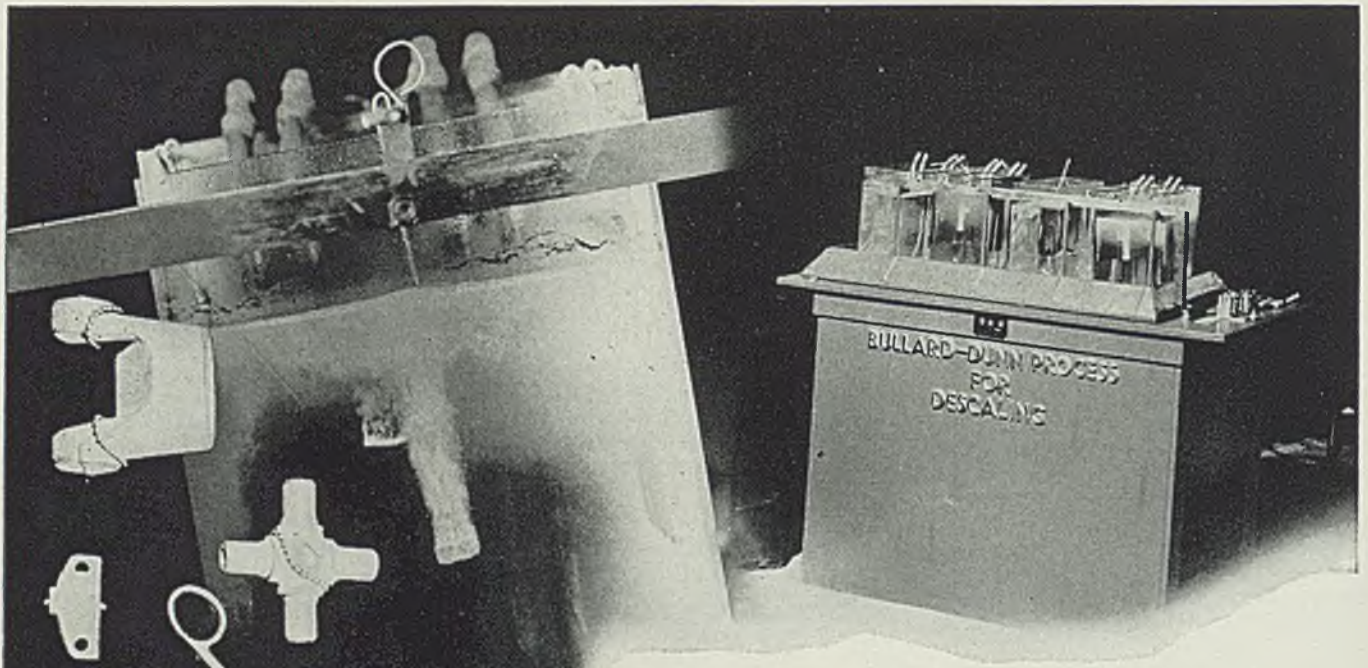
George W. Connors, secretary, and one of the organizers of Atlantic in 1901,

who is now president of Connors Steel Co., Birmingham.

Carl I. Collins, manager of American Steel & Wire Co. in the Worcester, Mass., district, who was a member of Atlantic's engineering department.

Robert M. Keeney, who was president of Pittsburgh Crucible Steel Co. until his death a few years ago. Mr. Keeney had been with Atlantic as open-hearth superintendent.

Others whose photographs do not appear in the above group include Arthur Taylor, now with the American Iron and Steel Institute, who was formerly open-hearth superintendent for Atlantic, and Arthur B. Haswell, now assistant to vice president in engineering and construction, Tennessee Coal, Iron & Railroad Co., Birmingham. He formerly was in Atlantic's engineering department.



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## DETROIT

**T**HERE was an air of finality in Detroit last week. With the election over and all the new cars now on open display, the two big events anticipated for more than ten months had at last reached fulfillment.

Now, it is beyond question that all of the 1937 automobiles have four wheels and that a president has been chosen for the next four years. From all outward appearances, the automobile industry took the election in full stride and a few days later appeared to be almost indifferent to the outcome.

Next on the calendar are the annual automobile shows. For ninety-nine people out of every hundred this week will be the first time that 1937 models stand revealed.

True, some of the early birds in motordom have had their cars on the streets for a month and their plants are choked with orders. Yet for most automobile manufacturers, the shows are conceded as the final proving ground.

**Production on Way Up**

At this focal point, automobile executives are planning runs something to this effect: Starting from the assumption that all 1937 models will sell proportionately as well as the Packards, Studebakers and Buicks, those cars already out a month or more, production schedules should begin to climb rapidly in November.

Before another week has passed assemblies will have reached 100,000 units per week. Production schedules for December doubtless will exceed November. In brief, this month and next may well account for turning out 750,000 automobiles.

Once Ford is in full swing, and this is more than imminent, the assembly curve will make rapid advances. Viewing the industry's production as a whole, the fourth quarter started like a lamb, due to Ford's delay of almost a month in getting into new model production, but it bids fair to close like a lion.

Beyond that, the industry wouldn't relish another February such as they experienced this year. Memory recalls that old man winter took a hand and tied up retail sales then,

much to the discomfiture of motor plants' cost sheets.

But barring the weather, it is cheering to record that this industry now appraises the next 60 to 90 days optimistically and for a progressive expansion in assemblies and sales.

For the fact that Ford had been more successful at concealing its hand on 1937 plans than many of its competitors, last Saturday afternoon's story detailing the new V-8's for the coming season took precedence over many a piece of automobile news now current.

In a sense greater than most people realize, the seclusion aspect to Ford's 1937 plans was not premeditated. True, the usual precautions were taken about publicity getting out on coming models, but much this year was accident that the automobile industry came right up to the deadline, so to speak, without being sure of many Ford '37 details.

To put the matter another way, Henry Ford's own personal slant on what the American public wanted played a dominant role in what changes were made over the 1936 model. Consequently, a number of engineering choices were kept dangling right up to a few weeks ago.

The matter of the small 60-horsepower motor which Ford is making optional on six of its body styles the coming year serves the point well. A trimmed-down Ford eight first came to the attention of the motor world last April when a number of small motor blocks were run through at Dearborn, to all intents and purposes on a production schedule.

**Ford Offers Two Motors**

Then activity ceased for a time, but through the intervening six months, by fits and spells, the subject was picked up again, only to be repeatedly shelved. At last, Henry Ford himself seemed convinced that a broad market existed for a car giving the maximum in economy, the executive o. k. was then initialed, and now Ford for the first time since 1930 is producing two types of motors.

The subject of brakes for the V-8 was another illustrated case. For the past summer and fall there were just as many supporting facts

that hydraulics would be adopted as there was proof that mechanical brakes would carry over.

Take the case of a leading parts-maker who works closely with Ford. Some time ago, in fact early last spring, the company spent around \$500,000 for new plant and equipment on the assurance from Ford that it would share in supplying brake requirements.

But one of the first stipulations issued by Ford headquarters was to the effect that this particular parts-maker should develop six different designs of brakes for a car in the low-price field such as Ford would bring out. Various interpretations on cable-controlled, rod-controlled, power-vacuum and hydraulic brakes were all to be engineered and perfected before any production orders were issued.

**Brake Decision Delayed**

So much was done, with the result that the company in question went to considerable expense on the job. It must have been dismayed to come up to as late as two weeks ago last Wednesday and find the decision still on the boards at Ford to carry over the same type of mechanical brake as was on the 1936 models.

In that brief interim, though, as the American public now knows, Ford switched to a cable and conduit controlled, self-energizing brake, and so equips its 1937 jobs.

On the subject of Ford's 1937 models some comment is arising from the "companion motor" idea. It runs this way: That the spreading out Ford now has gone to in making six of its 11 body styles available with an 85-horsepower motor and the other five bodies available only with the small 60-horsepower motor may have been a broad company policy move.

But instead of in 1936, this innovation might have been smarter in the depression days of 1931 and 1932. Then, people were really interested in cheap transportation. Today with incomes rising, they seem more interested in the middle-price car bracket. Ask such makers as Buick if they aren't.

Of course, the latest Ford move to drop a car purely designed for

# MIRRORS of MOTORDOM

economy into the market narrows still further the price gaps left uncovered by the V-8, the Lincoln Zephyr and the Lincoln. Furthermore, there still is to some extent, and probably always will be, a large market down where Willys-Overland and the Ford "60" soon will be competing.

Speaking of Willys, next week at the shows it will be ready to spring its new series. Only two body styles will be offered, a coupe and a two-door sedan, at a price somewhere close to \$400, f.o.b. Toledo, O.

The new Willys management, headed by Ward M. Canady, chairman, seems to have shrewdly sized up the situation, starting from the premise that because about 90 per cent of the population receives less than \$150 per month, they can sell a new Willys at \$7 a month less on payments and from \$3 to \$6 a month less on operating cost.

Some 900 dealers already are signed up by the only Toledo maker of motor cars and an appeal will be made to used car dealers, interests with small capital desiring to enter automobile retailing, and to dealers already in the high-price car business, as likely Willys sales outlets.

Late last week Willys began assembling cars after having had sub-assembly operations going for the preceding three to four weeks. It also sold its old Elyria, O., plant for \$100,000 to the Bender Body Co., Cleveland, who after spending another \$100,000 for alterations, will begin making trailers.

## Tool Trade-Ins Revived

To bring out its new model, Ford has been retooling sporadically for a number of months, especially for the small motor. The standard V-8 of 85 horsepower experienced little retooling on the line, but typical of Dearborn's participation in machine and equipment purchases, single units were, and still are, constantly being bought. This policy seems in direct contrast to other plants where large inclusive buying programs come out at one time on machine tools.

In replacing used machine tools in both its apprentice shops and tool rooms, Ford has recently revived a policy requiring the seller of the new machine to take back the machine tool being replaced, as a trade-in. So far this policy has not applied on new production equipment.

Once in a while this policy of trading in old machine tools on new ones has its kick-back. There is the interesting case at Ford now that had its inception a number of years ago when an old lathe was replaced by

## Automobile Production

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

	1934	1935	1936
Jan. ....	155,666	289,728	364,004
Feb. ....	230,256	332,231	287,606
Mar. ....	338,434	425,913	420,971
Apr. ....	352,975	452,936	502,775
May ....	330,455	361,107	460,565
June ....	306,477	356,340	452,955
July ....	264,933	332,109	440,999
Aug. ....	234,811	237,400	271,291
Sept. ....	170,007	87,540	135,130
9 mo. ....	2,384,014	2,875,304	3,336,296
Oct. ....	131,991	272,043	.....
Nov. ....	83,482	395,059	.....
Dec. ....	153,624	404,528	.....
Year ....	2,753,111	3,946,934	.....

Estimated by *Cram's Reports*

Week ended:	
Oct. 17 .....	48,195
Oct. 24 .....	59,740
Oct. 31 .....	66,985
Nov. 7 .....	84,305

a modern machine tool. It just so happened that the old machine was one of Henry Ford's original pieces of equipment and that he had had it since 1906 or thereabouts.

But it was traded in and got out of the plant unnoticed. Recently the Ford hobby of collecting the quaint and superannuated recalled this particular lathe. Since the company had traded it in it had passed through a number of dealers' hands and at last was found in a naval aircraft shop in Illinois. No amount of offers could unravel government red tape so that the Dearborn museum could be embellished.

Hudson, cheered by the public's attitude on its new models, has two assembly lines working that turned out better than 3000 models last week, or at an average of 600 a day. On the Terraplane, Hudson has added five commercial models for 1937. They are a ¾-ton panel, a ¾-ton pickup, utility coach, utility coupe pickup and a station wagon.

The story is making the rounds in automobile circles that up at Pontiac, President Klinger is satisfied for the first time since he took over the reins. On the score that Pontiac now makes most of its own castings, its axles and other parts, Pontiac is more self-contained than in its history and should have a smoother production gait in 1937.

Buick, fairly exuding prosperity these days, last week had a schedule of 27,326 cars down for December and was busy working down the November quota of 25,434 models. One day last week it made as high as 1010 cars between Flint and the new

Federal Motors plant in California. It claims to have orders for over 40,000 cars on hand.

It's pretty much the same story as a week ago at Packard, where assemblies clipped off over 2600 jobs for the week and still had not caught up with unfilled orders.

Olds is said to have had some difficulty recently with machining motor blocks but is working out of the difficulty and last week bettered 1500 assemblies in five days. Pontiac made slightly more than 3600 jobs last week; Cadillac-LaSalle, about 625 units.

"Look ahead, plan ahead and keep ahead in 1937" is the slogan Chevrolet has broadcast to its dealers, as it looks somewhat apprehensively on the two Ford entries spreading the low-priced field and realizes the 1937 race shapes up as a tight contest.

Last week Chevrolet's assemblies were up a shade to 19,000-odd cars for the week, as most of the trouble at Flint over fender breakage cleared up. The 20,000-unit week is the early goal of Chevrolet and should be realized soon.

At Dearborn, assemblies by comparison were not yet up to either Chevrolet or Plymouth. The Ford figure for the week now closed was about 5000 jobs, but close observers say it can be readily doubled and even trebled from that figure even in a week's time. In fact, Dearborn has about completed another steel and materials purchase for another 100,000 jobs.

## Plymouth Assemblies High

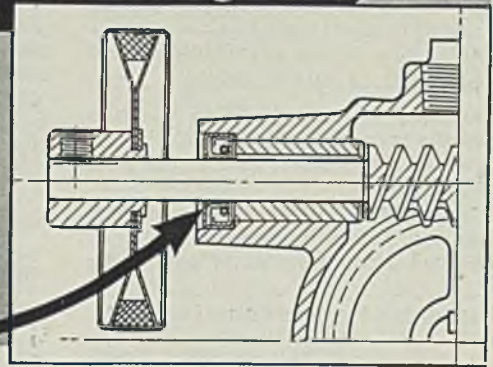
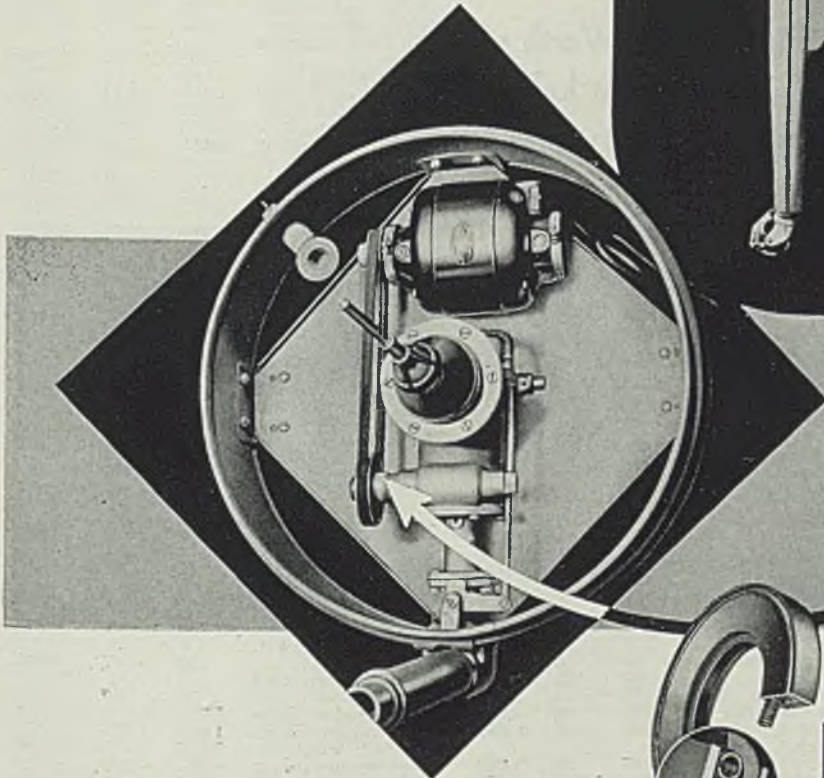
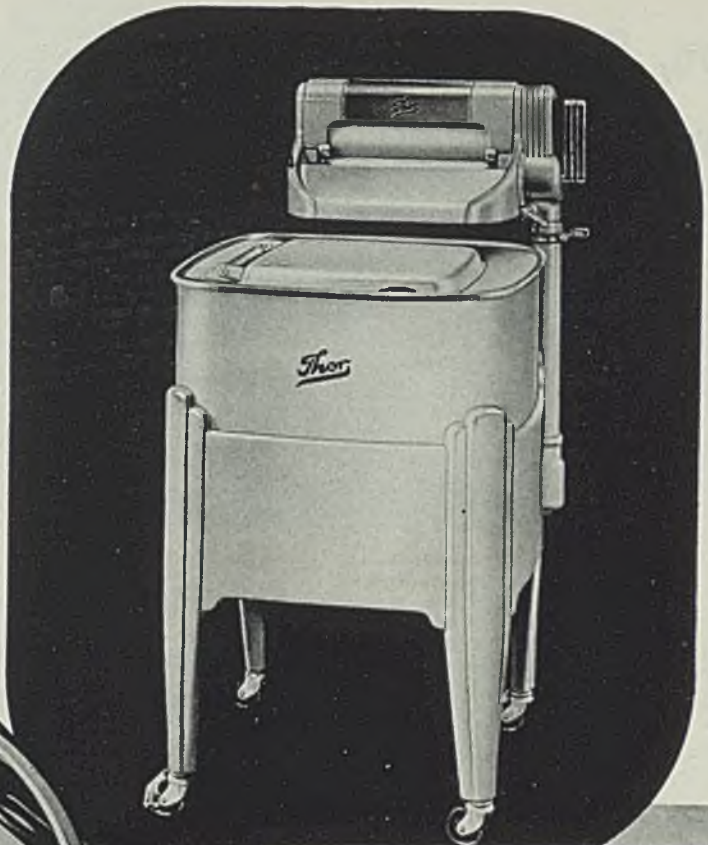
Plymouth's assembly picture shows 11,700 to 12,000 models coming out weekly, followed by Dodge at 7000 for the week, Chrysler at 2100 units and DeSoto trailing for Chrysler Corp. at 1600 models.

Chrysler Corp. seems to have struck on a euphonious name for its new Royal line which is to be the lowest-priced series under the Chrysler name, but few seem to remember that Reo, before it dropped out of the passenger car business a few months ago, had a "Royale" series. The same tag, but with a final "e."

One of the body shops has been experimenting with 1/58,000th needle holes for sewing canvas and rubber in convertible model tops, instead of the former specification of needle holes 1/50,000th . . . . Fisher has been scheduling some operations at the new Grand Rapids plant, but mainly on small stampings only . . . . The die makers feel there will be another wave of new business for them in spares and replacements when shows are over.



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there is no danger of oil leakage from the gear box to soil clothes or to mar the floor where the machine is used.

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# WINDOWS OF WASHINGTON

## WASHINGTON

**N**OW that the election is over the main question is what the President's course of action will be. Will he take the attitude that he has a mandate to go ahead and handle things in any way he chooses, or will he turn to the right, as many predict?

Mr. Roosevelt made few promises during his campaign speeches and the Republicans were unable to draw him out on some subjects. He made a few references to business and industry, but almost as many of his statements could be considered favorable toward business as unfavorable.

One of the interesting questions which will have to be answered in the near future is what Mr. Roosevelt is going to do about labor, and especially about some labor leaders with whom he apparently allied himself closely during the last few months of the campaign. Some observers think that he will find a way to quiet them, but others call attention to the fact that Mr. Roosevelt hates to say "no."

### Roper Hopes for Co-operation

Secretary of Commerce Roper, discussing the results of the election, expressed the hope that government and business in the future would co-operate more closely.

"Business, in light of the objectives, not only has nothing to fear from government, but it should be encouraged by the fact that it is through wise adjustments and the balancing of the segments of our economic and social life, better safeguarded than ever before against cataclysms and disturbing influences, that equitable and safe business relations are perpetuated," he said. "The proper application of the fundamental principles of democracy is the best business assurance; it is the best guarantee of progress."

Mr. Roper again called attention to the work of his advisory business council, outlining its past accomplishments and what may be expected in the future.

He also called attention to the upturn in the automobile industry. Average employment in this industry for the first half of this year was 465,000, he said, compared with 221,000 in the same period of 1933. The average weekly payrolls during the first half of the year were \$12,600,000, compared with \$4,200,000 during the same six months of 1933. He said that the "present trends and conditions in the automobile industry give every evidence that this progress will continue."

### LICENSING SYSTEM FOR IMPORTS NOW IN EFFECT

Under the new British iron and steel licensing system for imports, which went into effect on Nov. 4, the United States can export 651 tons of specified products at 20 per cent ad valorem, while all exports over that amount will be forced to pay a duty of 33 1/3 per cent ad valorem. The quota is based on the quantity of material exported by the United States to Great Britain in 1934.

Certificates of quota and origin must be obtained before shipments can be made to Great Britain. The American Iron and Steel institute was asked to participate in the issuance of these certificates but the word reaching here is that the Institute felt that such action was outside its province. Certificates will be issued for American shipments by the British board of trade or by British consuls.

Tariff quotas are imposed under this new scheme and it tends to carry out, in part, the agreement concluded in August, 1935, between the British iron and steel federation and the continental steel cartel. Briefly, the system as it went into effect sets up a tariff quota for the

specified iron and steel products, the quota for each supplying country to be 100 per cent of the corresponding imports in 1934.

All imports within this quota, if accompanied by a quota certificate and a certificate of origin in the prescribed form, will be admitted at the reduced import duty of 20 per cent. All imports of the specified products in excess of the quota will be subject to higher duties at the rate of 33 1/3 per cent.

Information received by the department of commerce indicates that the actual procedure for shipment from the United States will be for the importer to first obtain a quota certificate from the British board of trade. When this is obtained, the order can be placed, and the exporter, before actually making a shipment will obtain from the appropriate chamber of commerce, or other authorized organization, a certificate of origin to be forwarded to the importer, so that on arrival of the shipment in the United Kingdom the importer will be in possession of both the necessary certificates, the quota certificate and the certificate of origin, which will enable him to clear the shipment at the lower rate of duty.

### WALSH-HEALEY RULES ARE AMENDED

Steel manufacturers who are doing any government contract business are having their attention called to an amendment which has been made in connection with the keeping of employment records by manufacturers while working on contracts under the Walsh-Healey act. The amendment is as follows:

"Every contractor subject to the provisions of the act and these regulations shall maintain the following records of employment which shall be available for the inspection and transcription of authorized

representatives of the secretary of labor:

"(a) Name, address, sex and occupation of each employe covered by the contract stipulations.

"(b) Date of birth of each such employe under 21 years of age.

"(c) Wage and hour records for each such employe including the rate of wages and the amount paid each pay period, the hours worked each day and each week, and the period during which each such employe was engaged on a government contract with the number of such contract. Compliance with this subsection shall be deemed complete if wage and hour records of all employes in the plant are maintained during the period between the award of any government contract and the date of delivery of the materials, supplies, articles or equipment; provided, that where no separate records for employes engaged on government contract are maintained, it shall be presumed that all employes in the plant, from the date of award of any such contract until the date of delivery of the materials, supplies, articles or equipment, were engaged on such government contract.

"Such records shall be kept on file for at least one year after the termination of the contract."

Apropos of this whole situation, mention was made in these columns last week that the government had received bids for only part of an order for trucks. The government rejected the bids received for less than \$10,000 and has now advertised and received bids for 28 trucks. Only two bids were received for the whole number of trucks. There is every indication that government departments will not receive any bids for only part of an order on the ground that that would be getting around the law.

It is believed here that since the election is over the labor department will get down to more serious business in putting into effect the Walsh-Healey law. However, while it is known that amendments will be offered at the coming session of congress, the suggestion has been made that there will be no action by congress because not enough time has elapsed to ascertain the effect of the law.

This same idea is being expressed in connection with the Robinson-Patman law. Mr. Patman has prepared amendments, but congress may feel that it would like to see how the act is going to work before amending it.

#### **VALVE MAKERS NAMED IN PRICE FIXING COMPLAINT**

Thirty-four corporations and their officers, comprising most of the nation's manufacturers of water gate valves, hydrants, fittings and similar articles, have been named in a complaint by the federal trade commission in connection with alleged

uniform prices. The commission said the corporations are members of the water works valve and hydrant group of the Valve and Fittings institute, New York, which with its governing committee and its officers also is named a respondent.

The complaint alleges that in December, 1933, the respondents entered into price fixing combination, dividing the United States into zones where uniform discounts and enhanced uniform prices were maintained.

The commission allowed the respondents until Dec. 4 to show cause why they should not be ordered to cease and desist from the practices alleged in the complaint to be in violation of Section 5 of the federal trade commission act.

#### **HULL HOPES FOR END OF U. S.-AUSTRALIA TROUBLES**

Effort is being made by the state department to straighten out trade difficulties which have existed for some months between the United States and Australia.

Secretary of State Hull last week sent a message to the Australian government expressing the hope that favorable prospects for the financial and economic stability of that country would impel it to abandon the practices which the United States government regards as discriminatory.

Australia last May invoked a series of prohibitions on American goods imported into that country, which both increased tariff rates and actually prohibited imports from the United States. This was done on the ground that the heavy favorable trade balance that the United States had in the trade with Australia was one of the factors in the threat on the financial situation there. At the time the action was taken the United States retaliated by removing Australia from the list of the nations getting most favored treatment.

#### **AMERICAN MACHINE TOOLS GAIN IN BRITISH MARKET**

American machine tools have made striking progress in the British market during the current year, a report to the commerce department from Trade Commissioner E. B. Lawson, London, shows.

Imports of American machine tools in the first nine months of 1936 were valued at \$6,880,000, compared with \$3,220,000 in the corresponding period of last year, an increase of approximately 113 per cent, the report states.

During the first nine months of this year, American machine tools accounted for 58 per cent of total British imports of such items, compared with 53 per cent in 1935 and 1934; 46 per cent in 1933, and 41 per cent in 1932.

Germany is the outstanding competitor of the United States in the British machine tool market, the report shows. Imports from this source in the January-September period were valued at \$3,330,000, compared with \$1,896,000 in the corresponding 1935 period.

Lathes continued to rank as the leading machine tool item imported into Great Britain from the United States.

#### **RAILROADS MAY FILE AMENDED APPLICATION**

In connection with the application by the railroads for new freight rates, it is reported here, but unconfirmed to date, that the roads intend in the near future to file an amended application.

There is also talk here as this is written that the commission will give additional time for the filing of briefs by shippers in opposition to the proposed advanced rates. All of the briefs on this subject were to have been filed with the commission not later than Nov. 9.

#### **NEW ENGLAND FIRMS SHARE RUSSIAN EQUIPMENT ORDERS**

New England machinery manufacturers recently have received orders from Russia for more than \$1,000,000 in equipment. Pratt & Whitney Co., Hartford, Conn.; Farrel-Birmingham Co., Ansonia, Conn.; and Bullard Machine Co., Bridgeport, Conn., are among the companies receiving the orders. The Hartford-Empire Co., Hartford, has been awarded an order for \$250,000 glassmaking machinery.

#### **GERMAN EXPORTS OF PLATES AND SHEETS INCREASE**

Germany's export trade in steel plates and sheets registered a pronounced improvement in the first half of this year, compared with the corresponding period of 1935, according to a report from Vice Consul J. H. Wright, Cologne.

Shipments abroad under this classification advanced from 225,884 metric tons, valued at 32,894,000 reichsmarks (\$13,150,000) in the January-June period of 1935 to 291,566 tons, valued at 41,627,000 reichsmarks (\$16,650,000) in the first six months of 1936, representing a volume increase of 29 per cent and a value increase of 26 per cent.

#### **ALLOWS DRAWBACK**

Drawback allowance has been announced by the treasury department on steel bars, skelp, pipe, sheets and plates manufactured by the Youngstown Sheet & Tube Co. at its Brier Hill works and Campbell works, Youngstown; at its Indiana Harbor works, East Chicago, Ind., and its Evanston works, Evanston, Ill., with the use of imported ferromanganese and ferromanganese manufactured under drawback regulations.

# Editorial

## Industry Faces Difficult Task of Statesmanship

**N**O ONE but an incurable die-hard will try to discount the significance of the overwhelming victory of the new dealers at the polls last Tuesday. It was a decisive indication that a vast majority of the people of voting age approves in general the new deal program and desires that it be continued.

That such a large number of voters have made this decision is proof positive that this country has been going through a quiet, bloodless revolution. The balance of power has shifted from one group to another just as definitely as if the *coup de etat* had been accomplished by force of arms.

Industrial executives should mark well the fact that this shift is only partially political in character. One cannot possibly explain it adequately by merely saying that the Democrats took the play away from the Republicans. The outward evidence of a revolution provided by last Tuesday's vote denotes something much deeper and infinitely more sinister than simply the quadriennial political scrap between the major parties.

### Class Hatreds Created on Basis of Wealth Build Up Sinister Division of Citizens

What we saw on election day was the initial success of a clever scheme to establish a class consciousness in the United States. To lay the groundwork for this plan it was necessary to find a convenient dividing line so that the public could visualize or imagine that a class distinction actually existed. The age-old device of the "haves" and "have nots" was resurrected. Repeated use of such phrases as "economic royalists," "princes of privilege," etc. helped tremendously to build up an effective wall of class prejudice and hatred.

At the same time, favors thrown to influential and powerful labor union leaders, plus careful and thorough exploitation of the persons on public relief, recipients of public bonus monies and employes in public service, gave strength and unity to the allegedly "oppressed" class.

And thus having established a synthetic distinction of class, it was easy for new dealers to meet criticism of its acts by dubbing the critics as "economic royal-

ists," which automatically placed them in the condemned class. Time alone will reveal the extent of the injury to this country caused by the cold-blooded crucifixion of some of its outstanding, sincere citizens on the cross of synthetic class hatred.

But all of that is history. Today we are concerned with the present and the future. Industry, particularly, must decide upon a policy that will enable it to deal intelligently with the problems arising from this new alignment of pseudo classes.

Citizens on relief, recipients of bonus checks, union labor members, public employes and other beneficiaries of the shift of power to the "oppressed" class will be more vociferous in their demands. By direct promise or implication they have been led to believe that they will be enriched far beyond the ability of the economic system to support the burden of their financial desires.

Industrial executives, in the dual role of employers and taxpayers, will find it exceedingly difficult to meet these demands. No matter how much industry will be disposed to deal fairly and liberally, it is almost certain that exorbitant wages, impractically short hours, restrictive working conditions and excessive taxes will be demanded as a reward for aiding the politicians in the winning party.

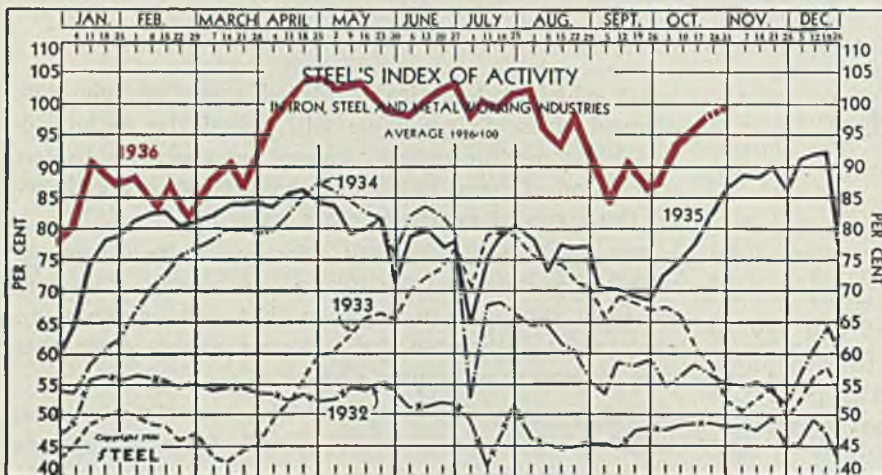
### Industry's First Task Is To Regain Confidence Of Employes and the Man in the Street

Of course the only way out for industry is to re-win the confidence of the public. To do this, industry must take a more realistic view of its relations with its employes and with the man in the street. Industry, like successful politicians, must earn the good will not only of the type of people who fill in *Literary Digest* ballots but also of the men and women whose names do not appear in telephone books, or on the lists of registered car owners but do appear on the roster of registered voters and carry political power.

At the same time industry will do well to muzzle a few of its old fogies who are addicted to saying publicly the wrong thing at the wrong time, arousing unfriendly reactions.

The big lesson of the election to industry is that it should muster immediately a higher standard of statesmanship. It must demolish the politically-built wall of class distinction. It can do it only by meriting the trust of the man in the street more effectively than the politicians can do it. This is a task calling for the utmost in tact and honesty, but not beyond accomplishment.

# THE BUSINESS TREND



STEEL'S index of activity in the iron, steel and metalworking industries gained 1.5 points to 98.6 in the week ending October 31:

Week ending	1936	1935	1934	1933
Aug. 1.....	102.5	78.4	64.8	75.9
Aug. 8.....	98.7	73.4	64.6	74.7
Aug. 15.....	92.6	77.5	61.4	74.2
Aug. 22.....	97.7	77.0	60.3	71.6
Aug. 29.....	94.0	77.3	55.1	70.3
Sept. 5.....	87.5	70.9	53.5	65.5
Sept. 12.....	83.1	70.1	58.7	69.1
Sept. 19.....	90.1	69.4	58.1	68.2
Sept. 26.....	86.2	68.5	59.3	66.9
Oct. 3.....	89.0	73.3	54.7	67.4
Oct. 10.....	93.4	74.9	56.4	66.0
Oct. 17.....	95.5	77.4	58.2	60.9
Oct. 24.....	97.1†	82.4	56.3	58.0
Oct. 31.....	98.6*	86.4	55.0	52.3

†Revised. \*Preliminary.

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

## Activity Continues Upward Through Election Period

**B**USINESS records for the period immediately before and after the national election indicate that industry took this important event in full stride. Seldom has the trend of business evidenced so little concern over the outcome of the nation's poll.

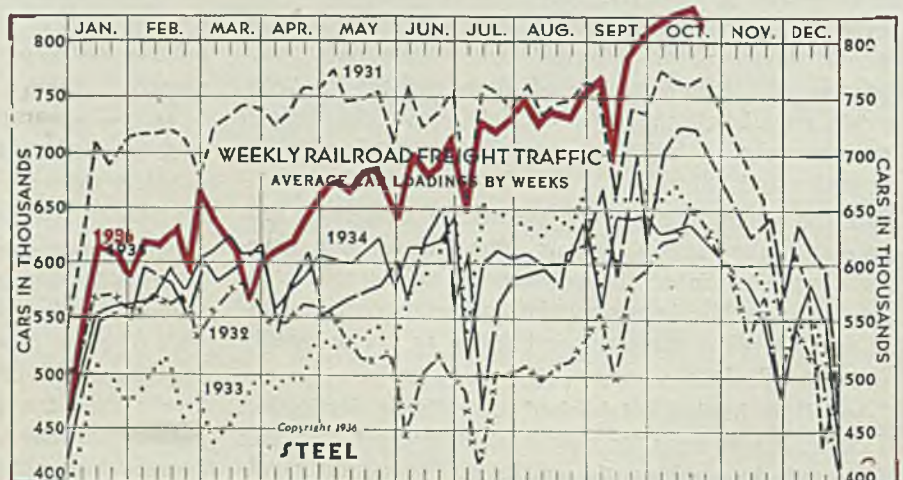
In the week ending Oct. 31, which was the last full week before election, industrial activity showed no signs of weakness or hesitancy. In fact, STEEL'S index for the iron, steel and metalworking industries gained moderately from 97.1 to 98.6. This increase was credited largely to another rise in automobile production, which more than offset a slight recession

in freight car loadings. Steelworks operations remained steady and electric power output continued at a brisk pace.

Some time must elapse before the real effect on industrial activity of the overwhelming vote of confidence for the new deal can be appraised accurately. The sharp rise in the stock market and in commodity prices on Wednesday probably reflected only the initial impulse of business sentiment. Later on it will be possible to study the effect of the election upon the authorization of long-term commitments and important reconstruction projects. Very likely the effect will be favorable.

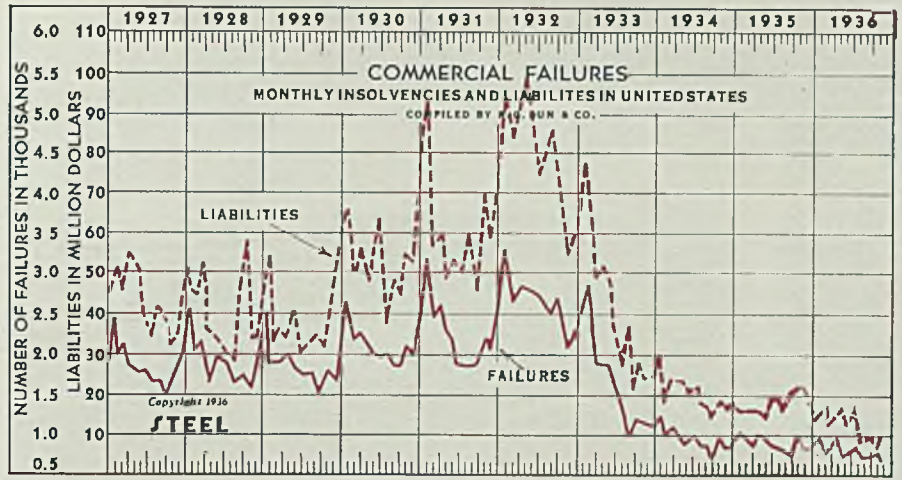
National City Bank of New York has tabulated the nine-months' profits of 245 corporations, showing a total for this period in 1936 of \$792,287,000 compared with \$485,098,000 in the corresponding months of 1935. This is a gain of over 60 per cent.

	1936	1935	1934
Oct. 24.....	815,972	707,826	624,200
Oct. 17.....	826,155	732,947	640,300
Oct. 10.....	820,195	734,274	635,600
Oct. 3.....	819,126	706,877	631,300
Sept. 26.....	807,070	630,771	644,600
Sept. 19.....	789,510	707,644	643,100
Sept. 12.....	699,859	700,357	645,900
Sept. 5.....	764,680	592,786	562,700
Aug. 29.....	753,742	679,861	645,800
Aug. 22.....	734,973	625,774	606,917
Aug. 15.....	736,497	614,005	601,788
Aug. 8.....	728,293	583,743	602,530
Aug. 1.....	747,551	597,083	611,298



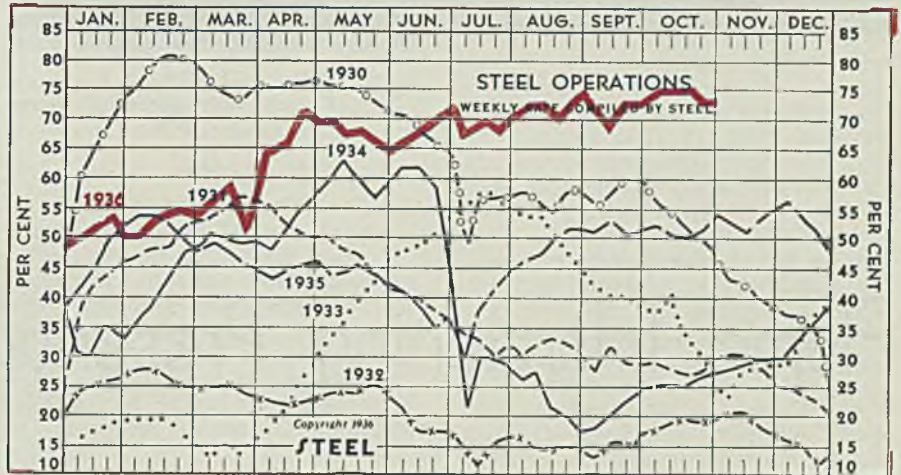
### Commercial Failures Decline Sharply in September

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



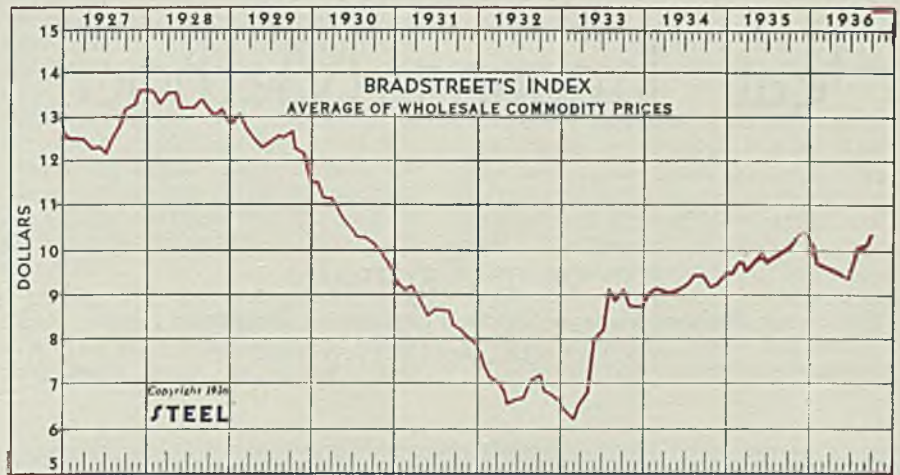
### Steelworks Operations Hold At 73.0 Per Cent

	1936	1935	1934
Oct. 31	73.0	54.5	27.0
Oct. 24	73.0	52.5	25.5
Oct. 17	75.0	51.0	26.5
Oct. 10	75.0	52.0	25.0
Oct. 3	74.5	53.5	25.0
Sept. 26	73.0	51.0	25.0
Sept. 19	72.5	52.0	22.5
Sept. 12	69.5	54.0	20.5
Sept. 5	71.5	52.0	18.0
Aug. 29	73.0	52.5	18.5
Aug. 22	72.0	52.5	20.5
Aug. 15	70.5	51.0	21.5
Aug. 8	71.5	48.0	27.5
Aug. 1	71.5	47.0	26.5



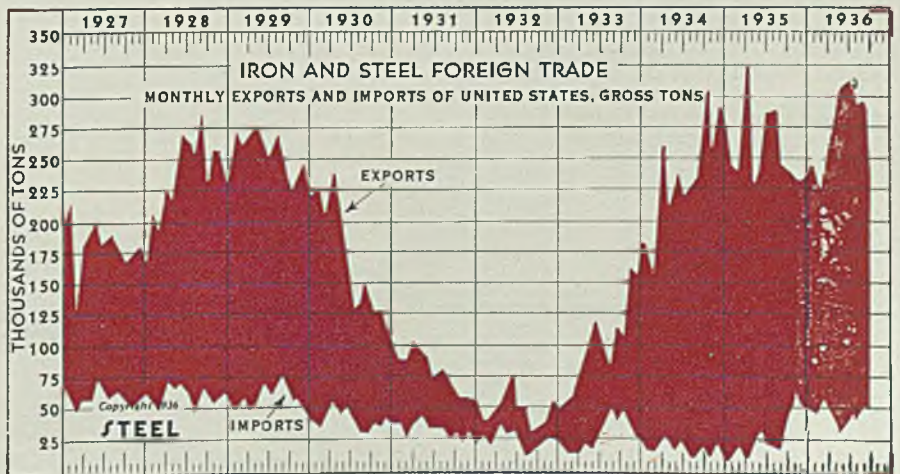
### Bradstreet's Price Index Continues Upward Trend

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



### Iron and Steel Exports Off Sharply in September

	1936		1935	
	Imports	Exports	Imports	Exports
Jan.	50,489	241,564	22,784	262,740
Feb.	43,358	213,802	28,905	228,537
Mar.	56,720	264,337	21,409	323,035
Apr.	49,621	301,987	28,866	205,336
May	59,391	314,950	47,719	286,598
June	59,910	294,951	33,208	286,333
July	47,940	296,738	31,894	296,782
Aug.	60,697	295,341	32,312	247,312
Sept.	59,993	235,784	53,158	244,419
Oct.	.....	.....	59,569	238,358
Nov.	.....	.....	56,637	205,242
Dec.	.....	.....	53,678	239,268



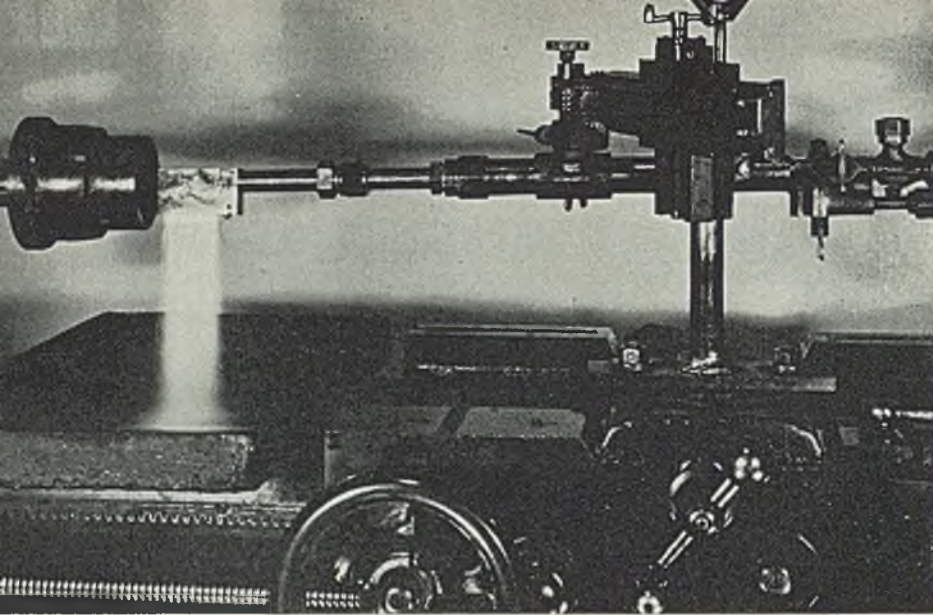


FIG. 1—Multiflame hardening torch with quenching water spray

LITTLE has been published as yet on the process of hardening steel by means of the oxyacetylene flame. While it is not a cure-all for heat treating difficulties, it does provide in many cases an economical and simple means for increasing the hardness of steel surfaces. In the accompanying article, Dr. Slottman outlines salient features of the method and equipment involved

# Flame Hardening Presents Economical Heat Treating Method

BY DR. G. V. SLOTTMAN

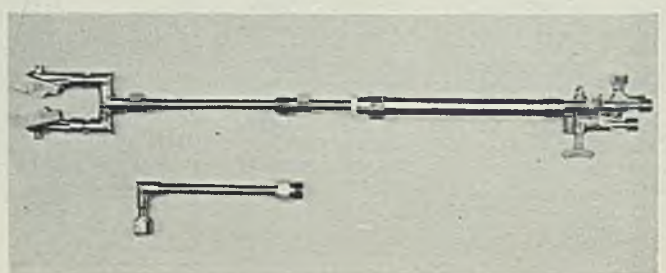
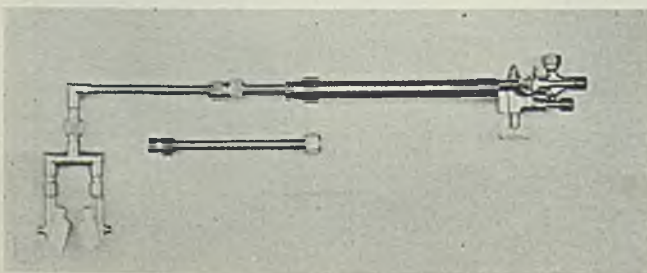
Assistant Manager, Applied Engineering Department,  
Air Reduction Sales Co. New York

**S**TEEL can be hardened from the as-cast or as-rolled condition by heating above its critical range and rapidly cooling, the degree of hardness obtainable depending on the steel analysis, on the temperature to which the steel is heated and on the rate of cooling.

The operation of steel hardening is simply one of providing a means for heating the steel above its critical point and then rapidly quenching it. There is no difference in the hardening effect obtained, whether the part be heated in a furnace or with the oxyacetylene flame, provided the steel has been brought to the same temperature, and with the same degree of penetration of heat into the interior of the object, and provided a consistent quenching procedure is maintained.

Furnace hardening of steel has

FIG. 2 (left)—Duplex head gear tooth hardening torch with 90-degree and straight connections. Fig. 3 (right)—Duplex head gear tooth hardening torch with straight and 90-degree connections





been practiced for a long time, particularly for the bulk of hardening of small objects which are to be hardened uniformly throughout their mass. For such purposes, furnace hardening undoubtedly is less expensive than hardening with the oxyacetylene process. However, there are a number of hardening operations where the pieces to be hardened are of considerable size and where distortion of the hardened piece when furnace-heated cannot be prevented. Numerous applications require hardening of only a small portion of the total surface of large objects. In many instances, single objects are to be hardened, and the expense of lighting a hardening furnace is not warranted. The oxyacetylene process of flame hardening is becoming recognized as a simple, inexpensive method of solving hardening problems such as these, and a considerable field of application is developing as field experience with oxyacetylene hardening is gained.

#### Standard Torch Used

Flame hardening can be done by hand with the standard welding or heating torch so that the principle of this operation can be demonstrated readily in the field using standard equipment. For automatic operation, the welding or heating torch is mounted on a cutting machine such as the Air Reduction Co.'s Radiagraph or Camograph and made to follow the contour to be flame hardened at a fixed rate of speed. For shop production, as in hardening gear teeth, the carriages of lathes and other metalworking machines can be adapted to carry the torch. The following equipment has been developed to supplement the simple welding or heating torch: Two-flame tips Nos. 4, 5, 6, 7 and 8; flame-hardening torch; mixers Nos. 10, 12 and 15; 90-degree extension tube; straight extension tube; adjustable yoke; universal yoke.

The 2-flame hardening tips, similar to Style 4 heating tips without spacers, are made of annealed copper, allowing the tips to be bent at sharp angles, thus making them suitable for the simultaneous hardening of both faces of small gear teeth. They are used with the standard style 9800 torch. Applications involving the heating of a broader area have required the development of water-cooled, multi-flame tips consisting of a solid brass or copper block containing a num-

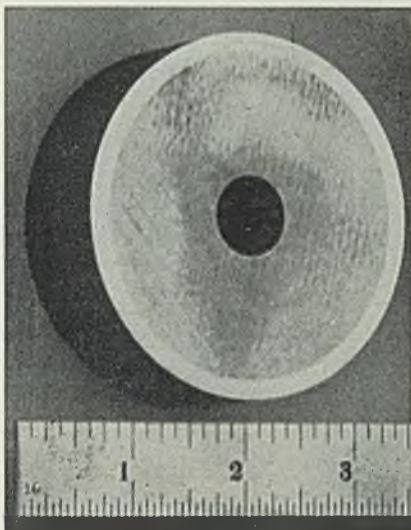


FIG. 4—Shows the hardened case produced by flame hardening a steel disk

ber of fine holes as heating orifices. These tips generally are provided with a row of quenching holes following the heating holes, passing either water or compressed air for the quenching stream. Multiflame tips are not carried as stock items, since their size and the spacings of heating and quenching holes must be determined for the particular job in hand.

The flame hardening torch listed above and shown in Fig. 1, has been developed to supply oxygen, acetylene and water to such a tip. Two rows of 11 heating flames can be seen against the background of the curtain of water issuing from the quenching holes. In this case the flame hardening torch is mounted on a lathe carriage and the part to be hardened is rotated on the lathe spindle.

In Fig. 2 is shown the hardening torch, mixer, 90-degree extension tube and yoke assembled for using multiflame gear hardening tips.

Use of the straight extension tube is illustrated in Fig. 3; the use of a straight or 90-degree extension tube is determined by the convenience in positioning the tips over the work.

Use of the flame hardening torch and multiflame tip in hardening wabblers of steel mill rolls is shown in Fig. 5, the torch being mounted on a Radiagraph machine. By maintaining a constant motor speed, oxygen, acetylene and water pressure, reproducible hardening effects easily are obtained.

#### Hardened Zone Is Uniform

In Fig. 4 is shown the hardened zone obtainable on a cylindrical object by setting up the flame hardening torch on a lathe carriage, the piece to be hardened on a mandrel and rotating the lathe spindle one complete revolution. The slight overlap caused by the starting and finishing off is barely discernible at the top of the photograph. In this case an auxiliary quenching stream was directed against the work forward of the heating flames to prevent the flow of heat ahead of the tip from annealing and reducing the hardness of the portion already treated. In Fig. 7 is shown a typical gear hardening set-up, using the Radiagraph and flame hardening torch and a universal yoke for carrying the gear hardening tips. Both sides of a tooth are treated simultaneously with consequent reduction of distortional effects. The heating holes are arranged in a vertical row, to play at right angles to the faces of the gear teeth.

A cross sectional view through a gear tooth is shown in Fig. 6. The hardness varies from Rockwell C-13 in the untreated center of the tooth to Rockwell C-59 at the wearing surface. Penetration of the hardening effect is observable to a depth of 3/16-inch, with a uniform tapering of hardness, desirable in preventing spalling of the hardened surface.

To list all the various applications

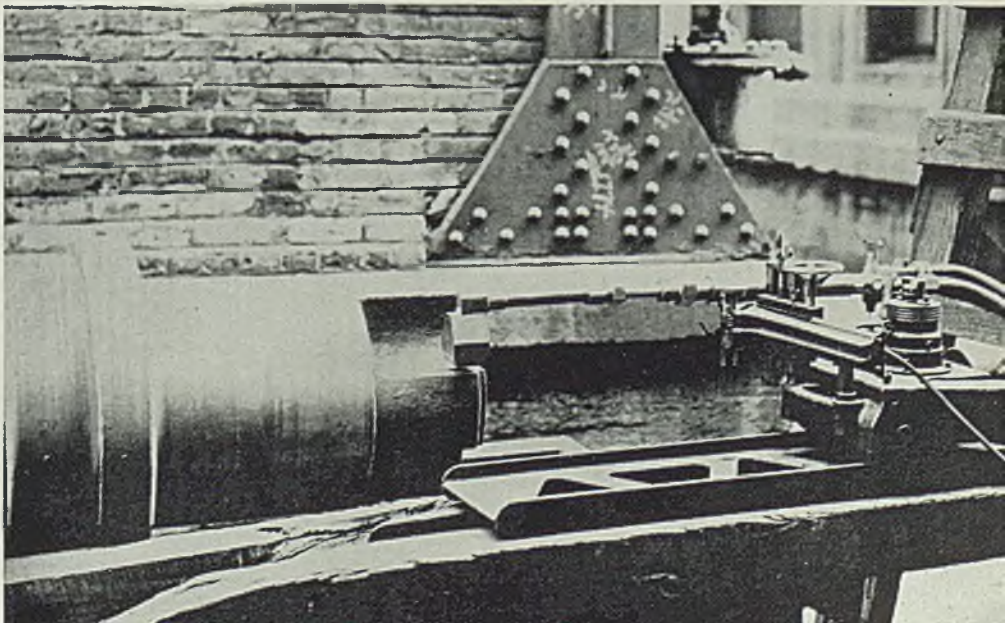


FIG. 5 — Flame hardening torch set-up for hardening the wabblers of a steel mill roll

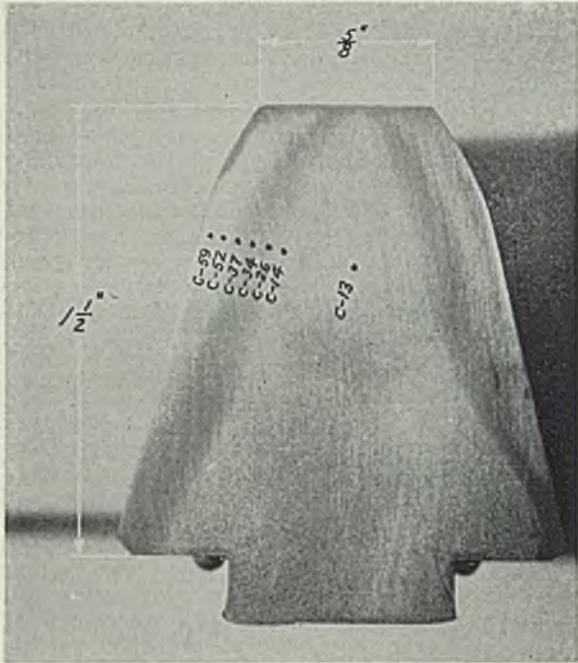


FIG. 6—Cross section of a flame hardened gear tooth, showing progressive Rockwell hardness

would involve the entire machine building industry since wherever the selective wear of a machine part is present there is a possible application of flame hardening. Gears of the herringbone, spur, spiral, bevel and sprocket types have been successfully hardened. Machinery shafts and crankshafts at their bearing surfaces, cams, steel mill roll necks, wabblers and similar parts subject to sliding friction can be hardened. Railroad and crane rails, street car rails for crossings, curves and car stop points offer possibilities. Guides for machine tools, planer tools, drilling heads, locomotive crossheads, backing-up plates, liners, punching and forming dies, ball-races, cutting edges of shears and pliers may be mentioned to illustrate the potential field of application of the flame hardening process.

In approaching a flame hardening

problem, the first point to bear in mind is the suitability of the steel for hardening. It is possible that the steel composition is such that satisfactory hardening cannot be obtained. In many cases, however, it is possible for the manufacturer to adjust the analysis of his machine part to make flame hardening possible. The part in question may be of such a nature, as explained above, that it is more easily and economically furnace hardened, in which case it is a waste of time to attempt to develop oxyacetylene flame hardening procedure. The part having been considered suitable for a flame hardening operation, it is possible that the standard, 2-flame, heating tip, either hand or machine guided, can be used, quenching being done with a suitable medium.

