

STEEL

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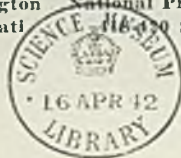
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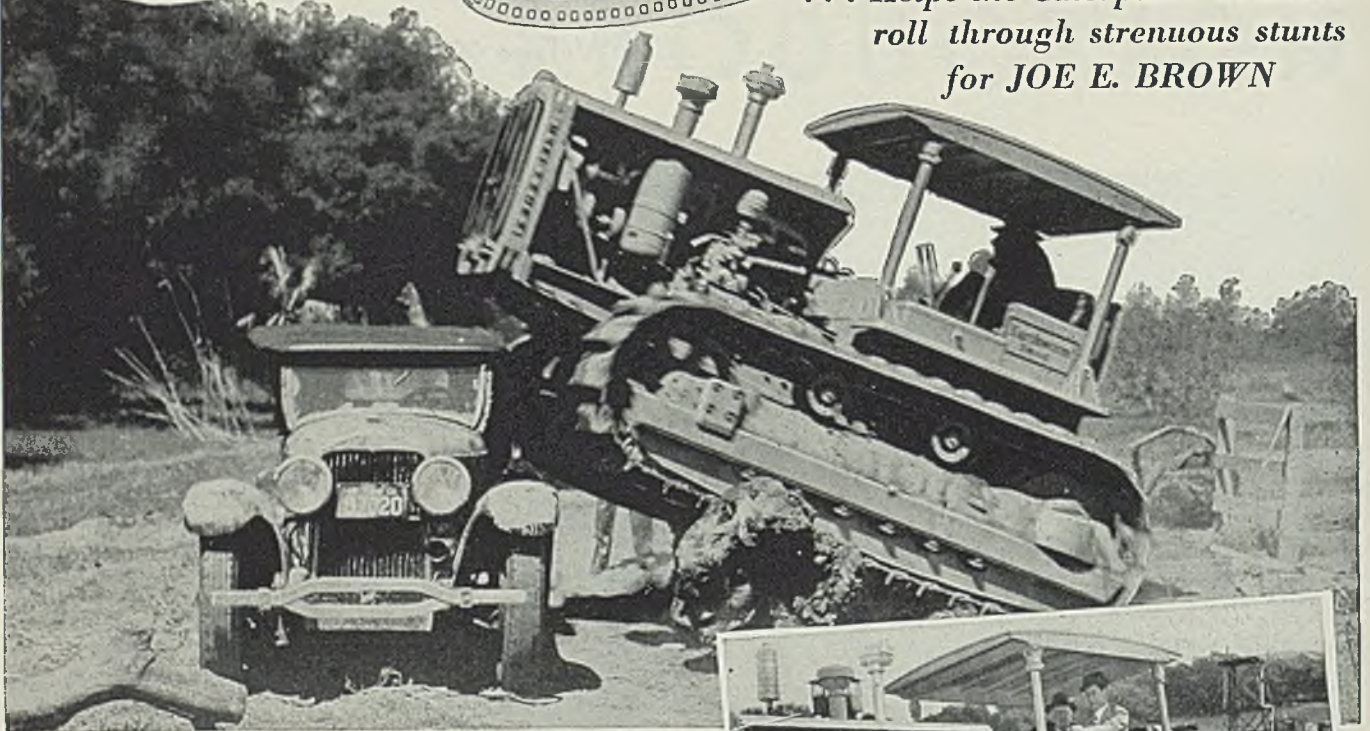




EVEN IN THE MOVIES

NICKEL PLAYS THE HEAVY RÔLE

... Helps the Caterpillar Tractors roll through strenuous stunts for JOE E. BROWN



Caterpillar tractor crashing through a fence and hurdling a car, as part of a wild-cat ride in the film "Earthworm Tractors."

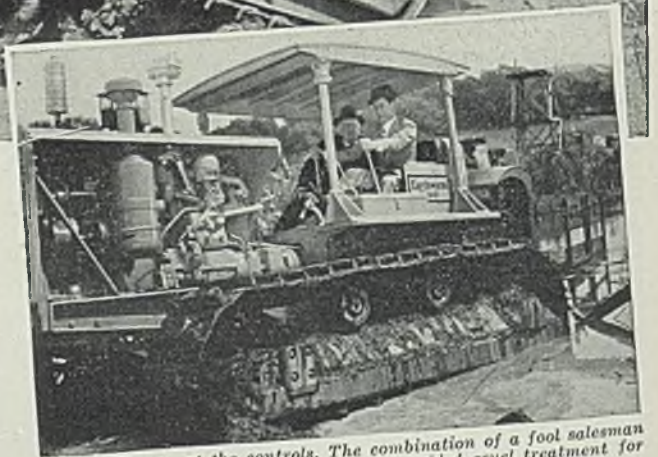
● No farmer in rocky hills, no construction gang, has ever put tractors through such a succession of stresses, bumps and jolts as the Caterpillar Diesel tractors had to take in the recent Warner Brothers' film, "Earthworm Tractors."

All tractors in the film are Caterpillar Diesels, taken from stock. The plot called for action: one of the mildest stunts the "star" tractor did was hurdle an automobile.

That the tractors came through all these jolts, surprised no engineer who knows the way Caterpillar builds machines. Quality materials for every part is their policy.

Caterpillar used about ten million pounds of Nickel alloys in 1935. Much of this is S.A.E. 2345, 3½% Nickel steel, which goes into the highly stressed gears and bolts. Cylinder heads and liners, piston rings, and starting engine crankshafts are made from Nickel Cast Iron.

For that extra resistance to fatigue and stress which all Diesels demand, engineers are turning more and more to alloys of Nickel. Find out where you can step-up the strength and dependability of your Diesel engines, by describing your special needs to Inco's technical staff.



Joe E. Brown at the controls. The combination of a fool salesman (Brown's rôle) and a heavy swamp provided cruel treatment for the tractor.



The camera can't very well feature the Nickel alloy gears and cylinder heads. They're out of sight,—but they help the "Caterpillar" laugh off punishment in every day rough work.

NICKEL STEELS AND CAST IRONS

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL ST., NEW YORK, N. Y.

As the Editor Views the News

TOMORROW more than forty million citizens of this nation will cast ballots to select an administration for the federal government. The candidates of both major political parties are running on "progressive" platforms. Both seek a common object—improvement in the economic and social status of the country—yet the methods they propose are as far apart as the poles. The party now in power desires a mandate to permit it to continue to build up a strong, centralized, paternalistic organization in Washington. The other party would put less emphasis on centralized authority and would rely more heavily upon private initiative for economic and social progress.

. . .

This conflict over method is well illustrated in the argument over provisions of the social security act which has been injected into the eleventh-hour of the present campaign. New dealers and Republicans agree that unemployment insurance and old-age pensions are desirable. Industry generally favors these objectives in principle, but like many Republicans and Democrats, it differs with new dealers on the method. The law providing for the alleged social security was drafted hastily and is admittedly impractical and defective in many respects. We can see no reason why its defects and its advantages are not proper subjects for debate in the present campaign.

Social Security 11th Hour Issue

ers and Republicans agree that unemployment insurance and old-age pensions are desirable. Industry generally favors these objectives in

From the attitude displayed by some new dealers and by the special senate committee investigating campaign expenditures, one would think that

Public Will Know Who Pays

it is a crime for an employer to place literature pertaining to the election in the pay envelopes of employes. The messages in pay envelopes dealing with deductions

for old-age pensions have been condemned vigorously by some politicians. From the anguish of their howls one would think that it is their money that is involved. Perhaps the fuss now being made over

the deductions will drive home the fact to employes and to the public that the cost of social "security" really is going to be borne directly by employes and indirectly by the public (through employers). The value of the election episode in familiarizing the public with this important but vaguely understood legislation will far outweigh the value of its effect on the voting on Nov. 3.

. . .

Straight-line assembly systems were born in the automotive industry, and their advantages have been translated into profits for numerous other fields of manufacture. Efficient as they are, however, these long stretches of conveyor line require extended building space and accommodating them often presents a knotty problem to plant layout men. In Packard's rearranged and refurnished plant (p. 42), a turntable or "merry-go-round" platform for radiator and front fender assemblies supplies the answer to completing these assemblies within restricted space and at the proper speed for the main assembly line. Throughout this entire plant are excellent examples of the automotive industry's reliance on the newest and finest production equipment for supplying "more goods to more people."

Uses Circular Assembly Line

fields of manufacture. Efficient as they are, however, these long stretches of conveyor line require extended building space and accommodating them often presents

. . .

Not all industries, of course, are concerned with quantity production methods. For instance, aircraft manufacturers are more concerned with adapting their equipment for frequent design changes and small runs. Two plants on the Pacific Coast have found the drop hammer (p. 46) an ideal tool for use in forming various duralumin parts. These hammers are not of the type encountered in steel forging work, however, being equipped with dies of lead and zinc which can be cast quickly — often right on the hammer — and later remelted for further use. The hammers are not powered; instead the upper die is hoisted by a rope through block and tackle arrangement, then allowed to fall of its own weight over the blank resting on the lower die. Here is a drop hammer in the truest sense of the word.

Drop Hammers In Novel Role

aircraft manufacturers are more concerned with adapting their equipment for frequent design changes and small runs. Two plants on the Pacific Coast have found the drop hammer (p. 46) an ideal tool for use

E. L. Shaner

Steel Producers' Profits Four Times Those of 1935

STEELMAKERS' profits so far this year are about four times as large as in the comparable period in 1935.

This represents the first ten of the leading producers to report, including the United States Steel Corp., and Bethlehem Steel Corp. The ten have 81 per cent of the nation's ingot capacity.

Measured by total ingot production, this year is 40 per cent ahead of 1935. In point of profits, as indicated by these financial reports, it is 300 per cent ahead.

The improvement has been two-fold; first showing the industry's recuperation power when operating in the higher brackets; the second reflecting the higher level of prices.

Prices Also Higher

In the nine-months period this year steelworks operations averaged 65.4 per cent, and in the period last year 46.6 per cent. For the nine months this year STEEL's composite of finished steel prices averaged 87 cents a ton above that in 1935.

Net profits of the ten producers this year total \$75,204,792 compared to \$18,466,565 for the same companies last year.

Based on their experience, total net profit in the nine months for the industry was about \$92,845,000. For the full year 1935 the industry's actual net profit was \$62,961,961.

Combined, these profits for 21 months — \$155,803,961 — make up more than the industry's net loss of \$137,019,528 in the year 1932.

Taking the difference into account,

there still remains \$65,251,629 to be made up to offset an aggregate loss of \$84,039,062 representing the years 1931, 1933 and 1934. Eight more months at the rate the industry has been going would net a larger sum.

Indicated average profit per ton of ingots produced by the industry in the nine months this year is \$2.24, compared with an indicated 71 cents in the nine months last year.

Estimated individual profit per ton based on each company's ingot capacity was much higher than last year.

For the United States Steel Corp. it is approximately \$1.12, compared with a loss of 16 cents in the nine months in 1935. Bethlehem Steel shows about 92 cents, compared with 20 cents profit last year. Inland Steel, tops the list with \$4.50, compared with \$3.33. National Steel's \$3.81 this year is about the same as last year. Republic Steel's average this year is approximately \$1.10 per ton of ingot capacity; Youngstown Sheet & Tube, \$2.19; Wheeling Steel Corp., \$1.18; Jones & Laughlin Steel Corp., 56 cents.

Practically all reports note that no provision has been made for surtax on undistributed profits, to be accounted for at the close of the year.

U. S. STEEL'S RECOVERY: PAYROLLS UP 31.6 PER CENT

Last year after nine months' operations the United States Steel Corp. had incurred a deficit of \$4,241,499. This year after nine months the Corporation's profit is \$29,874,904.

The third quarter of 1936 has been the best since 1930. Net income of \$13,636,177 is a gain of

\$773,754 over the second quarter's \$12,862,423. The third quarter of 1935 resulted in a deficit of \$1,305,205.

Preferred stockholders will receive a dividend of \$3.75 per share, \$1.75 for the September quarter, the first full quarterly dividend since February, 1933, and \$2 applying on arrearages. This payment will reduce the arrearages on the preferred to \$16.25 a share, or a total of \$58,545,679.

Net earnings in the third quarter are equal to 84 cents a share on the common stock after the regular quarterly preferred dividend. In the second quarter of this year 75 cents was earned on the common. Nine months' earnings are equivalent to \$1.25 a share on the common, compared to a deficit of \$2.66 in the same period last year.

Most Employes Since 1929

Third quarter shipments of finished steel, 2,836,357 tons, are slightly less than the 2,850,039 tons in the second quarter, but nine months' deliveries, 7,867,707 tons, are well ahead of the 5,341,223 tons in the comparable period last year. The net profit per ton would be \$3.79 in the nine months this year, compared to a deficit of \$1.25 in the same period last year.

The Corporation's payrolls show a 31.6 per cent increase in the nine months this year over the same period last year, and the number of employes, 216,709, is the largest since 1929.

Operations for the third quarter averaged 63.6 per cent of capacity, compared with 60.8 per cent in the June quarter. For the nine months ending Sept. 30 the average was 57.1 per cent, compared with 37.1 per cent for the same period in 1935.

Expenditures on capital account for additions and betterments and in payment of maturing subsidiary companies' bonds and mining royalty notes aggregated \$51,600,000 dur-

Third Quarter and Nine-Months Financial Comparisons for Iron and Steel Producers

All figures are profits except where asterisk denotes a deficit

	Thrd quarter 1936	Second quarter 1936	Thrd quarter 1935	Nine months 1936	Nine months 1935	Ingot capacity gross tons
United States Steel Corp.	\$13,636,177	\$12,862,423	\$1,305,205*	\$29,901,904	\$4,241,499*	\$26,657,000
Republic Steel Corp.	3,311,555	2,661,062	507,731	6,633,649	3,264,295	6,053,000
Jones & Laughlin Steel Corp.	1,870,866	1,115,738	233,914	2,053,320	516,463*	3,660,000
Youngstown Sheet & Tube Co.	2,359,998	2,588,089	574,799	6,845,386	103,788	3,120,000
Inland Steel Co.	3,788,199	3,298,191	1,801,203	9,021,022	6,668,509	2,000,000
Sharon Steel Corp.	342,418	268,335	.....	823,370	.....	450,000
Ludlum Steel Co.	270,968	271,369	11,947	705,350	447,482	38,000
Wheeling Steel Corp.	1,186,660	871,288	648,597	2,068,859	2,251,468	1,750,000
Bethlehem Steel Corp.	4,575,058	3,431,391	701,616	8,609,514	1,895,227	9,360,000
National Steel Corp.	3,359,704	2,805,570	2,287,763	8,542,418	8,603,758	2,240,000
FINISHING CAPACITY ONLY						
Acme Steel Co.	538,847	513,774	384,479	1,444,474	1,319,817	.....
Superior Steel Corp.	118,010	58,726	39,206*	203,824	32,524*	.....
PIG IRON CAPACITY ONLY						
Interlake Iron Corp.	99,311	48,978*	259,493*	67,634	674,252*	1,215,000
Virginia Iron, Coal & Coke Co.	8,029	60,508*	36,283	89,985*	58,889*	200,000

ing the nine months this year. The unexpended balances for authorized modernization expenditure made to Oct. 1 equal \$84,000,000.

Net working assets of the Corporation and subsidiaries exclusive of liability for dividends declared and unpaid, were as follows:

Dec. 31, 1931	\$450,432,522
Dec. 31, 1935	389,194,778
Sept. 30, 1936	413,871,904

The third quarter dividend and the dividends previously declared for 1936 aggregate \$18,914,758, leaving a net after dividends for the nine months of \$10,960,147. The total draft on undivided surplus from Oct. 1, 1931 to Oct. 1, 1936, is \$185,492,947.

By-laws of the Corporation have been amended to permit dividend action in respect of arrearages on preferred stock dividends at any regular or special meeting of the directors.

Employment and payroll statistics of the Corporation are as follows:

	9 months ending Sept. 30	
	1936	1935
Employees	216,709	194,222
Payroll	\$242,635,540	\$184,361,434
Aggregate hours	331,380,111	253,159,655
Av. hrs. per employe per mo..	169.9	144.8
Average earnings per hour.....	\$0.73	\$0.73

BETHLEHEM SURPLUS MAY MEAN COMMON DISBURSEMENT

Bethlehem Steel Corp. reports net profit in the quarter ended Sept. 30 amounted to \$4,575,058, equal to 84 cents a common share, compared with \$3,431,391 or 49 cents in the second quarter, and \$701,616 in the third quarter of 1935 when earnings failed to cover preferred dividend requirements.

President Eugene G. Grace said the fact that the company will have about \$5,000,000 on hand after paying the year's preferred dividends, probably will lead the board of directors to consider a common disbursement in December.

Regular quarterly dividends of \$1.75 a share and 25 cents a share on the 7 per cent and 5 per cent preferred stocks, respectively, were ordered.

Value of orders on hand had increased to \$93,272,198, the largest in several years from \$89,561,632 at the end of the second quarter, enough to support an operation of 75 per cent. Bethlehem's production increased to an average of 69.5 per cent in the third quarter.

INLAND STEEL CO.

Inland Steel Co.'s earnings for third quarter are equal to \$2.52 per share on 1,499,000 shares outstanding on that date. The earnings include third quarter earnings of Inland Steel Co. acquired on July 1.

Cash dividend of 75 cents per



Irving Sands Olds

COINCIDENT with the United States Steel Corp.'s financial report last week was the announcement that the corporation's by-laws have been amended increasing the number of directors by three, making a total of 18, the number of each class as to date of expiration of terms being increased by one. Mr. Olds, of the legal firm White & Case, New York, was elected to one of the additional directorships, term expiring 1939. The other two directorships will be filled later. Mr. Olds also was elected a member of the finance committee, membership of which was increased by one. For biographical sketch of Mr. Olds see page 30.

share on capital stock was declared payable Dec. 1 to stockholders of record Nov. 13.

As soon as the earnings for the full year can be more accurately estimated, the directors intend to consider the advisability of declaring

an additional dividend for payment before the end of the fiscal year.

NATIONAL STEEL CORP.

National Steel Corp. reports net earnings for the quarter ending Sept. 30 of \$3,359,704.57, equal to \$1.56 per share on 2,157,177 outstanding shares of capital stock. This is after all charges except that no provision has been made for federal tax on undistributed earnings. The net compares with \$2,287,763.49, equal to \$1.05 per share, in the third quarter last year. In the first quarter of 1936 earnings were \$2,377,144.69, equal to \$1.10 per share, and in the second quarter, \$2,805,570.10, equal to \$1.30 per share.

REPUBLIC STEEL CORP.

A consolidated net profit of \$3,311,555 was reported by Republic Steel Corp. for the third quarter. This is after deduction of interest on funded debt amounting to \$1,040,707, depreciation and depletion charges of \$2,599,580, and a provision for estimated federal income and undistributed profit tax amounting to \$1,118,207. For the first three quarters, Republic's net profit is \$6,333,649, including \$2,666,062 consolidated net profit for the second quarter.

Operating profits for the quarter after deduction of charges for maintenance and repairs of plants, depreciation and depletion and interest on funded debt but before deduction for estimated federal income taxes amounted to \$4,442,596. Corresponding profits for the first three quarters amounted to \$8,232,975. The corporation's operating

Earnings of Consumers, Fabricators and Suppliers

All figures are profits except where asterisk denotes a deficit

	Third Quarter		Nine Months	
	1936	1935	1936	1935
Transue & Williams Steel Forging Corp., Alliance, O.	20,133	25,482*	95,104	50,697
Doehler Die Casting Co., Toledo, O. . .	219,595	138,639	710,552	499,345
Federal-Mogul Corp., Detroit.....	102,925	36,736	329,010	127,617
Westinghouse Air Brake Co., Wilmerding, Pa.	1,153,091	63,191	2,503,764	32,181*
Caterpillar Tractor Co., Peoria, Ill. . .	2,551,379	1,403,491	7,032,470	4,311,643
Williamsport Wire Rope Co., Williamsport, Pa. ....	.....	.....	445,889	240,356
Midland Steel Products Co., Cleveland	262,188	89,811	1,299,657	743,311
Eaton Mfg. Co., Cleveland	501,431	223,917	1,836,716	1,265,877
Motor Products Corp., Detroit.....	152,345	25,589	958,243	718,694
A. M. Castle Co., Chicago	162,207	80,629	396,426	251,324
Rustless Iron & Steel Corp., Baltimore	103,151	.....	228,273	129,779
Clark Equipment Co., Buchanan, Mich.	110,663	51,958*	353,531	24,902*
General Refractories Co., Philadelphia	508,941	.....	1,052,308	426,035
Marion Steam Shovel Co., Marion, O. .	74,376	47,785	110,155	143,030*
Bliss & Laughlin Inc., Harvey, Ill. . .	.....	.....	444,725	282,159
General Motors Corp., New York....	34,626,078	30,753,088	178,198,624	114,482,926
Borg Warner Corp., Rockford, Ill. . .	1,403,519	1,201,676	4,861,644	4,213,000
Link Belt Co., Chicago	623,739	326,343	1,382,061	858,927
National Acme Co., Cleveland.....	160,816	34,834	468,946	121,262
Keystone Steel & Wire Co., Peoria, Ill.	222,705	382,049	.....	.....
U. S. Hoffman Machinery Corp., New York	102,299	23,427	420,537	135,778
Pittsburgh Screw & Bolt Corp., Pittsburgh	210,487	7,669	712,088	76,263*
Symington Co., New York	46,181	86,001*	110,982	215,908*
Spang Chalfont Co., Pittsburgh.....	1,559,280	117,913	1,562,559	717,544

rate for the third quarter was 74.2 per cent.

YOUNGSTOWN SHEET & TUBE

Youngstown Sheet & Tube Co. reported net profit of \$2,359,998 for the third quarter, compared with a net profit of \$2,588,089 for the second quarter this year, and \$574,799 in the third quarter of 1935. Profit figures are without deduction for any federal surtax on undistributed profits.

Cash and marketable securities, valued at the lower of cost or market, as of Sept. 30 amounted to \$9,010,070 and the ratio of current assets to current liabilities was 6.08 to 1.

Preferred dividend payable Oct. 1, amounting to \$206,250 was paid on that date. Accumulated preferred dividend for one quarter in amount of \$206,250 also was paid on that date. Preferred dividends in arrears at Oct. 1 amounted to \$2,681,250.

KOPPERS CO. TO ISSUE BONDS FOR \$25,000,000

A registration statement for the sale of \$25,000,000 of 15-year first-mortgage and collateral trust bonds has been filed with the SEC by Koppers Co., Pittsburgh. Proceeds will be used to redeem \$17,746,000 principal amount of the company's 5½ per cent debenture gold bonds at 103½, to retire notes payable in the amount of \$4,650,000, and for added working capital.

Sales by the company and its wholly owned subsidiaries for the 12 months ending June 30, 1936, totaled \$33,692,057, an increase of \$7,461,618 over the 12 months ending Dec. 31, 1933. Net earnings for the period ending June 30, 1936, after depreciation, and available for interest charges, were reported as \$3,830,786, or 3.83 times the interest requirements of \$1,000,000 on the proposed bond issue.

DIVIDENDS DECLARED

American Rolling Mill Co., Middletown, O., last week declared an extra dividend of 75 cents and a regular quarterly dividend of 30 cents a share on common. The extra is payable Dec. 15 to record Nov. 14 and the regular dividend Jan. 15 to record Dec. 15. It also authorized calling for redemption and payment on Dec. 5 at 102½ and accrued interest all outstanding 4¼ per cent convertible debentures due 1945. There are outstanding approximately \$12,700,000 of these debentures.

United Engineering & Foundry Co., Pittsburgh, has declared a \$1.75 preferred dividend and a 50-cent common dividend, both payable Nov. 17 to Nov. 7 record.

Last week, coincident with release of the earnings statement Jones & Laughlin Steel Corp. directors de-

District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended		Same week	
	Oct. 31	Change	1935	1934
Pittsburgh ..	69	- 1	47	19
Chicago	76	+ 1½	55	30
Eastern Pa....	48	None	38½	20½
Youngstown..	76	- 1	63	30
Wheeling	86	- 6	84	31
Cleveland ...	77	- 2½	72	38
Buffalo	87	+ 3	42	26
Birmingham..	61½	None	58½	25
New England	75	None	70	30
Detroit	95	- 5	94	59
Cincinnati ...	96	None	†	†
Colorado	38	None	†	†
Average.....	73	None	54½	27

†Not reported.

clared a \$1.75 per share dividend on the preferred stock on account of arrearages to Nov. 30 record, payable Dec. 15.

Chain Belt Co., Milwaukee, declared a fourth quarter dividend of 62½ cents, payable Nov. 16 to stock of record Nov. 2. This is the same as the dividend paid in the third quarter, and brings the year's payments to \$2.05.

Production

STEELWORKS operations last week were unchanged at 73 per cent. This compares with 54½ and 27 per cent, respectively, in the same weeks of 1935 and 1934. Details follow:

Cleveland—Off 2½ points to 77 per cent, as Otis Steel Co. dropped one open hearth to operate seven.

Chicago—Advanced 1½ points to 76 per cent, recovering the loss experienced the preceding week. Blast furnace schedules are steady, with 25 of 38 active.

Detroit—Off 5 points to 95 per cent, with 20 out of 21 basic open-hearth furnaces operating.

Wheeling—Off 6 points to 86 per cent, based on production schedules in 32 out of 37 open-hearth furnaces.

Pittsburgh—Down 1 point to 69 per cent, due to curtailment in operations of United States Steel Corp. subsidiaries, which were 64-65 per cent. Independents averaged 78-80 per cent. Forty-one out of 60 blast furnaces are active.

Cincinnati—Unchanged at 96 per cent, with 23 open hearths active.

Buffalo—Advanced 3 points to 87 per cent, with 32 open hearths in production.

Birmingham—Thirteen active open-hearth furnaces have held the steelmaking rate at 61.5 per cent. Tennessee Coal, Iron & Railroad

Co.'s rail mill will resume this week, and two or three additional open hearths will be lighted.

Youngstown—Off 1 point to 76 per cent, as Republic Steel Corp. shut down two of its furnaces here, and Youngstown Sheet & Tube Co. closed one at its Brier Hill works, reducing the active units to 63 out of a total of 83.

New England—Held at 75 per cent, with little variation expected.

Colorado—Unchanged at 38 per cent for the fourth consecutive week; six furnaces active.

Central eastern seaboard—Held at 48 per cent.

Woodward Reorganization Up for Hearing Nov. 7

Hearing on a petition for the reorganization of the Woodward Iron Co., Birmingham, under section 77-B of the federal bankruptcy law, will be held in federal court there Nov. 7.

Under the plan the company, which has four stacks in its blast furnace plant, iron ore, coke ovens and coal mines, hopes to reduce fixed interest charges. New first mortgage 5 per cent bonds will be exchanged for the present outstanding notes. New second mortgage bonds will be issued for the accrued interest not paid in the last four years and amounting to \$2,354,000. A total of \$7,834,000 first mortgage bonds will be issued and \$8,241,000 second mortgage bonds.

Tennessee Subsidiary Improving Sheet Mill

Tennessee Coal, Iron & Railroad Co., Steel Corp. subsidiary, is making additions to its sheet mill at Fairfield, Ala., works which will cost approximately \$1,125,000 and increase production 40,000 tons annually. The appropriation is in addition to the \$29,000,000 to be spent in construction of a tin plate mill and auxiliary plants as recently announced.

Mine and Equipment Sold

Entire properties and equipment of the Graceton Coal & Coke Co., Graceton, Pa., near Indiana, Pa., were sold recently to the Max Solomon Co., Pittsburgh. The mine, which is in operating condition, is complete with tippie washer, one steam locomotive, and numerous other equipment items. There are 8000 acres of coal land involved and 200 coke ovens. A store building, office building, 80 houses and three large concrete tanks were among the property sold.

Wage Action Considered, Is Word with Earnings Reports

ACCOMPANYING the release of their third quarter financial statements last week United States Steel Corp., and Bethlehem Steel Corp. referred to the wage problem.

Regarding labor, there were these significant paragraphs in United State Steel's report.

"During the past year management has been engaged in an intensive study of the wage structure in the subsidiary companies of the Corporation. In many cases, differentials between occupations are either too great or too small. "The problem, therefore, has been to develop a sound method of evaluation of employment services in order that the basic wage structure shall permanently reflect, in an equitable manner, the relative values of the various occupations. "This work in many of the plants of the Corporation is now well advanced, and, at an early date, will be in form for submission to and discussion with employe representatives and employes generally."

In issuing Bethlehem's report, President E. G. Grace said his company has under consideration the possibility of wage advances, but nothing definite has been decided. From a study of earnings, he added, it is self-evident that the price of steel would have to be advanced before wages are raised.

STEEL'S own compilations indicate that net earnings for the industry this year, as strong as the recovery from the depression low has been, are only about 2 per cent on capitalization.

That efforts to organize the steel industry are likely to be redoubled following the election was indicated at labor headquarters in Washington. The steelworkers organizing committee has been called into conference by the CIO in Pittsburgh, Nov. 7 and 8.

The national labor relations board ordered the Crucible Steel Co. of America to end alleged interference with employes in its Jersey City, N. J., mills, who are affiliated with the American Federation of Labor. The board also ordered reinstated with back pay two who were said to have been discharged after their election as president and sergeant-at-arms of their local union.

OTIS CO. REFUSES WAGE DEMAND, CLOSES DEPARTMENT

Following an ultimatum from employes in its blanking department, Otis Steel Co., Cleveland, last week closed the department.

E. J. Kulas, president, said the employes' committee refused to per-

mit normal production; that output had been restricted 50 per cent.

On Oct. 16 the company began a new system of computing wages in the department "to eliminate certain inequalities and also to make possible higher earnings."

At subsequent meetings the committee is said to have presented demands for prohibitive hourly rates, plus a tonnage bonus, and declared that normal output would not be resumed unless they were granted.

Later in the week, labor leaders said, several hundred of the 450 "locked out" had voted to return on conditions prevailing before their final demands were made, but pending clarification of what they meant the department remained closed.

Employes Given Chance To Improve Knowledge of Steel

Employes of Jessop Steel Co., Washington, Pa., will be given the opportunity to improve their knowledge of the science of steel-making at a series of classes to be conducted by the company two nights a week throughout the winter and spring months.

Subjects to be covered deal with the theoretical, physical, and practical phases of steel manufacture. Instructors include C. A. Liedholm, metallurgical engineer; R. E. Malmberg, metallurgist; and F. P. McGahan, manager of service.

Gross Profit May Be a Loss, Lukens Tells Labor Leaders

Labor leaders who do not know the difference between net and gross profits are taken to task in a folder issued recently by the Lukens Steel Co., Coatesville, Pa., in which the company asks whether the steel workers organizing committee has resorted to the use of "half facts and false interpretations."

The folder was a reply to a labor circular saying that Lukens' 1935 gross profit of \$1,076,189 meant that every steel producing employe had produced "\$597 gross profit for the company."

Items of expense entirely omitted from the labor circular, according to Lukens, included: administrative and sales expense, interest, legal costs, advertising, bad debts, pensions, insurance, federal and state

taxes, depreciation and research expense, all totaling \$1,383,918.

"The final figure for Lukens for the year was a net loss amounting to \$307,728," said the company. "Obviously, Lukens did not make any profit in the year and consequently no profit on any employe. It would be just as unfair and silly to divide the number of employes, 1812, into the net loss of \$307,728 and say that each employe caused the company a loss in the year averaging about \$170."

September Exports Are Below August

EXPORTS of steel and iron products, except scrap, in September totaled 78,653 gross tons, valued at \$5,725,286, which is 17.8 per cent less in quantity and 9 per cent lower in value than in August, according to the metals and minerals division of the department of commerce. Compared with September, 1935, the quantity was 9.7 per cent lower but the value 4.3 per cent higher.

The largest decline in September compared with August was in heavy rails, 9584 tons; tin plate dropped 5748 tons, cast iron pipe 2106 tons, plates 1789 tons and wire rods 992 tons.

Black sheet exports made the heaviest gain over August, 3063 tons, fabricated shapes 1130 tons, barbed wire 1065 tons, cold-rolled strip 770 tons and shapes 748 tons.

The largest export tonnage in September was black sheets, 10,178 tons; other large items, tin plate 8895 tons, shapes 5974 tons, skelp 5781 tons.

Total exports, except scrap, for nine months were 827,934 gross tons, valued at \$60,597,853. This is a gain of 20.6 per cent in quantity and 28.4 per cent in value over the corresponding period of 1935.

September exports of scrap items totaled 157,111 tons, 21.2 per cent in quantity and 22.8 per cent in value below those of August. Compared with September, 1935, a decline of 1.9 per cent in quantity was shown, with a value increase of 11.1 per cent.

Total steel and iron exports for nine months of 1936 were 1,630,582 gross tons, valued at \$20,057,869. This is a decline of 3.8 per cent in quantity and an increase of 10.5 per cent in value compared with the corresponding period of 1935.

Refund of \$32,635.99 has been granted to the Consolidated Steel Corp., New York, for overassessment of 1920 taxes, according to announcement made by the commissioner of internal revenue.

Gas Association Heartened By Revival in Industry

VIGOROUS strides in the application of gas to industry were reported by gas producers and equipment manufacturers in Atlantic City, N. J., last week. The occasion was the eighteenth annual meeting of the American Gas association and the first annual convention of the Association of Gas Appliance and Equipment manufacturers, which were held jointly.

Increasing use of gas was attributed not only to growing industrial activity, but to notable improvements in gas-fired equipment. It was said refinements in apparatus have been far in advance of the ability of gas producers to saturate their market.

Evidences of the technical improvement in equipment were seen at the large exhibit in the Atlantic City auditorium, where more than 150 manufacturers had their products on display, including several large steel companies.

Engineering improvements in industrial gas apparatus and their economic effect were discussed by Oliver Lloyd Maddux, United Gas & Fuel Co. Ltd., Hamilton, Ont. (see p. 75).

Controlled Atmospheres

Hale A. Clark, chairman, Detroit City Gas Co., Detroit, in submitting the report of the ferrous metals committee, said that in general special atmosphere for hardening operations is being found highly desirable, particularly where tools or machine parts are finished to exact dimensions before the hardening process.

Relative to normalizing, he stated that the 40-foot gas normalizing furnace, noted last year as having been installed in the Detroit district, has proved so successful that at least two additional units have been placed in operation. Gas appears to be particularly suitable for this type of work, it was said, because of the ease with which the required controlled drop in temperature is obtained.

Mr. Clark observed that there is a considerable reduction in the use of the "process" or "shop" method of annealing sheets. This is probably due largely, he said, to the fact that the trend is toward the use of single sheet of larger dimension for the sides and tops of automobile bodies and other assemblies, in which this process of annealing had formerly been largely used on smaller sheets.

In forging operations, the com-

mittee is of the opinion, based on some recent tests in Detroit, that the luminous flame, or delayed combustion type of burner, is the proper equipment for this work, not so much because of the saving due to the probability of reduced scale, but

New Officers

AMERICAN GAS ASSOCIATION

President

Herman Russel, Rochester Gas & Electric Corp., Rochester, N. Y.

First Vice President

N. C. McGowen, president, United Gas Public Service Co., Houston, Tex.

Second Vice President

Conrad N. Lauer, president, Philadelphia Gas Works Co., Philadelphia

Treasurer

J. F. Rooney, assistant to executive vice president, Consolidated Edison Co. of New York, New York

Chairman, Industrial Gas Section

Ralph L. Manler, Syracuse Lighting Co., Syracuse, N. Y.

Vice Chairman

Hale A. Clark, Detroit City Gas Co., Detroit

Chairman, Technical Section

M. I. Mix, Peoples Gas Light & Coke Co., Chicago

Vice Chairman

J. V. Postles, Philadelphia Gas Works Co.

because of increasing efficiency through having combustion take place immediately at the work, with the resultant higher flame temperature at that point rather than in the burner tunnel.

W. Wirt Young, chairman, Connecticut Light & Power Co., Waterbury, Conn., presented the report of the nonferrous metals committee. Pointing out that the annealing of copper and its alloys comprises the largest present and potential use of gas in the nonferrous field, he estimated that less than 20 per cent of the total available business in this field is now using gas.

Describing gas as "the only medium which can supply both heat and atmosphere—the twin requisites of present-day heat treating processes," Frank H. Adams, general manager, Surface Combustion Corp., Toledo, O., pointed to refinements in heating processes which have broadened the use of this fuel.

He spoke particularly of the changes in steel processes, recalling the time when sheet furnaces were coal fired and the lack of uniformity in heating was compensated for

only by an adjustment of the rolls. The automotive industry changed all this, he said. The continuous mill was developed, hand mills installed, automatic feeders and catchers, metallurgical specifications became more exacting and heat treatment underwent further refinement. Gas was able to share with other fuels as equipment was brought out which gave the same degree of control and performance of competing types of furnaces.

Dr. Scott Ewing, American Gas association research associate, national bureau of standards, Washington, discussed tests of pipe coatings, confining part of his report to field tests and the remainder of laboratory tests of new pipe coatings. Of the latter the most effective coatings, he said, all consisted of a waterprof bitumen next to the pipe, shielded or reinforced by some rather rigid material.

Discussing field tests, Dr. Ewing said that if any coating is justified it should be at least 0.1-inch thick. The upper limit of thickness is more variable, depending upon the cost of coating material and other factors.

Gas-operated air conditioning units for industrial plants were described by Charles W. Swenson, sales engineer, Consolidated Edison Co. of New York Inc., New York; however, of the applications listed, the nearest approach of the metal-working industry appeared to have to do with chemical and testing laboratories.

C. G. Conley Again Heads Constructors

AMERICAN Institute of Steel Construction has re-elected as president for another year Clyde G. Conley, Mount Vernon Bridge Co., Mount Vernon, O. He was first elected president in October, 1932.

Other officers re-elected: Clyde MacCornack, Phoenix Bridge Co., Phoenixville, Pa., first vice-president; H. A. Fitch, Kansas City Structural Steel Co., Kansas City, Mo., second vice president; Robert C. Post, Post & McCord Inc., New York, treasurer; Robert T. Brooks, executive vice-president and assistant treasurer; V. G. Iden, secretary.

These elections were made by the board of directors, meeting immediately after the fourteenth annual convention, in White Sulphur Springs, W. Va., Oct. 23 (STEEL, Oct. 26, p. 26).

One new director was voted by the convention, W. B. Truitt, Carolina Steel & Iron Co., Greensboro,

N. C. A total of 275 attended the convention, largest since 1929.

A number of members went to Hot Springs, Va., Oct. 24, guests of the Robert Morris associates. J. Lloyd Kimbrough, president, Indiana Bridge Co. and a director of the institute, spoke on "Financing Problems in Structural Steel." C. Oliver Wellington, Scovell Wellington & Co., New York, spoke on "Relationship of Cost to Price Setting." It was decided to appoint three from the institute and three from the Morris associates as a committee to study financing methods in the structural steel industry.

Meetings

GALVANIZING COMMITTEE TO CONDUCT FIRST MEETING

THE newly formed galvanizers' committee organized under sponsorship of the American Zinc institute at the request of operating men and technicians in galvanizing departments of producers of sheet steel will hold its initial meeting in Pittsburgh, Nov. 18-19.

Subjects for discussion will cover technical and operating problems, with special reference to coating of sheets. Plans also will be presented for formation of a permanent organization. A permanent governing body will be elected.

Attendance at the meeting will be limited to executive, operating and technical men of companies producing galvanizing sheets. Formal invitations are being issued under direction of the organizing committee and admittance will be restricted to those invited.

Chairman of the committee is F. G. White, Granite City Steel Co., Granite City, Ill. Ernest V. Gent, secretary, American Zinc institute, 60 East Forty-second street, New York, is acting as secretary.

SCRAP INSTITUTE ANNUAL MEETING IN CINCINNATI

Institute of Scrap Iron and Steel will hold its ninth annual convention at the Netherland Plaza hotel, Cincinnati, Jan. 14-16. The program will consist of committee and board meetings on the first day, concluding with a stag social event. Second day will be devoted to an open forum to discuss problems of the industry, followed by the annual formal banquet. On the third day, the annual business meeting will be conducted for election of the new board of directors and officers.

SCHEDULE MEETINGS FOR SCRAP INSTITUTE CHAPTERS

Eleven chapters of the Institute of Scrap Iron and Steel will convene during the next five weeks for their

annual meetings and to elect officers. Benjamin Schwartz, director general, New York, will attend each meeting, inaugurate the fall season for the institute, induct new officers and will attend a docket of arbitration hearings in most cities as impartial chairman of the arbitration bureau. The schedule of meetings follows:

Nov. 9, Cincinnati chapter, Netherland Plaza hotel, Cincinnati; Nov. 10, St. Louis chapter, Statler hotel, St. Louis; Nov. 12, Chicago chapter, Congress hotel, Chicago.

Nov. 16, Cleveland chapter, Statler hotel, Cleveland; Nov. 17, Pittsburgh chapter, William Penn hotel, Pittsburgh; Nov. 18, Michigan chapter, Statler hotel, Detroit; Nov. 23, New Jersey chapter, Newark Athletic club, Newark, N. J.

Nov. 24, New York chapter, Lincoln hotel, New York; Nov. 30, Buffalo chapter, Statler hotel, Buffalo; Dec. 2, Philadelphia chapter, Sylvania hotel, Philadelphia;

Dec. 3, Boston chapter, Parker house, Boston.

SECOND TESTING MATERIALS CONGRESS IS NEXT APRIL

International Association for Testing Materials announces that its second international congress will be held in London, April 19-24, 1937. K. Headlam-Morley, 28 Victoria street, London, S.W.1. is honorary secretary.

The new plant being erected at Philadelphia for the Crown Can Co., a subsidiary of the Crown Cork & Seal Co., Baltimore, will have an initial capacity of 3,600,000 tin cans daily. At the end of six months operation, it is said, the can capacity will be 7,500,000 daily, and a division for the production of steel barrels will be in operation.

Revival of NRA Opposed by 57 Per Cent of Voters at National Metal Show

TABULATION of ballots cast in STEEL'S poll at the National Metal exposition in Cleveland, Oct. 19-23, shows that of 1916 persons voting on the question on reviving the NRA, 1097 or 57.2 per cent oppose it, while 682 or 35.5 per cent favor it.

Attendance on the first five days was restricted to members of participating technical societies and invited guests, but on the evening of the last day workers in Cleveland plants were admitted. Totals in the accompanying table have been broken down accordingly.

Of the total 1916 persons voting for president, 1002 or 52 per cent

intended to vote for Gov. Landon, and 858 or 44.7 per cent for President Roosevelt.

Of the persons intending to vote for Landon 87 per cent are opposed to a revival of the NRA, while 67 per cent of those intending to vote for Roosevelt are in favor of reviving it.

Seventy-one per cent of the Landon supporters favor the employe representation plan over the other two types of labor—unions and unorganized—while 48 per cent of the Roosevelt supporters favor the employe representation plan and 33.9 per cent indicated a preference for labor unions.

Ballots Cast in STEEL'S Poll at National Metal Show

NOTE: Figures in boldface type represent votes cast when attendance was restricted to members and invited guests. On the last evening doors were opened to plant workmen, and votes cast on that evening are isolated in lightface figures.

Will vote in 1936 for:	—In 1932 voted for—						Do you favor Reviving NRA?			—Prefers—				
	Hoover		Roose-Thom-		Didn't		Yes		No		union		Unor-union ized vote	
	velt	as	vote	Yes	No	vote	Co.	Labor gan-	No					
Browder	9	2	3	0	4	5	1	3	1	0	0	3	0	1
	4	0	1	2	1	3	1	0	0	0	3	0	1	
Landon	881	649	128	12	92	63	770	48	625	38	148	70		
	121	77	20	1	23	14	104	3	91	11	9	10		
Lemke	17	1	11	1	4	8	7	2	8	4	3	2		
	10	1	5	2	2	2	4	4	4	4	0	2		
Roosevelt	602	126	466	20	90	382	165	55	301	191	49	61		
	256	47	164	12	33	198	38	20	113	100	16	27		
Thomas	10	0	5	3	2	6	4	0	5	5	0	0		
	6	4	0	0	2	1	3	2	2	1	1	2		
TOTALS	1519	778	513	36	192	464	947	108	940	241	202	136		
	397	129	190	17	61	218	150	29	210	119	26	42		
Total Vote	1916	907	703	53	253	682	1097	137	1150	360	228	178		

Europe's Steel Industry Gains from Devalued Franc

BY VINCENT DELPORT
European Manager of STEEL

NOT since the pound sterling went off the gold standard in 1931 has anything so important happened in the European economic field as the so-called "alignment" of the French franc, which occurred Saturday, Sept. 26. Within two weeks from that date another important step was taken by the French government, which, by a decree dated Oct. 10, reduced tariffs on imported goods 15 per cent for manufactured products and 20 per cent for raw materials. Reductions of the order of 20 per cent were made on other special taxes which had been imposed in the past two or three years to protect the French market against excessive imports from countries whose currency was then depreciated. Finally, certain import quotas, in particular those relating to pig iron and tin plate, have been cancelled.