In cases where a broad flat strip

is to be hardened or a surface of irregular contour, such as the tooth of a gear or the bearing guide of a machine tool, special tips must be designed. Similarly, in cases where the steel analysis is such that special hardening procedure is indicated, development work is required. To expedite the handling of flame hardening problems, therefore, complete information is needed on the proposed applications, including dimensioned drawings indicating the areas to be hardened, the depth and degree of hardness desired, the steel analysis and, if practicable, a suitably sized specimen of the material for hardening trials.

## Powder Inhibitor for Steel Shows Breakdown Resistance

Based on the acknowledged principle of setting up an electrolytic insulating film where steel is attempting to dissolve, Acitrol 100, recently introduced by E. F. Houghton & Co., Philadelphia, exerts an electrolysis control which differentiates between the productive and nonproductive galvanic couples present in a pickling solution. It is designed to include high dielectric strength, high cathodic affinity and freedom from breakdown. The product is a synthetically manufactured pure chemical powder which dissolves rapidly in either strong or weak acid solutions and leaves no greasy residue or stain on the steel. Acitrol 100 shows practically no breakdown at boiling temperatures over long periods of time, according to the Houghton company.

## Brazing Without Venting

An oxyacetylene welding service man recently called upon one of his customers just in time to prevent what might have been a serious explosion. An operator had brazed about 2 inches on a hollow cast-iron roller about 9 inches in diameter and 24 inches long without first having drilled a vent hole in it. The work was stopped and a 1/4-inch hole was drilled in the roller and as the drill went through gas and oil were blown out with such force that the workman had to jump back to protect his face from injury.

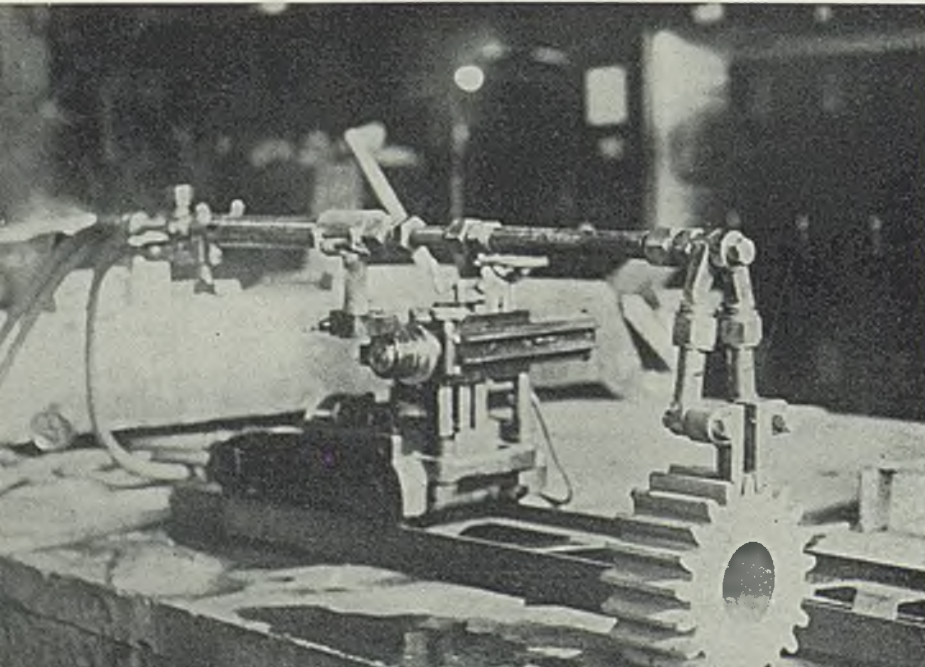


FIG. 7—Set-up for flame hardening gear teeth

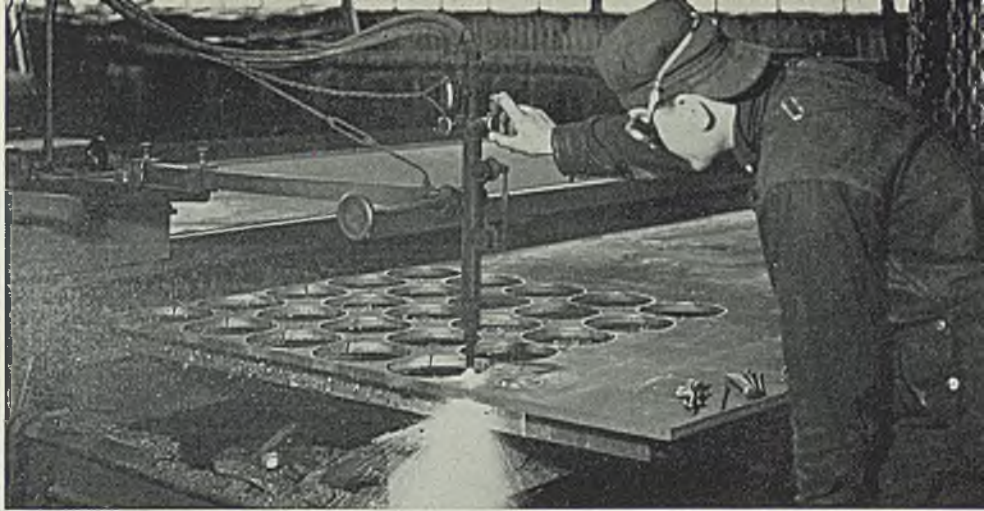


FIG. 1—Head rings are cut from steel plates by the oxyacetylene method

**S**TEEL rollers covered with corrosion-resisting metals have come into wide use in many processing operations. They are being used on an increasing scale in the paper, glass, steel, fiber, textile, chemical, rubber, soap and other industries. Though their first cost is higher as a rule than the rollers they displace, their life is extended. In one processing operation, for instance, it was customary to install a new roller on an average of once a month; a monel metal covered steel roller installed on this job about a year ago shows no deterioration and gives indications of indefinite life.

Production of these covered rollers at the plant of the Youngstown Welding & Engineering Co., Youngstown, O., calls for a specialized technique developed as a result of years of investigation on the part of this company in co-operation with engineers of the International Nickel Co., New York. This is because monel metal is used in a great majority of cases in covering the rollers. At the same time, the company covers a number of rollers with other materials, such as

## Special Welding Technique Required in Process for Cladding Steel Rolls

nickel, stainless steel, aluminum, copper and brass. Due to the coefficient of expansion of copper and brass, as compared with that of steel, these metals are used infrequently.

Usually these rollers are hollow.

Many of the shells are cut from lengths of seamless steel tubing of the proper diameter and wall thickness. In most cases the shells are formed from steel plate. The plates are cut to size, by oxyacetylene torches or shears, and formed into shells by usual fabricating methods, the longitudinal joints being closed by electric arc welding. Frequently there are variations from this method of making the shells, the rollers sometimes being cast hollow or solid from iron or steel. The shells vary in size, range from 5 to 96 inches in diameter and from 8 to 252½ inches in length.

Heads are circular rings cut with an oxyacetylene torch from steel plates usually between ¼-inch and 2 inches thick. The outer diameters correspond to the inside diameter of the shell and the inside diameters to the diameter of the shaft. The

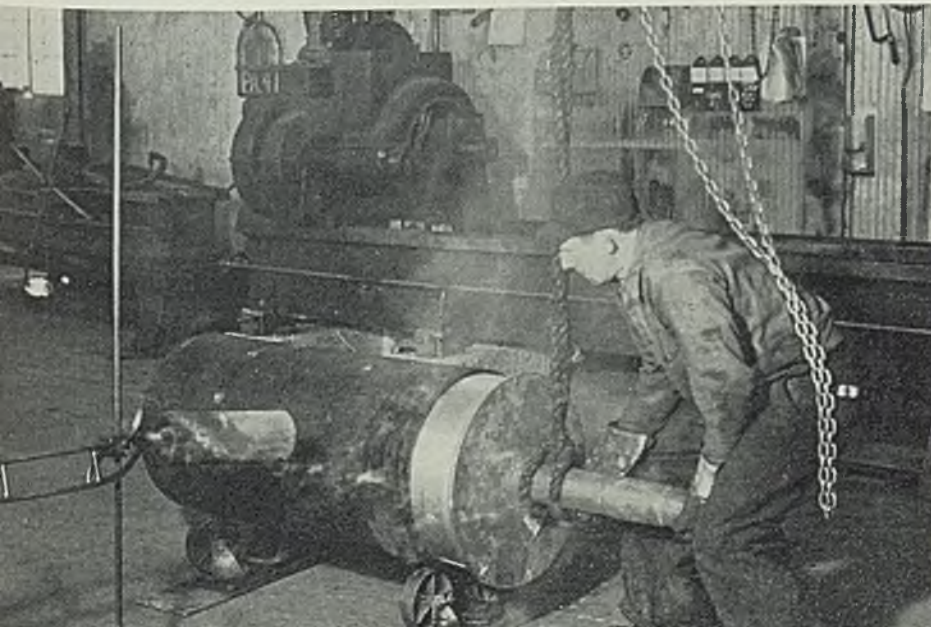


FIG. 2—Shells are heated prior to insertion of the heads in order to obtain shrink fits. Heating torch is shown at left

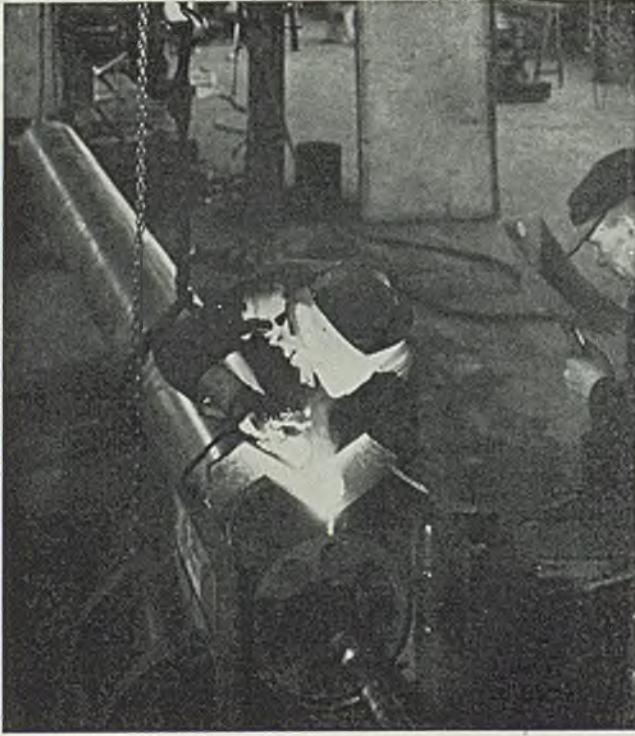


FIG. 4—Held tightly against the shell by circular die blocks in a hand squeezer or hydraulic press, the edges of the cover sheets are joined together on both sides by tack welds at intervals of approximately 1-inch. The joints are completed subsequently, the electric arc method being employed

The hand squeezer is used on shells up to about 10 inches in diameter while the hydraulic press is used on larger diameters. Held tightly against the shells by the die blocks, the covering sheets are tack welded on both sides. Welds are about an inch apart, the squeezer being set afresh for each tack weld. Subsequently, the shells are removed from the squeezer and the joints completely closed by the electric arc welding method.

#### Dies Correct Deviations

At this stage the shell is sized in a hydraulic press to correct any deviations from true circular shape; narrow dies with circular openings are used. The shell then is finish turned, ground and polished.

When it is necessary that the rollers be immersed in acids or corrosive liquids during processing operations, the shafts and heads, as well as the shells, are covered with monel metal or other corrosion resisting metals. The shafts are covered in the same manner as the

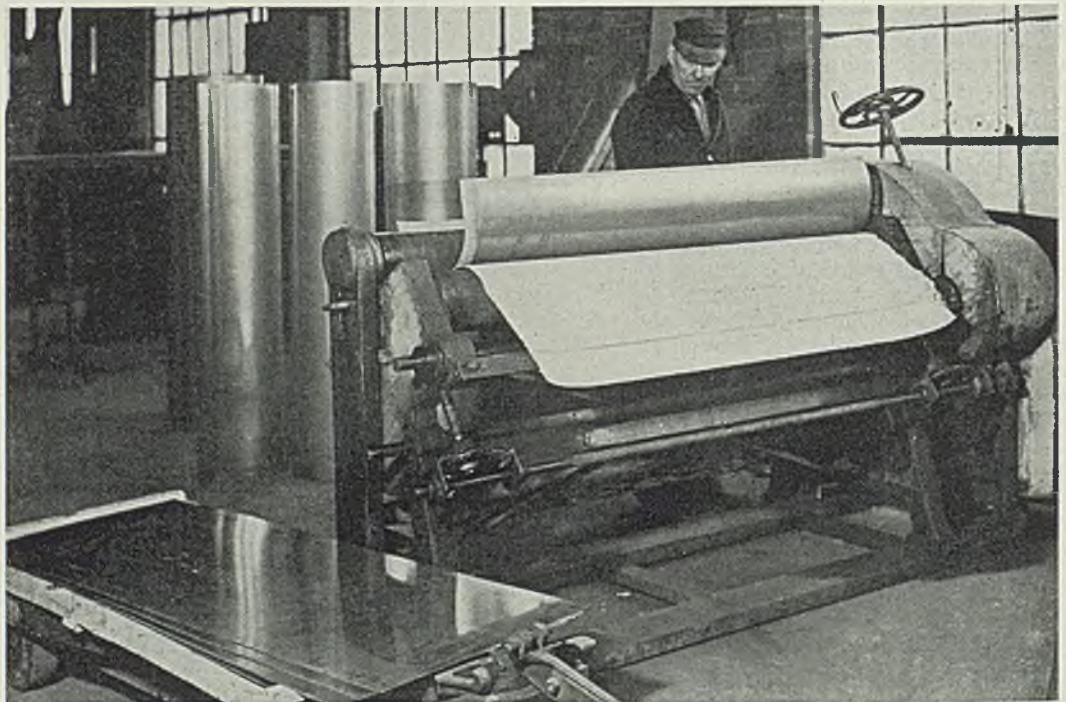


FIG. 3 — Cover sheets, of corrosion-resisting metal, are formed into semi-circular sections in bending rolls, as shown at the right

shaft is inserted in the rings and the rings and the joints welded by the electric arc method. Heavy-duty rollers are provided with shafts with inner rings spaced all the way through at short intervals, so as to reinforce the surface of the rollers. When the shaft does not go all the way through, but is in two pieces, each piece is provided with two rings, spaced usually 8 to 12 inches apart, to provide the necessary stiffness.

Prior to inserting the heads the shell is heated so that it can be shrunk over the heads. Next, the

joints between the shell and the head rings are closed by welding. The roller then is mounted in a lathe and shell, head and shaft surfaces machined.

The covering sheet, usually of monel metal, is formed in two halves, either in rolls or in dies in a hydraulic press. The semicircular halves are pressed on the shell either in a hand squeezer or hydraulic press, both being equipped with narrow die blocks with circular openings. There is a complete assortment of these die blocks for use with shells of any diameter.

shell. The ends are covered by rings whose outer edge is welded to the periphery of the head and whose inner edge is welded to the periphery of the shaft.

In welding monel metal, the company uses a heavily coated, special, monel metal electrode containing 3 per cent silicon. Great care is exercised in controlling the distance between the edges of monel sheets to be welded. This distance depends on the thickness of the covering sheets and the diameter of the roller. The arc welding process is used throughout.



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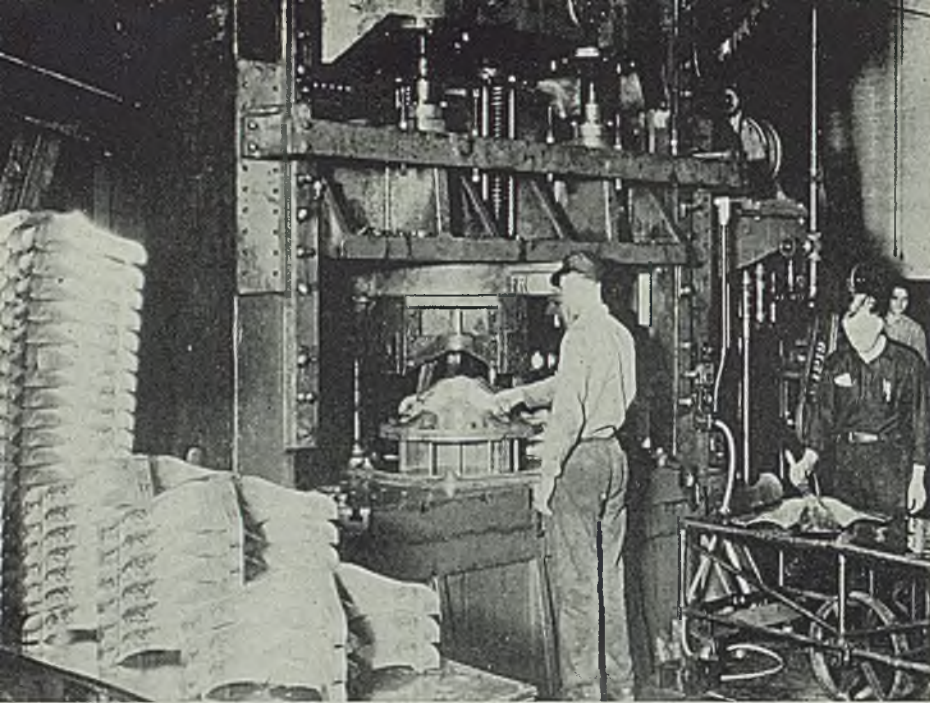
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BY FRED B. JACOBS

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FIG. 1—Base members for swivel office chairs are blanked from sheet aluminum and then subjected to three drawing operations

# ALUMINUM FURNITURE—HOW IT IS FORMED, ASSEMBLED AND FINISHED

**W**ITH an abundant supply of easily worked raw material on hand in practically all parts of the world, it is easy to understand why furniture has always been made of wood until recent years. At the present time, however, artistically designed metal furniture is coming into its own, especially as regards office equipment. Where weight is not a vital factor steel furniture is preferred in many instances. For example, steel filing cabinets have practically replaced wood units of other days. Steel desks also are gaining in favor. In cases where weight is an important factor, as in office chairs, restaurant chairs and tables and also in some varieties of home and institutional furniture, aluminum is popular.

Only within recent years has it been possible to make aluminum furniture on an efficient production basis. Many difficulties had to be overcome. For example, it is only

within the past decade or so that the process of welding aluminum has been perfected to a degree where it is practicable. Again, the scientific heat treatment of aluminum is comparatively recent.

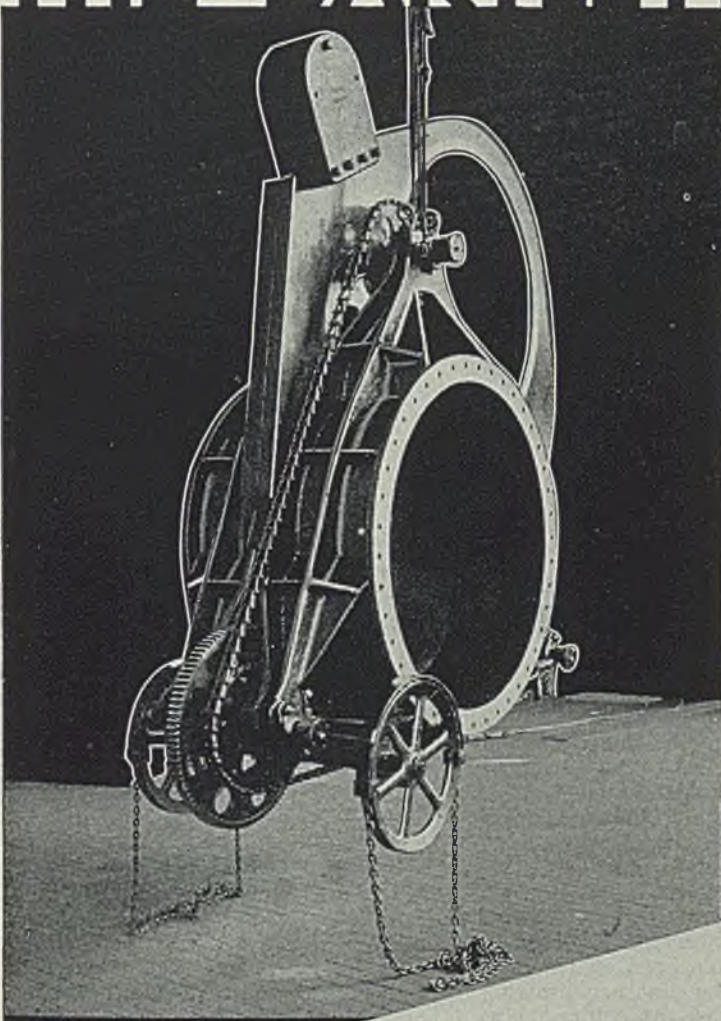
Further, the manufacture of aluminum furniture entails an enormous outlay for dies and other special tools.

A prominent manufacturer of aluminum furniture is the General



FIG. 2—In the welding operations the parts are securely and accurately located in special jigs. Welding is by the oxyacetylene method and the welding wire is a special product approximately 84 per cent pure aluminum

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4. The clamping mechanisms are encased in dust and moisture proof grease chambers, making permanent their ease and dependability of operation. No vital parts are exposed to abrasion by dust in the gas stream or in the atmosphere. All operating parts are readily accessible for lubrication and inspection.
5. The valve opening is entirely unrestricted. There are no projections to cause dust to lodge in the valve body.
6. Safety of men working in or around the gas main is assured and the danger of explosions eliminated.
7. Control is sufficiently remote to make the operator safe from the gas blow during the operation of the valve.
8. Both hand and motor operated types can be opened or closed by one man in a minimum of time.
9. Long periods of disuse have no effect upon the operating mechanism of the valve.
10. The valve is a self-contained unit which is assembled, adjusted and tested for gas-tightness before shipment from the factory.

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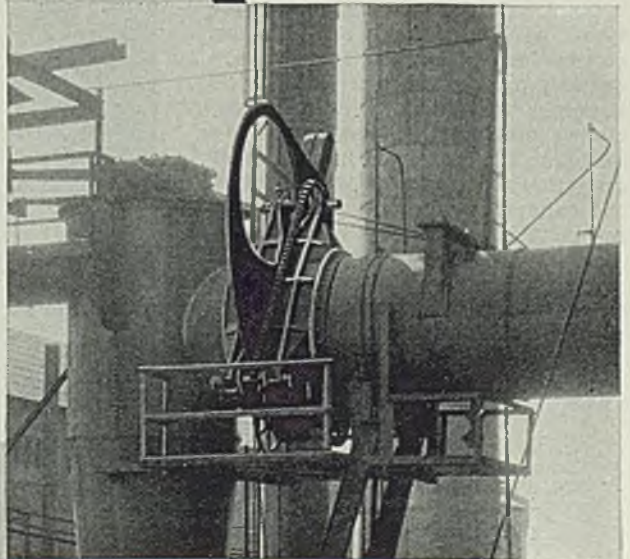




FIG. 4—Heat treating is done in special furnaces equipped with elaborate means for controlling the temperature. After being brought up to the correct heat the parts are air quenched

Fireproofing Co., Youngstown, O., which, in addition, manufactures all types of office equipment such as desks, filing cabinets and the like, primarily of steel. Here an extensive department, or series of departments, are devoted exclusively to the manufacture of aluminum chairs. In this article are outlined briefly the most important operations performed in making and finishing aluminum office chairs, both of the straight back and swivel base variety.

Raw material is delivered at the plant in aluminum sheets and tubes of several shapes, such as square and rectangular, which are used in making up various chair components. This material is a special alloy developed for this purpose. It is about 95 per cent pure aluminum and must be ductile so as to be formed readily in bending machines and under drawing dies, while at the same time having sufficient tensile strength to withstand severe usage.

Many components, such as some types of chair backs and frames, can be formed directly from square or rectangular tubing. Bending is done in special hydraulically operated machines of the company's design. The stock is placed over an articulated mandrel which enters the tube for a distance of 6 inches or so and is then fed between the dies which usually consist of a flat or curved and a rotary member. Once a bending machine is set up for a given operation all parts

formed in that operation will be exactly alike. This of course is not possible in the older bending methods wherein manual skill is relied on to a great extent in determining the necessary curvatures.

Many parts such as seat sections and bases are formed between heavy dies. For example, the operation shown in Fig. 1 involves forming the base members for swivel office chairs. These are blanked from sheet aluminum, followed by three drawings. Several finished bases are shown at the left, one is in place between the forming dies, while at the right the operator is greasing a part which has been drawn once and is ready for another drawing operation. Grease of course helps in causing the metal to flow into the dies readily without crimping.

The dies in question are costly and it is not unusual for a set of dies and jigs for a given chair model to cost upward of \$25,000. Such dies are of high-grade steel and expert workmanship is essential in their tooling. Volume production is desirable in these forming operations as it reduces the overhead. For example, it may take two or three times as long to set up a press and make it ready for forming as it would to do the actual forming operations on 500 to 1000 parts. Thus quantity production is desirable at all times.

To weld the parts properly they must be positioned accurately, and this is accomplished through the use of welding jigs or fixtures. A welding operation on a chair base is shown in Fig. 2. Various welding

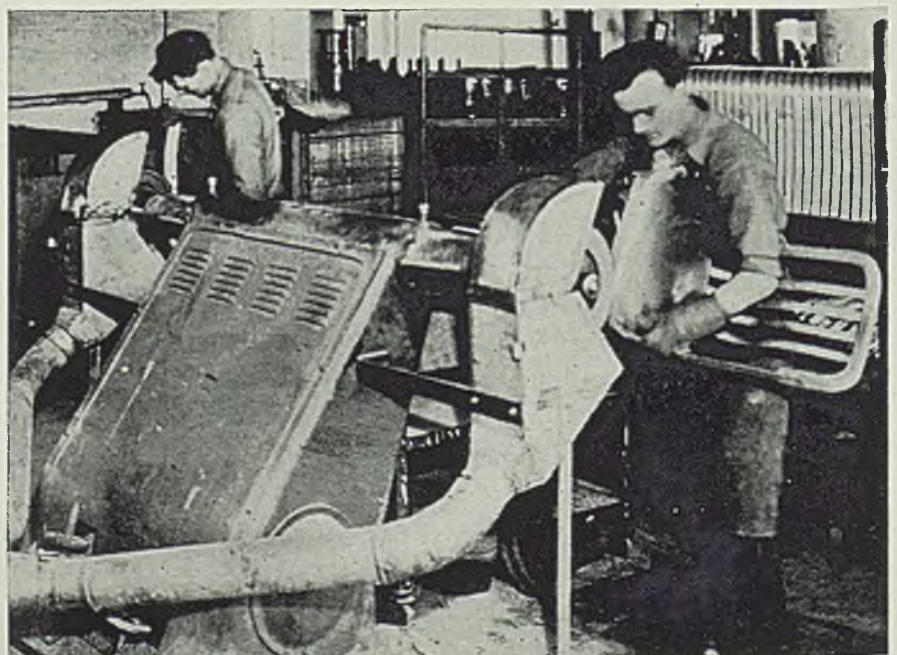


FIG. 3—Considerable polishing and buffing is necessary to bring out the smooth finish which is necessary on the product. The abrasive is strip cloth held over special wheels



fixtures must be provided for each type of chair.

Welding is done with oxyacetylene hand torches. The welding wire is a special product and is approximately 84 per cent pure aluminum. Under the intense heat the wire and the surrounding metal are fused together making an integral unit. Such a weld, when correctly made, is stronger than any section of the chair.

Anyone conversant with practical welding problems realizes the process always leaves considerable superfluous metal about the joints which would be unsightly unless properly finished. Joints are smoothed down by rotary files or burrs driven by flexible shaft machines. This is an exacting operation inasmuch as the operator holds and guides the tool by hand. However, through continued practice these operators become expert and are able to turn out nicely smoothed joints in a minimum of time.

#### Polish To Avoid Light Glints

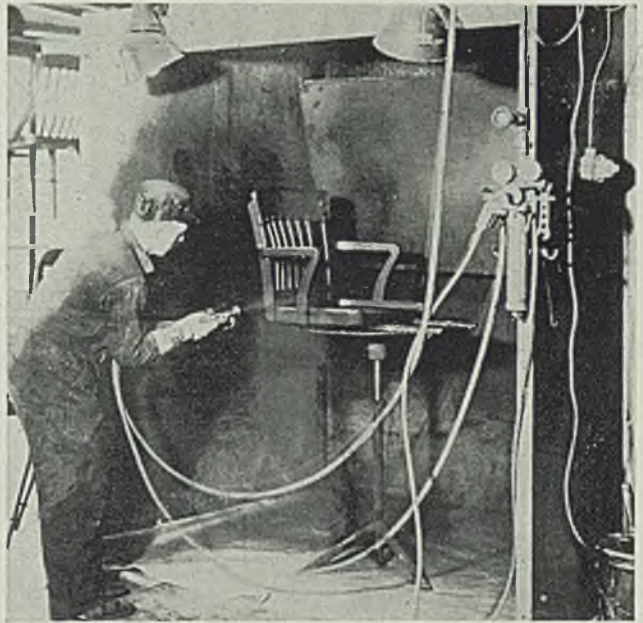
A large amount of abrasive work enters into the finishing of chairs. For example, all surfaces which have been formed by bending and drawing must be polished carefully to bring about uniform surfaces as bending and forming sometimes leave slight irregularities. If these are not removed, the finished chair will show "light glints." To guard against this in the finishing of the chairs each part is polished carefully.

Referring to Fig. 3, the polisher is finishing the edge of a chair seat. The equipment consists of a heavy-duty, double-spindle polishing lathe fitted with 10-inch polishing wheels which take a specially jointed strip of abrasive cloth. This cloth is manufactured alumina threemite; grit depends on the finish desired. This may be a smooth finish, a satin finish, or a lacquer finish. Thus several grits of cloth are used ranging from 50 to 120. As Fig. 3 shows, the wheels are guarded by hoods which are connected to an exhaust system to carry away abrasive dust.

For getting into radii on the base of a swivel chair, so-called abrasive sleeves are used to advantage. They are generally 50 grit threemite and are used over special expanding rubber cores provided for the purpose, driven by flexible shaft machines. Various sizes of the sleeves are used for different radii. When the abrasive work is done properly the final appearance is a smooth surface wherein all the welded joints are "blind" so that the product has the appearance of a one-piece job without welds.

In addition to the welded joints, there are two places where it has been found advantageous to employ

FIG. 5—Finish is applied by the spray method. Special booths are used and adequate lighting and exhaust facilities are provided



mechanical joints. These are where the chair back joins the seat frame at the rear and where the arms join the seat frame. These joints receive the greatest strain so that the aluminum is reinforced with heavy steel washers while a bolt runs through the aluminum and steel and the joints secured with nuts and special lock washers. While it is true these joints could be made by welding, it is thought best to add the washers to reinforce the aluminum metal itself. These joints are permanent and are out of sight in the finished chair.

The process of welding and assembling continues down an electrically operated conveyor so that when the frame reaches the end of the conveyor it is completely welded into a solid unit, cleaned off and is ready for the heat treating process.

Heat treating is of utmost importance. If the chairs were not normalized by correct heat treating they would fail in service and might crack at some of the joints inasmuch as different parts of the chair are under unequal strains caused by heat in the welding operations. Subsequent heat treating corrects these errors.

Heat treating of the material in question is a comparatively simple process although great care must be exercised to see that the temperatures are correct. Referring to Fig. 4, the operator is loading chair frames into a special electrically heated oven in which the temperature is controlled through three thermostatic units. The chairs remain in this oven about 20 minutes, being brought up to a temperature of 970 degrees Fahr., which is approximately 150 degrees below the melting point of aluminum. After the chairs are brought up to the correct heat they are removed quickly

from the electric oven and taken to an air quenching chamber where cool air taken from outside the plant is blown over them until the metal is reduced to normal temperature, requiring about 5 minutes. This process increases the strength of the metal as well as that of the welds. Properly heat treated, the chairs have approximately the same strength as mild steel.

#### Color Applied by Spray

After the chairs have cooled sufficiently they are ready for the final finishing. First, however, the entire surface is rubbed with No. 150 aloxite cloth. The standard finishes used are olive green, mahogany, walnut, sandblast and satin aluminum. The first operation consists of spraying on a ground coat as shown in Fig. 5. The booth is fitted with an exhaust system for carrying away fumes. While the spraying process is simple, considerable practice is necessary to turn out good work. Color of the ground coat depends on the final finish. Brown is used for walnut, green for olive green, and maroon for mahogany.

As soon as the chairs are sprayed they are placed on racks, each rack accommodating 18 chairs. When a rack is filled it is run into an oven where the enamel is baked at a temperature of 300 degrees Fahr., for an hour. In the baking of the ground coat a secondary heat treatment or accelerated aging of the aluminum takes place, increasing the strength of the metal. Thus, two processes are carried on simultaneously in the same oven. The synthetic enamel used is a glyptal type made of imported gums and resins.

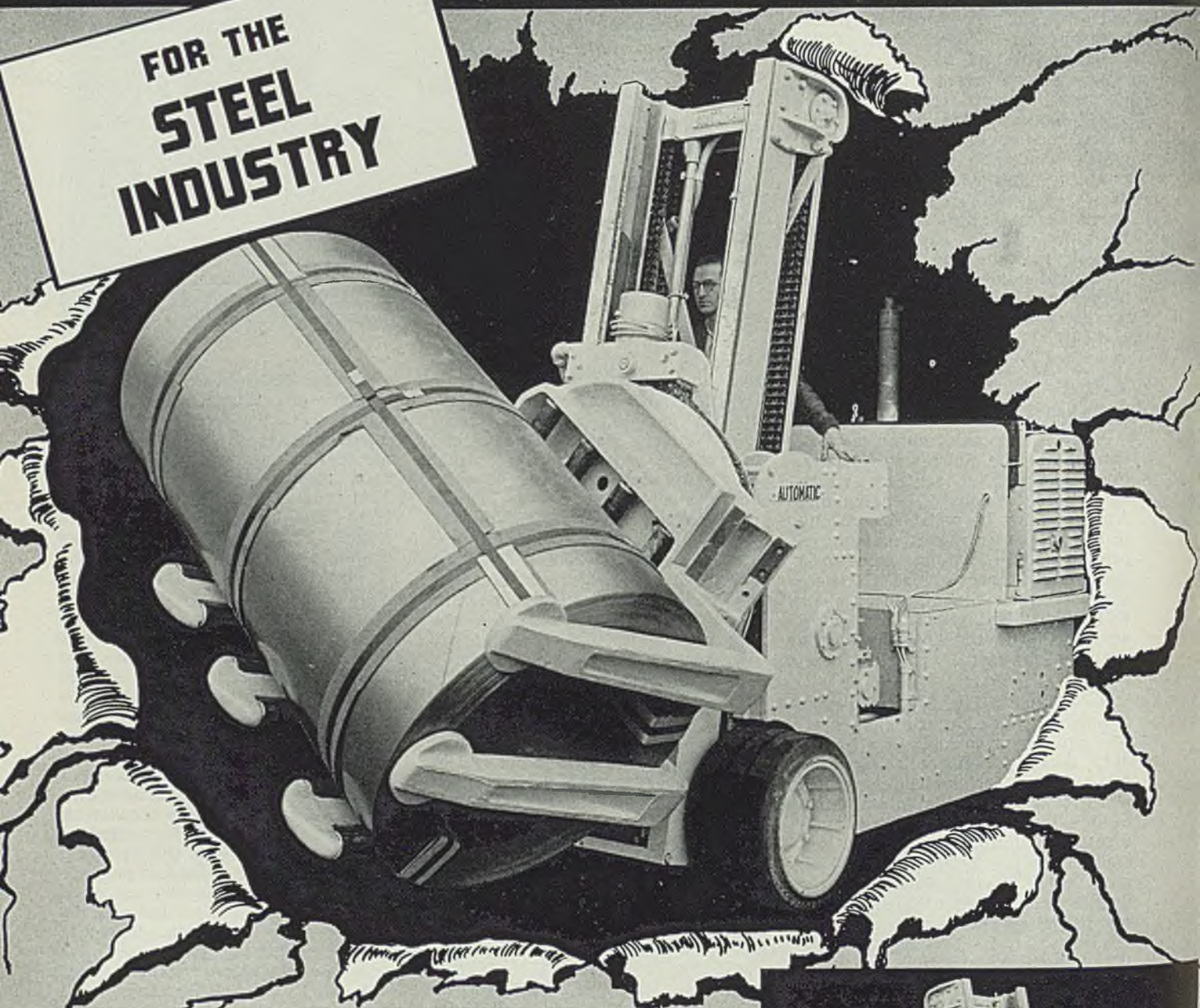
Enamel finishes can be of two types, solid or grained. Solid finishes receive at least two coats of  
(Please turn to Page 88)

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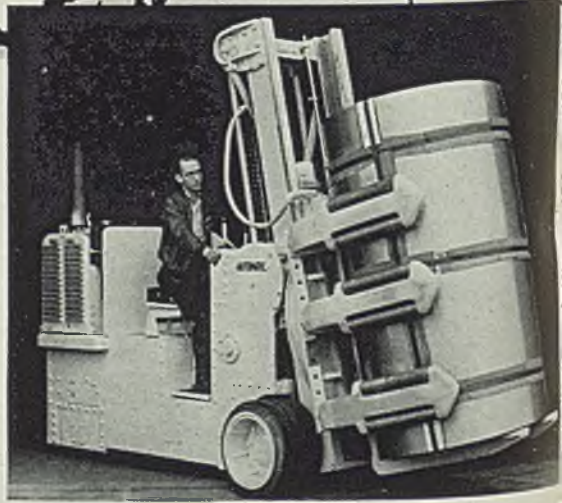


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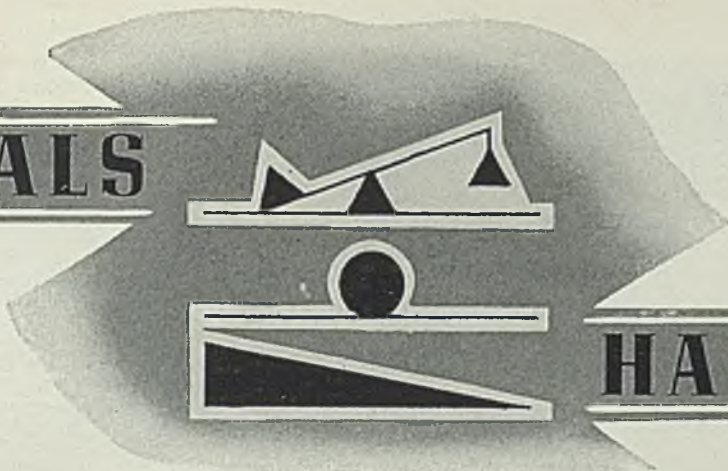


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## Tractor-Trailer Handling Offers Flexibility in Transportation

A STUDY of recent developments in materials handling operations indicates a rather definite trend toward careful selection of mechanical handling equipment with a view to more scientific application of this equipment to the particular task to be done today, and also to the adaptability of the equipment to the unseen handling problems of the future. Never before does there seem to have been a greater desire on the part of industrial executives to reduce their costs under the urgent necessity of meeting competition by putting more into the finished product, without increasing the price to the ultimate consumer.

In this endeavor to carry on in the face of present-day business challenges, executives seem to be moving constantly in the direction of utilizing more abundantly the old slogan of "a place for everything

and everything in its place." One of the results appears to be a displacement of certain types of materials handling equipment for certain tasks, and an almost parallel replacement, but in the opposite direction for other operations.

In the long run, this general tendency seems to be helpful to all branches of the materials handling industry for, while conveyors may give way to floor handling types of equipment in one instance, new uses

THIS is one of the many tractor-trailer trains used by Buick Motor Co., Flint, Mich., for hauling parts from the different fabricating units to the assembly line. It is a simple application of the freight train principle of transportation to industrial handling. In this instance, the motive power is supplied by a gas-powered industrial tractor and each of the six trailers has a capacity of 5000 pounds

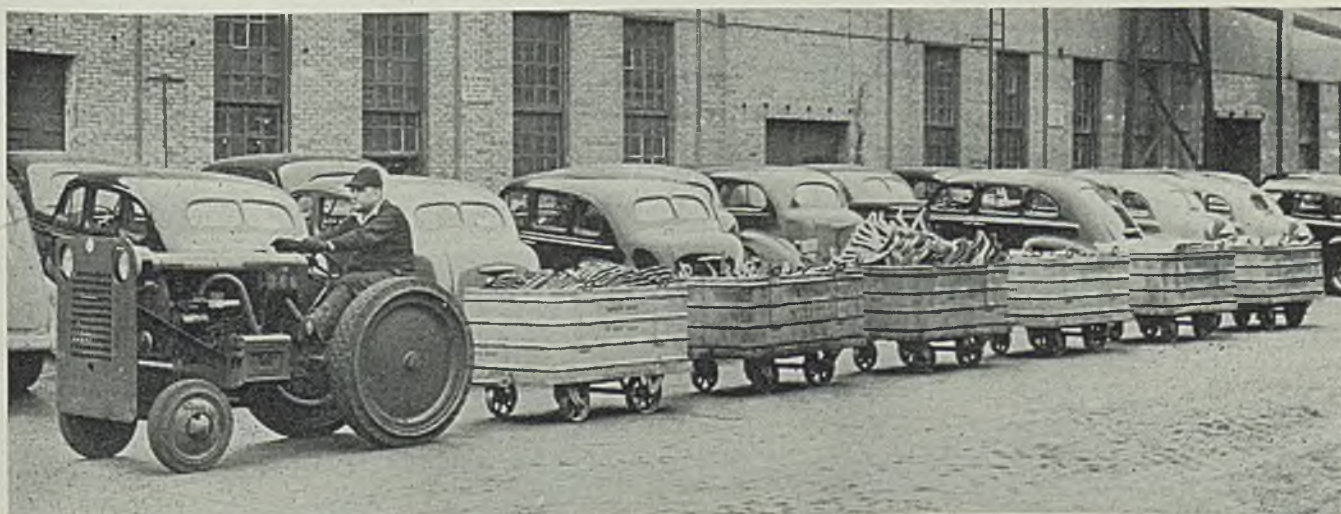
are being found for them in others.

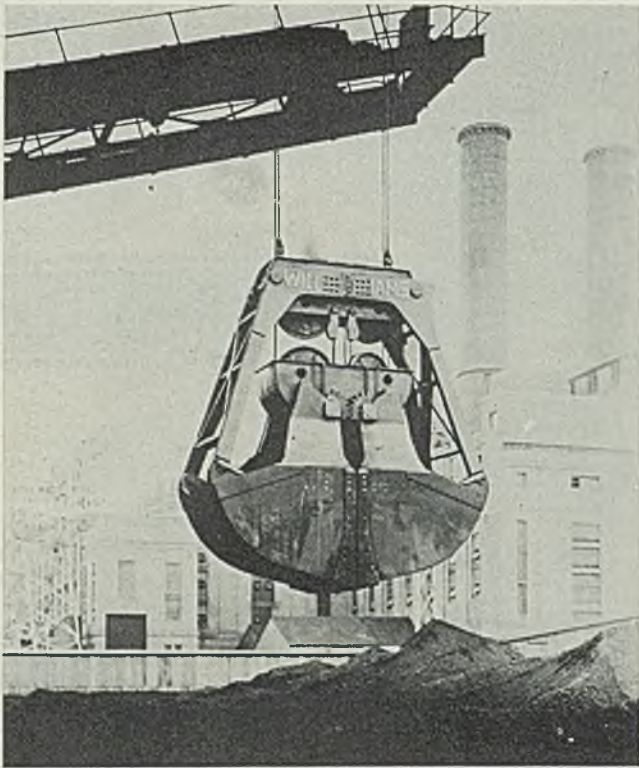
One of the recent examples of the adaptation of an old principle of materials handling is found in one of the large automobile manufacturing plants where, in the past year, the tractor-trailer method of handling has made great strides for inter-plant transportation. In this particular plant, years of efforts on the part of equipment manufacturers were unavailing until a few years ago when the company began to experiment with the tractor idea.

### Employing 3000 Trailers

Since the early part of 1935, and with renewed enthusiasms during the present year, the idea has taken hold, and today this one manufacturer is said to be regularly employing approximately 3000 trailers, with the necessary complement of powered tractor units. The studies of the officials of this plant indicated that the tractor-trailer equipment could do a great many jobs better than had been done under the former method of transportation.

That this innovation has not entirely displaced other types of equipment is indicated by the fact that this company during the past year installed eight units of one make of





**PAY LOAD** of this coal handling bucket was increased by constructing it of high-tensile alloy steel. The bucket has a capacity of 7 tons of coal and is used on a machine having only 6 tons capacity

ed, then hoisted and moved under tractor power to the freight house, where the pallet loads are lifted off and tiered by fork truck without re-handling, the trailers returning behind the tractor unit for the next load. This leaves the loads on the pallets, eliminating additional handling formerly required before delivery to motor trucks or freight trains.

It should be mentioned that in addition to the usual sling hoist, the Canada Steamship Lines' package freighters are equipped with elevators, which lower the trailers, two at a time, to the hold and bring them up unloaded.

In this operation, even odd shapes, such as steel bars, rods and angle iron up to 16 feet in length, are now successfully made up into pallet loads.

### Increases Bucket Capacity

**T**HE problem of handling 7 tons of coal with a machine designed for 6 tons capacity has been solved in a 7-ton capacity breakdown coal bucket recently constructed by the Wellman Engineering Co., Cleveland, for the Buffalo General Electric Co. which has placed the bucket in service unloading lake coal shipments at Buffalo.

Fabricated entirely of the high-tensile nickel-copper alloy steel, Yolo, produced by the Youngstown Sheet & Tube Co., Youngstown, O., the bucket has jaws with a 16-foot reach and grabs 8½ cubic yards at one bite. The steel has high resistance to atmospheric corrosion and high resistance to impact both in the plate and weld. The bucket weighs 18,000 pounds and has a yield strength above 60,000 pounds per square inch and an ultimate strength of 90,000 pounds.

electric industrial truck and a number of units of another make of electric fork trucks and low-lift trucks, as well as some additional conveyor units.

This method of handling is one that has been very popular in many freight terminals throughout the United States, and the idea has been spreading beyond the boundaries of this country. In a recent issue of *Storage Battery Power* is an interesting description of how this method of handling has contributed in large measure to the reduction of a full day in the time of movement of package freight between Montreal and Toronto since its installation by Canada Steamship Lines, Ltd.

#### Operations Speeded Up

In this particular operation, the loading operation employs a combination of tractor-trailer and pallet fork-truck systems. The beginning of this change in method of freight handling took place last year when the company purchased three tractors and 150 trailers for use at its Montreal freight houses. While adequate economies soon were realized, it was found that to attain the ultimate there should also be a speeding up of operations incidental to loading and unloading of ocean ves-

sels. To achieve the desired goal, the freight station handling system was introduced also for this additional service.

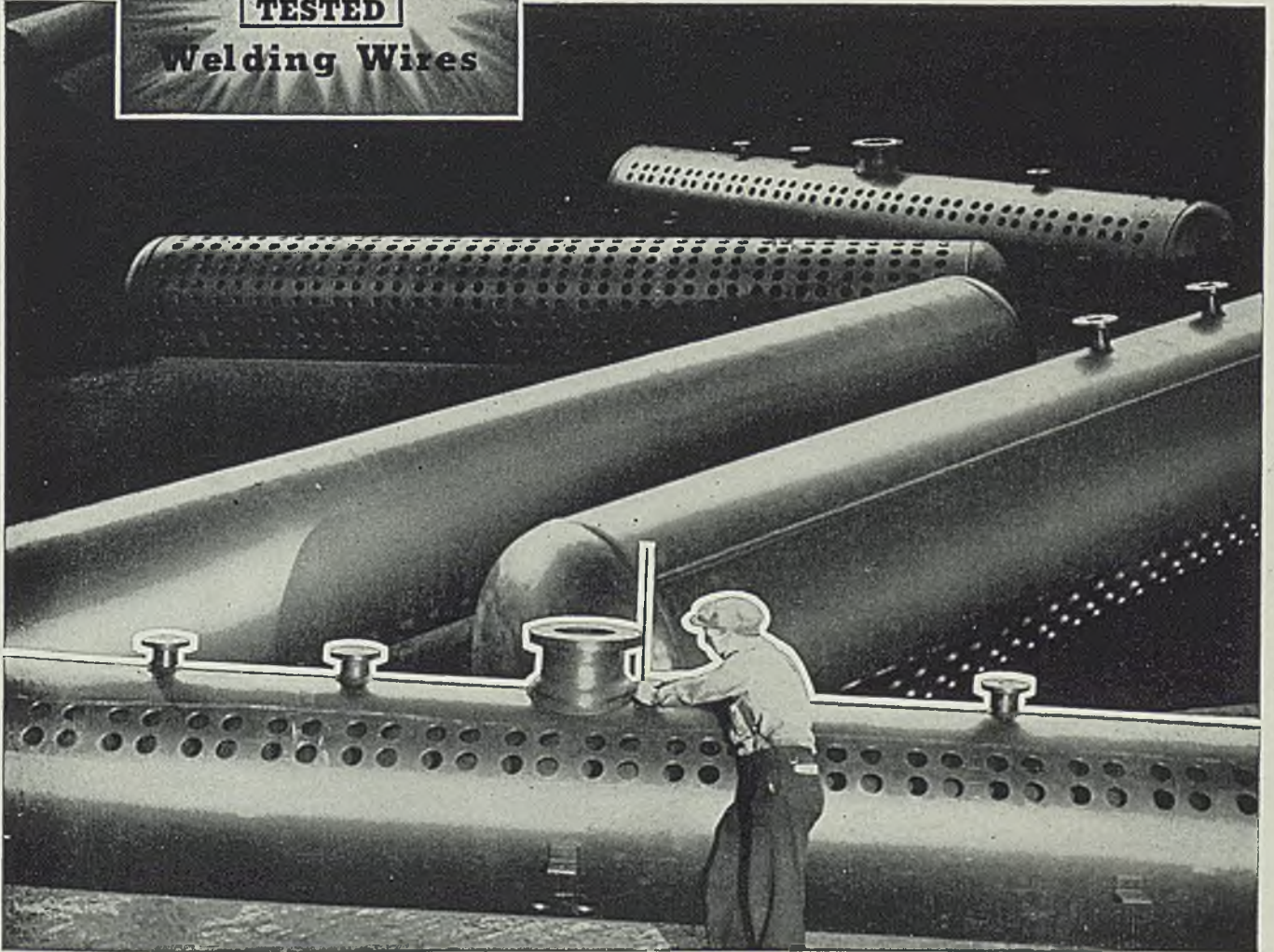
Here is a point of additional interest in this connection. Before the final decision of the installation, a study was made of industrial plant practice, and this resulted in the introduction of the pallet-fork truck for handling on and off the trailers.

The sequence of unloading a cargo from a freighter is now as follows: A tractor with a complement of trailers is taken aboard ship, each trailer bearing a pallet. The train moves aboard ship, trailers are lowered to the between deck, are load-



**T**HE method of handling sheet steel in the Buick plant is illustrated here. The bundles, which are steel strapped, are transported to storage space by an electric industrial fork truck. In this instance, the truck has a capacity of 10,000 pounds at a distance of 72 inches from its horizontal center-line without danger of tipping and can raise that load 8 feet

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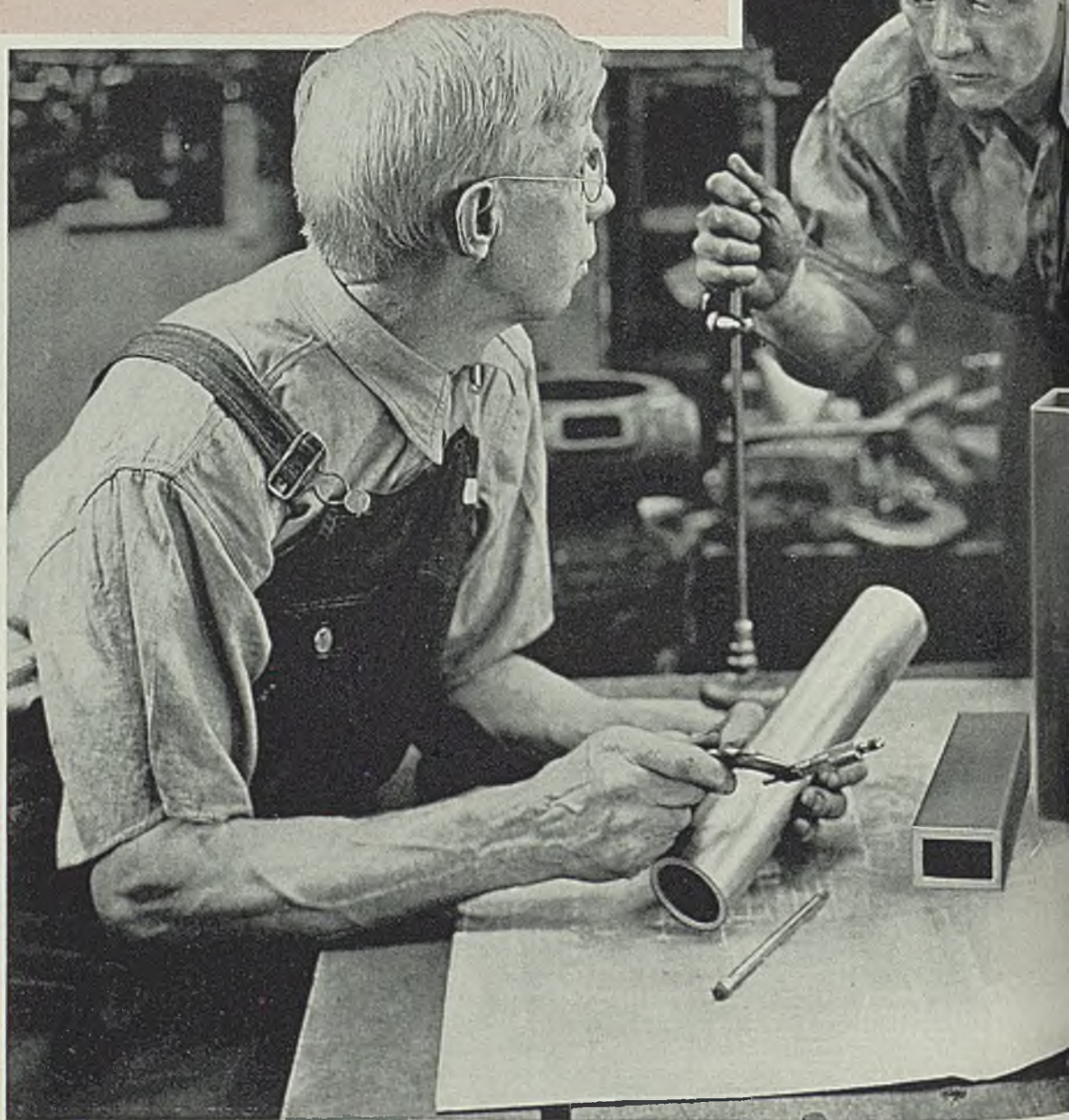


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3.



4.



5.

1. Bearing or collar with machined flange. 2. Gear ring. 3. Collar, grooved for shift fingers. 4. Case and cone for tapered roller bearing. 5. Expanded and flanged casing. 6. Cam follower for interrupter mechanism. 7. Flexible stay-bolt sleeves. 8. Coil of soft-annealed tubing.



6.



7.



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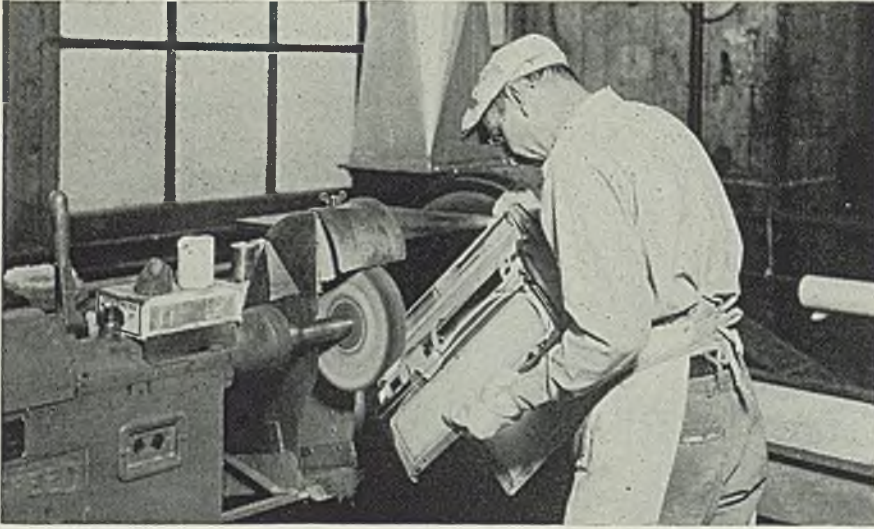
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# UNITED STATES STEEL

# SURFACE TREATMENT AND FINISHING OF METALS



*After nickel plating, cash register parts are buffed with white compound on 18-inch muslin buffing wheels. This is followed by chromium plating*

## Efficient Production Methods Reduce Cost of Finish on Cash Registers

**M**ODERN surface finishing is a comparatively costly procedure. In many instances the cost of finishing a given unit exceeds the cost of its production. Constant research, however, has brought about improvement in quality, economies in production, and a more complete knowledge of the physical characteristics of the various types of finishes.

Any finishing process such as painting, lacquering, enameling or electroplating, while costly, is necessary in breaking down sales resistance. A glance at any of the articles made for popular consumption, such as electric refrigerators, sewing machines, household electrical appliances, automobiles, bicycles and even children's toys, reveals that pleasing finishes are in demand.

Finishes, like styles, change with the times. For many years gold, silver, and nickel plate together with baked enamel were the most popular finishes. Today chromium plating and synthetic enamels enjoy popularity. They hold their present position because they are durable and pleasing to the eye. What the next decade may reveal in the way of finishes is difficult to predict.

In view of these factors modern

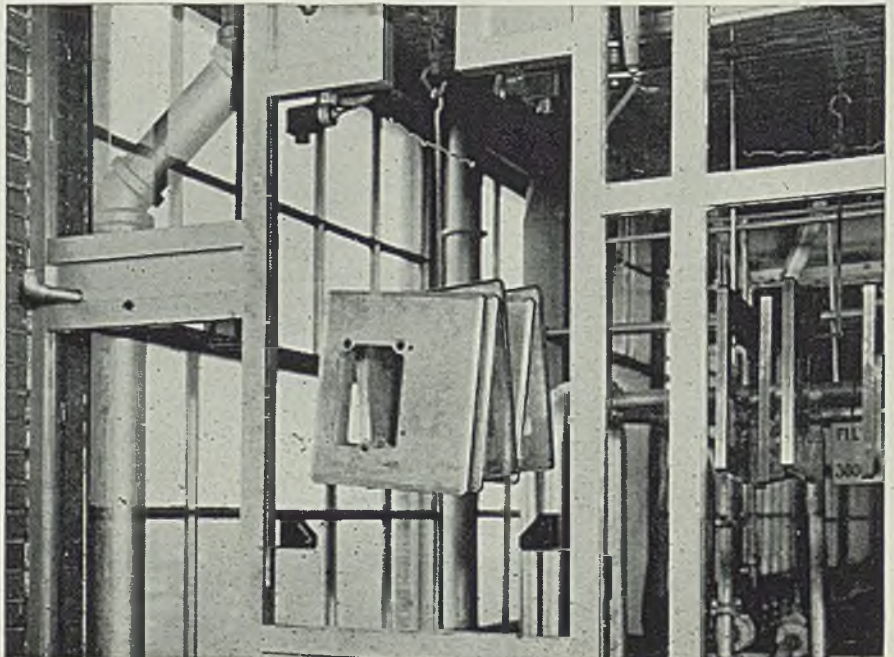
methods and efficient handling facilities are necessary in keeping down costs which otherwise might

become prohibitive. An example of such practice is shown in the following description of the general method used to finish chromium plated cash register cases at the plant of the National Cash Register Co., Dayton, O.

Due to the large volume of parts handled, chain conveyor systems are used for conveying the work from the time the cabinets and other highly finished parts start on their journey through the polishing and plating departments until the finished parts are finally inspected and ready for assembly. The heavy investment in conveyor equipment has been found to be warranted by the production cost savings obtained.

### Parts Are Highly Polished

Preliminary to polishing, the parts are cleaned in a hot alkali solution to remove grease and dirt, followed by a pickle in a 10 per cent acid solution to remove scale. The parts are then ready for polishing. They are polished on double-spindle lathes which carry 18 x 2½-inch felt wheels driven at a spindle speed of 2250 revolutions per minute. The first or rough polishing is done with No. 120 grit aloxite and subsequent operations are carried out on wheels set up with Turkish emery. The second operation is a dry finishing with No. 150 grit;



*Parts entering plating department pass between photoelectric control beams. If they are too wide or hung improperly so they will wedge in the narrow degreasing tank, the conveyor is automatically stopped until adjustments can be made*





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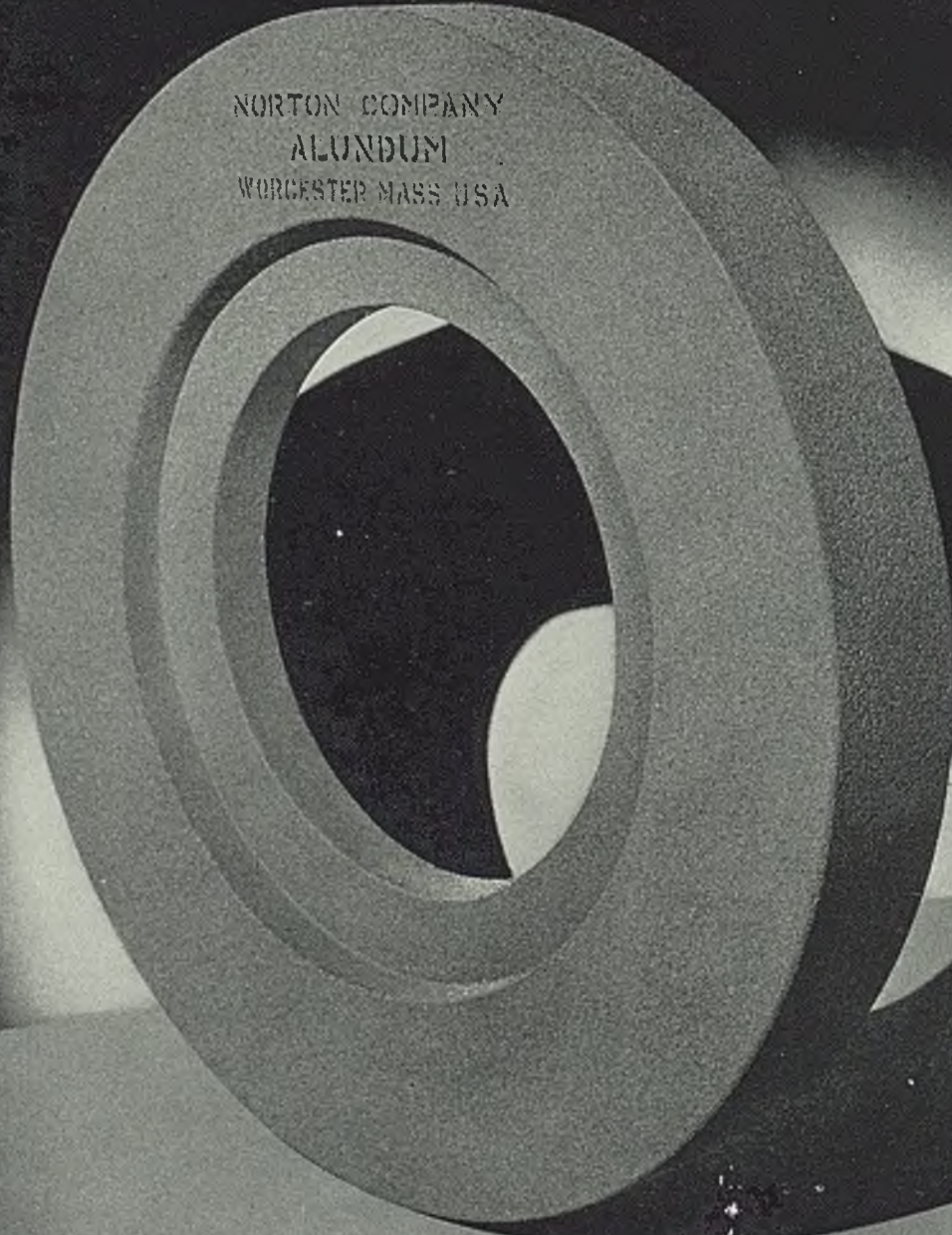
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*Nickel plating is done in automatic plating equipment and a maximum use is made of conveyor equipment. The inspector at the right is examining a cabinet as it comes from the plating bath*

third, an oiling operation with No. 180 grit; fourth, oiling with No. 200 grit; and fifth, oiling again with No. 200 grit, the wheel in this case being stoned down with lump pumice.

The work is inspected after each polishing operation to correct any possible errors before the work is passed on to the next operation. It has been found that this system saves considerable time and expense for if a final inspection after the complete polishing sequence is followed, parts which required reworking would have to be routed through the entire process over all the wheels.

#### **Electric Eyes on Guard**

After the parts are polished they are placed on a conveyor chain which takes them to the plating department. As shown in the accompanying illustration the parts are conveyed through an opening guarded by electric eyes. If a part is too wide to enter the degreasing tank the eye immediately shuts off the power to the conveyor belt line. This is of great importance because the degreasing tank is somewhat narrow and holds 900 gallons of alkali solution heated to a temperature of 180 degrees Fahr. If a part became wedged in this tank a lengthy shutdown would be necessary to free it and get the conveyor line started again. As it is, if the electric eye stops the line, the foreman remedies the difficulty before the part has a chance to get into the tank where it could do damage.

After the parts are degreased, washed and rinsed they are given a copper "strike," after which they

are washed and nickel plated. After nickel plating they are buffed with white compound on an 18-inch muslin buff. This operation is shown in an accompanying illustration. The parts are then chromium plated and chrome buffed.

As shown in one of the illustrations, the equipment used for nickel plating is automatic. Due to the fact that this department is partitioned off from the rest of the plating department it is possible to maintain clean surroundings. The conveyor chain shown at the left

runs through this department and parts are transferred from this chain to the plating equipment. The inspector at the right is examining a cash register cabinet as it comes from the plating bath.

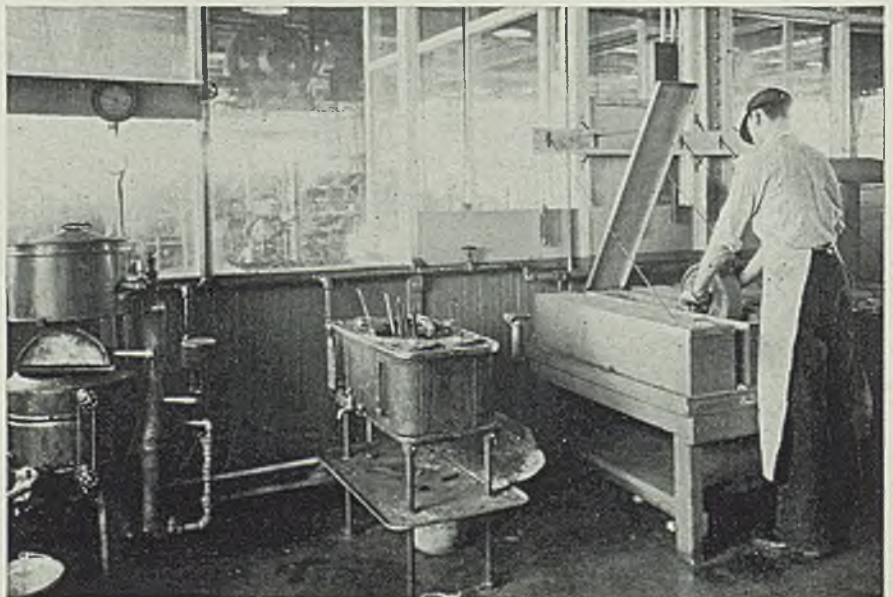
The arrangement for chromium plating is of a semiautomatic nature, that is, the parts must be conveyed manually from tank to tank. However, labor saving hoists are provided so that the number of operators are reduced to a minimum. After chromium plating the parts are buffed on muslin wheels with chrome rouge.

While the foregoing sequence applies particularly to parts which require a high finish before plating, there are a number of steel cash register parts which do not require such a high finish. Such parts are generally polished on muslin wheels made of several sections glued together. A three wheel sequence is often sufficient and includes rough polishing with grits varying from No. 90 to No. 120, depending on the work, oil fining with No. 180 grit and a second oil fining with No. 200 grit. Such parts are comparatively small and are not handled on the chain conveyor belts.

#### **Wheels Set Up by Specialist**

Due to the large number of parts polished it is necessary to set up about 400 wheels per day. This work is under the supervision of an expert in a separate department, a partial view of which is shown in an accompanying illustration. A polishing wheel can be set up several times before it is necessary to remove the head which only happens when the head is badly damaged. When this is necessary the

*(Please turn to Page 74)*



*Approximately 400 polishing wheels are set up per day in this well equipped department. Glue heaters are provided with automatic temperature control and abrasives are kept in troughs with hinged covers*

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Index—

Data Sheet No. 6

Subject—

Yearbook of Industry

Issued—

October 21, 1936

## YEARBOOK OF INDUSTRY

### DATE OF ISSUE

The "Yearbook of Industry" number of *STEEL* is an established institution in the iron, steel and metalworking industries. Issued the first Monday in January, it presents a comprehensive picture of the outstanding developments of the previous calendar year, with statistics, comparisons, analyses, etc. for the interpretation of the significance of those developments upon future trends.

January 4, 1937.

### IS INDUSTRY PREPARED FOR REAL PROSPERITY?

In the iron, steel and metalworking industries, are the facilities of finance, organization, plant, equipment and personnel ready for sustained activity at high levels?

Has rehabilitation and modernization been carried forward sufficiently to make up for the neglect of the depression period?

Are proper precautions being taken to guard against serious shortages of skilled workmen?

Is capacity for production, finishing, processing, and manufacture being brought into balance, or is the industry still topheavy in productive capacity?

In brief, is industry in a state of preparedness for big business ahead?

Preparedness for prosperity is the dominant theme of *STEEL*'s annual issue—the "Yearbook of Industry" number, dated January 4, 1937. Every one of the more than 30 major articles will be pointed toward the single question "Is Industry Prepared?" By text, illustrations, statistics, tables and charts, *STEEL* will attempt to show wherein the industries it serves are weak or strong in their state of readiness for big business ahead.

This theme will lend purpose and furnish co-ordination to the numerous annual features which have helped to make the "Yearbook of Industry" number distinctive in former years. The 1937 issue will include all of the established articles and departments. In it you will find *STEEL*'s annual analysis of distribution of finished steel, its exclusive surveys of engineering developments, "The Business Trend", "Windows of Washington", "Mirrors of Motordom", the annual summary of market developments, the essential price history of principal iron and steel products and numerous other features which for many years have made the "Yearbook of Industry" number invaluable for reference purposes.

## HOW READERS APPRAISED THE 1936 YEARBOOK

"I wish to congratulate you on the excellence of your annual issue. You have therein the usual statistical records but also a number of articles both editorial and otherwise which are quite worthwhile and of interest at this time. Also I think special attention should be drawn to the fact that it is comparatively easy to find the reading matter which you have seen fit to pretty well segregate separate and distinct from the advertising. In the similar issue of another magazine this has not been done and I find when I have a few moments' time that I turn to your magazine more readily than I do to the other because I can more readily find the article I want."

President

"It is the most complete compilation of facts and the most artistically arranged and printed magazine that has ever been brought to my attention."

Vice President

"I want to congratulate you on your annual issue which has just come in. It is certainly a marvelous piece of publication work and is a credit both to the publishing industry and to the steel industry which it represents.

I feel that in this particular issue you have accomplished just a little bit more than has ever been done by any publication of the kind. It is a masterpiece even to the printing and the binding which allows it, despite its size, to lie flat on a desk."

Advertising Agency

"I want to compliment you on the very efficient and beautiful make-up of this book in its entirety. It is a compliment to the Industry."

President and General Manager

"It is my habit to keep these 'Yearbooks' and I find them most convenient as reference books for looking up data and information about the steel industry. I have not had an opportunity of reading the latest one in its entirety, but I look forward to making use of it in the future."

Vice President

"We receive a great many trade magazines in this office, and you may be sure that I am not handing you any idle bouquets in saying that this copy is the 'best yet.'

We compliment particularly the binding, which seems to have accomplished all the advantages of a spring wire effect without its disadvantages."

Advertising Agency

"It is my personal opinion that STEEL has done an outstanding job this year from the standpoint of both the reader and the advertiser and this thought is echoed by all those to whom I have talked about your Annual issue."

Advertising and Sales Promotion Manager

"You have every reason to be proud of the January 6 issue of STEEL, the 1936 Yearbook of Industry. It is quite fascinating from cover to cover, splendid editorially and from an advertiser's standpoint, the best ever. That is saying a good deal. We congratulate your entire organization on this unusual number."

Assistant Secretary

"After looking over the 'Yearbook' we are pleased to congratulate you on the completeness and style of the book. It seems that each year it is better than the year before. Our best wishes for the future."

President

"I would like to compliment you on the general appearance of this issue, as well as the fact that you have proved to be definitely up-to-date in the new features which you have incorporated in the book, both from the standpoint of information of interest to the industry and the manufacturer serving same, as well as in those features of the make-up of the book which gives very definite evidence of the alertness of your entire organization."

Purchasing Agent

"You are certainly to be congratulated on the size and quality of this issue. It has aroused an unusual amount of favorable comment."

Engineer

"I particularly like the way you have arranged the material and certainly hope that the year 1936 will completely bear out your prophesies. I am very sincere in saying that you and those who worked with you on this particular issue have done a very excellent job and it should be appreciated by every man in the industry."

Secretary

"There was placed on my desk this morning the January 6 issue of STEEL entitled 'The Yearbook of Industry,' and I have had an opportunity to look it over.

The purpose of this note is to congratulate you as editor upon as fine an example of a trade paper as it has ever been my privilege to examine, and I particularly wish to compliment you upon your straightforward and thoroughly sound editorial under the caption 'As the Editor views the news.' Some of the advertisements in this issue are the finest I have ever seen and are equal to, if they do not surpass the best that I have observed in 'Fortune' and other similar magazines."

Executive Secretary

"You and your Company are to be congratulated upon the success of your 'Yearbook.' Add my congratulations to others which your organization has probably received for a real masterpiece. We appreciate your co-operation with our organization, and wish to send our kindest personal regards."

Sales Promotion Manager

N. B.—We promise a bigger and better issue on January 4, 1937.

# POWER DRIVES

## Manufacturers Provide Drive Specification Data

**M**ANUFACTURERS of V-belts and sheaves and silent and roller chains and sprockets are to an increasing extent providing stock drives in the larger cities and central locations. Also, by providing V-belt and chain tables and data the engineer, knowing his horsepower and speed ratio requirements, can specify his own drive with a minimum computations.

Making these computations easy and simple and reading results from the tables, the engineer is less likely to err in his work, which is an important factor as not even plant engineers are free from mistakes in "figuring." Also, knowing exact sizes of units the cost of the installation is easily determinable in advance, and thus approval of management is obtainable at once without extensive correspondence.

Usually time is an important factor in obtaining drives. Such tables, with stock units available for immediate shipment from nearby sources, have greatly simplified the problems in connection with laying out and obtaining drives. Such aid has led to the more extensive use of these drives and at the same time permitted manufacture on a quantity production basis, thus helping both manufacturer and user.

### Defect of Tables

There is one danger in relying too much on such tables. For the average drive, and the majority of drives fall within the classification of "average," such tables permit the selection of drives well within limits that provide satisfactory operation. However, on drives subject to peak loads, high fluctuations or pulsations in power demand, shocks from frequent starting or during operation, reversals under load, and other severe operating conditions, it is advisable to consult the manufacturer or his representative relative to the drive best suited to his requirements. The reason for this is that every drive should be designed for the extreme load and the motor nameplate rating does not always indicate the maximum load which it is capable of handling safely because of its built-in overload characteristics. A 5-horsepower motor may deliver 10 or more horsepower at times.

Manufacturers usually state in

explanatory notes to their tables that for such unusual services the manufacturer should be consulted but sometimes these notes are overlooked.

Belt manufacturers have not gone so extensively into the preparation of tables and data although some such tables are available. In general, in the selection of belted drives too much reliance is placed on the motor nameplate data for horsepower rating, whereas overloading has more serious effect on belts than on some other types of drives.

♦ ♦ ♦

## Needless Fire Hazard

**R**ECENT fatal burning of two football players and the serious injury to others of the squad at one of the leading engineering universities indicates the possibility of similar accidents in many plants. These men were using gasoline as a solvent to loosen adhesive tape when it became ignited with fatal results.

A newspaper report stated that only one out of 100 schools and colleges had been using carbon tetrachloride, an inflammable liquid used in fire extinguishers and for cleaning where fire regulations prohibit naphtha, for such purposes. No doubt the percentage is greater now.

The experience of the writer indicates that about the same percentage of industrial plants use carbon tetrachloride for cleaning and degreasing leather belts instead of gasoline, benzine, or naphtha. While probably only one or two men are endangered when cleaning belts the fire hazard to the plant is always present.

The added hazard of static electricity is encountered where belts are surface cleaned on the pulleys by washing with one of the inflammable solvents.

♦ ♦ ♦

## Preventing Static

**P**REVENTING trouble is generally more satisfactory than taking care of it after it happens. This applies particularly to belt static.

Friction, slippage and dry belts in dry air are contributory causes of static electricity. The trouble is increased with high speeds. Loose or overloaded belts slip most. Keeping belts tight, installing larger and

more flexible belts, changing to pulleys with greater gripping power, or using a pivoted motor base on motor drives correct slippage.

Dry belts are best corrected by keeping them soft and flexible. Neatsfoot oil, or some of the special dressings recommended by the belt manufacturer applied whenever the belt indicates dryness corrects this trouble. However, too much dressing may cause the belt to slip.

Such preventive measures are usually sufficient where the hazard is the danger of a shock to individuals. Where explosive fumes or dusts are present such protection, while worth while as a preventive measure, is not fully safe and grounded wire "combs" should be installed, sometimes on both sides of the belt.

♦ ♦ ♦

## Fighting Moisture

**M**OTORS exposed to moisture or slightly acid fumes or cast iron dust, if not sufficient to require totally enclosed, self-ventilation units, give longer life and less trouble if the armature is dipped and baked, even though individual coils had been so treated, before inserting in the windings. This extra treatment fills openings around the coils into which moisture fumes or dust may enter.

For protection against a minor amount of acid fume exposure, special protective coatings may be applied over the baked insulation.

Only dry air may be used to dry the armature before dipping. Compressed air lines often contain too much moisture which is trapped when the armature is dipped and baked.

Small plants which send repair work out will generally find that such extra service is an economy with unfavorable operating conditions. Some plants making their own repairs so treat all armatures when it becomes necessary to re-wind, even though operating conditions are normal.

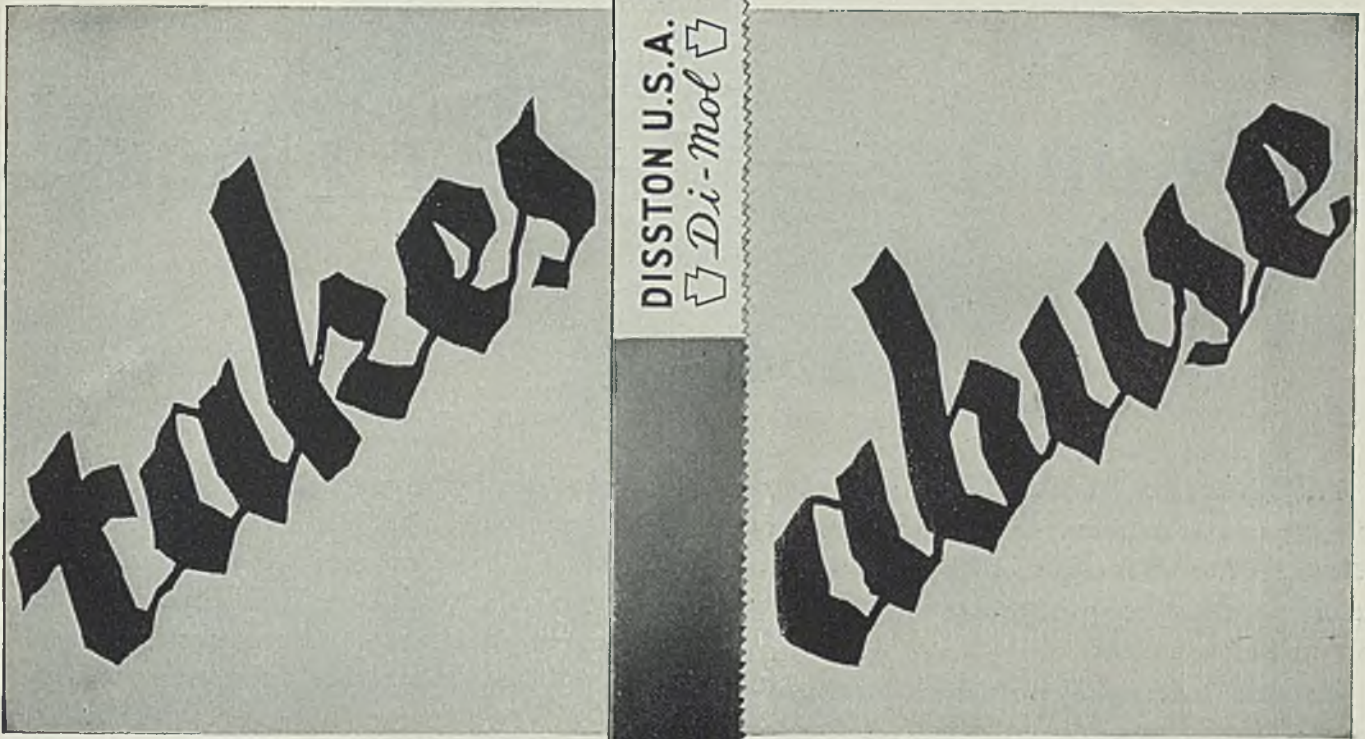
♦ ♦ ♦

Some types of flexible couplings are designed to operate with greater misalignment than others. Where misalignment cannot be prevented, carefully consider the type to be applied to the installation.

♦ ♦ ♦

*Check oil levels in speed reducers or other enclosed drives only when the unit is not in operation.*





● Disston comes to the relief of the shop where new hard, tough materials and modern production schedules are outclassing carbon and molybdenum hack saw blades.

Disston Di-Mol is the answer to that problem. Di-Mol is tougher. Is stronger. Has greater stamina. Di-Mol stands the uses and abuses of hand work. It withstands modern feeds and speeds in power production.

Di-Mol performance is the plainest sort of economy. Di-Mol Blades cut faster, cut longer, cost far less to use.

They are Disston quality, Disston workmanship—assured by the Disston name (with Di-Mol) on orange band on blade.

Standard lengths, widths, thicknesses and teeth. Hand blades, ½ gross in box; machine blades, 1 dozen.

Let us prove Di-Mol superior, on your own work. Write for demonstration. Henry Disston & Sons, Inc., 1105 Tacony, Philadelphia, U.S.A. Branches: Boston, Chicago, Detroit, Memphis, New Orleans, Seattle, Portland, Ore., San Francisco, Vancouver, B. C. Canadian Factory: Toronto.



A black and white illustration of a hand holding a nickel coin between the thumb and index finger. The coin is clearly marked with the number '5' and the word 'CENTS'.

# An Industry Jumps for a Nickel

For this coin of a hundred million pockets is the key to vast markets. As the price anyone can afford, it demands recognition. And only through modern mechanized processes can its purchasing power be maintained.

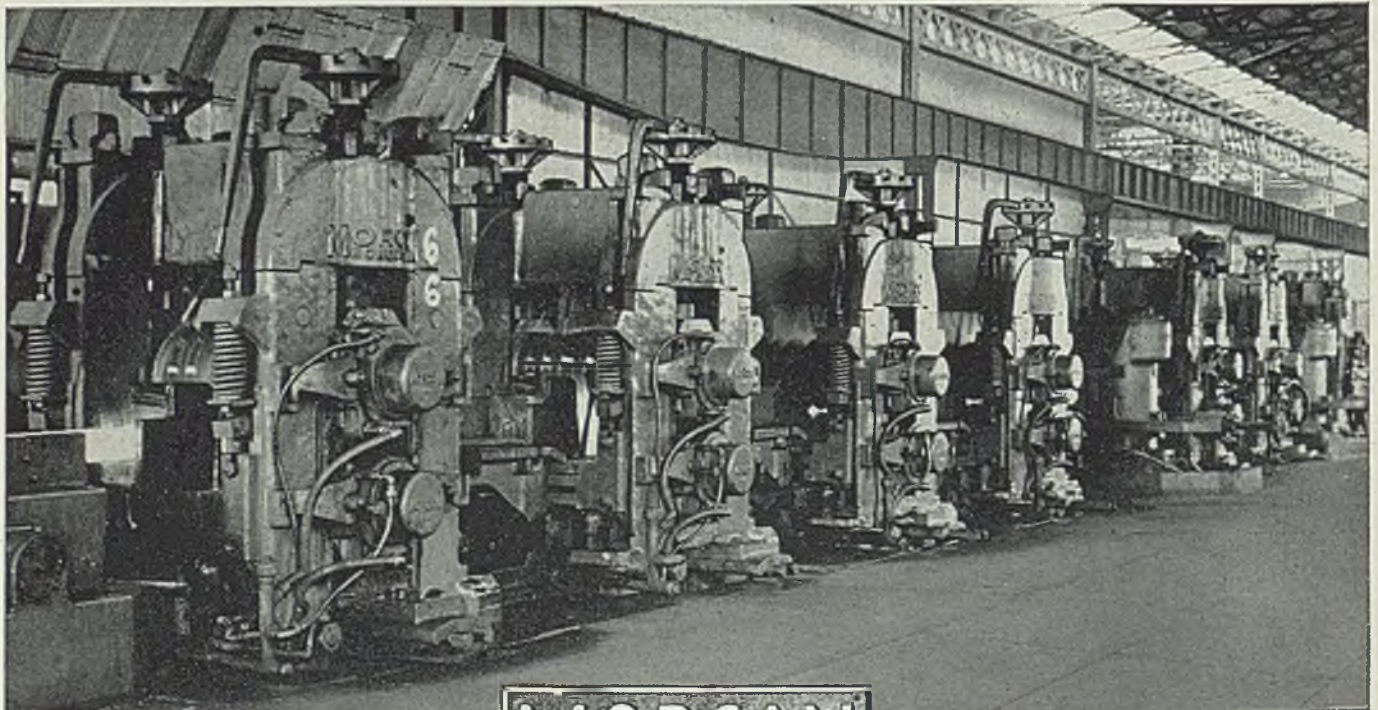
The steel industry offers dramatic proof of this value. Fly swatters, screw drivers, tea strainers, button hooks . . . it daily produces tonnage—and profits—for an army of fabricators. But *costs* must be figured in fractions.

As raw material and labor advance, speed must

increase, quality improve. This condition is beginning to make itself felt at the rolling mill, in demand for greater accuracy, better quality and finish in rod, strip and merchant shapes. And the mill equipped to meet these requirements profitably will find dependable, increasing tonnage.

\* \* \*

The modern Morgan Continuous Rolling Mill will meet specified conditions as to tonnage, accuracy, and production cost. For these are all governed by details, and details are *governed* by Morgan.



R-13

**M O R G A N  
CONSTRUCTION CO.**



**W O R C E S T E R  
MASSACHUSETTS**

## Broad Usage of Oxygen and Acetylene Results from Educational Program

**A** FIRE truck, muffler cut out and siren screaming, thunders through the city streets. This time it is on an errand of mercy. Husky firemen administer oxygen for hours or even days to save the life of a child who cannot breathe normally. The newspaper reader sighs with relief when the victory is won and a life is saved, but there is little public knowledge of the great industry producing and distributing the compressed and dissolved gases upon which modern civilization places so much dependence. It is a highly technical business which is staffed by men who have spent their lives in it.

The industry had its beginnings in the production of calcium carbide in France. By the addition of water to calcium carbide, acetylene was produced for lighting purposes. But the coming of electric lighting with Mr. Edison's new incandescent bulbs ruined that business. Then a man by the name of Bournonville invented a torch which would burn pure acetylene and pure oxygen to produce a flame capable of melting steel. Modern fusion welding was born. Then came oxyacetylene cutting, the oxygen lance, underwater cutting, torch hardening of teeth in gears. Estimates of the number of welding and cutting torches in use in this country vary from a quarter to a half million.

### Education Stressed

This industry is conspicuous in its emphasis on the job of showing its customers how to use its gases and apparatus. Instead of broadcasting to the world how much its scientists know about oxygen and acetylene, the industry will have a capable operator at John Jones' plant at 8 a. m. Monday morning to show him how to use oxygen and acetylene in his business profitably. There is probably no industry in the country in which such a high percentage of the personnel actually can perform all the operations for which the product is designed. The ratio of stuffed shirts to men who are capable and experienced in the art is of the order of one to fifty.

The International Acetylene association meets for its thirty-seventh

annual convention in St. Louis Nov. 18-20. As usual, the program deals entirely with means by which manufacturers and others can use gas profitably. Men who know their business will teach by showing how to do jobs. It is perhaps a quaint idea to many, but these men work hard for a living and have thereby gained a satisfactory degree of prosperity.

### Design of Arc Welders

**I**N 1913 a 150-ampere arc welding unit cost \$3500 and used the same amount of power whether the operator was working or not. A 400-ampere carbon arc welding unit cost \$5000 and an enthusiastic salesman would guarantee the outfit to weld a brick to a concrete wall.

From 1913 to the recent past, the

progress in arc welding was measured by the rate at which the machines were improved and, certainly to an equal degree, by the rate at which they were reduced in selling price. At present, due to widespread use of coated welding rods which are easy to operate compared with bare wire, reduction in price of the welding machine is more important than improvement in operating

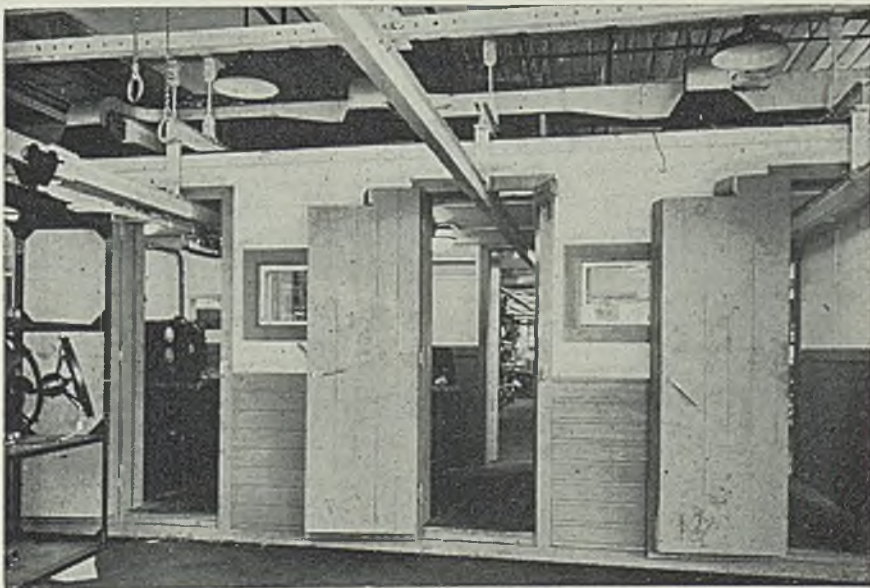
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*I*N THIS column, the author, well-known consulting engineer in welding, is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL.

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characteristics. This would appear to nullify the efforts of the exceptionally able designers who work on the production of new models of welding machines. However, the big job in the design of an arc welding machine is still ahead and remains to be done.

### Air Conditioning Keeps Testers Cool



**A**IR conditioned test departments which give greater comfort to the operators result in greater accuracy in the work, according to the Westinghouse Electric & Mfg. Co., which has recently finished installing the unit shown above in its East Springfield, Mass., plant. Soundproof and practically air tight booths are required for appliance testing work, which, without air conditioning, would result in discomfort to the workers and a decrease in efficiency

# All-Steel Unit-Type Bodies for New GMC Cars Designed for Safety

**C**ONSTRUCTION details of the "unisteel" turret top body by Fisher, which will feature the 1937 line of General Motor cars—Chevrolet, Pontiac, Oldsmobile, Buick, LaSalle and Cadillac, were revealed last week by Edward F. Fisher, general manager of Fisher Body Corp., Detroit.

The new body is a single steel unit, formed by the welding of the inner and outer panels into permanent shock-resisting structure, providing double-walled protection for occupants at all strategic points.

Windshield posts, doors, center pillars and hinge pillars, square-section rockers that reinforce the body along the floor, and the deep U-channels under the edges of the turret top are all constructed in this manner. U-shaped cross members at top and bottom and bulkheads at front and back add still further to the rigidity of the structure as a whole.

High resistance to torsional, beam and compression stresses is achieved by the "unisteel" type of construction, it is claimed, since the fusing of the inner and outer structures makes it possible to apportion the load between the two. Flash, spot, gas and arc welding are employed to join the various parts in the assembly operations.

## Floor Ribbed and Braced

Ribbed for strength and to eliminate noise vibrations, the steel floor is braced cross-wise with U-channels of heavier metal and lengthwise by the rocker panels. The latter are U-sections containing a special reinforcing ledge, and are welded to the underbody at the sides. The front end, which includes the corner posts and inner reinforcements at the top of the windshield opening, likewise is a single steel assembly.

These units, with the rear quarter panels, the improved seamless steel roof and the center pillars, are permanently joined in the first major assembly operation. The steel roof rails that constitute U-channels with the arch of the turret top are welded into position in this operation also.

The rails extend along the line of the new drip molding that has been incorporated in the design of the turret top, adding to the torsional and beam strength of the body and providing an anchorage for the U-shaped steel bows that reinforce the roof. The remainder of the interior bracing and the doors are

added as the body moves down the production line.

In keeping with the protection afforded by the new type of construction, Fisher Body is introducing what is known as the "saftiseal" floor in 1937 cars. All seams, such as that at the juncture of the metal toe board and the steel floor, are filled with a composition material to prevent exhaust fumes from entering the passenger compartment.

## New Bulletin Describes Making of Alloy Steels

Making and shaping of alloy construction steels is covered in a new 12-page booklet published by International Nickel Co. Inc., New York. Author of the paper is E. C. Smith, chief metallurgist, Republic Steel Corp., Cleveland. The paper is reprinted from a discussion, "Nickel Alloy Steels," assembled and edited by H. J. French and J. W. Sands, and covers the various methods of modern steelmaking, practice followed in alloy steelmaking and procedure in hot working the finished alloy ingots.

## National Founders Arrange Annual Meeting Program

Ten addresses and papers on economic and technical subjects are scheduled for presentation at the fortieth annual meeting of the National Founders' association to be held at the Waldorf-Astoria hotel, New York, Nov. 18-19. J. N. Taylor, secretary of the association, 29 South La Salle street, Chicago, has announced the subjects and authors as follows:

Wednesday, Nov. 18  
MORNING

"What Kind of Government Does the Business Man Want," by Thomas W. Pangborn, president, Pangborn Corp., Hagerstown, Md., and president, National Founders' association.

Report of A. E. McClintock, commissioner, National Founders' association, Chicago.

Address by Dr. Virgil Jordan, president, National Industrial Conference board, New York.

NOON

"Gas Hazards of Modern Industry," by Dr. Howard W. Haggard, associate professor, applied physiology, Yale university, New Haven, Conn.

AFTERNOON

Address on communism, Arnold Lunn, member of faculty, University of No-

tre Dame, South Bend, Ind.  
"Industrial Relations," by J. A. Voss, director of industrial relations, Republic Steel Corp., Cleveland.  
"Getting the Co-operation of Employees," by Whiting Williams, Cleveland.  
"Today's Business and the Public," by C. J. Stark, president, Penton Publishing Co., Cleveland.

Thursday, Nov. 19  
MORNING

"A Precision High-Power Metals Microscope and Its Application to the Study of Fatigue Cracks in Cast Iron," by Dr. Francis F. Lucas, member technical staff, Bell Telephone Laboratories Inc., New York.

"Uses and Limitations of Respiratory Protective Equipment," by Phillip Drinker, professor of industrial hygiene, school of public health, Harvard university, Cambridge, Mass.

"Other Controllable Costs," by Roger Williams, New York.

## Will Hold First Meeting

Local open-hearth and blooming mill operators and metallurgists are invited to attend the first sectional meeting of the Pittsburgh Open-Hearth committee which will be held under the auspices of the National Open-Hearth committee of the American Institute of Mining and Metallurgical Engineers at the bureau of mines, Forbes street, Pittsburgh, Nov. 13.

Sessions will be held at 2:00 and 7:30 p. m. Open discussion, not to be recorded, will deal with open-hearth raw materials and refractories, bath depth, iron oxide control, ferroalloy additions, safety in the steel mill, teeming and heating ingots, soaking pit operation, blooming mill practice and other subjects. Following dinner at 6:00 p. m. at Hotel Schenley, motion pictures of the Ford open hearth and new wide strip mill will be shown. R. C. Good, 2135 Oliver building, Pittsburgh, is chairman of the Pittsburgh section.

## Finishing Cash Registers

(Concluded from Page 64)

old head is removed on a special machine provided for the purpose.

The setting-up department is arranged along practical lines. An automatically controlled glue cooker is used which never allows the glue temperature to rise above 140 degrees Fahr. Only enough glue to last a few hours is cooked at any one time, thus assuring a fresh supply of glue at all times. As shown in the illustration, the abrasive is kept in troughs fitted with hinged lids to keep out dust and dirt. Wheels set up under these conditions can be assured of giving maximum life per set up which is not possible under haphazard conditions.

# A thief



## ...STOOD ON THE ROLLING FLOOR

EVERY day an ingot vanished from the rolling floor and left no mark of its loss on the day's production record. That one lost ingot meant a loss of profits. Lost labor and lost raw materials and lost overhead. "An ingot vanish?" you say. "Impossible!" But there it stood.

But the Old Man found the thief at last. Down on the floor, one scale was causing the trouble. The dial was in a dark corner, the weighman couldn't see very well anyway, and so he did the best he could—with an average loss of one per cent. One per cent isn't much of a figure, but it means one ton stolen out of every hundred rolled. One ton given

away for every hundred tons a perspiring sales department took days or weeks to sell.

Today, a mechanical weighmaster stands guard over that and several other scales in that plant. At the touch of a button, it not only weighs but prints an accurate down-to-the-pound figure on the company's weight ticket.

No matter how poor the light may be, no matter how long the working hours, no matter what the temptation to read the nearest graduation, this Fairbanks Printomatic Weigher never guesses. Never makes a mistake. Never



steals a pound. Never gives away a hard-won profit.

If you suspect leaks . . . if there is a chance that a variation in your scale readings is costing you money, find out about the Fairbanks Printomatic Weigher, which can be

attached to almost all existing Fairbanks dial scales. It will give you printed records on which you can rely.

For full information on these and other Fairbanks Scales, address Dept. N-491 Fairbanks, Morse & Co., 900 S. Wabash Avenue, Chicago, Ill. And 40 principal cities—a service station at each house

**FAIRBANKS**  **SCALES**

# Iowa Conference

## Promotes Better Gray Iron Castings

**A**PPROXIMATELY 150 foundrymen of the central west participated in the foundry conference held at the State University of Iowa, Iowa City, Iowa, Oct. 30-31, under joint sponsorship of the university, American Foundrymen's association, Quad-City chapter of the A.F.A., and Northern Iowa Foundrymen's association. Aim of the conference was to promote production of better castings.

Fundamentals of testing cast metals were discussed by Prof. H. L. Daasch, Iowa State college, Ames, Iowa, who described in some detail the types of chemical, physical and metallographic tests. Under chemical tests he stressed importance of proper sampling, and need for considering variations in shape of castings, dimensions, casting conditions.

Referring to the physical tests, Prof. Daasch defined certain terms, such as stress and strain, and strength property terms such as proportional limit, elastic limits, commercial elastic limit, yield point, ultimate strength and breaking strength. He then described various types of strength and hardness tests. Under metallographic testing, he included information on macroscopic, microscopic and X-ray examination.

Following this paper, Prof. C. J. Posey and members of the university staff demonstrated in the materials laboratory various tests on cast metals.

### Modern Trends Outlined

In a session on cupola practice, Fred J. Walls, International Nickel Co. Inc., New York, stated that present-day trends in cupola operation are featured by better melting efficiency, higher melting temperatures, more uniformity and faster melting. Higher temperatures are made possible by higher beds, a high volume of air, and co-operation of the refractory, coke and pig iron manufacturers in providing the type of materials best suited for the purpose.

The speaker recommended use of a high bed, from 50 to 75 inches, and at the same time an increase in blast

volume, since in his opinion the iron is superheated after the melting operation and while passing through the bed. He stated that a long soaking time should not be used, but that blast should be put on as soon as the charge is in the cupola. While several discussors agreed with Mr. Walls, one cupola operator stated that he uses a soaking time of 1 hour and has found that it makes little difference in the temperature of the first metal tapped.

Mr. Walls stressed the fact that slag is one of the most important products of the cupola. One operator stated that he found dolomite stone gave a better slag than straight limestone. The dolomite contained from 38 to 40 per cent magnesium. Another stated that at times old broken cores are charged in the cupola when the scrap used is especially clean. Another stopped milling the gates and sprues because it was found that the silica sand carried on this return scrap had a beneficial effect in producing a good slag.

### Discuss Use of Alloys

E. K. Smith, Electro Metallurgical Co., Detroit, discussed use of alloys in connection with metal melted in the cupola. He stated that alloys may be added through use of alloy scrap iron, alloy pig iron, ferro-alloys and briquets. He stressed the value of the chill test as a control in alloy work, and stated that in his opinion alloy heats should be run at the end of the day to obtain the greatest recovery of alloys. Good foundry practice dictates that gates and sprues from alloy castings should be kept separate, and used in the cupola in making up alloy charges.

V. A. Crosby, Climax Molybdenum Co., Detroit, pointed to the increasing use of equipment for preheating the cupola blast. He discussed the advantages of using preheated blast and described various types of equipment for the purpose. D. J. Reese, Whiting Corp., Harvey, Ill., described a unit which employs sepa-

rate firing with powdered coal, gas or oil.

Another session constituted a symposium on alloy cast iron. Principal participants were Mr. Smith; Mr. Crosby; Mr. Walls; and R. G. McElwee, Vanadium Corp. of America, Detroit.

It is quite necessary to know the composition of the base iron to which the addition is to be made, Mr. McElwee pointed out. From an engineering standpoint, he believes that other properties than relative tensile strength are more important with reference to cast iron. With slides he showed the influence of vanadium alone and in combination with other alloys on certain physical properties of cast iron.

Use of chromium alloys for heat resistance was discussed by Mr. Smith. He stated that chromium forms stable carbides, reduces growth, produces a harder iron, and provides resistance to wear. The speaker emphasized the need for proper consideration of the base alloy, use of the correct amount and right grade of the alloy material. Mr. Crosby stated that molybdenum is employed in an alloy in castings where high strength is required and may be added to practically any base iron successfully. However, he pointed out, it is desirable to start with the best base iron for the particular purpose, since that practice reduces the amount of alloys needed.

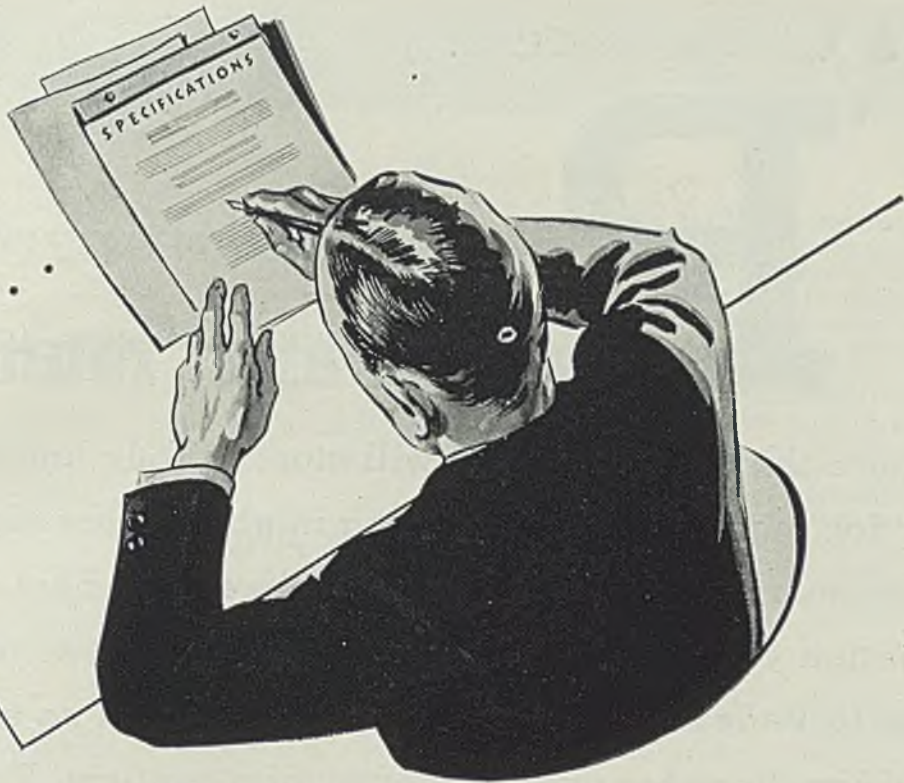
### New Furnaces Described

The final meeting of the conference was devoted to electric furnace and rotary furnace melting of cast iron. W. R. Jennings, John Deere Tractor Co., Waterloo, Iowa, outlined the various advantages in melting high test gray iron in the electric furnace. The speaker also presented data comparing the cost of metal produced in the electric furnace and the cupola. He pointed out that a furnace operated at or above capacity produces metal at the spout at a lower cost than one operated at less than capacity.

Discussing electric furnaces, Mr. McElwee stated that it is possible to obtain more constant results as to analysis with this type of furnace. He believes this is due to the fact that the electric furnace melts slower and that the metal is held in a bath, thus permitting greater diffusion. In his opinion, the electric furnace offers possibilities of introducing alloys in the most effective manner.

The Brackelsberg furnace was described by Mr. Reese, who discussed numerous operating features of that unit. He stated that the ultimate temperature of a rotary furnace is not the ability of the furnace to produce a temperature but the highest temperature which the refractories can withstand.

FOR EVERY  
TYPE OF  
NEED . . .



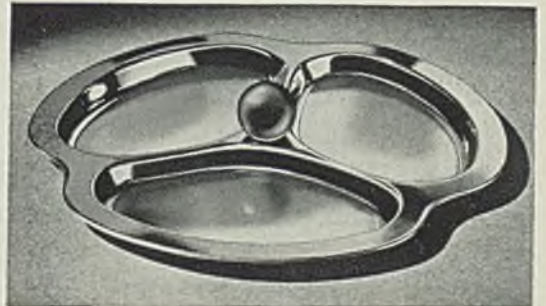
## Acme Superstrip ASSURES SMOOTH AND ECONOMICAL PRODUCTION

o "Success breeds success." And the wide application of Acme Superstrip is one reason for its preference.

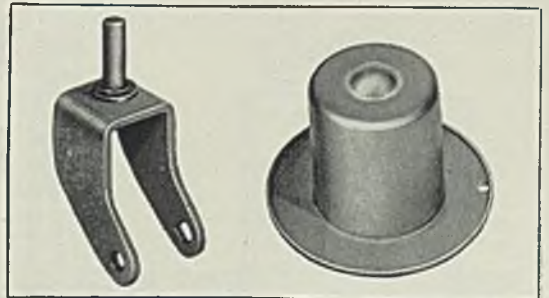
In the automotive, the electrical—and countless other fields—Acme Superstrip is helping to "bat out" better-looking, better-made, more economical products.

Even your method of handling Superstrip dictates the way it is packed for shipment. "Everything" is done to facilitate manufacturers' production.

Check into Acme Superstrip. Send today for a copy of the booklet, "Batting 'Em Out." It illustrates and describes more than a score of products made with the right Acme Superstrip. ACME STEEL COMPANY, General Offices: 2826 Archer Ave., Chicago, Ill. Branches and Sales Offices in Principal Cities.



• A distinctive "sweets" or condiment dish formed from the right Acme cold-rolled Superstrip.



At left is a castor part, illustrating one of the diversified uses of Acme hot-rolled Superstrip. At right is a deep-drawn cup made from "pinch temper" cold-rolled Superstrip. A highly successful deep drawing job.

**Acme Superstrip**  
HOT ROLLED • COLD ROLLED  GALVANIZED • STAINLESS

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# 'Round and 'round it goes

and where that responsibility will stop, nobody knows. The responsibility for ingot mould purchasing might be part of your job soon—a highly important part. If it is, you will want the best and latest mould information you can get—the soundest and most seasoned judgment.

Come to *Valley Mould*. Steel men have found us a wise counselor in mould matters for over a quarter of a century. Today, tomorrow, or another quarter of a century hence it will be the same, because *Valley* is making a determined effort to parallel its development with that of the great steel industry which it serves. This effort will not fail—it is rooted too deeply in past success and in the traditions of the steel industry.

**VALLEY MOULD AND IRON CORPORATION, HUBBARD, OHIO**

*Plants: HUBBARD, O. ; SHARPSVILLE, PA. ; CHICAGO, ILL. ; Western Office: 108 St. & Calumet River, South Chicago, Ill.*





# PROGRESS IN STEELMAKING

## Valve for Reversing Flow of Gases Is Made of Heat-Resisting Alloy Steel

**R**EVERSING valves for service on open-hearth, soaking pit and heating furnaces now are being made of heat-resisting alloy steel, thus eliminating the need for water cooling. The seat and gate are enclosed above floor level with a steel plate housing on which is mounted an integral motor-driven operating mechanism for raising and lowering the gate.

### Resists Chemical Attack

The chrome nickel steel used for the gates and seats is capable of withstanding high temperature and is resistant to chemical attack from flue gases. The gate is built with interlocking sections which are mounted on a central stem. This permits the individual sections to expand and contract independently, thus preventing warpage and leakage. The gate is an assembly of alloy steel I-beam sections embedded in the brickwork of the flue. The seating surfaces are machined to insure a tight fit.

The operating mechanism for manipulating the gate comprises a squirrel cage induction motor, driving a winding drum through a gear unit. A magnetic brake is provided for holding the gate in any desired position and with limit switches for fixing the upper and lower limits of travel. The motor is controlled by a push-button reversing type across-the-line starter. Any desired arrangement of electric interlocking or sequencing of operation is provided for two or more valves.

### Dual System Employed

Ordinarily two valves are used on a reversing system, one which is opened while the other is being closed. The valve being closed provides an overhauling load which runs its motor as an induction generator returning power to the line. Except for the power required for friction and motor losses, this regenerative braking furnishes the power for the valve being opened.

Waste gases in transit through the system are not subjected to water-cooled passages and, hence, no heat is absorbed. As a result greater steam production is obtained from waste-heat boilers. The

noncooled valve is made by the Freyn Engineering Co., Chicago.

• • •

## Roll Necks Are Machined

Specially processed alloy iron rolls have been developed as a substitute for nickel iron rolls of the hard grade. The new roll has a hardness value in keeping with conventional hard nickel rolls but with the advantage of a soft iron neck. By this arrangement the roll can be machined on ordinary roll shop equipment, eliminating the necessity of grinding the necks and keyways.

• • •

## Vats Are Operated Hotter

Conservation of acid is being accomplished at many plants by running the pickling solutions hotter. Practice at one plant where sheets for galvanizing are pickled the acidity of the solution is maintained between 7 and 8 per cent by volume and the temperature between 160 and 170 degrees Fahr. An inhibitor is used in the proportion of 1 to 2½ ounces per 100 pounds of 60-degree acid. Sufficient acid is added to maintain this acidity until the iron content of the bath reaches 6 per

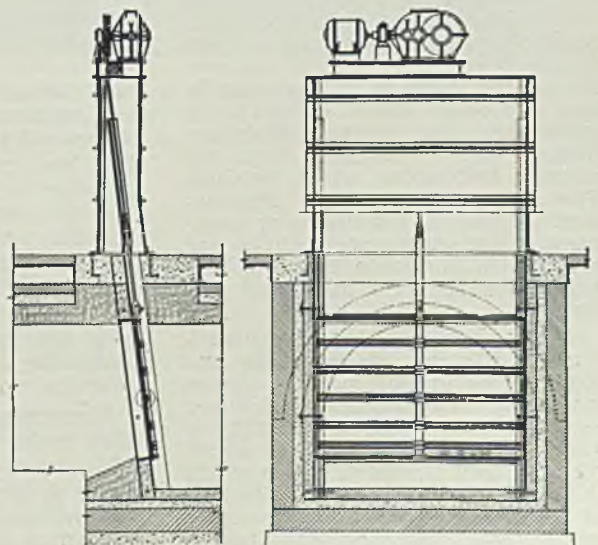
cent. No further acid additions are made. Acid remaining in the bath is used up by increasing the temperature from 10 to 15 degrees Fahr. at a time until the content of iron is around 9 per cent and the acidity around 2 to 3 per cent. Effective practice results when the acid is inhibited in the amount of 1 to 2½ ounces per 100 pounds, depending upon the tendency of the sheets to blister. If the pickling crates are loaded correctly and the foregoing practice is followed, the acid consumption will be about 90 pounds per ton of steel pickled.