These events have been hailed, especially in Great Britain, as starting a new era favorable to international trade, and breaking the vicious circle made up of ever-increasing tariff rates and restrictions that country after country built up in defense of its own trade. It is a fact that this action on the part of France was followed quickly by similar steps by other countries which had remained linked to the gold standard. Italy was the last of the more important powers to bring its currency in line with the British pound and to reduce its tariff barriers and quotas. However, the possible effects of these currency alignments are of a varied nature and, from some standpoints, not altogether without drawbacks.

French Action Inevitable

It certainly appears that the course adopted by the French government was inevitable, and doubts as to the ability of France to remain on the gold standard have already been expressed in these reviews. The deflation policy followed by the French governments preceding the present one did not succeed in bringing down the cost of living in France, and competition in foreign markets was rendered extremely difficult by rising costs and by the high value of the franc as compared with the devalued pound and other currencies which followed the pound. The considerable increase in production costs brought

about by recent socialist legislation, not being accompanied by a re-establishment of public confidence, was the last straw. Gold flowed freely out of France, capital became frozen, enterprise was stifled, and the franc fell from its pedestal.

The immediate effect of the franc devaluation on the French iron and steel trade has been to give it a moderate fillip. For months past, business was held back owing to uncertainty as to the course of the national currency. The accomplished fact has relieved the situation for the time being. Imported raw materials should naturally cost more, but the reduction of import duties is an alleviation, and as France possesses vast resources of iron ore,

Vicious Cycle Broken

THAT France's action in devaluing the franc and reducing tariff and tax rates has started a welcome reduction in trade barriers which may make for greater interchange of business between countries of Europe is the conclusion of Vincent Delport, European manager of STEEL, a close observer of business conditions in Great Britain and on the Continent, in the accompanying quarterly review. At least a break has been made in the vicious cycle of ever-increasing tariffs and other deterrents to free commerce, and the results, he says, may be of great value

only a certain proportion of coal requirements and special ores will tend to rise. Labor costs will probably increase with the rising cost of living measured in devalued francs, but selling prices will probably increase also. Finally, an advantage will be obtained in certain export markets.

On the other hand, owing to continuance of political unrest and to the fact that a large number of people have had their confidence further shaken by the devaluation move, as they look upon it as a breach of faith on the part of the government, the position is still critical and insecure. At the beginning of October unemployment in France

was still increasing, reaching over 400,000; sporadic strikes in several industrial districts were still prevalent, and the reorganization of trade and industry necessitated by the recent social legislation was being conducted under most difficult conditions. Lastly, the general improvement expected to follow the franc depreciation has not come up to expectation. It is already apparent that 1936 will go down in French history as one of the most unfavorable business years since the war.

Taking the devaluation of the franc from a wider angle, and beyond the frontiers of one country, satisfaction has been expressed in financial and business quarters, in view of the co-operation offered in most difficult circumstances by the two strongest financial powers, Great Britain and America. It is felt that the undertaking arrived at between these two countries and France to support the franc at its present value, and the constitution of strong exchange control funds, will eliminate a serious factor of speculation and bring about an international situation marked by greater stability.

It is also felt that, following the action of France and Italy in reducing tariffs and quotas, a substantial step has been made toward breaking up the vicious circle of ever-increasing trade barriers. At last there is serious ground for the hope that there will be greater fluidity in the international exchange of goods and services, accompanied by more active circulation of the tokens of wealth. The recent events may interfere temporarily with the foreign trade of certain countries in certain fields, but, taking the long view, there are now possibilities of real progress spreading in all directions.

Exports Not So Important

As regards Great Britain in particular, the country is so much taken up with its own domestic activities, especially in regard to the heavy industries, such as iron and steel, building, automobiles and even shipbuilding, that export trade at present does not assume quite the importance that it used to. It is as much as the steelworks can do to meet requirements of their home consumers, although steel production has reached the highest level in history, September output of steel ingots and castings having, for the first time for many months, exceeded one million tons.

Thanks to regulations of the Steel Entente, to which Great Britain is now a party, there is no danger of cheap French steel products flooding the British home market, since these imports are strictly regulated in tonnage by a new system of import licenses, and any tonnage in excess of the quota is subject to a

heavy duty. The prices at which Continental steel is sold in Great Britain are also controlled. Admittedly, France will become a stronger competitor in overseas markets, but even there the Steel Entente has a certain degree of control, since each member country is restricted to a certain quota of export business.

Reference has already been made to the record production of steel attained in Great Britain with 1,027,000 tons in September. For the first nine months of the year the output was 8,617,200 tons, which compares with 7,220,300 tons in the first nine months of 1935, an increase of 1,396,900 tons or 19.3 per cent. Signs are not lacking of Britain's successful bid for prosperity. Practically all steelworks and rolling mills are working to capacity. Many works are being enlarged to give scope for greater production: the latest important firm to expand is Richard Thomas & Co. Ltd., the large steel and tin-plate producer of South Wales. The works generally have their order books so filled up that the import quotas of Continental steel have been increased for the fourth quarter.

That firms engaged in steel activities are more prosperous today than for many years past is shown by the fact that Stewarts & Lloyds Ltd., steel and tube makers, have distributed bonus shares to their holders. Another large concern, the United

Steel Companies Ltd., held its annual meeting recently and the profit and loss account showed a substantial increase of profits at £1,378,587. There has been a strong revival in British shipyards, and by the end of the year nearly 1,000,000 tons of merchant shipping will be under construction. The annual motor show opened Oct. 15 and promised to be a record show for all time, and Oct. 12, Lord Austin, speaking at the annual meeting of Austin Motors Ltd., was able to disclose a trading profit for the past year of £1,496,696 and to give an optimistic forecast of the motor industry.

In a review of present conditions in Europe, special mention should be made of Germany, where industrial conditions are active. A recent visit to that country showed considerable improvement in conditions compared with three years ago. Here, too, steel production is reaching record figures, the output from January to August inclusive being 12,747,263 metric tons, compared with 10,563,583 tons in the corresponding period of last year, an increase of 2,183,680 tons or 20.75 per cent.

Steel prices in Germany are controlled by the domestic syndicates; there is also a certain control on wages, which cannot go beneath a certain level; these factors are so governed that under modern conditions of efficient production a suf-

ficient margin is left for a reasonable profit. Export prices, which are governed by the International Steel Entente, are not so good, but are still profitable.

The rates of wages paid in Germany are not high in comparison with British or American standards, nor are they high in relation to the German cost of living index, which has slowly tended to increase. A skilled workman in a rolling mill may earn from 8 to 10 reichsmarks a day, and an unskilled workman from 5 to 6 marks: they work from 48 to 50 hours a week. From these wages certain deductions are made to provide for various schemes of health and unemployment insurance, winter relief, etc., which deductions amount to about 8 per cent of wages paid. The relations between men and employers are generally good and differences are settled by arbitration. At present just over 1,000,000 men are unemployed in Germany, against 4,750,000 three years ago.

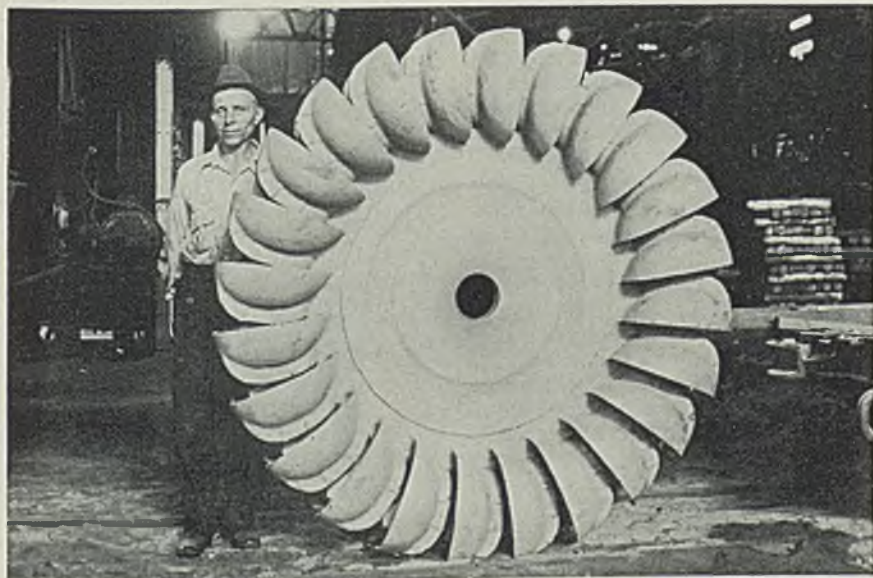
German Prosperity Fragile

While from all outward appearances Germany seems to be going through a period of great industrial activity, underlying conditions give rise to a certain uneasiness on the part of responsible leaders. The country tends to become more and more self-centered in order to reduce foreign commitments to a minimum; there is a resulting scarcity of certain raw products and food materials, which must be substituted by home-made commodities: in some cases the people have to go without or restrict the use of certain normal commodities which now tend to be considered as luxuries.

Apart from this factor, all the heavy expenditure entailed by the large program of armaments and other government work and activities has to be met. The financing is effected mostly by borrowing. About 25 per cent of the necessary financing is apparently procured by increased taxation and increased returns from taxation due to greater activities. The rest is obtained by internal loans, of which about one-third are long-term loans. Borrowing is effected through the Reichsbank, the other leading banks, savings banks, insurance companies, and large industrial companies, but in the last analysis, all the people's savings and a considerable amount of company investments are eventually directed into government bonds and obligations. In other words, the country is living on its capital: it is a question how far and how long this process can be continued.

In most of the other industrial countries of Europe, mainly Italy, Poland, Czechoslovakia, Sweden, trade conditions are improving.

Two-Ton Hydroelectric Wheel Made of Stainless Steel



ONE of the largest and most difficult castings ever attempted in stainless steel is this impulse runner wheel, produced recently at Midvale Co.'s plant in Nicetown, Philadelphia, for the S. Morgan Smith Co., manufacturers of hydraulic turbines, York, Pa. The wheel is for use by the Puerto Rico reconstruction administration in a hydroelectric plant where water containing particles of sand will be driven against it with tremendous velocity. Wheel and buckets were cast integrally of low carbon, 13 per cent chrome stainless steel, heat treated to get a tensile strength of 90,000 pounds per square inch. It weighs 3910 pounds, and overall diameter is approximately 72½ inches

Men of Industry

IRVING SANDS OLDS, who last week was elected a director and member of the finance committee of United States Steel Corp. for the term expiring in 1930 (see page 23), was born in Erie, Pa., Jan. 22, 1887. He was graduated from Erie high school in 1903, from Yale college in 1907, and Harvard law school in 1910; admitted to the bar in Pennsylvania in 1910 and in New York in 1912.

Mr. Olds was secretary to Justice Holmes of the United States Supreme Court, 1910-1911, becoming connected with White & Case, the well-known New York legal firm, in August, 1911, and admitted as a partner Jan. 1, 1917. During 1917-1919, Mr. Olds served as counsel for the purchasing department of the British war mission to United States, and in 1918 was a special assistant in the United States war department. Since 1919, Mr. Olds as a member of the firm of White & Case, New York, has engaged in legal work related to matters of organization and administration of corporate business enterprises.

Mr. Olds is a member of the council on foreign relations and Alpha Delta Phi fraternity. His clubs are the Century, Knickerbocker, University, Yale, Downtown and Grolier.

Frank M. Farmer, vice president and chief engineer of the Electrical Testing Laboratories, New York, has been elected chairman of the Engineering Foundation, New York.

D. Robert Yarnall, Yarnall-Waring Co., Philadelphia, has been re-elected vice chairman of the Foundation. Otis E. Hovey, New York; A.



Frank M. Farmer

L. J. Queneau, metallurgist, United States Steel Corp., New York; and Prof. Walter I. Slichter, of Columbia university, have been elected to the executive committee of the Foundation.

Thomas Towne, for several years connected with export sales for Union Drawn Steel Co., Massillon, O., in its New York office, resigned Oct. 1.

Walter P. Southard has joined the staff of the Trundle Engineering Co., Cleveland, where he will deal with special management and sales problems of the company and its clients.

Harrison W. Fitzgerald, assistant chief engineer of the Lackawanna, N. Y., plant of the Bethlehem Steel Co., has resigned to assume like duties at the Corrigan, McKinney division of Republic Steel Corp., Cleveland, Nov. 1.

Clarence W. Howatt, formerly vice president of Pittsburgh Steel Foundry Corp., Glassport, Pa., has recently associated himself with Erie Foundry Co., Erie, Pa., manufacturer of hammers and presses, as Pittsburgh sales representative with offices in the Grant building, Pittsburgh.

Theodore F. Smith has been appointed vice president in charge of sales of the Oliver Iron & Steel Corp. He also continues as secretary of the company.

Clarence Guthridge has been appointed general manager of sales of the Oliver corporation. These appointments were made to fill the vacancy caused by the recent resigna-

tion of Hanson T. Thomas as vice president and general manager of sales.

Lewis B. Lindemuth, consulting engineer, New York, has returned from England where he was engaged in consulting work for Richard Thomas & Co. Ltd., in connection with its expansion program. Mr. Lindemuth will sail for Australia next month where he will continue his work with the Broken Hill Proprietary Co. Ltd.

Thor M. Olson has been appointed sales manager of the Ex-Cell-O Aircraft & Tool Corp., Detroit, succeeding William F. Wise. Mr. Olson was general manager of the Continental Tool Works from the time it was founded until shortly before it was acquired by Ex-Cell-O in 1930, and during the latter part of the period he served as president. After becoming associated with Ex-Cell-O, Mr. Olson became vice president and a director.

R. H. Sonneborn has been named assistant manager of sales, pipe division, of Republic Steel Corp., Cleveland. Mr. Sonneborn was formerly special representative. Martin I. Shea will continue as the other assistant manager in the pipe division, which position he has held for the past eight years.

Mr. Sonneborn was associated with Colorado Fuel & Iron Corp., Denver, in the operating department, upon graduation from college, and later entered the sales department of the Youngstown Sheet & Tube Co., where he remained until going with Republic in January, 1936.

S. R. Thomas has been made manager of the automotive bearing division of the Bantam Ball Bearing Co., South Bend, Ind. He has been identified with the automotive industry



J. Harry Christman

Who has been named manager of the Chicago plant of the Milcor Steel Co., Milwaukee, as noted in STEEL, Oct. 19, page 23



A. R. Smith

Who has been promoted to general manager, Eyrria division, Steel & Tubes Inc., subsidiary of Republic Steel Corp., as reported in STEEL, Oct. 19, page 23

for 22 years, the past four years of which he has been associated with the Cord interests. Prior to that he was associated with General Motors Corp. in important engineering positions.

◆ ◆ ◆
Emil P. Kastien has resigned as purchasing agent of the Northwestern Barb Wire Co., Sterling, Ill.

◆ ◆ ◆
Axel Engstrom has been named vice president and general manager of Botfield Refractories Co., Philadelphia.

◆ ◆ ◆
N. W. Storer, affiliated with Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., for the past 45 years, has retired as consulting railway engineer.

◆ ◆ ◆
Frank J. Boehm, formerly connected with Steel & Tubes Inc., a subsidiary of Republic Steel Corp., Cleveland, has been appointed general sales manager for Jackson Tube Co. Inc., Brooklyn, N. Y.

◆ ◆ ◆
C. F. Bolles has joined the New York office of the Delta-Star Electric Co., Chicago, in the capacity of sales engineer. He formerly was connected with the Public Service Electric & Gas Co. of New Jersey.

◆ ◆ ◆
T. C. Fedders, vice president and assistant general manager, Fedders Mfg. Co., Buffalo, producer of automobile radiators, ventilating equipment and other metal products, has been appointed chairman of the Buffalo airport advisory board.

◆ ◆ ◆
Frank H. Prescott, general manager, Delco Products division of General Motors Corp. at Dayton, O., has been made vice president of the Electro-Motive Corp., La Grange, Ill. He will be succeeded at Dayton by C. H. Kindl, factory manager.

◆ ◆ ◆
H. W. Harman, for many years head of the engineering and research departments of the Stearns Magnetic Mfg. Co., Milwaukee, has been transferred to the sales department in the capacity of sales engineer with supervision of the purchasing department.

◆ ◆ ◆
E. F. Entwisle, assistant general manager, Lackawanna, N. Y., plant of Bethlehem Steel Co., has been appointed general manager, effective Nov. 1. Mr. Entwisle has been in active charge since Timothy Burns, general manager, was taken ill last spring. Mr. Burns will continue with Bethlehem in an advisory and consulting capacity.

Mr. Entwisle was formerly superintendent of the Saucon division of Bethlehem plant. He entered Bethlehem's employ at the Maryland plant in 1914, as mechanical engineer. He went to a similar post at the Steelton plant, was appointed



E. F. Entwisle

◆ ◆ ◆
general superintendent of the blast furnace division of Lebanon plant, and was again promoted to be assistant general manager of the Steelton plant.

◆ ◆ ◆
C. J. Fehheimer has joined the engineering staff of the Louis Allis Co., Milwaukee, manufacturer of electric motors, in the capacity of consulting engineer. For the past five years, Mr. Fehheimer has been engaged as a consultant in private practice, and for over 20 years he has been closely associated with the electrical manufacturing industry, as a designing engineer and a research engineer.

◆ ◆ ◆
Ambrose Swasey, 67 years a builder of machine tools and telescopes, has been cited by the board of award, representing the country's four ranking engineering societies, to receive the Hoover gold medal, "awarded by engineers to a fellow engineer for distinguished service." The medal will be presented to Mr. Swasey, chairman, Warner & Swasey Co., Cleveland, at the annual dinner of the American Society of Mechanical Engineers in New York, Dec. 2. Mr. Swasey is a past president and honorary member of the society.

◆ ◆ ◆
H. N. Holdren, traffic manager, Pittsburgh-Des Moines Steel Co., Pittsburgh, was re-elected chairman of the joint traffic conference at the recent convention of the American Institute of Steel Construction at White Sulphur Springs, W. Va.

◆ ◆ ◆
Other members of the committee are: R. C. Mahon, Detroit; S. A. Poyer, Chicago Bridge & Iron Works; H. A. Puls, Ingalls Iron Works, and R. W. Robberson, J. B. Klein Iron & Foundry Co., Oklahoma City, Okla. The latter two are both new members to the committee.

◆ ◆ ◆
Albert H. Thomas, first vice president of the Buckeye Steel Castings Co., Columbus, O., has been elected president, to succeed the late J. C.

Whitridge. He has been associated with the company more than 31 years and was elected first vice president nine years ago.

George T. Johnson, formerly second vice president of the company, has been elected first vice president, succeeding Mr. Thomas, and Frank H. Bonnet, who has been connected with the firm more than 20 years and at present is superintendent of the foundry division, has been named second vice president.

Died:

JAMES B. PATTERSON, 45, vice president, Hopp-Patterson Co., Chicago, in that city, Oct. 15. Mr. Patterson representative for the P. H. & F. M. Roots Co. Later he joined J. H. Hopp in organizing Hopp-Patterson Co. to sell machinery and materials and to serve as engineers and consultants to the metalworking industry.

◆ ◆ ◆
Roy C. Manson, 54, president and treasurer, Tufting Machine Supply Co., at Detroit, Oct. 26.

◆ ◆ ◆
James D. Wigglesworth, 36, secretary, Hill-Clarke Machinery Co., Chicago, in that city, Oct. 26.

◆ ◆ ◆
J. H. Kelly, 62, superintendent of the Ironton, O., plant, Dayton Malleable Iron Co., in that city, Oct. 19.

◆ ◆ ◆
John E. Burke, 51, production manager of the Ternstedt division of the General Motors Corp., Detroit, in Ann Arbor, Mich., Oct. 25.

◆ ◆ ◆
Harry Flint Huff, 46, manager of the extruded metals and die press department of the American Brass Co., Kenosha, Wis., in that city, Oct. 21.

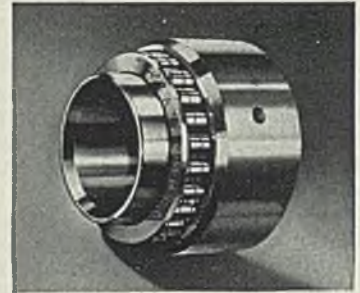
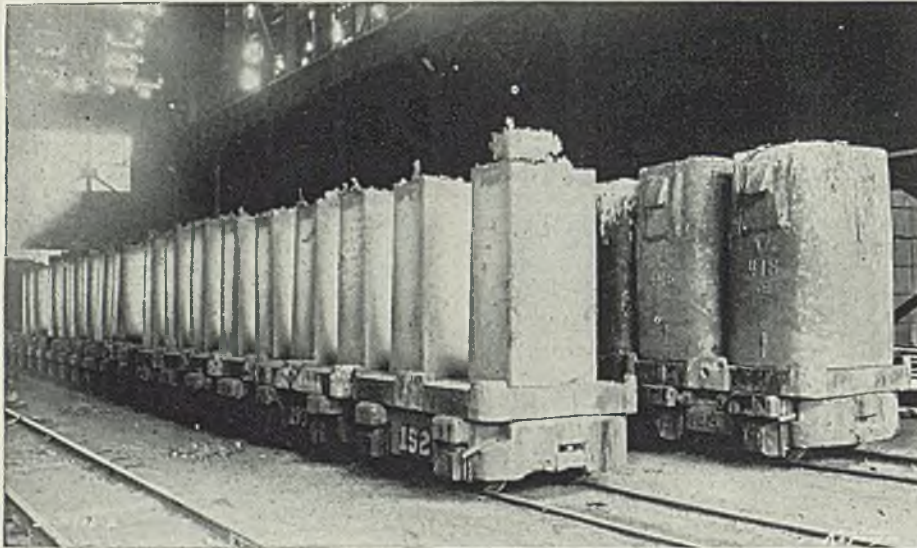
◆ ◆ ◆
August L. Kaems, 73, vice president, Jambor Tool & Stamping Co., Milwaukee, of heart attack while on a business trip to Davenport, Iowa, Oct. 23.

◆ ◆ ◆
Charles G. Jurack Sr., 78, founder and president of the Charles Jurack Co., Milwaukee, pioneer manufacturer of wood and metal patterns for the foundry trade, in that city, Oct. 23.

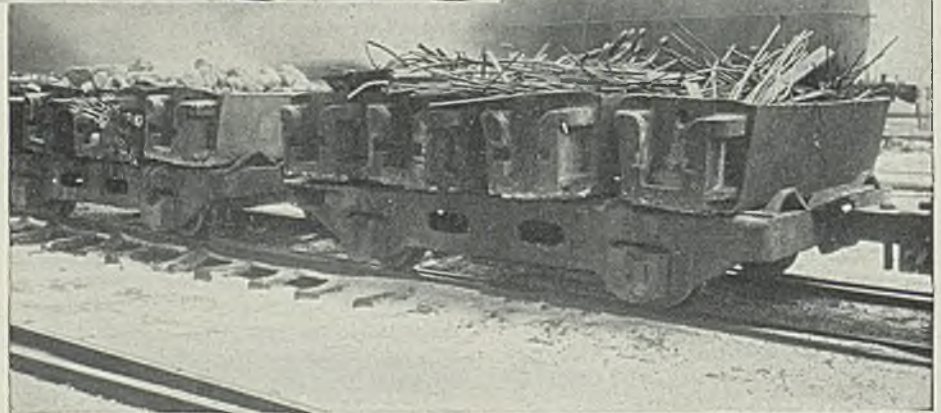
◆ ◆ ◆
Frank Ellsworth Curtis, 75, assistant treasurer and assistant secretary, Woodward Iron Co., Woodward, Ala., in that city, Oct. 20. He was connected with the Woodward company for a quarter of a century.

◆ ◆ ◆
John L. Smith, 68, superintendent of rolling mills of the Hamilton, Ont., works of the Steel Co. of Canada Ltd., in that city, recently. He had held executive positions with the company for the past 30 years.

Where Service is *Most* Severe **HYATTS PREDOMINATE**



Hyatt equipped **INGOT and CHARGING BOX CARS** by the thousands are in steel mill use today. Their record of performance — no time out for bearing care — is the reason for their predominance. The installations shown are part of the many similar trains of Hyattized cars at the Inland Steel Company.



○ Stops, starts . . . stresses, strains . . . call for dependable bearings.

The millions of hours of carefree equipment operation enjoyed by steel mills every year are largely dependent upon the bearings that carry the load—and a large percentage of these bearings are Hyatt.

In all types of applications, tables, cars,

cranes, motors, and auxiliary mill equipment, Hyatts serve and save, protect related parts, and take punishment without perceptible wear.

Small wonder, then, that steel mills and equipment manufacturers continue to use more and more Hyatt Roller Bearings for the better design, better performance, and longer life of their operating units.

HYATT ROLLER BEARING COMPANY

NEWARK

DETROIT

CHICAGO

PITTSBURGH

SAN FRANCISCO



DETROIT

FOR over a year now Lincoln and Packard have been making hay while the sun shone, figuratively speaking, through the discovery that sales could be increased by dropping a model with a new name into the middle price field.

Lincoln's Zephyr and Packard's 120—followed this year by the Packard 115—gave the public the privilege of owning a high-sounding name in motordom, also giving less of a jolt to the customers' pocket-books.

Packard started the idea and Lincoln soon caught on. Cadillac, the other member of the big three, whose names once were entirely synonymous with top hats and chauffeurs, apparently watched from the sidelines.

For 1937, however, the Cadillac division of General Motors has worked on LaSalle and groomed it for a niche down in the \$1000-\$1200 class. The LaSalle models for 1937 start as low as \$995, f.o.b. factory, a reduction of almost \$200 from 1936.

This car will come out late this week in five body styles: a two-passenger coupe, convertible two-passenger coupe, five-passenger touring coupe, five-passenger touring sedan and a five-passenger convertible sedan, all on Fisher bodies.

LaSalle Shifted Again

But unlike the Packard 120, where numerically the horsepower and wheelbase are synonymous at 120, the LaSalle motor, a V-8 type with 125 horsepower, has been set in a wheelbase of 124 inches.

Probably no make in motordom has been subjected to so much shifting up and down the scale as LaSalle. First brought out by Cadillac in 1927 as a high-priced companion car, it had a V-8 type motor, the power plant being interchangeable with the lower-price V-8 Cadillac.

In 1934 LaSalle prices were reduced and a straight eight engine substituted, almost to the same motor specification as Oldsmobile. But now, three years later, the motor has returned to the original design. One motivating reason was that a V-8 would take less hood space and give greater interior room,

inasmuch as the wheelbase was to be shortened.

From the standpoint of appearance, the 1937 LaSalle closely resembles the 1936 car. The radiator shell is somewhat the same, but ten hood louvre bands and six vents, all horizontal, replace the six circular-shaped louvres of last year.

Hypoid rear axles result in a lower body that gives several inches more head room. The bodies are also wider by a margin of over three inches in both front and rear seats. Two-piece pontoon type fenders are carried over unchanged. Frames have a new type of reinforcement like the Buicks for 1937.

Body door handles are noticeably heavier and longer. Furthermore, much of the cost in making the interior has been slashed by building up the front cowl and windshield in one piece, similar to the Packard 120 manufacturing policy.

Cadillac Remains Pegged

Embellishments include red LaSalle emblems centered on both front and rear bumpers. The three fender chevrons are carried over and the instrument panel is patterned after the Cadillac.

Though LaSalle has lopped almost \$200 off its price, Cadillac prices will be in line with the past. The new Cadillac series "65" starts at \$2152, delivered Detroit, and the first Fleetwood body on the line, which is series "70," begins at \$2891 for the two-passenger coupe.

The "70" will come in four body styles, followed by the series "75" which starts at \$2900 and runs up through seven body variations to \$4898, all delivered Detroit.

Apparently, the new LaSalle's wedge into the \$1000 field has not been felt yet by Packard. Last week Packard claimed unfilled orders on hand at the rate of 2.3 cars for every one turned out.

Production at Packard has been running on a six-day weekly basis and varying from a minimum of 365 units per day all the way up to 450 per day, but the latter only on exceptional breaks. Consequently, Packard's top speed of 9000-unit production per month has been tested.

For one thing, the new foundry additions plus the forge shop at

Packard have helped, but a week ago a strike in one of the parts plants which makes necessary ornaments caught Packard with but a five-day supply on hand and almost put a serious crimp in schedules.

Speaking of delays, Chevrolet is said to have encountered some temporary difficulty at Flint recently on its fenders. As quickly as possible, Chevrolet wants to be running smoothly at better than 100,000 production per month, but is just about half-way there at this time.

Detroit is talking up Chevrolet's new motor. In a recent preview a 1937 model left a 1936 model in the middle of an 11.6 per cent grade as it pulled over the top. Both, new cars, had started from scratch in high gear at 15 miles an hour.

The 1937 Chevrolet, chassis on which will be identical for both the master and deluxe master, is 112¼-inch wheelbase or ¼-inch shorter than in 1936. Exteriors are identical on both lines but the interior finish differentiates the two. Front and rear seats are both 3¼-inches wider.

Not to gloat at another's misfortune, Ford probably has profited inherently by the Chevrolet trouble at Flint, and at a time when the advantage can be greatly capitalized upon at Dearborn.

Ford Stores Heavily

Looking back six weeks recalls that Ford was the last to cease manufacturing 1936 models, while Chevrolet was one of the first. Because engineering changes were at the absolute discretion of one individual, Henry Ford himself, and were adopted only to be scrapped a good many times over, Ford was also the last to work out final engineering details on the 1937 line.

It is true that some parts plants, such as the lamp division, pressed steel division and motor block assembly, had the go-ahead earlier than others. But brakes, steering apparatus and many other detail were openly dangling not many weeks ago.

So, when October commenced, the picture at Ford was unbalanced. Large banks of motor blocks have been built up (close estimates say there are at least 75,000 in storage)

and similarly large inventories of most stampings had accumulated.

In many sections of the Ford plant warehouse space is completely taken up and in various outside plants, for example, where a supply of steel was required, these suppliers have, on Ford order, laid down finished stocks for immediate shipment. Ford itself is said to have 18,000 tons of steel from its own mill laid down in storage.

That in brief tells the story behind the news that Ford's assembly lines are closed. It also shows that Ford production in scarcely no time at all could reach several thousand a day.

And that is exactly what Ford is going to do. This week, coincident with having 7000 dealers into Detroit, Ford will announce the new 1937 V-8 lines on Nov. 6, just one day ahead of the date Chevrolet has proclaimed for its unveiling ceremony.

Evidently banking on the assumption that a good start is better than any amount of jockeying after the race begins, Ford has invited all dealers in at once to dispense as much factory-made enthusiasm on the spot as a thousand letters or billboards.

They say it is the first time in the Ford Motor Co.'s 33 years that all of the dealers have been home at once.

Italy Sends Commission

The crowd of dealers DeSoto played host to through October numbered better than 4200, but they were called in by geographical groups, with no group larger than 400. Incidentally, at the Ford conclave this coming Friday afternoon the dealers will present Henry Ford with a token for historic Greenfield village. It is a 300-year old Cape Cod windmill built at West Yarmouth, Mass.

Detroit likes being host to the country's dealers but there are other visitors here today making a far less auspicious visit. One is a commission of eight from Italy's Fiat motor works. This group ostensibly is studying American methods. The commission is showing so much interest in the situation at present on machine tools, both in deliveries and performance, that its mission actually may have a broader scope.

Another foreign group has nearly concluded its work here, this a buying agency that set up headquarters locally for the Nissan Motor Works, Japan, and succeeded in purchasing a large amount of used dies, tools

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. 10	39,945
Oct. 17	49,195
Oct. 24	59,740
Oct. 31	66,985

and machinery for export. Most of the business resulted from disposal by Graham equipment once used in making an old six model.

Some say it was envy for General Motors and Frigidaire, or possibly Chrysler and brother Airtemp, that led Nash and Kelvinator to work around to a merger last week. But the real truth is that Nash wanted a president and the man wanted happened to be president of Kelvinator.

George W. Mason, a former Chrysler, Studebaker and Dodge man, given to particular ability on reorganization problems is the man. He stepped into Kelvinator in 1927, fresh from Copeland Products and the Irving National Bank, New York, where he was a plant reorganizer.

In those nine years Kelvinator has expanded to a pre-eminent position in the field and has added air-conditioning units for medium-sized homes, electric stoves, oil burners and washing machines.

Other than the fact that Nash wanted a new president Detroit seemed unable last week to grasp the full significance of the move, which will result in a \$50,000,000 company when stockholders ratify the plan.

Admittedly, Nash whose financial strength is the envy of the independents in the motor car field, needs no reorganization. But apparently Nash's chairman wishes to relieve himself of many responsibilities. Furthermore, the Nash

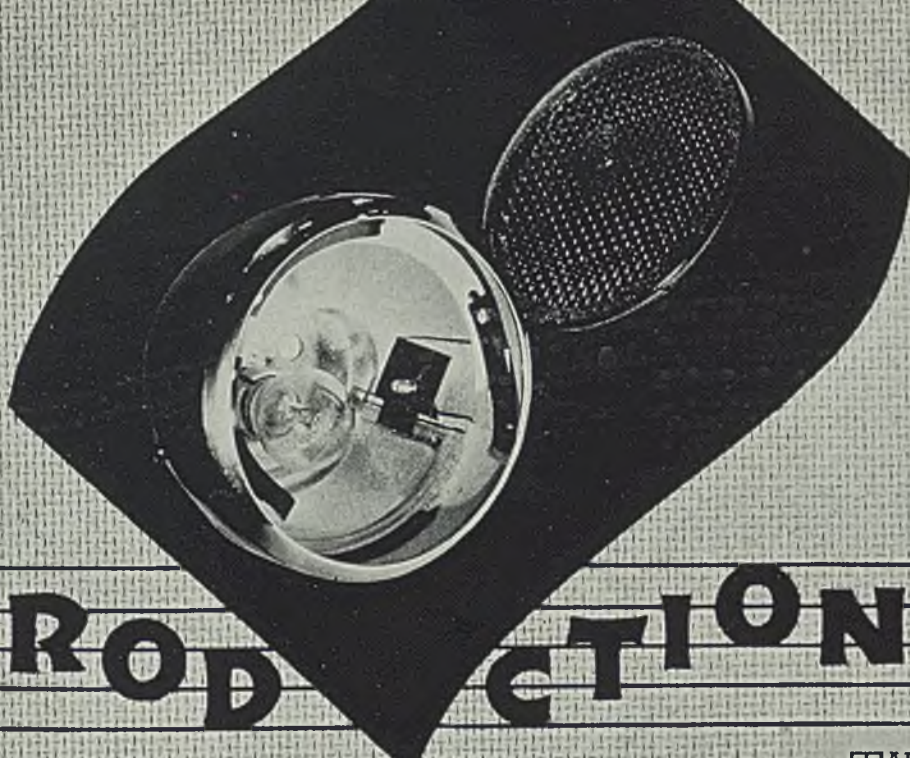
dealerships might merchandise Kelvinators more widely.

Of course, Nash has no plants in Detroit and its abundant capacity around Milwaukee makes it improbable that facilities are desired in the motor city. But under the surface there would be advantages in joint purchases of materials and parts, manufacture of certain stampings, and in retailing.

A. O. Smith Corp. at Milwaukee claims to have made some of the most material tool changes in its history preparing for 1937. Their frame business is running 10 to 15 per cent ahead of this time in 1935 Reo is borrowing a page from Ford in starting a policy to re-manufacture truck engines for exchange . . . Advance Auto Body Works, Los Angeles, has just completed a 3-wheel, 125-inch wheelbase, 204-inch overall length teardrop car costing \$8000 for the Arrowhead Spring Water Co., Los Angeles . . . According to engineers, the new box-type frames on all of the General Motors cars for 1937 will give greater tangential strength than the old banjo-type . . . Packard has added four new models, three deluxe body styles on the 120 line and a station wagon on the six.

Studebaker Adds Dealers

Pontiac has set a November production goal of 20,000 jobs and rounded out 14,000 units in October at its present rate which was better than 3300 last week . . . Studebaker appointed 120 new dealers in September . . . Hupp, which has postponed its special stockholders' meeting until Nov. 7, doesn't lend much promise of being in the November shows with 1937 models. Hupp has a few hand-built 1937 models but it would take another four months to get dies for production . . . All of the steel disk wheels on Chrysler Corp. models are coming through with three vents stamped out close to the rim for winter chains . . . All of the Buick departments are running two and three shifts daily, over 16,000 are employed and unfilled orders amount to more than 40,000 . . . Ford will have a new cam-type steering device for 1937, the part being made by Gemmer . . . Hudson, now running two lines, is turning out better than 600 assemblies daily on the six and eight, both of which are five inches longer wheelbase . . . The new Pontiac will feature a silver-streak motif in the rear as well as in the hood . . . Oldsmobile's shortage of bodies has been cleared up and assemblies started.

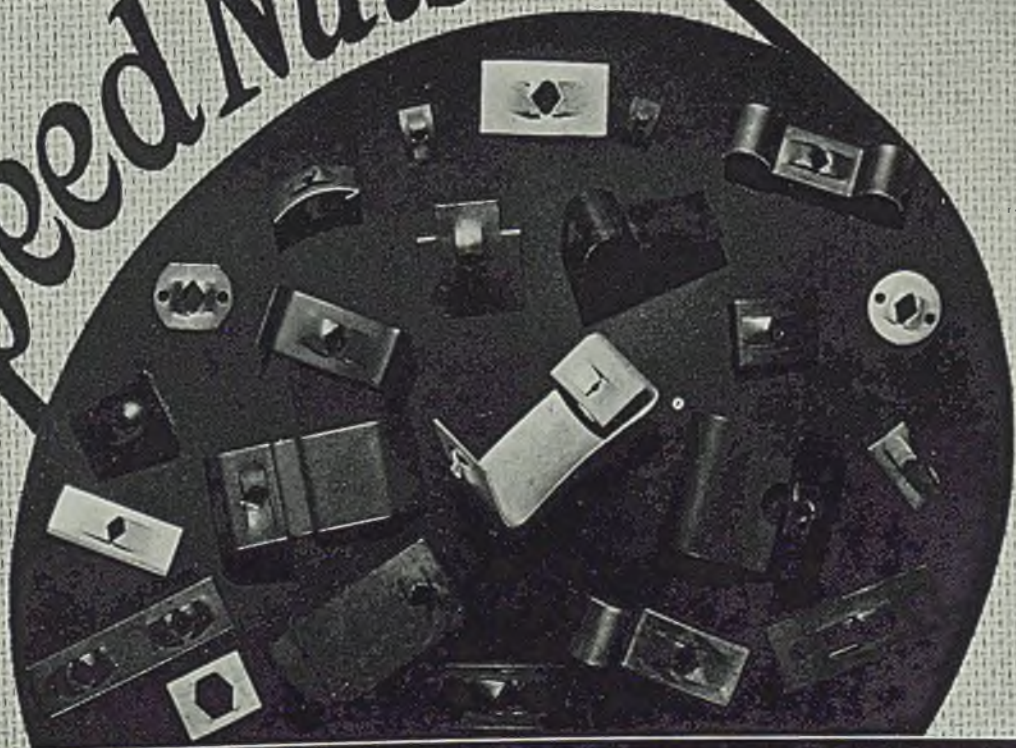


PRODUCTION NOTES

TAIL-LAMP assemblage calls for speed and permanency. The above lamp from one of America's leading make cars possesses a license reflector glass that must press firmly against its cork gasket—preventing vibration from shifting its position and rain from entering the shell's interior . . . accomplished with SPEED-NUTS.

Whether for automotive or general manufacturing, SPEED-NUTS do provide rapid assembly and lower production costs . . . A card of assorted samples and list of their many established uses will be mailed upon request.

Speed Nuts PATENTED



TINNERMAN STOVE & RANGE CO. • SPEED-NUT DIVISION • CLEVELAND, OH

Activities of Steel Users and Makers

TEXAS STEEL CO., Fort Worth, Tex., has a number of important improvements in progress. It has installed a machine for straightening sucker rods and for cold finishing hot-rolled steel bars in diameters up to and including 1½ inches. It is about to add to its output of hot-rolled steel bars a line of alloy steel bars of the 3100 S.A.E. analysis in rounds exclusively, and ranging from ½-inch to 1½-inches in diameter. The steel will be produced in the company's electric furnace.

It has rehabilitated its oil well supply department, through installation of new machine tools and testing equipment. It has expanded its line of oil pumping equipment and now is prepared to market complete turnkey installations, for central power pumping. Two types of alloy steel sucker rods also have been introduced by this company. One is a nickel steel rod recommended for use under sulphur conditions. The other is a nickel molybdenum rod and is for use in corrosive oils, under heavy loads.

Ex-Cell-O Aircraft & Tool Corp., Detroit, has appointed the Herberts Machinery Co. Ltd., Los Angeles, as its exclusive machinery sales representative in southern California.

Two new circular soaking pits recently completed at the Alton, Ill., plant of the Laclede Steel Co. have been placed in service. The pits, 16 feet in diameter, were built by the Salem Engineering Co., Salem, O.

King Plow Co., maker of plows and agricultural implements, has discontinued its manufacturing operations at Rome, Ga., and is concentrating them at its plant in Atlanta. A large addition is under construction to house the expanded business.

Towmotor Inc., Cleveland, has appointed the following representatives to handle its line of gasoline-powered material handling equipment: E. G. Artz Inc., Milwaukee; Carey Machinery & Supply Co., Baltimore; Glenn P. Chrissman, Detroit, and W. F. Webber, Chicago.

Allied Steel Products Co., Tulsa, Okla., has recently been organized to engage in the fabrication and erection of structural steel. The firm has taken over the business heretofore known as Bradeco Steel Service Co., organized in 1932 by E. C. Hinkefent and Duke B. Merrill. Services of the firm include designing, estimating, fabricating, erecting, dismantling, moving and re-

pairing. Mr. Hinkefent is president, Mr. Merrill is vice president and John E. Kirkpatrick is secretary-treasurer.

Lubrication Products Co., maker of the "Stapex" lubricating pad, has removed its manufacturing facilities from Burgettstown, Pa., to Cleveland, where it has taken over an entire building at 5103 Detroit avenue. This move was made to improve the service, in better manufacture and quicker shipments.

H. H. Bell Steel Co., steel jobber, New York, has purchased a 5-story warehouse at 727-729 Washington street, New York, which it will occupy after Jan. 1 when alterations have been completed. Present space will be increased about one and a half times and additional items will be added to the stock.

Dravo-Doyle Co., Pittsburgh, has received a contract for a direct-fired heater for a new steel finishing plant of the Greer Steel Co., Anderson, Ind. In addition, it has recently received an order for a large oil-fired heater from the Chapman Price Steel Co., division of Continental Steel Corp., Indianapolis.

M. S. Kaplan Co., iron and steel scrap merchant, has removed its general offices to the Continental Illinois Bank building, 231 South LaSalle street, Chicago. Ben G. Kaplan, president, is also president of the Chicago chapter of the Institute

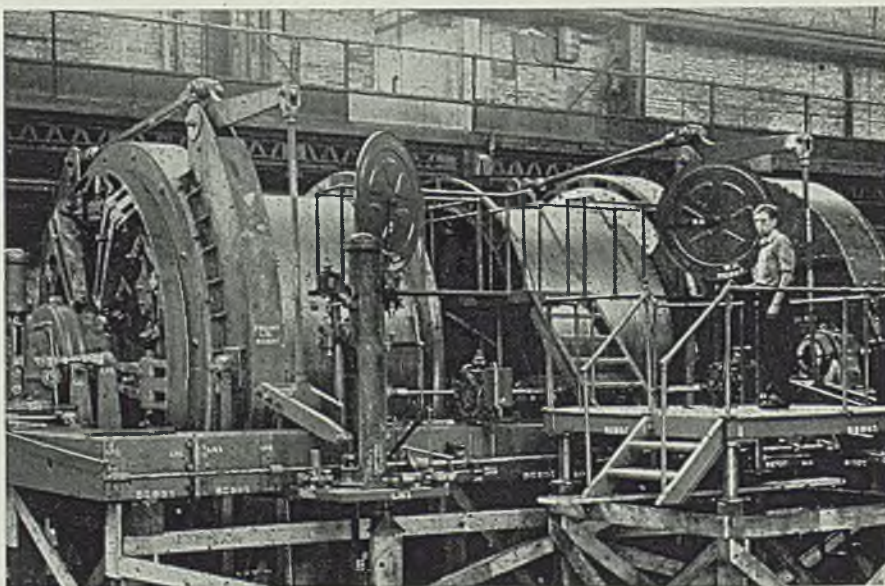
of Scrap Iron and Steel, and is a member of the institute's board of directors.