• • •

## Doubles Life of Pinions

Prolonging the life of pinions operated in conjunction with continuous hot and cold strip mills frequently is accomplished by the proper location of oil pipe connections and outlets for the lubrication. At one plant the circulating oil was discharged into a common receiver located in the top of the housing cap of 2-high pinion stand and then flowed through a series of holes onto the top of the upper pinion. It was carried through an arc of 180 degrees into the mesh of the pinion, and a large quantity was lost which resulted in rapid wear of the pinion teeth. Spacing the feed pipes on 6-inch centers and locating them at the pitch line of the pinions so that the oil was carried into the mesh resulted in doubling the life of the pinions.

*Side and front elevations of noncooled valve for reversing the flow of gases in open-hearth, soaking pit and heating furnaces*



# Probe Action of Titanium as Alloying Element in Steel

USE of titanium for degasifying and for cleansing steel, as an all around corrective agent for such solidification defects as blowholes, segregation, mechanical enclosures and pipe, is generally well known, but its use and effects as an alloying element are not so widely known. A paper by J. A. Duma, junior metallurgist, Norfolk navy yard, Portsmouth, Va., presented at the annual meeting of the American Society for Metals in Cleveland recently, reported an attempt at an evaluation of the alloying effects of titanium upon the mechanical properties of certain cast metals, namely, low and medium-carbon steel, cast nickel-chromium alloy steel, copper-bearing steel, 18-8 stainless steel and two copper-nickel alloys.

In the absence of the author, the paper was read by T. N. Armstrong, metallurgist, development and research department, International Nickel Co. Inc., New York. Besides discussing the influence of titanium on the mechanical properties of the various metals, the paper noted its effect upon their microstructure, their weldability, general corrodibility, machinability, and age hardening.

## Favorable Effects Reported

The author summarized the more important results as follows:

1. Titanium, when added to low-carbon irons and medium carbon steels in amounts under 0.20 per cent, increases tensile strength, yield point, and hardness with only a slight diminution of ductility and notch-impact resistance. It enhances general quality, for titanium-treated steels are low in nitrogen content, homogeneous in structure, free from blowholes, and contain a minimum of oxidized slag particles. Additions from 0.20 to 0.60 per cent embrittle the steel both dynamically and statically; steels alloyed with more than 0.60 per cent titanium, though ductile statically, show abnormal brittleness when notched. The structure of high titanium steels, under all conditions of treatment, is one which consists of coarse crystals of insoluble titanium carbide embedded in a matrix of soft ferrite.

2. Titanium additions to nickel-chromium steels raise tensile and yield strength; this increase is continuous up to approximately 0.40 per cent titanium, while the ductility is only slightly affected up to about 0.20 per cent titanium, above which it sharply falls. Excessive additions of titanium (over 0.60 per cent) aside from lowering the tensile

strength to a certain degree, exert the maximum effect by a serious decrease in the impact strength of the steel. Nickel-chromium steel containing 1.84 per cent titanium is free from precipitation hardening effects; its structure consists of titanium carbide segregated in the boundaries of polygonal ferrite grains.

3. Titanium has little advantageous influence upon the properties of copper-bearing steel. The presence of the element raises its tensile strength and at the same time reduces greatly its static and dynamic ductility. It also tends to decrease the solubility of copper in the solid solution.

4. Titanium exerts a definite alloying effect in cast 18-8 stainless, materially raising tensile strength, yield point, and hardness; this increase is continuous up to 3.50 per cent titanium; static ductility is lowered gradually up to about 0.60 to 1.00 per cent titanium, and at 3.50 per cent it is practically nonexistent; dynamic ductility is affected similarly, the high titanium specimens breaking off sharply instead of deforming in the "taffy candy" manner characteristic of tough austenites. It promotes the formation of magnetic alpha-delta ferrite. Magnetic tests are capable of furnishing a positive criterion of tensile properties. Titanium strongly inhibits susceptibility to intergranular corrosion; while it does not decrease resistance to corrosion in sea salt spray, it does lower the resistance of the metal to attack by nitric acid. The machining and welding qualities of the material are greatly enhanced.

## Hits Over-Optimism

Discussing Mr. Duma's paper G. F. Comstock, Titanium Alloy Mfg. Co., Niagara Falls, N. Y., asserted that the description of the new method of producing titanium steels was disappointing since the slag used, which evidently is the critical part of the process, was not described. He felt that the author has been perhaps a trifle over-optimistic in his enthusiasm for the new process and doubted that the reaction between aluminum and the various forms of titanium oxide, especially "titanalba," was as complete as claimed. His experience was that pure white titanium oxide is less easily reduced than rutile which contains iron oxide.

Continuing, Mr. Comstock said that in the discussion of the effects of titanium on the microstructure of these highly alloyed steels, more attention might have been paid to variations in silicon, chromium and

nickel contents between the titanium and nontitanium steels, though the author's observations regarding the effect of titanium are probably correct in a general way. The improved machinability due to titanium is a most interesting observation which does not seem to have been reported previously.

Russell Franks, research metallurgist, Union Carbide & Carbon Research Laboratories Inc., Niagara Falls, N. Y., confirmed in general the findings set forth by Mr. Duma in his paper but took issue with the statement that the titanium addition is the only practical method of securing in cast 18-8 chromium-nickel steels immunity from intergranular attack and that while other elements such as columbium, tantalum and uranium can be employed, use of these alternate remedies is not always possible, nor are any of them comparable to titanium in lowness of cost.

The columbium addition, Mr. Franks pointed out, can be used in castings of these steels to enhance their resistance to intergranular attack and there is no knowledge of a single instance where the use of columbium cannot be applied because of cost differential or for any other reason. The facts are, he said, that by use of columbium certain difficulties that are encountered in using titanium are eliminated.

## Columbium Has Advantages

Addition of titanium increases the sluggishness of the molten austenitic chromium-nickel steels and in some instances difficulty is met with in securing castings of a high quality, while in the case of columbium, the presence of this element does not change the pouring characteristics of the molten 18-8 steel, and castings of a high quality are easily obtained.

Furthermore, he continued, 80 to 90 per cent of the columbium introduced into the melt can be recovered in the finished product but in the case of titanium a recovery in the vicinity of 50 to 60 per cent is all that can be expected. If we take the cost of the titanium addition against the cost of the columbium addition, it will be found that there is comparatively little difference in the cost of these two elements in the finished steel, and even though the titanium addition might have a slight advantage as far as initial cost is concerned, this is offset by the fact that columbium-bearing steel scrap can be remelted with a relatively high recovery of columbium in the finished product.

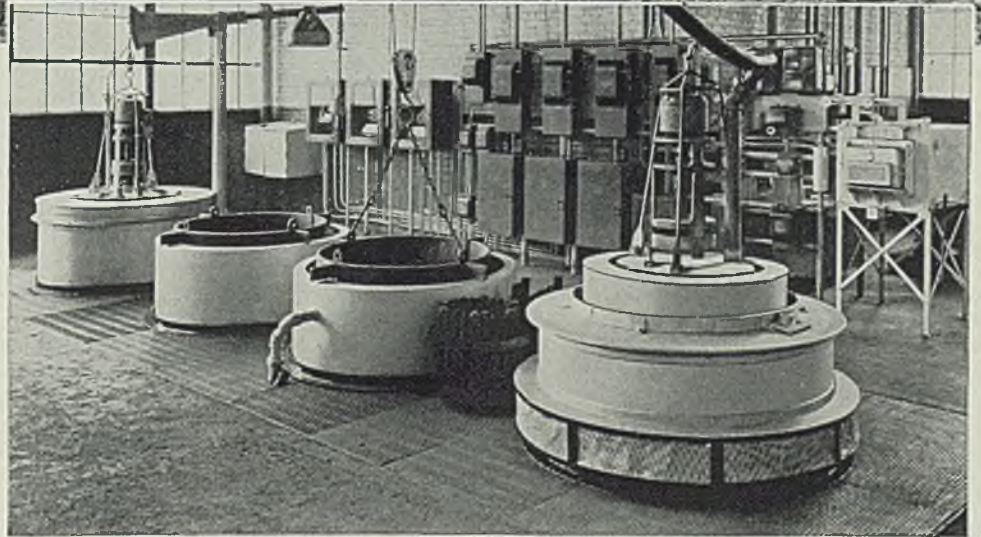
Columbium-bearing 18-8 steels can be welded without serious loss of columbium in the weld metal provided proper technique is employed, although it is generally recognized

(Please turn to Page 92)

# TRACKSON EQUIPMENT *and* HEVI DUTY FURNACES



To carry on daily logging operations, equipment such as Trackson must be constructed by scientifically controlled manufacturing methods. Important Trackson parts are heat treated in Hevi Duty Electric Heat Treating Furnaces.



Heat Treating Department at Trackson Company, Milwaukee, showing Carburizing and Heat Treating Furnaces which monthly treat thousands of pounds of parts.

Write for descriptive bulletins of Hevi Duty Furnaces

## HEVI DUTY ELECTRIC COMPANY

HEAT TREATING FURNACES **HEVI DUTY** ELECTRIC EXCLUSIVELY

MILWAUKEE, WISCONSIN

# NEW EQUIPMENT

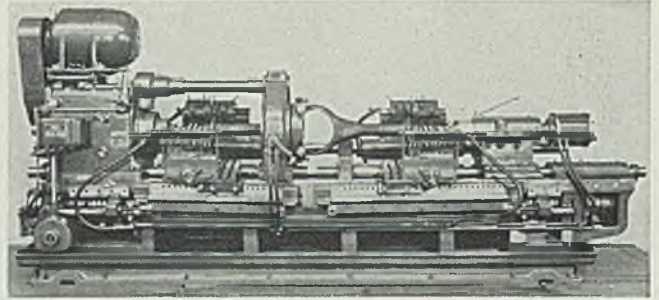
## Gear Tooth Chamfering Unit—

W. C. Lipe Inc., Syracuse, N. Y., has recently announced to the trade a new machine known as "Rutac," a name derived by taking the initials of rotary universal tooth acute angle chamfer. The machine is designed for use in chamfering the acute angle at the ends of the teeth on helical gears, pinions, spiral bevel gears and spur gears. The machine is a high speed production machine, being capable of chamfering teeth at the rate of from 300 to 600 teeth per minute. It is of universal design, so constructed that within the range of the machine any type or size of the above gears can be handled by changing the timing gears and the holding equipment and resetting the machine to a charted setup. By means of a burring tool which is automatically retracted from the work to permit easy loading and unloading, the ends of the teeth are burred at the same time that the chamfering operation is performed, thereby combining the two operations into one. Gears ranging in size from 5 to 60 teeth may be handled, from maximum outside diameter of 8 inches to a minimum of 1 1/4 in.

## Center Drive Lathe—

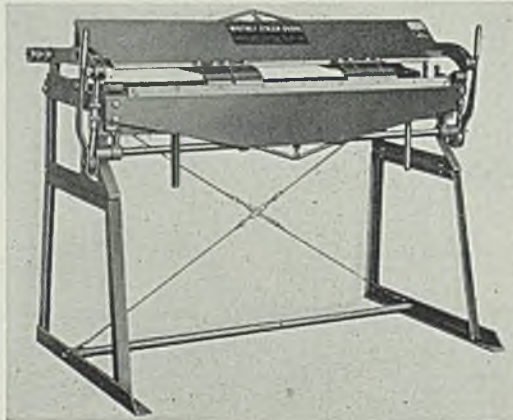
Jones & Lamson Machine Co., Springfield, Vt., has recently perfected a new center drive attach-

*Jones & Lamson center drive attachment for automatic lathes*

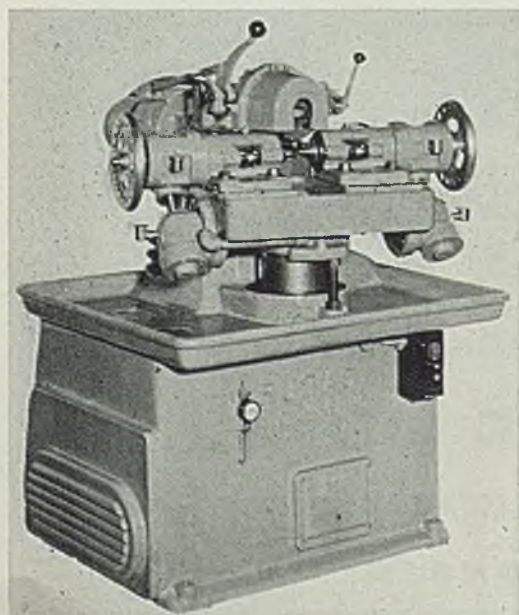


ment for its 20-inch automatic lathe which makes it possible to turn simultaneously both ends of long heavy shafts and similar pieces.

machine is the mounting of the carriage tool carrying members. They are mounted on separate center bars which are controlled by cams so



*Whitney portable bending brake for use in air conditioning ducts and similar uses*



*Lipe Rutac machine for chamfering acute angle at ends of teeth on helical gears, pinions, spiral bevel and spur gears*

that both carriages feed toward the center of the machine, additional cam space being provided for the tailstock center bar by an extra cam drum attached to the end of the bed. The front former slides are also arranged to travel in opposite directions so that proper relief may be obtained by the turning tools at the end of their cut. Each carriage carries eight turning tools and two chamfering tools, and each back arm carries five facing tools and one chamfering tool.

## Bending Brake—

Whitney Metal Tool Co., Rockford, Ill., announces a new model portable bending brake designed for use in bending sheet metal up to 20 gage in widths up to 49 inches. Equipped with fingers for box and pan bending, the new model provides a combination brake which can be carried out on the job for use in fabricating ducts and other sheet metal work in air conditioning and heating systems. The machine is built

# WISSCO STAPLE WIRE



*BING*  
*another* PERFECT STAPLE!

It's an art to make a wire that is stiff enough to pierce various thicknesses of paper and cardboard yet be sufficiently ductile to bend into a perfect clinch without fracture. We see so much of this wire in book bindings, milk bottle caps, pad matches and a host of other services besides paper staples that we perhaps forget the patient research required to develop it. Wissco Staple Wire, Stapling Wire and Bookbinding Wire are known for their fine finish, stiffness with ductility, uniformity and absolute roundness. Write for particulars about the Wissco Wire best suited to your purpose.

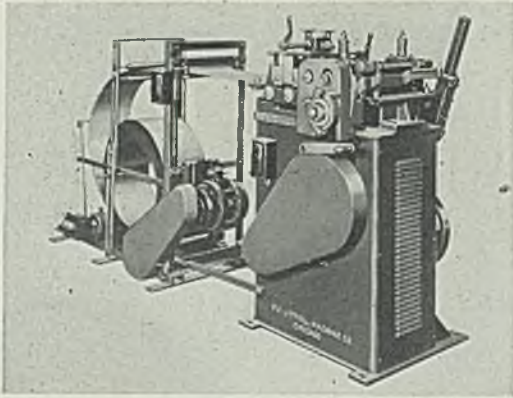


**WICKWIRE SPENCER STEEL CO.**

New York City, Buffalo, Chicago, Worcester, Pacific Coast Headquarters: San Francisco, Warehouses: Los Angeles, Seattle, Portland. Export Sales Department: New York City

Wickwire Spencer manufactures High and Low Carbon Wires—in various tempers, grades and finishes—for your specific purpose. Hard-Drawn, soft or annealed Basic or Bessemer Wires—Hard-Drawn annealed, or oil-tempered Spring Wire, Chrome Vanadium Spring Wire—Valve Spring—Music—Clip—Pin—Hairpin—Hook and Eye—Broom—Stapling—Bookbinding—Machinery Spring Wire—Reed Wire—Clock—Pinion—Needle-Bar—Screw Stock—Armature Binding—Brush—Card—Florist—Mattress—Shaped—Rope—Welding. Flat Wire and Strip Steel, High or Low Carbon—Hard, annealed or tempered—Clock Spring Steel—Corrosion and Heat Resisting Wires. Consult the Wissco technical man on your wire problems, however large or small.

**WISSCO WIRE**  
*by Wickwire Spencer*



*Littell automatic feed for punch presses*

for either bench or floor mounting, the lower part of the angle iron support frame being unbolted for bench mounting. Box and pan fingers of various widths are furnished and can be clamped anywhere on the front edge of the upper jaw. Two alternative connections for the adjustable toggle links which actuate the upper jaw are provided, and two sets of return springs, one for plain bending and one for box bending. These springs lift the upper jaw out of the way automatically when the bend is completed.

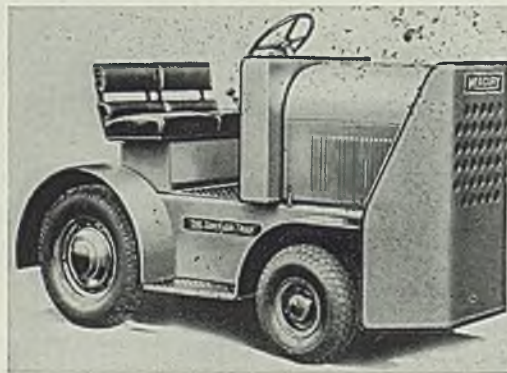
#### **Industrial Gas Tractor—**

Mercury Mfg. Co., Chicago, has completed recently the design and construction of a new gasoline powered industrial tractor. This addition to the company's line is a 4-wheel machine available with either solid zero pressure or pneumatic tires. It is powered with a 4-cylinder Ford engine and has a 4-speed truck type transmission and clutch. The tractor is 96 inches long, excluding coupler; is 48 inches wide, has a 54-inch wheel base and a turning radius of 108 inches. It is said to be capable of developing up to 3000 pounds drawbar pull and to travel at speeds up to 10 miles per hour. Frame and fender construction is of integral all-welded plate type. Semi-elliptic springs are used on both front and rear axles. Brakes are of the internal expanding types within drive wheels, and hand brake is provided for parking. Fuel supply is by gravity feed from a 6-gallon tank on the dash. The tractor is designed to handle large trailing loads and is adapted to work indoors and out.

#### **Press Stock Feeder—**

F. J. Littell Machine Co., 4127 Ravenswood avenue, Chicago, has placed on the market a machine to straighten and feed coiled stock to double action presses, either of the cam or toggle type. This machine is so arranged that it will

feed the required amount of stock into the press each time it is tripped. An intermittent feeding unit, which can be tripped by the operator, is usually used to a distinct advantage. Operator manually trips the unit with his left hand. The strip is fed forward very quickly, the press is tripped, and the operator



*Mercury gasoline powered industrial tractor*

picks out the work-piece from the die. This machine is driven by its own motor and has a clutch similar to that on a punch press, so it makes only one revolution when it is tripped. It is mounted on a welded steel base and is very rigid; it is also self contained so it can be moved to any press. The feeding machine is equipped with a five or seven roll straightener which is not usually power driven. The type of straightener required depends upon the width and thickness of ma-

terial. A power driven stock reel is used so that the feed always feeds from a loop of material. The reel is equipped with an automatic shut-off to prevent loop getting too large. Either a cradle type or an automatic centering type of reel can be used, depending upon the weight of the coils.

#### **Respirator—**

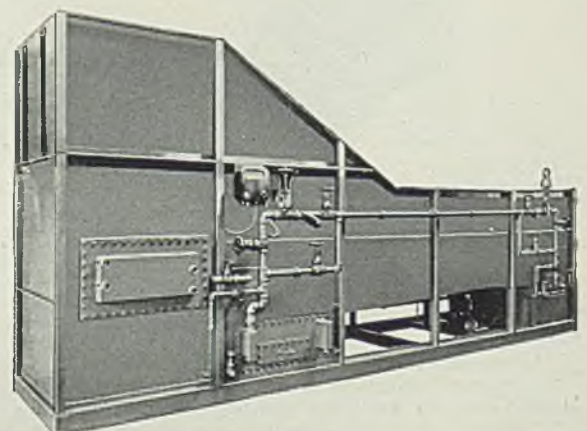
H. S. Cover, South Bend, Ind., is the maker of a new respirator featuring greatly enlarged area in its double filter chambers. The unit has been approved by the bureau of mines for use in type A or pneumoconiosis producing dusts. Face piece is of standard construction with large offset filter plates attached. Screw cap lid has been eliminated and the filtered air passes between the plate extrusions to the protected opening and into the respirator interior. Marginal edge

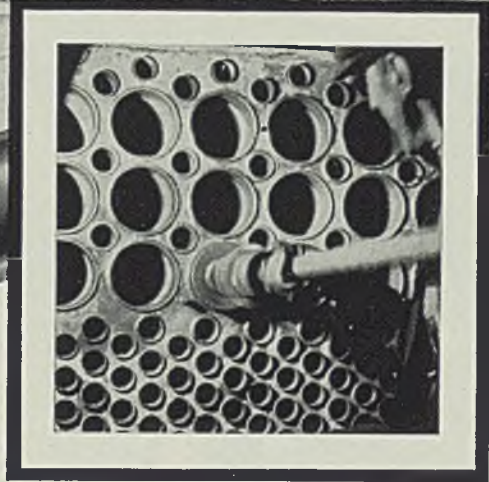
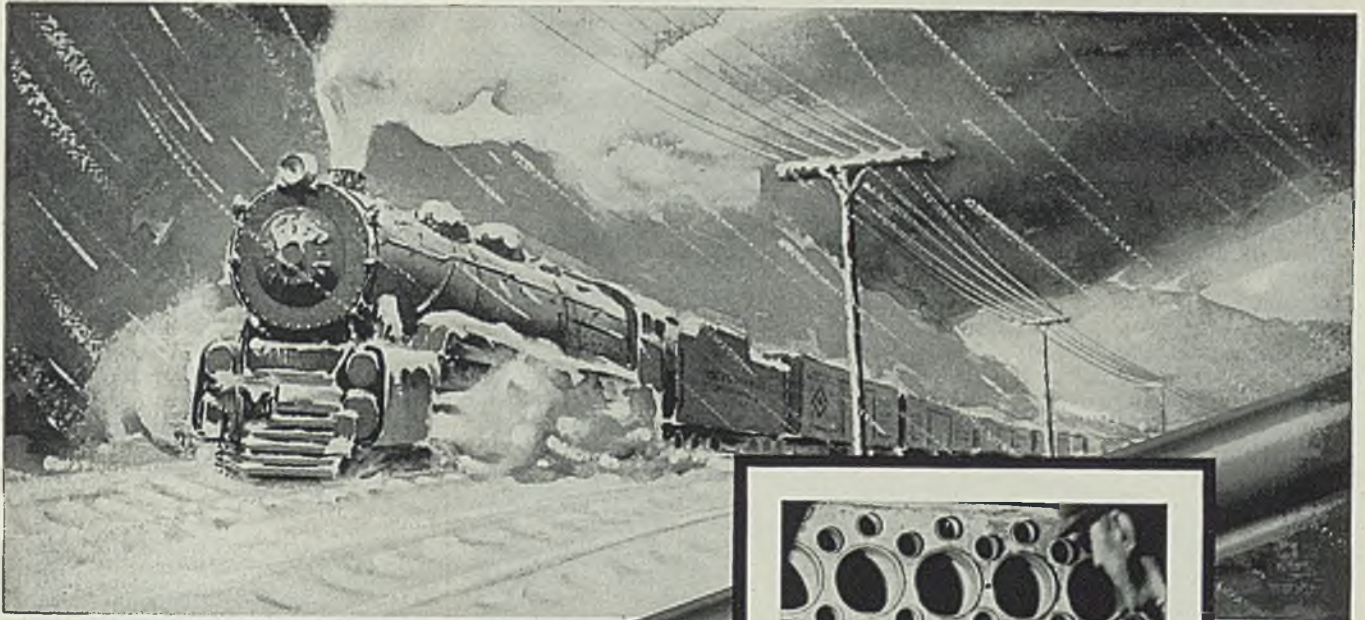
of the plate has an inwardly curved edge to anchor filter pads and prevent leakage. The new construction assures a larger filter area for easier breathing and unobstructed vision for the wearer, it is claimed.

#### **Vapor Spray Degreaser—**

Detroit Rex Products Co., 13005 Hillview avenue, Detroit, has recently placed on the market a spe-

*Detrex vapor spray type degreasing machine used in cleaning small parts on racks*





## OPERATE THROUGH THIS GRUELING GRIND . . .

Compare the conditions under which stationary boilers operate with those encountered in railway service where continual pounding and vibration throw severe stresses on tubes and tube sheets. Then remember that Electrunit Boiler Tubes are operating day and night in this grueling service—and giving such a satisfactory account of themselves that old users are re-ordering and new users are specifying them right along. • These are the features that enable Electrunit Boiler Tubes to save you time and money: They are straight, true to gauge and perfectly round. They slide through the tube sheet more easily—roll in tighter with less effort. They are controlled atmosphere annealed—free from scale—have less tendency to corrode, and therefore last longer. • Any tube that merits growing preference in locomotive service will easily meet even the most rigorous of stationary boiler requirements. Ask us to send you complete descriptive data on Electrunit Boiler Tubes.

See the new controlled atmosphere annealed ELECTRUNITE Boiler Tube at Booth No. 10, Twelfth National Exposition of Power and Mechanical Engineering, Grand Central Palace, New York, November 30th to December 5th.

# Steel and Tubes Inc.

WORLD'S LARGEST PRODUCER OF ELECTRICALLY WELDED TUBING  
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cial vapor-spray-vapor machine equipped with a monorail conveyor. The unit has been designed to handle small racked parts, and hangers have been provided on the conveyor to carry the work holding racks. The conveyor is arranged so that the work is lowered into the solvent vapors and passes through pressure sprays of hot clean solvent. After making a turn at the end of the machine, the parts are conveyed back through the vapors and pass out the same end they entered. Steam coils are placed in the boiling sump and in the clean solvent

distillate collecting chamber. The machine is equipped with an air actuated steam operated thermostatic control. The boiling sump is equipped with an auxiliary clean-out door to eliminate the necessity of removing the steam coils when cleaning out accumulated sludge.

#### Motor Starter—

Electric Controller & Mfg. Co., 2700 East Seventy-ninth street, Cleveland, announces a new direct current mill type starter for use with motors ranging from 5 to 25

horsepower, 230 volts, designed to provide a universal compact standardized unit suitable for use with a wide range of motor sizes and requiring only reconnection of the self contained resistors to give resistor values. Starters employ the new type RD mercury acceleration relays developed by this company which permit a time range of ½ second to 2 seconds per step. Relays are adjustable for this time range by means of a thumb screw and lock nut arrangement. A three-coil unbreakable resistor is mounted on the top of the starter cabinet and is covered by a ventilated enclosure. Particular attention has been given to the design



**S**URE, you can use strong backs to tote heavy hunks of steel around your plant. And for that matter, old hand-operated equipment will still lick the law of gravity. But for the speed and economy that will cut your material handling costs, look to 1936 methods.

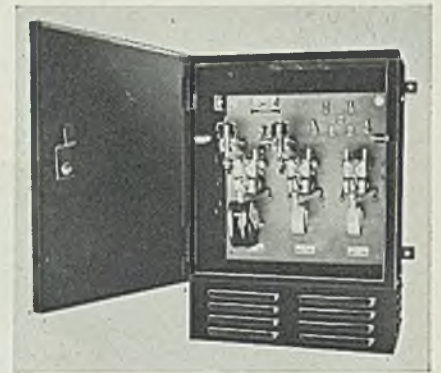
P&H engineers have experience with hundreds of different handling problems in all kinds of plants. They have the answers that save you money. That's why up-and-coming production men call in a P&H engineer occasionally . . . to see what's new in material handling methods and equipment. If any P&H engineer can't show you how to cut your costs, he'll frankly tell you so. There's no obligation. Why not ask one to call? Or write for Bulletin RH-2.

*Mounted on this gantry, a P&H Type "R" hoist unloads, stacks, sorts and picks up structural steel, quickly and at low cost.*



**HARNISCHFEGER CORPORATION**  
ESTABLISHED 1884  
4411 West National Avenue Milwaukee, Wisconsin

**P&H ELECTRIC HOISTS  
& P&H ELECTRIC CRANES**



*Electric Controller & Mfg. Co. designed the new direct current mill type starter*

of these resistors so that by only changing the manner in which they are connected the starters may be used with any motor within the range listed above. They are also suitable for use with a range of horsepower sizes on 110 and 550 volt motors within the ampere rating of the contactor. Optional features, such as overload relays, main line knife switch, field acceleration relay, field failure relay and the like can be incorporated as a part of the unit starter where required.

#### Belt Carrier—

Stephens-Adamson Mfg. Co., Aurora, Ill., has recently announced a new truss-frame, sealed ball bearing belt carrier. The new design is of the 3-roll in line type with outer rollers inclined to give the



*Sealed ball bearings support this belt conveyor carrier made by Stephens-Adamson Mfg. Co.*



belt a 20-degree trough. The whole roller assembly is tilted to center the belt without guide rollers and an effort has been made to produce a carrier that would minimize belt wear. All parts are made of steel or malleable iron, the rollers being of 5-inch steel tubing with ends rounded over the pressed steel end plates. Roller ends are recessed to house the bearings and to allow the rollers to be closely spaced to eliminate danger of pinching belts. Renewable cartridge type ball bearings are used throughout. The truss type frame is light and rigid with the load carried by a tension rod instead of depending on a heavy cross member for support.

♦ ♦ ♦

**Hood Respirator—**

De Vilbiss Co., Toledo, O., announces the development of a new hood respirator designed for use in those occupations where there is a



*De Vilbiss has developed an air-fed hood type respirator for use in industries with high dust or fume concentration*

dust or fume hazard beyond the protection offered by the more common type of respirator. This new respirator covers the head and neck fully and provides protection where ventilation is inadequate or against materials present in the air harmful to eyes, ears or respiratory organs. Hood is fastened with a drawstring around the neck and air is supplied from a hose connection in the air line. Incoming air passes through a filter, and passes out through the opening provided for vision. Pressure of the outgoing air removes necessity for a glass or transparent plastic eyepiece.

♦ ♦ ♦

**Perforated Plate—**

Abbe Engineering Co., 50 Church street, New York, announces a new perforated plate specialty designed for use in pulverizers, hammer mills, filters, centrifugals, dryers and the like. Openings as small as 0.01-inch



**T**HE services of Standard Oil engineers are simply this: They make a personal survey of your plant at any time, and at no cost or obligation. They discover every possible cost reduction that can be effected through improved lubrication practices. Years of practical, on-the-spot experience often enables them to make savings where it was thought the opportunity did not exist. Others have found this to be true. Why not you? Phone your local Standard Oil (Indiana) office today and give your men their opportunity to set costs at a definitely established minimum.

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(Indiana)**

**CORRECT LUBRICATION**

may be supplied in all metals including stainless steel. Plates of above ordinary thickness are available. Perforations in the screens are conical in shape, intended to prevent blinding of the screen perforations. Experimental plates are available from the company.

**Hydrostatic Gage—**

Binks Mfg. Co., 3114 Carroll avenue, Chicago, announces a new hydrostatic gage for paint mixing tanks. Clear vision gage shows exact weight of lacquer and thinner

added to the tanks, enabling the mixer to obtain the same viscosity in any number of mixes. The new indicator also serves as a level indicator and it is possible to read from the scale at a glance the number of gallons in the container. Hydrostatic in principle, the gage balances the weight of the paint against the known weight of liquid in a U-tube. Gages offered by this company are calibrated for paint mixing tanks built by them.

**Safety Valve—**

C. B. Hunt & Son, Salem, O., an-

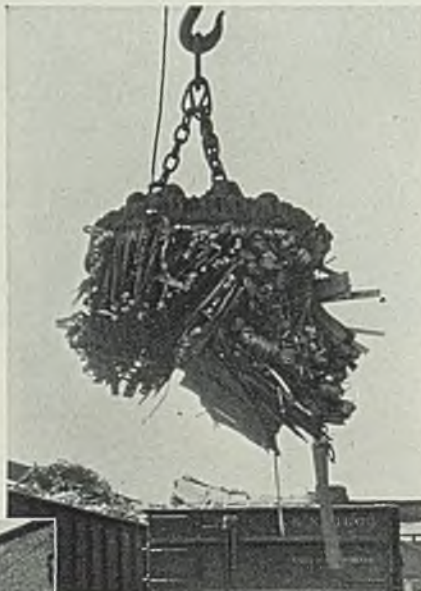
nounce a new "Quick-As-Wink" safety valve designed so that it is difficult for a press operator to block or hold the valve open to defeat its purpose. Valve presents a smooth exterior and is normally closed, while it is necessary for the operator to use both hands in operating the valve levers in order to keep the press operating. On presses operated by foot control two valves are used in series to necessitate use of both hands in each operation of the press. Valves use the same principle as other Hunt products, involving absence

# EC&M Magnet Users say—

*"New Magnets handle 25 to 55% more material than old ones."*

Bigger loads mean better profits. By replacing old magnets with the latest-design EC&M Lifting Magnet, Steel Mills, Pipe Foundries, Scrap Yards, etc. located throughout the prominent industrial centers, are moving their products and raw materials more quickly . . . and at a considerably lower cost.

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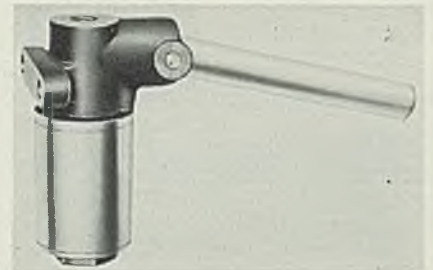
Illustrates and describes the advantages of these efficient EC&M Magnets for practically every kind of material handling . . . over 30 illustrations of magnets at work. Ask for your copy now.

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of metal to metal contact. New products are made in 3 sizes, with ¼-inch inlet and ⅜-inch outlet, with both inlet and outlet ⅜-inch and with both inlet and outlet ½-inch.

## Forming, Finishing Aluminum Chairs

(Continued from Page 53)

synthetic enamel, each coat being baked for an hour at a temperature of 300 degrees Fahr. Grained finishes such as walnut and mahogany receive at least three coats of baked enamel, plus the graining process.

Graining is the third finishing process. In graining metal furniture to represent natural wood, one of three processes can be employed. The decalcomania process is one. In this method the design is printed on specially prepared paper and transferred by wetting the paper and pressing it firmly on the metal. Then the paper is removed, leaving the design in place. The surface can be grained with graining combs and rollers by hand and when the work is done by an expert the results are pleasing and satisfactory. The offset lithographic process is the third method and it gives good results. At the plant in question hand graining is followed with mahogany finishes, while the offset lithographic process is used

for walnut and oak. The former process is simple and requires no comment. A brief description of the latter process, however, may prove of interest.

The lithographic plate, which is sheet zinc, is prepared from an actual photograph of grained wood. This plate is wrapped around a cylinder which rotates slowly, about 10 revolutions per minute. A roll supplies the ink, or stain, while a scraper removed the superfluous pigment leaving only what adheres in the depressions. As the roll rotates the operator presses a rubber faced hand block against it. This block takes the place of the transfer roll and blanket used in ordinary lithographic work. By means of the transfer block the impression is made by hand on various parts of the chair. As may be imagined, considerable care is necessary to insure correct impressions. The transfer blocks are of various sizes. Some are rocker shaped, 18 to 20 inches long, while others are from 6 to 12 inches long with flat surfaces for reaching into confined places. Two clear coats of enamels are baked in place over the graining.

#### Bright Finishes Popular

Another effective finish is obtained by sandblasting the chair to give it a matte surface. After sandblasting two to three coats of transparent enamel are baked in place. The satin finish, so called, often is employed. In this process the chair is rubbed down with No. 150 aloxite cloth and then given two coats of transparent enamel baked in place.


The two latter finishes are popular and possess a decided advantage. When the chairs are in use they are bound to be scratched and scarred to some extent. A color finish may be scratched away, leaving the white metal underneath. With the transparent finishes, however, scratches are not so noticeable. The transparent finishes are rapidly gaining in favor, for aside from their durability they are pleasing to the eye in these days of the free use of metal for a diversity of purposes.

The chairs are upholstered in genuine machine buffed leather or in fabrikoid. Certain top-grain leathers have a finer finish and can be made into more ornate color combinations, but for strength and durability the type of leather used has been found by actual test to be strong and durable.

All upholstery units are detachable as units and are securely fastened in place by clips or screws which permit the unit to be replaced quickly should occasion require. The upholstery unit itself is a steel or aluminum pan, depending on its use and location. The metal is covered directly with leather or in some instances a layer of felt is interposed between the leather and the pan.



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# RECENT PUBLICATIONS OF MANUFACTURERS

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

**Roll Top Door**—Kinnear Mfg. Co., 3000 Fields avenue, Columbus, O. Booklet No. 20M, describing the company's fireproof and burglar-proof all-steel Rol-Top door.

**Heat Treating Furnaces**—Surface

Combustion Corp., Toledo, O. Booklet on operations and services of the company, with views of installations.

**Arc Welding**—Lincoln Electric Co., Cleveland. Bulletin No. 412, illus-

trating benefits from welding by dual continuous control on the new "Shield-Arc S. A. E." welder.

**Seamless Tubing**—Summerill Tubing Co., Bridgeport, Pa. Folder illustrating the company's products and listing sources of supply.

**Oil Processing Kettles**—Patterson Foundry & Machine Co., East Liverpool, O. Folder describing kettles for oil processing and other process work; includes five separate designs with descriptions of each.

**Alloy Constructional Steels**—International Nickel Co. Inc., 67 Wall street, New York. Bulletin No. F-1, on the making and shaping of alloy constructional steels.

**Presses**—Niagara Machine & Tool Works, 637 Northland avenue, Buffalo. Bulletin No. 64-E, illustrating and describing the line of Niagara double crank presses; complete tabulations of specifications are given.

**Coupled Pumps**—Ingersoll-Rand Co., 11 Broadway, New York. Bulletin No. 7066, covering its line of coupled pumps, capacities 150 to 5000 gallons per minute against heads of 20 to 250 feet.

**Drills**—Ingersoll-Rand Co., Phillipsburg, N. J. Bulletin No. 2231, describing the "Corco" diamond drill, producing holes to 1150 feet with cores 3/4-inch in diameter or shorter holes with larger cores, up to 3-inch diameter.

**Sound System for Paging**—Stromberg-Carlson Telephone Mfg. Co., Rochester, N. Y. Bulletin No. 36-JN, describing No. 15 sound system, which consists of paging amplifier, microphone, and several loud speakers.

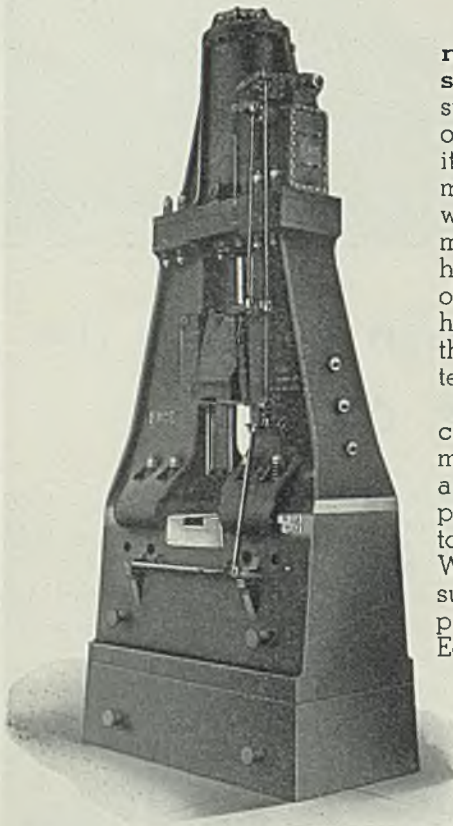
**Steelstrap**—Acme Steel Co., 2840 Archer avenue, Chicago. Folder No. 1070, describing the Acme steelstrap method to lower handling costs—reduce hazards to workmen and to eliminate damage to products in transit.

**Platform Trucks**—Elwell-Parker Electric Co., Cleveland. Bulletin No. A 7512, describing high lift platform trucks, with illustrations showing typical applications of the basic machine to various industries by the use of correct attachments.

**Finishing Ovens**—Despatch Oven Co., 622 Ninth street, S. E., Minneapolis. Two new bulletins which feature ovens for various processes on refrigerators, cans and containers, metal sheets, novelties, tractors, metal caskets.

**Blast Cleaning Equipment**—Rue-  
melin Mfg. Co., 3850 North Palmer street, Milwaukee. Bulletin No. 35, describing blast-furnace equipment,

## IS TEN MONTHS TOO LONG?



How long would it take a new hammer to pay for itself in your shop? A recent survey of opinion of a number of forge shop executives showed it was their average belief that modern ERIE drop hammers would pay for themselves in ten months. But compared to hammers ten or fifteen years old—and about 80% of the hammers in operation are more than ten years old—probably ten months is too long.

Labor costs are bound to continue upward. Only with modern equipment will you get a corresponding increase in production. You can't afford to run those old hammers. What investment today will pay such handsome returns as the purchase of Erie Forge Shop Equipment?

*A 12,000 lb. Erie steam drop recently installed by a prominent automobile manufacturer for forging six-throw crank shafts is shown in the illustration.*

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in many standard sizes and can be furnished with car-truck, turntable or monorail.

**Automatic Coal Stokers**—Link-Belt Co., 307 North Michigan avenue, Chicago. Booklet No. 1619, on automatic coal stokers for industrial and commercial use in capacities up to 300 horsepower; illustrated, reproduces numerous letters from users, and gives data.

**Gas Engine**—Cooper-Bessemer Corp., Mount Vernon, O. Bulletin No. 304, describing type EN gas engines rated 30 to 38 horsepower per cylinder, in 3, 4, 6, and 8 cylinders. Bulletin points to the many industrial applications of these engines.

**Co-ordinated Control System**—Bristol Co., Waterbury, Conn. Bulletin No. 460T, describing a new system of complete process control. Featuring the Bowser Mir-o-Meter, which measures, and records fuel consumed and indicates and records the rate at which it is being delivered to the furnace.

**Rolling Doors** — Cornell Iron Works Inc., Thirty-sixth avenue and Thirteenth street, Long Island City, N. Y. Folder on rolling doors and shutters, hand and motor operated; descriptions of types, illustrations, and photographs of steel and bronze doors in place; tables of dimensions and clearances for automatic closing rolling doors.

**Grinding**—Carboly Co. Inc., 2967 East Jefferson avenue, Detroit. Manual GM-36 showing latest technique for grinding Carboly tools; Catalog No. DR-36, describing the diamond-impregnated Carboly dresser for rough, semifinish and finish dressing of all types of grinding wheels; a sliding chart is enclosed to provide a quick method of selecting the proper dresser for each type of grinding wheel.

**Drilling Machines**—Two catalogs by Motch & Merryweather Machinery Co., covering drilling machines handled by this concern. One is devoted to the lines represented by the company's Cleveland office, 715 Penton building, the other is devoted to lines represented by its Pittsburgh office, Clark building. The catalogs are artistic and comprehensive, uniform except as representation varies in the two territories, well illustrated and containing much information relative to the several lines.

**Stainless Steel**—Republic Steel Corp., Cleveland. Series of five booklets on Enduro stainless steel; No. 142, explains the reasons for the popularity of stainless steel and illustrating many of the more important applications; No. 144, features detailed data on Enduro 18-8 and its several variations; No. 143, devoted to the straight-chromium types of Enduro—AA, S, S-1 and FC; No. 145, contains information on the heat-resisting types of Enduro—HCN, HC, and NC-3; No. 165, treats Enduro 4-6 per cent chromium steels; the latter are not stainless but are intermediate between carbon and stainless steels.

Where other metals  
have failed...



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AMPCO is truly "The Metal Without Equal". A process metal of amazing qualities. This "Bronze of Bronzes", is practically the universal specification in all instances where other metals have broken-down under abusive wear or operation.

Ampco has an astounding tenacity to resist breakage and deformation. It withstands crystallization and fatigue as no other metal can. And Ampco, as found in Wellman castings, is Ampco Metal at its best, for Wellman is completely equipped for producing first class AMPCO METAL castings.

If you have a problem, Wellman engineers will be glad to help you.

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# Titanium Causes Changes in Alloys

(Continued from Page 80)

that titanium can not be retained during the welding operation. In fact, Mr. Franks stated, the safest procedure at present is one that consists of using a columbium-bearing 18-8 steel rod when it becomes necessary to weld the titanium-bearing 18-8 steels because sufficient columbium can be recovered to impart to

the welded structure comparative freedom from intergranular attack. As in the case of titanium, the columbium addition must be controlled in order to obtain a steel having optimum physical characteristics associated with the necessary resistance to intergranular corrosive attack.

**E**FFECT of titanium on the hardness and microstructure of heat treated 18 per cent chromium steel ingots was discussed in a paper by R. E. Bannon, research associate, Titanium Alloy Mfg. Co., Niagara Falls, N. Y. These steels contained

0.20-0.30 per cent carbon. Conclusions arrived at by the author were:

1. Addition of titanium to 18 per cent chromium steel causes a refinement of grain in the ingot and a lessening of the tendency toward ingotism. With a titanium content of 1.11 per cent, ingotism is eliminated.

2. Although this alloy with sufficient titanium added to combine with all the carbon present may be considered for most practical purposes as a carbon-free, high-chromium iron with titanium carbide inclusions, the crystals of the titanium compound are soluble in steel at 2500 degrees Fahr. and are therefore subject to rearrangement by heat treatment; but the steel is not hardened by their solution.

3. Addition of 1.97 per cent titanium, or possibly less, to 18 per cent chromium steel with 0.20 to 0.25 per cent carbon eliminates both air hardening and hardenability, except that water-quenching from the vicinity of 2100 degrees Fahr. may cause a very slight hardening.

### Effect on Corrosion Resistance


Contributing a written discussion to Mr. Bannon's paper, V. N. Krivobok and G. C. Kiefer, research laboratory, Allegheny Steel Co., Brackenridge, Pa., observed that the presence of such high concentrations of titanium may affect corrosion resisting properties of these alloys. Presence of complete titanium-bearing inclusions has a definite effect on corrosion properties of chromium-nickel stainless alloys and it is logical to predict that the effect of titanium would be similar. Hence it may be suggested that if ever titanium-bearing chromium alloys are benefited in certain respects, as stated by Mr. Bannon, the conditions of service should be considered carefully before the use of the alloys is advocated.

**P**RESENTING a paper on the subject of production of flakes in steel by heating in hydrogen, R. E. Cramer, special research assistant in engineering materials, engineering experiment station, University of Illinois, Urbana, Ill., pointed out that a brief review of the literature shows that no conclusive proof of factors affecting the development of flakes was presented until 1935. In that year, work reported from Germany and Italy showed that steel treated in hydrogen would develop flakes.

The author analyzed flaked and sound steel for gases by the Vacher-Jordan vacuum fusion method. No relation was established between gas content and flakes or between microstructure and flakes. As examples of flake formation in steel, Mr. Cramer showed illustrations of a fissure developed from a flake in a locomotive tire; flakes in steel as received from the mill, both in seg-

# Bailey...

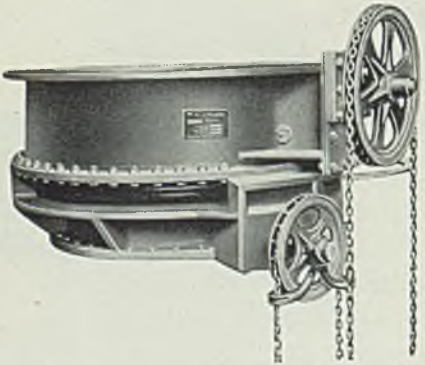
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They have proven  
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regation streaks and scattered at random; and flakes and cracks developed in 1½ x 3 x 10-inch steel bars heated in hydrogen at 2300 degrees Fahr. for 27 hours and cooled in various ways.

Mr. Cramer stated that while the mechanism of the production of flakes is not thoroughly understood, the explanation first presented by the European metallurgists appears to agree with available information. Molten steel in the open-hearth absorbs more than its own volume of hydrogen. During cooling of the steel, some hydrogen escapes but the steel holds a good portion of it in solution until it cools below the critical point after rolling. The rate of cooling of the steel in open air is not so fast but that hydrogen can diffuse out of the steel as it cools down to some temperature in the neighborhood of 400 degrees Fahr.

#### Builds Up High Pressures

At this temperature there is still in the steel a considerable volume of hydrogen, which is being liberated due to the lowering of the solution pressure accompanying the drop in temperature. When the diffusion rate suddenly changes the hydrogen which is being liberated is trapped in the interior of the steel, and probably collects in minute spaces around inclusions and in any other small voids. The pressures built up in these small spaces must be very high, and, since the stresses in the metal are distributed over minute areas, they may exceed the tensile strength of the steel. A small crack then develops which relieves the pressure. The crack remains in the cooled steel in the form of a flake.

This explanation, said Mr. Cramer, calls for some consideration as to how hydrogen can be introduced into the molten steel. There are many ways in which water, which, when dissociated, produces two volumes of hydrogen to one of oxygen, may be introduced or produced during the open-hearth steelmaking process.

Some sources are: 1. Production during the combustion of the fuel in the open-hearth furnace; 2. in the rust on scrap metal (iron hydroxide); 3. in the molten metal from the blast furnace; 4. in the ore and the lime used in the open hearth; 5. in the fuel and air used for combustion.

#### Dissociated Readily

The first item, the author pointed out, accounts for the largest supply of water. At the temperature of the open-hearth furnace the slag and the molten steel could readily break water vapor up into oxygen and hydrogen, through the reaction  $Fe + H_2O = FeO + 2H$ . The hydrogen would be readily absorbed by the molten steel. During the course of

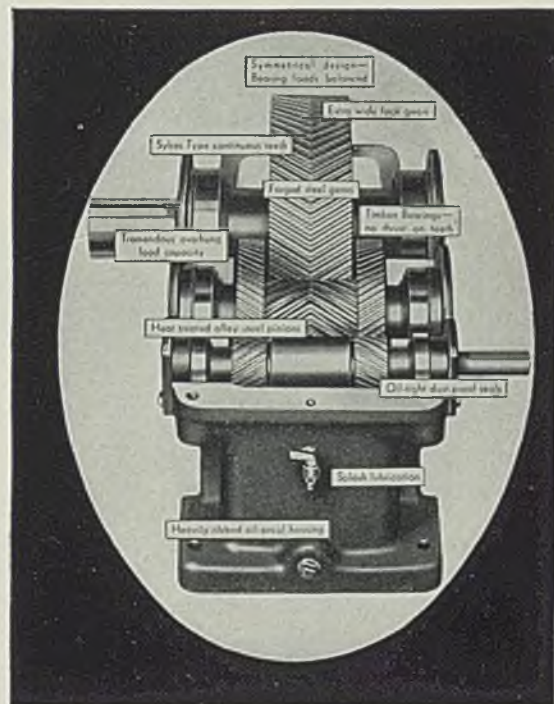
the production of a heat of open-hearth steel there seems to be a considerable opportunity for the absorption of hydrogen produced from the dissociation of water vapor which is present.

Summarizing his investigation, Mr. Cramer said it had been shown that flakes or small cracks are produced in an 0.80 carbon, 0.80 per cent manganese crack-free steel when heated at 2200 degrees Fahr. for 27 hours in an atmosphere of hydrogen, followed by cooling in air. A different type of cracking resulted when a specimen was heated in hydrogen until the surface began to

melt, and then air cooled. Specimens heated in hydrogen and then quenched in water showed numerous small cracks.

Although it has been shown that hydrogen can cause flakes in steel during cooling, this is no proof that other causes, such as localized temperature gradients, cannot also cause flakes. Gas analyses of flaked steel have failed to show any relation between the presence of flakes and gas content of the steel after cooling. Further experiments are necessary, he said, to determine accurately the temperature at which flakes are formed.

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*all the*  
*way through*



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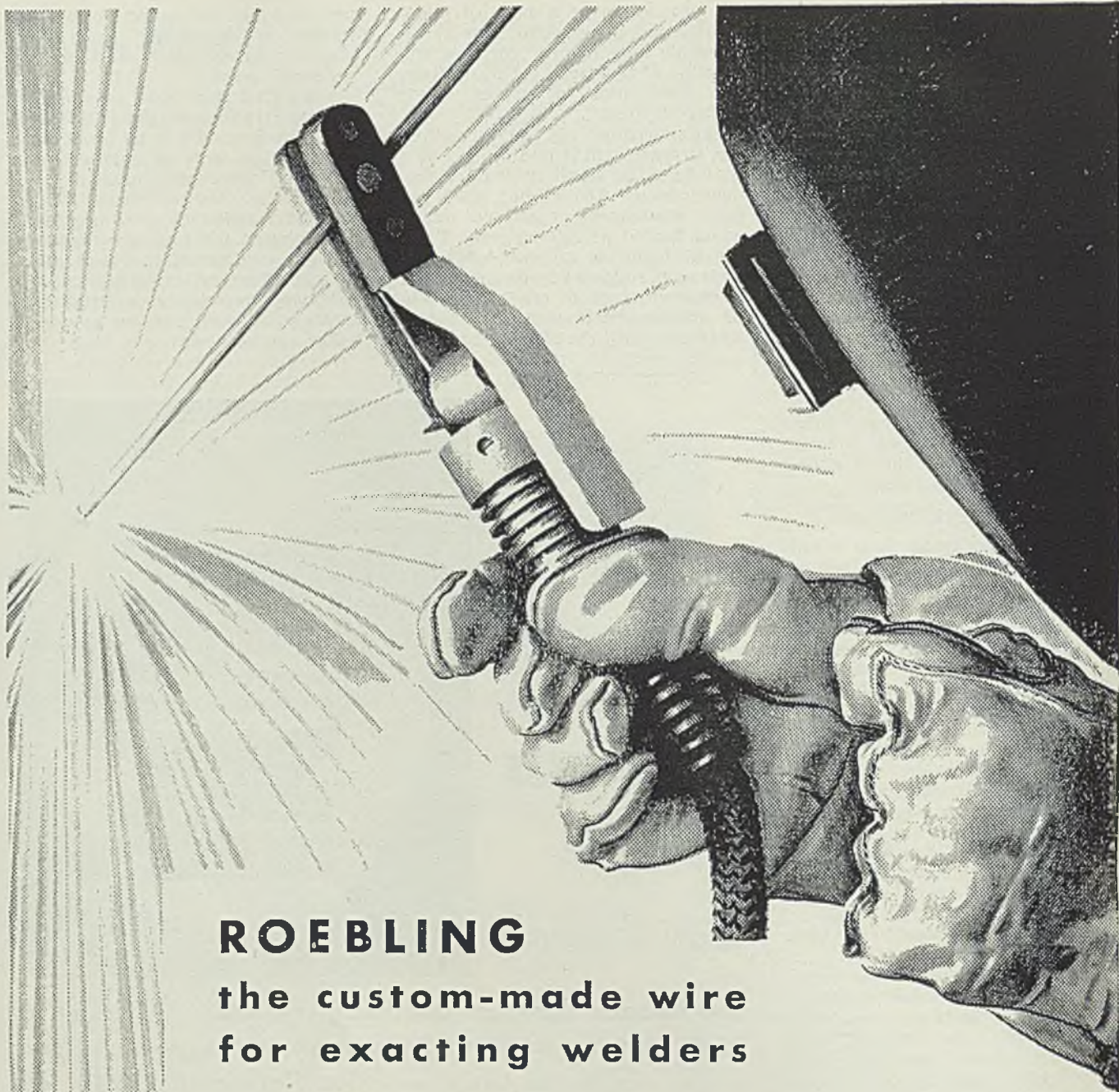
Horsburgh & Scott Herringbone Speed Reducers bring maintenance cost close to the zero point. Their depreciation is exceedingly low, even under very heavy shock loads and other difficult conditions of service.

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#### **ACETYLENE—**

**universal and indispensable servant of industry— will be discussed in all its phases at the thirty-seventh annual meeting of the International Acetylene Association, to be held in St. Louis, Nov. 18-20.**

**Recognizing the importance of the oxyacetylene process in the iron, steel and metalworking industries, STEEL takes pleasure in presenting the program for this meeting, together with a general report of progress in the oxyacetylene industry during the past year.**

**In addition, articles describing interesting applications of the process are set forth elsewhere in this issue.**

MAKE YOUR PLANS DEFINITE NOW

# I.A.A.

## *in St. Louis*

November 18, 19 and 20th, 1936

THE time draws near for making definite your plans to be in St. Louis for the I.A.A. Here, the International Acetylene Association will meet to review the money-saving applications of the oxy-acetylene process of welding and cutting metals, and to set up objectives for the further progress of the Oxy-Acetylene Industry. This 37th Annual Convention of one of the oldest active technical societies in the country will be held this year, for the first time, in St. Louis. Remember the time and place—November 18, 19 and 20 at the Hotel Jefferson.

### *Your Opportunity*

You and your associates are cordially invited to attend. If you have attended the Conventions in Philadelphia, Chicago, Pittsburgh or Cleveland during recent years, you will want to come again. If you have never attended an I.A.A. Convention, then you owe it to yourself to find out how really interesting and valuable these conventions are. This convention is *your opportunity* to profit by the other fellow's experience.

### *Important Papers*

Well-known engineers—recognized leaders and authorities in their fields—will present papers on subjects that vitally concern all of us interested in the oxy-acetylene welding and cutting process. A brief glance at the topics outlined in the program will indicate their importance to all industry. This is the one time when all the important developments and trends of the oxy-

acetylene welding and cutting process are coordinated, reviewed, and discussed for your benefit.

### *Welding and Cutting Forum*

This year the *Oxy-Acetylene Welding and Cutting Forum* will be bigger and better than ever. Live demonstrations will show the more recent welding and cutting techniques. Problems will be discussed by practical operators as well as by engineers and technicians of national prominence.

### *Welding and Cutting Round Tables*

A second evening will be devoted to a group of Welding and Cutting Round Tables on topics of particular interest. If you have a question or problem, here is the place to get it answered. Discussion in each group will be led by a chairman and technical advisers well informed in the particular subject at hand. Your business needs the information you will gather.

### *Write for Complete Program*

The preliminary program at the right outlines the many interesting sessions and lists some of the subjects to be discussed. But this is only an outline. Write to the Secretary now for an advance copy of the complete program as soon as it is off the press. . . . If you have not already decided to attend this 37th Annual I.A.A. Convention, the complete program will convince you that you owe it to yourself, to the industry, and to your business to be there.

INTERNATIONAL ACETYLENE ASSOCIATION

Established 1898

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*Basic demonstrations at an I. A. A. Welding and Cutting Forum show the fundamentals of acetylene generation.*



*Oxy-acetylene welding is demonstrated and discussed by practical operators and prominent engineers.*



*Oxy-acetylene cutting is demonstrated in all its phases by competent technicians.*



*Testing methods and technique are shown at an I. A. A. Welding and Cutting Forum.*



## PROGRAM

Wednesday, November 18, 1936

12:00 Noon — Opening Luncheon, *Gold Room, Hotel Jefferson*

2:30 P.M. — General Industries Session, *Crystal Room, Hotel Jefferson* — Welding of Cupro-Nickels and Silicon Copper Alloys . . . How Design for Welding Defers Obsolescence and Increases Profits . . . Metallurgical Joints in Repetitive Production . . . Oxy-Acetylene Welding in the Glass Industry.

8:15 P.M. — Welding and Cutting Forum, *Soldan High School Auditorium*

Thursday, November 19, 1936

10:00 A.M. — Inspection Trip, *Midwest Piping and Supply Co., Inc.*

2:30 P.M. — Heavy Industries Session, *Crystal Room, Hotel Jefferson* — Welding in Mining Operations . . . Application of Welding and Cutting in Heavy Construction Industries . . . Preparation and Cutting of Plate Steel for Cars . . . Shape Cutting in Production of Heavy-Duty Dirt Equipment.

8:15 P.M. — Welding and Cutting Round Tables, *Soldan High School Auditorium* — Informal discussions on subjects of particular interest.

Friday, November 20, 1936

12:00 Noon — Annual Luncheon and Business Meeting, *Crystal Room, Hotel Jefferson*

2:30 P.M. — Piping Industries Session, *Crystal Room, Hotel Jefferson* — Power Plant Piping . . . Why Should Piping Contractors Recommend Welding to Architects and their Clients? . . . Cutting of Steel Plate for Pressure Vessels . . . Welding of Pipe Lines . . . Welding Refinery Equipment.

37<sup>th</sup>

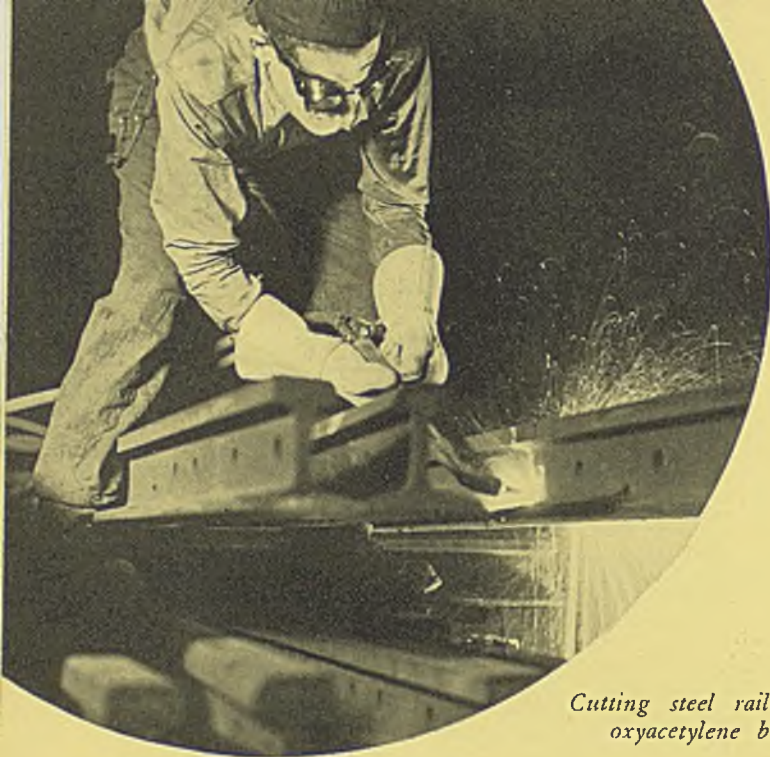
Annual Convention

*Hotel Jefferson*

ST. LOUIS, MO.

November 18, 19 and 20

1936



# Oxyacetylene

*Cutting steel rails with an oxyacetylene blowpipe*

**G**REATER acceptance of the oxyacetylene welding and cutting process is the direct result of a wider understanding of the possibilities of these processes. This situation results from years of research by the oxyacetylene industry, equally embracing the problems of its customers as well as its own. As a result of this continued effort, the oxyacetylene industry is moving rapidly toward new developments and discoveries. The progress report for the past year is, in general tone, similar to those for previous years. It represents a history of continual and rapid development and improvement. One significant change which first was noted two or three years ago, however, has become particularly impressive during the past year. This is that the oxyacetylene process has come to be considered from a metallurgical point of view, by its users as well as by the oxyacetylene industry itself.

## **Welding Is Applied Metallurgy**

Welding today is quite different from what it was 10 or even five years ago. It has grown from a simple, semimechanical process of joining or cutting to a matter of applied metallurgy. This change is due largely to the tremendous advances made during the past year in the knowledge of metals. Materials are now made to suit service requirements; a new alloy, if necessary, is developed. The result is that modern oxyacetylene welding and cutting have been called upon to meet fabrication demands for these new materials. This has made a definite demand on the energies of research laboratories, engineers

and on the help and co-operation of users of the process.

A glance over the more tangible developments and advances during the year cannot help but drive home the fact that the oxyacetylene process today is primarily a matter of metallurgy.

## **More Torch Cutting and Shaping**

Outstanding among the year's developments has been the tremendous increase in the use of oxyacetylene machine cutting. This year has marked another step in the continued progress of the intensive development of flame shaping. One of the main reasons for the notable advance this year has been the availability of many new types of cutting machines. The increasing need for new types of machines ranging from large templet-operated shaping machines to small portable and precision cutting units has been recognized.

Preparation of plate edges for welding by oxyacetylene machine cutting is accomplished with such accuracy that no machining or subsequent preparation is necessary.

---

*THE accompanying article is an abstract of a report to be presented at the thirty-seventh annual convention of the International Acetylene association, St. Louis, Nov. 18-20, covering progress in the oxyacetylene industry during the past year. The author, H. E. Rockefeller, is associated with the Linde Air Products Co., New York*

---

While the making of three dimensional cuts is not a new application by any means, having been practiced from time to time for several years, its wider acceptance during the year is important to industry. The fact that a finished product, or a product which requires very little finish machining, can be shaped out of a solid block of steel means an important saving to industry in general.

Another operation that advanced rapidly during the year is stack flame cutting. More and more shops that have been utilizing the oxyacetylene shape cutting process have come to realize that the economies of the process can be improved greatly by a little closer study of procedures. The answer in many cases has shown itself to be stack flame cutting in which several layers of plates are stacked together and a multiplicity of similar parts turned out at the same time by the use of one cutting flame. This is an idea that has given rise to numerous economies during the past year. As its possibilities and advantages become more widely known it will undoubtedly find increasing use.

## **Boiler Code Recognition**

Increased knowledge of the effect of oxyacetylene cutting on steel has led to wider acceptance and use of the process. Extensive tests have revealed that oxyacetylene cutting on low and medium carbon steels is superior to shearing in its effect on the base metal. An example of this trend was the recognition of oxyacetylene cutting in the revision adopted by the boiler code committee of the American Society

# Process Wins Wider Recognition

BY H. E. ROCKEFELLER  
Linde Air Products Co., New York

of Mechanical Engineers for the A.S.M.E. boiler code by the American Petroleum institute. These changes give definite approval of the use of oxyacetylene flame cutting for the preparation of steel plate edges in steel of 0.35 maximum carbon content for boiler and pressure vessel fabrication. Provision was made that the edges be uniform, smooth, and free of all loose scale and slag accumulation before welding. This action came as a conclusion to much research that has been carried on in several quarters during recent years. Since boiler and pressure vessel fabrication comes under perhaps the most rigid control of any type of manufacturing, official acceptance of flame cutting in this case indicates its acceptability for any type of edge preparation, be it for boiler, structural steel, or fabrication of machinery parts and structures.

## Multiflame Welding

Many of the recent welding developments have taken advantage of the use of a series of flames instead of a single flame, through proper positioning of tips to distribute the heat as desired. This method increases welding speed and steps up production in the welding of overland pipe lines.

Another development in the pipe line field is the change in procedure to what is known as the "stab-on" method. In this method, advantage is taken of the peculiar adaptability of the oxyacetylene process for welding economically in all positions. This is brought about because the welding rod and source of heat are separate and consequently the pressure of the flame

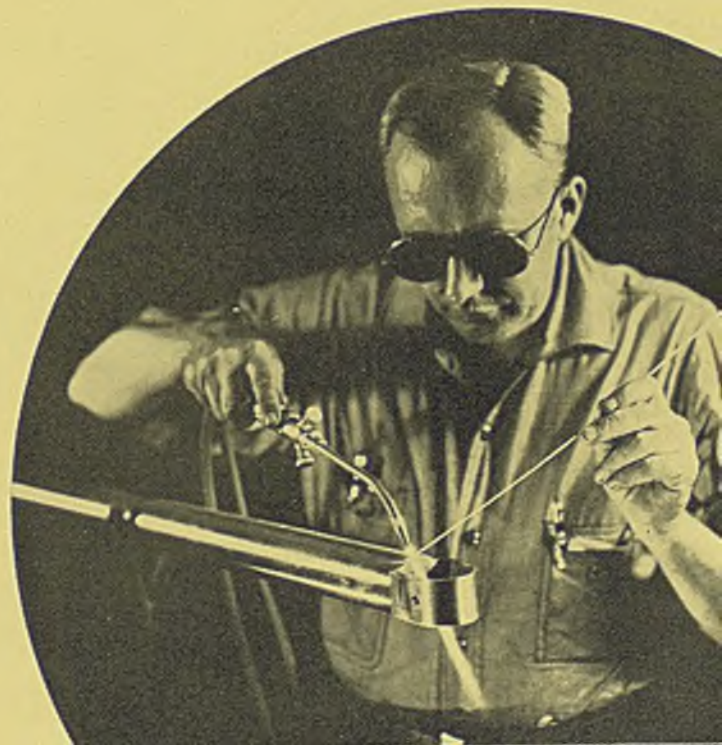
and the rod manipulation make possible the deposition of metal with approximately equal facility in any position. The all-bell-hole method also known as the "stab-on" or "stove-pipe" method, consists in assembling the line a length at a time and making all welds in position. In short, it amounts to making all welds as bell-hole welds. This means the elimination of the usual line-up and firing-line gangs, with the bending or tie-in gang handling 40-foot instead of the usual 200-foot sections.

While relatively little building work of a general character has been done during the past three or

four years, that which has been done shows that oxyacetylene welded piping for building and industrial purposes has become standard practice. Welded joints in piping systems in a good many federal buildings constructed during the past year were permitted or specified.

An interesting application of the use of the blowpipe in connection with pipe is the fabrication of light building structures in which tubular material is used as the framework. Following widely scattered trials in recent years, several buildings are being erected with pipe as the main structural members. In-

*Columbium-treated  
18-8 chromium-  
nickel stainless steel  
is oxyacetylene  
welded with colum-  
bium-treated stain-  
less steel welding  
rod*



# For Modern Metal

## *Oxy-Acetylene Cutting with Oxweld Machines*

**M**ODERN metal working demands a fast, flexible, accurate, and economical method for shaping metal parts. Oxy-acetylene cutting with new machines developed by Linde is the answer.

For every cutting need, there is an Oxweld cutting machine . . . portable or stationary, partly or fully automatic, and of almost any desired capacity. These machines are production tools that cut intricate shapes with amazing accuracy.

*The Oxweld CM-12 Cutting Machine* is Linde's latest contribution to automatic precision shape cutting. Such features as rigid crane-type construction . . . ready adaptability to hand tracing, templet tracing, and radius cutting . . . unusual flexibility for automatic straight line, circle, bevel, and angle cutting, and dual controls at tracing table and blowpipe

make it an ideal all-purpose machine.

*The Oxweld CM-14 Cutting Machine* has a wider range than any other stationary shape cutting machine now available. Its travel covers 102 inches in width and 144 inches in length. The latter can be extended in 6-foot units. This machine is especially suitable for cutting machine frames and other large shapes.

*The Oxweld CM-8 Cutting Machine* is a portable cutting machine. It is extremely rugged, flexible, compact, and powerful—designed for the newer cutting techniques in everyday production. It cuts any shape, and prepares edges for welding.

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A Linde representative will help you determine what oxy-acetylene cutting can do in your plant and which machine is best for your purpose. Address the Linde office near you. The Linde Air Products Company, Unit of Union Carbide and Carbon Corporation, New York and principal cities.

### *Your Opportunity*

Hear oxy-acetylene machine cutting discussed at the 37th Annual Convention of the International Acetylene Association, Hotel Jefferson, St. Louis, Missouri, November 18, 19, and 20, 1936.

*Everything for Oxy-Acetylene Welding and Cutting*

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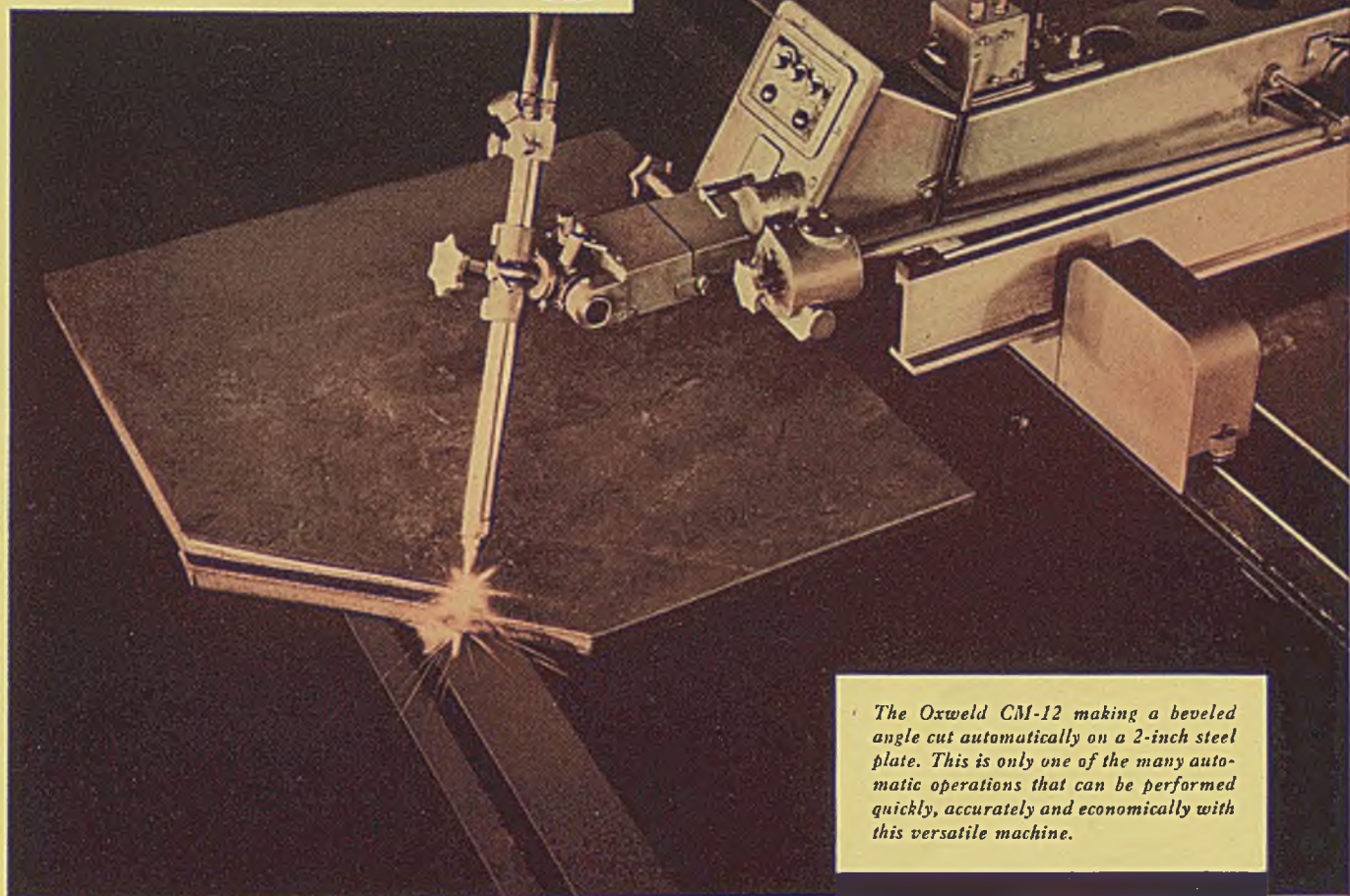
FROM



LINDE

UNION CARBIDE

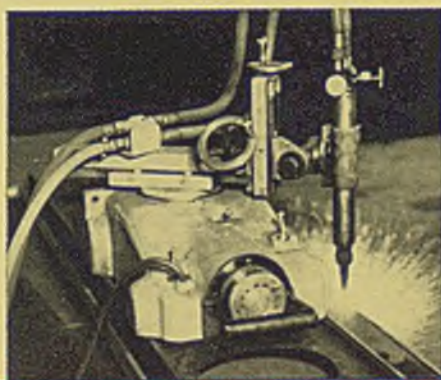
# Working



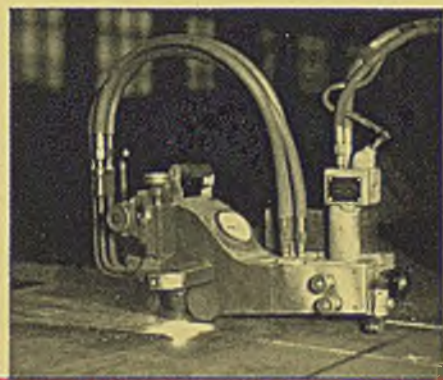
*The Oxweld CM-12 making a beveled angle cut automatically on a 2-inch steel plate. This is only one of the many automatic operations that can be performed quickly, accurately and economically with this versatile machine.*



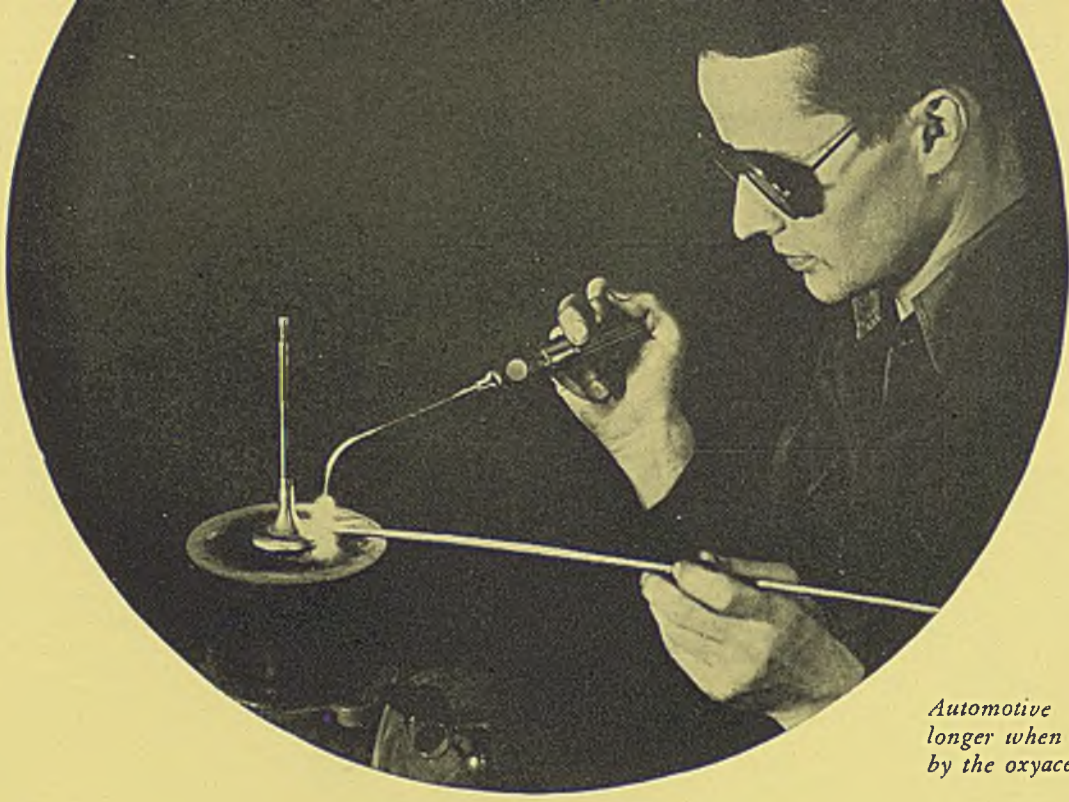
*The Oxweld CM-11 (100-inch) cutting a machine frame member from a 2-inch steel plate 8 feet square.*



*The Oxweld CM-8 cutting 1-inch steel plate for a derrick mast step at a speed of 14 in. per min.*



*The Oxweld CM-5 cutting a steel base plate 3 1/2 inches thick at a speed of 5 to 6 in. per min.*



*Automotive valves last longer when hard surfaced by the oxyacetylene process*

terest in this new structural technique is spreading.

Interest in the use of the oxyacetylene bronze-welding process for repairing damaged cast iron machinery has grown widely. While this is not a new application or method, the fact that insurance regulatory bodies look with favor upon and are taking greater interest in the repair of damaged cast iron machinery by means of the blowpipe is significant.

#### **Resurfacing Now Is Routine**

Much work that a year ago was spectacular because of its novelty, involving resurfacing of worn parts by the use of bronze welding rod today has become routine. Better wearing surfaces of bronze are being applied literally to millions of parts, thus saving huge expenditures for replacements or other types of repairs.

Problems of air hardening in the

welding and cutting of 4 to 7 per cent chromium steels were overcome. The air-hardening propensities of the 12 to 30 per cent chromium steels were overcome in a similar fashion. The well-known tendency toward intergranular corrosion at high temperature of the 18-8 type steels had become a serious problem when methods of overcoming these factors were developed.

Similar problems presented themselves in the cutting of these various materials either in cast or plate form. What is of greatest significance is the fact that it was discovered that the use of columbium or titanium in small quantities properly alloyed in these various materials would eliminate the air hardening difficulties, improve ductility, even in the as-rolled condition,

and improve the cutability of these materials.

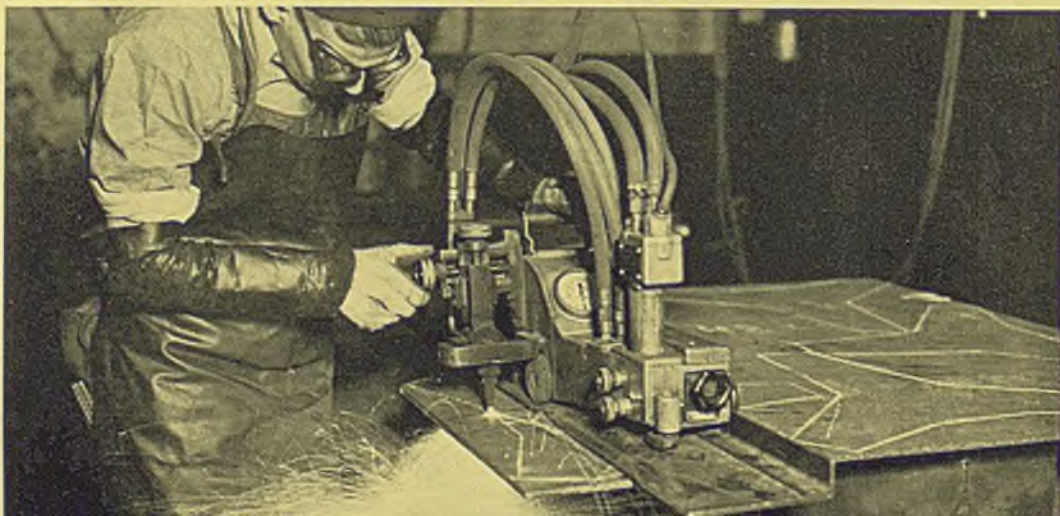
This development is one of the most significant in recent years and is one which will merit watching.

#### **Welding Stainless Steel**

The development of columbium and titanium treated, stainless steel welding rods was a companion step forward. The use of these rods in conjunction with 18-8, chromium-nickel base metals "treated" or "stabilized" with columbium or titanium permits the fabrication of welded stainless steel products which, in the as-welded condition, have full resistance to corrosive and oxidizing influences, particularly at elevated temperatures. A great deal of study, culminating in several important announcements during the past three or four months regarding the use of columbium or titanium in welding rod, has shown

*(Concluded on Page 103)*

*Cutting shapes from steel plates by means of the oxyacetylene torch*





# Morehead Medal to D. S. Jacobus

**D**R. DAVID SCHENCK JACOBUS has been awarded the Morehead medal of the International Acetylene association for the year 1935 for his outstanding leadership in the formulation of codes and procedures which have made fusion welding acceptable. The medal will be presented to Dr. Jacobus during the opening session of the association's thirty-seventh annual convention in St. Louis, Nov. 18.

## Medal Established in 1922

The Morehead medal was established in 1922 by John Motley Morehead, formerly United States minister to Sweden, in honor of his father, the late James Turner Morehead who, in 1892, sponsored the experiment which led to the discovery of the electric furnace method of producing calcium carbide. The medal is awarded annually by the International Acetylene association to the person or persons who, in the judgment of its officers and board of directors, have done most to advance the industry or the art of producing or utilizing calcium carbide or its derivatives.

Dr. Jacobus was born in Ridgefield, N. J., Jan. 20, 1862. He graduated from Stevens Institute of Technology in 1884, and received the degree of doctor of engineering from the same university in 1906. From 1884 to 1906, he taught experimental mechanics and engineering and physics at Stevens Institute, the latter year joining the Babcock & Wilcox Co., New York, as advisory engineer. He is now head of the company's engineering department.

## Experimented With Acetylene

He has written many papers and is considered one of the world's authorities on steam engineering. He is a member of many societies, including the American Society of Mechanical Engineers, Society of Naval Architects and Marine Engineers, American Welding society, American Institute of Mining and Metallurgical Engineers, American Mathematical society, Society for the Promotion of Engineering Education, American Institute of Electrical Engineers, American Society for Refrigerating Engineers, Franklin institute, Holland Society of New York, and American Association for the Advancement of Science.

Dr. Jacobus has been interested in the oxyacetylene process for



David S. Jacobus

many years, and as far back as 1897, he experimented with the uses of the oxyacetylene torch. An account of some of these experiments was published in the *Journal of Franklin institute*, March 12, 1897. The title of the lecture was "Artificial Light: Modern Methods Compared—Electric, Incandescent Welsbach, Acetylene." These experiments also included the coding of thin steel.

Being conducted at the time that carbide was first made, these experiments proved highly interesting as well as entertaining and demonstrated the high heat value of the oxyacetylene flame in a number of ways. For a number of years Dr. Jacobus reported on all the acetylene generating machines that came to the New York Board of Fire Underwriters for approval.

## Worked on Boiler Code

Dr. Jacobus has served as president of the American Society of Mechanical Engineers, as president of the American Society for Refrigerating Engineers and for three terms as President of the American Welding society.

While president of the A.S.M.E., he was one of the organizers of a series of military lectures on preparedness, and later on became a member of the military engineering committee organized to arouse engineers to the need of preparedness and to instruct them in military tactics. The movement was a highly successful one.

He was a member of the organization committee for the industrial census which was obtained as a war-time measure for the purpose

of assisting the naval consulting board.

Dr. Jacobus has been active in many fields. He is perhaps best known to members of the acetylene industry for his work with the A.S.M.E. Boiler Code committee which he joined in 1914, becoming chairman of its executive committee. He now holds the position of chairman of the Boiler Code committee. His interest in fusion welding dates back to his early experiments. In his work in the Boiler Code committee he has shown a continued constructive interest in the development and acceptance of welded construction, and has taken a leading part in formulating rules that recognized fusion welding for pressure vessel construction which, upon subsequent development in 1931, led to the present comprehensive rules in the Code for Fusion Welding of Pressure Vessels and Boiler Drums and Shells.

Promulgation of these rules has led to their adoption by various states and municipal authorities and today fusion welding of boilers and other pressure vessels is recognized as a safe form of construction; whereas prior to the promulgation of these rules such welding was not permitted.

## Acetylene Progress

(Concluded from Page 102)

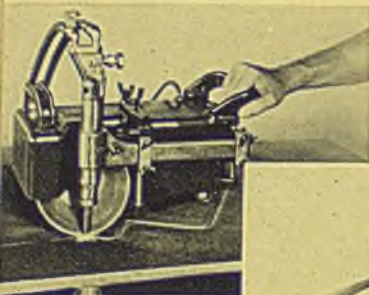
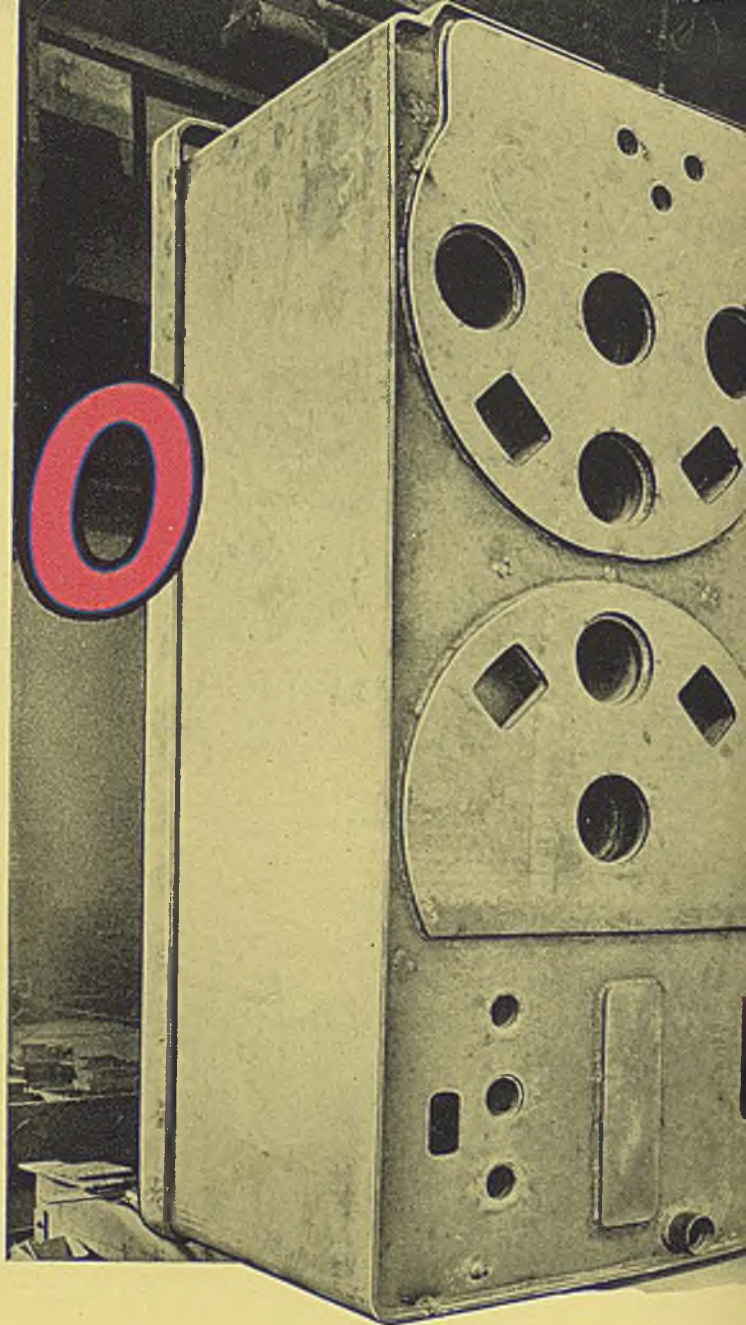
that a real victory has been gained in the war against corrosion and new economies and more satisfactory products offer themselves to the fabricators and users of stainless steel equipment.

The many developments leading toward the use of the oxyacetylene process in manufacture and construction during recent years has drawn attention to some extent from the very important place the process still holds in the fields of reclamation and repair. As long as 10 years ago it generally was conceded that the process was indispensable to industry in keeping the wheels turning from the standpoint of reclamation and repair, and this is as true today as it was at that time. No report of progress of the process would, therefore, be complete without mention of these important phases of the use of the process. Attention is still being given to this and the oxyacetylene process is securing an ever increasing acceptance in these fields.

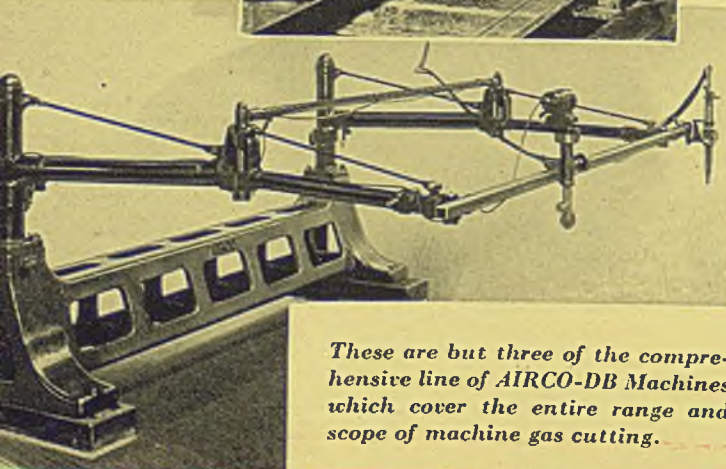
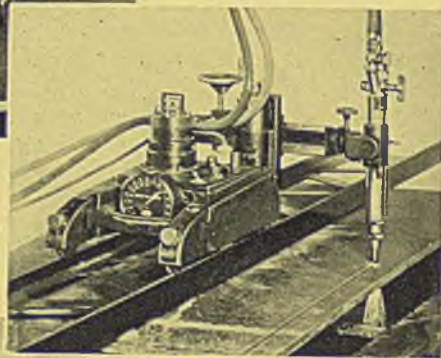
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Welding on the actuator base in progress showing the battery of WILSON ARC WELDERS which serve the shop.

ON-WIDE SUPPLY SERVI



# Questions on Cutting and Welding Will Be Answered Dramatically

ONE of the high spots of the International Acetylene convention will be a forum on welding and cutting, to be held Wednesday evening, Nov. 18, in the auditorium of the Soldan high school, 918 North Union boulevard, St. Louis. It will be featured by "live" demonstrations of the more recent welding and cutting techniques.

For years, officers and members of the association had been aware of a need for some method of bringing together those interested in the use of the oxyacetylene process and men capable of discussing the users' problems in everyday language and at a convenient time. To meet this need, the forum on welding and cutting was developed and introduced last year at the association's Cleveland convention. This session proved to be one of the most popular at the convention, with more than 1200 in attendance. Interest was keen and the majority of the audience remained after completion of the formal program to visit the stage and inspect the specimens and apparatus and ask questions of the speakers.

## Will Use Actual Equipment

The forum was devised to answer some of the many questions that continually arise with regard to the process—questions more frequently asked by users of the torch or blowpipe than by others. It was developed also to present the most recent advances in oxyacetylene welding and cutting techniques. For a majority of the questions asked the forum provided a unique an-

swer, made possible by one of the outstanding advantages of the oxyacetylene process, its portability.

Just as the tanks and apparatus more often than not are taken to the job, so they will be brought to the forum at St. Louis to illustrate in a practical and uninterrupted series of demonstrations, by skilled operators, the answers to the different questions which will be given by the speakers. Even some of the oxyacetylene shape cutting machines will be used in the forum—further evidence of the extreme portability of the process.

## Welding's Public Enemy No. 1

What are some of the questions to be answered? Welding today is a much different matter than it was 10 or even five years ago. It has grown from a simple semi-mechanical process of joining metals to a consideration more of metallurgy than anything else. This change is due largely to the tremendous advances made in the past few years in the knowledge of metals. As a result, modern oxyacetylene welding has been called upon to meet the fabrication demands of users of these new materials. Because there are so many different kinds of metals and alloys in commercial use today, each requiring some deviation in method or technique from what is considered the fundamental technique, it is imperative that the welding operator know what he has to work on before he starts the job. If he knows his metal, there is no reason why he shouldn't do a perfect job every time. In a series of demonstra-

tions that can be duplicated in almost any welding department or shop, the forum will present one important method of metal identification.

What is considered Public Enemy No. 1 of the welding industry? How can rivets be cut at speeds of 700 and more per hour without scoring plate. These and many other questions will be answered.

Brass and copper pipe, the use of which is increasing so rapidly, present problems in welding that have caused a veritable flood of questions. Many will be answered at the forum.

The proper technique to use in certain welding operations involving low carbon steel, as well as the correct procedure to follow when welding some of the high alloy steels will be discussed and illustrated by trained operators, skilled in bringing out the fine points of the techniques. Knowing how to identify the various metals and how to weld them is vitally important.

## Polariscope Demonstration

Much has been written about securing complete penetration, about correct reinforcement and the elimination of blow holes or slag spots, and many articles have been written on the importance of making welds correctly. That these features are important will be demonstrated vividly with a polariscope. By means of an image projected upon a screen, visible evidence of what happens when any of these points are neglected will be shown.

It is obvious from questions con-  
(Concluded on Page 124)

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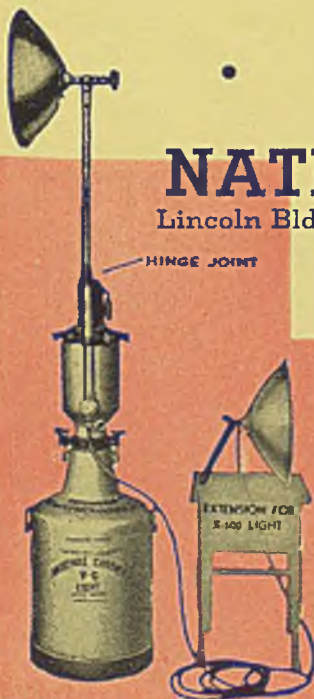


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NATIONAL CARBIDE INSPECTOR'S LANTERN

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1500 Candlepower

# I. A. A. Committee Activities Reflect Progress in Acetylene Industry

BY C. O. EPPERSON

President, International Acetylene Association

SINCE its inception a few years after the discovery of commercial methods of making calcium carbide, the International Acetylene association has progressed continuously toward the advancement of this important cross section of American technical and scientific endeavor. Within the last few years the activities of the association have come more and more prominently before the eyes of the general public as opposed to its former importance in technical and industrial circles almost exclusively. This has been due to a growing knowledge on the part of the public of the acetylene industry's variety of in-

terest within itself and its widespread sphere of activity.

People are more aware now of the uses to which compressed industrial gases are being put than they were a few years ago and it is only natural that in the course of time they should realize that this industry represents property and plant investments which make it, on the basis of this factor alone, well up among the first ten industries in the United States. The enormous investments which the acetylene industry and its associated organizations in the compressed gas industries have in cylinders alone is indicated to all who see evidences

of its activity in every garage, large shop, and in many construction projects which meet the eye on every hand.

This industry also supplies to hundreds of thousands of workers a means to a livelihood, not only in the manufacture of its products, but also in the use of these materials throughout the length and breadth of the land in all types of metal working industries and in many other activities.

The International Acetylene association has grown from a small group concerned mainly with the technical advancements of the use of acetylene, first, in lighting applications, and gradually in the adoption of the oxyacetylene welding and cutting process; through the war-time period and in the 1920's, to the great number of interested users of acetylene and related products who are immediately concerned with the advancement of the industry and the way in which it has made it possible for them to prosper.

## Chemical Field Promising

Unmentioned so far is the probable growth of the industry both in the welding and particularly in the cutting phase of the work and also in another division of the use of acetylene which up to now has not received as much prominence in the minds of the general public as the lighting and welding activities. This is the use of acetylene from calcium carbide as a basis for the manufacture of synthetic chemicals. This work started during the World war, when supplies of needed chemicals were shut off from abroad, and has progressed to the point where we are entirely independent of foreign imports of chemicals made from this source.

Many thousands of tons of chemi-



C. O. Epperson

C. O. EPPERSON, president, International Acetylene association entered the oxyacetylene field in 1914 by way of the legal profession. He joined the

Purox group of companies and was successively secretary and assistant treasurer, vice president and general manager, and president. He continued in the latter post until 1929. Following a brief interlude in the field of investment banking, he re-entered the compressed gas business. He is now vice president Keith Dunham Co., Chicago, and National Cylinder Gas Co., Chicago, and several of the latter's subsidiaries. Elected a director of the I. A. A. in 1933, he became vice president in 1934 and president in 1935.

HERBERT F. REINHARD, secretary, International Acetylene association, is well known in the acetylene industry, having served as secretary of the organization for the past six years and prior to 1931 was chief engineer, J. B. Colt Co., New York. He is a graduate of Purdue university in chemical engineering. During the World war he served as a commissioned officer in the coast artillery in France. Following this service, Mr. Reinhard was with the Indiana state board of health, Indianapolis, as



Herbert F. Reinhard

chemist for two years. In 1922 he joined the engineering department of the Prest-O-Lite Co. Inc., Indianapolis, transferring in 1925 to J. B. Colt Co.



C. D'W. Gibson

C D'W. GIBSON, vice president, International Acetylene association, and member of the executive committee, has been active in the oxyacetylene industry for 17 years, having been associated with the Air Reduction Co. Inc. since 1919. He is assistant vice president and gen-

erals derived from acetylene are manufactured each year in the United States and Canada. Literally hundreds of new chemicals or chemical products by new methods from this base have been prepared synthetically from acetylene. In case of another great war or calamity which might destroy sources of supply of materials now used by producers of chemicals, the acetylene industry may again be called upon to jump into the breach and supply synthetic chemicals to fill our needs in excess of this extensive normal output.

#### Progress Is Outlined

Much of the story of the acetylene industry is reflected in the trends through which the International Acetylene association has progressed and in turn the association's record is best explained by an outline of its major activities, especially the working of its committees. The association had its beginning at a time when efforts were being made to utilize its highly efficient acetylene flame for lighting. Acetylene and calcium carbide were first sold in conjunction with small generating plants for use in lighting homes. That these plants and this general system of lighting were satisfactory and efficient is evidenced by the fact that there are still about 400,000 homes, mainly in rural areas, lighted by acetylene.

Portable hand-lamps were the next development and even today in hundreds of coal and metal mines throughout the country the miner's cap-lamp is found to be the safest and most convenient means of lighting mine operations. Railroads also use thousands of portable acetylene hand lanterns for inspection work and portable floodlights

eral sales manager with headquarters in New York. A native of Schenectady, N. Y., Mr. Gibson attended Union college, studying electrical engineering. He was first connected with the Air Reduction Co. in Boston; was later made manager of the Richmond, Va., district; and subsequently managed the Detroit district. In 1926, he was appointed assistant to the first vice president and transferred to New York, and in 1928 was made assistant vice president and general sales manager. He has been active in the affairs of the I. A. A. for several years, serving on the executive and program, publicity and arrangements committees. He was elected vice president in 1935. Other societies in which Mr. Gibson is active are the American Iron and Steel Institute and American Welding society.



HENRY BOOTH, treasurer, International Acetylene association, has been active in the organization for many years. Prior to his election as treasurer, he served as chairman of the membership committee and also in other official capacities. His diligent service on the membership committee earned the gratitude and admiration of the entire



Henry Booth

association. Mr. Booth has been affiliated with the Shawinigan Products Corp., New York, since 1920, his present position being sales manager. Prior to that time he was associated with Fairbanks-Morse & Co. and also engaged in the advertising business.

are a common sight for temporary lighting of construction jobs, emergencies or catastrophes and in similar places where permanent lighting systems cannot be installed conveniently.

The dependability of acetylene as a lighting medium has long been recognized in marine service where buoys, using acetylene as a source of fuel, are common throughout the nation's waterways, as in the Panama canal and in many rivers and coastal harbors.

Automobiles for many years used the small acetylene tanks as a source of supply for the bright illumination which the acetylene flame affords and even today many automobile trucks and tractors are provided with this type of lighting equipment.

The activities of the association with regard to lighting have fostered these important uses of acetylene and carbide gas. Through its Engineering and Safety committees, the association has actively furthered the efficient and economical use of this important product in lighting applications.

With the introduction from Europe early in the century of efficient blowpipes for utilizing the oxyacetylene flame, the outlet for acetylene and its related gas oxygen

for welding and cutting metals enlarged considerably. The association fostered the spread of information on applications of the oxyacetylene process through its annual conventions and by means of the Morehead medal award which brought to the attention of the general public the important figures who were making contributions to the progress of the industry.

The welding and cutting activity has far outshadowed the lighting interest within the association and its work has been generally reported through the Oxyacetylene committee which has offered printed reports on its activity for the last eight years representing the best thought within this industry on a number of important problems which it is obliged to face.

#### Safety Is Promoted

The activity of the association with regard to its chemical products has not been so marked up to this time, but the next few years may see a substantial growth of interest in this important phase of the activities of the International Acetylene association.

At the present time the committee work of the association is profoundly concerned with the subject of oxyacetylene welding and cutting. The Technical and Engineering committee is active in continuing its work, started many years ago, of maintaining safe and efficient practices in the manufacture and use of acetylene. All of the committee work within the association is concerned greatly with the problem of safety and the record of the association in this respect is highly commendable since, with a product which may be potentially hazard-

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THE accompanying article constitutes the presidential address of C. O. Epperson to be presented at the thirty-seventh annual convention of the International Acetylene association in St. Louis, Nov. 18-20

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# How Industry



*Your Opportunity*

Attend the  
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# goes Modern

## *...with Alloy Steels*

**T**HERE are alloy steels for every purpose . . . for extra strength and toughness . . . for resistance to wear, abrasion, and impact . . . for withstanding highly corrosive conditions even at high temperatures. By their use, dead weight, wear, and corrosion—the enemies of profits—grow less and less. That's why the modern cry is "alloy steels."

### *Alloy Steel Applications*

A streamlined train made of high-tensile, mild-alloy steel containing chromium and silicon weighs only 230 tons, about half as much as a standard steam train of the same passenger capacity . . . An 18-yard dipper bucket made of strong, tough manganese steel *weighs 5 tons less* than the 14-yard dipper it replaced—and will last much longer.

The strength and stamina that special alloy steels gave to gears, connecting rods, shafts, axles, frame, and many other parts in Sir Malcolm Campbell's "Bluebird" made possible his safe dash across the salt flats of Utah for a new record of over 5 miles a minute . . . A modern combined mine skip and hoisting cage made of mild-alloy steel *weighs 30 per cent less* than the steel lift it replaced and enables the mine to operate 800 feet below its former floor without overloading its hoisting machinery.

### *Stainless Steel Applications*

A 38,000-gallon stainless steel yeast propagator makes better beer because stainless steel does not affect the taste or clarity of the brew nor does the brew affect the steel . . . A piece-dye kettle is made of stainless steel, because dyes and dye solvents do not corrode or tarnish the stainless steel, nor does the stainless steel discolor the dyes . . . Steam-jacketed autoclaves made of 18-8 chromium-nickel steel for carbonating and grinding hot acid sludge resist the severe corrosion, heat, and abrasion involved in this service.

### *Let Electromet Help You*

Electromet is not a manufacturer of alloy steels, but for over thirty years, Electromet has made the ferro-alloys and metals that go into their making. During this time, Electromet has cooperated with the steel industry in developing new and better alloy steels for the specialized needs of industry.

If you make steel, Electromet metallurgists will gladly come into your plant and help you use Electromet Ferro-Alloys and Metals to the best advantage. If you use steel, Electromet offers you unbiased data and assistance in selecting the right alloy steel for your purpose. This service is available without obligation.

ELECTRO METALLURGICAL COMPANY  
*Unit of Union Carbide and Carbon Corporation*



Carbide and Carbon Building, 30 West 44th Street, New York, N. Y.

**Electromet**  
**Ferro-Alloys & Metals**

ous, such as acetylene, the possibility of incorrect practices with detrimental effects is great.

The acetylene industry, however, can point to a safety record which is better than that of any other products at all comparable in relation to potential hazard. This has been done largely through the cooperation of the Technical and Engineering committee with regulatory bodies, such as the National Safety Council, National Board of Fire Underwriters, the Factory Mutual Insurance Companies, the National Fire Protection association, and other insurance and safety organizations throughout the country. The industry makes a sincere effort to live up to the regulations and rules of these bodies and in so doing has made for itself an enviable record for safety.

#### Other Committee Activities

In addition to the Technical and Engineering committee experts, the association maintains a Legislative and Insurance committee for the advice and counsel of regulatory and semiregulatory bodies which make frequent use of this service.

Another association committee activity and one of the utmost importance at the present time is the Oxyacetylene committee which has been reporting each year the progress of applications of oxyacetylene welding to industry. The annual report of this committee has grown in size from its original presentation until in recent years it has

taken the form of a series of individual publications, a few of which are presented each year as the material is compiled and checked by the committee members.

Such important subjects as welding and cutting apparatus, acetylene generators, welding materials, training welders, testing welds, procedure control, research in welding, welding in engineering education, welding of unfired pressure vessels, boiler welding, hard-facing metals, mechanical gas welding, machine cutting, and heat treatment, have been covered in the published reports. The 1933 annual report contained a compendium of information on oxyacetylene cutting and welding which has been used widely as a reference and text book since that time.

The following year saw the start of individual sectional reports on specific subjects. These reports produced in 1934 and 1935 covered the following subjects:

- Sec. I—Oxyacetylene Cutting
- Sec. II—Oxyacetylene Welding and Its Applications
- Sec. III—Miscellaneous Uses of the Oxyacetylene Flame
- Sec. IV—Welding Codes and Specifications
- Sec. V—Sample Pipe Welding Specifications
- Sec. VI—Tests for the Selection of Operators of Welding Equipment
- Sec. VII—Bronze Welding or Hard Brazing of Cast Iron and Mal-

leable Iron by the Oxyacetylene Process

#### Sec. VIII—Effect of Flame Cutting on Steel

The 1936 reports now on the press include sections on "Hard Facing" and on "Safety in Oxyacetylene Welding." The importance of these reports and other literature distributed by the association has been felt not only by the industrial users of the oxyacetylene process, but also in our educational institutions where these messages have been widespread to the young men who are later to take over the problems of the metal working industry. The trade press has been prompt to abstract these reports and also the technical and scientific papers given at the annual conventions and thus spread their usefulness widely.

#### Industry Is Stable

The acetylene industry through 38 years of important progress has in this way relied substantially on its committees to build within industrial America a knowledge of the economic significance of acetylene and its many uses. The results of this work have been the safe and economical operation of acetylene apparatus to the extent that the industry is one of the most stable in the country and the widespread use of the oxyacetylene process which is helping thousands of industrial firms to solve their major problems which would otherwise cost millions of dollars to the ultimate consuming public.



H. Sidney Smith

**H** SIDNEY SMITH, past president, International Acetylene association, and member of the executive committee, is well known in the acetylene industry both in America and abroad. He is directly responsible for many important developments in acetylene utilization. Born in Newark, England, he was educated as an electrical engineer in the University of Nottingham. Leaving college, he was employed as a mechanical engineer by Messrs. Robey & Co. After working for a time with the Brush Electrical Engineering Co. Ltd., Mr. Smith

specialized in electrometallurgy. In 1895 he joined the Acetylene Illuminating Co. Ltd., which was experimenting with the manufacture of calcium carbide at Leeds Forge. He assisted in preliminary experiments there and in conjunction with S. G. Worth, founder of the British Acetylene association, and P. C. Day turned out the first calcium carbide made in Europe on a commercial scale. He was appointed works manager of the company's plant at Foyers. In 1902 Mr. Smith began experimenting with use of dissolved acetylene and also with acetylene welding; subsequently the use of dissolved acetylene was sanctioned by the home office. He remained with the Acetylene Illuminating Co. until 1911 at which time he was general manager, also general manager of the British Autogenous Welding Co. Ltd. The British Acetylene association elected him president in 1910. Coming to the United States in 1911 to join the Prest-O-Lite Co. Inc., Indianapolis, he was made works manager in charge of all gas plants. In 1917 he became consulting engineer, Union Carbide & Carbon Corp., New York. He was elected president of the I.A.A. in 1920 and president of the Compressed Gas Manufacturers' association in 1928.

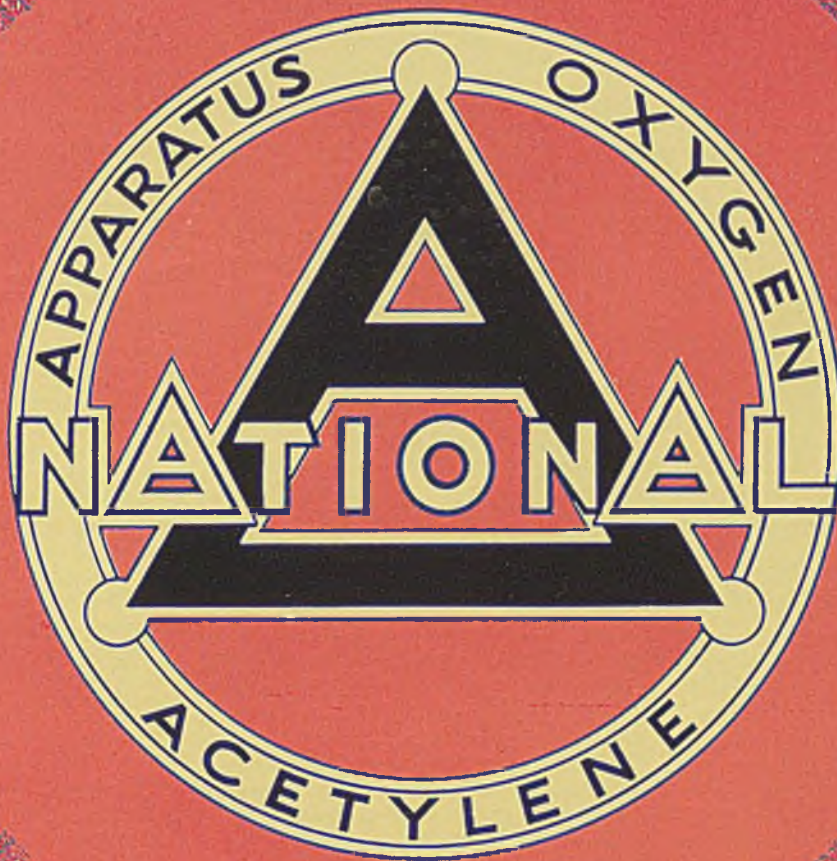
♦ ♦ ♦

**P**HILIP KEARNY, past president, International Acetylene association and a member of the executive committee, has been long affiliated with the acetylene industry. In 1914 he was instrumental



Phillip Kearny

in founding the K-G Welding & Cutting Co. Inc., New York, a concern formed to take over the manufacture and distribution of the equipment known as "Blaugas." He became president of this organization in the same year and under his guidance the manufacture of equipment for oxygen and acetylene was undertaken. Within a short time, the entire output was confined to this class of equipment. Mr. Kearny was elected a director of the I. A. A. in 1932 and served as vice president in 1933 and as president in 1935.



## Use Acetylene in Cylinders

It offers these advantages: (1) National Acetylene is purified to eliminate detrimental elements . . . (2) It is easily portable to all sorts of locations . . . (3) The pressure is constant and dependable . . . (4) It is dry . . . (5) It is free from trouble . . . National Acetylene is delivered to you in *Cylinders*—Try it and see the difference.

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 COLUMBUS - - - - - OHIO  
 DETROIT - - - - - MICHIGAN  
 LOGANSPORT - - - INDIANA



CHICAGO ILLINOIS

*Factory Directory*  
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 MILWAUKEE - - - WISCONSIN  
 PEORIA - - - - ILLINOIS  
 ST. LOUIS - - - - MISSOURI  
 LOS ANGELES - CALIFORNIA

THE PITTSBURGH GENERATOR CO., McKEESPORT, PENNSYLVANIA

# Distinctive Program To Feature St. Louis Acetylene Meeting

**T**HE International Acetylene association will hold its thirty-seventh annual convention at the Hotel Jefferson, St. Louis, Nov. 18-20. For this occasion the committee in charge has arranged for discussions which will be of greatest possible assistance to users of the oxyacetylene process of cutting and welding, so as to enable them to derive fullest benefits from this process in their metalworking operations. In particular, the program was drawn up with special attention to the industrial problems of the territory of which St. Louis is the center.