Battelle Memorial institute, Columbus, O., has plans for constructing a new building to provide additional facilities for industrial research. The new building will contain about 25,000 square feet of floor space and has been designed to accommodate the heavy equipment for commercial scale foundry work and ore handling.

Pittsburgh Store Fixtures & Equipment Co. has purchased the Blairsville, Pa., plant of the Schwarzenbach-Huber Co. The company manufactures refrigerating and display cases for food stores and is preparing to manufacture air conditioning equipment. Alterations will be made immediately and production is expected to start in about two months.

H. B. Fuller Equipment Co. has been appointed agent in Cleveland territory for the Easton Car & Construction Co., Easton, Pa. The new arrangement includes the complete Easton line of quarry equipment, dump bodies and industrial cars, electric bitumen heaters, railway and industrial turntables and electric lift trucks and trailers. The electric lift truck division of the Easton company was formerly the Lakewood Engineering Co., purchased by Easton in 1931.

Hoists Nine Tons of Ore Per Trip



DESIGNED to lift nine tons of ore per trip, this is one of the largest mine hoists for the iron country in Michigan. It has an overall length of 40 feet, width of 34 feet, total weight of 475,000 pounds. It is capable of working to a depth of 4500 feet and lifting at a speed of 2400 feet per minute. The welded steel drums, 12 feet in diameter, will be motor driven. Allis-Chalmers Mfg. Co., Milwaukee, built it for Youngstown Mines Corp. and it will be operated by Pickands, Mather & Co. at its Newport mine, Iron Mountain, Mich.



WINDOWS OF WASHINGTON

ALL kinds of stratagems are being tried by manufacturers to find where they stand in connection with the application of the new Walsh-Healey government contract law.

As a typical example: Last week General Motors Corp., International Harvester Co. and several other corporations put in bids for fourteen trucks for a government department. That is, bids were for fourteen trucks, but each corporation bid on just enough of them to place its total bid under the \$10,000 limit allowed under the law. In other words, under the bids submitted by these companies they would not come under this new act. Nothing has yet been done with these bids by the government and everyone is waiting to see what will happen.

Again, at least some corporations intend to bid direct on government business on contracts under \$10,000 but on amounts over that they will bid through recognized distributors. Under the law they cannot set up dummy organizations as distributors. These are two of the plans being experimented with and doubtless there are others which have not yet come to light.

Contracts Board a Makeshift

In connection with the application of this act it is interesting to note that Frank Healy, who heads the public contracts board, set up by Secretary Perkins to administer this law temporarily, is about to resign his post. The story is to the effect that he will go with the procurement division of the treasury department. It is whispered about, and so far this is just rumor, that Healy has not been able to find for himself whether the government is serious about enforcing the law. Also he is much at sea because congress made no appropriation for this work and the members of his board and even

the few clerks who are working for it are only "loaned" by various government departments and this must continue until congress meets in January and gives the labor department some money for this purpose.

Healy was formerly head of the government contract division of the defunct NRA and has been attached to the labor department doing special work for sometime. The two other members of this contract board are also employes of the labor department engaged in other work and can give only their spare time to enforcement of this contract act. Altogether it can be imagined that all is not so rosy with the contract board.

Industrial Advisors Asked

Apropos of this new law Miss Perkins is sending a communication to leading trade associations, including the American Iron and Steel institute, calling upon them to appoint some member of the industry to act in any advisory capacity when it comes time to discuss hours and wages in each industry. Miss Perkins says;

"The department of labor is charged with the administration of the new public contracts act, which became applicable Sept. 28 to all contracts advertised for bids on and after that date.

"For the purpose of carrying out the act a special unit is being created in the department, headed by an administrative officer. There is also a board to perform this quasi-judicial function vested in the department of labor under the act. The studies and investigations necessary for the information of the board before action will be made by the regular existing divisions of the department where possible and presented to the board with recommendations by the chief examiner.

"It is my thought that efficient administration of the act would be promoted if the department had a

panel of consultants consisting of industrialists and labor representatives who are familiar with each of the principal industries for which determinations of minimum wages and overtime regulations are to be made. When the board is to make a finding for a particular industry, the chief examiner could then draw from the panel for consultation the industrialist and the labor representative familiar with that industry and might also join with them in such consultation the purchasing agent of the government. Consultation with members of the panel will also be available to the board. While final responsibility for the decisions and findings would still rest with the board, the availability of such consultants would be extremely valuable.

"I should appreciate it if your association would give consideration to suitable representation for the * * * * industry on this panel and to submitting recommendations for appointment to some representative manufacturer in this field."

EARLY FREIGHT RATE DECISION IS EXPECTED

A quick decision is looked for from the interstate commerce commission in connection with the application of railroads asking that they be allowed to file various new tariffs. These new tariffs would be in connection with rate increases on iron, steel and other commodities, to take the place of the present emergency surcharges which expire Dec. 31 next.

While the commission has refused to extend these emergency surcharges, as a whole, there is every indication that it will allow the roads to file these proposed tariffs. That means only that the tariffs having been filed, the commission would as a routine matter, probably suspend them until after hearings have been held. Thus there is little

chance that any of the new rates could become effective, even if the commission so ordered, by the time the surcharges are discontinued.

In their petition to the commission the roads gave some interesting figures showing that traffic is increasing but, on the other hand, they showed just how far in the red they would have been if it had not been for the present surcharge. The fact that the commission has turned down definitely application for the blanket surcharge continuation does not mean in any sense of the word that the commission will be averse to granting increases in certain tariffs over the present normal rate in an effort to bring the roads into the black.

In connection with the application the commission has issued an order giving shippers and others a chance to file briefs up to Nov. 7 against the granting of the application.

It is interesting traffic experts a good deal that the commission made no provision for holding any hearings or arguments on this application but will only allow the filing of briefs in opposition to the request.

At the same time the commission is allowing shippers in their brief to protest against any specific rates contained in the proposed tariff changes. In this connection says the commission, "Persons filing replies may, if they so indicate their desire, frame such replies so that they may be treated and considered as requests for suspension of tariffs or items thereof which may be filed pursuant to any permission granted upon the petition."

PRESIDENT FORCED TO DODGE ON NRA REVIVAL

Ever since James Roosevelt made some kind of a statement at a political rally in Massachusetts about the President's attitude on NRA Washington newsmen have been trying to find out how Mr. Roosevelt felt about it.

The President has not been in the Capitol much lately and when he has been here on his regular semi-weekly press conference days he has cancelled them. The story got about that he didn't want to be questioned on the NRA and finally one of the well known columnists stated that the President was afraid to have a press conference for that reason. That rather took the White House crowd off their feet with the result that a press conference was held last week. About the only thing asked was concerning the James Roosevelt statement and it was asked from every angle. The Washington correspondents are as much at sea now as when they went into the conference.

The President parried every question on this subject. The newspaper men are asking why it is, if he has given up all idea of reviving the

NRA or some similar organization, the President did not simply deny that he would try anything of the kind and set at rest a matter that has caused a great deal of speculation in the past few weeks.

Of course one of the obvious answers to that is that if he denied he intended to revive an organization of that kind, he would alienate some of the labor people and just before election that just wouldn't be cricket. On the other hand also, no matter which way he answered the question, he would not be doing what some people or groups of them would want and therefore undoubtedly he feels that even if it is not satisfactory the best way to do is to hold his peace—keep them all guessing—until after the election.

FTC CHARGES PATTERNMAKER

A complaint has been issued by federal trade commission against the Central Pattern Foundry Co., Chicago, charging unfair competition in the sale of aluminum and other castings.

The commission charges that the company offered to prospective customers through circular letters, clean, smooth aluminum castings at a price as low as 23 cents a pound, using only "new ingot metals." The complaint points out that the phrase "new ingot metals" means castings made from virgin ingots and that the respondent company's castings were not made from virgin ingots and were not "new ingot metals." as understood by the trade. These castings, according to the complaint, were made from secondary or so-called number two grade of No. 12 remelted metals and alloys.

It is charged by the commission that representations made by the company have a tendency to deceive buyers and unfairly to divert trade from competitors to the respondent company in violation of the trade commission act. The commission has given the company until Nov. 27 to state why it should not issue a cease and desist order against these alleged methods of violation of the law.

TO REVIEW WAGNER CASES

The United States Supreme Court last week decided that it would review lower court cases which involve the constitutionality of the Wagner national labor board act. The appeals which will be taken up by the court are in the case of the Associated Press and the Washington, Virginia & Maryland Coach Co.

There are three other appeals in connection with the constitutionality of this act on which the court has not yet taken action, including the Jones & Laughlin Steel Corp., the Fruehauf Trailer Co. and the Friedman-Harry Marks Clothing Co. Inc. It is not known yet whether the

court will decide the first two cases and let them act as a precedent for the other three or whether appeals will also be granted in the latter. In all these cases the lower courts upheld the constitutionality of the Wagner labor act. This law guarantees collective bargaining to labor and sets up the national labor relations board to settle industrial disputes.

LA FOLLETTE COMMITTEE TO HEAR TERRORISM CHARGES

While it has never needed any excuse the LaFollette subcommittee of the senate committee on education and labor, looking into so-called civil liberties matters, will now open up in earnest on the steel industry because of a copy of a letter sent to the committee by Phil Murray of the United Mine Workers who heads the proposal to organize the steel industry.

Murray has sent a letter to the governors of Ohio and West Virginia charging that steel companies are having armed thugs attack organizers of the steel campaign.

The matter became public when Senator LaFollette last week announced that his subcommittee is inquiring into charges of "a campaign of terror" against organizers attempting to unionize the steel industry.

Mr. LaFollette, chairman of the subcommittee, made public charges brought by Murray that in at least six instances organizers have been victims of physical violence. These charges were made in the letters to the two governors. The incidents, according to Murray, centered around Steubenville, O., and Weirton, W. Va., and Murray charged directly Ernest T. Weir.

In a prepared statement Senator LaFollette said that "the committee at this time desires to announce that the study of this situation is being continued by its agents with a view to determining the extent, nature, and particulars of the violations.

"The committee has, from time to time, received many other complaints from various labor and civic organizations regarding alleged violations of the right of free speech and assembly and violations of the rights of labor to organize collectively."

Lee Pressman, general counsel for the steel workers' organizing committee, in transmitting the Murray charges said that "open violations of civil liberties have been completely disregarded by the lawfully constituted authorities in the states.

"Shocking assaults upon steel workers and organizers of this committee have resulted in absolutely no redress through the local or state officials. Uncontroverted evidence as to the identity of the assailants when presented to the grand juries, has simply been disregarded."

Good "Career Men" Help Take Curse Out of Politics

ONE of the high points in the program of the annual convention of the American Institute of Steel Construction, held recently at White Sulphur Springs, W. Va., was an address, "Forgotten Bridges," by J. R. Burkey, chief engineer of bridges of the state department of highways of Ohio.

Those who were privileged to hear this address will remember it a long time for two reasons: First, it dealt with an extremely important subject; and, secondly, the speaker—probably unwittingly and unintentionally—revealed how a conscientious, competent employe in public office can go a long way toward offsetting the curse of politics in the environment in which he works.

Chief Engineer Burkey related how the state department of highways, when established by law, fell heir to certain roads in the state, including thousands of bridges and tens of thousands of culverts. Somebody in the early stages of the department's work (we suspect Mr. Burkey had much to do with it) conceived the idea that the department was launching into the business of conducting a transportation system. He envisioned a job for the department comparable to that performed by the track and bridge engineers and maintenance of way personnel of a first class railway system.

Tried To Plan Job So Well That Changes in Administration Would Not Destroy System

With this business-like conception of the job, it was clear that the first essential was a record or inventory of the highways and their bridges and culverts—one that could be kept up to date. Moreover, the sponsor of the idea reasoned that this record or file should be made so satisfactory and indispensable that no successor or successors in office would dare to discard it.

Each bridge was given a number and symbols designating its location and type. Essential information was recorded on the back, and the front of the card was designed to show the condition of the structure as well as important data such as width, capacity, etc. The cards were arranged in trays, in sequence of their location on highways. The visible lower edges show at a glance the presence of narrow, weak or otherwise inadequate bridges on any state highway. The cost of getting this information and installing this file system, covering 12,000 miles of highway,

7405 bridges and 63,000 culverts, was \$40,000. The proof of its efficacy lies in the fact it has survived the whims of numerous changing state administrations.

But that is only part of the story. Every few days a group of important citizens descends en masse upon the state highway department with an urgent request that a monumental bridge be erected in their community. The visitors usually are escorted by politicians who know their way around the capitol.

Here is a situation fraught with danger. Good business and common sense are pitted against political expediency. Which shall win?

The highway commission listens respectfully to the speeches of the mayor, the president of the chamber of commerce and the other dignitaries of the visiting delegation. Then out comes the file of bridges. Carefully the representatives of the highway department explain the general problem of highway transportation in the visitors' community. They show that Bridge Cu 16.2, which the delegation says should be replaced, is adequate, but that Bridge Cu 22.6 in the same vicinity, is four feet too narrow, is sadly deficient in capacity and is 20 years older than the other bridge.

Complete Knowledge of Facts Permits "Career Men" To Cope with Demands of Pressure Groups

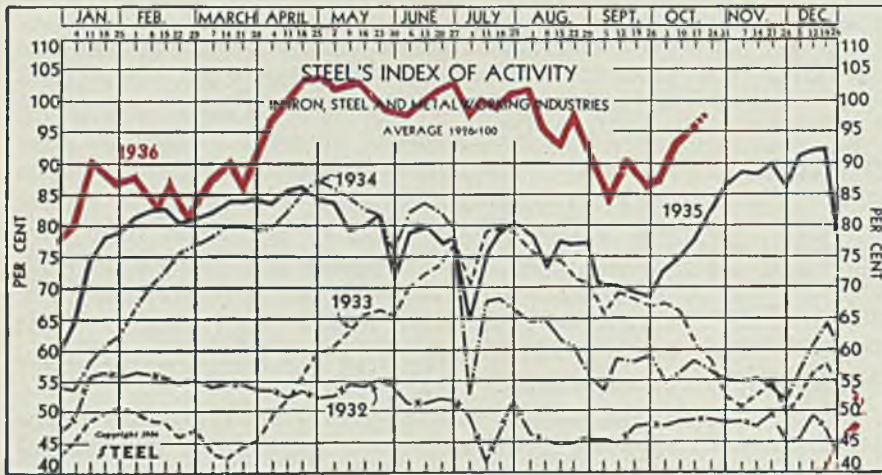
The visiting delegates realize that the highway department knows more about their bridge problem than the local authorities. They depart with the realization that they have been given a fair hearing. They feel that their money is going to be spent wisely.

It happens that the file of Ohio state highways shows that one-fourth of all of the bridges over 10 feet in span are too weak or too narrow "to a degree which constitutes a serious hazard to traffic." Mr. Burkey believes that the figure probably is representative for the entire country. In other words, about 25 per cent of all of the highway bridges in the United States should be replaced in the interests of safety.

Remedying this situation is an important problem. Certainly the replacing of "forgotten bridges"—many of them structures of the "horse and buggy" era—should take precedence over some of the boondoggling activities of the past few years.

How comforting it would be to taxpayers if they could know that all such replacements in the next few years were to be subject to the critical and intelligent control of a system similar to the one Mr. Burkey has described! The steel construction industry owes him a debt of gratitude for demonstrating, in simple, modest narrative, the great service which competent "career men" in public office can render in the public interest.

THE BUSINESS TREND



STEEL'S index of activity in the iron, steel and metalworking industries gained 1.9 points to 97.4 in the week ending October 24:

Week ending	1936	1935	1934	1933
July 25	102.1	80.8	66.4	78.8
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	97.4*	82.4	56.3	58.0

†Revised. *Preliminary.

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

Industry Showers Voters with Good News on Election Eve

ALTHOUGH it is entirely unpremeditated and unintentional, industry is shooting off a sensational array of pyrotechnics on the eve of the national election.

One after another, producers and manufacturers in the iron, steel and metalworking industries have been announcing gratifying earnings for third quarter. Also, the current records of business show that industrial activity is being maintained at high levels. These favorable reports on past profits and present activity certainly will tend to emphasize to voters the marked degree of recovery. Politicians and industrial-

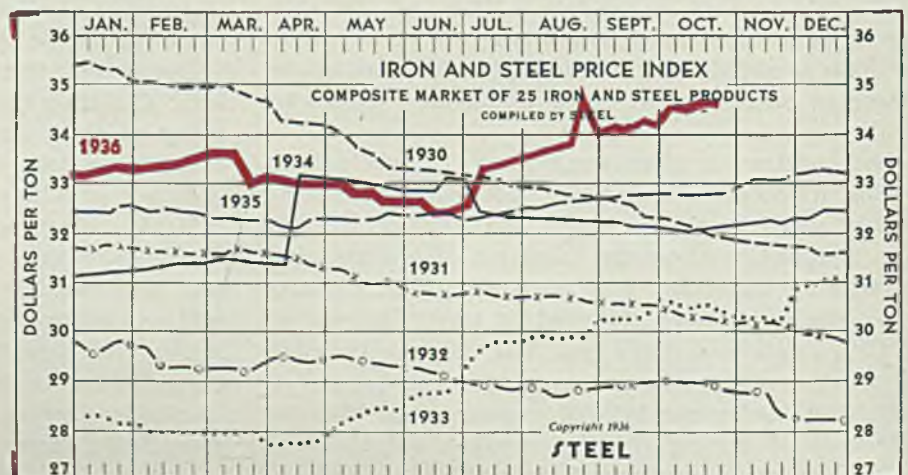
ists alike probably are wondering how this sudden burst of emphasis on favorable business conditions will affect the vote of Nov. 3.

Activity in October, for many companies, has exceeded that of the third quarter, on which the good profit records were established. Thus the current brisk pace of industry presages another series of encouraging earnings statements for the final quarter.

STEEL'S index for the week ending Oct. 24 stands at 97.4, a gain from 95.5 in the preceding week. The increase was accounted for by a sharp step-up in automobile production and a moderate expansion in revenue freight traffic, which more than offset minor recessions in electric power output and in the rate of steelworks operations.

The October averages for car loadings, electric power output and rate of steelmaking will establish new highs for 1936 and for the recovery period to date.

	1936	1935	1934
Oct. 24	\$34.62	\$32.85	\$32.12
Oct. 17	34.64	32.83	32.09
Oct. 10	34.60	32.86	32.09
Oct. 3	34.62	32.82	32.09
Sept. 26	34.19	32.83	32.13
Sept. 19	34.22	32.83	32.13
Sept. 12	34.10	32.81	32.14
Sept. 5	34.10	32.79	32.17
Aug. 29	34.03	32.78	32.17
Aug. 22	34.94	32.72	32.22
Aug. 15	33.88	32.68	32.23
Aug. 8	33.82	32.64	32.23
Aug. 1	32.72	32.59	32.28



September Automobile Output Registers Sharp Decline

	1936	1935
January	377,306	300,325
February	300,874	350,345
March	438,945	447,888
April	527,726	477,059
May	480,571	381,809
June	470,887	372,085
July	451,474	345,178
August	275,951	245,092
September	139,785	92,863
October	280,356	280,356
November	408,555	408,555
December	418,303	418,303

Merchandise Exports Up Sharply in September

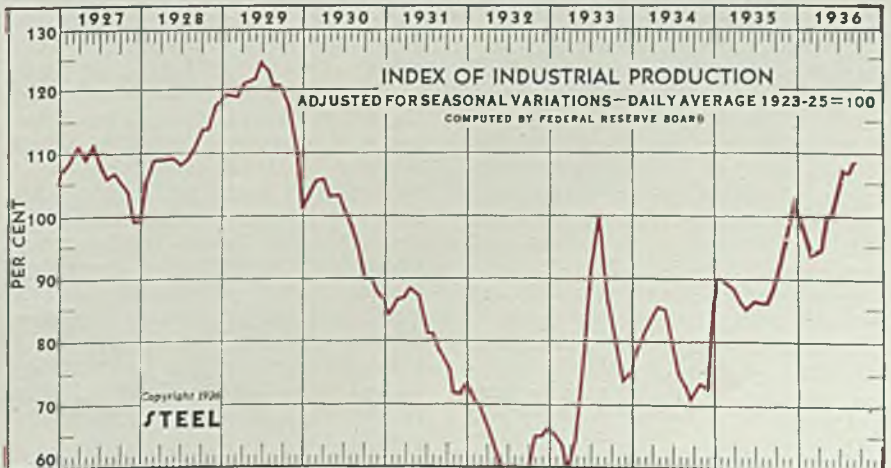
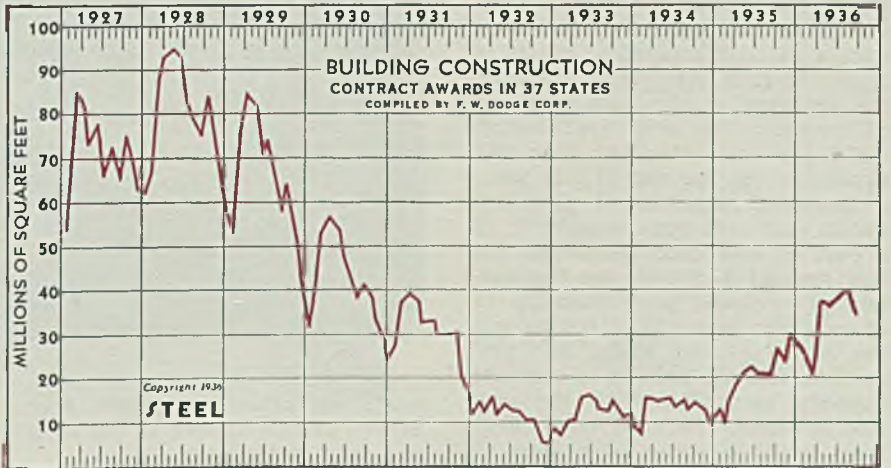
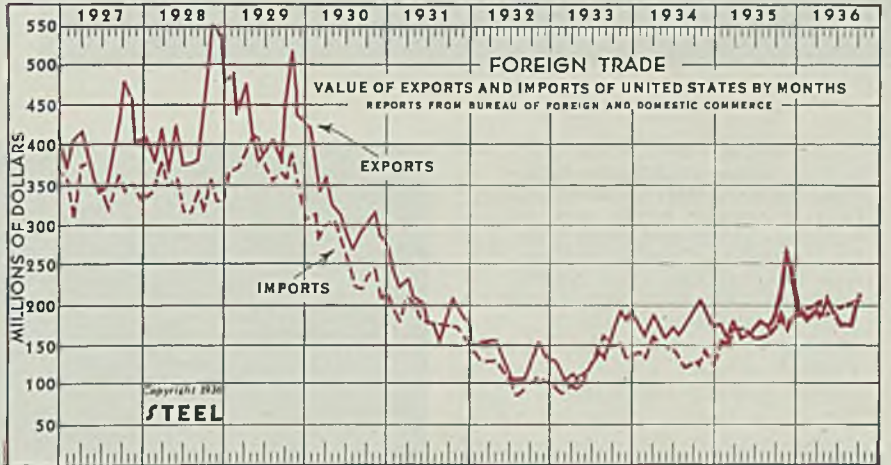
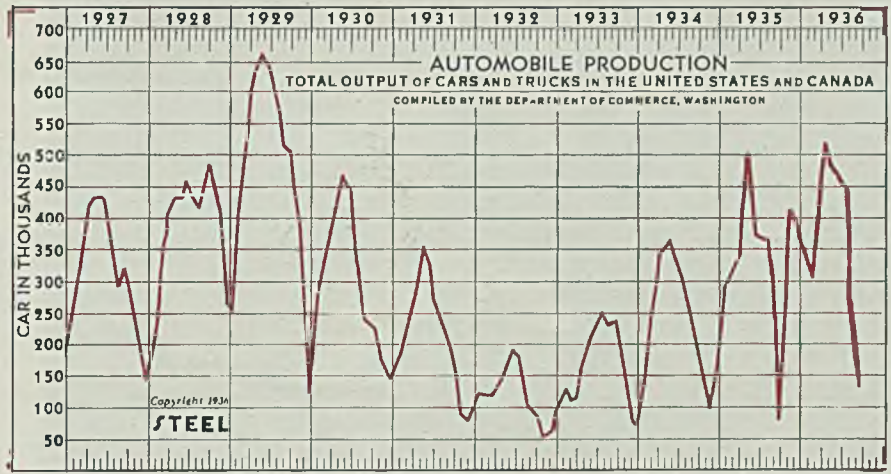
	Dollars (000 omitted)			
	1936		1935	
	Exports	Imports	Exports	Imports
Jan.	198,654	187,482	176,223	166,993
Feb.	182,030	192,771	162,999	152,491
Mar.	194,790	198,686	185,603	177,279
Apr.	193,490	202,437	164,350	170,567
May	201,042	191,110	165,457	170,207
June	185,188	192,233	170,193	156,756
July	178,324	193,409	173,371	177,698
Aug.	178,249	195,016	172,128	169,030
Sept.	219,976	215,525	198,189	161,653
Oct.	.....	.....	221,215	189,240
Nov.	.....	.....	269,400	168,955
Dec.	.....	.....	223,737	186,648

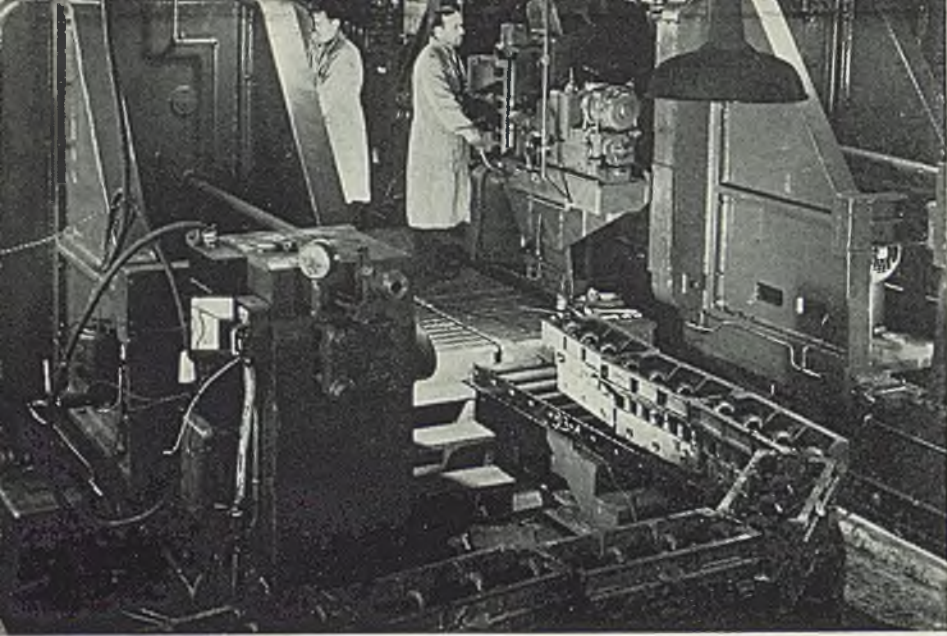
Building Awards Decline in September; Above Year Ago

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

Industrial Production Index Continues Upward

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



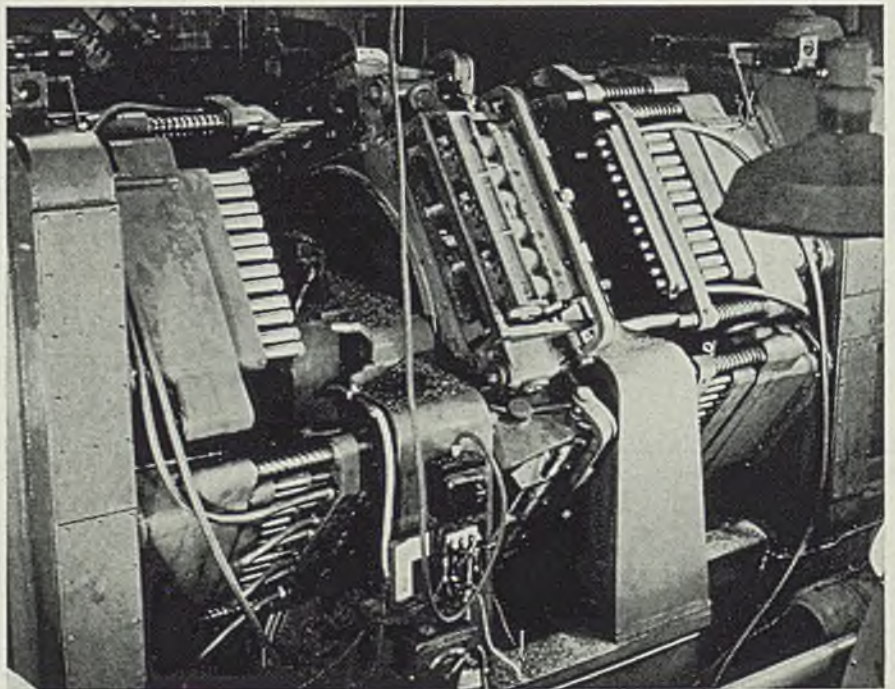


Packard

FIG. 1 (above)—Two vertical drum-type drilling machines for finishing holes in oil pump and distributor pads of cylinder blocks, and for finishing all valve and tappet holes. Fig. 2 (right)—Closeup of drum-type trunnion fixture for holding work and the two heads carrying the tools

METEORIC rise of Packard in the volume automotive market is becoming too well known to bear repetition, but it is appropriate to note briefly some of the features of the vast program of re-equipping and rearranging which has been attendant upon this expansion. By the end of this year, a three-year schedule of plant revision will have been completed, at a cost of well over \$15,000,000. Of this amount \$7,173,000 has been allocated to bring production up to 45 cars per hour, \$5,120,000 to put the new 6-cylinder model into production, and the balance to increase capacity generally. With the new line of sixes, Packard now offers four complete series of models — the six, the 120, the super-eight and the twelve-cylinder lines.

Machine tools, presses and auxiliary equipment made up most of this plant expenditure, although extensive rearrangement of departments also was required. For instance, in the cylinder block machining division, many new tools were installed and conveyor lines re-routed to handle both six and eight-cylinder blocks. Probably the largest pieces of new equipment are the two vertical drum-type machine tools shown in Figs. 1 and 2, one for drilling, countersinking, reaming, counterboring and automatically tapping all holes in oil pump and distributor pads on the six-cylinder block, and for finishing from the



rough all valve and tappet holes, as well as core drilling in the thrust and four water holes.

The first of these machines, right in Fig. 1, also spot faces the oil pump pad at the loading position, while other operations are performed at the four other stations on the drum fixture. The machine has two-way operation, center feed, and is fully hydraulic. Assembly is of welded steel bases and heads, with heavy section cast iron angle supports to the heads, with heavy ribbed cast iron saddles. Operation is interlocked electrically with a single pushbutton control. The five-station trunnion fixture is indexed hydraulically and is fully interlocked with all units. Drilling radius is 30 inches. From 55 to 60 blocks per hour can be handled.

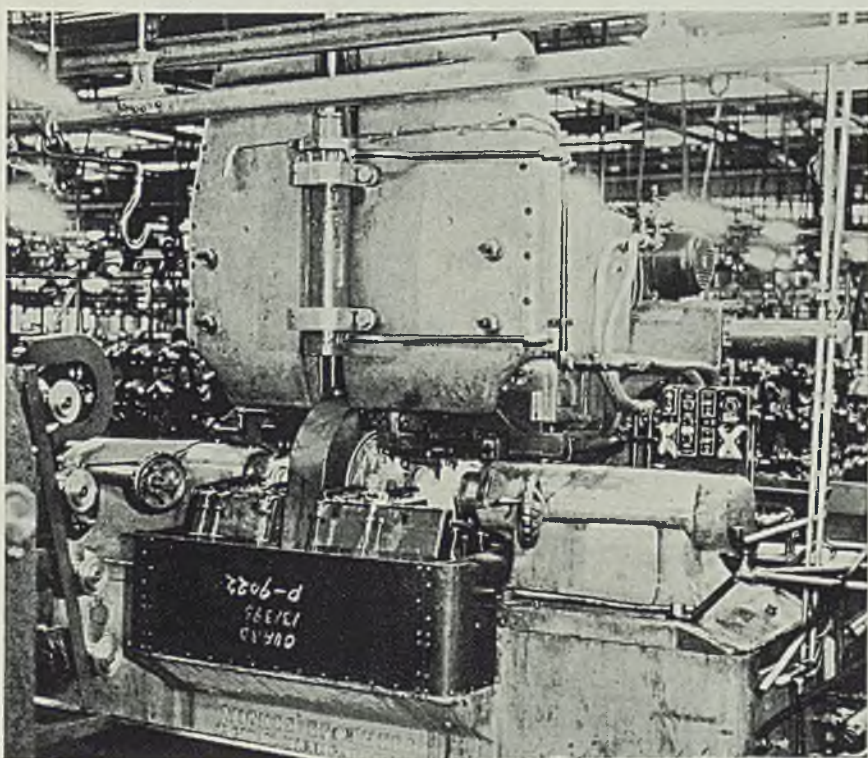
The second machine, separated

from the first by an operators' platform to which the incoming cylinder block conveyor feeds, weighs about 73,000 pounds, compared with about 70,000 pounds for its neighbor, and resembles the first machine in general construction. Two heads move horizontally on a saddle plate; the right-hand fixed-center head houses 48 spindles, and the left-hand head 40 spindles. Each spindle is mounted in a single-seal double-row bearing, with a backing bearing to take the thrust load.

Drum-type trunnion fixture is similar in construction and operation to that of the adjoining machine. Fig. 2 shows a closeup of the drum and two heads. Left-hand head carries a 25-horsepower motor and the other head a 30-horsepower motor with two 5-horsepower motors driving the hydraulic pump and a

Adds to Facilities for New Cars

BY A. H. ALLEN
Engineering Editor



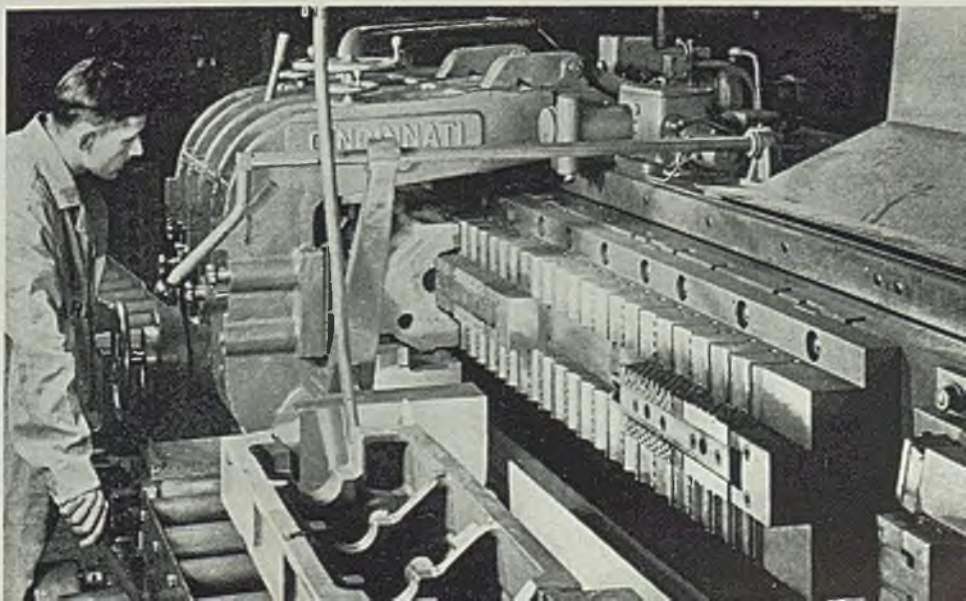
3-horsepower motor operating the hydraulic index. Production is the same as the first machine described. Both units were built by Bausch Machine Tool Co., Springfield, Mass.

One particularly impressive feature of the entire machining setup at Packard is the extent to which various types of broaching have been developed to reduce production time on various parts to a fraction of what it was formerly. For, example, in Fig. 3 is a special type of combination lathe and broach for circular broaching crankshaft bearings. The machine is entirely automatic and eliminates the necessity for rough grinding these bearings. It was specially built by Wickes

Bros., Saginaw, Mich., and is proving highly successful in finishing crankshafts accurately and at high speeds.

Fig. 4 is an action view of probably one of the largest broaching machines in existence. In one swipe of its multiple tools it surface broaches bottoms of cylinder blocks and main bearing rabbets, with a resultant finish that would pass the eye of the most critical inspector. This method, while involving high tool cost, far outdistances former milling methods from the standpoint of production time. A similar machine is used for broaching the tops of both six and eight-cylinder blocks. Builder of both these large

FIG. 3 (left)—Combination lathe and broach for circular broaching crankshaft bearings. Fig. 4 (below)—Hours of laborious finishing work on cylinder blocks are eliminated by this giant broaching machine which in one stroke finishes the bottoms of the blocks and the main bearing rabbets



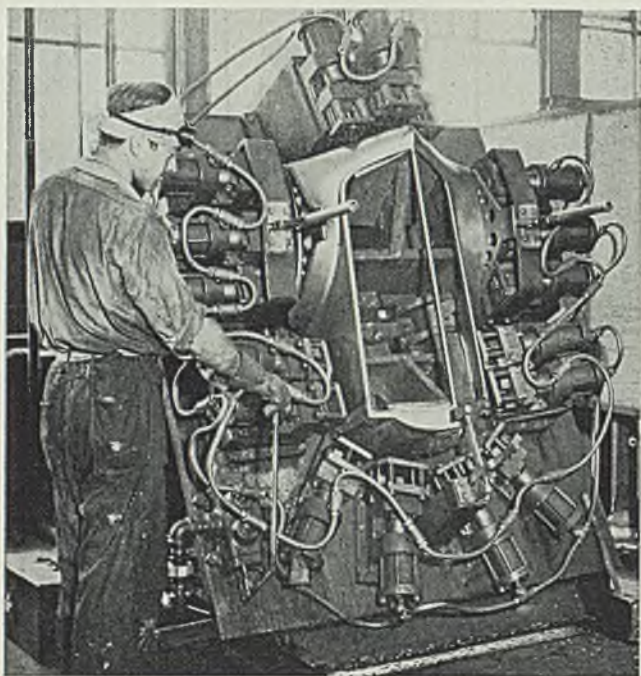


FIG. 5 — Specially built multiple hydraulic punch in which radiator shell is clamped over a die and 22 various-sized holes for assembly bolts, hood lacing, etc., are punched simultaneously

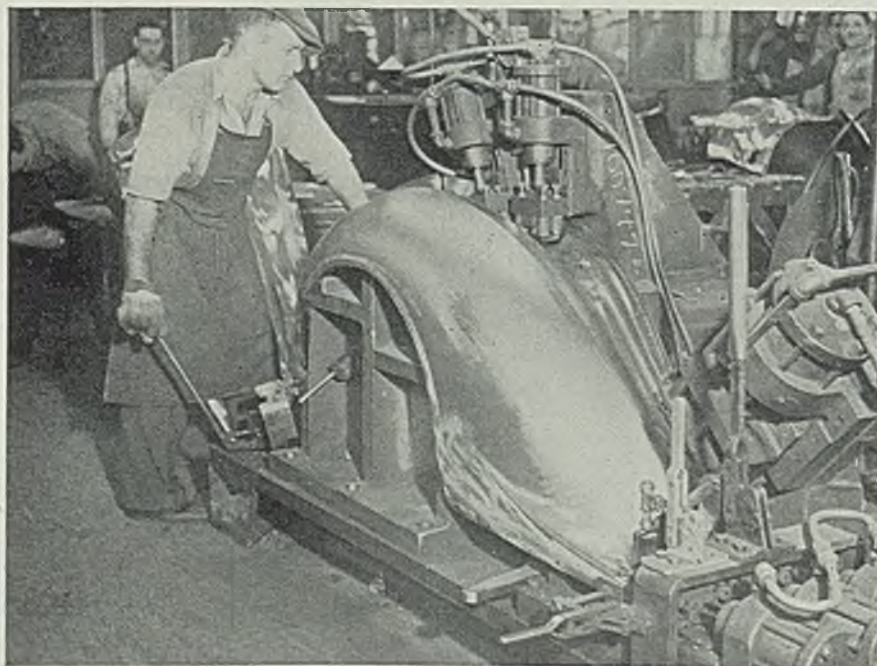
units is Cincinnati Milling Machine Co., Cincinnati.

Turning from the machining department to the sheet metal department for the moment, in the latter division are two newly developed machines of more than ordinary interest. They are for accurately locating and punching assembly holes in fenders and radiator shells. Fig. 5 shows the unit for handling radiator shells. The unfinished shell is placed in the fixture mounted on an inclined backing plate and locked securely in position with three hand operated clamps. A lever is thrown and 19 hydraulic cylinders come into action, each actuating from one

to four hardened steel punches. These cylinders are mounted on the backing plate at varying angles to the shell, and are so spotted with relation to the shell that the required holes can be punched quickly and with greatly increased accuracy over former methods. Dies backup the shell with holes to receive the punches and prevent bending the shell.

Some 22 holes are required in the shell to accommodate assembly

FIG. 6—Similar to the machine shown above, this unit punches 12 holes in a front fender by means of five hydraulic cylinders carrying the tools



bolts, hood lacing, etc., and by punching all of them simultaneously, it is assured that they will be located properly, and furthermore considerable time is saved over the old method of punching these holes, several at a time, in a punch press. The new method has licked many problems which occasionally arose from assembly holes not matching when the shells were being installed in chassis of cars on the line.

Fig. 6 shows a similar machine used for punching holes in front fenders. The fender is securely clamped over a die which follows the contour of the fender and is provided with holes in the proper places to receive the punches. Five hydraulic cylinders, with a total of 12 punches, are actuated simultaneously, the holes are punched and the fender released to pass on to finishing and assembly operations, the entire punching operation consuming not over 30 seconds. Both these machines were designed and built by Packard.

Merry-Go-Round Assembly

An interesting feature of Packard assembly operations is a turntable assembly station where front fenders and radiators are assembled for subsequent installation on chassis. This comprises a 20-foot diameter steel table flush with the floor, on which are mounted rigidly six fixtures for receiving the parts for assembly. Monorail hoists remove fenders and radiators from nearby conveyor chains and carry them to the proper fixture. Electrically operated assembly tools are suspended from overhead supports and are within easy reach of operators. The table is driven by elec-

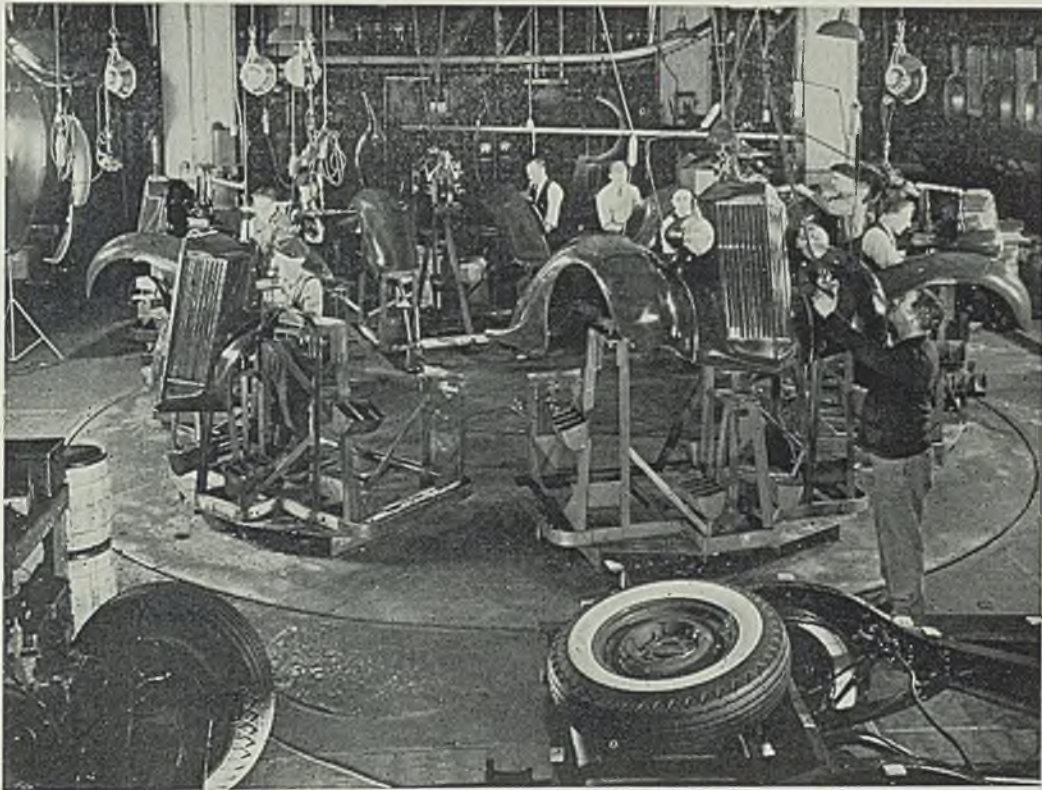


FIG. 7—Turntable assembly station for front fenders and radiators. The latter are assembled in a single unit with one revolution of the table, and transferred to the main assembly line partially shown in the foreground

tric motor through reduction gear drive, with the speed synchronized exactly with that of all conveyor lines, to avoid danger of bottlenecking the assembly work at this point. As fast as the radiator and fender assemblies have been completed and inspected they are removed from the fixtures and transferred to the main assembly line which is approximately tangent to the circular station along one side of the plant.

Use of this table system, shown in Fig. 7, avoids the necessity of stretching this assembly work over a straight section of the assembly line which is required for other purposes. It is an interesting refinement of the straight-line assembly system which originated in auto-

otive plants, and circumvents one of the main objections to the conveyor line — the long stretch of building which it requires.

Timing of the table is such that an assembly is completed for each revolution and the finished assembly arrives at the point adjacent to the main assembly line at the exact time that the particular chassis for which it is intended passes this point.

bleware, such as pots, trays, casseroles, knives, forks and spoons. Knife blades must be made of another material, however, since Roneusil steel cannot be hardened. The new material takes a high polish and does not tarnish or become dull. It is tasteless and nonmagnetic. Sheets 1 millimeter in thickness may be drawn into shells 14 millimeters deep.

The steel may be soldered or welded, the latter requiring a special welding rod which does not need flux. Heat treatment of the joint is unnecessary.

The manufacturer states that Roneusil is intended for the German market only at present. An American patent application has been filed recently and although the producer is in touch with several American companies regarding patent licenses it will not enter into any agreements until patent is granted.

German Stainless Steel for Tableware

FURTHER information on a new type of German stainless steel, announced in STEEL originally Aug. 17, p. 46, has been obtained through R. L. Harding, chief of the metals and minerals division, department of commerce, Washington, and through the consulate general at Frankfurt-on-Main, Germany.

The steel, known by the trade name Roneusil, contains 8 to 9 per cent chromium and 12 per cent man-

ganese, but no nickel. It resembles silver in appearance and is reported to be quite ductile, making the material suitable for a wide variety of stamped products, chiefly tableware and household utensils.

Manufactured by Rochlingstahl G.m.b.H., Volkingen, Saar, the alloy is furnished in sheets from 0.3 to 5 millimeters in thickness, in sheet sizes up to 600 by 1200 millimeters (about 24 by 48 inches), in bars, rods and tubing, the latter welded and available only in smaller diameters up to 40 millimeters.

The steel is said to be rustproof and resistant to acids ordinarily present in foods, principal use therefore being in the manufacture of ta-

Institute Issues Revision Of Steel Joist Handbook

Steel Joist institute, Chicago, has recently issued a revision of its handbook which includes engineering practice and the code of standard practice for members, covering design and application of open web steel joists of both the all-steel and nailer types together with safe load tables for each type. The booklet contains tables of properties and dimensions of open web steel joists manufactured by members of the institute in standard types.

Drop Hammers and Dies Used To

TO DEVELOP maximum aerodynamic efficiency in aircraft it is extremely important to manufacture efficiently dies and forms which will produce the many accurately faired lines and curves that are so necessary for the streamlined airplane of today. This fact was brought out by R. J. Minshall, J. K. Ball and Fred P. Laudan, Boeing Aircraft Co., Seattle, in a discussion presented at the aircraft production meeting of the Society of Automotive Engineers in Los Angeles, Oct. 15-17. Since an order for planes rarely exceeds 75 to 100 units, these forms and tools must be economical to fashion, since there are no long runs over which the cost may be amortized. One efficient method for certain types of work is the use of zinc dies and lead punches in drop hammers.

Make Plaster Cast First

The ordinary procedure with the drop hammer method at the Boeing plant is to make a plastic cast of the die to be made, the shapes being developed through the use of loft templates, from a mockup, from a plaster model or even from a "hand made" part. This plaster cast is used as a pattern from which a zinc die is cast. The zinc die is then filled with molten lead which produces the punch. This gives the die set which only requires further that the faces be ground to allow clearance for the metal to be stamped in the die. When the required parts have been made, the dies are remelted and the plaster cast is stored for future use if required for additional orders or spares.

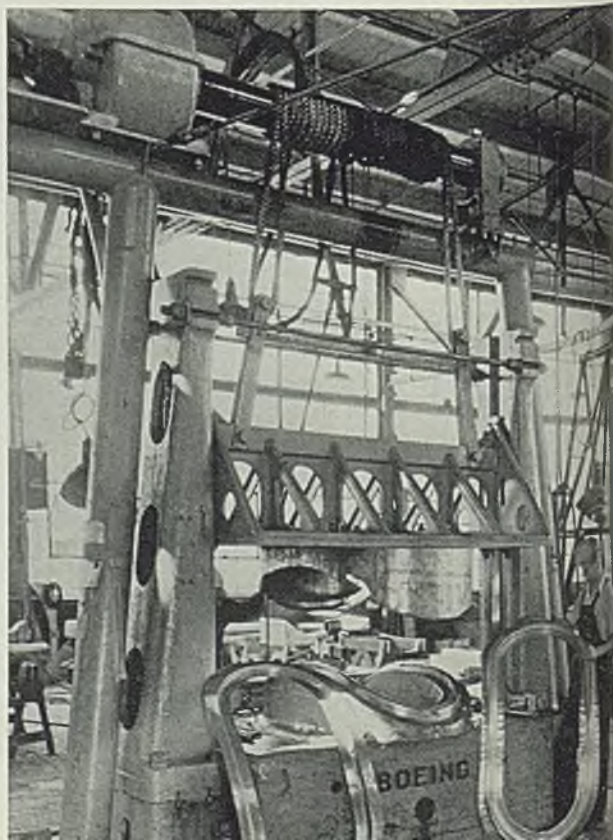
During the early stages of the development of the drop hammer method, Boeing was producing an all-metal plane of approximately 3000 pounds gross weight and it was found that a drop hammer with a bed of 27

inches by 30 inches and designed to handle a punch with a maximum weight of 3150 pounds was all that was required. Next was manufactured a plane with a gross weight of approximately 13,500 pounds and it was necessary to provide a hammer with a bed size of 36 inches by 45½ inches and facilities for pouring and handling punches with a maximum weight of 4650 pounds. This served the purpose well until planes of 30,000 pounds and more were planned, when it was found necessary to design and build a hammer with a bed 48 inches by 72 inches and capable of handling punches up to 11,625 pounds. This strained pouring and handling facilities to the utmost. At present, han-

dling equipment consists largely of four-legged handling dollies which have chain blocks for the hoisting mechanism and run on casters. These dollies straddle the rows of dies in storage and run on steel channels on the floor as wood floors deteriorate rapidly due to the heavy loads on the small casters.

With present equipment, it is possible to manufacture complete door frames and channels in one piece. Wing root fairings 11½ feet long by 17 inches in width have been made in one piece, by using lead and zinc dies in a 700-ton hydraulic press. These fairings do not require much forming but would be difficult to fabricate by any other method without resorting to "shingling."

THREE sizes of drop hammers operated at the Boeing plant in shaping aircraft parts of duralumin. Largest hammer, at the left, has bed size of 48 by 72 inches, and here is forming one-piece door frames. Bed sizes of the two smaller hammers are 36 by 45 inches and 27 by 30 inches



Form Duralumin Aircraft Parts

which does not produce the smoothly faired lines required. It is believed present equipment will take care of all future needs even though planes of 100,000 pounds and more were to be constructed. Extremely large parts will have to be spliced, however, as there is an economic limit in connection with the die cost and handling.

An accompanying illustration shows an installation of the three hammers mentioned above and the handling dollies and several types of parts that have been produced by this method.

Further details regarding the use of drop hammers and zinc and lead dies in forming duralumin aircraft parts were given by George H. Prud-

den of the Lockheed Aircraft Corp., Los Angeles, who pointed out that the first application of the drop hammer in aircraft manufacture testifies to the simplicity and flexibility of its use.

The time was 1928 and the place San Diego. A toilet seat had just been made from duralumin at a cost of 30 hours of labor. The cracks had been welded and filed and the results were far from satisfactory. Previous experiments had indicated that duralumin would not lend itself to deep drawing operations. However, it was obvious that something had to be done before it would be possible to realize one of the basic anticipated advantages of duralumin in airplane construction—reproduc-

tion of parts by mechanical means.

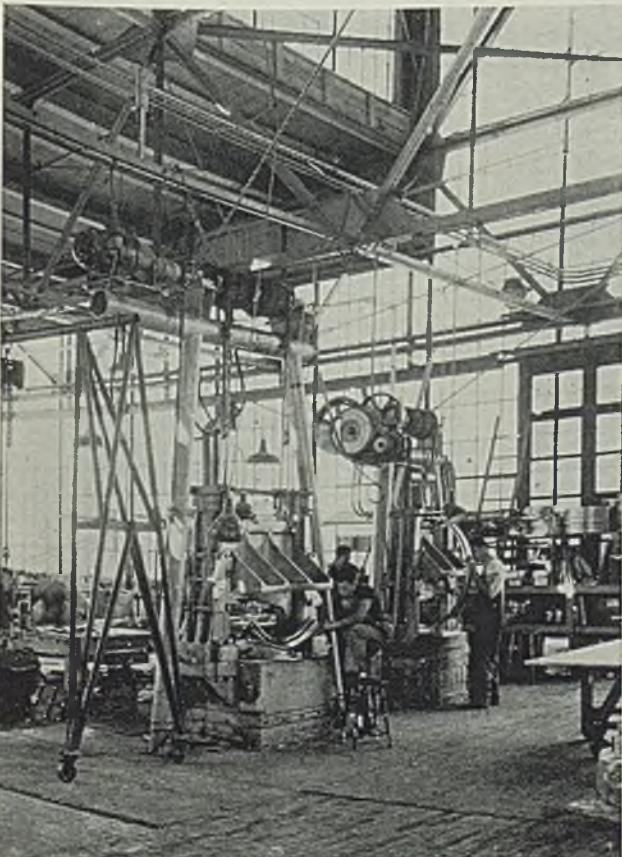
Deciding to take another fling at it from a different direction, engineers unfastened a toilet seat and laid it on the shop floor. Then they boxed it in on four sides and poured in a rich cement mixture. Turning it over and removing the seat gave a female die in the exact replica of the seat. The surface of this was rubbed with graphite, the walls extended vertically with wood forms and a male die poured right in place. Ways were then erected to guide the block in vertical travel. The male die was raised with block and tackle and released with a trip. Ten seats were produced in 15 minutes—all perfect.

New Field for Old Method

Obviously, there is much more to be said about the various applications of the process, but this simple first experiment gives the picture. Having discovered something absolutely new, it was soon found on inquiry that, like most other things, it was not new. The process had long been in use in sheet metal fabrication. To many laymen it would not come as a surprise that unconsciously a page had been borrowed from the undertaker's book for an airplane manufacturing process, inasmuch as for some time metal caskets and vaults have been formed by the drop hammer.

The next step was to build a hammer of steel, and dies of lead and zinc, which lend themselves to simple foundry practice.

Of course, no approach is made to large-scale production in aviation, as production is known in other industries. Even if present production schedules were increased many times the chances are strong that continual changes would obsolete any form of die equipment. Machined steel dies which would permit production economies are not warranted by parts demand; and



FEMALE dies are of zinc, male dies of lead. These metals are readily adaptable to short production runs on parts, and can be melted up quickly for recasting. Note the four-legged dolly with chain block, between the two larger hammers, for handling dies into and out of hammers

From a Simple Experiment in 1928, This Unusual Metalworking Method Has Grown To Considerable Importance in Aircraft Construction

would furthermore restrict progress on account of capital investment. The basic conditions of airplane construction require processing that is quick, flexible and inexpensive. The entire drop hammer process answers these requirements.

Patterns are normally made of plaster poured over a modeled clay or wood form, or frequently modeled directly in the wet plaster. The development of the clay or wood form needs no explanation. The direct plaster modeling is a quick, interesting and inexpensive process. It can be applied wherever the resulting die is straight or curved in a single radius. A sheet metal template is cut to the cross section of the desired die. This is attached to a rough wood backing extending to a guide running parallel to the work. The work is accomplished on a smooth marble to which the wet plaster will adhere while being worked but from which it can be removed without sticking after hardening. The wet plaster is then poured on the table followed by a sweep of the template which cuts the successive pouring until the cross section of the plaster is the exact shape of the template.

Woodworking Tools Used

In the straight die the smooth surface of the table acts as a horizontal guide for the template while a piece of wood with one straight side guides it laterally. If a curved pattern is required the template is attached to an arm pivoted at the proper length of radius at any point desired in relation to the plane of the table. When hardened, the pattern is susceptible to manipulation by any woodworking tools, and ends or sides may be trimmed to the size of the die required. Because of the rapid hardening of the plaster the entire operation cannot consume more than 10 to 15 minutes. No other process of patternmaking is as rapid. Furthermore, if the template is correct the pattern cannot be otherwise and the pattern requires no checking.

Assume that a fillet is to be produced between the vertical fin and the fuselage. This represents a problem of patternmaking about as difficult from a layout and checking standpoint as one could conceive. Fortunately it is one that comes along at the tail end. But there are many such cases. The fin and fuselage are assembled in place. The

patternmaker has but to model a fillet on the airplane in clay. The designer can see and approve the physical article in place and in relation to all other parts—or change it to suit his desires. No end of layout drawings could represent more accurately the desired results. It simply remains for the patternmaker to mix up a batch of plaster, put it on, wait a few minutes for it to harden, and the pattern is made.

Patterns are made from quick hardening dental or casting plaster. The best method of preparing the plaster is first to fill a container with an amount of water equal to the volume of plaster required. Then shake in the plaster so that it does not lump and fills the water completely. Let it stand from three to five minutes. Then with the hands reach into the liquid and break up any lumps that may be formed. Pour and work immediately. If the plaster is to be worked into shape it must be done with the utmost speed, as it sets too hard to work within a few seconds after being poured. Inside of an hour all forms can be removed, the pattern shelacked, and removed immediately to the foundry. In making patterns for zinc casting a shrinkage allowance of $\frac{1}{8}$ -inch to the foot must be made.

Casting Technique Is Simple

As previously stated, the dies are of lead and zinc. In practically all cases the female die is of zinc, because of its higher tensile strength as compared with lead. The foundry is concerned principally with the use of zinc. Only the purest zinc should be used, and this kept frequently skimmed to prevent dross from spoiling the casting. The best temperature for the pour is approximately 800 degrees Fahr. The sand mold should be placed in such position that the final base of the casting will be level. If the zinc is poured at the proper temperature, and risers kept filled until chilled, so that cavitation does not result in cooling, no machining of the base will be required. Otherwise there is nothing peculiar to this foundry practice. Other than a little sanding for smooth surfacing the dies are ready to use immediately after casting without machining operations.

The male die is in most cases of lead and is poured directly into the female die, with the result that it is a perfect fit and requires no pat-

terns or other operations. It can be poured directly in place on the anvil of the hammer or at a remote distance.

If poured on the anvil the following is the procedure: In the face of the anvil are a number of scattered shallow holes about $\frac{5}{8}$ -inch in diameter. The female die is placed on the anvil with a little block under each corner about $\frac{1}{2}$ -inch high. Boards approximately 1 inch thick are laid on the face of the anvil surrounding the die and about 1 inch therefrom to form a dam. Lead is poured under the die and to the top of the dam. Following into the holes in the anvil surface sets the location of the lead with respect thereto, and flowing up the sides of the die to the top of the dam sets the location of the die with respect to the lead. Thus the female die is anchored laterally in place. The dam is then removed.

Anchored to Hammer Head

A sheet metal dam is then strapped around the female die to the desired height of the male die. From two to four bolts are let through the holes in the hammer head and nuts applied at the top side so that the heads of the bolts project about 1 inch below the hammer surface. The lead is poured and the head let down gently until the bolts are buried in the molten lead and the surface of the head is touching the surface of the lead. Cooling takes place rapidly and the head can be raised, taking with it the male die. Stripping of the sheet metal dam prepares the entire set-up for immediate service.

From the above procedure it will be seen that the female die is located approximately at the center of the anvil and secured there by the lead without the necessity of dimensionally locating it with respect to anything. The male die, being poured in place and frozen to the bolts in the head, not only fits the female die perfectly but is located exactly without dimensional reference. If desired, both of the dies can be removed from the hammer and replaced at any subsequent time without dimensional location references. Their perfect register has been automatically accomplished in the pour.

In some cases it is desirable to pour the lead die away from the hammer. In this case the bolts are let into it from a bar through which the bolt holes are in register with those in the hammer head. In such case the location of the dies in the hammer is the reverse of the first described process.

Lead melts at a lower temperature than zinc, and if poured at approximately 700 degrees Fahr. it will not stick to the other die. Normally about 4 per cent of antimony



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is fused with the lead in the melting pot to harden it. In some few cases it is necessary to increase this proportion to 12 per cent.

Either or both dies can be melted up and the metal reworked after serving its purpose, or the dies stored for future use.

Of considerable importance are the shapes into which the blanks are cut out for stamping. This is arrived at in a simple manner. The faces of the dies are wiped with oil, and a sheet of wrapping paper is placed in the hammer and stamped. The paper will neither stretch nor compress. The result is an oily impression on the paper showing exactly how much metal is required to draw into the impression, what part will be stretched, and what parts compressed, and to what degree. Laid out flat the paper is not only a pattern for the blank but tells the whole story of the required flow of sheet metal into the die.

In the main, stretching of the metal should be avoided at every point. If the die is too deep to allow the metal to slide in without stretching and without too much wrinkling it is sometimes necessary to carry the operation through two or more stages. For example: A small sump is desired in a tank end. Obviously, if the entire piece is struck in the same operation the metal will be restricted from sliding into the indentation without stretching. A small die can be made to draw the metal in locally to the sump to be followed by the second operation of forming the entire piece.

The drop hammer is a plastic medium for a pliant art. Dies can be made, melted and remade with-

in a few hours time and yet one set of dies has been used continuously for the production of as high as 300 parts. The useful life of a die is determined largely by its shape and the strain imposed, but the actual life is more often determined by obsolescence.

In any case, beyond the metal which can be melted and reworked, the capital investment in a die is only a few hours labor. Its benefit reaches far beyond the making of parts. If both covering and structure are subjected to die processing final assembly becomes simplified. Parts destined by uniformity to fit perfectly can be delivered to final assembly jig drilled for riveting. With the use of rubber, cutting and blanking operations can also be accomplished in the hammer. The drop hammer cannot eliminate all other machinery, but there is scarcely any forming operation in the manipulation of sheet metal which cannot be accomplished in the hammer. For aviation production, it can in most cases do the job with the same uniformity and refinement of other tools with much greater speed and economy.

Cause of Variations in Brinell Test Studied

Variations in the brinell readings from a given sample will be wide unless proper precautions are taken to control the process. Effects of small variations in testing procedure have been studied and the re-

sults published by the national bureau of standards, Washington, in pamphlet form as research paper RP903. Authors of these studies are Serge N. Petrenko, now deceased, Walter Ramberg and Bruce Wilson. The paper concludes with recommendations for a test procedure which would lead to greater concordance in the brinell numbers obtained by different observers using a ball of given diameter on a specimen of given metal.

Four New High-Temperature Steels Are Announced

To enable engineers and operators to achieve the economic balance essential to minimum production costs in refinery and other high-temperature operations, the Timken Steel & Tube Company, Canton, O., has developed a new series of steels, to be known as Sicromo 1, 2, 3 and 5.

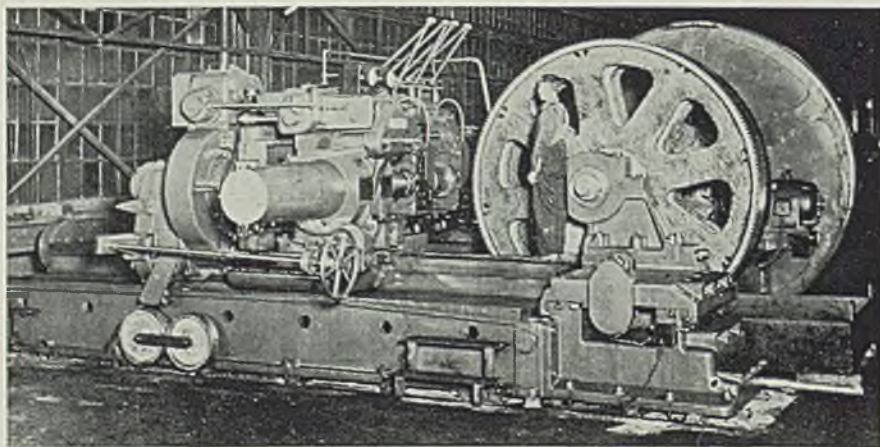
These new high temperature electric furnace steels extend the economic possibilities outlined by Timken DM Steel, the first silicon-chrome-molybdenum alloy offered for high temperature use. Sicromo steels contain the 0.50 per cent molybdenum which has been found to be effective for increasing creep strength on an economic basis. High silicon content develops the desired degree of oxidation resistance while economic resistance to corrosion is assured by the varying percentages of chromium indicated by the numbers.

Sicromo 1, 2 and 3 are particularly suitable for use in high-temperature applications where low to medium oxidation and corrosion resistance is required. Sicromo 5 is designed for use where severe corrosion and oxidation is encountered, yet where equipment cost must be held to the minimum consistent with economic life and efficient operation.

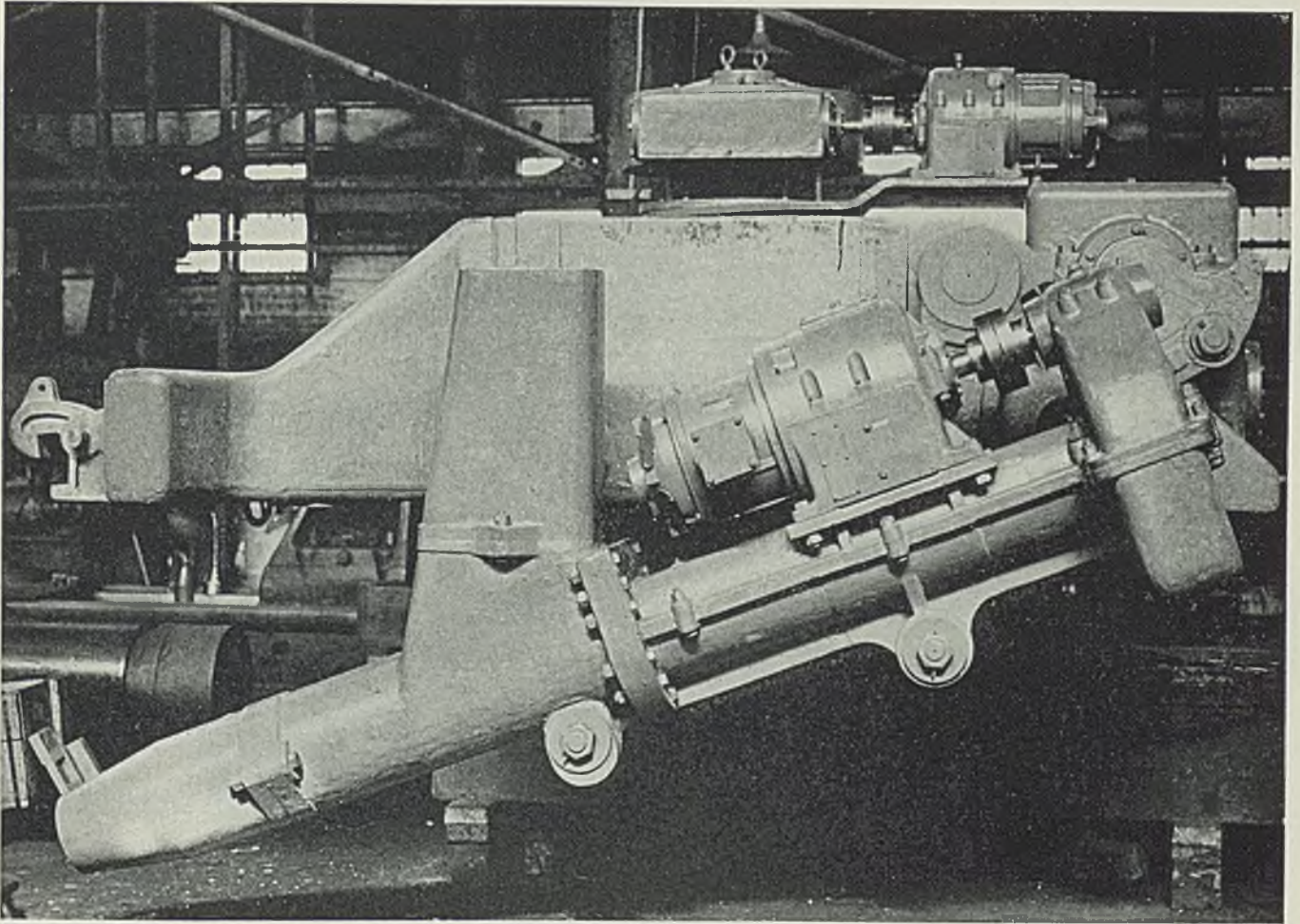
Reduces Corrosion of Oil Refinery Steel

Petroleum Rectifying Co. of California, Los Angeles and Houston, Tex., has developed a new process for use by petroleum refiners for removing salt and other corrosive materials from their crude oil charging stocks. It also is effective in removing suspended sand and other solid matter which may be present in the crude. Its use is said to effect a reduction in the amount of corrosion of refinery equipment and to permit the refiner to get long operating periods without having to shut down and clean out tube stills, heat exchangers or other apparatus.

For Russian Gears To Cut Their Teeth



GEARS for Russian machinery will be cut on this machine, one of a pair ordered from Farrell Birmingham Co., Inc., Buffalo, N. Y. Capacity of the larger machine, intended for the Kramatorsk plant, ranges up to 8 meters, approximately 26 feet. The smaller machine of the two is being built for the Ural works and will cut gears up to 6 meters, approximately 20 feet. The machines are capable of cutting practically every type of gear which operates on parallel axes, and also internal gears with either straight or helical teeth



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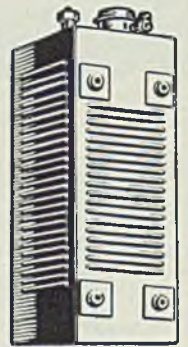
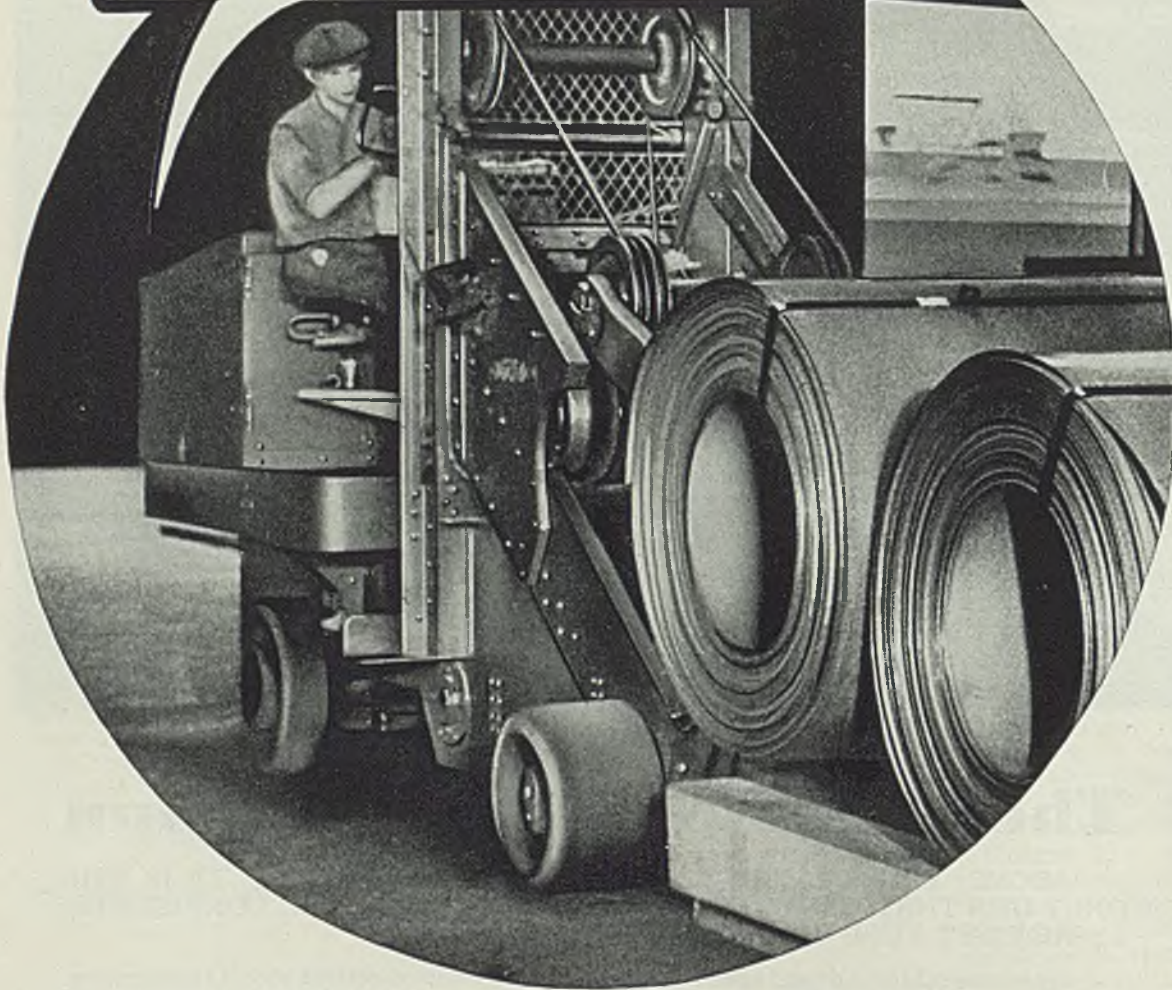
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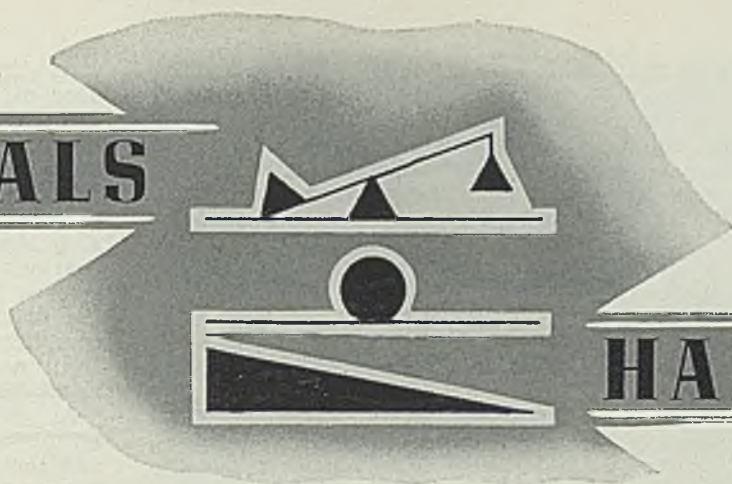
EDISON BATTERIES thrive on hard work. There are big batteries to do big jobs. The picture above shows an Edison-equipped battery truck which can handle loads up to 20 tons, day in and day out. Ten years ago, in industrial truck service, batteries were seldom called upon to handle more than 2 tons at a time.

Whatever the power job where continuous line current connection is not available or economical, there's an Edison Steel-Alkaline Battery of the right

size to do it. Edison's principle of a steel battery using alkaline electrolyte is rushing right in to tackle industry's biggest jobs—24 hours a day, in many cases. It is important to note that the number of Edison Batteries going into service is several times greater than the general increase in the battery business. That's because in U.S.A. only the Edison is steel-alkaline... only the Edison provides assurance against unexpected failure. It lives 2 to 5 times as long; costs least per year.

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Handling Equipment Speeds Operations in Auto Accessories Plant

IN MANY industrial communities throughout the United States are important employers of labor whose products include automotive items, many of which are accessories without which the average automobile owner today would feel he was missing something essential to safety and comfort. In Bridgeport, Conn., the Casco Products Corp. is one of the busiest pro-

ducers in this category, and is pointed out by local business men as an organization whose growth has been phenomenal during its comparatively short existence. The company recently instituted an expansion program which includes the acquisition of a second large factory building, located directly across the street from its main plant.

Beginning business in 1922 as a

manufacturer of vacuum tank floats, the company later added a line of cigar and cigarette lighters for automobiles. Its origin was modest indeed. Its president, J. H. Cohen, long identified with the automotive supply business in Bridgeport, began his manufacturing career with 25 or 30 employes in a manufacturing space of only a few thousand square feet. Today, Casco Products Corp. has on its payrolls approximately 1200 employes, and occupies factory and office space totaling 125,000 square feet.

In addition, the company has a sizable warehouse, and its line of products, originally centered about the vacuum tank floats, now includes lighters, hand brake lever extensions, steering wheel controls, fender guides, fenderettes, gear shift balls, head lamp beam indicators, defrosters, auto fans and illuminated rheostat switches for hot water heaters. As some of these are original equipment on several

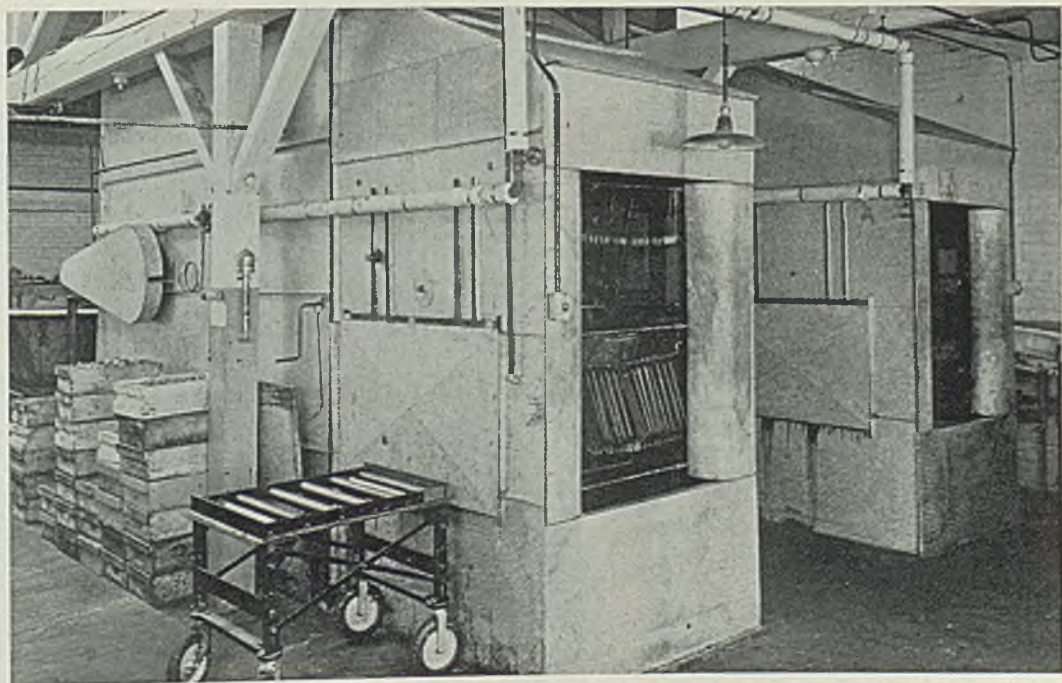


FIG. 1—Small roller conveyor tables mounted on rubber tired casters are used to handle heavy paint tanks into and out of ovens. Drive for the conveyor in the oven is by chain and sprocket from a worm reducer with variable-speed transmission from the motor

makes of cars, it is natural that in its expansion program the company has taken advantage of some modern materials handling equipment and methods to assure a smoother flow of parts through production, and a certainty of meeting delivery dates.

The need for expansion is apparent from a study of the company's sales reports. For example, the first five months of the company's fiscal year sales were \$886,000, compared with \$535,000 for the corresponding period a year ago. For August, 1936, the company's sales were estimated at approximately 101 per cent over those for the corresponding period last year.

by four-wheel floor trucks and by elevator to the various presses and molding machines. By similar means, pressed parts are carried to the fourth floor where the buffing and polishing machines are located. From here, parts are trucked to the new materials handling installation which carries them through the painting operations.

Conveyor-Ovens Used

It was imperative that parts be kept moving and that floor space be kept as free as possible. Dip-paint units of the conveyor-oven type were installed. In these, the parts are dipped, dried and cooled. The oven was shaped to occupy

sure. The oven housing is carried over all the mechanism, and the paint tank chamber is ventilated amply to exhaust the fumes into the stack above the damper.

The conveyor chain is looped over standard sprockets revolving on stub shafts set into solid journal bearings fixed therein with set screws. The only through shaft is the drive shaft. The drive is accomplished by chain and sprocket from a worm reducer driven by varispeed belt from the motor.

As different parts require different colors or grades of paint, and the paint tanks are too heavy for manual handling, the tank has been set on a roller bed. Roller



FIG. 2—View of section of shipping department showing delivery end of spiral chute which connects with the manufacturing building. A gravity roller conveyor also is used for handling outgoing shipments

The Casco Products factory does not have the advantage of a railroad siding. Consequently, both incoming materials and outgoing products are transported by motor trucks. The receiving department is located on the first floor of the main factory, but outgoing goods are dispatched from a separate shipping building located in the center of the factory yard and connected with the assembly department by gravity roller conveyor and spiral chute. Delivery end of the chute in the shipping department is shown in Fig. 2.

Flow Is in Two Directions

Due to the multistory factory construction, the flow of materials is both vertical and horizontal. Alloy steel and plastics are used in manufacturing so that operations include production of a large number of small pressed parts and of several molded items; buffing and polishing; cleaning, painting and finishing; and assembly of small parts into finished products.

From the receiving room on the first floor, materials are transported

space between the roof trusses on a top floor. A double-strand chain conveyor is spaced with crossrods at suitable intervals. From these crossrods are suspended hooks, on which the operator deposits a rod or a string of parts to be painted.

The conveyor moves upward, taking the parts from the operator's position and down into the paint tank. Coming out of the dip, the conveyor carries the parts up an inclined drain sheet, and then travels downward to pass beneath the oven partition into the drying chamber, over two loops of conveyor and out at the bottom of the drying chamber into a horizontal cooling chamber.

The oven is heated from steam pipes on the bottom, which is pierced for air holes from the cooling chamber so that any heat derived from the cooling is used advantageously in the oven. The volume of air is controlled by a damper in an ample-sized exhaust stack at the top of the oven and passing directly out through the shop roof. The damper is hinged to be easily opened by explosion pres-

conveyor tables mounted on casters carry the one or two other colors, and are parked between the oven units when not in use. The paint in the spare tanks is well protected by tight covers. A side door in the oven housing permits the tank to be withdrawn easily to its roller table, and the change tank similarly put in place with ease and dispatch by the operator. Fig. 1 shows two of the dip paint and oven units, also the portable roller conveyor table for handling paint tanks.

Conveyors Boost Production

Under former methods, production figures showed approximately 480 dips per hour; the new conveyorized methods have boosted this to 1600 per hour. From the standpoint of employes, however, the present procedure has a decided advantage; the operator now stands away from the fumes of the paint tank. Previously, the floor space was occupied by a large number of racks used to hold loaded rods while cooling before assembly. The new method eliminated one handling here as the parts are both dried

and cooled in the oven and are then placed in shop trucks for direct delivery to the assembly department.

J. H. Bentley, materials handling engineer, Bentley & Holmgren, Bridgeport, Conn., designed and installed the equipment in the Casco Products plant.

Electric Trucks in Demand

GENERAL business improvement and greater interest in materials handling equipment have been reflected in the reports of sales of electric industrial trucks during the first three quarters of this year. Total shipments for the period were 889 machines as compared to 588 for the corresponding nine months of 1935. During the entire 12 months of last year the total shipments were 920 units. Export shipments of trucks in the period covered by the report amounted to 59 machines as compared to 28 for the corresponding period of 1935.

Novel Use of Tractors

TRACTOR-trailer method of handling has been making rapid strides in attaining an important

TRANSFERRING steel pipe from erection shop to railroad at Fort Peck dam. Each section is trued horizontal by a small hoist as it is lowered by the 70-ton electric crane. See STEEL, Oct. 26, page 54. Photo courtesy Whiting Corp.

ranking among economical methods in many industries. In the past few years, it has been winning favor in the Buick automobile plant for use in certain operations. Among the latter is the transportation of engine blocks from foundry to machine shop.

A more recent adaptation is in body handling. Bodies are received on wheel structures known as body bucks. From the point of unloading from railroad cars or highway trailers, bucks are handled down through storage and to the assembly line by means of gasoline powered tractors. The machines have a special hitch which enables the operator to hook up from the rear of the tractor and maneuver

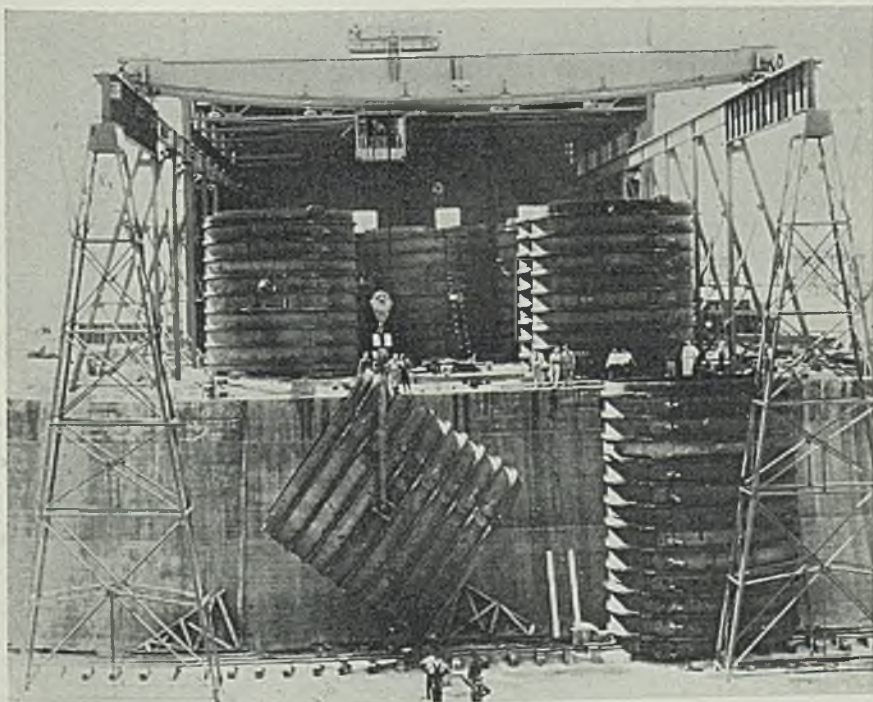
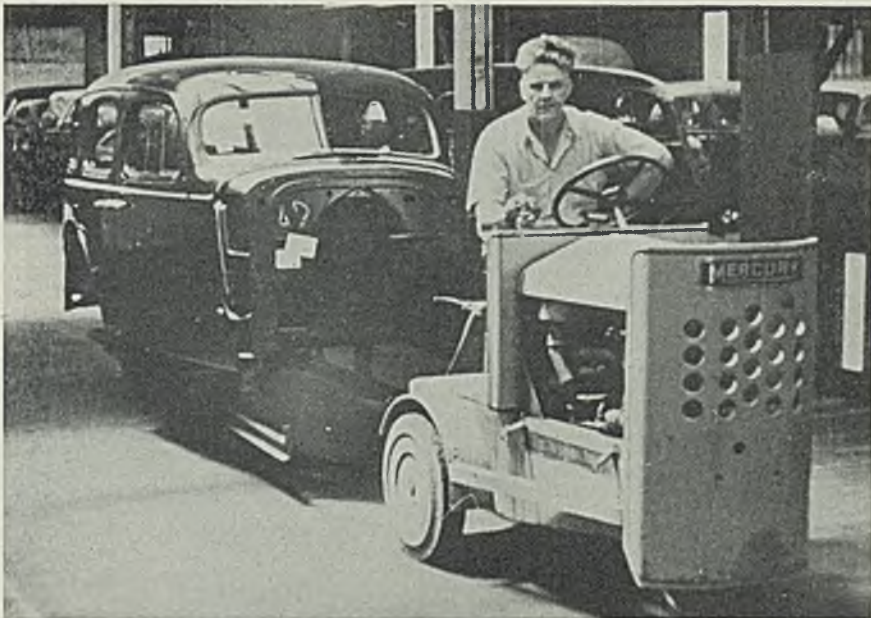
SMALL gas-powered tractor attached to buck carrying automobile body performs important handling operation in body storage department. Operator hooks up from the rear of the tractor without leaving his seat. Photo courtesy Mercury Mfg. Co.

the body on the buck conveniently, all without leaving his machine. This eliminates the necessity of installing any coupling apparatus on the body bucks proper.