More than 30 men of authoritative status in the oxyacetylene industry will make major contributions to the discussions. Preprints of their papers will be available at the association's press headquarters in the Hotel Jefferson. Copies of the Oxyacetylene committee's re-

port of progress in the use of the process during the past year will be available at registration to each member and guest.

A major feature of the program will be a welding and cutting forum to be held Wednesday evening, Nov. 18. This forum will be devoted to a discussion of the questions which have been asked most frequently of the association's technical committees and of the engineering representatives of the association's members, particularly in the vicinity of St. Louis. It is intended to be profitable particularly to welding superintendents, foremen and welding operators, as well as to proprietors of welding shops and others interested in the application of efficient welding and cutting methods. The welding and cutting forum will include demonstrations of materials used in the oxyacetylene process; oxyacetylene welding; testing welds

and the welded structure; safe practices and oxyacetylene cutting.

Another major feature will be a group of welding and cutting round table discussions to be held Thursday evening, Nov. 19. The plan for the evening includes a group of nine meetings to be held concurrently, during which questions may be asked from the floor for general discussion. These group meetings will be devoted to welding high and low alloy steels; safety in the handling and use of oxyacetylene equipment; codes and welding design and construction; qualification and training of welding operators to meet code requirements; hard facing; merchandising welding shop services; welding and cutting in engineering education; oxyacetylene cutting; non-ferrous metals and their welding characteristics. These round table discussions will present full opportunity for discussion of important phases of the oxyacetylene process with outstanding leaders. The meetings will be entirely informal and no record will be kept of the discussions.

## Morehead Medal Award

The opening session, Wednesday noon, will be featured by a welcoming address by Thomas N. Dysart, president, St. Louis chamber of commerce, and by the presentation of the Morehead medal to Dr. D. S. Jacobus, in charge of the engineering department, Babcock & Wilcox Co., New York, in recognition of his outstanding leadership in the formulation of codes and proced-



*Oxyacetylene cutting and welding will be dramatized and subjected to round table discussions at two evening sessions in the Soldan high school, 918 North Union boulevard, St. Louis*

ures which have made fusion welding acceptable. Election of officers for the ensuing year will take place at the annual luncheon and business meeting to be held on Friday. An interesting feature of the program is to be an inspection trip at the plant of the Midwest Piping & Supply Co. Inc., Second and Miller streets, St. Louis.

#### Many Authoritative Speakers

Many men of distinction will participate in the International Acetylene association convention proceedings. Thomas N. Dysart, who is to make the address of welcome, is president of the St. Louis chamber of commerce and a business and civic leader in that city. He graduated from Washington university, St. Louis, and went into the investment banking business in that city becoming a member of Knight, Dysart and Gamble. He served as director of organization of the eighth federal reserve district during all liberty loan drives. He is a former governor and president of the Investment Bankers association and has served prominently in other capacities.

A. E. Gibson, who is to serve as chairman of the general industries session, is president of the American Welding society. After graduating from the mechanical engineering department of Ohio State university, Columbus, O., in 1909, Mr. Gibson entered the machine shop of the Wellman-Seaver-Morgan Co., Cleveland, now the Wellman Engineering Co. He rose through various positions in this company and now is vice president. He has had extensive experience in welded construction and of late has made considerable use of low alloy, high tensile steels in welded equipment.

Dr. Augustus B. Kinzel, who will conduct the forum on oxyacetylene welding and who will participate in conducting the forum on testing welds and the welded structure, is



*Hotel Jefferson, St. Louis, is to be the home of the thirty-seventh annual convention of the International Acetylene association, Nov. 18-20*

chief metallurgist, Union Carbide and Carbon Research Laboratories Inc., Long Island City, N. Y. He graduated from Columbia university, New York, and from Massachusetts Institute of Technology, Cambridge, Mass., as bachelor of science. Later he graduated from the University of Nancy, France, as doctor of metallurgical engineering and doctor of science. He was employed on special research work at the Pittsfield, Mass., plant of General Electric Co. and then became metallurgist for Henry Disston & Sons Inc., Philadelphia. He lectured at Temple university, Philadelphia, in an advanced course on metallurgy and in 1934 joined Union Carbide and Carbon Research Laboratories, Inc.

Dr. Kinzel is the author of numerous papers on testing and weld-

ing of metals, on metallurgy and physical chemistry of steel making and on the composition, physical properties and uses of alloy steels. He is chairman of the iron and steel division of the American Institute of Mining and Metallurgical Engineers, chairman of the section on tests for ductility. American Society for Testing Materials. chairman of the advisory committee of Dynamic Testing laboratories, Massachusetts Institute of Technology and a member of the international commission for acetylene and welding. At the St. Louis meeting Dr. Kinzel also is scheduled to submit a report on the twelfth international Congress of the acetylene welding and allied industries held in London in June.

Dr. George V. Slottman, assistant  
*(Please turn to Page 122)*



A. E. Gibson



John J. Crowe



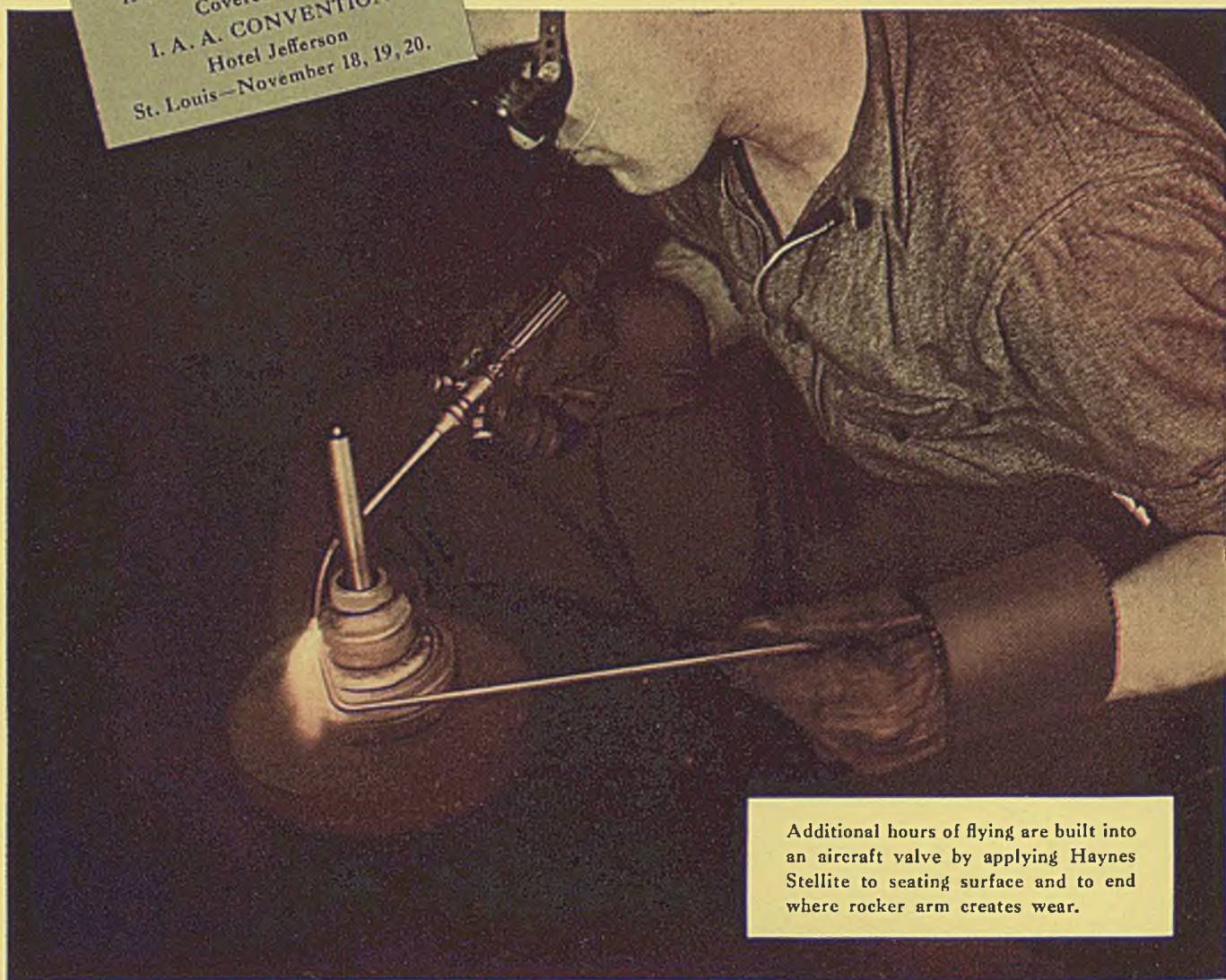
A. B. Kinzel



James I. Banash

# Wherever

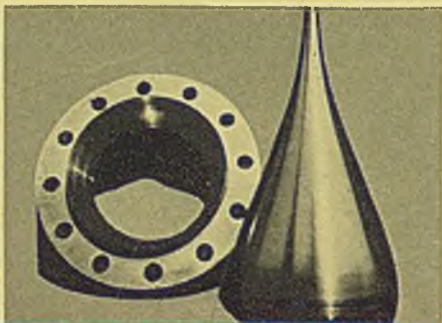
**HARD-FACING**  
Is an Important Subject to be  
Covered at the  
**I. A. A. CONVENTION**  
Hotel Jefferson  
St. Louis—November 18, 19, 20.



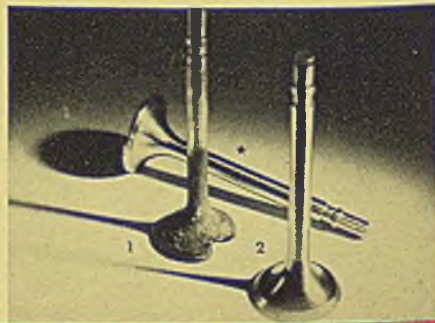
Additional hours of flying are built into an aircraft valve by applying Haynes Stellite to seating surface and to end where rocker arm creates wear.



68,152 ring gears were hot-treated by this one set of Haynes Stellite dies. Haynes Stellite improves the performance of hot-treating dies because it remains hard at red heat and when in contact with hot steel.



In a hydro-electric plant, exciter needles and throat rings formerly lasted three months. Now, these same parts protected with a hard-facing of Haynes Stellite last two to three years without wear.



These valves from a 400-hp marine motor show clearly how Haynes Stellite valves are "Burn-Proof." The valve lying down is a new valve, the other two ran 150 hours in the same motor. The burnt valve was not Stellite.

# wear is a problem

## *Haynes Stellite can help you*

**H**AYNES STELLITE is used throughout industry as the standard hard-facing, wear-resisting alloy. It is a cobalt-chromium-tungsten alloy, with excellent welding characteristics and maximum wear resistance. Haynes Stellite has a unique combination of physical properties—red hardness, abrasion resistance, corrosion resistance, and a low coefficient of friction. Due to these properties, the life of Haynes Stelited parts in severe service is from 3 to 10 times that of ordinary materials under the same conditions. Haynes Stellite is available in the form of welding rod, and is easily applied to metal surfaces by welding on a coating or edge. Special grades

of Haynes Stellite, cast and ground to shape, are available for machine-tool use.

A nation-wide service organization is maintained to assist you in utilizing Haynes Stellite to best advantage. Haynes Stellite engineers bring to your plant experience thoroughly grounded in metallurgical research and a wealth of information on hard-facing applications gathered from all parts of the United States. The 96-page book, "Hard-Facing with Haynes Stellite Products," describes in detail 494 ways in which money can be saved by hard-facing. This book may be obtained without charge from the nearest Haynes Stellite office.



*A red-hard, wear-resisting alloy of Cobalt, Chromium and Tungsten*

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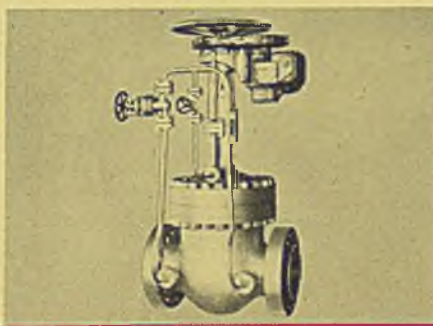
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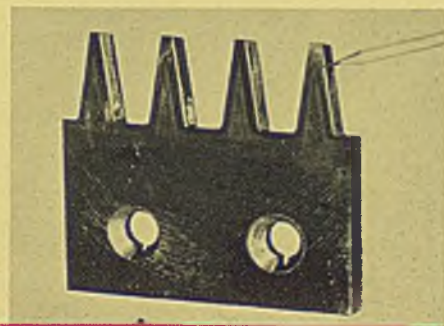
*Haynes Stellite Welding Rods and information on other Haynes Stellite Products also are available through the 42 apparatus shipping points of The Linde Air Products Company*



These three Haynes Stellite J-Metal Tools are turning an SAE 1045 steel piston shaft at 125 feet per minute surface speed with a feed of .017 inches per revolution — at better than 1 inch a minute!



Wedge faces and seats on this 12-inch valve for 1500-lb. steam service are protected with Haynes Stellite. Haynes Stellite retains its hardness at red heat, and consequently resists scoring, wire-drawing, pitting, and corrosion.



This cutter, which peels the ice from the freezing drum of an ice machine, is edged with Haynes Stellite to prevent wear and corrosion. Cutters such as this have been in service for over a year and show no wear or rusting.



H. R. Wass



B. F. Orr



Berthoud Clifford



F. C. Fantz

## Program of

# International Acetylene Association

Wednesday, Nov. 18

10:00 A. M.—HOTEL JEFFERSON  
Registration  
12:00 NOON—HOTEL JEFFERSON  
*Opening Luncheon*

### Chairman

C. O. EPPERSON, president, International Acetylene association; vice president, National Cylinder Gas Co., Chicago

### Vice Chairman

C. D'W. GIBSON, vice-president and member executive committee, International Acetylene association; assistant vice president and general sales manager, Air Reduction Sales Co., New York.

ADDRESS OF WELCOME, by T. N. Dysart, St. Louis Chamber of Commerce, St. Louis

KEYNOTE ADDRESS, (Speaker to be announced)

PRESIDENT'S ADDRESS, by C. O. Epperson, vice president, National Cylinder Gas Co., Chicago

Report on XII International Congress of Acetylene, Welding and Allied Industries, London, June, 1936 by Dr. A. B. Kinzel, chief metallurgist, Union Carbide & Carbon Research Laboratories Inc., New York

Presentation of Morehead Medal, Philip Kearny, president, K-G Welding & Cutting Co., New York

Acceptance of Morehead Medal, Dr. D. S. Jacobus, Babcock & Wilcox Co., New York.

2:30 P. M.—HOTEL JEFFERSON

*General Industries Session*

### Chairman

A. E. GIBSON, president, American Welding society; vice president, Wellman Engineering Co., Cleveland

### Vice Chairman

G. O. CARTER, consulting engineer, The Linde Air Products Co., New York

Welding of Cupro-Nickels and Silicon Copper Alloys, by I. T. Hook, research engineer, American Brass Co., Waterbury, Conn.

How Design for Welding Defers Obsolescence and Increases Profits for Manufacturers and Users of Metal Products, by Erik Oberg, editor, *Machinery*, New York  
Oxyacetylene Welding in Plant Construction and Maintenance, by Berthoud Clifford, vice president, Radiant Fuel Corp., St. Louis

Wednesday, Nov. 18

8:15 P. M.—SOLDAN HIGH SCHOOL AUDITORIUM  
(918 North Union Blvd., St. Louis)  
*Welding and Cutting Forum*

### Presiding

WILLIAM B. BROWNING, service engineer, The Linde Air Products Co., Chicago

### Supervisors of Demonstrations

W. P. BURGLUND  
J. F. CALLAHAN

### Demonstrators

(To be announced)

### Speakers

J. I. BANASH, past president, National Safety council; consulting engineer, International Acetylene association, Chicago

J. J. CROWE, past president, American Welding society; research engineer, Air Reduction Sales Co., New York

H. F. HICKS, chief engineer, Modern Engineering Co., St. Louis

DR. A. B. KINZEL, chairman Iron and Steel division, American Institute of Mining and Metallurgical Engineers; chief metallurgist, Union Carbide & Carbon Research Laboratories Inc., New York

DR. G. V. SLOTTMAN, applied engineering department, Air Reduction Sales Co., New York

### Outline of Demonstrations

#### Part I

Materials Used in the Oxyacetylene Process: William B. Browning

#### Part II

Oxyacetylene Welding: Dr. A. B. Kinzel

#### Part III

Testing Welds and the Welded Structure: John J. Crowe, H. E. Hicks and Dr. A. B. Kinzel

#### Part IV

Safe Practices: James I. Banash

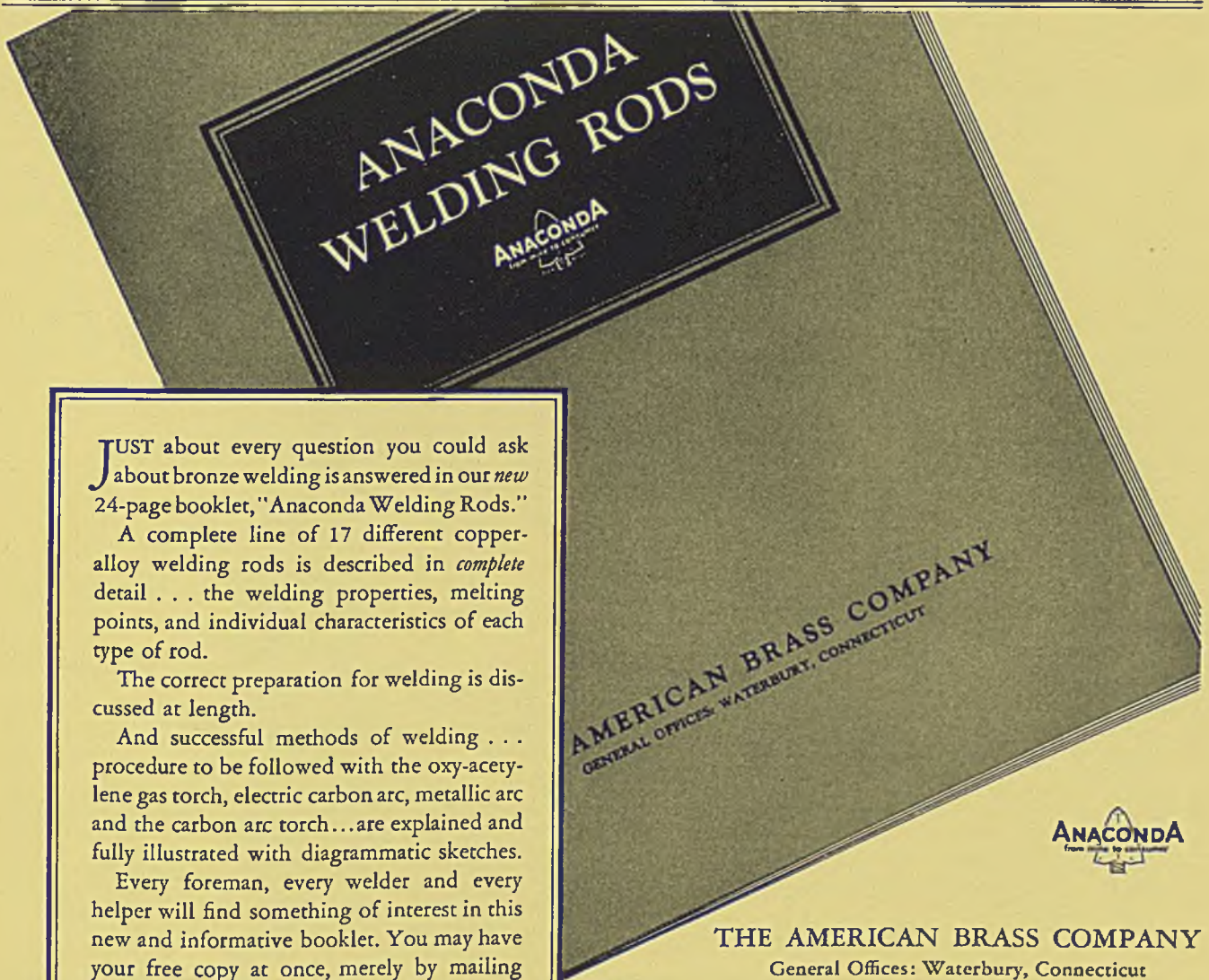
#### Part V

Oxyacetylene Cutting: John J. Crowe and Dr. George V. Slottman



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# the latest *facts* on bronze welding



JUST about every question you could ask about bronze welding is answered in our *new* 24-page booklet, "Anaconda Welding Rods."

A complete line of 17 different copper-alloy welding rods is described in *complete* detail . . . the welding properties, melting points, and individual characteristics of each type of rod.

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And successful methods of welding . . . procedure to be followed with the oxy-acetylene gas torch, electric carbon arc, metallic arc and the carbon arc torch . . . are explained and fully illustrated with diagrammatic sketches.

Every foreman, every welder and every helper will find something of interest in this new and informative booklet. You may have your free copy at once, merely by mailing the coupon below. We suggest you do it now, while the subject is in your mind.

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# Program of International Acetylene Association

(Continued from Page 118)

**Thursday, Nov. 19**

10:00 A. M.

Inspection Trip, Midwest Piping & Supply Co. Inc., Second and Miller streets, St. Louis

2:30 P. M.—HOTEL JEFFERSON

*Heavy Industries Session*

**Chairman**

JULIAN CONOVER, secretary, American Mining Congress, Washington

**Vice Chairman**

H. S. SMITH, past president, British Acetylene association; chairman executive committee, and past president, International Acetylene association, New York  
Welding in Mining Operations (Hard-Facing, Maintenance of Mining Machinery, Electrical Equipment, Rail Fabrication and Bonding), by G. S. Jenkins, general superintendent, Consolidated Coal Co., St. Louis  
Potential Welding in Heavy Construction Industry, by C. H. Ellaby, civil engineer, U. S. engineer dept., U.M.V.D., St. Louis  
Preparation and Cutting of Plate Steel for Cars, by B. F. Orr, superintendent of car shops, Cleveland, Cincinnati, Chicago & St. Louis R. R., Beech Grove, Ind.  
Oxyacetylene Welding Practices in the Metal Mining Industry, by H. R. Wass, St. Louis Lead Co., New York  
Oxyacetylene Cutting in the Production of Heavy-Duty Dirt Moving Equipment and as a Preliminary to Other Welded Fabrication, by R. G. LeTourneau, president, R. G. LeTourneau Inc., Peoria, Ill.

**Thursday, Nov. 19**

8:15 P. M.—SOLDAN HIGH SCHOOL AUDITORIUM  
(918 North Blvd., St. Louis)

*Welding and Cutting Round Table Discussions*

**Vice Chairman**

J. I. BANASH, past president, National Safety council, Chicago

1. Welding High and Low-Alloy Steels
2. Safety in the Handling and Use of Oxyacetylene Equipment
3. Codes, and Welding Design and Construction
4. Qualification and Training of Welding Operators to Meet Code Requirements
5. Hard-Facing
6. Merchandising Welding Shop Services
7. Welding and Cutting in Engineering Education
8. Oxyacetylene Cutting
9. Nonferrous Metals and Their Welding Characteristics

**Friday, Nov. 20**

12:00 NOON—HOTEL JEFFERSON

*Annual Luncheon and Business Meeting*

**Chairman**

C. O. EPPERSON, president, International Acetylene association

**Vice Chairman**

H. S. SMITH, chairman, executive committee, International Acetylene association

**Secretary**

H. F. REINHARD, secretary, International Acetylene association  
Report of Oxyacetylene Committee, by H. E. Rockefeller, chairman  
Report of the Consulting Engineer, by James I. Banash  
Report of the Legislative Committee, by H. S. Smith, chairman  
Report of the Secretary, by H. F. Reinhard  
Report of the Treasurer, by Henry Booth  
Report of the Auditing Committee, by M. M. Smith, chairman  
Report of Membership Committee, by Henry Booth.  
Report of Lighting Committee, by Henry Booth.  
Report of Resolutions Committee  
Report of Nominating Committee  
Election of Officers

2:30 P. M.—HOTEL JEFFERSON

*Piping Industries Session*

**Chairman**

F. C. FANTZ, vice president, Midwest Piping & Supply Co., St. Louis

**Vice Chairman**

JOHN J. CROWE, research engineer, Air Reduction Sales Co., New York  
Power Plant and Process Piping, by Wilson A. Benoit, assistant engineer, Anheuser Busch Brewing Inc., St. Louis  
Why Should Piping Contractors Recommend Welding to Architects and Engineers?, by Sherman T. Seeley, sales engineer, Midwest Piping & Supply Co., St. Louis  
Modern Overland Pipe Line Construction, by T. R. Jones, president, T. R. Jones Inc.  
Oxyacetylene Welding in the Operation and Maintenance of Pipe Lines, by R. P. Gonzales, assistant general superintendent, Arkansas-Louisiana Pipe Line Co., Shreveport, La.



Ira T. Hook



G. S. Jenkins



Erik Oberg



R. G. Le Tourneau

This booklet tells

why **ACETYLENE** is the most effective and economical of all fuel gases for you to use in welding and cutting

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the economical fuel gas for welding and cutting

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It explains, in non-technical language, the *thermal advantages* with which nature has endowed ACETYLENE, that place it in a class by itself for gas welding and cutting.

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H. E. Hicks



Wilson A. Benolst



S. T. Seeley



Thomas N. Dysart

## Details of Program

(Continued from Page 115)

manager, Applied Engineering department, Air Reduction Sales Co., New York, who will assist in conducting the forum on oxyacetylene welding, has done a great deal of work in the theory and application of gaseous combustion in steel mill operations in this country, in England and on the European continent. He graduated from Massachusetts Institute of Technology and subsequently received the degree of doctor of philosophy from the University of Berlin, Germany, in 1927. Until 1930 he served as professor of chemical engineering at Massachusetts Institute of Technology and at the same time served

as director of Buffalo station, School of Chemical Engineering Practice, at the Lackawanna plant of Bethlehem Steel Co. In 1930 he became chief combustion engineer, United Steel Co. Ltd., Sheffield, England, later becoming manager of blast furnaces at Workington, England. He joined the Air Reduction Sales Co. in 1933.

John J. Crowe, who will assist in conducting the forums on testing welds and the welded structure and on oxyacetylene cutting, is engineer in charge, Apparatus Research and Development department, Air Reduction Sales Co., Jersey City, N. J. He is past president of the American Welding society and is active in numerous technical societies. He served as director of metallurgy at Temple university,

Philadelphia, from 1901 to 1923. A graduate of George Washington university, Washington, he taught for a short time at that institution and while in that capacity became connected with the National bureau of standards as a metallurgist and continued in that work until 1925. In his work with Air Reduction Sales Co. he has taken a number of patents on oxyacetylene equipment and also has contributed much valuable literature.

### Will Preside Over Forum

James I. Banash, who will preside over the forum on safe practice in connection with the oxyacetylene process, is a national authority on safety measures concerning compressed gases. After graduating from Massachusetts Institute of Technology, he taught there for a year and then went with Underwriters' Laboratories, Chicago, becoming head of the casualty department. During recent years he has been a consulting engineer in Chicago, serving as consulting engineer for the International Acetylene association and being an active member of many other engineering and research societies. A specialist in fire and accident prevention in their relation to the physical and chemical sciences, he recently has achieved prominence for his work with artificial atmospheres high in oxygen, in relation to therapeutic applications. He is past president of National Safety Council.

H. E. Hicks, who will assist in conducting the forum on testing welds and the welded structure, is a graduate of Washington university, St. Louis. He is chief engineer for the Modern Engineering Co. with offices in St. Louis. He is a member of the Engineers' club of St. Louis and in 1935 was elected a director of the St. Louis Welding society.

F. C. Fantz, who will serve as chairman of the piping industries

The **NEW WELDIT** *Automatic* MODEL A

**WELDING TORCH**  
with **GAS AVER** in Handle

**SAVES FUEL...  
...CUTS COST**

Thumb controlled Gasaver in handle cuts welding flame to pilot light size instantly when torch is not in actual use. Savings not affected by hose length. No re-lighting, no re-adjusting. Safe and simple to operate.  
*Send for literature.*

**WELDIT ACETYLENE CO.** 642 BAGLEY AVE. DETROIT, MICH.

TEST THIS WELDING TORCH FREE FOR TWO WEEKS IN YOUR PLANT

AUTOMATICALLY ON IN USE

AUTOMATICALLY OFF NOT IN USE



Charles H. Ellaby

session, received his training as a mechanical engineer through International Correspondence Schools, Scranton, Pa., and started his career in steel mills in the East. He subsequently has been connected with Garford Automobile Co., Elyria, O., with the Illinois Central railroad, as master mechanic at Memphis, Tenn., with the Southern Pacific railroad, as supervisor of tools and machinery at Houston, Tex., with the Grant Locomotive & Car Works, Houston, as general manager, and with the Texas Co., Port Arthur, Tex., in charge of mechanical equipment. For the past 14 years Mr. Fantz has been with Midwest Piping & Supply Co., St. Louis, first as chief engineer and in recent years as vice president.

#### Will Discuss Welding Design

Erik Oberg, who will submit a paper on "How Design for Welding Defers Obsolescence and Increases Profits for Manufacturers and Users of Metal Products", graduated from the Boras Technical college, Sweden, and came to the United States 35 years ago. For five years he was engaged by Pratt & Whitney Co., Hartford, Conn., and Cincinnati Milling Machine Co., Cincinnati, as a draftsman and designer of machine tools. He has been editor of *Machinery*. New York, since 1918.

Ira T. Hook, who will present a paper entitled "Welding of Cupro-Nickels and Silicon Copper Alloys", was a skilled mechanic prior to his entrance at the University of Michigan, Ann Arbor, Mich., in 1908. He graduated in 1913 as bachelor of chemical engineering and went with General Motors Corp. as physical test expert which connection he severed in 1920 to teach strength of materials at Yale university, New Haven, Conn. He was in charge of the Army ordnance school, Washington, in 1918. He has served as test and research engi-

neer, American Brass Co., Ansonia, Conn., since 1923. At the present time he is engaged in writing a critical review of the literature on the welding of copper alloys.

Berthoud Clifford, who will submit a paper entitled "Oxyacetylene Welding in Plant Construction and Maintenance", is a graduate of Yale university and prior to the war was connected with the D'Arcey Advertising Co., St. Louis. In 1919 he joined the Air Reduction Sales Co., remaining with this company in general sales and development work for 10 years. When the Radiant Fuel Corp., St. Louis, was organized in 1933 to develop and exploit a new process for carbonizing local coals, he went with this company as vice president.

G. S. Jenkins, who will present a paper entitled "Welding in Mining Operations, Including Hard Facing, Maintenance of Mining Machinery, Electrical Equipment, Rail Fabrication and Bonding", received his engineering education at Massachusetts Institute of Technology, Cambridge, Mass., and Washington university, St. Louis, graduating from the latter in 1922 as mechanical engineer. He became connected with Industrial Engineering Co., St. Louis, and later became a power plant engineer. He became associated with Consolidated Coal Co. in 1924 and in 1935 was appointed general superintendent in charge of operations of this company with offices in St. Louis.

Col. Charles H. Ellaby, who will submit a paper entitled "Potential Welding in the Heavy Construction Industry", graduated from Ohio



George V. Slottman

Northern university, Ada, O., as civil engineer in 1923. Since then he has been engaged in much work on railroads, highways, sewerage systems and locks and dams. Since 1930 he has been occupied in the design and construction of locks and dams, with the United States Engineer office at St. Louis.

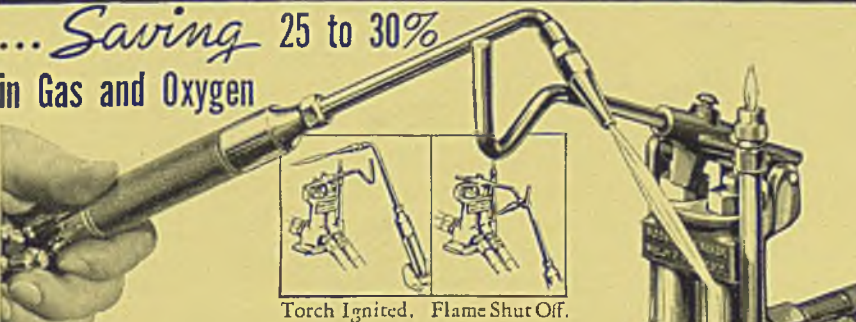
B. F. Orr, who will submit a paper entitled "Preparation and Cutting of Plate Steel for Cars", since 1927 has been superintendent of shops of the car department of the Cleveland, Cincinnati, Chicago & St. Louis railroad at Beech Grove, Ind. In this capacity he has jurisdiction over general repairs to both freight and passenger equipment. His experience in railroad shop operations dates back to 1905.

H. R. Wass, who will present a  
(Concluded on Page 124)

# WELDIT *Gasaver*

**AUTOMATICALLY SHUTS OFF FLAME BETWEEN WELDS**

... *Saving* 25 to 30%  
in Gas and Oxygen



Torch Ignited. Flame Shut Off.

America's largest production plants use Weldit Gasavers. Cuts cost, eliminates idle torch flame hazards, increases production. Price \$10.00. Two weeks trial. Send for circular.

**WELDIT ACETYLENE CO.**

642 BAGLEY AVE.  
DETROIT, MICH.

**TEST THIS  
WELDIT GASAVER  
FREE FOR TWO WEEKS  
FOR TWO WEEKS  
IN YOUR PLANT**

# Special Session for Round Table Talks

**I**N ADDITION to all of the regular features of the program of this year's annual convention of the International Acetylene association there is to be an innovation in the form of a group of welding and cutting round table discussions. These meetings are to be held on Thursday evening, Nov. 19, at the Soldan high school, 918 North Union boulevard, St. Louis.

The plan for the evening includes a group of meetings held concurrently but in separate rooms, for the purpose of open discussion on important subjects pertaining to welding and cutting. The meetings will be entirely informal and no stenographic reports will be made. The program committee has announced that no formal talks will be made at any of these group discussions but that the round table meetings will be preceded by a brief general meeting which will begin promptly at 8:15. At this general gathering the chairmen and discussion leaders for the various groups will be introduced.

## Will Discuss Nine Subjects

Nine important discussion subjects have been selected. These are:

- 1—Welding high and low alloy steels
- 2—Safety in the handling and use of oxyacetylene equipment;
- 3—Codes, and welding design and construction;
- 4—Qualification and training of welding operators to meet code requirements;
- 5—Hard facing;
- 6—Merchandising welding shop services;
- 7—Welding and cutting in engineering education;
- 8—Oxyacetylene cutting;
- 9—Non-ferrous metals and their welding characteristics.

It is expected that each of the round table group meetings will be under the guidance of a chairman who will be assisted by one or more guest technical advisors who are recognized authorities on the subjects under discussion.

The subjects chosen have been selected because of their importance today and cover a broad range. Many will undoubtedly wish to at-

tend more than one of the group meetings, but since they are to be held concurrently, this will not be possible. It will thus be necessary for everyone to make his choice of the subject regarding which he desires the most information, and attend the round table meeting. It is hoped and expected that those participating will profit by this opportunity for informal interchange of opinions and information on these important subjects. Since there will be no record or transcript made of the meetings, the benefits can be obtained only through personal participation.

## Details of Program

*(Concluded from Page 123)*

paper entitled "Oxyacetylene Welding Practices in the Metal Mining Industry", for 30 years has been engaged in the design and construction of quarrying plants, coal and metal mining operations, the operation of ore reduction plants and smelters, steel foundries and rolling mills, chemical plants, public utility plants and industrial and trunk line railways. He now is engaged in maintenance supervision and in electrical and mechanical engineering design as division master mechanic for the St. Joseph Lead Co. at Bonne Terre, Mo.

R. G. Le Tourneau, who will present a paper entitled "Oxyacetylene Cutting in the Production of Heavy Duty Dirt Moving Equipment and as a Preliminary to other Welded Fabrication", began manufacturing all-welded earth-moving machinery in 1920 in California. He is president of R. G. Le Tourneau Inc., with headquarters at Peoria, Ill., and plants at Peoria and Stockton, Calif. In his Peoria plant, Mr. Le Tourneau employs approximately 70 oxyacetylene welders.

Wilson A. Benoist, who will present a paper entitled "Power Plant and Process Piping", is a graduate of the United States Naval academy, Annapolis, Md. After serving in the navy he resigned in 1923 and subsequently joined the Scullin Steel Co., St. Louis, as engineer of tests, leaving to become, successively, experimental engineer for

Curtis Mfg. Co., St. Louis, and lubrication engineer for Vacuum Oil Co. at St. Louis. Later he became assistant engineer for Anheuser-Busch Inc., St. Louis; he subsequently was appointed superintendent of refrigeration and now is superintendent of maintenance for this company.

S. T. Seeley, who will present a paper entitled "Why Should Piping Contractors Recommend Welding to Architects and Engineers?", graduated from Franklin Institute, Philadelphia, and started his connection with the piping business in 1911. During the World War he served for two years in the army engineer corps. After the war he became chief engineer and works manager for the M. J. Dougherty Corp., Philadelphia. He established the contracting firms, Seeley Co. and Seeley-Peteet Pipe Fabricating Co., Atlanta, Ga. He was vice president of the Loftis-Seeley Plumbing & Heating Co., Washington, and then eastern manager of Mehring & Hanson Co. Mr. Seeley now is sales engineer for the Midwest Piping & Supply Co., St. Louis.

## Oxyacetylene Forum

*(Concluded from Page 106)*

stantly being received that there is a lively interest in the subject of testing welds. Various methods for testing welds, destructive and non-destructive, will be illustrated and demonstrated.

An analysis of current questions also showed that there is a broad interest in oxyacetylene cutting. Repeatedly, the question of cutting with the oxygen lance has come up. While one of the simplest forms of cutting, requiring only oxygen and a piece of  $\frac{1}{4}$  or  $\frac{3}{8}$ -inch steel pipe, the principle involved, the procedure to be followed, and the safety precautions to be observed do not appear to be generally understood. Each of the questions about the oxygen lance will be answered by the speaker and illustrated with actual demonstrations by a skilled operator.

This year the forum will be divided into five main sections. The first will be devoted to the materials used in oxyacetylene welding and cutting. The second section will be devoted to oxyacetylene welding, the third to testing welds and welded structures, while the fourth section will deal with safe practices. Oxyacetylene cutting, both hand and machine gas cutting, will be shown and demonstrated in the fifth and last section.

Men qualified by research and experience have been invited to conduct these sections.

# Wage Increases Presage Higher Steel Prices

## Demand Undisturbed So Far by Election; Rate Holds at 73%

**D**EMAND for steel has remained steady so far in the few days following the election, and the favorable outlook for the balance of the year has not been altered to any great extent, although the outcome leaves the industry no nearer to a solution of such problems as taxes, wages, prices, expansion programs and conservation of surpluses.

Last week national operations held at 73 per cent of capacity, automobile production increased to 84,305 units and rail awards totaled 65,625 tons.

Following wage advances announced by some of the leading steel producers after weeks of negotiations, it was generally assumed finished steel prices would be raised \$1 to \$2 a ton.

Relating the leading interest's payrolls of \$242,635,540 in the first nine months of 1936 to its total shipments of 7,867,707 tons of finished steel, brings a payroll factor of \$30.84 a ton. On this basis, a 10 per cent wage increase apparently would raise production costs \$3 a ton.

### Rail Prices in Spotlight

**O**NE price structure commanding considerable attention at present is that concerning rails. If an increase is effected Dec. 1 railroads likely will take advantage of the first quarter period of grace on the present quotation, and rail mills should be fairly busy until the end of the year.

The week's heavy rail awards included 48,500 tons for Chicago & North Western, 7550 tons for Texas & Pacific and 8000 tons for an unidentified western road. Union Pacific, which like the Chicago, Burlington & Quincy, plans to spend \$8,000,000 for rolling equipment, placed 300 cars with its own shops and ordered 20 freight locomotives.

Automobile production this week is likely to pass the 100,000-mark for the first time since June, and the increased shipments of steel to this industry have offset slight declines in other lines. Assemblies last week made a gain of 17,320 units, which if continued would result in the manufacture of 750,000 cars during November and December.

Shape awards were up about 8000 tons to 21,514. Inquiries are headed by 4100 tons for a Florida bridge, 2200 tons for three Pennsylvania state highway bridges, 1250 tons for a Maine bridge and 4000 tons for the Jamaica, N. Y., courthouse.

Average daily production of steel ingots in Octo-

### MARKET IN TABLOID

**DEMAND** . . . . . Strong; Automobile and railroad requirements heavy.

**PRICES** . . . . . Finished steel likely to advance \$1-\$2 a ton.

**PRODUCTION** . . . . . Rate unchanged at 73.

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

ber, 168,333 tons, was a gain of 5.17 per cent over September. Total calculated production for ten months of 1933 was 38,150,305 tons, compared with 27,194,171 in the corresponding period last year.

Pig iron producers in other districts so far have made no move toward increasing prices in line with the action taken by a New England producer last week. The sheet and strip announcement of a week ago has been modified slightly.

October pig iron production, 2,991,794 gross tons, was the highest since May, 1930, and represented a gain of 9.7 per cent over September's 2,728,257 tons. Average daily output, 96,509 tons, was a gain of 6.1 per cent over the 90,942 tons produced daily in September. For ten months this year production of 24,607,570 tons is 45.9 per cent ahead of last year. At the end of October 162 stacks were active, compared to 154 at the end of September.

With a shortage of coke continuing, at least 120 more beehive ovens are rapidly being made ready for production in the Connellsville, Pa., district.

### Scrap Index Down

**L**AKE SUPERIOR iron ore shipments, 41,063,872 tons up to Nov. 1, are 52 per cent ahead of the comparable period last year.

Price weaknesses in several districts have forced STEEL'S scrap composite down 21 cents to \$16.04, the third decline from the year's peak of \$16.54. The iron and steel composite at \$34.60 is down 2 cents as a result of the decline in scrap. The finished steel index remains at \$53.90.

Operations in the Pittsburgh district were up 1 point to 70 per cent; Wheeling 3 to 89; Cleveland 2½ to 79½; Birmingham 5¼ to 67; New England 13 to 88. Youngstown was down 2 to 74; Buffalo 3 to 84; eastern Pennsylvania ¼ to 47¼, and Cincinnati 5 to 91. Other districts were unchanged.





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

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

Wire Products

(Prices apply to straight or
mixed carloads; less carloads
\$4 higher; less carloads fenc-
ing \$5 over base column.)
Base Pitts.-Cleve. 100 lb. keg.
Standard wire nails ... \$2.05
Cement coated nails ... \$2.05
Galv. nails, 15 gage and
finer ... \$3.05
do. finer than 15 ga. ... \$4.55
(Per pound)
Polished staples ... 2.75c
Galv. fence staples ... 3.00c
Barbed wire, galv. ... 2.55c
Annealed fence wire ... 2.80c
Galv. fence wire ... 3.15c
Woven wire fencing
(base column, c. 1.) ... \$6.00
To Manufacturing Trade

Plain wire, 6-9 ga. 2.50c
Anderson, Ind. (merchant
products only) and Chicago up
\$1; Duluth up \$2; Birming-
ham up \$3.
Spring wire, Pitts.
or Cleveland ... 3.05c
Do., Chicago up \$1, Worc. \$2.

Cold-Finished Carbon
Bars and Shafting

Base, Pitts., one size, shape,
grade, shipment at one time
to one destination
10,000 to 19,999 lbs. ... 2.35c
20,000 to 59,999 lbs. ... 2.30c
60,000 to 99,999 lbs. ... 2.25c
100,000 to 299,999 lbs. ... 2.22 1/2 c
300,000 lbs. and over... 2.20c
Gary, Ind., Cleve., Chi., up 5c;
Buffalo, up 10c; Detroit, up
15c; eastern Michigan, up 20c.

Alloy Steel Bars (Hot)

(Base, 3 to 25 tons)
Pittsburgh, Buffalo, Chi-
cago, Massillon, Can-
ton, Bethlehem ... 2.55c
Alloy
S.A.E. Diff. S.A.E. Diff.
2000 ... 0.25 3100 ... 0.55
2100 ... 0.55 3200 ... 1.35
2300 ... 1.50 3300 ... 3.80
2500 ... 2.25 3400 ... 3.20
4100 0.15 to 0.25 Mo. ... 0.50
4600 0.20 to 0.30 Mo. 1.25-
1.75 Ni. ... 1.05
5100 0.80-1.10 Cr. ... 0.45
5100 Cr. spring ... base
6100 bars ... 1.20
6100 spring ... 0.70
Cr., Ni., Van. ... 1.50
Carbon Van. ... 0.95
9200 spring flats ... base
9200 spring rounds,
squares ... 0.25

Piling

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

Strip and Hoops

(Base, hot rolled, 25-1 ton)
(Base, cold-rolled, 25-3 tons)
Hot strip to 23 3/4-in.
Pittsburgh ... 1.95c
Chicago or Gary
Birmingham base
Detroit, del. ... 2.15c
Philadelphia, del.
New York, del. ... 2.26c
2.30c
Cooperage hoop,
Pittsburgh ... 2.05c
Chicago ... 2.15c
Cold strip, 0.25 carbon
and under,
Pitts., Cleveland. 2.60c
Detroit, del. ... 2.81c
Worcester, Mass... 2.80c
Cleve- Worcester-
Pitts. ter, Mass.
Carbon Pitts.
0.26-0.50 ... 2.60c 2.80c
0.51-0.75 ... 3.70c 3.90c
0.76-1.00 ... 5.45c 5.65c
Over 1.00 ... 7.50c 7.70c

Rails, Track Material

(Gross Tons)
Standard rails, mill \$36.37 1/2
Relay rails, Pitts.
20-100 lbs. ... 25.50-28.00
Light rails, billet
qual. Pitts., Chi. \$35.00
Do., reroll. qual. 34.00
Angle bars, billet,
Gary, Ind., So. Chi. 2.55c
Do., axle steel. 2.10c
Spikes, R. R. base. 2.75c
Track bolts, base. 3.75c
Tie plates, base... 2.00c
Base, light rails 25 to 40
lbs.; 50 to 60 lbs. inclusive up
\$2; 16 and 20 lbs., up \$1; 12
lbs. up \$2; 8 and 10 lbs., up
\$5. Base railroad spikes 200
kegs or more; base tie plates
20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Bir-
mingham, Chicago. Discounts
to legitimate trade as per Dec.
1, 1932, lists:
Carriage and Machine
1/2 x 6 and smaller ... 70-10 off
Do. larger ... 70-5 off
Tire bolts ... 50 off
Flow Bolts
All sizes ... 70-5 off
Stove Bolts
In packages with nuts at-
tached 75 off; in packages
with nuts separate 75-5 off;
in bulk 82 1/2 off on 15,000 of
3-inch and shorter, or 5000
over 3-inch.
Step bolts ... 65 off
Elevator bolts ... 65 off

Nuts

S. A. E. semifinished hex.:
1/2 to 3/8-inch ... 60-20-10 off
Do., 1/2 to 1-inch ... 60-20-10 off
Do., over 1-inch ... 60-20-10 off
Hexagon Cap Screws
Milled ... 50-10 off
Upset, 1-in., smaller ... 60 off
Square Head Set Screws
Upset, 1-in., smaller ... 75 off
Headless set screws ... 75 off

Rivets, Wrought Washers

Struc., c. 1., Pitts-
burgh, Cleveland 3.05c
Struc., c. 1., Chicago 3.15c
1/4-in. and smaller,
Pitts., Chi., Cleve. 70-5 off
Wrought washers,
Pitts., Chi., Phila.
to jobbers and
large nut, bolt
mfrs. ... \$6.00 off

Cut Nails

Cut nails, Pitts.; (10%
discount on size extras) \$2.90

Do. less carloads, 5
kegs or more, no dis-
count on size extras... \$3.20
Do. under 5 kegs; no
disc. on size extras... \$3.35

Pipe and Tubing

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

Welded Iron, Steel Pipe

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

Butt Weld Steel
In. Blk. Galv.
1/4 and 3/8 ... 60 44 1/2
1/2 ... 64 1/2 55
3/4 ... 67 1/2 59
1-3 ... 69 1/2 61 1/2
Iron
1/2 ... 31 1/2 15
3/4 ... 36 1/2 20 1/2
1-1 1/4 ... 39 1/2 25 1/2
2 ... 41 1/2 26
Lap Weld Steel
2 ... 62 53 1/2
2 1/2-3 ... 65 56 1/2
3 1/2-6 ... 67 58 1/2
7 and 8 ... 66 56 1/2
9 and 10 ... 65 1/2 56
Iron
2 ... 37 22 1/2
2 1/2-3 1/2 ... 38 25
4-8 ... 40 28 1/2
Line Pipe Steel
1/4, butt weld ... 56
1/4 and 3/8, butt weld ... 59
1/2, butt weld ... 63 1/2
3/4, butt weld ... 66 1/2
1 to 3, butt weld ... 68 1/2
2, lap weld ... 64
2 1/2 to 3, lap weld ... 64
3 1/2 to 6, lap weld ... 66
7 and 8, lap weld ... 65
Iron
1/4-1 1/2 inch, black and galv.
take 4 pts. over; 2 1/2-6 inch
2 pts. over discounts for same
sizes, standard pipe lists, 8-
12-inch, no extra.

Boller Tubes
C. L. Discounts, f.o.b. Pitts.
Lap Weld Charcoal
Steel Iron
2-2 1/4 ... 33 1 1/4 ... 8
2 1/2-2 3/4 ... 40 2-2 1/4 ... 13
3 ... 47 2 1/2-2 3/4 ... 16
3 1/2-3 3/4 ... 50 3 ... 17
4 ... 52 3 1/2-3 3/4 ... 18
4 1/2-5 ... 42 4 ... 20
4 1/2 ... 21
In lots of a carload or more,
above discounts subject to
preferential of two 5% and
one 7 1/2% discount on steel and
10% on charcoal iron.
Lapwelded steel: 200 to 9999
pounds, ten points under base,
one 5% and one 7 1/2%. Under
2000 pounds 15 points under
base, one 5% and one 7 1/2%.
Charcoal iron: 10,000 pounds
to carloads, base less 5%; un-
der 10,000 lbs., 2 pts. under base.

Seamless Boller Tubes

Under date of May 15 in lots
of 40,000 pounds or more for
cold-drawn boiler tubes and in
lots of 40,000 pounds or feet or
more for hot-finished boiler
tubes, revised prices are quot-
ed for 55 cold-drawn boiler
tube sizes ranging from 1/4 to
6-inch outside diameter in 30
wall thicknesses, decimal
equivalent from 0.035 to 1.000,
on a dollars and cents basis
per 100 feet and per pound.

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

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

Seamless Tubing

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

Cast Iron Water Pipe

Class B Pipe—Per Net Ton
6-in. & over, Birm. \$39.00-40.00
4-in., Birmingham. 42.00-43.00
4-in., Chicago ... 50.40-51.40
6 to 24-in. Chicago. 47.40-48.40
6-in. & over, east. fdy. 43.00
Do. 4-in. ... 46.00
Class A pipe \$3 over Class B
Std. ftgs., Birm. base. \$100.00

Semifinished Steel

Billets and Blooms
4 x 4-inch base; gross ton
Pitts., Chi., Cleve.,
Buffalo & Young. \$32.00
Philadelphia ... 37.67
Duluth ... 34.00
Forging Billets
6 x 6 to 9 x 9-in., base
Pitts., Chi., Buff... 39.00
Forging, Duluth ... 41.00
Sheet Bars
Pitts., Cleve., Young.,
Chi., Buff., Can-
ton, Sparrows Pt. 32.00
Slabs
Pitts., Chi., Cleve.,
Young. ... 32.00
Wire Rods
Pitts., Cleve., No. 5
to 3 1/2-inch incl... 40.00
Do., over 3 1/2 to
4 1/2-inch incl. ... 42.00
Chicago up \$1; Worcester up \$2
Skelp
Pitts., Chi., Young,
Buff., Coatesville,
Sparrows Point.. 1.80c

Coke

Price Per Net Ton
Beehive Ovens
Connellsville, fur... \$3.75- 4.00
Connellsville, fdry. 4.25- 4.50
Connel. prem. fdry. 5.50
New River fdry. 6.00
Wise county fdry... 4.45- 5.00
Wise county fur... 4.00- 4.50

By-Product Foundry
Newark, N. J., del. 10.20-10.65
Chi., ov., outside del. 9.00
Chicago, del. ... 9.75
New England, del... 12.00
St. Louis, del. ... 10.00-10.50
Birmingham, ovens 6.50
Indianapolis, del... 9.40
Cincinnati, del. ... 9.50
Cleveland, del. ... 10.30
Buffalo, del. ... 10.50
Detroit, del. ... 10.70
Philadel, del. ... 9.88

Coke By-Products

Spot gal. Producers' Plants
Pure and 90% benzol... 16.00c
Toluol ... 30.00c
Solvent naphtha ... 30.00c
Industrial xylol ... 30.00c
Per lb. f.o.b. Frankford,
Phenol (200 lb. drums). 15.50c
Do. (450 lbs.) ... 14.50c
Eastern Plants, per lb.
Naphthalene flakes and
balls, in bbls., to job-
bers ... 5.25c
Per 100 lbs. Atlantic seaboard
Sulphate of ammonia... \$1.275
†Western prices. 1/4-cent up

Pig Iron

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

Table with 5 columns: Basing Points, No. 2 Fdry., Malleable, Basic, Bessemer. Lists various basing points like Bethlehem, Pa., Birdsboro, Pa., etc.

Delivered from Basing Points:

Table with 5 columns: Basing Point, No. 2, Malleable, Basic, Bessemer. Lists delivery points from various locations like Akron, O., Baltimore, etc.

Table with 5 columns: Delivered from Basing Points, No. 2 Fdry., Malleable, Basic, Bessemer. Lists points like St. Louis from Birmingham, etc.

Low Phos.

Table with 4 columns: Basing Points, Gray Forge, Charcoal, Silvery. Lists basing points like Birdsboro and Steelton, Pa., etc.

Text describing prices for Bessemer Ferrosilicon and other materials, including notes on delivery and freight.

Refractories

Table with 2 columns: Refractory type (e.g., Fire Clay Brick, Silica Brick), Price. Lists various refractory materials and their costs.

Fluorspar, 85-5

Table with 2 columns: Description (e.g., Washed gravel, duty paid), Price. Lists prices for fluorspar and related materials.

Ferroalloys

Table with 2 columns: Alloy name (e.g., Ferromanganese, Ferrochromium), Price. Lists various ferroalloys and their market prices.

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

Table with columns: Metal (Copper, Straltn Tin, Lead, Lead East, Zinc, Alumi-99%, Antimony, Nickel), Price. Lists spot prices for various nonferrous metals.

\*Nominal range 19.00 to 21.00c.

MILL PRODUCTS

Table with 2 columns: Product name (e.g., Electro, del., Lake, del.), Price. Lists prices for mill products like copper and brass.

OLD METALS

Table with 2 columns: Metal type (e.g., No. 1 Composition Red Brass), Price. Lists prices for old metal products.

Table with 2 columns: Alloy name (e.g., Light Brass, Lead), Price. Lists prices for ferroalloy products.