Several months ago five tractors were purchased for this operation. The tractor itself was stripped down by removal of some of its customary fixtures. This was done to keep the weight as low as possible as the operation takes place on a second story area where load carrying restrictions of the floor made it advisable to avoid excessive bulk.

Two Sides of a Picture

THE September reports of industrial fatalities in the state of New York, released recently, show a decrease in the number of deaths from materials handling accidents. Nevertheless, the state department of labor stated that "complications such as peritonitis and septicemia resulted in the death of five workers who strained themselves while handling heavy objects." Here is a clear case of a need for further materials handling equipment. On the other side of the picture may be noted a need for greater caution in loading lifting equipment, and in making inspections of the same. Hoisting apparatus accounted for eight deaths in New York during the month of September.

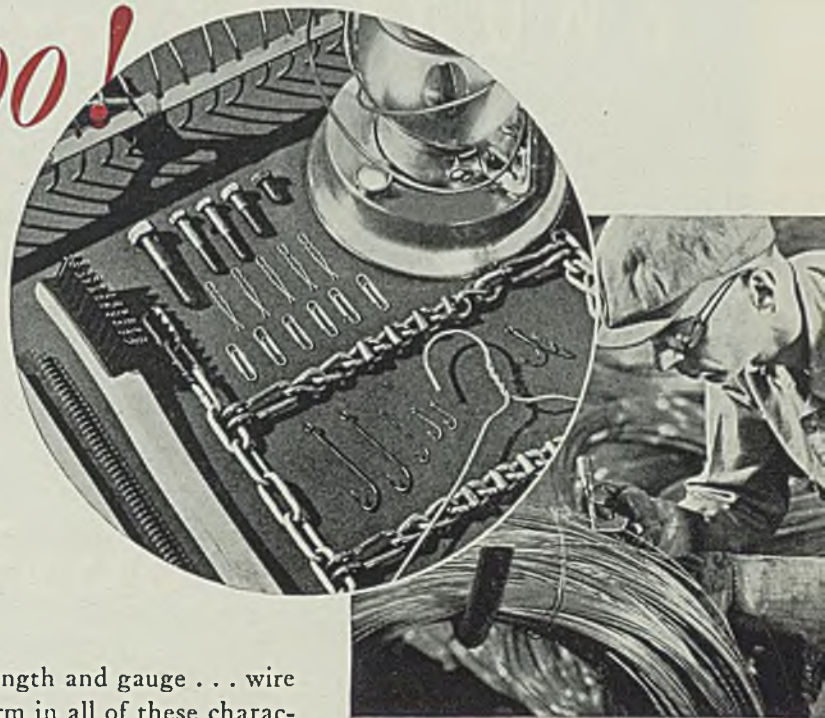


... it takes more than
GOOD



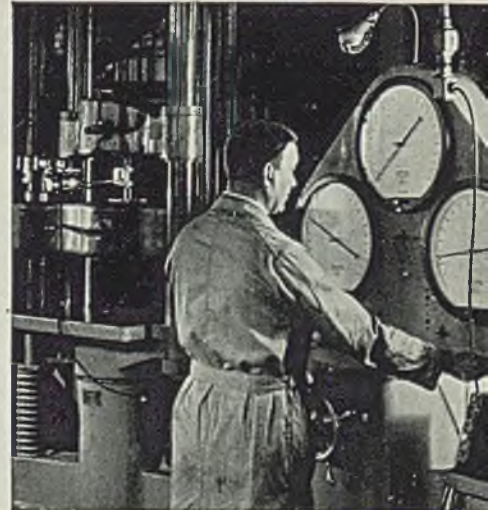
Specifications to make WIRE, *too!*

When you buy wire the experience and skill of the manufacturer are just as important as the specifications you give him.



Gauge is carefully checked all along the line. This is only one of the many precautionary measures that are constantly taken to be sure that the wire meets all of the requirements specified for it.

Laboratories are constantly employed for the assistance of our customers and in the improvement of our products. It is here that your wire problems can be carefully and skillfully worked out for you.



GIVE several women the same recipe and one of them will bake a better cake. The same is true of any product that requires a multiple of ingredients and treatments. Wire is such a product, and in the manufacture of wire nothing is more important than the *knowing how* that only long experience can give.

Three generations of wire users have depended upon the American Steel & Wire Company to produce wire that will assure them of the finest quality in the products they make. In over a hundred years of wire making we have discovered the little kinks and the tricks of the trade that make craftsmanship so important. It has given us a knowledge of those things that go beyond new plants and modern equipment in the production of wire. Through this background of experience our men have learned the factors that go into making wire of the proper

analysis, strength and gauge . . . wire that is uniform in all of these characteristics.

We have seen new wire needs grow as industry has developed new products . . . We have helped in answering the wire problems that have made many of these products possible. In every coil of wire we make lies more than a century of experience. *We know how* to put quality into wire.

Whether you make one or many products requiring the use of wire we can produce the wire you need in any quantity. The wire you get from us will be of the uniformity and quality you look for in your own product. Our mills are located so that deliveries can be made in any quantity to meet your schedule of production. And our laboratories and engineers are always at your service to help you work out any of the problems you may have concerning wire.

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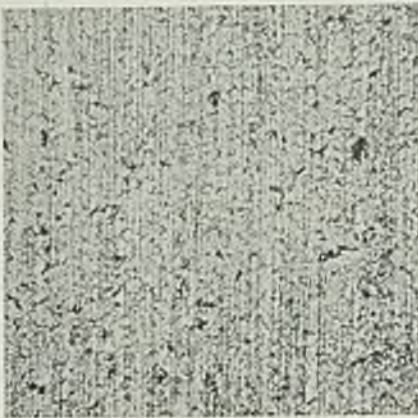
Microscope Determines Suitability of Steel Surfaces Preparatory to Finishing

INCREASED appreciation of the sales appeal of an attractive finish on refrigerators and necessity that the finish be durable enough to withstand the energetic cleaning methods of housewives have led to consider-

BY HAROLD ALLEN

Instrument Laboratory, Westinghouse Electric & Mfg. Co., Mansfield, O.

However, after mechanical details had been refined to their present stage of development, engineers decided that it was time to dress up the apparatus, and styles of cabinets were changed to suit the likes



ILLUSTRATING the surface of a rejected piece of steel (left) as appears under the microscope. The lines are rolling marks from the mills. At right is shown surface of steel which is satisfactory for enamel adhesion. Note evenly distributed teething arrangement which characterizes this surface. Both photographs taken at magnification of 30 diameters



able research into the matter of finishes on the part of manufacturers. Mechanical refrigerators were originally sold with little or no sales

talk on the beauty of the cabinet because at the time they were developed it was not considered necessary to beautify so utilitarian an object.

of the housewife. Finishing the exterior of the cabinet then became a serious problem.

The process of vitreous enameling, long in use, was first to come to the assistance of the cabinet engineer. After a short period of time, competition and the necessity for manufacturing economy led to the use of lacquer as an exterior finish. It was foreseen that if enamel could withstand the rigors of home cleaning methods, the cost of finish per cabinet could be decreased considerably. Not only would the enamel itself cost less, but lighter gage metal, and reduced handling would contribute toward appreciably lower manufacturing costs. Using enamel, the complete cabinet could be finished on a continuous conveyor, a factor which alone would afford a major saving.

The conditions which a refrigerator would encounter in the field were then studied. It was finally decided that the most severe test the enamel would undergo was cleaning after the cabinet had been soiled by hands closing the door and by fumes from the kitchen. Soap or scouring powder would normally be



With this type of metallographic apparatus the test pieces can be examined visually or photographed for future reference



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Ohio Ferro-Alloys Corporation
Canton, Ohio

used for cleaning and laboratory tests with these materials indicated that after a few applications, the enamel would wear completely off the metal then used. The manufacturer was then confronted with the problem of securing a base to which enamel could adhere securely.

Westinghouse turned this problem over to the testing laboratories of the inspection division whose first line of attack was to examine the steel purchased and determine the character of the surface. The thought was at first to obtain a surface which was smooth or mirror-like, similar to the type of material purchased for plating. However, it was soon found that enamel has its own peculiarities and requires rougher surfaces for the best adherence.

Test panels were made up from the various steels received and a bend and cup test procedure was set up to determine the adhesion of the synthetic type enamel used. This test required that the panel run through the regular finishing process, and the time required for drying and testing caused considerable delay. Since the steel was left in the cars until it had been approved, this method was not satisfactory.

Surface Preparation

Duplicate samples were cut from the same sheets of material in the raw state and observed under the microscope. The surface of the metal was first cleaned with cocoline and alcohol and noted as to physical surface conditions under the microscope. As a result of this study it was found that pieces of stock which successfully passed the cup and bend test had certain surface characteristics.

Under a microscope the appearance effect was that of looking down on a closely coupled range of mountains and valleys. At a magnification of 30 diameters, the part in focus was the peak of the mountain, and that out of focus, the valley. This condition gave an effect of teeth and was exactly what was required for enamel adhesion. On the other hand, pieces of material which did not pass the cup and bend test revealed entirely surface characteristics. In these practically the entire surface was in focus or a decided glare noted in the eyepiece, with perhaps a few lines from the rolls when it was processed at the mills.

Photographs were then taken of the various surfaces, with the tip of the tooth in focus and the lower portion out of focus, which when developed, displayed a light and dark portion evenly scattered, if the piece was satisfactory, and a light surface with a few roll marks if the material was unsatisfactory. Ex-



Suitable surface conditions permit continuous finishing of assembled cabinets, affording appreciable reductions in manufacturing cost

amples of both types of surfaces are illustrated on page 58.

After this find, a reverse set-up

was made; that is, steel samples were routed through the laboratory and observed under the microscope. If the teething condition was evenly distributed and deep enough, it was passed. About 100 samples were rechecked by passing them through the cup and bend test, and it was found that the decisions arrived at under the microscope coincided exactly with the results obtained under the actual test.

To classify the materials suitable for enameling for the benefit of the steel suppliers, photomicrographs were made of all steel received during the experimental period. A display board was made up showing samples, photomicrographs and test results. From this a standard was set up and used as the basis of making the visual requirements upon which each shipment of steel was accepted or rejected as conditions warranted.

The decisive and expedient knowledge gained in this manner provided the inspection department a means of checking shipments with accuracy and determining in a few minutes whether a car of steel will be unloaded or returned.

Sale of Consumer Goods Affected by Type and Color of Finish Used

SUCCESSFUL merchandising of consumer goods depends to a large extent upon the anticipation of changes and trends in popular taste. This applies especially to the finish which is used on the products to be sold. Methods of manufacture and styles in design are affected by popular demand, it is true, but they do not change as rapidly or as radically as the finish.

While the primary purpose of a finish is to protect the base metal from corrosion, the appearance factor will outweigh almost every other consideration from the standpoint of merchandising. Eye appeal is necessary to attract attention and colors must be such that they will harmonize with the popular color schemes of the day. Retailers have learned from experience that buying trends must be studied closely before they stock their shelves. Because of their intimate contact with popular buying habits, several buyers of prominent department stores were interviewed to ascertain the trend of consumer preferences in color and finish.

In the matter of colors many interesting facts developed. For instance there is a definite trend toward a white background in all metal goods used in households. Kitchen

utensils, waste baskets, bathroom fixtures and other household goods made of metal finished in white and trimmed with red, blue, or green are growing rapidly in popularity. Solid red goods are also popular, while all-green utensils are not.

Color popularity varies over the country as in the case of a recently introduced color known as delphinium blue. This color sold rapidly in New York, Pittsburgh, Chicago and Detroit and is maintaining its sales record. In Cleveland, however, it came in slowly and has not sold with nearly the rapidity that it did in the other cities although it is gaining ground steadily.

Bathroom color schemes continue the white background trend with perhaps a black or colored trim. However, peach, orchid, and maize are meeting with some approval as background colors as well as trim in this field. Attempts to introduce colored refrigerators appear to have met with failure and white continues to be the reigning color.

Another significant trend is toward the use of steel cabinets in kitchens in place of the customary wood. Here again the color scheme is predominantly a white background with a black or colored trim.

(Please turn to Page 79)

POWER DRIVES

Anticipating Maintenance Saves Cost and Trouble

IN DISCUSSING problems in connection with drive installations a transmission engineer who has come up from the ranks as a machinist and millwright made the following comment: "It is surprising how often installations are made in such a manner that it is difficult and sometimes almost impossible to make any changes. No installation should ever be made with the belief that maintenance never will be necessary.

"Servicing of some type is almost inevitable, although it may be years before such work is necessary. In the old days engines were commonly set so close to a brick wall that the engineer or oiler was in danger when he worked around it in operation. To remove or work on the flywheel or drive pulley would require tearing out a brick wall. Today, air compressors are often located in similar inconvenient locations.

"The plant engineer is not always at fault because many of these installations were planned by the architect whose only thought is to be sure the 'hole' is big enough for the equipment. He does not even consider future maintenance."

Air compressors and brick walls are not the only trouble makers. Frequently motors, clutches, and speed reducers are so located that the maintenance men must dismantle part of the equipment to remove them. Such locations usually foster neglect in regular servicing, too.

Some machine manufacturers have been thoughtless in the design of their equipment in anticipating future maintenance requirements. For example, one manufacturer so designed the drive that to replace the endless drive unit three shafts, one of them with a heavy flywheel, had to be removed. This would require dismantling a large portion of the machine and its careful and accurate replacement and realignment. A different type of drive unit could have been used which would not have required dismantling of the equipment for changing.

In one case, large punch and forming presses were placed so close to a sloping roof that the roof would have to be removed to get room to do any extensive servicing and

each of these machines will eventually require partial dismantling for replacement of the drive.

A little forethought on future maintenance requirements will pay handsome returns because no transmission equipment is so perfect that maintenance will be unnecessary. New equipment should be studied before purchase for possible maintenance requirements and difficulties. Economies in first cost may be paid for several times over in later maintenance requirements, if not anticipated.

♦ ♦ ♦

Special Purpose Motors

FOR practically all the severe drive services in industrial manufacturing or processing operations motor manufacturers have now developed special purpose motors. Some of these are designed to stand up under the particular power requirements; others, such as the totally enclosed units, are protected against exterior hazards.

New equipment installed today generally has such modern motors built into the machine or the manufacturer recommends the proper type for the installation. Often, to obtain the proper motor the policy of standardizing all motor equipment may well be sacrificed. On older equipment, where motor trouble from standard motors has become a serious operating problem, it may be advisable to invite suggestions for modernization of the drive from the manufacturer of the equipment or from motor manufacturers.

A few of the problem solutions incorporated in these more modern motor units are: Frequent reversal under load; exceptionally heavy starting torque; continuous, heavy-duty service; operation under dust, corrosive fume or wet conditions; explosive dust or gas hazards; operation under extreme heat; high speeds; wider range of adjustable speeds; extreme peak-load fluctuations, and others. Practically any motor problem may be met and conquered by some type of unit now available.

Such use of special motors often results in only one, or at most a few, units of a size and type in a plant. A spare armature, extra coils for rewinding, and bearings for re-

placement will in most cases be a sufficient stock of repair parts. Where the operation or process cannot be interrupted, except for a very short period, spare motors may be necessary.

Whenever these special purpose motors are used it is well to design the connecting transmission element to the equipment for the peak power rating of the motor or at least for the greatest probable overload that may occur. The nameplate rating on the motor is usually far below the actual output for short periods.

♦ ♦ ♦

Air Service in Off Hours

AFTER an extensive addition to a plant and its equipment the old air compressor was entirely inadequate for the new installation. As this was an old type unit it was considered to have only junk value. The force was too busy at the time to remove it.

As the maintenance force then had considerable overtime and night work and required air for drilling in concrete and for other tasks the small compressor was put in service during off hours. It is still used for off-hours maintenance or when only a few machines are in operation on overtime production, thus not requiring the use of the large compressor to supply only a small amount of air.

♦ ♦ ♦

Increasing the capacity of a drive to the normal required for the service may add only 10 to 15 per cent to the cost but, conservatively, increases life 25 to 30 per cent or more with a corresponding decrease in servicing and maintenance. Drive satisfaction cannot be obtained by skimping on cost.

♦ ♦ ♦

Some plant engineers overhaul equipment or perform major maintenance work only when a failure makes it necessary. Others "pull" equipment when failure appears imminent. Usually the second policy reduces the amount and cost of the necessary repairs.

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MAXIMUM ECONOMY AND
PROTECTION FOR EVERY
LUBRICATING DOLLAR

Sound Engineering Solves Manufacturing Problems

MANUFACTURING problems in connection with welding are similar to problems where other processes are involved. Once it is established that a job can be welded, the battle may be considered about half won. The job from then on is one of insuring a high percentage of passable work. In all manufacturing, an unexpectedly high percentage of rejects may wipe out profits or show a heavy loss. The problems are the same for gas welding, flash or spot welding, and arc welding. The plant which has no rejects is a plant which has no inspection so that the trouble merely appears as service failures in the field.

The most powerful weapon production men use to combat a high percentage of rejects is procedure control. By the theory, if the correct method of doing a job is discovered and followed, the correct result will be obtained every time. But then, human beings have to carry out the method so that the

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

theory, while entirely correct, is difficult to apply.

Also, conditions change in an unforeseen manner. Thus, a production welding job went along for six months without a rejection. One morning the temperature dropped to 5 degrees above zero Fahr. and every single job was rejected because of cracks. In another case, more than \$50,000 was spent to obtain a job acceptable to an inspector. Then suddenly the inspectors were changed and the new inspector accepted the work without question on the grounds the complaint was based on a point which had no significance on the job.

Sound production engineering in connection with welding jobs requires establishment of the vari-

ables which may cause rejection of the job. The next step is to establish how much the variables can change and result in an acceptable job; taking into account the fact all variables may change in the same direction and at the same time. The final step is to restrict the amount which the variables may change to such a degree that the result will always be acceptable. This is often a nice problem but one reject in 1000 jobs is frequently attained by smart production men.

Mathematicians Wanted

WELDING, particularly with the fusion processes such as gas, arc and atomic hydrogen, involves a tendency to deform or warp the pieces welded. The forces which cause this difficulty are understandable but little is known in a quantitative sense about them. Thus, a certain amount of welding heat applied to a steel plate at a certain rate will cause three times the amount of deformation longitudinal to the weld as in the dimension transverse to the weld. Apply the same heat at a considerably lower rate of speed and there may be no longitudinal deformation at all and extreme amounts transverse to the weld. It all makes sense; the difficulty lies in the fact the forces involved have not been evaluated.

The mathematics involved in the problem of predicting deformation due to application of welding heat is of the order of the mathematics used by astronomers. Such ability in combination with a serious effort to obtain measurable data upon which calculations might be made would result in information of great value to industry. There are certainly 500 firms which would profit enormously if they could buy this information at \$500 apiece. Eventually the information will be issued in a series of tables which will permit accurate prediction of not only deformation but also residual stresses due to welding heat.

The fact that this useful job has not been done heretofore is due to the fact astronomical mathematics have not had their interest aroused in the problem of the welding industry. Since most of them are of the type little interested in money, it is recommended they be offered a gold medal about a foot in diameter and 4 inches thick for applying their able minds to the job.

New A. W. S. Head Inspects Flame Cutter



OPERATOR S. R. OLDHAM (left) demonstrates to A. E. Gibson, new president of the American Welding Society and vice president, Wellman Engineering Co., something new in automatic shape cutting machines at the metal show in Cleveland. The machine, part of the exhibit of Linde Air Products Co., is slicing a 10-inch steel billet

HIGH speed steel is a material which has an economic importance far in excess of the amount produced or of its monetary value. It is a material of general interest, since nearly every manufacturer will use at least small amounts of it. It is complex material, so its behavior offers many opportunities for study and investigation. This lecture discusses the carbide segregate and grain size in high speed steel in an effort to explain some puzzling phenomena of its behavior.

Only one composition of high speed steel is dealt with, namely, a steel containing almost exactly 0.70 carbon, 18.00 tungsten, 4.00 chromium, 1.00 vanadium and with about 0.25 manganese and 0.30 per cent silicon. The characteristics of a steel represented by this analysis will not only be found to varying degrees in all types of high speed steels, but apply in some degree to many types of highly alloyed steels having a medium or high carbon content. The lecture is divided into several parts as follows:

(A) Nature and characteristics of the carbide segregate.

(B) Segregate and grain size as they affect the physical properties.

1. Strength and plasticity
2. Thermal conductivity
3. Hardness at elevated temperatures

(C) Effect of segregate on grain size.

(D) Grain size as affected by repeated hardening.

(E) Grain size as affected by furnace atmosphere for hardening.

Nature of Segregate

A 7-inch square ingot of 18 per cent tungsten high speed steel as cast and photographed at a magnification of 1000 diameters shows the characteristic appearance indicative of a definitely cored structure. Upon annealing to any temperature from about 1400 to 1700 or 1800 degrees Fahr. there results a structure which does not show so clearly the zonal characteristics. The white parts of the skeleton-like structure and the spheroidal particles are termed the carbide segregate. It is generally assumed that this segregate has a pronounced effect upon many of the characteristics of steels in which it occurs, but most investigators have been primarily interested in determining its composition rather than the effect it exerts upon the physical properties of the steel.

It is common knowledge that this segregate varies in size and distribution from the outside to the inside of the ingot, and that the distribution is influenced by many factors. It is also generally agreed that this segregate can only be distributed or broken up by mechanical work which causes it to elongate

Investigates Effect of Carbide Segregate and Grain Size in High Speed Steel

and break apart in the direction of working. It is also known that there is a direct relationship in the size and distribution of this segregate when comparing the structure of the bar with the structure of the ingot from which it was made.

If a well-worked bar of an 18

THE 1936 Edward De Mille Campbell memorial lecture of the American Society for Metals presented by James P. Gill, chief metallurgist, Vanadium-Alloys Steel Co., Latrobe, Pa., on Oct. 21, during the society's annual convention in Cleveland, bore the title "High Speed Steel, Carbide Segregate and Grain Size." In the accompanying article, STEEL reports in most abbreviated form the purpose and nature of the investigation pursued by the lecturer and his general conclusions

per cent tungsten high speed steel is annealed the segregate will appear in a rounded form quite well distributed throughout the steel. The segregate with this appearance will be called "spheroidal." If a bar of steel with this spheroidal structure is heated to the temperature generally recommended for hardening, there results a familiar structure, but by increasing the temperature slightly above that recommended for hardening, these spheroids will begin to fuse and coalesce. With further increase in time or temperature the spheroids will again, on cooling, form an eutectic-like structure considerably

below the melting point of the steel, similar in appearance to that in the cast material.

By heating for an extended length of time at some temperature in the vicinity of 2200 degrees Fahr. or for a shorter length of time with increase in temperature, this segregate begins to have an entirely different appearance than in properly heated and annealed steel; it begins to become angular in appearance and the crystals will vary in size and degree of angularity with the time and temperature. Annealed steel with the segregate in an angular appearance, exhibits both small crystals and large crystals.

Appearance of Particles

Thus it is evident the segregate may have a variable distribution determined by ingot size, mold design, casting temperature, rate of cooling and by degrees of mechanical work, but the individual particles may have a variable form, either quite spheroidal or having a mixed spheroidal and angular appearance. A completely angular appearance is unusual, but when it appears it cannot be readily broken up by mechanical work. A partially angular appearance is not unusual.

An 18 per cent tungsten high speed steel with a carbon content of 0.70 per cent can, from the unannealed condition, usually be hardened to Rockwell C 67. From the usual annealed condition it can be hardened to about Rockwell C 65-66, but if the segregate becomes angular in appearance hardenability is irregular, so that in some instances the steel can only be hardened to Rockwell C 63 and in other instances as high as Rockwell C 65, but when the higher Rockwell hardness is obtained on quenching,

even tempering to 1050 degrees Fahr. will lower the hardness to Rockwell C 62 or C 63. Thus it appears that the outward form of the segregate has a relationship with hardenability. This may be because diffusion of the segregate is less rapid as it becomes more angular in appearance.

By the somewhat questionable method of dissolving the iron matrix in dilute hydrochloric acid the segregate was obtained from a number of different samples treated in different ways. It is interesting to note from the results that the residues from the annealed material show a higher carbon, chromium and vanadium content than the residues from the hardened samples. The differential in carbon content between the annealed and hardened samples is indicative of diffusion of the carbon from the carbides to the matrix.

The residues were also analyzed by X-ray diffraction, with the result that the photograms of all the residues were found to be substantially the same.

Segregates Affects Properties

The melting point of the carbide segregate as present in the solid steel appears to be about 2400-degrees Fahr. but synthetically prepared Fe_3W_3C has a melting point much higher than this, approximately 3200 degrees Fahr. The general appearance of the carbide segregate in both the cast steel and in highly overheated steel is suggestive of an eutectic. It, therefore, appears likely that the carbide segregate is predominantly composed of Fe_3W_3C , with probably small amounts of chromium and vanadium carbides, possibly a small amount of Fe_3W , and iron associated in an eutectic, which would explain the difference in apparent melting point between that observed in the solid steel and that noted for the synthetically prepared carbide. The large proportion of Fe_3W_3C present in the structure justifies the use of the word "carbide" as applied to this segregate.

The primary purpose in making X-ray diffraction patterns of these residues was not to study the basic composition of each but to make a comparison of the compositions of the residues when obtained from the steel in different structural conditions. The X-ray patterns of the residues most definitely demonstrate that regardless of the structural condition of the steel, whether it is annealed or hardened, with the segregate in a spheroidal, angular or fused condition, the primary constituent of the carbide segregate remains essentially the same.

Investigation of the probable effects of the segregate on the physi-

cal properties of the steel, in accordance with the foregoing outline, is productive of the following conclusions:

1. Carbide segregate in an 18-4-1 high speed steel is not materially changed in composition by heat treatment, by distribution or by outward form.
2. Outward appearance of carbide segregate seems to influence the rate of diffusion and hardenability.
3. Strength and plasticity of high speed steel is materially affected by grain size, distribution of the segregate and by outward form of the segregate.
4. Thermal conductivity is not materially affected by grain size or by distribution and form of the segregate.
5. Hardness at elevated temperatures is materially affected by grain size and by outward appearance of

the segregate. Distribution of the segregate is of inferior influence.

6. Susceptibility to grain growth is not a characteristic of the method used in melting and deoxidizing the steel.

7. Carbide segregate which is not dissolved in solid solution in the steel mechanically obstructs grain growth.

8. Stresses which result from the initial hardening of high speed steel require a considerable length of time for removal at comparatively low temperatures. The stresses when fully removed will only slightly affect the physical properties of the steel on re-hardening.

9. Grain size of the steel is affected by the composition of the furnace atmosphere surrounding the steel during hardening only as the composition of the gases affect the rate of heating and the temperature of the specimen.

Tells Wiremakers of Need for Planned Research Program

CW. MEYERS, development engineer, American Steel & Wire Co., Cleveland, O., in speaking on "Research As Applied to Manufacturing" before the Wire association in Cleveland, Oct. 21, emphasized that in the strictest sense of the word, no business however small, can dispense entirely with some form of fact finding. He contended the more complex the industry, the more complicated the research facilities and programs.

In his opinion management for executive staff of an enterprise has a definite responsibility in the establishment and maintenance of a research program. Whenever possible managements should endeavor to foresee the need for research and not wait to institute a detailed program of research after the need has arisen.

In industries in which many problems are to be considered, the speaker pointed out that the correct allocation of effort is of prime importance to avoid an overlapping of activities with attendant loss of time and money. He emphasized that money spent on good equipment will be more than paid back in time saved and in the dependability of results.

There are no set rules for the conduct of research laboratories, Mr. Meyers stated. The character of work accomplished and the method for doing it are dictated largely by the type of industry in which the research is being con-

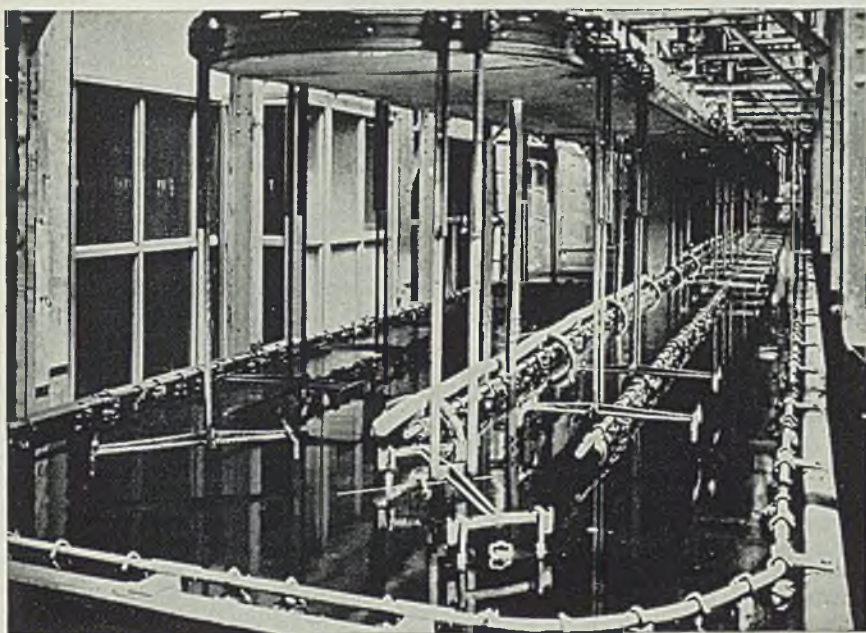
ducted. He made it plain that the research laboratory through its knowledge of technical subjects can be of great aid to both its own company and the customer in the simplification of standards.

The speaker laid emphasis on personnel training. Graduate scientists and engineers may be hired without much difficulty, he explained, but the man who has had some experience in the business of the company for which he is working is doubly valuable. However, he stated, some form of training in company products and processes give the research man a much clearer conception of the reasons back of many research problems. He is, therefore, a much greater asset to the organization.

In conclusion he hinted that it sometimes is advisable to mix in a few so-called "hard shell mill men" to serve as foils and to provide a different point of view. In any event, he concluded, the leader should make certain that the research man does not lose sight of the commercial aspect of the problem on which he is working.

SOME fundamental principles of wire drawing were presented by B. L. McCarthy, metallurgist, Wickwire-Spencer Steel Co., Buffalo, who spoke on "Plastic Deformation in Wire Drawing". Exploring cut-and-try methods in the manufacture of wire he emphasized

Why Put Up With Either Leakage or Contamination WHEN GOODRICH PLATING TANKS ELIMINATE BOTH



*Goodrich tank used for continuous nickel-plating
by Packard Motor Car Company, Detroit, Mich.*

Before the days of Triflex lining and the Vulcalock Process it was necessary to tolerate one or the other of two plating evils — either leaky tanks or contaminated solutions.

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And you don't need to be afraid of contamination of the plating solution, either. The exclusive Goodrich Vulcalock Process provides such a strong rubber-to-metal bond (500 to 700 lbs. per sq. in.) that no foreign material need be compounded with rubber for adhesion purposes. Plating solutions are exposed only to *pure gum rubber in Goodrich tanks.*

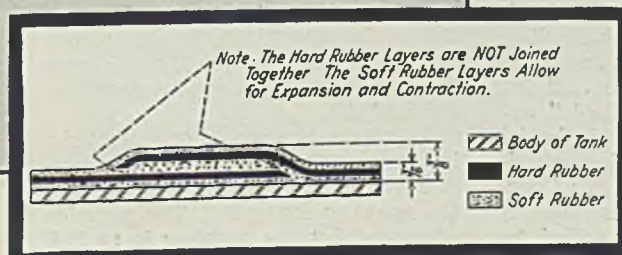
Solution leakage, electrical leakage, tank repairs, solution contamination—abolish them all with Triflex lining applied by the Vulcalock Process. For names of prominent users and how they save by use of Goodrich tanks, write The B. F. Goodrich Co., Mechanical Rubber Goods Division, Akron, Ohio. (In Canada: Canadian Goodrich Co., Ltd., Kitchener, Ont.)

Goodrich Plating Tanks

ALL *products* *problems* IN RUBBER



*Cross section of the Triflex
expansion joint*





WELDING machines, torches, rods and accessory equipment occupied prominent positions at the National Metal exposition in Cleveland, Oct. 19-23

that corrective measures must be applied in order to cope with the ever increasing demands for high-quality wire.

He explained at length what occurred when metal is cold worked and cited many factors that interfere with the uniform distribution of cold working strains.

In the author's opinion the slip interference theory of Jeffries and Archer offers the most adequate explanation on the hardening of metals as a result of cold working. Mr. McCarthy mentioned that strain distribution is influenced by the amount of drafting and the degree of variation in hardness of different areas. Areas which are strained beyond the limit of atomic cohesion will produce internal fractures and the wire will be rendered inherently brittle.

The rate at which deformation is carried on has a decided influence on the quality of wire according to the speaker. The more uniform the metal as regards variation in hardness, the faster the deformation can be made. Cuppy wire is the result of internal fractures and in the speaker's opinion is usually traceable to a segregation of elements at the axis of the wire.

Mr. McCarthy's paper, which drew citation from the Wire association, is an elaboration of his paper entitled "Grain Size and Its Influence on the Manufacture of Steel Wire," presented before the Wire association, September, 1935.

AR. ZAPP, manager, Firth-Alloy division, Firth-Sterling Steel Co., McKeesport, Pa., in speaking on "Tungsten Carbide and Its Application to Dies and Tools" explained that sintered carbide basically is formed by carburizing metallic tungsten with some form of carbon. To this tungsten carbide a binder, usually cobalt, is added to form a matrix to cement together

the minute tungsten carbide particles. This binding medium is added in various proportions to obtain certain predetermined characteristics of hardness and toughness.

The speaker pointed out that this mixture of tungsten carbide and cobalt is combined with a lubricant and pressed into any desired size and contour. The blank or nib thus formed is stoked into a hydrogen-atmosphere sintering furnace and subjected to the exact heat required for proper sintering over a definite length of time. To obtain the desired physical characteristics and control grain size, the speaker warned, the cooling of the sintered carbide must be regulated by a definite schedule pre-calculated for that particular grade.

Toughness Varied at Will

At the present time the toughness of tungsten carbide has been considerably improved, the speaker announced and both the toughness and velocity are controlled within narrow limits and can be varied at will. Improvements in carbide dies, he stated, have been achieved through careful selection and preparation of raw materials such as tungsten, carbon and cobalt, as well as all other materials used. The process of manufacture of the nib from the raw materials also has been improved with various refinements.

Through careful manipulation of the basic powder, grades that possess different properties can be produced, tested and duplicated, since the grain size of the basic powder has been found to greatly influence the hardness and toughness of the finished die.

A slight change in the carburizing process has resulted in the production of a more uniform carbide, the speaker contended. The practice employed by the speaker is to ball mill the carbide combinations with

metallic cobalt, varying the grinding practice to suit the various grades produced. The prepared powder, he explained, is pressed to shape in steel molds and then sintered. Just before it is pressed a lubricant is added to the material so that it will flow in the mold and thereby reduce any differences in pressure to a minimum. The pressure has a direct bearing upon the amount the pressed piece will shrink, Mr. Zapp stated, and consequently a piece pressed with varying density will shrink more in one part than another, thus producing internal ruptures which may not be visible on the surface.

Dies now are sorted for both size and grade, and are sintered separately to produce individualized results. The speaker predicted that dies up to 12 inches outside diameter by practically any height desired up to 8 inches will be available in the near future.

Die Life Depends on Drawer

Discussion brought out the fact that the majority of dies used for drawing low-carbon wire contain about 13 per cent cobalt. Where severe shock takes place up to 18 to 20 per cent binder is employed. Approximately 90 per cent of the dies used in the wire industry contain from 5 to 13 per cent cobalt.

The question of employing various grades of carbide for various wire drawing jobs is of little importance according to J. R. Longwell, chief engineer, Carboly Co., Inc., Detroit.

He pointed out that the die drawer controls the quantity of wire that can be drawn from a single die rather than the die itself. If wiremakers want to get low die costs, he contended, they should look to the men actually drawing the wire rather than to the die-maker.

In discussing the trend in water-

cooled dies, H. B. Clark, vice president, Union Wire Die Corp., Cleveland, mentioned that most mills who use this method of cooling secure improved die wear. But for the ordinary run where 200 feet of wire is turned up a minute the speaker questioned whether water cooling made any difference from the standpoint of die life. He admitted, however, that water cooling does no harm.

One member favored air over water for cooling the die. Water, he stated, is a messy medium and causes trouble in cold weather. He favored passing air through a holder prepared especially for this cooling medium.

Solves Handling Problem

Economies to be effected through the proper handling and selection of dies and efficient service methods were outlined by K. R. Beardslee, general sales manager, Carbology Co., Inc., Detroit, who spoke on "A Method of Handling Tungsten Carbide Dies Within the Die Room". Quality of die depends upon the shape and the smoothness of the surface within. Manufacturing and servicing these dies permits the mill to rigidly control these requirements within limits which have been established to meet their own problems, he pointed out.

Best results from all dies are obtained by cleaning immediately upon their return to the die room from the mills. This, he explained, may be accomplished by the use of a wire brush mounted on a spindle of a grinding head.

Inasmuch as a complete installation of carbide dies necessitates a considerable investment, the speaker recommended that suitable cabinets should be provided so that each die is accessible readily and classified accurately. New dies for those returned from the mill, he explained, may be placed in the rear of each row, and dies sent to the mill taken from the front of each row. This assures rotation of dies and evens up work to maximum size.

H. B. Clark, vice president, Union Wire Die Corp., Cleveland, in discussing Mr. Beardslee's paper, pointed out that some mills have found it burdensome in keeping die records. He described a check system followed by one wire mill, explaining that when the wire drawer obtained a die he deposited a check showing his station number and not until this die was returned could he obtain another. This system, the speaker pointed out, has been more successful than keeping a card record. In fact, the mill in question, which uses 5000 dies per year, accounted for all but one of the dies. The system has released two clerks for other duties, the detail work

now being handled by the window man.

IMPORTANT characteristics to be considered in the selection of wire for springmaking were cited in a paper written by J. W. Rockefeller Jr., New York, and delivered by E. J. P. Fisher, Republic Steel Corp., Chicago. Properties of various steels were covered, including music wire, annealed steel, hard wire and a variety of alloy steels such as chrome-vanadium, silicomanganese, 18-8 chrome-nickel and in addition the nonferrous alloys—spring brass, monel metal and phosphor bronze.

B. L. McCarthy, Wickwire Spencer Steel Co., Buffalo, N. Y., in commenting on this paper voiced the opinion that elastic limits as established by the author were far too small. He concluded that there was

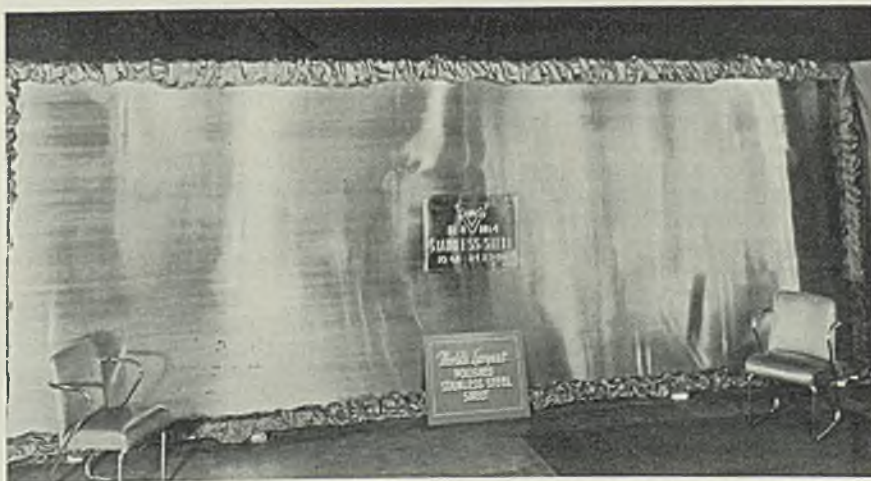
a point where certain changes in elasticity occurred, but that the elastic limit was above this point. Considerable discussion on relative merits of Swedish and domestic steel for springmaking arose from a question of that nature by F. A. Westphal, Sheffield Steel Corp., Kansas City, Mo. General consensus of opinion was that slower rolling speeds and smaller furnaces used in the Swedish process make for fewer surface imperfections, which seemed to be the most important difference between the two steels. Removal of sulphur and phosphorus from American ores produces a condition antagonistic to good surface conditions, while in the Swedish ores removal of these elements is not necessary. Surface conditions of American steels are further aggravated by the guides necessary in high speed rolling.

Welding Nonferrous Metals Reviewed in Symposium

BRIEF survey of the uses of copper alloys as welding materials in industrial applications was presented by I. T. Hook, American Brass Co., Waterbury, Conn., at a welding symposium held by the American Society of Mechanical Engineers in collaboration with the American Welding Society in Cleveland, Oct. 23. Three fields were included in the survey—joining of copper alloys by various welding and brazing methods, joining of ferrous and other alloys by copper alloy weld metal, and building up wear and corrosion resisting sur-

faces of copper alloys. Major portion of the presentation was devoted to various phases of welding copper alloys. Oxides formed in the flame welding process sometimes cause cracking in aluminum bronze welding, making the arc or resistance processes more satisfactory in this connection, it was brought out in discussion. Trend toward resistance welding of thin plates was also generally cited.

Metallic arc and carbon arc welding of monel and nickel and the welding of these two metals to steel plate was described in a paper



Claimed to be the world's largest polished stainless steel sheet, this 84 by 240-inch piece of 10-gage 18-8 stainless steel was a feature of the American Rolling Mill Co. display at the metal show. It weighed about one ton

written by F. G. Flocke and J. G. Schoener, both of the International Nickel Co., New York, and presented by Mr. Flocke. Chemical and physical characteristics of the weld metal deposited were given and results of hardness tests on the deposit were listed. The speaker stated in answer to questions that in the monel-steel weld, small amounts of steel are dissolved in the monel, especially in the case of low-alloy steels. It was claimed that yield strength values are greater than indicated in the paper. Effects of heat treatment on the weld cannot be determined entirely by tensile strength. In using carbon arc welding, said the speaker, nickel and monel plate will absorb carbon up to 0.50 or 0.60 per cent without its being thrown out as graphitic carbon, which is a wide enough margin to make use of that method practicable.

Welding Aluminum Alloys

Electric resistance, metallic arc and gas welding are the only types now commercially applicable to aluminum and its alloys, according to G. O. Hoglund, Aluminum Co. of America, New Kensington, Pa., who discussed the use of these methods in fabrication of aluminum products, and covered the difficulties encountered in welding. Types and gages of aluminum alloys suitable for welding were listed as well as the types of equipment most applicable. Applications in industry of welded aluminum alloys were cited. In discussing this paper, Mr. Hoglund established the fact that ductility is gained in the immediate vicinity of the weld. In designing, according to the general discussion, ultimate tensile strength and not yield point is used as a basis. However, in cases such as the design of aircraft, the yield point, which is usually lower, is used as a basis.

Controversy between welding and casting was aired in the afternoon session by J. L. Brown, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Advantages and disadvantages of each method from the standpoint of cost, utility and appearance of the finished product were covered in the discourse. Several specific cases were cited in comparing the two methods, telling in each instance the factor which influenced the decision. Fields which are closed to one method or the other were noted. In discussion, general opinion was that improvement in welding apparatus, especially coating of electrodes, has made many welding jobs feasible which were formerly impossible. On a cost basis, pattern costs, life of the pattern and number of castings to be made from the single pattern govern choice of methods in many cases.

Uses and methods of X-ray radio-

graphy in testing welds was explained by H. R. Isenburger, St. John X-Ray Service, Long Island City, N. Y. The author outlined the methods employed in locating the exact position of defects such as slag inclusions and blowholes. Equipment necessary for use in this connection was described, including a description of a new 220-kilovolt X-ray tube. Mr. Isenburger stated that in radiography of thick or uneven pieces such as large castings, gamma rays are more satisfactory than X-rays, since higher power X-rays, in addition to being difficult to handle with present equipment, cause a secondary radiation which must be filtered out in order to obtain clear results.

Discussion of the use of the magnafux process in inspecting welds was given by J. W. Yant, Standard

Oil Co. of Indiana. Chief value of this test is in locating small cracks and fissures which are not revealed by radiographic inspection. The method is purely magnetic, and entails magnetization of the piece to be inspected, by wrapping cable around it. A specially prepared magnetic powder is then sprinkled on the piece and the small defects show clearly in the patterns formed. Inventor of the process is Prof. A. V. DeForest, Massachusetts Institute of Technology, Cambridge, Mass., who added his comments to the paper, noting that shrinkage cracks and other small defects caused by drawing or shaping are often of greater danger in pressure vessels than slag inclusions, and that this test has played an important part in discovery of these small imperfections.

Time-Temperature Important In Silver Solder Brazing

BRAZING with silver solders was discussed by R. H. Leach of Handy & Harman Inc., before the American Welding Society in Cleveland, Oct. 21. Mr. Leach pointed out that the term brazing was a misnomer inasmuch as it was a welding and not a soldering operation. Seven standard compositions of material are used, it was stated, the selection depending on the work to be welded. With the exception of a few special compositions the melting points of silver solders range from 1200 to 1600 degrees Fahr. Time of welding and temperature are important factors in making the joints and strong joints made at low heat are to be preferred whenever possible. It was pointed out that the joints in question successfully withstood vibration and for that reason were to be preferred to other welding methods. Use of jigs for holding the work was advocated and clean, close joints made ideal conditions as the material should not be used in the nature of a filler to fill up a joint.

In the discussion which followed it was brought out that prefluxing of the joint was advocated and that excessive heat was detrimental. The question was asked if malleable iron could be welded successfully by the silver method and the reply was that it was practicable. Regarding joints, it was brought out that they should be fitted closely and in many cases polished. Filed joints were said to

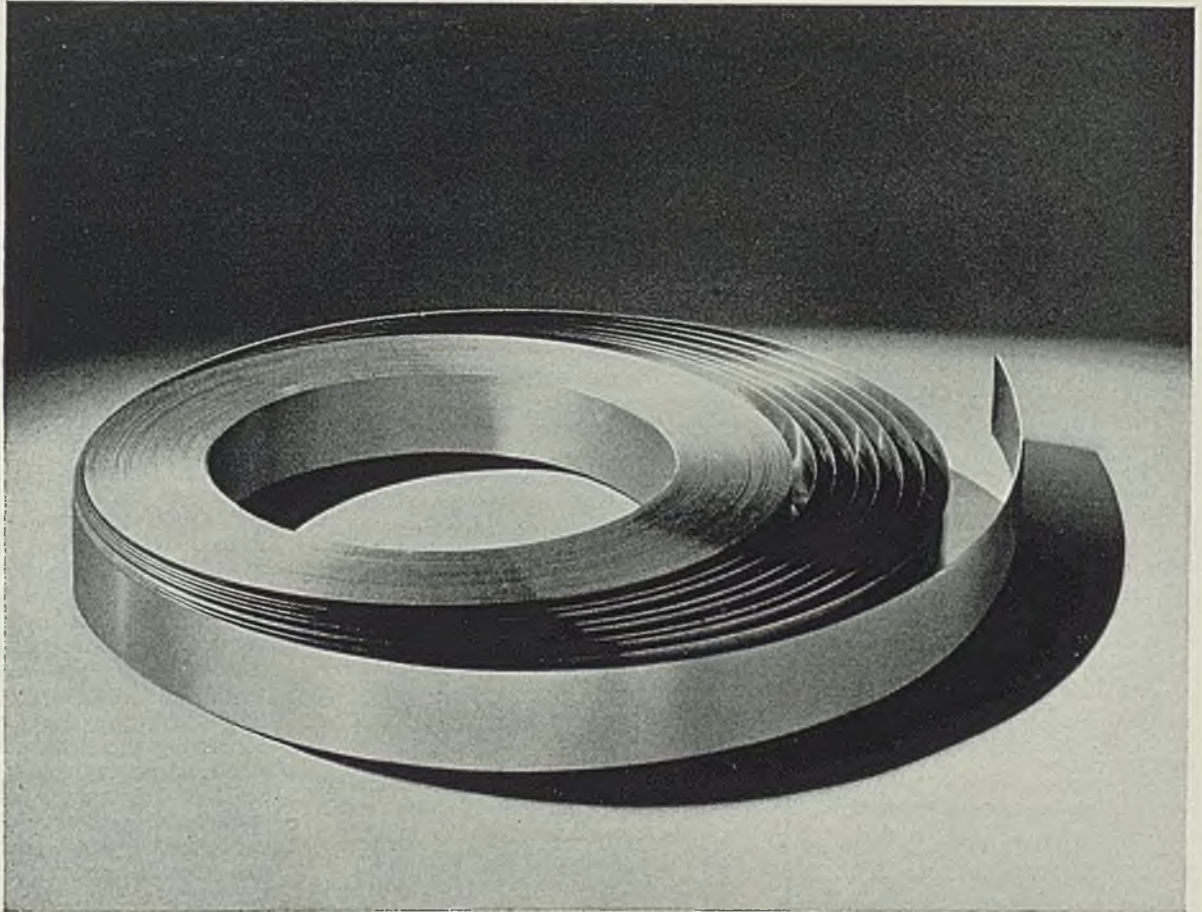
be satisfactory if the file marks were even and not too deep.

Importance of design control for welding piping systems was the subject discussed by T. W. Greene, Linde Air Products Co., New York, and illustrated by slides. Several test joints were shown and failures under pressure fully explained. It was pointed out that the method was practicable and had met with gratifying success in the petroleum industry. Expansion and contraction are of importance and means to take care of these factors were advocated. In the discussion that followed it was brought out that stress relieving was still a moot question and that much experimentation along these lines would be necessary. The fact that conditions influence the design of joints was stressed and that vibration must always be considered. No definite specifications are available at present as the entire subject is still under investigation. All factors considered, the type of joints under consideration are meeting with success.

Hard Surfacing Discussed

E. W. P. Smith, Lincoln Electric Co., Cleveland, read an interesting paper dealing with principles of surfacing by welding. He stressed the fact that any type of surface, hard or soft, could be made to suit conditions under which it was to be used. Discussion brought out the fact that the hard surfacing of

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

metal cutting tools could be accomplished successfully if care was exercised in the operation. Also it was pointed out that correct heat treatment would eliminate the tendency for the metal deposited to chip away.

"Welding Copper and its Alloys," by Ira T. Hook, American Brass Co., Waterbury, Conn., was a review of available data on the subject. The metallurgy of copper as applied to welding was explained and it was pointed out that over 30 elements will alloy with copper. Pure copper is to be preferred, such as the copper demanded by the electrical trade. The melting point of the oxide is important in making good welds and it was stressed that the ductility of metal also is important. Phosphorus was said to be a good deoxidizing agent, also silicon and manganese. An excess of oxide, it was stressed, would weaken a weld at least 60 per cent. The author explained the progress made in Europe in welding copper locomotive fireboxes and stressed the point that the repeal of prohibition in this country had created a demand for high-grade copper welding in the brewing and distilling industries. In welding copper, it was stressed that heating should take place as quickly as possible as the high heat conductivity of this metal dispersed the heat from the point of welding rapidly. Selection of welding rods also was stressed as being of the utmost importance in this operation.

Metallic Arc Explored

In a paper, "An Exploration of a Modern Metallic Arc," by L. J. Larson, A. O. Smith Corp., Milwaukee, was stressed the fact that welding had passed the experimental stage long ago. What we would like to know, he asked, is what is in the arc and the surrounding space? In what form is the metal transferred from the electrode to the work? Is the metal vaporized or is it in a liquid state? If it is in the form of liquid does it fall by gravity or is it projected across the space by other means? What happens to the coating, how does it affect the ac-

tion of the arc, and what does it accomplish? Mr. Larson explained that as neither photography nor visual observations were possible other means to solve these problems were necessary.

WELDING design was the general subject of a paper by C. H. Jennings, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Mr. Jennings described a number of important design features which are essential in the design of economical welded structures. These features included the recommended minimum size of fillet welds, the given plate thicknesses, the application of intermittent welds in design and the influence of joint design on the economical fabrication of butt joints.

He also discussed the calculation of weld stresses in different types of joints and gave suitable formulas which were determined on their agreement with test results and their applicability and acceptance in present design practice. He also stressed the fact that there is a lack of agreement among designers as to the methods of calculating weld stresses and the correct working stresses to employ for different types of joints.

Alloy steels and their weldability were reviewed by A. B. Kinzel, Union Carbide & Carbon Research Laboratories, Long Island City, N. Y. He treated the subject under three general headings: The low-alloy steels for general structural purposes; the heat treated steels of the automotive type for machines and general engineering; and the high-alloy steels such as stainless for use in the chemical industries

and the like. He also stated that the welding of heat treated steels with austenitic welding rods and the welding of stainless steels with columbium-bearing welding rods were recent developments of note along this line.

Rolled steel in machinery construction was considered by H. G. Marsh, Carnegie-Illinois Steel Corp., Pittsburgh. He discussed the extent to which welding is used in the design and construction of machine tools and he advanced reasons why its application is not more universal. He pointed out that there seemed to be a readily discernible apathy toward welding on the part of many engineers and that a large number of these engineers still regard welding just as a handy tool for the millwright in case something breaks. He further stated that manufacturers of machines involving welded construction often hesitated to mention this fact in their advertisements or other items of sales promotion literature.

Bracket Stress Studied

A study of stress trajectories in welded web brackets was presented in "Welded Structural Brackets" by Cyril D. Jensen, also from Fritz engineering laboratory, Lehigh University. The investigation was carried out in three steps: (1) The testing of celluloid models by polarized light, for the purpose of determining the lines of stress in the web plates; (2) testing of brackets of steel which were built to a linear scale of seven times the celluloid models, the purpose being to check the models and to measure more precisely the stresses in the webs; and (3) testing of small brackets built for the most part of $\frac{3}{8}$ -inch plates for the purpose of determining the reserve strength of the bracket webs and to determine the accuracy of a proposed method for designing the webs. It was found that all of the brackets tested gave good results and that, therefore, the selection of bracket shape should be based on economy and architectural limitations involved in the design.

APPROXIMATELY 160 attended an informal banquet following the joint meeting of the Eastern States Blast Furnace and Coke Oven association and the Blast Furnace and Coke association of the Chicago district, at the Palmer House, Chicago, Oct. 16. For report of technical discussions at meeting see STEEL, Oct. 26, p. 76



PROGRESS IN STEELMAKING

Elliptical Shape Welded Steel Ladle Handles Large Tonnage of Hot Metal

DEAD weight in the tapping and pouring of steel virtually is halved by a hot metal ladle of welded steel construction that has been designed by the Bethlehem Steel Co., Bethlehem, Pa. It holds 120 tons of molten metal and yet weighs only 31,000 pounds. The older design of ladle that it supplants weighs 55,000 pounds, yet holds but 100 tons of hot metal. The new ladle, as shown in the accompanying illustration, is elliptical rather than circular in its horizontal cross sections.

It was designed to meet a specific problem in several of the Bethlehem open-hearth units where melts were increased from 100 to 120 tons. To hold this increased tonnage of hot metal, it was self evident that the new ladle would have to be either taller or of larger circumference. Increasing the height of the ladle would have resulted in the disadvantage of increased hydraulic head. Therefore, by making the horizontal cross sections elliptical rather than circular it was possible to increase the capacity of the ladle without lengthening the distance between trunnions. Thus, the same

trunnion hooks can be employed that originally were designed for the smaller 100-ton ladle.

The welded ladle is so much lighter that it goes far to offset the added working loads that the larger tonnage of hot metal imposes on the handling equipment. The welded construction made possible direct attachment of the trunnions to the ladle, and weight was saved throughout, due to the lighter plates that could be used without sacrifice of strength.

There was also a saving in weight in the trunnions which were made of welded reinforced shoulder construction. Essential strength for the bottom construction was secured by the use of welded-in 2 x 6-inch reinforcing bars in conjunction with a flat plate rather than a flanged section, the use of which was precluded, in any case, because of the ladle's elliptical shape.

Protects Steel Surfaces

Iron and steel surfaces exposed to the action of acids and general se-

vere chemical conditions can be protected by the application of a black acid-proof enamel. The product is a combination of acid-resisting hydrocarbons and chinawood oil which dries to a hard acid-resistant surface. The product may be used outdoors as well as indoors, and does not get sticky in hot weather inasmuch as it dries by oxidation. The commodity is well adapted for coating the interior of tanks.

Provides Sharp Contrast

Draftsmen, designers and engineers will be interested in two new pencils which afford metallic tints of silver and gold. These provide a sharp contrast to the dark background of blueprints and other colored paper. The tints, which can be erased easily, are used to designate flashings, piping, wiring and facings of steel, tin and other metals.

Inspection Is Beneficial

Automatic grease systems serving roll neck bearings frequently employ rubber hose for connecting the pipe line with the bearing, to facilitate adjusting the bearing when roll diameters are changed. At one plant where this type hose is used, a bearing ran hot. After inspection of various parts of the lubricating system for leakage and finding none, the rubber hose was investigated. An attempt to run a wire through the hose indicated its clogged condition. Closer inspection of the hose showed that the interior layers had expanded to such an extent as to close the hole. As a result of this difficulty, inspection of rubber hose on all lubricating systems at this plant is made periodically.

Increases Life of Punch

A large manufacturer of steel car wheels now is blanking the center hole of the forged steel wheels at a temperature of 2000 degrees Fahr. The punch formerly employed for this operation had a life of from three to ten holes before replacement was necessary. A carbon steel punch with its cutting edge hard-faced will punch from 100 to 160 holes before being replaced.



Welded steel ladle designed to handle open-hearth melts which were increased from 100 to 125 tons. Capacity of the ladle was increased by making horizontal cross sections elliptical rather than circular

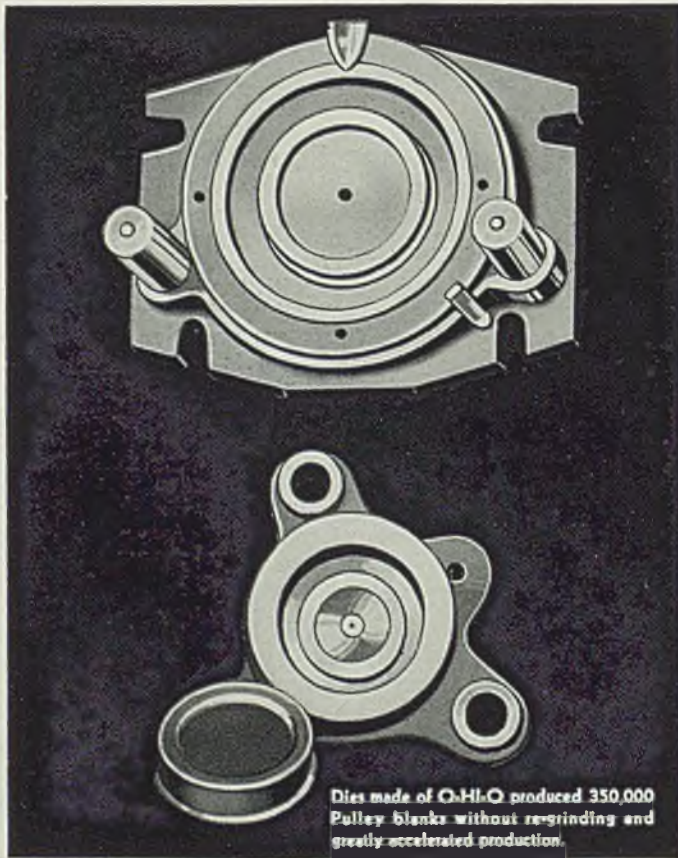
O-H-I-O Die Steel could be depended upon to withstand the 400 tons pressure per square inch exerted on this hub.

Use

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DIE STEEL

WHERE MINIMUM OF MOVEMENT AND WARP-AGE ARE DESIRABLE.



Dies made of O-H-I-O produced 350,000 Pulley blanks without re-grinding and greatly accelerated production.



25,000 pieces stamped from 3 1/2" hot rolled scaly stock with dies of O-H-I-O. 7,000 pieces was best previous record.

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Engineering Improvements in Industrial Gas Apparatus and Their Economic Effect

IN THE not too distant past we used to think of many low-temperature operations as requiring a predetermined amount of heat, depending on circulation of that heat to satisfy the requirements of the method or operation. What a vast difference there is between that type of heating and the application of convection and recirculation in these lower temperature operations.

Within the last few years the adaptation of convection heating has grown by leaps and bounds. Convection and recirculation have been applied to core baking, drawing, japanning, annealing of steel, aluminum, brass and other nonferrous metals, at temperatures up to 1400 degrees Fahr.; and there are many reasons why these operations can be accomplished more satisfactorily in this manner. Due to the constant intimate contact that the convection medium has at all times with the work to be heated, temperature distribution is more uniform and operating results entirely successful and economical. Applications of this method of heating have been made in both batch and continuous belt conveyor units. In the continuous type of unit the work is sometimes carried through on a belt, sometimes in baskets and in the case of small parts, springs, etc., packed to a depth of several inches.

Small Oven Furnaces

Another recent development in gas apparatus is the improvement that has been made in small oven furnaces. One manufacturer now constructs a small oven furnace firing top and bottom, venting from the bottom. This method of application insures heat distribution and better control of furnace atmosphere. Products of combustion must be discharged from the bottom vent and from the door when it is open. The chimney effect of the open door is entirely eliminated and with the proper mixtures on a one-valve control set, both scaling and decarburization of the work is reduced to a minimum. Another new small oven furnace is the muffle type atmosphere furnace. These furnaces provide a uniformly heated work-

BY OLIVER LLOYD MADDUX*
United Gas & Fuel Co. Ltd.,
Hamilton, Ont.

ing chamber within a muffle and have a special self contained apparatus for the preparation of furnace atmosphere. With this type of unit the best available atmosphere can be had to prevent those harmful effects that have been hard to eliminate in the past.

One of the newest developments in small tool room furnaces is that type of furnace equipped with atmospheric burners. These oven furnaces are lined with semi, or insulating refractory brick and permit heating to 1400 degrees Fahr. in 15 minutes' time; and in a little over an hour, a temperature of 2000 degrees Fahr. can be reached. This application of atmospheric burners has also been made to high temperature pot furnaces for salts and metals where temperatures as high as 1600 degrees Fahr. are required. This equipment requires no blower, is low in first cost and is ideally suited for installations where air under pressure is not available. Recently pot furnaces have been redesigned with top firing and bottom venting, which results in better efficiencies, longer pot life, more uniform heating, ease of control and more general satisfaction to the user.

The economic effect of these small furnaces is apparent; better working conditions in the furnace and in the shop; better work turned out of the furnace, more uniformly heated with less distortion and less cleaning and finishing.

Low-Pressure Boilers

Another recent development in apparatus for the use of gas is that of the high temperature, low pressure boiler. There are many operations in which a vapor is more satisfactory as the medium of heat exchange than any other known method. Saturated steam is an ideal method up to 350 degrees Fahr. (120 pounds gage) but above that point until recently there has been no universally satisfactory medium for this heat exchange. A recent development along this line is Dow-

therm, a product which is an eutectic mixture of diphenyl and dipheniloxide. This material is a liquid at ordinary room temperatures and boils at 500 degrees Fahr. Its vapor at that temperature has 34.44 B.t.u. per cubic foot and is comparable with the latent heat of steam at a temperature of 212 degrees Fahr. of 36.24 B.t.u. per cubic foot. At 120 pounds gage pressure Dowtherm has a temperature of 735 degrees Fahr. and a latent heat of approximately 199 B.t.u. per cubic foot, with a total heat of 473 B.t.u. per pound.

There are many applications ideal for a Dowtherm boiler; among them are: Heating evaporators, vacuum pans, moulding presses, oil stills and in processing oils and varnishes, melting tin and asphalt, in heating oil tempering tanks, drying ovens, dyes, lead cable sheath presses, etc.

These Dowtherm boilers are designed especially for the use of gas fuel and their operation can be controlled either by vapor pressure or vapor temperature. They are constructed in 36 sizes with a range from 15,000 to 2,250,000 output B.t.u., indicating a wide adaptability where high temperatures and low pressures are desired.

Controls

Manufacturers of temperature and safety control equipment have made tremendous strides during the past few years with attending beneficial effects. There is still lacking the desired sensitiveness of thermocouples but work along this line is now being undertaken by the bureau of standards and others. Control within very close limits can be had on temperatures up to 1000 degrees Fahr. with the use of sensitive bulb thermostats operating floating controls. On temperatures above 1000 degrees Fahr. thermocouples are used with diaphragm valves, proportioning motor valves and potentiometer-type controllers.

The greatest advance in recent years has been in safety control equipment. The thermocouple type of pilot control, more commonly known as the Baltimore cut-off, has established an enviable record for positive action in actuating a gas valve and in breaking in an electric control circuit.

There is another type of thermocouple control in which the e.m.f.

Abstracted from a paper presented by Mr. Maddux at the annual meeting of the industrial gas section, American Gas Association, in Atlantic City, N. J., Oct. 26-30.

generated by the couple is transferred through a sensitive relay operating a main gas valve and through timing switches to other safety circuits in sequence.

Another combustion safeguard is that one in which the flame is made a part of the electrical circuit. With this instrument as long as the flame is of sufficient length to touch the other pole of the instrument a small amount of electrical energy is carried through the circuit. This current may be passed through two types of relays, one to cut off the apparatus in case of pilot failure, the second to automatically relight the equipment should conditions return to normal. In the first case manual attention is required before re-ignition, while with the relighting unit flame failure causes immediate shut down but if within a predetermined time conditions of safety have returned combustion is restored by entirely automatic means. All these instruments may be used in conjunction with other safety devices such as door, blower and sail switches.

Valve Types Vary

Valves are now made of four different types, one of which may be diaphragm actuated, two others the induction and proportioning motor types, operating either single valves, dual valves or ratio proportioning valves and the solenoid type. A new type of magnetic globe valve is a recent development. In this valve the kinetic energy of the gas is used to operate the main valve seat. This energy is controlled by a small magnetically operated bleeder port. One peculiarity of this valve is the infinitesimal amount of auxiliary power required to control the flow of relatively large quantities of gas. The simplicity of these valves and the small amount of auxiliary power required enable them to be produced at a remarkably low unit cost for capacity.

For many years blast type immersion coils have been used in heating low-temperature solutions. This type of heating element has recently been applied to tinning pots and there are now many installations using gas, serving the tin plate industry. Many installations have been made recently applying atmospheric equipment to heating solutions and only recently

this type of equipment has entered the higher temperature fields in melting and heating inorganic compounds and soft metals. Atmospheric immersion heating has a three-fold economic effect:

1. Relatively low cost of installation.
2. High operating efficiency.
3. Wide range of application.

Coils for immersion heating have been constructed of various materials such as brass, copper, boiler tubing, pipe, etc. for atmospheric burner equipment and of the alloys of iron and steel for blast equipment where higher temperatures are required in the material to be heated. Pipe coils are constructed by bending, welding and the use of pipe fittings and can be adapted to tanks of either wood or metal. The most recent applications of immersion heating have been with the use of lead coils internally fired in acid solutions in which it is impossible to use other materials. Only the surface of potential application in this field has been scratched.

Hot Tube Furnace

Research has brought to the gas industry what is probably its major development in recent years in industrial gas equipment, the hot tube furnace. At its inception the broad possibilities of its application was little realized. Until this type of heating was developed muffles were required in the application of atmosphere control which were both expensive to install and maintain. Bright annealing of ferrous and nonferrous metals called for atmospheres within the furnace under positive control. Clean hardening in the automotive industry became one of the specifications wherein machined surfaces could maintain close tolerances. Uniform control of case in carburizing and the cost of this operation in the production of gears, pinions, camshafts, etc. called for a positive application of controlled atmosphere.

A decided recent improvement in the art of gas carburizing has been made in which a continuous furnace has been constructed for this operation which maintains work entirely free from carbon soot deposit. In the steel industry hot tube heating is widely used for annealing coiled strip, tin plate and wire.

Covers for annealing of strip and tin plate have been constructed to anneal, in one operation, as much as 100 tons of this material. Gradually the piling of this material under the cover has been increased to heights heretofore believed impossible.

Being closely allied with hot tube heating, it is necessary for a moment to explain the various types of atmosphere control which can be had. One of these atmospheres is that which eliminates oxygen from the furnace atmosphere, freeing the work entirely from scale and eliminating surface decarburization. The apparatus for producing this gas is a converter in which the raw gas is partially burned in about 60 per cent of the amount of air required for complete combustion of the gas being used. Either manufactured or natural gas can be successfully converted in this equipment. In the production of this gas no external heat is required since sufficient heat is generated during the partial combustion to reform the gas completely. A special refractory combustion chamber is used for this conversion. The converted gas is then reduced to cooling water temperature and may be further reduced with refrigerating equipment to completely remove the water vapor formed during partial combustion. Just enough combustibles are retained during conversion to neutralize the oxygen contained in the furnace atmosphere.

Air Conditioning Equipment

No method of heating a furnace in which a controlled atmosphere is required is possible without either a conversion unit as described or the use of more expensively prepared gases or with raw manufactured or natural gas. Either manufactured or natural gas containing a high carbon content can be used as the atmosphere for gas carburizing and in some cases prepared gases are used in bright annealing the high nickel alloys, in nitriding and in several other processes.

Much has been said and written with regard to air-conditioning in theatres, restaurants, office buildings and for industrial operations where control of temperature and humidity play an important part in the comfort of people and in production of materials.

Two types of apparatus have recently been developed for use in this work, the gas dehumidifier, used to control the amount of moisture carried in suspension in the conditioned space and the gas engine driven compressor for a refrigerant to be used in the reduction of temperature. The former consists of an adsorbing material

Dowtherm Boilers, Hot Tube and Controlled Atmosphere Furnaces, Air Conditioning Equipment, Improved Stationary Gas Engines—These and Other Developments Testify to Progress in the Field of Industrial Gas

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Dow Chemical Co.
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Hobart Mfg. Co.
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Stainless
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THAT IS USED.

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IngAclad greatly widens the possibilities for the use of stainless steel. By reducing material costs approximately 50%, marked economies are offered to the Chemical, Food and other process industries. The secret of the inseparable bond is in the Ingersoll Ingot Patented Process. The molten metals are bonded inseparably, so that sheets and plates of IngAclad may be handled through all fabricating processes without danger of separation. It may be drawn, formed, beaded, welded, soldered and fabricated by the same equipment used with mild carbon steel.

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The "finest sheet I ever used," says one user. The Continental tight-coat galvanized sheets do offer manufacturers the happy answer to some difficult economic and production problems. This zinc coating, being more ductile and adherent than standard galvanizing, endures more rigorous forming without fracture or flaking, and sets up less friction against tools or dies. Yet in cost, appearance, and weather resistance tight coated sheets come in the galvanized class. Continental supplies them in two degrees—tite and extra-tite—for close conformity to job conditions.

Continental Steel Corp., Main Office, Kokomo, Ind.



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Collaboration with our engineers and metallurgists has enabled many manufacturers and other users of sheets to achieve lower-cost production, reduce wastage, and turn out a better finished job. We invite you to take advantage of their specialized experience. No obligation, of course.

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OTHER PRODUCTS

Billets and Wire Rods; Bright Basic, Annealed, Galvanized and *Konik Wire; Nails, Staples. Lawn, Chain-Link, Diamond Mesh, Farm and Poultry Fence; Gates and Fittings. Black, Galvanized, Galvannealed, and Special Coated Sheets.

CONTINENTAL

PLANTS AT CANTON, KOKOMO AND INDIANAPOLIS

of a capacity to remove the amount of moisture required. This material is enclosed in compartments with such arrangements as are required for its regeneration by gas heat. Cooling of the dehumidified air may be accomplished either by the use of tap water if below 70 degrees Fahr. or by refrigerant should the tap water be too warm for the final temperature desired.

The gas engine driven compressor operates on either manufactured or natural gas and is fully automatic. This unit, quiet in operation, and low in operation and maintenance costs, is ideal for cooling in air conditioning work, for general refrigeration purposes and allied applications such as fur storage rooms, solution cooling either with immersed, expansion or Baudelet coils. In other words these units or a multiple of them are entirely adaptable to all forms of existing air conditioning and refrigerating equipment.

One of the most beneficial effects in its application to industrial gas equipment is the advance made in insulating refractories. This material being porous, and therefore light in weight, is ideally adaptable to gas fuel.

In natural gas districts there is one application of industrial gas which does not want to be overlooked — the installation of gas engines as sources for power.

Low Cost Gas Power

With natural gas selling at around 5 cents per therm, power can be generated at a cost of 0.63 cent per kilowatt using a gas engine and generator. This cost includes lubricating oil, maintenance and attendance with the engine operating at 75 per cent of its rated capacity. Should this engine operate at 150 hours use of demand monthly with an allowance of 10 per cent of the investment cost for interest and depreciation, the cost of electric current so generated will be approximately 1 cent per kilowatt. Certain improvements have been made in the construction of gas engines readily convertible with a slight additional investment to full diesel engines. There is one particular economic advantage in this type of installation in that it permits the customer to buy power rather than take power. Inherent possibilities of improvement of gas engines are great, as would naturally be the case where overall operating efficiencies due to thermal and cooling water losses, are as slow as now obtain. We commend to the manufacturers of this type of engine the thought of supercharging to enable a higher B.t.u. input per cubic inch of displacement which should result in much more compact designs and lower thermal losses.

Finish Trends in Consumer Goods

(Concluded from Page 60)

The introduction of pressed steel kitchen sinks finished in white enamel has been widely publicized in advertising campaigns and needs no further mention. Table tops of monel metal and stainless steel are also coming into demand. The use of monel metal has been extended to cutlery recently and acceptance by the purchasing public is reported to be promising.

Manufacturers may be interested in the fact that there have been calls in department stores for waste baskets of monel metal, aluminum or stainless steel. The requests definitely specified that paint or lacquer finishes were not wanted. It was also specified that the finish must not be hard and bright but rather a soft satin finish. An explanation for this demand is believed to lie in the fact that in many apartments which have garbage incinerators the housewife is in the habit of wrapping the kitchen waste in paper and depositing it in the waste basket, later to be dumped in the incinerator. Water leaking through the paper causes the bottom of the waste basket to rust out and present an unsightly appearance before it becomes entirely unusable.

Pottery Gaining Over Metal

Metal coffeeware is definitely losing ground to pottery, glass and porcelain enameled ware. One Cleveland department store reports that glass and pottery outsell metal 50 to 1 in this field. The growing popularity of the Silex and drip methods of making coffee appears to be responsible for this. However, other kitchen utensils of stainless steel have a strong market. The use of copper for kitchenware is decreasing except possibly in the case of chromium plated copper. Black iron kitchenware has little or no sale. Even the once popular cast aluminum is dropping off in sales, according to department store buyers.

An interesting example of the effect of color on sales was given in the case of porcelain enameled skillets. Housewives were slow to accept the product and sales have been reported as low. This is undoubtedly due to the dark color of the cobalt base coat enamels which are used because of their heat resisting qualities. The quality of the ware is high but the dark glossy finish does not seem to appeal to the housewife.

A definite trend toward higher quality merchandise has been noted

of late. Department stores report that the public is purchasing with an eye to long service and is willing to pay the difference in price over lower quality merchandise. For instance, one department store reports that 75-cent paring knives sell faster than 25-cent knives. Other parallel instances were also cited.

In electrical apparatus there is a trend away from the conventional black handles toward natural wood finish such as walnut and the like. Sunlamps and other electrical apparatus not used in the kitchen appear to sell most rapidly when finished with an oxidized bronze or similar finish. Ivory and other colors do not sell nearly as well. Again the trend is toward the higher quality and more expensive finish.

Another indication of the tendency to pay a premium for quality is the call for a hardened stainless steel knife which will hold its edge under hard usage. A knife sold under the trade name of "crobalt" which fulfills this demand is selling rapidly despite relatively high cost.

Dull Finish Preferred

In serving ware, hand hammered aluminum, satin finished aluminum, and bright aluminum with a satin chrome finished interior have all been enjoying steady sales. There is a tendency toward the duller finished hand hammered ware, however, because of the fact that scratches do not mar the finish appreciably. While bright chromium plated ware has all the advantages of corrosion and wear resistance, its hard, bright finish lacks the formal effect desired in serving ware. The softer tones of a matte or satin finish are much more desirable. Cheap chromium plate of the type which flooded the market when chromium plating was first introduced is definitely "out." The use of brass fittings and ornaments on serving trays met with many complaints on the part of purchasers who claimed that they gave the food a "taste."

The use of copper for ornamental vases, plaques and the like is popular. Some beautiful trays of hand hammered copper mounted in a wood frame and covered with glass are now being offered and promise to sell well.

All these points are significant to manufacturers of paints, lacquers, and plating supplies and equipment as well as to manufacturers of the articles themselves. Popular taste changes rapidly at times and trends must be closely studied before a new article is placed on the market. Many manufacturers can trace the failure of a product to sell to a finish which did not meet popular approval. It is true that extremely low cost can sometimes sell a product regardless of finish but this does not apply to high quality material. The customer, of course, is always right.

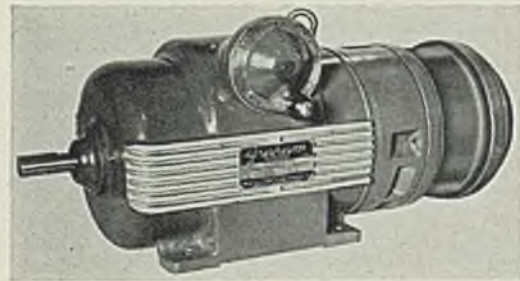
NEW EQUIPMENT

Welding Electrode—

Lincoln Electric Co., Cleveland, announces a new coated welding rod for use in welding 4-6 per cent chrome steels, which are being widely used in applications where resistance to crude oil corrosion at high temperatures and pressures is required. Under proper welding procedure and annealing at 1550 degrees Fahr. and slow cooling, the welds produced with these new rods possess the following characteristics, according to company claims: tensile strength, 65,000 pounds per square inch; yield point, 35,000 pounds per square inch; ductility, 35 per cent elongation in 2 inches; reduction in area 65 per cent, and brinell hardness 130.

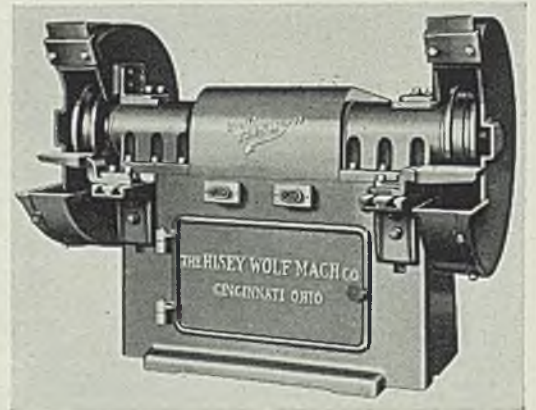
Variable Speed Drive—

Graham Transmissions, Springfield, Vt., announces a new type



variable speed transmission in a housing of approximately motor size which offers an infinite range of speed variations from half-speed to zero and reverse. Speed changes are obtained through a single control wheel. The unit is self contained and runs in oil. The power

Hisey-Wolf dual-drive double spindle snagging grinder. Single spindle models are also available



is taken from a constant speed motor, the shaft being connected to a carrier. Revolving at motor speed, the carrier supports three taper rollers which are kept in intimate contact under pressure with a nonrotating ring, and thus the rollers must turn at motor speed

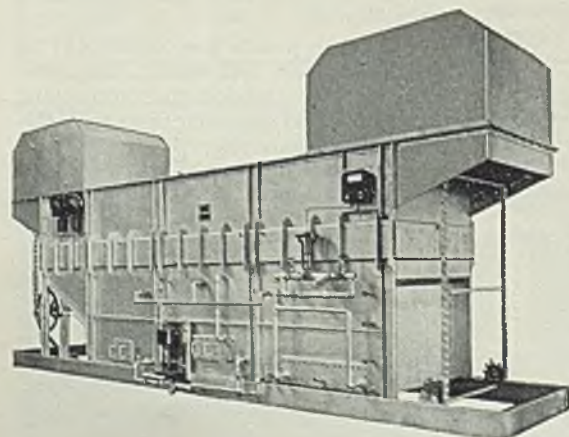
ternal gear which is connected to the output. This gear is nonmetallic in order to eliminate noise. Several combinations are available. Motor may be built in, connected through a flexible coupling, or the device may be driven from a lineshaft. A geared head is also available for installation at the output end if desirable, providing a reduction as low as 7 to 1 or an increase of 1 to 4.

Graham variable speed transmission which involves an interesting new principle

times the ratio of ring and roller diameter at the point of contact. Thus the variation in speed is obtained by moving the ring along the tapered rollers, changing the diameter ratio of these two members. The three rollers carry planet pinions which mesh with an in-

Degreaser—

Detroit Rex Products Co., 13005 Hillview avenue, Detroit, has recently added a new three-dip conveyorized degreaser to its line. The new product is designated as model 3DC-650 and consists of three chambers separated by two wide overflow dams. It is equipped with a two-strand cross-rod type conveyor and a variable speed drive. Cycle of cleaning operations in this machine consists of immersion in boiling solvent, immersion in solvent distillate rinse and immersion in pure solvent vapors. Work is placed in baskets which are suspended from the conveyor cross rods. Steam coils for heating the solvent are located in the first chamber, and temperature is controlled by an automatic thermostat. The machine is completely hooded so that the solvent loss is less than two quarts per hour, it is claimed.



Detroit Rex conveyorized triple-dip degreaser

Snagging Grinder—

Hisey-Wolf Machine Co., Cincinnati, announces a new line of heavy-duty texdrive snagging grinders, made in four sizes of 5, 7½, 10 and 15 horsepower. Single spindle, multispeed and dual spindle grinders are offered in 15 types. Machines

BOOK OF FACTS

Hose has especially tough going in the steel mill. But the brands of air, water, steam, welding, and fire hose offered by U.S. Rubber are designed for services just as tough... have demonstrated their ability to do outstanding jobs where the going is even tougher.

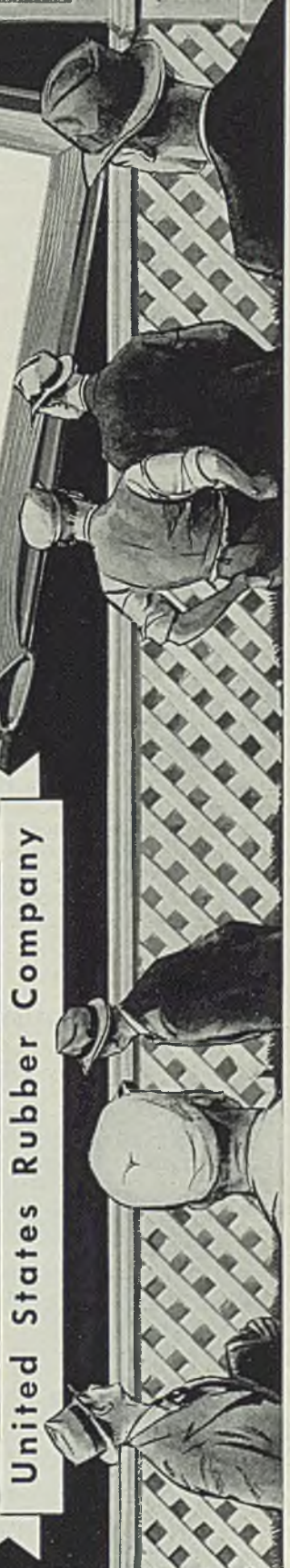
BOOK OF FACTS

U. S. Hose recommended for steel industry service:

- Super Royal Cord Air
- Royal Cord Air
- Peerless Water
- Perfected Water
- Matchless H. P. Steam
- Rainbow Welding
- Single and Double Jacket
- Cotton Rubber Lined Fire



United States Rubber Company



are designed and proportioned throughout for severe usage with weight distributed to limit vibration. Wheel guards and mounting brackets are of steel, and have hinged covers and steel chip breakers mounted in a box type slide. Guards are adjustable to the wear of the wheels. Work supports have vertical and horizontal adjustment and are extra heavy. The two-motor, two-spindle grinder is the most efficient model in that either spindle is adjustable independently to suit the diameter of the wheel. The single spindle models are governed by the size of the larger wheel for obvious safety reasons. Speed changes are accomplished by shifting belts from one set of sheaves to another.

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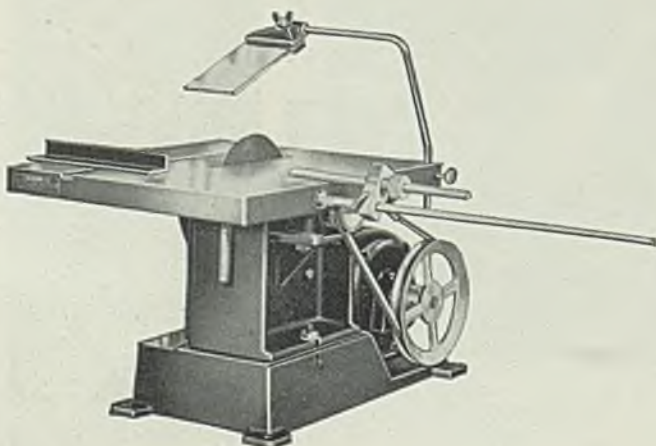
Liquid Extractor—

Binks Mfg. Co., 3114 Carroll avenue, Chicago, is offering an oil and water extractor for installation on main air lines. This extractor is used with compressors of large capacities to insure the delivery of clean air to spray painting jobs and similar jobs requiring air free from liquid matter. The new unit has a capacity up to 200 cubic feet of air per minute, and is equipped with 2-inch inlets and outlets. Height is 45½ inches and overall diameter is 8¾ inches. The extractor is ideal for installation on air lines which are exposed to variations in temperature due to the distance which the main air line must travel.

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Abrasive Cut-Off Machine—

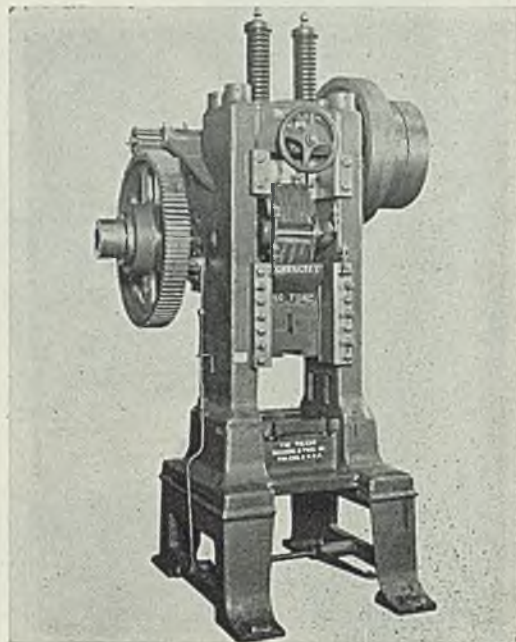
Challenge Machinery Co., Grand Haven, Mich., has recently marketed a new abrasive cutoff machine which is intended to cut any metal, either tubular or solid. A self-contained unit in the moderate price class, the machine has a capacity for metal



Any metal may be cut on this Challenge abrasive cut-off machine

up to 1 inch thick. Table is adjustable and measures 15 x 14 inches, and gages are conveniently located and easily adjusted. Mounted on a cast iron base, the machine comes equipped with a 6 x 1/32 x ½-inch elastic cutoff wheel and has a pre-

Toledo Machine & Tool Co. is the maker of this line of presses ranging from 25 to 2500 tons capacity



cision ball bearing mounted spindle. The outfit may be plugged into any light socket and may be furnished either with or without a steel stand. Alternating-current motor of either 110 or 220 volts, single phase is included with the machine.

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Coining Press—

Toledo Machine & Tool Co., division of E. W. Bliss Co., 1420 Hastings street, Toledo, O., has recently announced the development of a new 150-ton tie-rod frame press to add to the line of knuckle joint presses for the sizing or cold finishing of forgings and other coining, extruding, swaging and cold squeezing operations. Presses range in ca-

capacity from 25 to 2500 tons, and number among their features rolling key clutch and tie-rod frame construction. Uprights, crown and bed are of high-tensile pearlitic alloy castings and are held together by steel shrunk-in tie-rods. Ability

of the rods to stretch in case of a heavy blank or other mishap gives a needed measure of protection. Operating rate of the geared press shown is regularly 43 strokes per minute.