# Iron and Steel Scrap Prices

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

<b>HEAVY MELTING STEEL</b> Birmingham† ..... 11.00-13.00 Bos. d'ck, No. 1 exp. †12.00 N. Eng. del. No. 1 .. 12.75 Buffalo, No. 1 ..... 16.00-16.50 Buffalo, No. 2 ..... 14.50-15.00 Chicago, No. 1 ..... 16.25-16.75 Cleveland, No. 1 ..... 15.50-16.00 Cleveland, No. 2 ... 15.00-15.50 Detroit, No. 1 ..... 13.50-14.00 Eastern Pa., No. 1.. 14.50-15.00 Eastern Pa., No. 2.. 13.50-14.00 Federal, Ill. .... 12.75-13.25 Granite City, R. R. 14.50-15.00 Granite City, No. 2. 12.75-13.25 New York, No. 1 ... †11.50-12.00 N. Y. d'ck, No. 1 exp. †10.50-11.00 Pitts., No. 1 (R. R.) 17.50-18.00 Pitts., No. 1 (dlr.).. 17.00-17.50 Pittsburgh, No. 2 .. 15.25-15.75 St. Louis, R. R. ... 14.25-14.75 St. Louis, No. 2 ... 14.50-15.00 Toronto, dlrs. No. 1 10.50-11.00 Toronto, No. 2 ..... 9.50-10.00 Valleys, No. 1 ..... 16.75-17.25	<b>COUPLERS, SPRINGS</b> Buffalo ..... 17.50-18.00 Chicago, springs ... 18.25-18.75 Eastern Pa. .... 18.00-18.50 Pittsburgh ..... 20.50-21.00 St. Louis ..... 16.50-17.00	<b>ANGLE BARS—STEEL</b> Chicago ..... 18.00-18.50 St. Louis ..... 15.50-16.00 Buffalo ..... 14.50-15.00	<b>RAILROAD SPECIALTIES</b> Chicago ..... 18.00-18.50	<b>LOW PHOSPHORUS</b> Buffalo, billet and bloom crops ... 18.50-19.00 Cleveland, billet, bloom crops ... 19.00-19.50 Eastern Pa., crops.. 18.50-19.00 Pittsburgh, billet, bloom crops ... 20.50-21.00 Pittsburgh, sheet bar crops ..... 19.50-20.00	<b>FROGS, SWITCHES</b> Chicago ..... 16.00-16.50 St. Louis, cut ..... 15.25-15.75	<b>SHOVELING STEEL</b> Chicago ..... 16.25-16.75 Federal, Ill. .... 13.00-13.50 Granite City, Ill. .. 12.75-13.25 Toronto, dealers ... 6.50	<b>RAILROAD WROUGHT</b> Birmingham ..... 8.00- 9.00 Boston, district ... †8.00- 8.25 Buffalo, No. 1 ..... 14.50-15.00 Buffalo, No. 2 ..... 16.00-16.50 Chicago, No. 1, net. 14.00-14.50 Chicago, No. 2 ..... 16.25-16.75 Cincinnati, No. 2.. 14.00-14.50 Eastern Pa. .... 15.50-16.00 St. Louis, No. 1 ... 13.00-13.50 St. Louis, No. 2 .. 14.50-15.00 Toronto, No. 1 dlr. . 7.00	<b>SPECIFICATION PIPE</b> Eastern Pa. .... 14.00-14.50 New York ..... †10.00-10.50	<b>BUSHING</b> Buffalo, No. 1 ..... 14.50-15.00 Chicago, No. 1 ..... 14.75-15.25 Cinchn., No. 1, deal. 11.00-11.50 Cincinnati, No. 2 .. 6.50- 7.00 Cleveland, No. 2 .. 10.50-11.00 Detroit, No. 1, new. 13.00-13.50 Valleys, new, No. 1. 16.00-16.50 Toronto, dealers... 6.00	<b>MACHINE TURNINGS</b> Birmingham ..... 6.00- 6.50 Buffalo ..... 9.25- 9.75 Chicago ..... 8.50- 9.00 Cincinnati, dealers. 7.50- 8.00 Cleveland ..... 10.00-10.50 Detroit ..... 8.50- 9.00 Eastern Pa. .... 10.50 New York ..... †5.00- 5.50 Pittsburgh ..... 11.75-12.25 St. Louis ..... 6.00- 6.50 Toronto, dealers ... 4.00- 4.50 Valleys ..... 10.75-11.25	<b>BORINGS AND TURNINGS</b> <i>For Blast Furnace Use</i> Boston district ... †5.00- 5.25 Buffalo ..... 10.00-10.50 Cincinnati, dealers. 6.50- 7.00 Cleveland ..... 11.50-12.00 Detroit ..... 8.50- 9.00 Eastern Pa. .... 10.50 New York ..... †6.00- 6.50 Pittsburgh ..... 11.50-12.00 St. Louis ..... 8.50- 9.00 Toronto, dealers, net 5.50- 6.00	<b>CAST IRON BORINGS</b> Birmingham ..... 6.00- 6.50 Boston dist. chem.. †6.25- 6.75 Boston dist. for mills 16.00- 6.25 Buffalo ..... 10.00-10.50 Chicago, dealers ... 9.25- 9.75 Cincinnati, dealers. 6.50- 7.00 Cleveland ..... 10.50-11.00 Detroit ..... 9.25- 9.75 E. Pa., chemical... 10.00-13.00 New York ..... †6.00- 6.50 St. Louis ..... 7.00- 7.50 Toronto, dealers ... 4.50- 5.00	<b>PIPE AND FLUES</b> Cincinnati, dealers. 9.00- 9.50 Chicago, net ..... 8.00- 8.50	<b>RAILROAD GRATE BARS</b> Buffalo ..... 11.00-11.50 Chicago, net ..... 10.00-10.50 Cincinnati ..... 9.00- 9.50 Eastern Pa. .... 12.00-12.50 New York ..... †8.00- 8.50 St. Louis ..... 10.50-11.00	<b>FORGE FLASHINGS</b> Boston district ... 9.65- 9.75 Buffalo ..... 14.50-15.00 Cleveland ..... 14.50-15.00 Detroit ..... 12.50-13.00 Pittsburgh ..... 15.25-15.75	<b>FORGE SCRAP</b> Boston district ... †6.50- 7.00 Chicago, heavy ... 18.00-18.50 Eastern Pa. .... 14.00	<b>ARCH BARS, TRANSOMS</b> St. Louis ..... 16.50-17.00	<b>AXLE TURNINGS</b> Boston district ... †7.25- 7.50 Buffalo ..... 12.50-13.00 Chicago, elec. fur.. 16.00-16.50 Eastern Pa. .... 13.00-14.00 St. Louis ..... 10.50-11.00 Toronto ..... 4.50	<b>STEEL CAR AXLES</b> Birmingham ..... 14.50-16.00 Boston district ... †14.50-15.00 Buffalo ..... 17.50-18.00 Chicago, net ..... 18.00-18.50 Eastern Pa. .... 21.50 St. Louis ..... 17.00-17.50 Toronto ..... 8.50	<b>SHAFTING</b> Boston district ... †15.25-15.50 Eastern Pa. .... 20.50-21.50 New York ..... †16.00-16.50 St. Louis ..... 15.00-15.50	<b>CAR WHEELS</b> Birmingham ..... 14.00-15.50 Boston dist. iron.. †11.00-11.50 Buffalo, iron ..... 16.00-17.00 Buffalo, steel ..... 18.00-19.00 Chicago, iron ..... 16.50-17.00 Chicago, rolled steel 18.00-18.50	<b>Cincinnati, iron ... 13.00-13.50</b> <b>Eastern Pa., iron.. 16.00-17.00</b> <b>Eastern Pa., steel.. 18.00-18.50</b> <b>Pittsburgh, iron ... 18.00-18.50</b> <b>Pittsburgh, steel ... 20.50-21.00</b> <b>St. Louis, iron ... 14.00-14.50</b> <b>St. Louis, steel ... 16.25-16.75</b> <b>Toronto, net ..... 8.50</b>	<b>NO. 1 CAST SCRAP</b> Birmingham ..... 11.50-12.50 Bos. dis. No. 1 mch. †10.75-11.00 N. Eng., del. No. 2. †9.00- 9.25 N. Eng., del. textile 12.00-12.50 Buffalo, cupola ... 14.50-15.00 Buffalo, mach. .... 15.50-16.00 Chicago, agri. net.. 12.00-12.50 Chicago, auto ..... 12.50-13.00 Chicago, mach. net 14.00-14.50 Chicago, rail'd net 13.00-13.50 Cincl., mach. cup.. 13.50-14.00 Cleveland, mach.. 16.25-16.75 Eastern Pa., cupola. 16.00-16.50 E. Pa., mixed yard. 14.00-14.50 Pittsburgh, cupola. 17.00-17.50 San Francisco, del.. 13.50-14.00 Seattle ..... 10.00-11.00 St. Louis, No. 1 ... 12.50-13.00 St. L. No. 1, mach. 13.00-13.50 Toronto, No. 1, mach., net ..... 9.50-10.00	<b>HEAVY CAST</b> Boston dist. break. 10.25 New England del.. 11.00-11.50 Buffalo, break. .... 13.25-13.75 Cleveland, break. ... 13.00-13.50 Detroit, No. 1 mach. net ..... 13.50-14.00 Detroit, break. .... 11.50-12.00 Detroit, auto net.. 13.50-14.00 Eastern Pa. .... 15.00 New York breakable†11.00-11.50 Pittsburgh ..... 14.00-14.50	<b>MALLEABLE</b> Birmingham, R. R.. 13.50-14.00 New England, del. †16.25-17.50 Buffalo ..... 17.00-17.50 Chicago, R. R. .... 18.00-18.50 Cincl., agri. del... 14.00-14.50 Cleveland, rail ... 17.50-18.00 Detroit, auto, net.. 14.50-15.00 Eastern Pa., R. R.. 16.50-17.50 Pittsburgh, rail ... 17.50-18.00 St. Louis, R. R. ... 15.50-16.00 Toronto, net ..... 7.00	<b>RAILS FOR ROLLING</b> <i>5 feet and over</i> Birmingham ..... 14.00-15.00 Birmingham ..... †11.00-11.50 Buffalo ..... 16.50-17.50 Chicago ..... 17.00-17.50 Eastern Pa. .... 16.00 New York ..... †12.00-12.50 St. Louis ..... 16.00-16.50	<b>LOCOMOTIVE TIRES</b> Chicago (cut) .... 17.50-18.00 St. Louis, No. 1 ... 13.50-14.00	<b>LOW PHOS. PUNCHINGS</b> Buffalo ..... 18.00-18.50 Chicago ..... 18.50-19.00 Eastern Pa. .... 18.00-18.50 Pittsburgh (heavy) 19.50-20.00 Pittsburgh (light). 18.50-19.00
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## Iron Ore

<b>Lake Superior Ore</b> Gross ton, 51 ¾% <i>Lower Lake Ports</i> Old range bessemer ... \$4.80 Mesabi nonbess. .... 4.50 High phosphorus ..... 4.40 Mesabi bessemer ..... 4.65 Old range nonbess. .... 4.65	<b>Eastern Local Ore</b> Cents, unit, del. E. Pa. Foundry and basic 56-63% con. (nom.) 8.50- 9.00 Cop.-free low phos. 58-60% (nom.).. 10.00-10.50	<b>Foreign Ore</b> Cents per unit, f.a.s. Atlantic ports (nominal) Foreign manganiferous ore. 45.55%
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iron, 6-10% man. 11.00 No. Afr. low phos. 13.00 Swedish basic, 65% 10.00 Swedish low phos.. 11.50 Spanish No. Africa basic, 50 to 60% .. nom. Tungsten, spot sh. ton unit, duty pd. \$15.85-16.00 N. F., fdy., 55% .... 7.00 Chrome ore, 48% gross ton, c.i.f. .... 19.50-19.75
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## Manganese Ore

<i>(Nominal)</i> Prices not including duty, cents per unit cargo lots. Caucasian, 50-52% .... 27.00 So. African, 50-52% .. 27.00 Indian, 50-52% ..... 27.00
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# Bars

Bar Prices, Page 128

**Pittsburgh**—Orders for carbon steel bars, in common with those for alloy grade, recorded a moderate falling off through last week, as compared with the weekly average through October. Present declines seem to be attributed to fewer specifications from farm implement manufacturers and miscellaneous users, but orders for automotive consumption are still steady. The price of carbon steel bars based on 2.05c, f.o.b. base, Pittsburgh, and on alloy bars at 2.55c, Pittsburgh, may be increased for first quarter, according to current reports in the trade.

**Cleveland**—While sales have declined since the opening of the quarter, no slackening in shipments is reported. A further movement is expected towards the middle of this month, in view of the rapid depletion of consumer stocks. Auto partsmakers, steel forging concerns and nut and bolt manufacturers are the most active users of bars here. Alloy bar market has also shown improvement, as a result of rapidly increasing production schedules among auto-builders.

**Chicago**—Steel bar shipments are increasing, principally as a result of a heavier movement to the automotive industry. Demand from miscellaneous users is steady, and farm implement manufacturers are increasing their production of spring tools. Schedules of tractor builders are steady at a high rate, though output is restricted by the strike at the Racine, Wis., plant of the J. I. Case Co. Cold-bar finishers are taking heavy shipments, being fortified by substantial backlogs. Mill deliveries of hot-rolled material show little improvement, with several weeks usually required for orders to reach the finishing end.

**New York**—Commercial steel bar sellers expect increasing activity over the next few weeks in view of the possibility of higher prices for first quarter. Business is moderately active with deliveries a shade easier.

**Philadelphia** — Commercial steel bar business has further declined, although part of this may be due to interruption of the election last Tuesday, and for that reason there may be an increase this week. However, sellers look for little real improvement before prices are announced for first quarter. In a number of quarters it is believed that an increase will be announced at that time, and if so this will undoubtedly stimulate protective cov-

ering. The current price is 2.36c, delivered Philadelphia.

# Plates

Plate Prices, Page 128

**Pittsburgh**—Absence of tank projects of size and a decline in marine work have tended to cause a decline in plate specifications. Releases against contracts continue on a fairly level basis, among them specifications from railroad car

shops, the oil industry and a widely diversified list of miscellaneous uses. According to all advance indications, the plate price of \$1.90c, f.o.b. Pittsburgh, seems destined for an advance for first quarter.

**Cleveland**—Demand from tank and boiler fabricators has been dormant for some time. Mills report improved delivery conditions, thus enabling some fabricators to once more take on new business with reasonable assurance of meeting delivery schedules. Boat and freight car repair work is expected to show some improvement before the first

**B & L COLD DRAWN EXTRA WIDE FLATS**

**IT** is the "made to order" utility of B & L Cold Finished Steels that insures economy for the fabricator.

These popular Extra Wide Flats are typical of the special sections which B & L engineers have developed for bed plates and backing plates for dies, jigs, fixtures and equipment parts.

They save time in fabrication, reduce machining costs and insure precision in manufacture.

You can obtain these convenient sections in widths of 6" to 12" and from 1/4" to 2" in thickness, cold sawed to length.

Ask our representative about Extra Wide Flats.

**SMOOTH FINISH**

**ACCURATE DIMENSION**

**TRUE FLAT SURFACES**

**CLEAN CUT EDGES**

**STRAIGHT ALL SIDES**

**BETTER MADE STEELS LABORATORY TESTED**

Cold Drawn Bars \* Ground Shafting \* Ultra-Cut Steel \* Alloy Steels

**BLISS & LAUGHLIN, INC.**  
 HARVEY, ILL. Sales Offices in all Principal Cities BUFFALO, N.Y.

of the year. Prices remain strong and unchanged.

**Chicago**—New plate business continues relatively quiet and shipments are receding. While backlogs of orders from freight car builders are being reduced, favorable prospects for additional equipment buying indicate an early increase. Structural fabricators are taking shipments at a somewhat slower rate. Tank fabricators still are busy, though backlogs have been reduced materially since midsummer.

**Philadelphia**—In common with

shapes and bars, the two other principal heavy products, plate tonnage is lagging. The past 10 days have been particularly quiet, apart from the placing of car tonnage, amounting to more than 1000 tons. Some ship tonnage is pending, with placing of a mine layer for the U. S. engineering department with Pusey & Jones, Wilmington, Del. This craft will require 340 tons of plates and approximately 160 tons of shapes and bars. Pusey & Jones are also low on two tug boats for the Chesapeake & Ohio railroad and the Maryland Dry Dock Co., Balti-

more, is reported to have booked three car floats for the Pennsylvania, requiring approximately 600 tons of hull steel each. Plates are 2.00c, Coatesville, Pa., or 2.09c, Philadelphia, with some speculation at this time as to the probability of an advance for first quarter.

**Lancaster Iron Works, Lancaster, Pa.**, has booked plates for a steel hull for a gold mining dredge for the Yuba Mfg. Co., San Francisco.

**Birmingham, Ala.**—Plate mills are maintaining an active schedule and production is equal to that of the past several weeks. Demand promises to hold steady for some time. One of the larger plate mills has been operating with three shifts. Fabricating shops are specifying a little more actively.

**Seattle**—Inquiry is active and important projects are developing, both public and private. One of the largest jobs of the year, in excess of 6000 tons, will be up for figures in late November when Everett, Wash., calls bids for a water supply line. Puget Sound Machinery Depot has booked 600 tons for three digesters, each 18 x 56 feet, and a 32-foot diameter spherical accumulator for the Soundview Pulp Co., Everett. Specifications call for 1½-inch riveted plate.

### Contracts Placed

700 tons, beer tanks for Blatz Brewing Co., Milwaukee, to Heil Co., Milwaukee.  
600 tons, digesters and accumulator for Soundview Pulp Co., Everett, Wash., to Puget Sound Machinery Depot, Seattle.  
410 tons, two 55,000 barrel tanks for Pure Oil Co., Toledo, O., to Chicago Bridge Iron Works, Chicago.  
256 tons, 36-inch welded steel pipe, Spokane, Wash., to Steel Tank & Pipe Co. of Oregon, Portland, Ore.  
100 tons siphon covers, metropolitan water district, to Los Angeles, to unnamed interest.  
Unstated tonnage, 250,000-gallon elevated water tank, Clintonville, Wis., to Chicago Bridge & Iron Works, Chicago.

### Contracts Pending

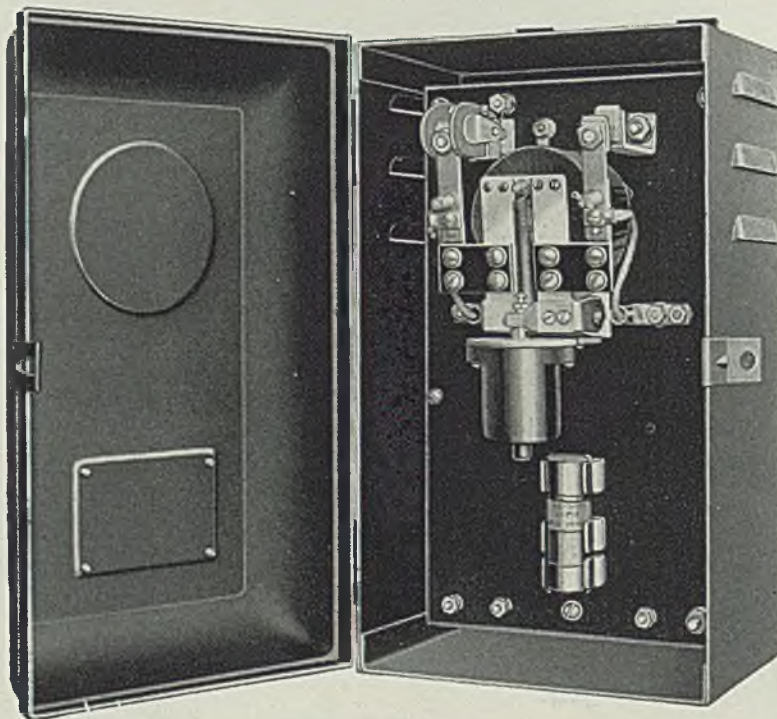
6000 tons plus, water supply line, Everett, Wash., bids about Nov. 15.  
560 tons, 10 and 12-inch water pipe, St. Marias, Ida.; bids in.  
Unstated, discharge pipes and appurtenances, Dead Ox pumping station, Owyhee project; bids at Denver, Nov. 12.  
Unstated, river siphon and outlets, Roza project, Wash.; bids to Reclamation bureau, Denver, soon.

### Tin Plate

Alloy Prices, Page 129

**Pittsburgh**—Tin plate mills held capacity rate of operations through last week, with orders for about two weeks' rolling, a condition directly contrasting with a few months ago when six to seven weeks'

# Clark-Sundh



BULLETIN 5360

## Small but Militant

A Direct Current Automatic Motor Starter rated at 10 H.P. and under at 230 Volts. Two step. One magnet coil. Just itching to enlist in heavy duty service. A comrade for the large Mill Type Control by Clark.

**THE CLARK CONTROLLER CO.**

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backlogs were not uncommon and in cold reduced plate, delivery promises were considerably more. From all indications there should be little interruption in tin mill operations over the remainder of the year for advance orders for 1937 shipment are coming closely on the heels of declining 1936 orders for rush delivery. The \$5.25 per base box price on tin plate, f.o.b. Pittsburgh, is quotably without change.

**New York**—Tin plate specifications are seasonably easier although far in excess of the usual fall volume. Keen speculation exists as to prices when books are opened for new contracts, probably about Dec. 1.

## Sheets

Sheet Prices, Page 128

**Pittsburgh** — Producers have changed their initial announcement on revised quantity differentials as they affect size and have decided to include one length as a necessary factor, whereas in the first announcement this was dropped, it being planned to have only gage and width make up size. The sheet market last week showed an increased volume of backlogs but a falling off in number and size of inquiries, although the pressure is still unabated for prompt and near-prompt deliveries. A number of factors still point toward an advance in sheet prices for first quarter.

**Cleveland**—Backlogs are extended on hot-rolled annealed and galvanized but some improvement has been noted in the other grades. No let up in demand is anticipated through this month. The market for electrical sheets has given indications of broadening into some real tonnages. Manufacturing of stoves, radios, refrigerators and furnaces continue unchanged at the rapid pace set during the last two months. Considerable forward buying is expected over the remainder of the quarter, because of probable price advance the first of the year.

**Chicago**—Sheet mill operations continue near capacity and with automotive shipments expanding, some mills are being taxed to meet desired deliveries. With backlogs still extensive, it is likely that full operations will be continued through this quarter. Automotive requirements have yet to reach a peak, and demand from some miscellaneous consumers also is expanding. Deliveries on most show no improvement, particularly cold-rolled material.

**New York**—Following a recent lull sheet buying at the weekend showed a flurry of activity. Prospects of

higher prices for first quarter and knowledge that mills have little capacity left for this year on several grades contributed to the present activity.

**Philadelphia**—Sheet buying has been less active, reflecting undoubtedly the interruption of the election last Tuesday and possibly in part the approach of inventory season. With the possible exception of cold finished sheets deliveries are somewhat easier. Some sellers are now able to offer galvanized sheets and enameling stock at three to four weeks. Hot-rolled No. 10 also is

available in about that time. Hot-annealed No. 24 shipments are more extended, at around six weeks. Cold-finished sheets average around eight weeks, although six weeks can be done in some instances. The trade generally looks for higher prices next quarter. Apollo Steel Co., Apollo, Pa., has been awarded 300 tons for automobile license tag stock by the state of Pennsylvania. While some leading sellers are adhering to the new schedules on quantity extras, announced the week before last, certain other mills have as yet taken no action, and in the instance

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**This Seamless Drawn Tank is  
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**MADE FROM 1/4" STEEL WEIGHT 25 LBS.**

**10 3/4" DEEP 8" DIAM.**

*Stamping Specialists Since 1896*  
**An Experience You Should Not Overlook  
Send Us Your Next Specification**

**THE CROSBY COMPANY**  
BUFFALO, N. Y.

NEW YORK — CHICAGO — PHILADELPHIA — DETROIT — CLEVELAND

of one large seller, the order to district offices rescinding instructions to place the new schedules into effect still stands.

**Buffalo**—Heavy demand for sheets is keeping both mills here operating practically at capacity. In case of materials not made here, notably tin plate, demand is also at the peak of recent years and large tonnage is being sold. Where extended deliveries are necessary there is much interest in first quarter tonnage.

**Cincinnati**—Sheet mill operations are being maintained steadily near

capacity, with delivery no better. New bookings appear to be routine to assure delivery position and serve to sustain backlogs.

**St. Louis**—Producers and distributors of sheets report October shipments the largest for the month since 1930. Buying is in fair volume, though below a month or six weeks ago. Deliveries are less protracted than two weeks ago.

American Shear Knife Co., Homestead, Pa., has removed its Detroit office to 1010-1015 Stephenson build-

ing. Frank C. Moyer is district manager.

## Pipe

Pipe Prices, Page 129

**Pittsburgh**—The pipe market displayed an even tone last week and still is featured by orders for small lots. In contrast with the third quarter the present absence of line pipe orders is keenly felt by producers, and it likely will be the first or second quarter of 1937 before additional business develops. A likely market for line pipe may develop in the future from the idea to construct cross-country gas lines originating at coal mines where the plan is to convert coal at the mouth of the mine.

**Cleveland**—Pipe requirements remained much the same during the last 30 days. Both industrial and domestic needs have accounted for considerable tonnage here. Jobbers report satisfactory turnover of stocks. Seamless copper tubing has furnished stiff competition among sellers of light gage butt welded pipe. Prices are firm. Cast pipe producers report little activity. Some expect considerable tonnage, held up because of the election, to appear within 4 to 6 weeks.

**Chicago**—Cast pipe inquiries continue fairly active despite the approach of freezing weather. While most inquiries are small, there is a fair number involving 100 to 500 tons. Contractors are pushing work in northern districts, though a number of weeks of favorable weather remain. Shipments against old orders are well maintained.

**New York**—Cast pipe foundries are cleaning up old orders and are looking forward to a good volume of business during the winter months. An encouraging sign is an inquiry from Standard Oil Co. for 200 lengths of 4-inch pipe for the plant at Bayway, N. J. Approximately 120,000 feet of 6, 8 and 10-inch sizes will be required in four PWA financed water projects, which have been announced. Prices are steady.

**San Francisco**—United States Pipe & Foundry Co., Burlington, N. J., secured the largest cast pipe award in over six weeks when it booked 965 tons of 4 and 6-inch pipe for the East Bay municipal utility district, Oakland. Few inquiries of size are pending.

**Seattle**—Demand for cast pipe has not improved and only small tonnages are moving. Parker & Hill, Seattle, engineers, will call bids for 10 miles of cast iron and steel pipe for Issaquah, Wash., with-

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cold drawn steel

You are never in the dark in the selection of your cold drawn steel when you deal with Wyckoff. Our metallurgical engineers offer you the benefit of their specialized knowledge in metallurgy based on the lifetime of research and development... helps you solve the problem of "which one" among the hundreds of analyses of cold drawn steel best suited for your purpose. Let us serve you.

## WYCKOFF DRAWN STEEL COMPANY

General Offices: First National Bank Bldg., Pittsburgh, Pa.  
Mills at Ambridge, Pa. and Chicago, Ill.

Manufacturers of  
Carbon and Alloy Steels Turned and Polished Shafting  
Turned and Ground Shafting



in a month. Joliet, Mont., is planning a \$27,000 system improvement.

### Cast Pipe Placed

965 tons, 6 to 10-inch, Oakland, Calif., to United States Pipe & Foundry Co., Burlington, N. J.  
 283 tons, various sizes, water department, New York city, to Donaldson Iron Co., Emaus, Pa.  
 100 tons, 4 and 6-inch, Burbank, Calif., to United States Pipe & Foundry Co., Burlington, N. J.  
 100 tons, 20-inch, Los Angeles, specification X-61, to American Cast Iron Pipe Co., Birmingham, Ala.  
 Unstated tonnage, 5000 feet, various sizes, for Appleton, Wis., to United States Pipe & Foundry Co., Burlington, N. J.

### Cast Pipe Pending

300 tons, 6-inch, Steger, Ill.  
 200 tons, 6 inch, Ironwood, Mich.  
 Unstated tonnage, 2800 feet 12 to 14-inch, Bloomer, Wis.; bids close Nov. 13.  
 Unstated tonnage, Oshkosh, Wis.; PWA grant for water main extensions costing \$71,874 approved.

### Steel Pipe Pending

300 tons, Lake Burien, Wash., improvement; Pacific Water Works Supply Co., Seattle, low.

## Transportation

Track Material Prices, Page 129

Railroads continue to furnish the steel market a gratifying tonnage, in rails and fastenings and material for new cars and repairs. In the past week some 65,625 tons of standard steel rails have been placed and one lot of track fastenings totals 14,104 tons.

Union Pacific has awarded 20 locomotives to American Locomotive Co., New York, and 300 automobile cars to its own shops and is in the market for 40 coaches and five diners. This road announces it is planning to spend about \$8,000,000 in improvements, principally in rolling stock. Chicago, Burlington & Quincy is inquiring for five locomotives and is expected to enter the market soon for 3250 freight cars.

Although the current price of standard rails has been reaffirmed until Dec. 1 for shipment through first quarter, by at least one important producer, railroads expect an increase, possibly to \$38, on business placed after Dec. 1. This expectation is likely to drive in considerable tonnage during the present month.

Award of 50 locomotives by the New York Central is expected at once. These will require about 2000 tons of plates. Western Pacific is in the market for 200 box cars in

addition to the 650 cars of various types reported last week.

American Car & Foundry Motors Co., New York, has booked four Hall-Scott powered coaches for the Evanston & Niles Center Bus Co., Evanston, Ill., and four for the Calumet District Transit Co., Hammond, Ind.

Twin Coach Co., Kent, O., is low on 240 trackless trolleys and 135 gas coaches for Seattle. Award awaits completion of financing.

### Rail Orders Placed

Chicago & North Western, 28,750 tons to Carnegie-Illinois Steel Corp., Chicago;

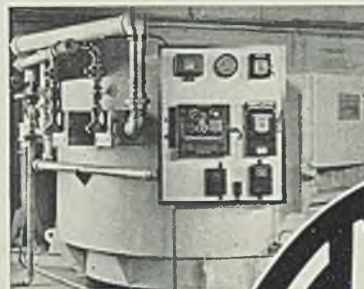
12,250 tons to Inland Steel Co., Chicago; 7500 tons to Bethlehem Steel Co., Bethlehem, Pa.; 14,104 tons of fastenings placed with various producers. Richmond, Fredericksburg & Potomac, 1575 tons, to Bethlehem Steel Co., Bethlehem, Pa.  
 Texas & Pacific, 7550 tons 112-pound rail, to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

### Car Orders Placed

Union Pacific, 300 automobile cars to own shops.

### Locomotives Placed

Union Pacific, 20 freight locomotives, 4-8-4 type, to American Locomotive Co., New York.



Rotary Forge Furnace with Water Seal (Patented)



Alloy Car Type Furnace for Annealing Coiled Rod

# GMCO

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Pusher Type Normalizing Furnace for Rear Axles



Car Type Furnace for Annealing Cold Drawn Steel



### Car Orders Pending

Union Pacific, 40 coaches and five diners.  
Western Pacific, 200 box cars, in addition to previous inquiry.

### Locomotives Pending

Chicago, Burlington & Quincy, five, type 4-8-4 freight locomotives.

### Cold Finished

Cold Finished Prices, Page 129

Pittsburgh—Backlogs of cold-fin-

ished carbon steel bars are being worked down as rapidly as possible and the delivery situation seems less acute than a month ago, with the possible exception of turned and ground shafting where many producers still have unwieldy backlogs. Virtually all types of cold-drawn bar consumers have orders awaiting shipment, but specifications for the past several weeks have diminished to a noticeable degree. The market shows a condition where present backlogs assure at least 30 to 45 days' operations

at present high levels. Prices show no change, firmly quoted 2.35c, base, Pittsburgh, on new inquiry.

### Wire

Wire Prices, Page 129

Pittsburgh—More significant test of the \$2.05 per keg, Pittsburgh, market on standard wire nails is expected to develop shortly in view of the impending likelihood that first quarter prices will be higher. In fact, it is evident on the surface that some adjustment in the wire nail price in relationship to the 2.50c price of plain manufacturing wire and the \$40 base on wire rods is necessary. Activity in manufacturing wire continues at a fairly high rate, chiefly for the account of automotive partsmakers. Ellwood Steel Corp., Ellwood City, Pa., is preparing to install galvanizing equipment for the manufacture of galvanized merchant wire products.

Cleveland—Sales of wire products have felt an impetus indirectly due to the resumption of activity in the automotive industry. Supplementary suppliers are buying in considerable tonnages. Demand for nails has declined somewhat, as was seasonally expected. Agricultural requirements are improving daily, in preparing for next spring. Consumers' stocks have been boosted somewhat over the last 30 days, but no extensive speculative buying is reported.

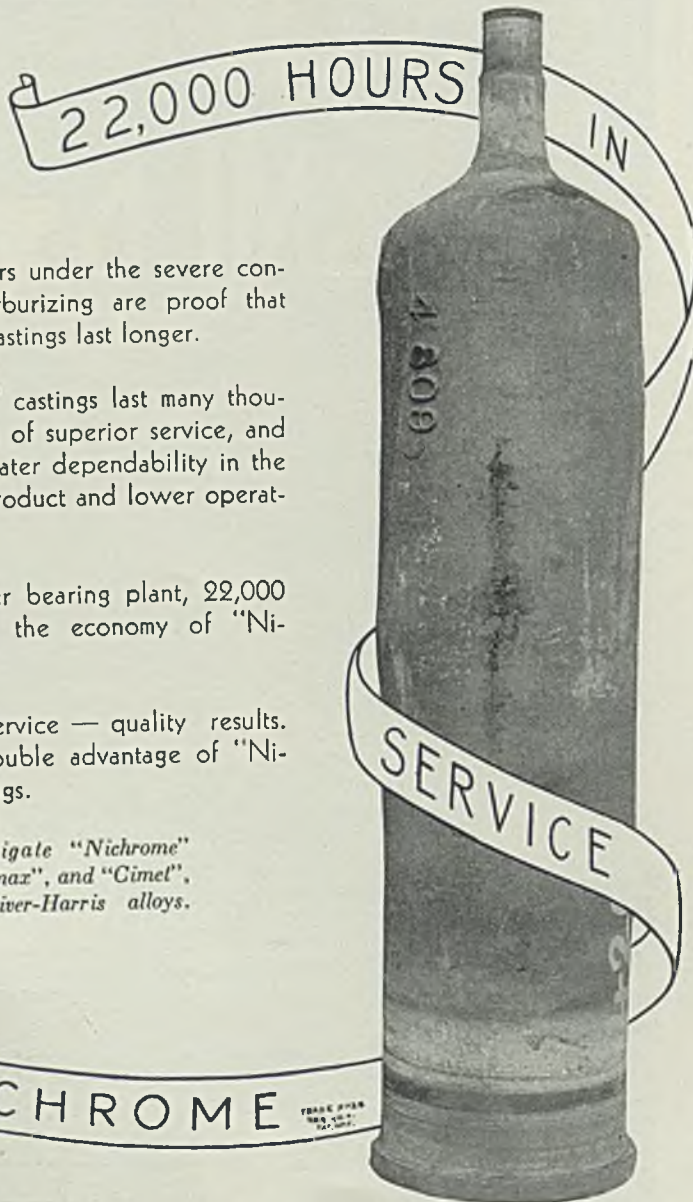
Chicago—New business in wire and wire products is steady, but makes an unfavorable comparison with the active buying before the Oct. 1 price increase. Consumption is increasing, however, and producers anticipate an upturn in orders the latter half of this month. Increasing automotive activity accounts for a share of the gain in consumption, though operations of miscellaneous users of manufacturers' wire are expanding in some instances. Demand for merchant products in farm districts is spotty but is heavier than at this time during the past several years. Current prices are steady on new business.

### Strip

Strip Prices, Page 129

Pittsburgh—No further change in the various descriptions under the quantity extra method of pricing strip steel has followed on the announcement of ten days ago that more flexibility would be permissible under the size and delivery def-

## Thousands and Thousands of Hours in a ROLLER-BEARING PLANT



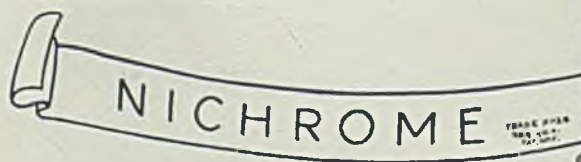
22,000 hours under the severe conditions of carburizing are proof that "Nichrome" castings last longer.

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nitions. However, contrary to the initial announcement, length is included in the definition of size along with gage, or thickness, and width. Though last week a more active volume of orders for narrow strip was in evidence, contrasted to the condition of some of the larger continuous mill interests who evidenced a need for wide strip orders immediately. Present base prices on strip at Pittsburgh, 1.95c for hot-rolled and 2.60c on cold-rolled, seem favored for an advance for the first quarter.

**Cleveland**—Mills report increasing demand from partsmakers as the larger automobile builders get under way. Electrical equipment manufacturers continue to hold their own as heavy consumers. Deliveries have improved somewhat on hot-rolled, but are still far extended on cold strip. Prices are firm and unchanged. There is little probability that any change will be made before the first of the year.

**Chicago**—With the automotive industry increasing its receipts of strip steel, shipments are expanding steadily. Demand from other users is at a steady or improved rate and producers see active schedules assured for the remainder of this quarter. Prices are steady on new business.

**New York**—Demand for cold-finished strip is well sustained with most eastern producers booked weeks ahead. Hot-rolled strip reflects this situation, with deliveries extended, though one leading producer still is able to give deliveries in 10 days.

**Philadelphia**—Business in narrow strip is lagging. Consumers of this material in this district at the moment are not specifying extensively. This is said to be particularly true in the case of one radio manufacturer who is tapering production as stocks for the holiday have been practically completed.

## Ferroalloys

Ferroalloy Prices, Page 130

**New York**—Heavy shipments of ferromanganese continue, as steel-making operations are being well sustained. Prices, meanwhile, are unchanged at \$75, duty paid, Atlantic and Gulf ports. Domestic spiegeleisen consumption also reflects high steelmaking operations, with prices firm at \$26, Palmerton, Pa., on quantities up to 50 tons, and \$24 on 50 tons and over.

Production of ferromanganese in the Pittsburgh district continues at a high rate, strongly supported by an active volume of orders. Carnegie-Illinois Steel Corp. has com-

menced production of ferromanganese in one of its Edgar Thomson furnaces, which supplements production in the Isabella furnace. The market at \$75, base, Baltimore, \$80.13, delivered, Pittsburgh, is without change.

## Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 129

Bolt, nut and rivet specifications are slightly heavier in some direc-

tions, but total demand shows no improvement. Farm implement manufacturers and automotive partsmakers are increasing their present requirements.

Specifications from jobbers are fairly steady. Railroads and freight car builders are taking more than for several years. Prospects are favorable for a continuation of good demand during coming months, in view of proposed equipment buying. Rivet demand from tank and structural fabricators is fairly steady, though the tendency is downward.

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# Shapes

Structural Shape Prices, Page 128

**Pittsburgh**—Structural inquiries, which showed a declining trend last week, featured 2421 tons for the Pennsylvania state highway department to be closed Nov. 13, made up of 1220 tons for a viaduct at Wilkes Barre, Pa., 610 tons for a truss bridge between Armstrong and Westmoreland counties, and 596 tons for a truss bridge at Johnstown, Pa. An advance in plain struc-

tural steel from the present 1.90c, Pittsburgh, market seems imminent for first-quarter deliveries.

**New York**—New inquiries for structural shapes have picked up slightly, with average requirements ranging between 100 to 500 tons each. It is expected that it will be about a month before inquiries become heavier. Lettings last week continue to be light. An encouraging sign is an increasing number of additions or alterations actively contemplated or out for figuring.

**Cleveland**—Mills report a marked improvement in deliveries, and in

line with this trend fabricators have been able to meet, and in some cases better, their delivery schedules. Austin Co., Cleveland, let 1400 tons of steel to Fort Pitt Bridge Works, Pittsburgh, for erection and machine shop at McCook, Ill., for Electro-Motive Corp., La Grange, Ill. Considerable tonnage is involved in projects under consideration. While some feel that a price advance is probable within the next two months, no definite announcement has been made.

**Chicago**—New business in plain structural material is declining slowly, though shipments against orders are holding fairly well. Fabricators continue to receive a relatively large number of small inquiries and this work partly is offsetting the absence of larger projects. A total of about 8500 tons is involved in miscellaneous inquiries. Structural shipments to freight car builders are fairly steady, but producers have completed most orders of this nature.

**Philadelphia**—Bridge work is far from active, although some fair jobs are pending for the state and the proposed toll bridge between Easton, Pa., and Phillipsburg, N. J. Shapes are unchanged at 2.00c, Bethlehem, Pa., or 2.115c, Philadelphia. With indications of general wage increases in the steel industry by the first of next year, the trade regards an increase in shapes along with other products, as probable.

The city of Philadelphia voted a program recently for financing the placing of Market street elevated system underground, between Thirty-second and Forty-sixth streets. Should the program develop, approximately 10,000 tons will be required. Final work on South Broad and Locust street subway is also contemplated under the financing program, but relatively little steel would be required.

**St. Louis**—Operations at structural steel yards continue at about 50 per cent of capacity, with new bookings disappointing and small individually in size. The only large project pending is for a bridge over

## Behind the Scenes with STEEL

### In the Making

IN THIS publication business you have to work months in advance of publication dates sometimes to produce a job to jolt your readers. While it is impossible to anticipate news with any great regularity, it is not impossible to lay plans for thorough and careful treatment of the special issues of STEEL which are familiar to all readers.

That is why there are faint rumblings these days emanating from the editorial department where editors' heads are colliding in the development of plans for STEEL'S annual *Yearbook of Industry*, which will appear Jan. 4, 1937. Attuned to the theme, "Is Industry Prepared for Real Prosperity," it will present in a new style all the basic features of these Yearbook issues, plus a host of added values—informative, educational, profitable.

Are you going to be sorry if you fail to renew that subscription which expires before the first of the year? Don't say we didn't warn you. But perhaps the warning is unnecessary, after all, for statistics show that four out of every five readers renew their subscriptions to STEEL year after year. We're just shouting now at that fifth man who falls down. We'll get him.

### Torch Toughened

YOU hear a lot about flame hardening these days, as a new and economical heat treating method. Little has been published in the technical press on the subject, principally because it has been so difficult to obtain authoritative information.

For a quick picture of the method and what types of equipment are involved, we suggest you scan the article in this issue, page 42, written by Dr. Slottman of the Air Reduction Sales Co.

### Cake

THAT picture of the dejected housewife whose first cake fell flatter than Landon did last Tuesday, and reproduced in American Steel & Wire Co.'s advertisement

in the Nov. 2 issue of STEEL, was a dandy. It was ample proof that one good picture can tell more than volumes of linotype.

The sad bit of pastry shown reminded us of some cakes we have attempted to down as a gesture of encouragement to fresh brides. Incidentally, it must have emphasized to many the importance of the formula: Experience + specifications = quality product.

• • •

### Ho, Shutter Snappers

MATERIAL for our Inquisitive Camera Dept. is practically at the vanishing point and, knowing that among our readers is a vast army of candid camera operators, we are inviting contributions to the picture section of this column. If you have a photograph, snapshot or otherwise, that you think is amusing or unusual and would interest *Behind the Scenes* readers, send it in to us. If printed, a check for \$2 will go forward to you at once; if not the photo will be returned to you intact.

Dig up one of those striking views of people, plants or places and grab yourself a couple of iron men with it. How do you Leica that plan?

• • •

### Surprise

ONE of the greater disappointments in life, to our way of thinking, is to poise one's ear expectantly over what appears to be a delicious, steaming bowl of cream of tomato soup, and then to find out the stuff is bisque of lobster.

• • •

### Win by a Head

HEADLINE of the week: "Nature's on Our Payroll"—centrifugally cast products of Shennango-Penn Mold Co. in the Nov. 2 issue of STEEL, p. 97. For their next message, we suggest the following: "Centrifugally Cast Metal—Dizzy but Dense."

—SHRDLU

## Shape Awards Compared

	Tons
Week ended Nov. 6	21,514
Week ended Oct. 30	13,004
Week ended Oct. 23	20,380
This week, 1935	21,750
Weekly average, 1935	17,081
Weekly average, 1936	22,038
Weekly average, October	16,068
Total to date, 1935	760,937
Total to date, 1936	991,747

the Red River in Oklahoma, calling for 1650 tons. Winn Construction Co. has been awarded the general contract for the new clinic at the Missouri State Hospital, Nevada, Mo., in which 130 tons of structurals will be required.

**San Francisco**—Shape awards were the largest in over a month, 3065 tons being placed. This brought the year's total to 147,027 tons, compared with 103,948 tons the same period a year ago. No new inquiries of size developed during the past few days.

### Shape Contracts Placed

- 1800 tons, state highway bridge over Connecticut river, Deerfield, Mass., to Bethlehem Steel Co., Bethlehem, Pa.
- 1790 tons, sheet piling, marine park, Staten Island, to Jones & Laughlin Steel Corp., Pittsburgh.
- 1400 tons, erection shop and machine shop at McCook, Ill., for Electro-Motive Corp., La Grange, Ill., to Fort Pitt Bridge Co., Pittsburgh; Austin Co., Cleveland, general contractors.
- 1100 tons, steel piling, Horace Harding boulevard bridge, Queens, N. Y., department of public works, to Carnegie-Illinois Steel Corp., Pittsburgh, through Arthur A. Johnson Inc., New York.
- 910 tons, apartment house, for Orpington estate, New York, to Harris Structural Steel Co., New York.
- 820 tons, superstructures, Pier No. 9 and 19, San Francisco, to Columbia Steel Co., San Francisco.
- 815 tons, store building, S. H. Kress Co., Birmingham, Ala., to Ingalls Iron Works Co., Birmingham, Ala.
- 700 tons, building, Houston, Tex., to Pittsburgh-Des Moines Steel Co., Pittsburgh.
- 700 tons, plant addition, Armstrong Cork Co., Lancaster, Pa., to American Bridge Co., Pittsburgh; Hughes Folkrod Co., Philadelphia, general contractor.
- 670 tons, control 124-3-6, Wilbarger county, Texas, to Austin Co., Cleveland.
- 639 tons, building addition for Gordon Building Co., Long Island City, N. Y., to Jones & Laughlin Steel Corp., Pittsburgh.
- 520 tons, state highway bridges, Blairsville, Indiana county, Pennsylvania, to American Bridge Co., Pittsburgh.
- 448 tons, truss bridge, Center and Clearfield counties, Pennsylvania, F. E. Trimpey, Rockwood, Pa., low; includes 52 tons of plain bars.
- 430 tons, warehouse, at Huntington, W. Va., for Owens Illinois Glass Co., Toledo, O.; to Pittsburgh Bridge & Iron Works, Pittsburgh.
- 400 tons, elevators for Federal building, Los Angeles, to Otis Elevator Co., New York.
- 380 tons, trash racks for Fort Peck, Mont., project, to unstated interest.
- 360 tons, state highway bridges, Saugus, Mass., to Bethlehem Steel Co., Bethlehem, Pa.
- 350 tons, highway bridge, route 32004, Indiana county, Pennsylvania, to American Bridge Co., Pittsburgh.
- 320 tons, grade crossing elimination, Scottsville, N. Y., for Pennsylvania railroad, to Bethlehem Steel Co., Bethlehem, Pa.
- 295 tons, intake gates for Pickwick land-

- ing dam, Tennessee Valley authority, Sheffield, Ala., to Bethlehem Steel Co., Bethlehem, Pa.
- 278 tons, truss bridge, Blair county Pennsylvania, C. L. Johnson & Son Co., Mansfield, Pa., low; includes 39 tons of bars.
- 240 tons, Western Furniture exchange building, San Francisco, to Bethlehem Steel Co., Bethlehem, Pa.
- 240 tons, bridges No. 126-1-B and 152-B, Rosebank and New Brighton, Staten Island, N. Y., for Staten Island Rapid Transit railway, to American Bridge Co., Pittsburgh.
- 210 tons, grade crossing elimination, Bellevue, O., to Bethlehem Steel Co., Bethlehem, Pa.; Freeman & Jones Co.,

- Cleveland, general contractors.
- 205 tons, bridges 168-A and 176-B, Claborn county, Mississippi, to Virginia Bridge & Iron Works, Roanoke, Va.
- 200 tons, apartment, Grand concourse and 167th street, New York, to Dreier Structural Steel Co. Inc., New York.
- 200 tons, alterations to Criterion theater, Broadway and Forty-fourth street, New York, to Dreier Structural Steel Co. Inc., New York.
- 200 tons, apartment, Grand concourse and 147th street, New York, to Dreier Structural Steel Co. Inc., New York.
- 200 tons, postoffice, San Diego, Calif., to Bethlehem Steel Co., Bethlehem, Pa.
- 140 tons, bridge, WPGM 959-A, Randall county, Texas, to Pittsburgh-Des

## To Users of ROLLS

If you want to improve the accuracy and finish of your rolls and at the same time grind them faster and cheaper, our new Bulletin No. 111 will be of interest.

This contains much useful information on roll grinding and explains the features of design and construction of the Farrel Heavy Duty Roll Grinder which are responsible for its exceptional **FIVE-POINT PERFORMANCE**.

In addition to tabulations giving general specifications and dimensions and weights, the bulletin also describes the standard and optional attachments which can be furnished, and the electrical equipment required.

Thirty-seven illustrations include photographs of different sizes of roll grinders, close-up views of various units and installations of Farrel machines. A typical foundation plan shows how the foundation is constructed.

Bulletin No. 111 will be helpful to engineers, production executives and plant operating men who are responsible for the quality and output of metal finishing rolls.

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Moines Steel Co., Pittsburgh.  
 138 tons, pony truss bridge, Luzerne county, Pennsylvania, Corraale Construction Co., Hazelton, Pa., low; includes 26 tons of bars.  
 136 tons, bridge for Western Pacific Co., Pleasanton, Calif., to Columbia Steel Co., San Francisco.  
 125 tons, high school buildings, San Pedro, Calif., to Minneapolis-Moline Power Implement Co., Minneapolis.  
 120 tons, plate girders, Pittsburgh & Lake Erie railroad, Homestead, Pa., to American Bridge Co., Pittsburgh.  
 115 tons, extension to mill buildings, Cumberland, Md., for Republic Steel Corp., to Pittsburgh Bridge & Iron Works, Rochester, Pa.  
 103 tons, girder underpass, Lancaster county, Pennsylvania, Kaufman Construction Co., Philadelphia, low; includes 19 tons of bars.  
 100 tons, apartment, 215th street and Park terrace, New York, to Dreier Structural Steel Co. Inc., New York.  
 100 tons, Lincoln high school, Los Angeles, to Minneapolis-Moline Power Implement Co., Minneapolis.  
 100 tons, Jefferson high school, Los Angeles, to Minneapolis-Moline Power Implement Co., Minneapolis.  
 100 tons, bridge in Santa Fe county, New Mexico, to unnamed interest.

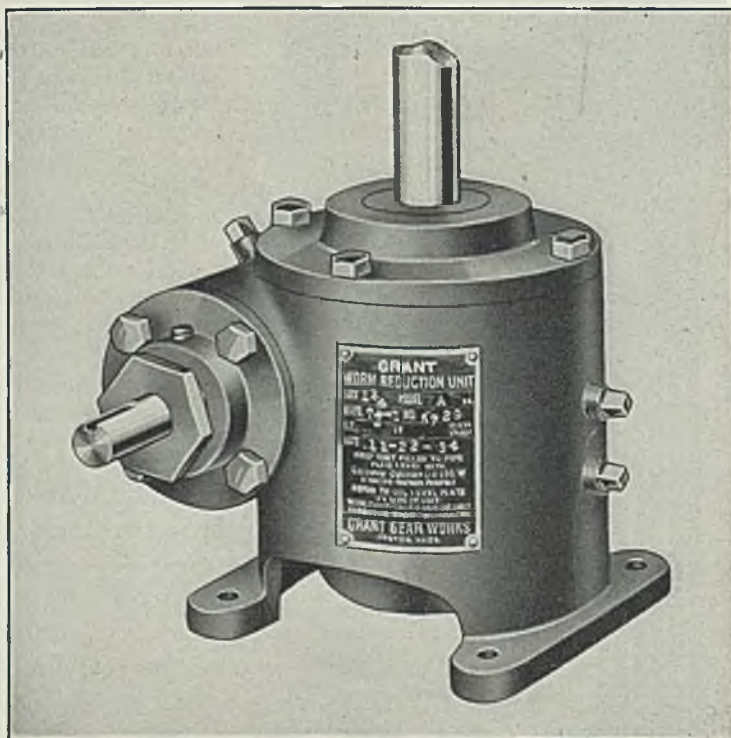
### Shape Contracts Pending

4100 tons, Florida Keys bridges, Contracts D, E and F, Monroe county, Florida.  
 4000 tons, court house, Jamaica, N. Y.; bids about Dec. 1.  
 1250 tons, suspension bridge over Aggemoggin Reach, Hancock county, Maine, for Deer Isle bridge commission.

1220 tons, concrete and steel viaduct, Wilkes Barre, Pa., bids to state highway department, Harrisburg, Pa., Nov. 13; bids of Oct. 16 rejected.  
 1000 tons, warehouse, Eleventh avenue and Twenty-seventh street, for Terminal Warehouses Inc., New York; postponed until December.  
 800 tons, shed, port of San Francisco.  
 710 tons, extension to plant, Los Angeles, for Owens-Illinois-Pacific Coast Co., to Consolidated Steel Corp., Los Angeles.  
 700 tons, building, Swift & Co., Milwaukee.  
 605 tons, four-span truss bridge over Kiskiminetas river, Armstrong-Westmoreland counties, Pennsylvania; bids to state highway department, Harrisburg, Pa., Nov. 13; 53 tons of plain steel bars included.  
 600 tons, grade crossing elimination, Lorain county, Ohio.  
 600 tons, treasury department, procurement division, for various New York City projects; bids taken Nov. 2-4-5.  
 596 tons, through truss bridge, Johnstown, Pa., bids to state highway department, Harrisburg, Pa., Nov. 13; 11 tons of plain steel bars and 29 tons of reinforcing bar frames included.  
 530 tons, Mary Louise Academy, Jamaica, N. Y.; Patrick Construction Corp., Brooklyn, N. Y., general contractor.  
 500 tons, building, Krueger Brewing Co., Newark, N. J.; bids Nov. 15.  
 450 tons, hangar, Hartford, Conn., treasury department, to Lehigh Structural Steel Co., Allentown, Pa.  
 420 tons, airplane manufacturing building, Central park, Long Island, N. Y., to Austin Co., Cleveland.  
 375 tons, post office building, Aberdeen, S. Dak.  
 370 tons, bridge Lebanon, N. H., to Amer-

ican Bridge Co., Pittsburgh.  
 350 tons, including plates, Fresno dam, Milk river, Mont.; Wachter, O'Neil & McGarry Bros., Blsmarck, N. Dak., low.  
 345 tons, plant expansion, Manville, N. J., to Savary & Glaser, Dunnellen, N. J.  
 300 tons, store, Montgomery Ward & Co., Salt Lake City, Utah.  
 290 tons, state highway bridges, various locations, Iowa.  
 275 tons, bridge over Sabine river, Ruliff, Tex., for Kansas City Southern railway.  
 265 tons, grade crossing elimination, Weedsport, N. Y., for New York Central railroad.  
 250 tons, health center building, Klips Bay-Yorkville, N. Y.; bids Nov. 10 by New York City department of health.  
 250 tons, building, American Rough Wool Co., South Plainfield, N. J.; general contract bids being taken.  
 230 tons, repairs to arch span over Connecticut river, Bellows Falls, Vt.  
 227 tons, two bridges, Brownfield, Me., state highway department; bids due Nov. 18.  
 210 tons, addition to parcel post building, Richmond, Va., to American Bridge Co., Pittsburgh.  
 210 tons, bridge project 8143 Morganton, N. C., to Carolina Steel & Iron Co., Greensboro, N. C.  
 202 tons, bridge, North Haven, Conn., over railroad tracks.  
 200 tons, post office, Evanston, Ill.; bids Nov. 27.  
 175 tons, building, Fifty-sixth street and Fifth avenue, New York, for Corning Glass Co., to Post & McCord Inc., New York.  
 150 tons, building, South Brooklyn Savings Bank, Brooklyn, N. Y.; out for figuring.  
 150 tons, Sheffield farms building, Yonkers, N. Y., George P. Atwell Foundation Corp., New York, general contractors.  
 150 tons, addition, Lansdale power house, Lansdale, Pa., to Frank M. Weaver & Co., Lansdale, Pa.  
 135 tons, bridge, Milford, Me., state highway department, bids due Nov. 18.  
 120 tons, covers for syphon transmissions, metropolitan water district on specification 174 for use in California, to Consolidated Steel Corp., Los Angeles.  
 120 tons, sulphur color house addition, Carneys Point, N. J., to Belmont Iron Works, Philadelphia.  
 120 tons, warehouse, for General Motors Parts Corp., Cleveland; bids Nov. 7.  
 103 tons, rigid truss bridge, Connecticut highway department; bids taken Nov. 2.  
 Unstated, 294-foot state bridge, Montana, LaLonde & Sidney, Helena, Mont.; low.  
 Unstated, two state bridges, Lincoln county, Montana; Thomas Stanton, Great Falls, low.  
 Unstated, warehouse for Rainier Pulp & Paper Co., Shelton, Wash.; Austin Co., Seattle, general contractor.  
 Unstated tonnage, alterations to Russeks, Fifth avenue, New York; David Gutman, engineer.  
 Unstated tonnage, building, in Linden, N. J., for Argonate Realty Co.; Austin Co., Cleveland, is asking bids.  
 Unstated tonnage, two additional buildings, housing project, Cambridge, Mass., to John Bowen Co., Boston.

## GRANT SPEED REDUCERS



A complete line of Vertical Worm Gear Shaft type of Worm Reducers. Ratios 5-1 to 100-1 and Horse Powers 1/50 to 15. Excellent agitator drives. Write for catalog No. 58.

**GRANT GEAR WORKS — BOSTON**

Cyril A. Fox, Oliver building, Pittsburgh, manufacturer of grinders, will be known as Fox Grinders Inc. This change became effective Nov. 1.

# Reinforcing

Reinforcing Bar Prices, Page 120

**Pittsburgh**—Rust Engineering Co., Pittsburgh, has the general contract for construction of a substructure to a large coal loading dock on the Ohio river at Catlettsburg, Ky., for the United Collieries Co. Bids have been readvertised by the state highway department for 338 tons of new billet bars needed for a concrete and steel viaduct at Wilkes Barre, Pa., which will be closed Nov. 13. The market on new billet quality bars for reinforcing purposes continues to be quoted 2.05c by distributors for cut lengths in carloads.