• • •

Etching Pencil—

Continental Machine Specialties Inc., Minneapolis, has just placed on the market a new "electric pencil" known as the Doall etcher. With this pencil, writing on steel is a process of arc welding in which the tip of the pencil vibrates to permit the miniature arc to be interrupted and produce the etching effect. An entirely new principle is used to accomplish the vibration of the pencil point, this being a special coil which is attached directly to the writing point. The point is made of pure tungsten to resist heat and wear. Current regulation is accomplished by means of the switch which gives any desired degree of intensity for the etching arc. The pencil is furnished with Doall machines which now not only fabricate a piece from the roughing out to the final polish but also mark it for identification.

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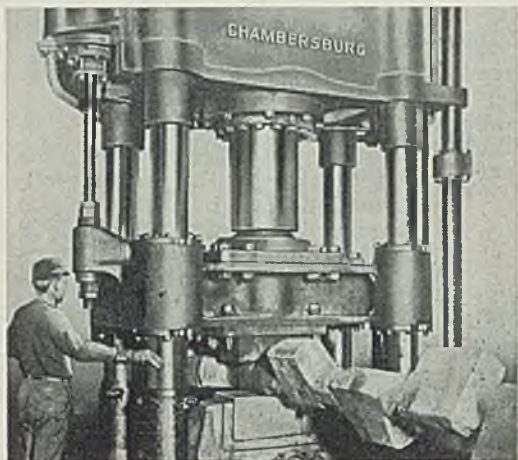
Forging Press—

Chambersburg Engineering Co., Chambersburg, Pa., has recently added a new high-speed steam-hy-

draulic forging press to its line. New products are built in two styles, the single frame and four column models. Close control of the forging stroke is attained through the use of a controlling gear attached to the intensifier which operates to

standard model of this heater is rated at 500 watts 110 volts alternating or direct current. Special models are also available for operation on either 220 or 440 volts alternating or direct current. The heater consists of a heating ele-

Conn., has recently announced a new No. 0 tool crib cutter which will cut practically all materials of the smaller sizes, including solid bars up to $\frac{3}{8}$ -inch square or round, and tubing up to $1\frac{1}{4}$ inches in iron, steel, brass, bronze, drill rod, monel, metal, high-speed steel, porcelain and other materials. Cutting is done by an abrasive disk, and it is claimed that the resulting surface in many cases does not need further finishing operations. The machine can be used either wet or dry and can be adjusted as to the amount of coolant used. No coolant pump is required since the wheel itself picks up the coolant from a tank. Disk is mounted on a spindle running in preloaded ball bearings which is operated by a fully enclosed chain drive. Disks up to 12 inches in diameter are used.



Chambersburg forging press which is of the steam-hydraulic type, furnished in a wide range of capacities

close the steam valve at a point in the stroke corresponding to the position of the hand lever. The single frame press is built in 150 and 300-ton sizes, particularly suited to repair shops where a variety of operations are performed. The four column model is built as a single cylinder press up to the 1500-ton size and as a duplex ram press from 2000-ton capacity upward. These presses embody a patented steam saving device utilizing exhaust steam for useful work at the beginning of the following lifting or pressing stroke.

ment, control thermostat, thermometer pilot light and a 3-inch outlet box mounted on a rigid pressed steel frame. The heating element is protected by a perforated pressed steel guard designed so as not to interfere with the circulation of heat. Overall length of the heater is $27\frac{3}{4}$ inches, width 5 inches and depth $5\frac{1}{4}$ inches.

Hydraulic Punch—

Hannifin Mfg. Co., 621 South Kolmar avenue, Chicago, has recently built a new type portable high speed hydraulic punch for semiautomatic handling of a range of punching operations. Unit weighs 59 pounds and has a capacity of $17\frac{1}{2}$ tons. Dies are interchangeable, providing for punching holes of various diameters up to $\frac{3}{8}$ -inch in drawn and formed parts of sheet steel up to 10 gage. The yoke is provided with shoulders for attachment of an adjustable stripper for automatic removal of shells of various depths. Operating cycle is approximately 2 seconds. Punch is operated by hy-

Tool Crib Cutter—

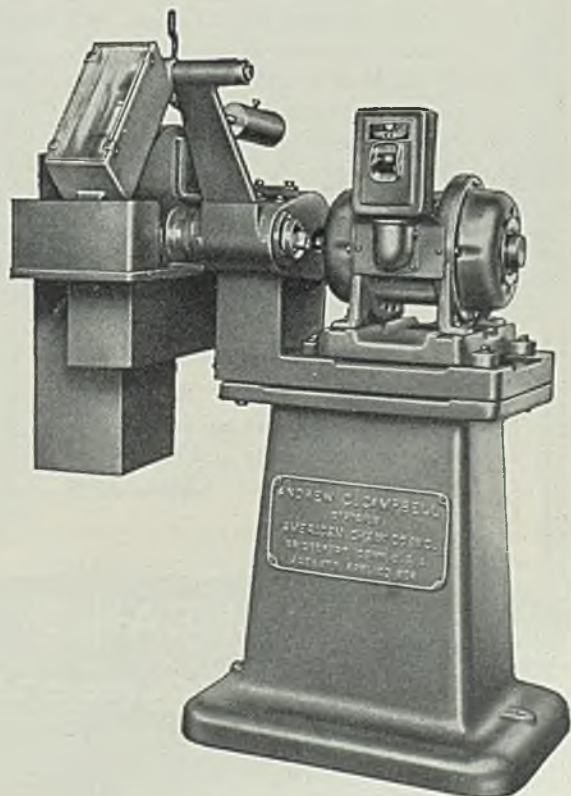
Andrew C. Campbell division, American Chain Co., Bridgeport,

Metal Buffing Brush—

Lea Mfg. Co., Waterbury, Conn., announces a new type of brush, known as the Lea string brush, designed to replace cloth buffs in the production of satin and Butler finishes. It facilitates rapid and economical finishing of articles having contours and ornamentations. The brush is pliable and permits the flexible surface, when coated with compound, to get into the various contours of many intricately shaped articles. Finishes which vary from a very dull satin to a bright Butler can be produced with this brush.

Space Heater—

Rockwood Sprinkler Co., 38 Harlow street, Worcester, Mass., announces a new automatic electric space heater. Originally designed to prevent freeze-ups in valves on dry pipe sprinkler systems, these heaters are applicable to a wide range of industrial uses where small spaces require heating. The



Campbell No. 0 tool crib cutter which uses a 12-inch abrasive wheel

draulic power from a pressure generator consisting of motor driven oil pump, automatic electric valve unit and oil reservoir. Push button on the handle of the punch controls the entire operation of the unit, and numerous safety features are provided.

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Filter Condenser—

DeVilbiss Co., Toledo, O., announces an improved heavy duty condenser. This new unit removes oil and water, which finds its way into the air line, by a baffle arrange-

ment within the condenser and pair of filter pads conveniently located in such a way that they can be removed and replaced without disconnecting the condenser from the air line. The condenser is recommended for operation at a maximum air delivery volume of 75 cubic feet per minute or less.

Air inlet and outlet are both in the top cap which is fastened to the body of the condenser by means of a companion flange. This permits removal of the body of the condenser without disturbing the air line. The filter pads, which fit

snugly around the inlet tube and interior wall of the condenser tube, stop passage of any oil, water or dirt, and remain effective up to the point of saturation.

The condenser is 4 feet 8 inches long, has a tube diameter of 6 inches, takes a 2-inch pipe thread on inlet and outlet tubes, and has a net weight of 140 pounds.

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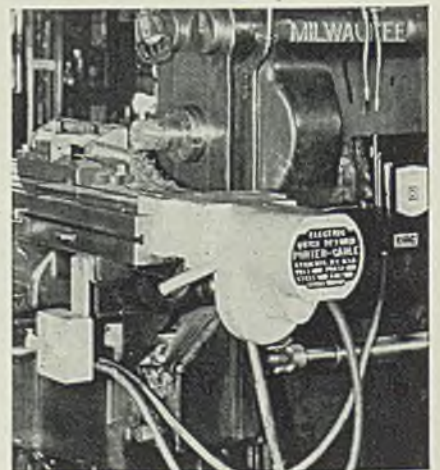
Non-Reversing Linestarters—

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has recently announced a new line of de-ion non-reversing linestarters. Available in four sizes ranging from 25 to 150 amperes, they are used as across the line starting squirrel cage induction motors and as primary switches for wound rotor induction motors. Typical applications include machine tools, textile machinery, pumps, fans and similar machinery where control is desired from a pushbutton or other pilot device with complete protection to operator, motor and machine. Arc quencher confines, divides and extinguishes the arc quickly without flash or scattering of flame, it is claimed. Vertical operation of the magnet prevents accidental closing of contacts due to mechanical shock or tilting. Contactor and overload relay are mounted on a steel panel with no back of panel wiring. All parts and terminals are conveniently accessible from the front.

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Milling Machine Return—

Porter-Cable Machine Co., Syracuse, N. Y., has recently placed on the market an electric quick return for production milling machines built since 1912 without the automatic quick return feature. It cannot be used on the rack type machine. The unit is mounted on the machine by means of special



Porter-Cable quick electric return for milling machines

Bailey... EQUIPMENT



THE AMERICAN OPEN JOINT STOVE CHECKER for BLAST FURNACE STOVES

* * * * *

An efficient stove is a necessity for satisfactory operation of the Blast Furnace, the very foundation of steel manufacture. To obtain sufficient heating surface with standard brick shapes, four stoves were necessary to operate a 500 to 600 ton blast furnace. The increase in the size of the blast furnace to 1,000 ton capacity made increased heating capacity in stoves a necessity. The American Open Joint Checker not only provides the surface required, but provides it in three (3) standard sized stoves, thus reducing the capital expenditure by the cost of one (1) stove and all auxiliary equipment necessary.

Orders for seven (7) stoves and results obtained on those already operating, prove the efficiency and reasonable cost of the American Open Joint Checker.



WILLIAM M. BAILEY COMPANY Engineers

MAGEE BLDG.

PITTSBURGH, PA.

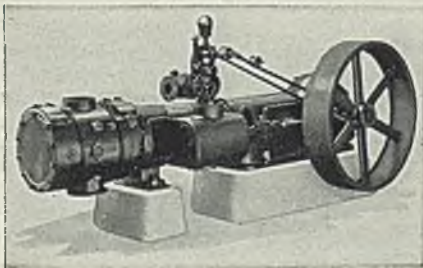
European Agents—Ashmore, Benson, Pease & Co. Ltd., Stockton-on-Tees, England

brackets, and the drive is mounted on the feed screw nut. If desired the table can be operated by hand in connection with the automatic return by means of a hand crank at the opposite end. Standard equipment is 220-volt, 60-cycle three-phase alternating current motor. Drive is through gears to the safety clutch on the feed screw of the machine, to allow slippage in case carriage should jam. Ball bearings are installed throughout the unit. Table travel is approximately 30 feet per minute.

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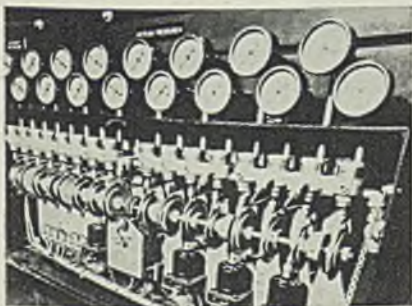
Steam Driven Compressor—

Sullivan Machinery Co., Michigan City, Ind., has developed a new single stage steam driven horizontal compressor for steam pressures 80 to 250 pounds, air pressures up to



Sullivan WA-7 single stage steam compressor

150 pounds, in sizes 279 to 1987 cubic feet per minute. The WA-7 is a heavy-duty single-cylinder double acting unit for either air or gas compression. The steam cylinder is placed in tandem with the air cylinder next to the frame and is heavily lagged for steam economy. The steam valve is of the balanced piston type with inlet pressure in the middle so that the valve rod box is sealed against exhaust pressure only. A variety of controls is available to provide economy under each operating condition. Timken double-row main bearings, force-feed lubrication, special cast alloy air cylinder liner and valves with laminated cushion



Complete process control system developed by Bristol Co.

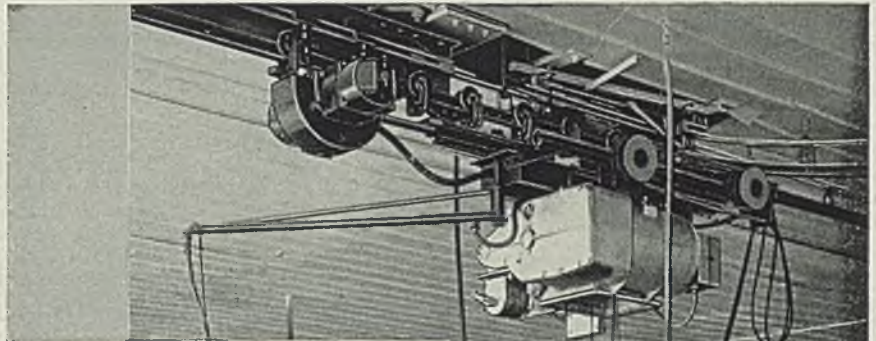
backs are features which add to efficiency.

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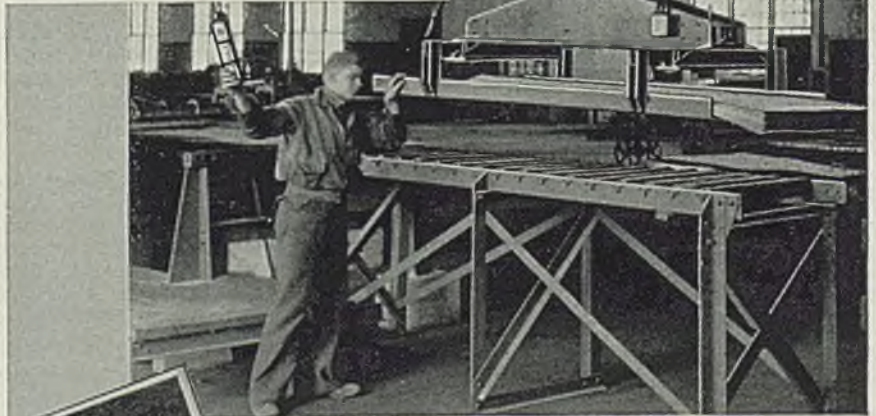
Process Control—

Bristol Co., Waterbury, Conn., has recently perfected a new system of process control which makes it possible to put intricate scientific processes under complete automatic control. The system is intended for use on processes which require the control of such factors as the time of operations of valves of all sizes, pumps, blowers, dampers and the like, and the control at a definite

value or according to a time schedule of such variables as temperature, pressure, liquid level, flow, humidity and speed. Control may be applied to any process in which the most efficient schedule is known or can be determined by laboratory experimentation. Built of standard instruments, the system is a collection of recording and controlling instruments grouped in a master station. A unit known as the "mechanical brain" co-ordinates the efforts of the instruments and causes their operation in concurrence with the given schedule.



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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.

Hydraulic Riveters—Hannifin Mfg. Co., 621 South Kolmar avenue, Chicago. Bulletin 39, describing hydraulic and air operated production tool equipment.

Dust Counter—Bausch & Lomb Optical Co., Rochester, N. Y. Folder No. D 188-10M-1X-36, describing how the dust counter provides means for measuring dust concentration.

Mining Drill Steel—Edgar Allen & Co. Ltd., Imperial Steel Works, Sheffield, 9, England. Folder describing essential features of rock drill and the proper rock drill treatment to obtain best results.

Floor Truck—Lewis-Shepard Co., 259 Walnut street, Watertown station, Boston. Folder No. 225, illustrating floor trucks for factory, warehouse and industrial use, for interior transportation.

Indicator — Federal Products Corp., Providence, R. I. Folder describing light, low-friction indicator. Free action allows the point to follow every variation and record it.

Arc Welding—Hobart Bros. Co., Box EW-56, Troy, Ohio. Folder describing and illustrating why arc welding is easier and more profitable, with the new 40 volt "simplified" welder.

Sprockets, Chains, Couplings—Morse Chain Co., Ithaca, New York. Folder describing by illustrations and diagrams the company's silent chain drive, couplings, and roller chains. Price lists are also included.

Die Castings—Madison-Kipp Corp., 20 Waubesa street, Madison, Wis. Folder No. L-3700, describing the company's principal products, including fresh oil lubricators, die castings, die casting machines and tools.

Forging and Heating Furnaces—W. S. Rockwell Co., 50 Church street, New York. Catalog No. 361 covering forging and heating furnaces, by illustrating a few types and including a brief description of each.

Equipment for Contractors — Worthington Pump & Machinery Corp., Harrison, N. J. Bulletin No. WP-1061, showing power, compressed air, drilling, pumping, and miscellaneous equipment on the job and in the shop; photographs showing application of equipment in construction work are included.

Sheet Grab—J. B. Engineering

Sales Co., 1722 Orange street, New Haven, Conn. Bulletin No. 1002, showing a grappling device, built in capacities dependent only on requirements, supplied for hand or motor operation.

Metal Cleaning — Detroit Rex Products Co., 13001 Hillview avenue, Detroit. Folder No. 118, describing vapor-spray-vapor machine, automatic conveyerized units, and solvents mill, used in degreasing operations.

V-Belt Drives—Rockwood Mfg. Co., Indianapolis, Ind. Data books No. 782 for multiple groove drives, and No. 783 for fractional horsepower single groove drives; cover a range from fractional to 500 horsepower and present the data in a simple manner.

Low Lift Platform Trucks—Elwell-Parker Electric Co., Cleveland, Bulletin No. A-7431, describing type "EQ" low lift platform trucks; capacity of 3000 pounds, capable of handling skids of the same size and capacity formerly used with hand lift trucks.

Flexible Shafts and Equipment—Swartz & White Mfg. Co., 243 Water street, Binghamton, N. Y. Booklet describing portable electric grinders, die sinkers, flexible shaft grinders and heavy duty tire buffer; includes illustrations and prices of attachments.

Anti-Friction Bearing Taper Attachment—Monarch Machine Tool Co., Sidney, O. Bulletin on an improvement in taper attachments for lathes, designed to remove friction, prevent back lash, eliminate wear, end lost motion and double taper turning capacity.

Portable Cranes—Lewis-Shepard Co., 175 Walnut street, Watertown, Mass. Folder No. 506, describing portable cranes, hand and electric powered, with either revolving base, telescopic or hinged frame; for shop, factory, warehouse and general utility to pile or service products or materials of many kinds.

Micarta Bearings—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Leaflet D.M.F. 5705 illustrating applications of micarta bearings, rings and standard miscellaneous shapes; No. D.M.F. 5707, includes description of micarta, its mechanical and electrical properties and the standard forms available.

Dust Collector—American Foundry Equipment Co. 555 Byrkit street, Mishawaka, Ind. Data book No. 22, devoted to description, illustration and drawings of the Amer-

ican dustube dust collector, and its application to dust control problems; booklet No. 555, giving information on featherweight flasks, aluminum flasks, steel plate pouring jackets, flexible aluminum pouring jackets and flexible cast iron pouring jackets.

Electric Motor Starters—Square D Co., Milwaukee. Bulletin No. 132, describing line voltage type of automatic starter, used with polyphase squirrel cage motors; also used for the primary circuit of slip-ring motors in conjunction with manual speed controllers for the secondary circuit.

Automotive Uses of Nickel Alloy Steels—International Nickel Co. Inc., 67 Wall street, New York. Bulletin U-1, describing the part nickel alloy steels have played in keeping the weight down in vital automotive parts, ability to resist shock and fatigue, and in general satisfying increasing demands from automotive builders.

Industrial Controls—Automatic Temperature Control Co., 34 East Logan street, Philadelphia. Bulletin No. G-9, on industrial controls regulating temperature, time, level, flow, and pressure; bulletin No. 115, illustrating and describing an automatic reset cam timer, series 2500; resets instantly to starting position on power failure.

Material Handling Equipment—Barrett-Cravens Co., 3255 West Thirtieth street, Chicago. Catalog No. 500, on materials handling equipment; illustrations cover lift-trucks, skids, portable elevators, structural steel storage racks, floor-to-floor elevators, drain racks, and barrel trucks, showing use of equipment under varying conditions.

Finishes for Aluminum—Aluminum Co. of America, Pittsburgh. Booklet to assist users of aluminum in solving finishing problems. In an effort to indicate the field of usefulness of the various classes of finishes; valuable features, limitations, and the methods of the application of each have been pointed out.

Welded Chains—American Chain Co. Inc., Bridgeport, Conn. Catalog No. 365, covering welded chain and attachments from the lighter sizes and types used for fabricating other manufactured articles to the heavier types used for maintenance service and material handling in industrial plants, oil fields, mines, shipyards and on boats. Catalog No. 366, describing weldless chains and attachments.

Operations Hold at 73% on Eve of Election

Producers Studying Wage Increases and 1937 Price Policies

RELECTING the strength of the iron and steel market despite the proximity of the national election, steelworks operations have held steady at 73 per cent of capacity during the past week.

At the same time, prospects for increased activity in the heavy products became brighter as two western railroads announced equipment programs aggregating \$21,000,000. Chicago, Burlington & Quincy plans to spend \$8,000,000 for freight equipment, involving possibly 3000 cars, and Western Pacific \$13,000,000 for rails, cars, locomotives and other equipment.

Nine months' net profits which are 300 per cent higher this year than in the same period last year have been reported by ten leading integrated producers who account for 81 per cent of the nation's ingot capacity.

This year up to Oct. 1 aggregate net profits of the ten were \$75,204,792, against \$18,466,565 in the nine months last year. Ingot production was 40 per cent ahead of the 1935 period; operations averaged 65.4 per cent against 46.6 per cent, and STEEL'S composite of finished steel prices was approximately 87 cents a ton higher than in the nine months of 1935.

Plans Price Advance in Pig Iron

TWO leading producers in connection with their financial reports have stated that they are considering wage adjustments. At the same time the companies are giving thought to price policies for the first quarter of 1937.

The first increase in the price of domestic pig iron since a year ago is scheduled to go into effect Nov. 4 at Everett, Mass. The producer there will raise all grades \$1 a ton. Other eastern pig iron sellers may follow suit, stimulating trading as consumers seek further protection.

One of the principal producers has made more flexible the \$3 per ton deduction for sheet orders of 150 net tons and over, previously allowable for one size and shape, for shipment at one time to one destination. A maximum of six sizes, each 25 tons or more, and shipments within 15 days, will be permitted. This will apply to hot-rolled strip also.

Automotive shipments of sheets have shown further gains and many mills still are unable to offer quicker deliveries. Total auto production last week

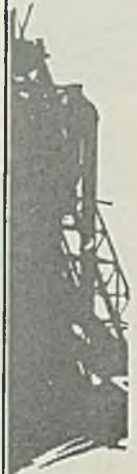
MARKET IN TABLOID

DEMAND Steady.

PRICES Massachusetts producer advances pig iron \$1 a ton.

PRODUCTION National rate steady at 73 per cent.

SHIPMENTS Automotive releases improving.



was 66,985, an increase of 7245 units. Shipments of bars and other materials to the automobile industry have improved also.

Specifications from some of the leading can companies last week were nearly double the amount released in any recent week, indicating that tin plate operations for the balance of the year would remain close to their present 95-100 per cent rate.

Shape awards during the week declined 7376 tons to 13,004, while reinforcing bar awards held about even at 2803 tons. Although the trend in both lines during the next few months likely will be downward as cold weather hampers construction, there is a fair amount of new business which should help cushion the decline.

STEEL'S scrap composite is off 8 cents to \$16.25 on a price weakness in heavy melting steel at Philadelphia, due to the lack of demand for export. The iron and steel composite is down 4 cents to \$34.62 from last week's revised \$34.66, and the finished steel index is unchanged at \$53.90.

Ore Shipments Hampered

OCTOBER shipments of pig iron are reported the heaviest for any month this year, showing a gain of about 10 per cent over September. Backlogs of producers are fairly substantial and a further gain may be made in November.

Lake Superior iron ore shipments have been hampered at the loading docks by cold weather. However, the October total probably will be close to that of September because of the unusually heavy movement up to and including the middle of October.

Operations in the Pittsburgh district were down 1 point to 69 per cent; Detroit 5 to 95; Youngstown 1 to 76; Wheeling 6 to 86, and Cleveland 2½ to 77. Buffalo was up 3 points to 87 per cent; Chicago 1¼ to 76. Other districts were unchanged.

COMPOSITE MARKET AVERAGES

	Oct. 31	Oct. 24	Oct. 17	One Month Ago Sept., 1935	Three Months Ago July, 1936	One Year Ago Oct., 1935	Five Years Ago Oct., 1931
Iron and Steel	\$34.62	\$34.66	\$34.68	\$34.15	\$33.49	\$32.84	\$30.30
Finished Steel	53.90	53.90	53.90	53.10	53.40	53.70	48.22
Steelworks Scrap	16.25	16.33	16.54	16.18	12.89	12.72	8.50

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

A COMPARISON OF PRICES

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

	Oct. 31, 1936	Sept. 1936	July 1936	Oct. 1935		Oct. 31, 1936	Sept. 1936	July 1936	Oct. 1935
Finished Material					Pig Iron				
Steel bars, Pittsburgh	2.05c	1.95c	1.95c	1.85c	Bessemer, del. Pittsburgh	\$20.8132	20.8132	20.8132	19.81
Steel bars, Chicago	2.10	2.00	2.00	1.90	Basic, Valley	19.00	19.00	19.00	18.00
Steel bars, Philadelphia	2.36	2.26	2.26	2.16	Basic, eastern del. East. Pa.	20.8132	20.8132	20.8132	19.81
Iron bars, Terre Haute, Ind.	1.95	1.85	1.85	1.75	No. 2 fdy., del. Pittsburgh	20.3132	20.3132	20.3132	19.31
Shapes, Pittsburgh	1.90	1.90	1.90	1.80	No. 2 fry., Chicago	19.50	19.50	19.50	18.75
Shapes, Philadelphia	2.11½	2.11½	2.11½	2.01½	Southern No. 2, Birmingham	15.50	15.50	15.50	14.50
Shapes, Chicago	1.95	1.95	1.95	1.85	Southern No. 2, del. Cincinnati	19.44	19.44	20.2007	19.38
Tank plates, Pittsburgh	1.90	1.90	1.90	1.80	No. 2X eastern, del. Phila.	21.6882	21.6882	21.6882	20.68
Tank plates, Philadelphia	2.09	2.09	2.09	1.99	Malleable, Valley	19.50	19.50	19.50	18.50
Tank plates, Chicago	1.95	1.95	1.95	1.85	Malleable, Chicago	19.50	19.50	19.50	18.75
Sheets, No. 10, hot rolled, Pitts.	1.95	1.95	1.95	1.85	Lake Sup., charcoal, del. Chicago	25.7528	25.2528	25.2528	24.90
Sheets, No. 24, hot ann., Pitts.	2.60	2.50	2.50	2.40	Ferromanganese, del. Pitts.	80.13	80.13	80.13	90.13
Sheets, No. 24, galv., Pitts.	3.20	3.20	3.20	3.10	Gray forge, del. Pittsburgh	19.6741	19.6741	19.6741	18.67
Sheets, No. 10, hot rolled, Gary	2.05	2.05	2.05	1.95	Scrap				
Sheets, No. 24, hot anneal., Gary	2.70	2.60	2.60	2.50	Heavy melting steel, Pittsburgh	\$17.75	17.75	14.15	13.65
Sheets, No. 24, galvan., Gary	3.30	3.30	3.30	3.20	Heavy melt. steel, No. 2, east. Pa.	14.25	14.00	11.50	11.00
Plain wire, Pittsburgh	2.50	2.40	2.40	2.30	Heavy melting steel, Chicago	16.25	16.15	13.25	12.50
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.25	Rail for rolling, Chicago	17.25	16.75	14.00	14.00
Wire nails, Pittsburgh	2.05	1.95	2.10	2.40	Railroad steel specialties, Chicago	17.75	17.65	14.75	13.50
Semifinished Material					Coke				
Sheet bars, open-hearth, Youngs.	\$32.00	30.00	30.00	28.00	Connellsville, furnace, ovens.	\$4.00	3.90	3.45	3.55
Sheet bars, open-hearth, Pitts.	32.00	30.00	30.00	28.00	Connellsville, foundry, ovens.	4.25	4.25	4.25	4.35
Billets, open-hearth, Pittsburgh	32.00	30.00	30.00	27.00	Chicago, by-product foundry, del.	9.75	9.75	9.75	9.75
Wire rods, No. 5 to ½-inch, Pitts.	40.00	38.00	38.00	38.00					

Steel, Iron, Raw Material, Fuel and Metals Prices

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

Sheet Steel	Tin Mill Black No. 28	Corrosion and Heat-Resistant Alloys	Structural Shapes
Prices Subject to Quantity Extras and Deductions (Except Galvanized)	Pittsburgh 2.75c Gary 2.85c St. Louis, delivered 3.08c	Pittsburgh base, cents per lb. Chrome-Nickel No. 302 No. 304 Bars 23.00 24.00 Plates 26.00 28.00 Sheets 33.00 35.00 Hot strip 20.75 22.75 Cold strip 27.00 29.00	Pittsburgh 1.90c Philadelphia, del. 2.11½c New York, del. 2.16¼c Boston, delivered 2.30¼c Bethlehem 2.00c Chicago 1.95c Cleveland, del. 2.10c Buffalo 2.00c Gulf Ports 2.30c Birmingham 2.05c Pacific ports, f.o.b. cars, dock 2.45c
Hot Rolled No. 10, 24-48 in. Pittsburgh 1.95c Gary 2.05c Chicago, delivered 2.08c Detroit, del. 2.15c New York, del. 2.30c Philadelphia, del. 2.26c Birmingham 2.10c St. Louis, del. 2.28c Pacific ports, f.o.b. cars, dock 2.50c	Cold Rolled No. 10 Pittsburgh 2.60c Gary 2.70c Detroit, delivered 2.80c Philadelphia, del. 2.91c New York, del. 2.95c Pacific ports, f.o.b. cars, dock 3.20c	Straight Chromes No. No. No. No. 410 430 442 446 Bars . . 17.00 18.50 21.00 26.00 Plates . . 20.00 21.50 24.00 29.00 Sheets . . 25.00 28.00 31.00 35.00 Hot strip 15.75 16.75 21.75 26.75 Cold stp. 20.50 22.00 27.00 35.00	Bars Soft Steel (Base, 3 to 25 tons) Pittsburgh 2.05c Chicago or Gary 2.10c Duluth 2.20c Birmingham 2.20c Cleveland 2.10c Buffalo 2.15c Detroit, delivered 2.20c Pacific ports, f.o.b. cars, dock 2.60c Philadelphia, del. 2.36c Boston, delivered 2.47c New York, del. 2.40c Pitts., forg. qual. 2.40c
Hot Rolled Annealed No. 24 Pittsburgh 2.60c Gary 2.70c Chicago, delivered 2.73c Detroit, delivered 2.80c New York, del. 2.95c Philadelphia, del. 2.91c Birmingham 2.75c St. Louis, del. 2.935c Pacific ports, f.o.b. cars, dock 3.25c	Cold Rolled No. 20 Pittsburgh 3.05c Gary 3.15c Detroit, delivered 3.25c Philadelphia, del. 3.36c New York, del. 3.40c	Steel Plate Pittsburgh 1.90c New York, del. 2.19c Philadelphia, del. 2.09c Boston, delivered 2.32c Buffalo, delivered 2.15c Chicago or Gary 1.95c Cleveland, del. 2.09¼c Birmingham 2.05c Coatesville, base 2.00c Sparrows Pt., base 2.00c Pacific ports, f.o.b. cars, dock 2.45c St. Louis, delivered 2.18c	Rail Steel To Manufacturing Trade Pittsburgh 1.90c Chicago or Gary 1.95c Moline, Ill. 1.95c Cleveland 1.95c Buffalo 2.00c
Galvanized No. 24 Pittsburgh 3.20c Gary 3.30c Chicago, delivered 3.33c Philadelphia, del. 3.51c New York, del. 3.55c Birmingham 3.35c St. Louis, del. 3.53¼c Pacific ports, f.o.b. cars, dock 3.80c	Enameling Sheets Pittsburgh, No. 10 2.45c Pittsburgh, No. 20 3.05c Gary, No. 10 2.55c Gary, No. 20 3.15c		
Tin and Terne Plate Gary base, 10 cents higher. Tin plate, coke base (box) Pittsburgh \$5.25 Do., waste-waste 2.75c Do., strips 2.50c Long ternes, No. 24 unassorted, Pitts. 3.50c Do., Gary 3.60c			

Bars

Bar Prices, Page 88

Pittsburgh—The recent modification of what constitutes a single size and shipment in 150-ton lots of sheets and over has not spread to hot-rolled merchant steel bars where a similar setup exists. The bar base remains 3 to 25 tons with the largest quantity deduction \$3 a ton off for 150-ton lots of a single size, grade and analysis for shipment to one destination at one time. The bar market is still experiencing an active rate of specifying, although one or two of the larger bar mills have been able, by heavier operating schedules, to reduce their backlogs so that delivery promises are a shade better. Some market influences are discussing an advance for the first quarter from the present base of 2.05c, f.o.b. Pittsburgh, for hot-rolled carbon bars and 2.55c for cold-drawn bars.

Cleveland—Slight increase in production schedules of automobile builders has resulted in an almost corresponding advance in activity among partsmakers. Mills report heavier shipments during October, but as was expected, sales declined. Most orders placed at lower prices, before opening of fourth quarter, have been cleared up, but some mills were forced to carry some of that tonnage over into November. Alloy bar market has recently shown increased strength. Present prices on both alloy and commercial steel bars have received little opposition from consumers.

Chicago—Automotive bar releases continue to improve and demand elsewhere is fairly steady. Mills are improving slightly on deliveries, though three to four weeks still are required in some instances. Tractor manufacturers are maintaining steady schedules, while some gains are apparent in production of other types of farm equipment. Operations are below the peak earlier in the year, however. The market is steady on new business.

Boston—New bar business is slow, due primarily to the extensive covering before the \$2 advance went into effect Oct. 1.

New York—Buying of commercial steel bars is fairly well sustained, with substantial releases from bolt and nut manufacturers and jobbers.

Philadelphia—Commercial bar demand, while less than in September, is remarkably brisk considering the protective covering earlier in the fall and nearness of inventory, which will begin earlier this year to

expedite preparation of surplus tax statements.

Plates

Plate Prices, Page 88

Pittsburgh—Plate mills report aggregate backlogs have declined somewhat and some are in a position to make deliveries within a week to 10 days, against two and three weeks previously.

Cleveland—Tank and boiler shop demands have been rather dull through the greater portion of last month, but other miscellaneous requirements held up well. Prices remain firm and unchanged. However, an increase of at least \$2 a ton is expected, by some, to go into effect the first of next year. Considerable locomotive buying is looked for over the remainder of the year.

Chicago—While plate consumption by railroads, tank builders and structural fabricators has receded only moderately during the past few months, backlogs are off substantially. Prospects for new business in railroad equipment are bright, however, and no extended lull in plate demand from that direction is anticipated. Tank fabricators still are busy but have only small backlogs. Plate mills are giving relatively prompt delivery, with prices steady.

Boston—Demand for plates continues unabated at a strong rate. Standpipes and storage tanks being figured or those awarded require a sizable amount of plates.

Bath Iron Works, Bath, Me., has awarded 20 tons of steel plates for the America's cup defender being built for Harold Vanderbilt to United States Steel Corp. The frames and plating are to be of steel.

New York—Plate buying is somewhat livelier with some good tonnages being placed for railroad repairs. Tank work is slow and shipbuilding requirements have not developed as well as had been expected.

Philadelphia—Plate tonnage has been stimulated by placing of about 1300 tons by the Reading railroad, of which 1100 tons is for new cars and the remainder for repairs. Baldwin Locomotive Works has closed on the remainder of the plates needed for 65 locomotives it has on order.

Birmingham, Ala.—Plate mills are maintaining active operating schedules with heavy bookings and new business coming in. Local fabricators are still busy on the large sized pipe for the industrial water project here.

San Francisco — Plate lettings

were all confined to lots of less than 100 tons. No subaward has yet been made on 4500 tons of liner plates and reinforcing material for the concrete pipe and the plates for the welded steel portion of the line.

Seattle—The market is more active as additional projects are up for figures. Lettings of considerable importance are scheduled during the next week. Shell Oil Co., Seattle, plans improvement of terminals early in 1937 to cost \$300,000, including several 80,000 barrels each oil storage tanks.

Contracts Placed

3000 tons, Salem, Oreg., water supply system, 27 and 36-inch, to Steel Tank & Pipe Co., Portland, Oreg.

200 tons, eleven oil storage tanks for Inland Navigation Co., The Dalles, Oreg., to Western Engineering Corp., Seattle.

117 tons, standpipe, Abington, Mass., to Chicago Bridge & Iron Works, Chicago.

100 tons, 2 tanks, Merrimac Chemical Co., Everett, Mass., to Chicago Bridge & Iron Works, Chicago.

Contracts Pending

6000 tons, 30 to 42-inch welded steel pipe, Everett, Wash.; bids postponed.

4500 tons, 27 to 36-inch welded and reinforced concrete pipe, Salem, Oreg.; general contract to American Concrete & Steel Pipe Co., Tacoma, Wash.

170 tons, University Mound reservoir, San Francisco; bids opened.

Sheets

Sheet Prices, Page 88

Pittsburgh—The \$3 per ton deduction for sheet orders of 150 net tons and over has been made more flexible by announcement last week by a leading sheet mill that it would place a new interpretation on size and shipment. This \$3 a ton deduction had been allowable for single grade, analysis, size and gage released for shipment to one destination at one time. Under the new interpretation the subject of size has been changed to permit a maximum of six sizes, none of which to be smaller than 25 tons, and shipment will be permitted within 15 days. The definition of "size" means one gage or thickness and one width, whereas formerly it had included on length in addition to the first named three specifications. In line with this change there is some basis for believing that the quantity base of 1 to 25 tons may be narrowed to a minimum of possibly 8 or 10 tons and that small lot extras will be increased soon.

Cleveland—Sheet bookings during October declined slightly from the previous month, while shipments increased. One producer is reported

out of the market for the remainder of the year. In general, mills are filled with orders to keep them operating close to capacity for several weeks. Enameling and stainless sheets requirements have been holding up well, but a seasonal recession in galvanized has occurred.

Chicago—Sheet mills still are unable to better delivery promises. Automotive shipments show further gains, but will be slower to reach their fourth quarter peak than was anticipated a short time ago. Specifications elsewhere are holding their own, and new business is somewhat less active than 30 to 60 days ago. Prices are steady.

Boston—Sheet sales are being maintained at a good level. With the advent of the autumn season stove manufacturers are increasing orders to some extent.

New York—Sheet buying is expanding after a slight lull. Deliveries are becoming further extended. Most sellers are putting into effect the new quantity schedules although one large seller has advised its district offices to hold up application of these schedules.

Philadelphia—Sheet specifications are still heavy, with deliveries becoming more extended on several grades. New quantity schedules on hot-rolled, hot-rolled annealed, hot-rolled pickled and cold provide that in total weight to which each deduction applies there may be two or more sizes of not less than 25 tons of any one size and give mills 15 days in which to handle the order as to time of shipment.

Buffalo—Sheet mills are booked solidly for the remainder of the year on some grades and have good runs in prospect on others. No recession from present operations, now placed at 85 to 90 per cent of capacity, is anticipated in the next 30 days.

Youngstown, O.—New business in steel sheets continues in fair volume but has tapered somewhat. Mill shipments are good, with users anxious to obtain material but delivery dates have been falling farther back.

Cincinnati—Specifications to sheet mills from automobile manufacturers are being stepped up rapidly, a feature of the current market. Mills maintained capacity operations throughout October. Ordering continues above capacity, building up a heavier backlog and further extending deliveries. Refrigerator makers show tendency to anticipate needs earlier than usual.

St. Louis—Sheet demand continues near the peak levels of the year, with deliveries still backward and pressure by customers increasing. Practically all principal consuming groups are specifying heavily, with

particularly large tonnages being accounted for by stove, implement and household appliance industries.

Transportation

Track Material Prices, Page 89

Announcement of approval by the Chicago, Burlington & Quincy of expenditure of \$8,000,000 for rolling stock, involving possibly 3000 cars, is taken as a sign of approaching large buying by western roads to meet traffic needs. Carbuilders in the Chicago district estimate prospective buying of cars will total close to 20,000 this winter.

Western Pacific plans to spend \$13,000,000 for rails and other equipment, including \$1,800,000 for freight cars and \$1,600,000 for locomotives. The \$1,800,000 aggregate for freight cars will be used to replace arch bar trucks amounting to the expenditure of \$836,000 on existing cars, purchase of 100 hoppers at \$233,000, major repairs to 1094 existing freight cars, purchase of 400 new box cars, purchase of 100 new flat cars, purchase of 50 new gondola cars, purchase of one wrecking crane. The locomotive purchases will include four 2-8-2 type locomotives and seven 4-6-6-4 type locomotives.

Kennecott Copper Co. has placed 250 hopper cars of 100 tons capacity with Pressed Steel Car Co., Pittsburgh, and Kansas City Southern has placed 900 freight, five passenger cars and ten locomotives. Elgin, Joliet & Eastern is in the market for six diesel switchers.

Chicago & North Western is inquiring for 48,500 tons of rails. The Southern railroad will open bids Nov. 15 for substantial quantities of spikes and fastenings.

New York Central has postponed opening of bids for 50 locomotives from Oct. 26. The navy has awarded two 70-ton flat cars to Haffner Thrall Car Co.

The price of standard rails at \$36.375 per ton, f.o.b. mill, has been extended into 1937 through the announcement of one rail maker that it would accept specifications at this price up to Dec. 1 for shipment through the first quarter of 1937. Previously rail makers were willing only to accept specifications at this price up to the close of October for shipment no later than Jan. 1, 1937. The latest price development obviously precludes a first-quarter increase in rails of any effect.

Car Orders Placed

Kansas City Southern, 500 box cars, four passenger coaches, one combination diner-chair car to Pullman-Standard

Car Mfg. Co., Chicago; 300 box cars to General American Tank Car Corp., Chicago; 100 gondolas to Mt. Vernon Car Co., Mt. Vernon, Ill. Kennecott Copper Co., 250 100-ton ore cars, to Pressed Steel Car Co., Pittsburgh.

Locomotives Placed

Kansas City Southern, ten 2-10-4 type locomotives to Lima Locomotive Works, Lima, O.

Car Orders Pending

Chicago, Burlington & Quincy, expenditure of \$8,000,000 for freight equipment approved; to involve possibly 3000 cars.

Western Pacific, 400 box cars, 100 hoppers, 100 flat cars, 50 gondola cars and one wrecking crane.

Locomotives Pending

Elgin, Joliet & Eastern, six 600-horsepower diesel switching locomotives.

Western Pacific, four 2-8-2 type and seven 4-6-6-4 type.

Rail Orders Pending

Chicago & North Western, 48,500 tons.

Pipe

Pipe Prices, Page 89

Pittsburgh—Excluding the two large line pipe orders placed during October and considering average pipe requirements which usually run to carload lots, October's record was slightly better than September in tubular products. Demand is well diversified, mainly in small sizes of both butt and lap weld. Pipe mills are operating at between 50 and 55 per cent of capacity.

Cleveland—Steel pipe demand for industrial requirements during October, compared favorably with September. Domestic sales increased in the last 60 days. Recent activity in automobile production has resulted in a mild reaction in demand for mechanical tubing. Shipments of cast pipe dropped a little from the September level, probably due to the fact that considerable WPA work has been held up until after elections. J. B. Clow & Son Co., Cleveland, was awarded 125 tons of 12-inch pipe, for water main at Columbus, O., last week. Prices on steel and cast pipe remain firm.

Chicago—Cast pipe shipments continue near the most active rate of the past several months, and while backlogs are receding, there is a fair amount of new business. Activity is expected to decline seasonally during the balance of the quarter, with the outlook for the longer term generally favorable.

Boston—With the probability that

WPA and PWA projects requiring cast pipe will be pushed forward to completion during the winter months it is expected that the pipe market will continue to be active and that operations will be maintained at a fairly high level. Prices are firm.

New York—Activity in the cast pipe market increased last week, principally on the strength of inquiries from federal projects. Bids will be taken Nov. 2 on 205 tons of cast pipe for the New York city water department. Federal funds have been allotted to Port Byron, N. Y., for the purchase of 32,000 feet of 6-inch cast pipe, and to Trenton, N. J., for the purchase of about 29,000 feet.

Birmingham, Ala.—New business is rather spasmodic, but sufficient to warrant fairly active production at pipe shops here. Shipments of pipe on federal projects continues, and several similar contracts are anticipated in the next few weeks.