**Cleveland**—Requirements of consumers here average well under 100 tons. Little public work is in prospect except 800 tons for sewage contract 93, this city, on which Lindoff-Bicknell, Cleveland, was awarded the general contract. Fabricators report considerable improvement in delivery. Prices continue strong in spite of relatively light buying.

**Chicago**—While new business is moderately less active, backlogs are sufficient to indicate heavy shipments for four to six weeks. Unfilled orders of some smaller producers are such that new business is not being actively sought. While inquiries and orders include few large lots, there is considerable activity in projects taking up to 50 tons. Prices are fairly steady despite some irregularities.

**New York**—The troublesome price situation for both new billet steel and old rail steel, has cleared up considerably in New Jersey, where it has been particularly noticeable. The new warehouse for Terminal Warehouses Inc., New York, has been held up until around Dec. 1.

**San Francisco** — Outstanding award of the week was 1623 tons for invitation A-42,111-A for the bureau of reclamation for delivery at Laguna, Calif., placed with Columbia Steel Co., San Francisco. Awards aggregated 4726 tons and brought

the total for the year to 216,034 tons, compared with 195,822 tons for the corresponding period 1935. It is reported that the metropolitan water district, Los Angeles, has already placed most of the steel and that subsequent calls for bids will involve relatively small quantities.

**Philadelphia**—Small orders, averaging 15 to 20 tons, comprise most of the business. Demand is decidedly sluggish, with state road works most promising, with only a restricted amount of business. Prices lack test.

**Seattle**—Important tonnages are few but mills have sizable backlogs which are being augmented by many small awards of less than 100 tons each. These include post-offices and other public buildings and industrial expansion is also adding to the lettings.

## Reinforcing Steel Awards

- 1623 tons, bureau of reclamation, invitation A-42,111-A, Laguna, Calif., to Columbia Steel Co., San Francisco.
- 435 tons, South Los Angeles district high school, Los Angeles, to Consolidated Steel Corp., Los Angeles.
- 417 tons, all-American canal project, southern California, to Colorado Fuel & Iron Corp., Denver.
- 365 tons, Chicago sanitary district, to Concrete Engineering Co., Chicago; M.

- J. Boyle & Co., Chicago, general contractor.
- 350 tons, post office, San Diego, Calif., to unnamed interest.
- 261 tons, high school addition, San Pedro, Calif., to Soule Steel Co., Los Angeles.
- 222 tons, addition, state hospital, Talmage, Calif., to Kyle & Co., Fresno, Calif.
- 200 tons, warehouse for Las Vegas Land & Water Co., Vernon, Calif., to unnamed interest.
- 160 tons, dormitory for sanatorium, Phoenix, Ariz., to unnamed interest.
- 150 tons, plant extension Grays Harbor Pulp & Paper Co., Hoquiam, Wash., to Bethlehem Steel Co., Seattle; Austin Co., Seattle, general contractor.
- 150 tons, addition, Washington boulevard school, Los Angeles, to Consolidated Steel Corp., Los Angeles.
- 130 tons, addition high school, Covina, Calif., to unnamed interest.
- 100 tons, hospital addition, Santa Monica, Calif., to unnamed interest.
- 100 tons, gymnasium, Marshall high school, Los Angeles, to unnamed interest.
- 100 tons, theatre, Wilshire and Dunsmuir, Los Angeles, to unnamed interest.
- 100 tons, post office, Mesa, Ariz., to unnamed interest.
- 100 tons, Jefferson high school, Long Beach, Calif., to Truscon Steel Co., Los Angeles.

## Reinforcing Steel Pending

- 338 tons, concrete and steel viaduct, Wilkes Barre, Pa.; bids to state highway department, Harrisburg, Pa., Nov. 13; bids of Oct. 16 rejected.
- 865 tons, Fresno dam, Milk River, Mont.,

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## Concrete Awards Compared

	Tons
Week ended Nov. 6 . . . . .	5,193
Week ended Oct. 30 . . . . .	2,803
Week ended Oct. 23 . . . . .	2,336
This week, 1935 . . . . .	17,916
Weekly average, 1935 . . . . .	6,862
Weekly average, 1936 . . . . .	6,403
Weekly average, October . . . . .	3,728
Total to date, 1935 . . . . .	322,284
Total to date, 1936 . . . . .	288,158

project; Wachter, O'Neil & McGarry Bros., Blsmarek, N. D., low.  
 800 tons, sewage disposal contract 93, Cleveland; Lundoff-Bicknell Co., Cleveland, general contractor.  
 750 tons, building, Schenley, Pa., for Joseph T. Finch Co.; to Bethlehem Steel Co., Bethlehem, Pa., through Frank Messer, Cincinnati.  
 400 tons, sections 10-A, 11-A, route 40, state highway department, Trenton, N. J.; bids Nov. 13.  
 211 tons, procurement division, treasury department, New York; W. Ames & Co., Jersey City, N. J., low.  
 181 tons, paving work, Cumberland and Perry counties, Pennsylvania, S. J. Groves & Sons Co., Ridgefield, N. J., low.  
 100 tons, sections 7, route 34 in Ocean county, state highway department, Trenton, N. J.; S. J. Groves & Sons, Ridgefield, N. J., low.  
 110 tons for public school, St. Louis; bids Nov. 4.  
 Unstated, state underpass, Mountain Home county, Idaho; Morrison-Knudsen Co., Boise, general contractor.  
 Unstated tonnage, warehouse for Rainier Pulp & Paper Co., Shelton, Wash.; Austin Co., Seattle, general contractor.  
 Unstated tonnage, foundation for coal loading dock on the Ohio river, Catlettsburg, Ky., for United Collieries Co.; Rust Engineering Co., Pittsburgh, low bidder.  
 Unstated tonnage, additional two buildings, housing project, Cambridge, Mass.; John Bowen Co., Boston, general contractor.

nance was taken for the Pittsburgh district. Through October, production in this district accounted for the heaviest total of any month since October, 1929. Carnegie-Illinois Steel Corp. is now making ferromanganese in one of its Edgar Thomson furnaces at Braddock, Pa.

**Cleveland**—Shipments this month are expected to exceed those of the best month this year. Foundries producing auto parts and farm equipment show increasing activity. Household heating appliance foundries and those handling the railroad trade have also felt the impulse of late fall activity. Some felt that since New England iron has been advanced \$1 a ton by one maker, southern iron may follow.

**Chicago**—Pig iron shipments are increasing and a gain over the peak October volume appears likely during November. New business also remains active. Talk of higher prices still is heard, but local producers are not ready to commit themselves. Consumption is improved, with producers of automotive and farm implement castings showing best gains.

**Buffalo**—Buffalo merchant interests have advanced their pig iron price in the New England territory to stay in line with new quotations of producers in that territory, and this has caused much fill-in tonnage to be entered on order books here. Shipments are progressing at a rate which indicates there may be considerable more fourth quarter buying. Shipments by canal are heavy, the total of 1935 having already been

surpassed by clearances so far this season.

**New York**—All sales for shipment of pig iron to New England are up \$1 a ton, following the advance last week by Mystic Iron Works, Everett, Mass. Most buyers had covered for fourth quarter before the advance and little business was stimulated by the announcement. A buying lull is expected for the next two months. Prices of foreign pig iron delivered in New England are reported to have been advanced but this has not been confirmed.

Producers of pig iron in other districts have not followed the lead of Mystic and expectation is held that no change will be made until books are opened for first quarter.

**Philadelphia** — Eastern Pennsylvania pig iron producers have made no move toward increasing base prices, in line with the action taken by the New England producers in putting into effect an increase of \$1. While there has undoubtedly been some buying within the past week in expectation of an early increase, the volume of this business has been restricted by the uncertainty that exists.

**Cincinnati**—Shipments of pig iron are slightly heavier, in accord with an improved melt in this district. Demand for machine tool and automobile parts castings accounts principally for the gains. Renewed talk of a possible price advance is expected to spur November covering.

**St. Louis** — Distributors of both southern and northern pig iron report October shipments the largest for any month this year, about 10 per cent above that of September. New orders continue in fairly large volume, many melters believing prices may advance before Dec. 31. Consumption continues at the high rate of recent weeks. Sellers are not trying to press iron upon customers, because they already have satisfactory order books.

**Birmingham, Ala.**—While spot orders predominate, a few larger sized orders are being placed, and heavier shipments of pig iron are noticed. Thirteen blast furnaces are active, with basic iron making the greatest tonnage. Steady melters of iron, stove and pipe shops in particular, give evidence of continued activity through the remainder of the year.

**Toronto, Ont.**—General improvement in the iron and steel industry and markets as a whole is reflected in increased business in the merchant pig iron. Sales are running better than 1200 tons weekly, with principal call for foundry grades. Daily melt is running better than 60 per cent, with indications of a higher rate before the end of the year. Prices are firm.

## Pig Iron

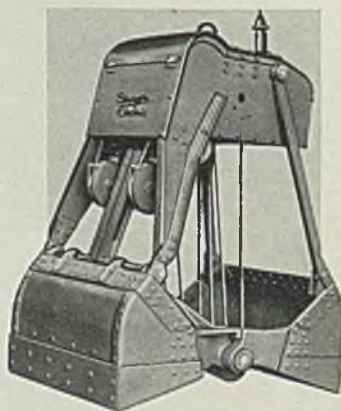
Pig Iron Prices, Page 130

**Pittsburgh**—Due to the fact that pig iron producers are booked up for the balance of the fourth quarter, no price action similar to that announced by the New England fur-

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# Scrap

Scrap Prices, Page 131

**Pittsburgh**—Ability of an independent mill here to purchase slightly over 5000 tons of No. 1 heavy melting steel at \$17.25 per ton, delivered, last week forced the quotable range of the market 50 cents lower to a range of \$17 to \$17.50, but at the same time brokers were paying around \$17 for supplies to cover orders, indicating the present weakness is not pronounced. Owing to scarcity, low phos specialties still hold at around \$20.50 to \$21, but machine shop turnings, hydraulic compressed and other open-hearth grades are weaker sympathetically with No. 1 steel. The Pennsylvania railroad closes Nov. 11 on a list headed by 10,000 tons of No. 1 steel, and Norfolk & Western, Nov. 12, on 54 items, the largest of which is 1000 tons of destroyed steel cars.

**Cleveland**—Buying of scrap has been confined mostly to specialties and small orders. Considerable material is coming in by vessel and important local consuming interests are adding to their stocks. Quotations here and in the valleys are unchanged.

**Chicago**—Strength still predominates in the local market and with dealers and brokers paying from \$16.50 to \$17 in covering old orders for heavy melting steel, the price on this grade may be quoted 25 cents higher at \$16.25 to \$16.75. A small tonnage is reported to have been taken by a local mill at the latter figure. Offerings are heavier, but this tonnage is being absorbed by heavy shipments against contracts. Steel foundry grades have been slightly more active recently, with prices continuing strong.

**Boston**—Domestic buying prices for scrap have been revised downward on three grades. No. 2 machinery cast is down 25 cents to \$8.75, forge flashings are being quoted at \$9.65 to \$9.75, and skeleton \$9.65 to \$9.75. Foreign demand for scrap is still nonexistent. Domestic demand is also somewhat slack.

**New York**—Last week domestic buying prices of scrap metal were revised downward 25 cents to \$1 a ton as demand from the mills continued to narrow. The slight demand for export scrap has not retarded the downward trend of prices, old metal for this disposition being quoted at 50 cents to \$1 a ton less than during the previous week. Some sellers expect a month to elapse before mills come into the New York market for orders of any size. A shipment of scrap for Italy is being loaded, with indications that

several other consignments to foreign nations will be announced soon. Japan has several inquiries in the market.

**Philadelphia**—Scrap prices continue easy with No. 1 steel holding at \$14.50 to \$15 and heavy cast at \$15. There also has been some reduction in some of the specialties, such as wheels and knuckles and couplers. The reduction in No. 1 steel follows substantial buying at \$14.50, delivered Bethlehem, Pa., at which point the offering price has since been dropped to \$14. The leading eastern Pennsylvania buyer has also reduced his offering price for Steelton, Pa., to \$14.50 and for Sparrows Point to \$13.50. In some quarters it is believed an early firming up in prices will develop. In the main scrap buying over the past fortnight has been quiet, with Claymont, Del., consumers holding up shipments and with a check being placed on scrap for Harrisburg, Pa., Coatesville, Pa., and Conshohocken, Pa. Nevertheless, the belief appears to be that with the uncertainty of election now out of the way, and with prospects for improved steel ingot production later in the year, a firmer tone will develop.

**Buffalo**—Strength in cast scrap and stove plate has overshadowed

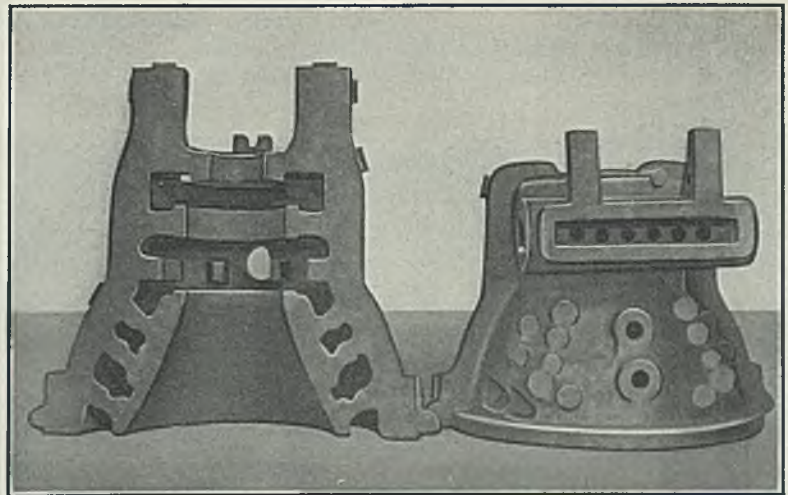
other developments during the past week. Dealers will not sell No. 1 heavy melting steel in tonnage at the current bid of \$16 for large lots. Until there is a break in this situation tonnage dealing in this material is improbable. Dealers report \$15.50 bid, \$16 asked, for No. 1 machinery cast with proportionate prices for other grades. Stove plate is sought but consumers so far have refused to pay the asking price of \$12.50 a ton. Dealers have accumulated stocks in anticipation of heavy purchases. Receipts of scrap by canal were large during the past week but the material in most cases moved direct to mills.

**Detroit**—A strong market in blast furnace material and low phos scrap is contrasted to a quiet and somewhat weak condition in open-hearth scrap. Although no quotable weakness has been justified the market definitely shows signs of uncertainty.

**Cincinnati**—Dullness in iron and steel scrap which developed immediately before the election has not been dissipated. Mills declined to buy without concessions from current asking prices, but dealers and brokers continued their bullish position. Dealers' buying prices were unchanged, but renewal of market activity may cause an increase.

**St. Louis**—The market for iron

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and steel scrap was enlivened during the past several days by the purchase of about 12,000 tons of steel and specialties by East side mills. Prices were said to be at the top of the existing ranges on all items taken, and approximately \$1 per ton higher than was paid for the last preceding purchase of the same material.

**Birmingham, Ala.**—Considerable iron and steel scrap is moving but market conditions are unchanged. Quotations are the same as for the past few weeks, heavy melting steel holding at \$11 to \$13.

**Seattle**—The export market is inactive but this is offset by strong domestic demand. No. 1 melting is quoted at \$11, which is easily obtainable. Unfavorable exchange retards export inquiry and little business is being done with Japan. Tide-water supplies are short and not much material is being offered from inland.

**Toronto, Ont.**—No changes are reported in iron and steel scrap prices and quotations are firm. Some dealers are said to be paying the top price for desirable lots. Steel mills in the Hamilton district are taking regular delivery of heavy melting steel, turnings and other grades against contract and dealers also report improvement in sales to other consumers in Ontario and Quebec.

## Metallurgical Coke

Coke Prices, Page 129

At least 120 more beehive coke ovens in the Western Pennsylvania

district are preparing to go into production, one a battery of 50 and the other of 70 ovens. Extensive repairs to these units have been necessitated as they have not been operated in about 12 years. In spite of the fact that total beehive coke output in the Connellsville district is still at a high for the last decade, a shortage of coke, is still evident and supplies are difficult to obtain. Many blast furnaces are actively trying to get fill-in lots of beehive as their by-product supplies are currently inadequate. Current trading in beehive furnace grade shows a firm range of \$3.75 to \$4, f.o.b. ovens, one moderate transaction last week being closed at \$3.90. Common foundry, at \$4.25 to \$4.50, is less active by comparison, and premium foundry is noticeably dormant at a nominal price of \$5.50.

## Warehouse

Warehouse Prices, Page 132

**New York**—Warehouse sales are showing renewed strength and volume in October exceeded that of September. All cold-finished items are moving rapidly. Sheet sales are holding at the volume registered during the last week of October.

**Chicago**—Sales are fairly steady following the peak October demand, but seasonal precedent calls for a recession during the balance of this quarter. Prices are steady.

**Cleveland**—Warehouse distributors report a slight decline in sales during the past few weeks. Some believe this is the direct result of

improved delivery conditions by mills. This is more clearly shown by the fact that sales have dropped most in the products on which mill deliveries have shown greatest improvement. Prices remain firm.

**Philadelphia**—Some leading warehouses report an increase of 10 per cent in business in October, as against the preceding month, but look for leveling off this month, in accordance with the usual trend at this time of the year. Prices are unchanged.

**Cincinnati**—Warehouse business is holding to volume gains attained during October. Unfavorable weather and other seasonal influences have cut demand for building materials. Jobbers' stocks continue adequate despite slower mill deliveries.

**St. Louis**—Sales by warehouses in October exceeded September by slightly more than 6 per cent. The general manufacturing trade leads in new business placed, serving to more than offset a recession in building material demand. Oil country goods are moving at a brisk rate.

**Seattle**—Warehouse business is spotty. Sheet sales are outstanding, 10-gage and lighter being in good demand, while other items also are moving in satisfactory volume. Prices are unchanged. Portland jobbers are quoting 20 cents under Seattle on steel bars and are also working on lower prices for black and galvanized sheets.

## Iron Ore

Iron Ore Prices, Page 131

**New York**—Reflecting increasing strength of the ore market abroad and further increases in ocean freight rates, prices have been advanced by importers here on several grades. North African low phosphorus is now 13 cents per unit, f.a.s. Atlantic ports; Swedish basic, 65 per cent, 10 cents, and Swedish low phosphorus, 11.50 cents. The first price represents an increase of 2 cents, the second ½ cent and the third 1 cent.

In addition Indian manganese ore, 50 to 52 per cent, has been increased 1 cent to 27 cents, to a parity with Caucasian and South African manganese.

While other grades of iron are unchanged, prices continue exceedingly strong, with the possibility of advances later in the year. This strength in the foreign ore market comes in the face of devalued currency by France, a situation which emphasizes heavy demand abroad and curtailment of supplies from

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Spanish mines because of the rebellion, to say nothing of the higher ocean rates.

**Cleveland**—Total shipments of iron ore from the upper lakes during the month of October were 7,301,284 tons, compared with 7,481,071 tons in September, and 4,600,661 in October, 1935. This represents an increase of 2,700,623 tons, or 58.7 per cent over October last year. The amount carried this year up to Nov. 1, was 41,063,872 tons against 26,804,874 tons in 1935, an increase of 53.2 per cent.

Shipments from upper lake ports for the season to Nov. 1, follow:

Port and Dock	To Nov. 1 1935	To Nov. 1 1936
	Escanaba .....	1,530,110
Marquette .....	2,750,665	3,924,834
Ashland .....	2,848,857	4,286,997
Superior .....	9,733,268	14,987,083
Duluth .....	6,851,686	10,685,044
Two Harbors .....	3,090,288	5,127,703
<b>Total .....</b>	<b>26,804,874</b>	<b>41,063,872</b>

## Steel in Europe

Foreign Steel Prices, Page 132

**London**—(By Radio)—Many makers of pig iron in Great Britain have sold their entire output to the end of the year and consumers are being rationed in proportion to their needs. No further contracts are being taken for delivery before March. It is becoming difficult to obtain sufficient supplies of iron ore. Demand for steel exceeds output and the deficiency is being partly made up by increased imports from the Continent. A large shipbuilding contract has been booked from Denmark. Galvanized sheet exports are quiet but the market for tin plate is fairly active.

Continental steelmaking countries find export demand is brisk, especially from Scandinavia, South America, China and India.

## Nonferrous Metals

Nonferrous Metal Prices, Page 130

**New York** — Major nonferrous metal markets seethed in activity last week. Copper, lead and tin prices advanced sharply as consumers rushed to cover their requirements. Zinc was strong and higher prices appear in the offing.

**Copper** — After several days of tenseness with many producers restricting sales and others refusing any additional business, all sellers advanced prices ½-cent on Friday to 10.50c, Connecticut. The rise was attributed to the well-sold position of sellers and the absence of sufficient supplies available at the old level

to satisfy buyers' demands. The market was also influenced by the sharp advance in prices abroad to around 10.80c, c.i.f. European ports. Brass ingot, copper wire and cable, and mill product prices also advanced. The future trend of the market was uncertain with some interests believing a further rise possible.

**Lead** — Quotations gained another \$4 per ton in two successive increases to 5.00c, New York, and 4.85c, East St. Louis. St. Joseph Lead Co. continued to ask 5.05c, New York, for certain brands. Heavy demand and statistical strength of the industry contributed directly to the advances. Prices on lead sheet and pipe advanced ¼-cent.

**Zinc** — Prime western held unchanged at 4.85c, East St. Louis, but the market tone was strong. An advance in prices is expected over the next few days. Apparent consumption is holding up well while stocks have declined sharply to the lowest level in recent years. London prices advanced, further strengthening the domestic market.

**Tin** — Prices soared in both the domestic and foreign markets on the announcement that an agreement for extending the restriction scheme had been reached. Straits spot closed around 51.00c, New York, compared with 45.75c at the end of the previous week. Sellers remained out of the market believing that a reaction would take place.

**Antimony** — Demand continued quiet but American spot advanced to 12.25c, in cases of 12 from Laredo,

Texas. Chinese spot was nominally unchanged at 12.50c.

## Equipment

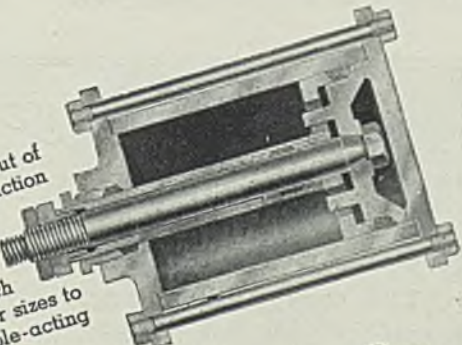

**Pittsburgh**—Bethlehem Steel Co., Bethlehem, Pa., has placed an order with the Dravo-Doyle Co. here for installation of a heater, fired with coke-oven gas, for use in its wire plant at Johnstown, Pa. Moore Dry Dock Co., Oakland, Calif., has placed an order with Thomas Spacing Machine Co., Pittsburgh, for eight modern tools for its new structural shop, covering large multiple punches and automatic spacing tables, various shears, plate duplicator and other production tools.

**Chicago**—The election was without influence on demand for most types of plant equipment. October machine tool sales for some interests were the best this year, with no hesitancy noted in closing promptly on orders. Inquiries are well sustained and November appears likely to be a busy month. Electro-Motive Corp. will require some equipment, including cranes, in connection with a new plant expansion program. Small tool demand reflects steady operations in most metalworking fields.

**Seattle**—Business has maintained a steady volume notwithstanding the late season and labor difficulties affecting many lines. The outlook is not promising as logging and lumber plants are closing because of the maritime strike.

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# Construction and Enterprise

## Connecticut

NEW HAVEN, CONN. — Wire Rope Corp. of America Inc. plans one-story plant addition to cost \$40,000. Leo F. Caproni is architect.

## Rhode Island

WESTERLY, R. I. — Town has preliminary plans for pumping station, 300,000-gallon steel tank and other waterworks equipment at Bradford. Estimated cost is \$105,000.

## New York

BATAVIA, N. Y. — Grange League Co-operative Federation Inc. will erect a new storage warehouse, 40 x 120 feet, adjoining the New York Central tracks in Batavia.

BROOKLYN, N. Y. — Board of Estimate, Municipal building, City of New York, plans steam-electric plant at Brooklyn college, Court and Willoughby streets, to cost \$400,000. Federal aid will be asked.

DEFERIET, N. Y.—Village will construct waterworks system, to cost \$42,000, including shallow well, pumping equipment, supply mains and elevated storage tank of 200,000 gallons capacity.

ELMIRA, N. Y. — Morrison Machine Products Co., 1420 College avenue, will construct \$45,000 combination office and factory building. Douglas G. Anderson is president and general manager.

ELMIRA, N. Y. — Elmira Foundry Co. will install gas equipment to heat its ovens and buildings, as part of an expansion program which includes storage building, crane runway and crane and other equipment. Foundation work is being done by Henry W. Streeter Corp.

ESOPUS, N. Y.—City will construct waterworks system consisting of shallow well, two horizontal motor-driven pumps,

pump house, cast iron force and distribution mains and 500,000-gallon steel storage tank. Cost is estimated at \$125,000.

HEMPSTEAD, N. Y. — Village will construct extensions to existing sewer system at a cost of \$685,454. Federal aid has been granted.

NEW YORK — Varicraft Products Corp., Manhattan, has been formed by Rosenblum & Rosenblum, 217 Broadway, to deal in metal products.

NEW YORK—Max Fischer & Spierer Inc. has been formed here by J. M. Fishback, 11 Park Place, to deal in sheet metals.

NEW YORK—Lewis Steel Products Corp. has been incorporated to deal in metals. Offen & Schimmel, 185 Madison avenue, are agents.

NEW YORK — John Eichler Brewery Co. has acquired the old David Meyer brewery at 3548 Third avenue, the Bronx, and plans expansion.

NEW YORK—Borough of Queens, George U. Harvey, president, will erect municipal asphalt plant costing \$550,000 at the site of the old New York state barge canal terminal between Harper street and Willets Point boulevard. Buildings will include power house, storage tanks, two-unit asphalt plant and dock equipped with railroad crane.

NIAGARA FALLS, N. Y. — Kimberly-Clark Paper Co., Neenah, Wis., has awarded contract for its new warehouse here, to Wright & Kremers Inc. Building will be live-story, 140 x 280 feet, of reinforced concrete construction.

OLEAN, N. Y.—City plans waterworks system to cost \$144,000, consisting of four deep wells, four pump houses and pumps and 9800 feet of 16-inch cast iron supply main.

PORT BYRON, N. Y. — Village will spend \$100,000 for construction of addi-

tions to the present waterworks system. Program includes installation of mains, hydrants, valves, meters and 200,000-gallon steel standpipe.

ROCHESTER, N. Y.—City plans construction of refuse incinerator and waste heat boiler plant at a cost of \$409,100. Plant will include fireproof building, 60 x 108 feet, incineration equipment, waste heat boilers and necessary auxiliary equipment.

## New Jersey

BOUND BROOK, N. J. — Eastern Steel Barrel Co., Henry Leeds, president, has purchased factory from Pierce Estates Inc.

HALEDON, N. J. — Borough plans enlarging filtering capacity of its waterworks, at a cost of \$45,454. R. Spinnier, 242 Main street, Paterson, is engineer.

MIDDLESEX, N. J.—Borough plans construction of 21 miles of collection sewers and a treatment works, to cost \$550,909. Treatment plant will be of chemical precipitation type, and will include chemical feed machines, flocculators, combined settling and filtering tanks, sludge conditioning tanks and vacuum filters and an incinerator.

TRENTON, N. J.—City plans construction of extension to water distribution system. Extensions include about 17 miles of pipes and mains and construction of booster pumping station containing three units. Cost is estimated at \$270,000.

## Pennsylvania

BRADDOCK, PA. — Borough will construct filtration plant, pipe lines and intake pier for improvement of present water supply. Cost is estimated at \$219,847.

FINLEYVILLE, PA. — Gas compression station of Equitable Gas Co. was destroyed by an explosion, Oct. 30.

McKESPORT, PA. — Daily News Publishing Co. has permit for construction of three-story building at 407-409 Walnut street. Cost is estimated at \$75,000.

PITTSBURGH — Duquesne Brewing Co., Twenty-second and Mary streets, has permit for alterations to its plant, at an estimated cost of \$28,700. Navarro Corp., 6219 Broad street, is contractor.

PITTSBURGH—Weirton Coal Co. will rebuild its coal loading dock on the Monongahela river, at the same time removing about 8500 cubic yards of material for harbor improvement.

PITTSBURGH—Pittsburgh Store Fixtures & Equipment Co., maker of refrigerating and display cases, has acquired the Blairsville, Pa., plant of the Schwarzenbach-Huber Co. and plans expansion and alterations.

SPRING CITY, PA.—City plans construction of sanitary sewage system and disposal plant, at an estimated cost of \$205,454. Project includes sewer system, pumping station, and treatment plant. Treatment plant will contain primary settling tank, sludge digestion tank, chlorination and contact tank and sludge drying beds.

## Ohio

BELLEVUE, O. — Gypsum Canning Co., Port Clinton, O., will construct new office and scale house, at a cost of \$40,000. F. J. Emlinger, Port Clinton, is contractor.

CHILLICOTHE, O. — United States Shoe Co., Herold avenue, will install motors, conveyors, and other equipment in one-story, 70 x 265-foot plant addition, to cost over \$100,000. Karl J.

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Ordinary spring wire, Out-of-date methods, poorly regulated heat treatment, lack of broad experience, produce the ordinary spring, perhaps useful fifty years ago, but worse than useless in the high grade engineered products of today.

Kiefer Inc., Schmidt building, Cincinnati, is consulting engineer.

CLEVELAND — Sheffield Farms, Inc., recently chartered dairy company, has acquired a plant at 10712 Superior avenue, and plans to expend between \$20,000 and \$25,000 for modernization.

CLEVELAND — City, department of public utilities, is authorized to enter into contract with Dravo-Doyle Co., 4810 Prospect avenue, for miscellaneous repair parts for DeLaval steam turbines and auxiliaries, including condensers, condenser pumps, circulating pumps, air pumps, air ejectors, oil pumps, drives, fans, etc. Frank O. Wallen, 105 City hall, is director.

COLUMBUS, O. — Drawn Steel Co. Inc. has been formed here by Edward S. Coons Jr., Morris Lopper, 44 East Broad street, and associates.

DAYTON, O. — Materiel division, office of contracting officer, Wright field, will take bids until Nov. 16 on various taper pipe taps. Invitation circular 37-296; bids f.o.b. contractors plant.

DE GRAFF, O. — Village, W. H. Dachembach, clerk, is preparing plans for \$63,000 waterworks project. Carl J. Simon, Van Wert, O., is consulting engineer. (Noted Nov. 2).

DELAWARE, O. — City plans construction of water storage tower to cost \$23,129. Sidney A. Rowland is mayor.

DELAWARE, O. — City will purchase plant and system of Delaware Water Co. for \$560,000. Burns & McDonnell Engineering Co., Kansas City, Mo., is consulting engineer on survey.

ELYRIA, O. — Bender Body Corp., 6114 Barborton avenue, Cleveland, has acquired former plant of Falcon-Knight division of Willys-Overland Co. Plant will be rehabilitated and equipped to manufacture auto trailers, at a cost of \$100,000. Herman Bender is president.

GALION, O. — Central Ohio Steel Products Co. has awarded general contract for one-story addition to machine shops, to Jacob Wolf Co., Mansfield, O. Cost is close to \$40,000 with equipment.

GALION, O. — City will advertise for bids soon on furnishing 3000-kilowatt generator-condenser and auxiliary; and constructing addition to plant building. Cost is estimated at \$150,000. L. Cline is service director for the city.

KENT, O. — Twin Coach Co. will spend \$125,000 to expand plant facilities. Paul H. Brehm is general manager.

LIBERTY CENTER, O. — Village will spend \$60,300 for construction of waterworks system consisting of 12-inch well, pump and motor, elevated 100,000-gallon storage tank on 100-foot tower and distribution system.

MANCHESTER, O. — Village will ask federal aid for construction of \$30,000 municipal electric light plant. Norman Holderness is clerk.

MIDDLEPORT, O. — Jordie Mfg. Co., maker of screen doors, is installing machinery in its plant here, formerly occupied by the Mossman auto repair shop.

NILES, O. — City will construct improvements to municipal electric distribution system. A new substation with 5625-KVA transformer will be added. Cost is estimated at \$176,479.

OHIO CITY, O. — Village has PWA allotment of \$44,900 for construction of publicly-owned diesel electric light and power plant. Project will include two 150-horsepower, 100-kilowatt, 2300-volt three-phase units, and one 75-horsepower,

50-kilowatt unit; and housing facilities.

PIQUA, O. — City will construct power line connection with Troy, O. F. R. Buechner is city manager; Albert Schroeder is city engineer. (Noted Nov. 2).

SEBRING, O. — Limoges China Co. plans construction of circular decorating kiln as first step in plant modernization. Allied Engineering Co., Cleveland, will build the kiln.

ST. CLAIRSVILLE, O. — Village will construct sewage system and disposal plant at a cost of \$200,000. Federal aid has been granted. Consulting engineers are Jennings & Lawrence, 12 North Third street, Columbus.

WELLSVILLE, O. — City is having preliminary tests and survey made for installation of proposed filtration plant and dam. R. H. Hunter, Wooster, O., is consulting engineer.

WILLOUGHBY, O. — Main factory building of J. H. R. Products Co. was destroyed by fire Oct. 29.

### Michigan

BAY CITY, MICH. — Dow Chemical Co., Midland, Mich., will remodel its recently acquired plant, former site of Union Motor Truck Co., on Patterson avenue, at a cost of \$20,000. The plant will be occupied by the entire Dowmetal foundry unit of the company.

DETROIT — Gar Wood Industries Inc., Highland Park, is constructing a new manufacturing building. The structure will be 60 x 180 feet, air-conditioned, with arc-welding machinery and other equipment for manufacture of road-building machines. R. H. Hidey is contractor; Giffels & Valett Inc., are engineers.

FLINT, MICH. — Burton township trustees are having plans prepared for proposed waterworks system, including storage tank, distribution system, diesel pump equipment, deep wells, cast iron mains, hydrants, pump house and meters. Cost is estimated at \$100,000. Plans are expected to mature about Feb. 1,

1937. Ora Gould is consulting engineer. (Noted Nov. 2).

LANSING, MICH. — City plans construction of sewage and garbage disposal system, to cost \$900,000. Project includes two sewage pumping stations and 6000 feet of trunk sewers; sewage disposal plant, sedimentation, aeration and sludge digestion facilities; garbage disposal plant, grinding, sludge digestion and disposal equipment. Public Works funds have been allocated.

LANSING, MICH. — Motor Wheel Corp., 712 East Saginaw street, will break ground immediately for foundry plant on Michigan Central railroad, north of McKinley street. Plant buildings and equipment will be leased to Campbell, Wyant & Cannon Foundry Co., Muskegon, Mich., which will install manufacturing equipment. Cost is estimated at \$1,000,000. H. F. Harner is president of Motor Wheel Corp.

MANISTEE, MICH. — Great Lakes Chemical Corp., Edwin N. Turner, general manager, will install conveyors, transformers, pumping machinery and other equipment in liquid bromine plant at Filer City. Cost is estimated at \$150,000. (Noted Sept. 28).

PLYMOUTH, MICH. — City will construct addition to water supply system, including additional wells, pumps, and equipment, at a cost of \$89,091. Allocation of PWA funds has been approved.

PLYMOUTH, MICH.—Burroughs Adding Machine Co., 6071 Second boulevard, Detroit, will install conveyor and loader systems in branch plant here, at a cost of \$250,000. Albert Kahn, New Center building, Detroit, is architect and engineer.

### Illinois

CHESTER, ILL. — City plans \$48,500 extensions and additions to present water distribution and fire protection facilities. Project includes installation of approximately 22,820 feet of cast iron pipe, 28 valves, 10 hydrants and 200 service connections.

CHICAGO — Calne Steel Co. plans one—  
(Please turn to Page 151)

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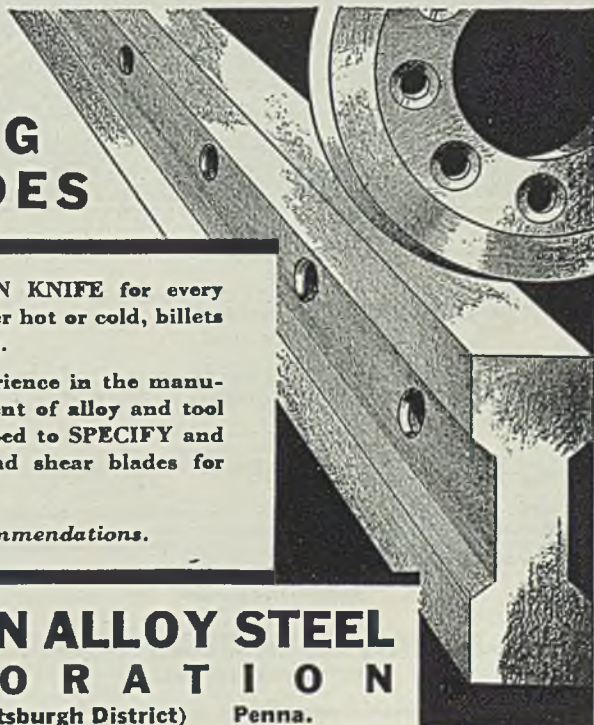
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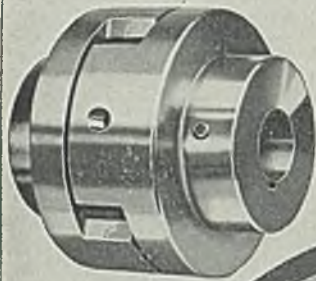
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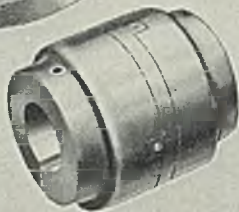
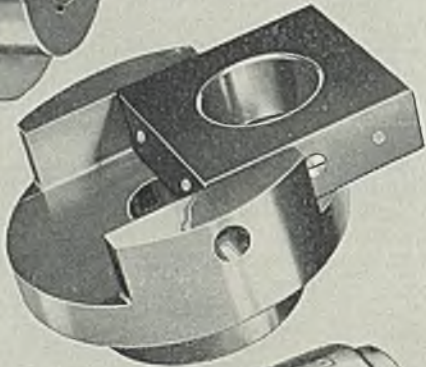


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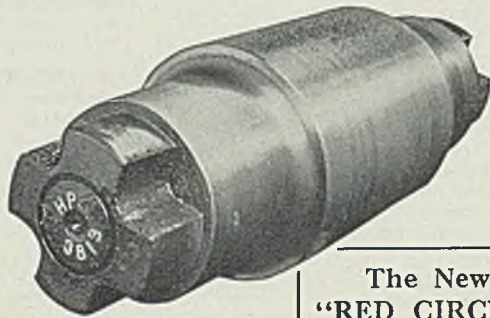


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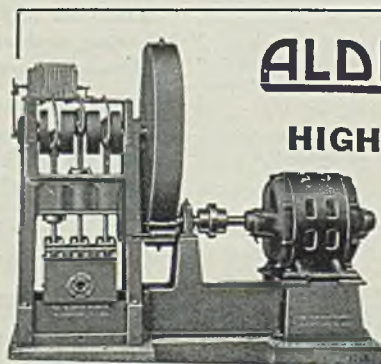
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The ALDRICH PUMP CO., Allentown, Pa.

(Continued from Page 149)

story plant building, 40,000 square feet floor space, to be erected in Keeney industrial district on North Central avenue, at a cost of \$90,000.

CHICAGO — Transportation Specialties Co., 77 West Washington street, has been incorporated by F. D. Bronkalla and associates, to manufacture and sell railway and trucking specialties.

CHICAGO — United Scrap Iron & Metal Co., 3159 South LaSalle street, has been incorporated by Barney Fadnos and associates, to deal in scrap iron and scrap metals.

CHICAGO — Electro-Motive Corp., builder of diesel locomotives, will spend \$750,000 for equipment and an addition to its La Grange, Ill., plant. About 84,000 square feet of additional floor space will be provided. Austin Co., Cleveland, has contract for building addition.

CHICAGO — Republic Machinery Sales Co., 3539 Fifth avenue, has been incorporated by M. A. Lipschultz and associates, to deal in tools and machinery. Correspondents are Lapkoff & Weinstein, 134 North LaSalle street.

CHICAGO — Pheoll Mfg. Co., 5708 Roosevelt road, manufacturer of screws, bolts, and nuts, is constructing a two-story addition to its factory. The building will be used as a warehouse, packing and shipping plant and general office building.

CHICAGO — Commonwealth Edison Co. will construct additional power-generating capacity at a cost of \$5,000,000. Plans call for second generating unit of Chicago District Electric Co. state-line station, to add 95,000 kilowatts.

CUBA, ILL. — City will expend \$49,090 to improve its water supply. Project includes laying cast iron pipe, approximately 11,000 feet; building a pumping station, and constructing a complete water-softening and purification plant.

MANITO, ILL.—Village will construct \$50,909 waterworks system, including well, pumping plant, elevated tank, distributing system, house services and meters, fire hydrants and chlorinator.

MATTOON, ILL. — City will spend \$307,273 for construction of sanitary sewers and two sewage disposal plants, one on Kickapoo creek, the other on Riley creek. Kickapoo creek plant will be of the trickling filter type, with primary settling tanks, trickling filters, secondary tank, sludge digestion tanks, sludge drying beds, pump house and screen and grit chambers; the Riley creek plant will be activated sludge type.

PERU, ILL. — City will construct extensions to sewer system, at a cost of \$58,181.

ROCKFORD, ILL. — J. L. Clark Mfg. Co. plans installation of motors and controls, conveyors, loaders and other equipment in one-story addition to metal can and container plant. Cost is estimated at \$250,000. Nimmons, Carr & Wright, 333 North Michigan avenue, Chicago, are architects.

### Indiana

BREMEN, IND. — City will call for bids soon on construction of municipal power plant, financed through federal aid. Leroy Bradley, 221 West Wayne street, Fort Wayne, Ind., is architect.

CAMBRIDGE, IND.—Town plans construction of new \$49,090 sewage treatment plant and appurtenances.

INDIANAPOLIS — Allied Specialties

Inc., Eastgate building, has been incorporated by Russell W. Johnston and associates, to manufacture machinery.

INDIANAPOLIS — Indianapolis Power & Light Co. has plans for one-story shop building at 1230 West Morris street. Cost will be about \$55,000.

JEFFERSONVILLE, IND. — Colgate-Palmolive-Peet Co., 105 Hudson street, Jersey City, N. J. plans installation of power plant equipment in its five-story addition to branch soap factory building here, at a cost of \$200,000.

MISHAWAKA, IND. — City will build sewage treatment plant, of the activated sludge type, at a cost of \$311,727. Plant is designed to handle 3,500,000 gallons daily normal flow with 10½ hours detention.

### Alabama

BIRMINGHAM, ALA. — City has additional WPA allotment of \$680,628, for construction of Birmingham industrial water system.

CULLMAN, ALA. — Cullman County Electric Membership Corp. has additional REA allotment of \$42,000 for constructing 105 miles of rural transmission lines.

JACKSONVILLE, ALA. — City has PWA allotment of \$61,818 for construction of complete municipal sanitary sewerage system, including treatment plant.

FORT DEPOSIT, ALA. — Warehouse of Norman Trading & Milling Co. was damaged by fire with loss estimated at \$48,000. Ralph Norman is owner.

PRICHARD, ALA. — City voted to award light and power franchise to Shirley H. Cochran, who will erect plant at a cost of \$100,000.

TUSCALOOSA, ALA. — United States engineers, Mobile, Ala., receive bids until Nov. 10, change of date from Oct. 28, for construction of lock and dam abutment and operation building with machinery complete, on Warrior river at Tuscaloosa.

### Maryland

BALTIMORE — Rustless Iron & Steel Corp., 1001 Edison Highway, has filed plans for construction of steel crane runway to be built by Engineering Contracting Corp., at a cost of \$13,000.

MIDDLE RIVER, MD. — Glenn L. Martin Co., maker of airplanes, plans doubling floor space of its plant here, and improving local airport.

### District of Columbia

WASHINGTON — Bureau of supplies and accounts, Navy department, will receive bids until Nov. 10 on one engine lathe, schedule 9138, for delivery Mare Island; one threading machine, schedule 9142, for delivery San Diego; 120 welding torches, schedule 9170, for delivery Brooklyn; miscellaneous outdoor transformers, schedule 9178, for delivery Philadelphia; one welding set, schedule 9211, for delivery Brooklyn. The bureau will receive bids until Nov. 13 for one engine lathe, schedule 9171, for delivery Puget Sound; one hacksaw machine, schedule 9177, for delivery Mare Island; and until Nov. 17 for miscellaneous diesel engines, schedule 9152, for delivery Norfolk; miscellaneous drill chucks, schedule 9158, for delivery various east and west coast points; 29,300 pounds of steel plates, schedule 9172, for delivery Mare Island; 20 floor machines, schedule 9187, also for delivery Mare Island; miscellaneous chain hoists, schedule 9189, for delivery various east and west coast points; and one radial

drill, schedule 9196, for delivery Puget Sound.

### Florida

HOWEY-IN-THE-HILLS, FLA. — J. R. Allen, operating cannery at Thomasville, Ga., leased plant of W. J. Howey Co. here, and will renovate building and add new equipment.

LAKE LAND, FLA. — John E. Ballenger Construction Co. is low bidder at \$16,250 for extension of power lines in section north of city limits.

TRENTON, FLA. — City voted \$19,500 bonds for improvement of waterworks.

### Georgia

ATLANTA, GA. — Jones Machinery Co., Bishop street N. W., will erect one-story, 60 x 60-foot addition to its plant.

BRUNSWICK, GA. — Scott Paper Co., Chester, Pa., and Mead Corp., Chillicothe, O., will be affiliated in development of Brunswick Pulp & Paper Co. It is planned to spend \$3,500,000 on the initial unit here.

FOLKSTON, GA. — Georgia Power & Light Co., Valdosta, applied to federal power commission for permission to acquire Folkston Power Co.

### Mississippi

ELLISVILLE, MISS. — City has PWA allotment of \$8182 for construction of improvements to waterworks system, including well, deep well pump and 220-volt motor, connection to city reservoir, and pump house.

ISOLA, MISS. — Town has PWA allotment of \$5454 for construction of improvements to waterworks system, including well, well-casing, pump and pump house.

PICKENS, MISS. — Town has PWA allotment of \$6364 for construction of improvements to waterworks system.

### North Carolina

CHARLOTTE, N. C. — Duke Power Co. will construct 72 miles of additional rural electric lines in Burke, Henderson, Polk and Transylvania counties.

GREENSBORO, N. C. — City rejected bids for Reedy Fork pumping station and residence; will call for new bids.

### Tennessee

CHATTANOOGA, TENN. — United States Pipe & Foundry Co. has completed alterations to plant buildings and will install machinery in January.

MEMPHIS, TENN. — City, light and water division, Goodwin Institute building, P. O. box 421, will have contracts ready soon for proposed electrical distribution system. M. J. McCall, above address, is chief electrical engineer.

MEMPHIS, TENN. — City borrowed \$300,000 from private bankers for beginning construction of municipal electric power distribution system estimated to cost \$6,872,000. Grant of \$3,092,000 has been approved by PWA.

NEWBERN, TENN. — City has PWA allotment of \$59,000 for construction of distributing system. Project will consist of building, switchboard, transformers, 94 street lighting units and 418 service connections.

### Virginia

COVINGTON, VA. — Town will improve water supply by construction of

(Please turn to Page 153)

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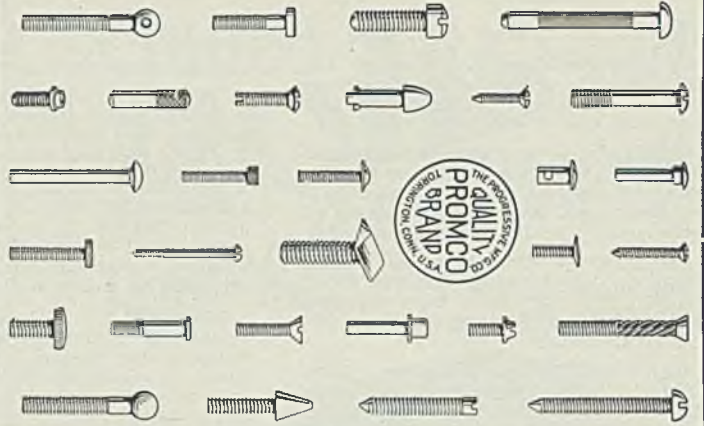
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(Concluded from Page 151)

reservoirs, water line extensions, booster pumps and pumping station. Cost is estimated at \$83,500.

**RICHMOND, VA.** — State corporation commission authorized expenditure of \$218,500 by Farmers Rural Utilities Inc. for rural electrification program in Caroline, Hanover and neighboring counties.

**SUFFOLK, VA.** — City has PWA allotment of \$31,000 for construction of electric generating system.

### Missouri

**CABOOL, MO.** — City plans to spend \$50,900 for construction of municipal diesel electric generating plant and distribution system. Project includes two 100-kilowatt diesel electric units, distribution system, and street lighting system.

**FORN FELT, MO.** — City will construct complete waterworks system, including deep well, pump, distribution system, and 75,000-gallon elevated steel tank. Federal aid has been granted.

### Arkansas

**LITTLE ROCK, ARK.** — City plans expending \$220,000 for municipal waterworks improvements. C. K. Mathews, associate with Burns & McDonnell Engineering Co., 107 West Linwood, Kansas City, Mo., is engineer.

### Oklahoma

**OKLAHOMA CITY, OKLA.** — City will increase treating capacity of its water plant, at a cost of \$170,000. Program includes extension of 30-inch main; installation of lime plant, pumping unit; and construction of two pressure tanks.

**POTEAU, OKLA.** — City has voted \$50,000 reservoir bonds.

### Texas

**HOUSTON, TEX.** — Cameron Iron Works, 711 Milby, has acquired site on Rusk street, adjoining plant, for future expansion.

### Wisconsin

**APPLETON, WIS.** — J. J. Plank & Co., makers of paper mill equipment, are constructing plant addition to manufacture new type of roll. J. J. Plank is president.

**CAMP DOUGLAS, WIS.** — Oakdale Co-operative Electric association will erect 80 miles of transmission and distribution lines in Juneau county, at a cost of \$95,000. E. B. Wayne, Capitol building, Madison, Wis., is engineer.

**GREEN BAY, WIS.** — Green Bay & Western Railway Co. has started work on machine shop, costing about \$15,000, at Norwood avenue and Clinton street.

**MILWAUKEE** — Haven Co., 530 West Lapham street, maker of milk-cooling apparatus, has merged with Babson Bros., Chicago, and will move to that city.

**MILWAUKEE** — Blatz Brewing Co., 1120 North Broadway, has let general contract to Stark-Wallner Construction Co. to build six-story stock house, 110 x 116 feet, with deep basement, tanks and other equipment. Cost is estimated at \$700,000. (Noted Sept. 28).

**SOUTH MILWAUKEE, WIS.** — Wisconsin Appleton Co., maker of malleable iron castings, has awarded general contract for foundry addition, 80 x 180 feet, to Austin Co., Cleveland. Investment will

be about \$40,000. E. B. Hansen is secretary.

**WAUKESHA, WIS.** — Waukesha Motor Co. has broken ground for machine shop extension, 66 x 154 feet, 21 feet high. J. B. Fisher is vice president and chief engineer.

### Minnesota

**ROCHESTER, MINN.** — City will spend \$25,848 for construction of warehouse, 48 x 120 feet, two stories and basement. Allotment from PWA has been secured.

### Kansas

**BAZINE, KANS.** — City has PWA allotment for construction of sewer system and disposal plant at a cost of \$32,727. Disposal plant consists of Imhoff tank, dosing chambers, trickling filter, and sludge drying beds.

**CLIFTON, KANS.** — City has PWA funds for improving waterworks system by drilling new well and erecting pump and pump house. Cost is estimated at \$17,272.

### Iowa

**MAQUOKETA, IOWA** — City will construct improvements to present water system, including erection of elevated steel tank, pumps, pump house, chlorinators and cooling tank, at a cost of \$40,800, with PWA aid.

**SPENCER, IOWA** — City will construct sewage pumping and disposal plant, including grit chamber, primary clarifier, trickling filter, secondary clarifier, separate sludge digester and sludge beds, to cost \$101,000. PWA aid has been granted.

### Nebraska

**BAYARD, NEBR.** — Chimney Rock power district has REA allotment of \$250,250 for construction of 218 miles of rural power lines in Morrill, Scotts Bluff and Banner counties.

**FULLERTON, NEBR.** — Boone and Nance counties public power district is being organized for construction of rural electrification lines in Boone and Nance counties. Edward Hall, Fullerton, is secretary.

### Colorado

**LA JUNTA, COLO.** — City plans waterworks improvement by adding four new wells, pumps, pump houses, booster pump and house, at a cost of \$15,800.

### Utah

**BOUNTIFUL, UTAH** — City will improve water distribution system and supply lines by replacing wood stave pipe with cast iron and steel mains, at a cost of \$25,454.

### Pacific Coast

**BEVERLY HILLS, CALIF.** — City will improve waterworks system with federal aid. Program includes cast iron pipe lines, two steel storage tanks and booster pumping plant. Cost is estimated at \$93,000.

**LOS ANGELES** — Premier Oil & Lead Co. plans \$3000 addition to its factory at 3950 Medford drive, City Terrace.

**LOS ANGELES** — Joshua H. Marks-Charde Co., new general contracting firm, has been organized by J. H. Marks and Newell Charde.

**LOS ANGELES** — Sears, Roebuck & Co. plan erection of \$400,000 one-story warehouse, 320 x 660 feet, on the west

side of Soto street, between Fifty-seventh street and Fruitland avenue.

**LOS ANGELES** — Eureka Iron & Metal Co. is having alterations made to office and shop building at 551 Macy street. Work includes erection of two-story steel frame shop addition, 80 x 100 feet, and two-story office addition, 30 x 80 feet, at a cost of \$35,000. Lester T. Squiers is architect.

**SAN DIEGO, CALIF.** — San Diego Consolidated Gas & Electric Co. is installing new machinery and equipment at a cost of \$2,220,000. Installations will include 35,000-kilowatt steam turbine generator unit, two boilers and auxiliary equipment.

**SANTA PAULA, CALIF.** — Briggs Lemon Association will build fruit-packing plant at a cost of \$175,000. Roy C. Wilson, Say road, is architect.

**WHITTIER, CALIF.** — Murphy Ranch is building \$100,000 lemon storage plant on Whittier boulevard at Penn street. C. C. Moore & Co. is contractor.

**PORTLAND, OREG.** — Beall Pipe & Tank Corp., 1945 North Columbia avenue, has opened office and warehouse on First avenue South, in charge of B. C. Larabee.

**OKANOGAN, WASH.** — Okanogan Packing Co., recently organized by G. K. Dodson and associates, has purchased 13-acre site and plans construction of meat packing plant.

**SEATTLE** — Index Gold Mines Inc., has been organized by Henry Stepman and associates, 603 West Crockett street.

**SEATTLE** — Sundfeldt Equipment Co. handling industrial, milling and mining equipment, has moved to 3315 First avenue South.

**SEATTLE** — Buchan Baking Co., 1604 North Thirty-fourth street, has opened bids for construction of 60 x 114-foot plant addition. Bids for new equipment will be invited later.

**SEATTLE** — Rainier Pulp & Paper Co., Shelton, Wash., has awarded general contract for construction of two warehouse buildings, 60 x 100 feet and 50 x 120 feet respectively, to Austin Co., Dexter Horton building.

**SEATTLE** — City Light, municipal plant, has completed preliminary plans for Ruby dam, Skagit river power project. Bids for the dam, to cost \$4,000,000, will be asked about the end of the year, and later bids will be invited for construction of \$2,000,000 transmission line. (Noted Oct. 26).

**SEATTLE** — General Paint Co., 1406 Dearborn street, has awarded general contract for rebuilding plant, recently destroyed by fire, to Austin Co., Dexter Horton building. New equipment and machinery to be installed include sprinkling system, pebble, roller and stone mills.

### Canada

**SIDNEY, N. S.** — Dominion Steel Co. will extend its plant at a cost of \$300,000. The program includes construction of two charcoaling plants, installation of electric furnace, replacement of steam engine with electric motor drive in the rod mill and installation of additional equipment at the blast furnace.

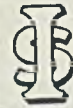
**BRANTFORD, ONT.** — Ruddy Freeborn Ltd. has been organized by E. T. Sterne, W. J. Freeborn and Fred Mann, to manufacture refrigerator cases.

**TORONTO, ONT.** — Mantle Lamp Co., Chicago, is establishing a plant for the assembling and finishing of electric floor and table lamps.

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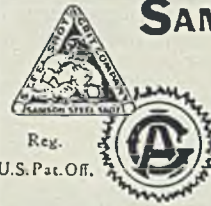
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