San Francisco — Featuring the market was the opening of bids on 965 tons of 6 to 10-inch cast pipe for the East Bay municipal utility district, Oakland, Calif., on which United States Pipe & Foundry Co. was low.

Seattle—Approval of PWA grants for several municipal water system projects will be followed by call for bids. Meanwhile the cast pipe market is dull, in lots of less than 100 tons. Parker & Hill, Seattle, engineers, are preparing plans for a \$23,000 water system at Alderwood, Wash., and for Lowell and Tenino, Wash.

Cast Pipe Placed

- 1300 tons, city of Providence, R. I.; bids taken Oct. 26.
- 120 tons, 12 inches pipe, for water main at Columbus, O., to J. B. Clow & Son Co., Chicago.
- 120 tons, treasury department, San Francisco, to United States Pipe & Foundry Co., Burlington, N. J.
- 100 tons, North Las Vegas, Nev., to Pacific States Cast Iron Pipe Co., Provo, Utah.
- 100 tons, 4 to 6-inch, La Mesa, Lemon Grove and Spring Valley Irrigation district, La Mesa, Calif., to unnamed interest.
- Unstated tonnage, 3000 feet for city of Lowell, Mass.; bids taken Oct. 27.

Steel Pipe Placed

1500 tons, for Everett and Chelsea, Mass., districts, Metropolitan district water supply commission, Boston, to Walsh Holyoke Steam Boiler Works Inc., Holyoke, Mass., through V. J. Grande, Boston.

Cast Pipe Pending

- 965 tons, 6 to 10-inch, Oakland, Calif.; United States Pipe & Foundry Co., Burlington, N. J., low.
- 293 tons, water department, New York;

Donaldson Iron Co., Emaus, Pa., low. 205 tons, 12 and 18-foot lengths, water department, New York city; bids Nov.

150 tons, Rockaway Beach boulevard; Warren Pipe & Foundry Corp., Phillipsburg, N. J., low.

150 tons, sewage disposal plant, South river, N. J.; Utility Construction Co., Jersey City, N. J., low.

130 tons, 4-inch, interior-Indian department, Albuquerque, N. Mex.; bids opened.

Unstated tonnage, 16,270 feet 48-inch with 120 feet 54-inch at Toledo, O., for new force pipe line water system, also pumping station units of 25,000-000 gallons per day capacity.

Strip

Strip Prices, Page 89

Pittsburgh—As noted under the Pittsburgh sheet market this week, a change in the interpretation on size and shipment has been made to apply in exact conformity to strip steel as well. Heavier mill operations on wide strip through the past two or three weeks have reduced backlogs appreciably and one or two leading interests report need for immediate orders in this classification.

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However, backlogs on narrow strip are still so large that considerable arrearages are reported by nearly all producers. Considering the industry, hot-rolled strip operations last week were slightly higher at 65 per cent and cold-rolled showed a moderate gain to 70 per cent. Strip mill interests are especially encouraged at present, even in view of the situation in wide strip, at the good diversity of orders. The present price of 1.95c, Pittsburgh, on hot-rolled strip, and 2.60c, Pittsburgh or Cleveland, base, for cold-rolled strip, appears firm.

Cleveland—Demand for hot and cold strip held up well last month, in view of the mild activity of auto partsmakers. November is expected to show a rather marked improvement because of the anticipated increase in automobile production schedules. Deliveries on hot-rolled improved somewhat, but cold-rolled is no more active. Consumer's stocks are reported normal; little opportunity has been offered for stocking. Prices remain firm.

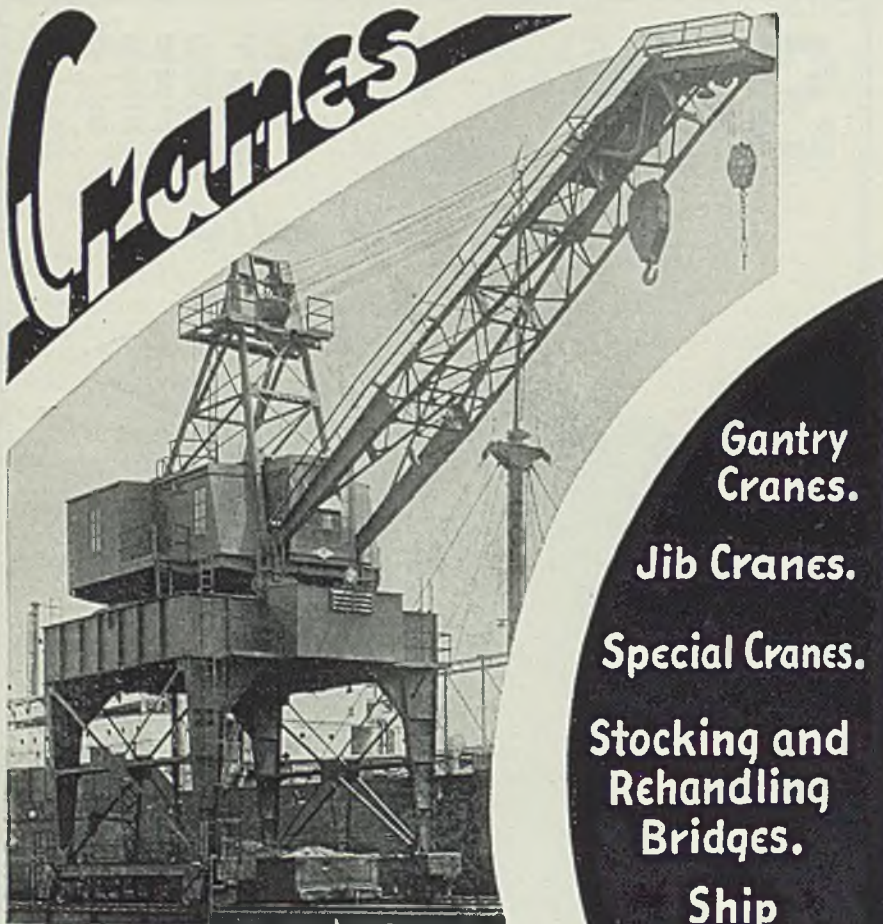
Chicago—New business is steady and automotive releases are improving. While there has been some de-

lay in shipments to motorcar interests, the heavier schedules planned for coming weeks point to a gain in releases shortly. Consumption by miscellaneous users is sustained in most instances. Deliveries of about three weeks for hot-rolled strip and six to seven weeks for cold-rolled strip are common, though shipments depend to a certain extent on size of material. Prices are steady.

New York—Narrow cold strip demand is heavy, with some eastern producers endeavoring to sublet excess tonnage, but finding others also booked solidly. Cold strip deliveries are now eight to ten weeks and hot strip more extended than a month ago, averaging three to four weeks. Cold strip demand is highly diversified with automobile accessories taking most.

Boston—Some new business is coming in, but sales have not been nearly as heavy as at the end of third quarter. For the most part manufacturers are using up stock on hand or material now being delivered on old contract. However, some manufacturers have placed urgent orders for strip, which may indicate that considerable new buying will be done soon.

Youngstown, O.—The only unsettling feature in the strip trade has been the announcement of important makers broadening the quantity differential on hot and cold-rolled strip and sheets. This amounts to an average actual reduction of \$1.80 a ton on the 50-ton to 150-ton lots. Most automotive partsmakers and others buy on the 150-ton lot basis, and the reduction evidently was made as a gesture to the automotive interests. While there has been some recent hesitation in new buying of strip mills have been booking tonnage as heavily in October as in September. Some mills are finding difficulty in promising delivery much before early December.



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Wire

Wire Prices, Page 89

Pittsburgh—Buying of merchant wire products still appears to be declining, but manufacturing wire demand has shown increasing tendencies. The latter is largely due to automotive parts needs, chiefly for springs, bolts, nuts, screws and miscellaneous parts. The present market is quoted \$2.05 per keg, f.o.b. Pittsburgh, on standard wire nails, 2.50c on plain manufacturing wire and \$60 per base column on woven wire fence.

Cleveland—Producers report an active October. New business was heavy in spite of rather extensive

speculative buying before the price advance, opening the fourth quarter. Bolt and nut manufacturers and indirect suppliers to the automotive trade are the heaviest consumers.

Chicago—New business in wire and wire products continues at a moderately unfavorable comparison with the volume a month ago. Consumption of manufacturers' wire is improving in the automotive industry and is sustained in other directions. A large share of the decrease in new business during October was accounted for by forward buying during September. Merchant products are moving rather slowly in farm districts, this partly being a consequence of the season.

Boston — New business being booked in wire products is light. It is reported that an effort is being made to re-establish firmly the practice of producers selling to wholesale jobbers, who will in turn sell to dealers, and they to retail outlets.

New York—Wire demand is surpassing trade expectations with deliveries becoming more extended on several leading items. Cut nails are more active than in months, especially for flooring and shingling.

Tin Plate

Tin Plate Prices, Page 88

Pittsburgh—A few leading can companies last week had issued specifications for 1937 delivery that were roughly double the amount released in any of several previous weeks. This tonnage is entered for rolling and shipment at convenience through November and December, a fact more or less guaranteeing that operations will hold at close to their present high level of 95-100 per cent of the industry's capacity. According to expectations, the 1937 contract price on tin plate will be announced in another two weeks, the market meanwhile holding at \$5.25 per base box, f.o.b. Pittsburgh.

Cold Finished

Cold Finished Prices, Page 89

Pittsburgh—Still reporting backlogs of six to eight weeks, the cold-drawn bar industry has been little concerned with a falling-off in new specifications the last week or two, but is showing apprehension in the event demand from the automotive industry for rush shipment should suddenly appear. The price situation is strong and consumers are more interested in obtaining deliveries than in shopping for possible price advantage. Consequently, the market of 2.35c, f.o.b. Pittsburgh, is firm, with no change in extras since

the recent adoption of a 150-ton quantity bracket (and over) and the reduction in size extras on small cold-finished rounds.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 89

Sales and specifications for bolts and nuts are lighter and October business is expected to be off moderately from that of September. The outlook for sustained demand from freight car builders is favorable in view of the increase in prospective equipment purchases, and the farm

equipment industry is expected to be a steady or heavier buyer during the next several months. Jobbers' specifications show little change. Prices are fairly steady, though irregular in some instances.

Magnetic Mfg. Co., Milwaukee, has changed its name to Stearns Magnetic Mfg. Co., although the former company is maintained as a separate corporate entity. The Stearns plant has been enlarged to provide increased production facilities in the main fabricating and erecting departments.



Nature's on our payroll

—or she *should* be. Employing the centrifugal force of nature, putting it to work in our foundries, is our method of producing a better casting of Bronze Alloy, Monel Metal, Nickel, Iron, or Semi-Steel.

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Shapes

Structural Shape Prices, Page 88

New York—The market remains quiet. Most fabricators regard this as only temporary although it is not expected that activity will be very heavy during the winter months. Approximately 500 tons of shapes are involved in a building now out for figuring for the Kreuger Brewing Co., Newark, N. J. The second large apartment let in greater New York for Silk & Hitlin, Brooklyn,

was booked by Bethlehem Fabricators Inc., Bethlehem, Pa.

September bookings and shipments of fabricated structural steel showed a slight gain over August, according to tabulations of the American Institute of Steel Construction. This reverses the usual trend as between these months. Total business of this industry in nine months this year is greater than during the entire year, 1935.

Pittsburgh—Deliveries on wide-flanged material have become slightly more favorable to users in spite of the fact that backlogs held by

fabricating shops are still sizable. Among inquiries are 1350 tons for transmission towers and a substation for the Tennessee Valley authority, and 650 tons in two county bridges in New York. Plain structural shapes at 1.90c, f.o.b. Pittsburgh, seem favorable for an advance for the first quarter.

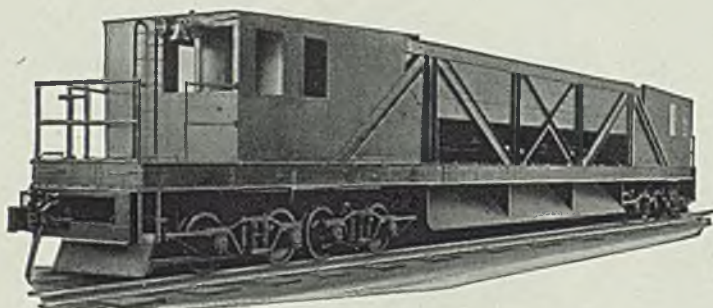
Cleveland—Small structural jobs continue to predominate, but some encouraging news comes from one fabricator who reports receiving seven jobs, well over 100 tons each during October, compared with only one in September. Most of these jobs have come from private sources. Deliveries are still well extended in the mills, thus forcing fabricators to fall behind schedule. Grade crossing elimination projects are expected to show a rather marked recession in the near future.

Chicago—Awards of fabricated structural steel continue light and plain material sales and specifications are receding. Fairly heavy shipments still are being made to railroad shops and freight car builders, but a decrease in building activity is expected to restrict production during the next few months. Outstanding in new inquiries are the Moffat tunnel extension and Detroit sewer and viaduct work, involving a total of 8260 tons of plates and shapes.

Boston—A lull regarded as temporary, and to some extent seasonal has developed. It has been estimated that approximately 30,000 tons of material will be needed for bridge and grade crossing elimination projects and private building within the next several months in New England. The city transit department has authorized construction of the Huntington avenue subway with the aid of federal financing.

Philadelphia—Structural business is principally bridge work with bids opened on 1000 tons by Pennsylvania state Oct. 30. United States engineer, Philadelphia, opens bids Nov. 13 on 1500 tons of piling, for work on Rehoboth and Delaware bays. Belmont Iron Works, Eddystone,

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Shape Awards Compared

	Tons
Week ended Oct. 30	13,004
Week ended Oct. 23	20,380
Week ended Oct. 16	10,435
This week, 1935	23,041
Weekly average, 1935	17,081
Weekly average, 1936	22,048
Weekly average, September	19,999
Total to date, 1935	729,187
Total to date, 1936	970,153

Pa., was awarded 110 tons for a sulphur house at Carneys Point, Pa., for E. I. du Pont de Nemours & Co., Wilmington, Del.

San Francisco—Movement on the Pacific Coast has become quite restricted, awards totaling less than 800 tons. To date this year 143,962 tons have been placed, compared with 102,145 tons for the same period a year ago. The important factor was the opening of bids on the Federal building, Los Angeles, involving approximately 12,000 tons, on which George A. Fuller Co., New York, was low.

Seattle—As a rule plant capacity is engaged but backlogs are decreasing and no important projects are up.

Shape Contracts Placed

1520 tons, national guard armory, Teaneck, N. J., to American Bridge Co., Pittsburgh. Reported in STEEL Oct. 26 to Oltmer Iron Works.

1290 tons, piling, Mississippi river dam No. 12, Bellevue, Iowa, to Bethlehem Steel Co., Bethlehem, Pa.

1200 tons, Eighth avenue bridge viaduct, Denver, to American Bridge Co., Pittsburgh.

920 tons, state bridges No. 5308 and 5309, St. Louis Park, Minn., to American Bridge Co., Pittsburgh.

910 tons, bridge No. 146, Grant and Crawford counties, Wisconsin, to Midland Structural Steel Co., Cicero, Ill.

875 tons, bridge, Rochester, N. Y., for New York Central railroad, to Bethlehem Steel Co., Bethlehem, Pa.

700 tons, plant building, Blatz Brewing Co., Milwaukee, to Milwaukee Bridge Co., Milwaukee.

500 tons, Columbia Heights apartment, Brooklyn, N. Y., for Silk & Hittin, Brooklyn, to Bethlehem Fabricators Inc., Bethlehem, Pa.

460 tons, department store for Frederick Loesser & Co., Garden City, Long Island, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

450 tons, state highway bridge WPGM-293-B, Worcester, Mass., to Phoenix Bridge Co., Phoenixville, Pa.

425 tons, assembly plant, Somerville, Mass., for Ford Motor Co., Detroit, to R. C. Mahon Co., Detroit.

400 tons, bridge, North Little Rock, Ark., to Virginia Bridge Co., Roanoke, Va.

400 tons, building at East Chicago, Ind., to United Boiler Heating & Foundry Co., Hammond, Ind.

350 tons, extension to factory building, for Chase Brass & Copper Co., Waterville, Conn., to American Bridge Co., Pittsburgh.

345 tons, building, Colorado bureau of roads, Denver, to E. Burkhardt & Sons Steel & Iron Works Co., Denver.

328 tons, bridge over Nashua river, Clinton, Mass., to Truscon Steel Co., Youngstown, O., through Antonio Pendisco, Fitchburg, Mass.

292 tons, loft building, Woodrum Inc., Charleston, W. Va., to Pittsburgh Bridge & Iron Co., Rochester, Pa.

292 tons, bridge, Durham-Lisbon, Me., to American Bridge Co., Pittsburgh.

270 tons, buildings No. 32-B and 35-F for Carborundum Co., Niagara Falls, N. Y., to R. S. McMannus Structural Co., Buffalo.

270 tons, King avenue viaduct, project No. 253, Columbus, O., to Bethlehem Steel Co., Bethlehem, Pa.

250 tons, passageways for Triboro bridge authority, New York, to Weatherly Steel Co., Weatherly, Pa.

250 tons, improvement to water front, Key West, Fla., for United States Navy department, to Bethlehem Steel Co., Bethlehem, Pa.

250 tons, machinery for South Ashland avenue bridge, Chicago, to American Bridge Co., Pittsburgh.

244 tons, truss spans, Henry county, Iowa, to Clinton Bridge Works, Clinton, Iowa.

160 tons, Roy street power station, Spokane, Wash., to unnamed interests. Alloway & Georg, Spokane, general contractor.

128 tons, Cavina avenue bridge, Los Angeles, state and veterans hospital, Camarillo, Calif., and veterans hospital, Sawtelle, Calif., to Bethlehem Fabricators Inc., Bethlehem, Pa.

125 tons, warehouse for Federal Barge Line, to Mississippi Valley Structural Steel Co., St. Louis.

120 tons, Bellingham, Wash., high school, to Pacific Car & Foundry Co., Seattle. Hendrickson - Ahlstrom Co., Seattle, general contractor.

100 tons, New York state highway bridge RC-243 5, Stuben county, to Lackawanna Steel Construction Co., Buffalo.

100 tons, state highway bridge, Orange, Va., to Virginia Bridge & Iron Co., Roanoke, Va.

100 tons, extension to garage, Pennsylvania truck lines, Pittsburgh, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

100 tons, tunnel ribs, metropolitan water



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Brass and Bronze Products

Bellefonte, Pennsylvania

district, Los Angeles, to Commercial Shearing & Stamping Co., Youngstown, O.
 100 tons, piling, White Cap canal diversion dam, Denver, to unnamed interest.
 100 tons, three bridges in Routt county, Colorado, to unnamed interest.
 100 tons, highway work, Gilpin county, Colorado, to unnamed interest.
 100 tons, steel piling, Spokane, Wash., water system project, to Bethlehem Steel Co., Seattle.

Shape Contracts Pending

12,000 tons, Federal building, Los Angeles; George A. Fuller Co., New York, low on general contract.
 5000 tons, plates and shapes, extension to Moffat tunnel, Colorado.

4300 tons, Sixth Avenue subway, New York; George H. Flinn Corp., New York, low.
 3500 tons, bridge over Connecticut river, Turner Falls, Mass.; bids soon.
 3250 tons, section No. 8, Detroit river sewer and Pere Marquette railroad viaduct, Detroit.
 2650 tons, Columbia avenue viaduct super-structure, Cincinnati; bids awaiting PWA inspection.
 1350 tons, transmission towers and substation for Tennessee valley authority, Nashville, Tenn.
 1200 tons, bridge, Blountstown, Fla.
 1000 tons, Magregor street bridge for city of Manchester, N. H.; bids soon.
 1000 tons, bridge, Huntington, Mass.; bids soon.
 771 tons, overpass bridge, Butler county,

Pennsylvania; Holmes Construction Co., Wooster, O., low on Oct. 23 letting.
 650 tons, state highway bridges RC-3840 and 8498, Onandaga and Herkimer counties, New York.
 500 tons, building, Krueger Brewing Co., Newark, N. J.; plans out.
 470 tons, bridge over Arkansas river, Arkansas, Kans.
 400 tons, through truss bridge, Cambria county, Pennsylvania; Sheesley & Tanne Construction Co., Johnstown, Pa., low on Oct. 23 letting. Included, 17 tons of plain steel bars.
 275 tons, Sommerville bridge, Biddeford-Sacco, Me.; bids Nov. 4.
 250 tons, building, health center, East Sixty-ninth street, New York; plans out.
 225 tons, bridge over Sacco river, West Buxton-Hollis, Me.; bids soon.
 203 tons, through truss bridge, Tloga county, Pennsylvania; Robert Rosser, Wilkes Barre, Pa., low on Oct. 23 letting. Included, 24 tons of plain steel bars.
 200 tons, fertilizer plant for Swift & Co., Newburg, N. Y.
 175 tons, bridge over Sacco river, Brownfield, Me.; bids soon.
 150 tons, Bronx Eye & Ear Infirmary, Bronx, N. Y.; Bethlehem Fabricators, Inc., Bethlehem, Pa., low.
 150 tons, water service station building, Flushing avenue, Brooklyn, N. Y.; bids Nov. 2 by procurement division, Treasury department.
 125 tons, addition to building, Arrow Carrier Corp., Paterson, N. J.; plans out.
 123 tons, plate girder bridge, Jay township, Elk county, Pennsylvania; bids to state highway department, Harrisburg, Pa., Nov. 6. Included, 34 tons of plain steel bars.
 100 tons, bridge over Boston & Albany railroad, Grafton-Shrewsbury, Mass.; Carlo Bianchi, Framingham, Mass., low.
 Unstated tonnage, two steel frame buildings, costing approximately \$100,000, for extensions to Bridgeville, Pa., plant of American Cyanamid & Chemical Corp.; Rust Engineering Co., Pittsburgh, general contractor.
 Unstated tonnage, overpass, Mason street, and 2-story steel and concrete garage and repair shop building, Berlin, N. H. PWA has allotted \$227,000 to city.
 Unstated tonnage, bridge, Bartlett, N. H.; bids Nov. 5.
 Unstated tonnage, 3-story high school to cost \$1,500,000, Troy, N. Y.; PWA aid.

Behind the Scenes with STEEL

Gas Over St. Louis

ACETYLENE welders are swooping down on St. Louis Nov. 18 for the annual meeting of the International Acetylene association, and this "city with the United States around it" is preparing to make the week an eventful one. Being the home of the "gas-house gang" makes it an ideal setting for a convention of gas welders. It is not known yet whether Dizzy Dean will be on hand to throw a few fast ones or not. At least there will be plenty of room under the Anheuser-Busch for all comers.

STEEL will strike the keynote of

INQUISITIVE CAMERA DEPT.—XIX



ROBERT M. "BOB" KLEIN, portly member of STEEL's promotion staff, who is a recent newcomer to the organization. Bob is a football prognosticator of no mean repute, specializing in winning quarters from widows and orphans in football pools. We suspect him of proselyting, however, in this work.

this annual event in next week's (Nov. 9) issue with a specially prepared insert section giving full details of the program and locale, together with several thematic articles on the subject of oxyacetylene welding.

Speaking of welders, reminds us of that hard-working gang which operated a group of welding machines day and night at the recent National Metal exposition in Cleveland. Friday night, when the show finally closed, the welders were escorted to a nearby restaurant, treated to a big dinner, followed by indefinite rounds of

drinks on the boss. In the early hours of the morning they were all rolled home, and for all we know may be there yet.

* * *

Telephony

WE ARE pioneering (we hope) a move a compel plant telephone operators to discontinue the practice of answering a call with: "Good morning, this is the Blank Pretzel Co."—"Good afternoon, this is the Crunch Wrench Co."—"Good evening, this is the Joe Zilch Hash House Co."—etc., etc.

Besides being a phony (ouch!) greeting, this *good-something* idea is annoying and a waste of time. We suggest President Roosevelt issue an executive order making its use punishable by a fine of not more than \$5000 or ten years in prison or both.

In its place, we suggest: "Perkins Pipe Co.—whaddaya want,"

* * *

Campaign in the Neck

RELIEF is in store this week for radio listeners and newspaper readers who have developed severe cases of campaign complex. Election oratory, in our humble opinion, was nothing to rouse the average voter into a frenzy of righteous indignation or drive him into speedily exercising his inalienable franchise. If we may borrow a couple of Frank Sullivan's cliches.

Alexander Woolcott intoned a few grandfatherly chastisements and scholarly witticisms the other night on behalf of the Dems. E. T. Weir, of course, came to bat nobly in a recent *Fortune* for the Reps.

Seeking to out-Digest the *Digest*, we turned to our Automatic Decider. After whispering the question, "Will Roosevelt win?", we flipped the magic talisman into the air, waiting for its decision. Suddenly in midair it exploded into a hundred pieces, and there we were.

* * *

Bon Tete

HEADLINE of the week: "Castings Trundle Easily when Ellwell-Parker says, 'Come On.'"—In the Oct. 26 issue of STEEL. What a title for a swing number!

—SHRDLU

Reinforcing

Reinforcing Bar Prices, Page 89

New York—Both inquiries and lettings are few and tonnages are comparatively small. Without sufficient tonnage to test a stiffening here, prices are fairly firm. However, in New Jersey the price situation is still unsettled. Although activity may increase within the next week or so, most sellers do not believe that business will be very heavy during the winter months. An unstated tonnage will be required for the grade crossing elimination over the central railroad of New

Jersey track at Wilson avenue, Newark, N. J.

Pittsburgh—Some influences seasonally have tended to restrict construction projects. The market is quoted 2.05c by distributors for new billet quality in straight lengths.

Cleveland—Requirements for reinforcing material from miscellaneous sources improved slightly during October. No changes in prices are in prospect until possibly the first of the year. At present they are holding firm. Bids went in last Friday on the sewage disposal contract 93, this city, involving 800 tons. This has been reported to be one of the biggest jobs in years for this district.

Chicago—While backlogs of distributors are declining, the steady flow of small purchases helps to sustain shipments and gives a favorable outlook to the next several months. Shipments will be affected adversely by the season, but relatively heavy demand is in prospect. Several large tonnages are pending but new inquiries generally call for only small lots.

Boston—Both lettings and inquiries are comparatively light. An undetermined quantity of bars will be used in the construction of the Huntington avenue subway, authorized by the city transit department and to be built with federal aid. Robinson & Steinman, New York, architect, expect to have plans out around Nov. 10 for a bridge at Deer Island, Me. Prices are fairly near base but there continues to be some weakness.

St. Louis—Demand has declined since mid-October, large lettings being absent. Numerous small projects, calling for 20 to 75 tons, are helping the situation. Laclede Steel Co. has booked an order for 350 tons to be used in construction of fermenting tanks for the Anheuser-Busch Brewing association, St. Louis.

San Francisco—Little or no let-up in demand is noted on the Pacific coast and awards aggregated 3555 tons, bringing the total for the year

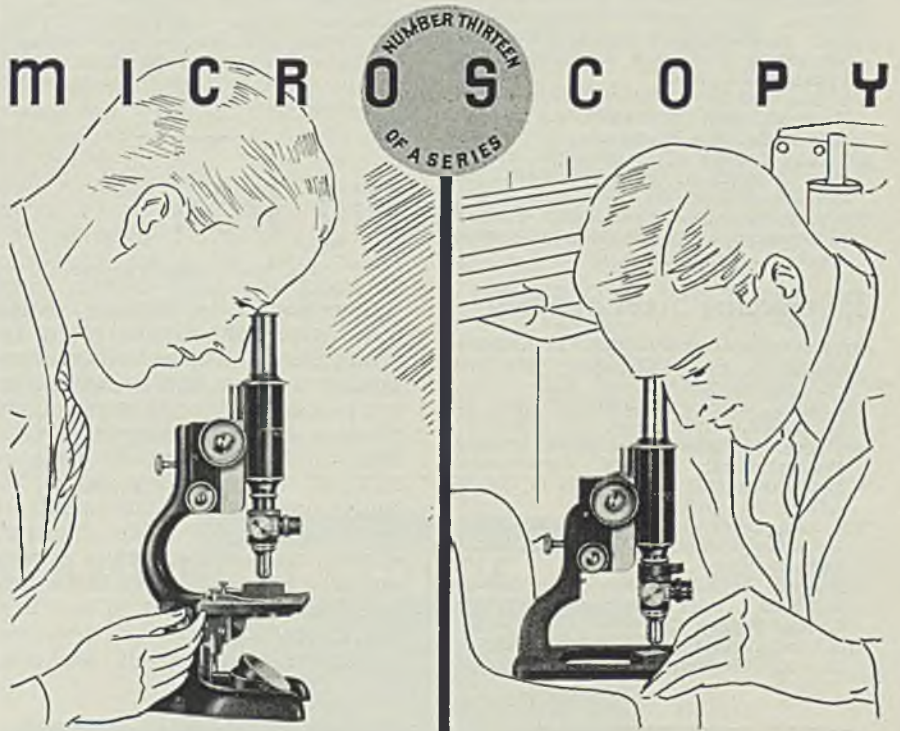
to 211,308 tons as compared with 195,018 tons for the corresponding period in 1935. Truscon Steel Co. booked 502 tons for a refinery at Woodland, Calif., for the Spreckles Sugar Co. The bureau of reclamation, Denver, placed eight projects in Oregon, Washington, California, Colorado and Montana involving 982 tons. Bids have been taken on 6000 tons for the Federal building, Los Angeles.

Seattle—Inquiry is confined mostly to small lots of less than 100 tons involved in both public and private

construction projects. The aggregate of unimportant awards is considerable and local mills have ample orders for immediate execution. Montana plans construction early next year of a \$670,000 concrete bridge over the Missouri river, at Great Falls.

Reinforcing Steel Awards

4100 tons, bureau of reclamation, invitation A-42,068-A, Potholes, Calif., to Northwest Steel Rolling Mills, Seattle.
700 tons, Tliff street viaduct, Buffalo, to Truscon Steel Co., Youngstown, O.



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Concrete Awards Compared

	Tons
Week ending Oct. 30	2,803
Week ended Oct. 23	2,336
Week ended Oct. 16	3,002
This week, 1935	5,522
Weekly average, 1935	6,862
Weekly average, 1936	6,431
Weekly average, September	6,987
Total to date, 1935	304,368
Total to date, 1936	282,965

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350 tons, fermenting tanks, Anheuser-Busch Brewing association, St. Louis, to Laclede Steel Co., St. Louis.
 266 tons, highway work, San Juan county, New Mexico, to unnamed interest.
 226 tons, bureau of reclamation, invitation 38,295-A, Odair, Wash., to Northwest Steel Rolling Mills, Seattle.
 188 tons, foundation, oil storage tank, Metropolitan Coal Co., Boston, for Chelsea, Mass., to Concrete Steel Co., New York, through C. J. Maney Co. Inc., Boston.
 180 tons, bridge, Providence, R. I., for state highway department, to Truscon Steel Co., Youngstown, O.
 171 tons, bureau of reclamation, invitation A-42,119-A, Colorado, to Bethlehem Steel Co., Bethlehem, Pa.
 165 tons, bureau of reclamation, invitation A-42,087-A, Potholes, Calif., to Colorado Fuel & Iron Co., Pueblo, Colo.
 148 tons, bureau of reclamation, invitation A-42,085-A, Potholes, Calif., to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
 105 tons, factory, Sixteenth street and Vermont, San Francisco, to W. C. Hauck Co., San Francisco.
 104 tons, bureau of reclamation, invitation A-42,125-A, Potholes, Calif., to Bethlehem Steel Co., Bethlehem, Pa.
 100 tons, bureau of roads bridge, Rainier national park, Washington, to Truscon Steel Co., Youngstown, O.

Reinforcing Steel Pending

6000 tons, Federal building, Los Angeles; George A. Fuller Co., New York, low on general contract.
 800 tons, sewage disposal contract 93, Cleveland. Bids taken.
 348 tons, overpass bridge, Butler county, Pennsylvania; Holmes Construction Co., Wooster, O., low bidder in Oct. 23 letting at \$373,545.
 227 tons, Black Canyon canal, Boise reclamation project, Idaho. Geo. B. Henly, Ontario, Oreg., low.
 178 tons, Broadway low level tunnel, Oakland, Calif.; general contract to George Pollick Co.
 163 tons, Natlick bridge, Warrick, R. I.; M. A. Gammino Construction Co.,

Providence, R. I., low.
 150 tons, bridge, Deer Island, Me.; plans out Nov. 10 through Robinson Steinman, New York, architect.
 118 tons, super-structure, pier No. 9 and 19, San Francisco; Barrett & Hilp, San Francisco, general contractor.
 100 tons, state overpass, Boston & Albany railroad, Grafton, Mass.; Carlo Bianchi, Framingham, Mass., low.
 100 tons, bureau of roads crossing in Bonner county, Idaho. Bids at Ogden, Utah, Nov. 2.
 Unstated tonnage, federal project, Huntington avenue subway, Boston; City transit department has authorized ½-mile long construction.
 Unstated tonnage, construction of county road, Stowe-Kennedy townships, Allegheny county, Pennsylvania; federal allotment of \$114,367 granted. Project estimated to cost \$254,150.
 Unstated tonnage, construction of county road, Oakmont-Verona boroughs, Allegheny county, Pennsylvania; estimated cost, \$472,160. Federal allotment of \$212,472 granted.

Pig Iron

Pig Iron Prices, Page 90

Cleveland—Sales during the last week were light in contrast to the recent trend. General feeling among producers here is that consumers are well covered for at least the next 30 days and that many are bidding time until after election. As a result of heavy buying before the fourth quarter, sales last month fell behind September while shipments showed an increase. Prices at present are at the 1929 level, while total tonnage sold this year to date is at the most 55 per cent of that level.

Pittsburgh—The well booked-up

condition of pig iron producers places them in a position where their backlogs are assured for at least the next month to six weeks. In fact, one integrated steelworks has been trying to get some merchant furnace here to take over all of its unfilled orders for foundry iron. A small lot of iron has been placed on the market by a local broker, this development arising out of a trade which the pig iron producer made for beehive coke it requires. Prices are firm.

Chicago—October pig iron shipments were the heaviest for any month so far this year, increasing about 10 per cent over September. Producers have fairly substantial backlogs and a further gain in deliveries is seen for November. Foundry operations gradually are expanding, aided by better activity in the automotive and farm equipment industries.

Boston—The first increase in the price of domestic pig iron since a year ago will go into effect Nov. 4 when Mystic Iron Works, Everett, Mass., will raise all grades \$1 a ton. Foundries are showing less inclination to anticipate requirements. Despite this recession in sales, shipments of foundry coke are being maintained at the old rate.

Philadelphia—Pig iron specifications are expanding, although new orders are less numerous as most consumers have contracted for entire needs. A price advance by the first quarter of next year is confidently expected.

Buffalo—Pig iron producers are shopping for fleets to haul metal to the seaboard in the final month of this season. Barges are scarce and premiums are being paid for boats available for quick loading. It appears there is little chance of getting all the barges needed and heavy rail shipments will result. Demand continues heavy, with shipments fully absorbing current production.

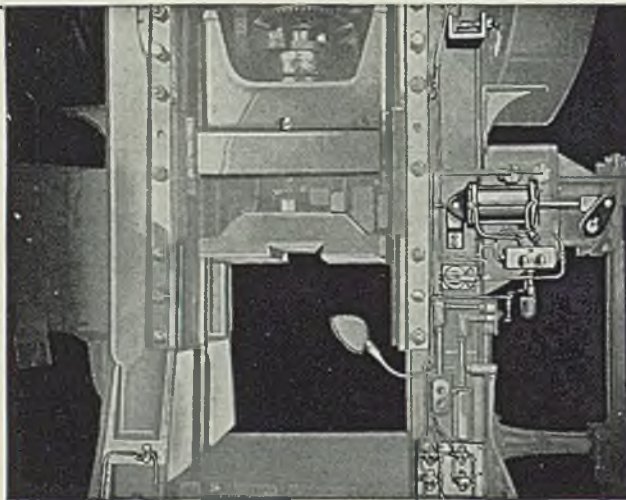
Youngstown, O.—Sales of pig iron by district blast furnace interests are piling up into a very respectable tonnage backlog, in some instances, and are cleaning up stocks on furnace banks, in others. More talk is heard of the likelihood of a price advance of at least \$1 a ton before the end of November. Youngstown Sheet & Tube Co. is planning to relight one Hubbard stack, now being relined, about Nov. 15.

Cincinnati—Shipments of pig iron are improved, with no evidence melters are increasing stocks. Instead, there is a gain in the melt with jobbing foundries and those on automobile parts in the lead.

St. Louis—Consumers of pig iron during the past two weeks have been

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placing additional orders, some for substantial tonnages, on the theory that prices will be advanced during the present quarter for delivery in the first quarter of next year. Some of the recent buying, however, has been by melters who underestimated their needs.

Birmingham, Ala.—Spot purchases of pig iron continue the rule, but in the aggregate total a fair amount. Twelve blast furnaces are melting. Prompt deliveries are being made to consumers who order in single carlots, as well as to those taking larger quantities.

Toronto, Ont.—New business for spot delivery, is appearing in good volume, and is having stimulating effect on merchant pig iron sales. No forward delivery contracts were placed last week, although several melters have covered to the end of the year. Awards for the week held around 1200 tons. Prices are firm.

Scrap

Scrap Prices, Page 91

Pittsburgh—The market took on an exceedingly quiet appearance last week which failed to feature any important sales into consumption and therefore left a \$17.50 to \$18 range on No. 1 steel nominally unchanged. Among local developments was the lifting of an embargo at one down-river point which permitted shipments on a restricted basis. Important railroad lists of some size are beginning to appear for closing this week. The first will be the Baltimore & Ohio which sells 3000 tons of heavy melting steel, 2000 tons of scrap rails and 500 tons each of structural and steel car material at Baltimore Nov. 2. Ford Motor Co. has sold its Glassmere, Pa., glass plant for dismantling, which will realize about 5500 to 6000 tons of scrap, and Pressed Steel Car Co. is preparing to sell its North Side plant shortly also for dismantling.

Cleveland—Steel and iron scrap is static in this area, with prices unchanged. Supplies are difficult to obtain and both dealers and melters are remaining quiet until the situation is better defined.

Chicago—Prices continue strong in the absence of heavier offerings. The market has not been influenced by the easier situation at eastern centers as sellers find it necessary to pay as much in covering heavy melting steel orders as was received on last sales. Higher prices on subsequent mill purchases are regarded as not unlikely. Shipments against contracts continue heavy. Scrap is being loaded for some of

the last boat shipments of the season to eastern ports.

Boston—Reflecting decreased demand for scrap, brokers' buying prices for domestic scrap have been revised downward 10 to 25 cents a ton. Brokers are reluctant to take on new commitments at the present in view of the situation at the mills.

New York—The market is leveling off, supplies are coming out more freely than during previous weeks, and the domestic price is weak but unchanged. The downward revisions of quotable prices for foreign scrap reflect the dull situation. Mills are still reluctant to take shipment on large commitments of scrap. Scrap for export has been reduced as much as 50 cents a ton, with No. 1 heavy melting steel now quoted at \$11.75 flat, and No. 2 \$1 less. Stove plate is down to \$9.50, and No. 2 cast down to \$10.

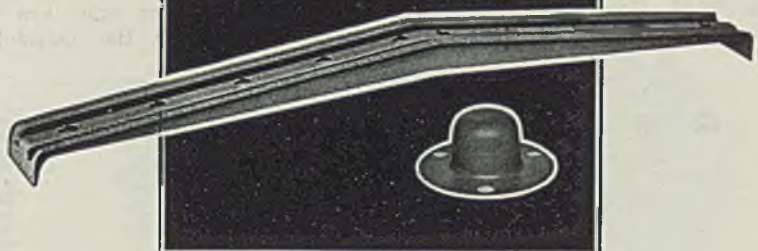
Philadelphia—Prices of steel and iron scrap are easier, with No. 1 heavy melting steel now \$15.00 to \$15.50, delivered consuming plant, and No. 2 at \$13.50 to \$14.00. The inside figures have been established on substantial buying by a leading consumer of material from outside territory. Brokers have also dropped

their prices 50 cents on shipments to Coatesville, Pa., to \$15, delivered. Substantial barge arrivals from other Atlantic ports contributes to this weakness, a reflection of decline in export demand.

Buffalo—Bid of the largest local melter for a large quantity of heavy melting steel threw dealers into a turmoil this week. The prospect of being able to sell perhaps 50,000 tons of scrap failed to bring out the usual gratification as dealers found themselves short of material and unwilling to gamble on ability to pick it up. As a result the offer to buy No. 1 heavy melting steel at \$16 for local delivery brought only a few sales of 500 and 1000-ton lots. Dealers expressed belief deliveries of those who sold would be largely No. 2 steel and other differential materials. The whole market was strengthened by the offer and advancing prices were the rule in dealer's asking prices. Active buying of many materials is believed certain this month and next.

Detroit—The local market has yielded further to the pressure of larger offerings locally and 50-cent declines in No. 1 steel, hydraulic compressed sheet, machine shop turnings, No. 1 busheling, and No. 2 melting steel took place last week.

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This marks the second 50-cent decline in the local market in as many weeks.

Cincinnati—Conflicting elements are present in the iron and steel scrap market. A softening in prices, not enough to affect listed quotations, is traced to absence of mill buying and easier markets elsewhere. Dealers, however, are taking a bullish position, holding material tightly and appear confident of upturn in activity after election.

St. Louis—The market for iron and steel scrap continues strong with specific advances on a number of items, including iron and steel car axles, scrap rail, steel springs and some other railroad specialties.

Birmingham, Ala.—While a steady movement of iron and steel scrap is noted the market is not considered stronger. No change is reported.

Toronto, Ont.—Trading in iron and steel scrap continues to expand with principal call being for steel grades. Steel mills in the Hamilton district are taking heavy melting steel and turnings against contracts and are said to have made heavy purchases from railroads recently. Montreal and other consumers show interest and have booked good tonnages within the past two weeks. Iron grades are in demand but supplies are light. Stove plate has a fair call in small lots for spot delivery.

United Metal Hose Co. Inc. has removed its general offices and factory to 36-01 Forty-third avenue, Long Island City, N. Y.

Warehouse

Warehouse Prices, Page 92

Pittsburgh—October closed at a level moderately ahead of September on a day-to-day basis in specifications and shipments received by local steel warehouses. There is a marked current demand for light structurals, bars and hot-rolled sheets, as well as cold drawn bars. Prices are steady.

Cleveland—Stocks are more than substantial to meet present requirements. Sheets, bars and tubular goods have been most active, probably due to tied up delivery condition in the mills. In general sales during October compare favorably with September, and on some products an increase was reported. Prices remained firm at the higher level all through the month.

Chicago—October was one of the three most active months of the year in warehouse sales and except for the anticipatory buying prior to the Oct. 1 price increases the month would show a substantial increase compared with September.

Boston—Most sellers are of the opinion that sales of warehouse items during October were slightly ahead of those recorded in September. Strip and sheets are among the more active items.

Philadelphia—Warehouse business is well sustained, with October exceeding September volume. Prices are steady.

New York—Sheet sales are outstanding items in the warehouse

line. Sales of hot-rolled strip have picked up considerably during the past week, while heavier items, including structural shapes and plates, continue to lag.

Detroit—Number of warehouse steel sales and total shipments are holding at the rate established in September. Prices are steady.

Cincinnati—Buying of sheets from warehouse has shown exceptional gains during October, attributed in large part to delay on mill delivery. Total tonnage was considerably above September and no signs of a contrary trend are seen in inquiries and releases for early November. Prices are unchanged.

St. Louis—While still well ahead of the volume in the corresponding period during the past several years, warehouse business has tapered off slightly during the past week or ten days. Movement of standard shapes and other items in the building material group have receded moderately, and wire products are somewhat spotty. Demand from railroads continues brisk.

Seattle—Jobbers report sustained demand for out-of-stock items. Buying is largely for plant repair jobs although federal projects and governmental departments are furnishing considerable business. Prices are firm.

Iron Ore

Iron Ore Prices, Page 91

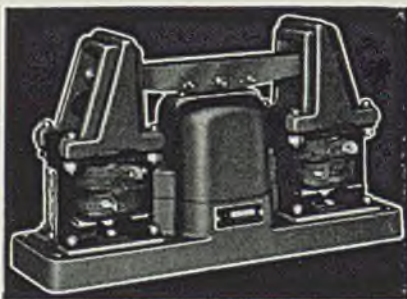
Cleveland—Coldest October weather in 66 years tied up 41 ore carriers in Duluth-Superior harbor last week. The mercury dropped to 9 degrees above zero. Steaming operations were required to make possible the movement of ore from cars to boats, extending the loading time to three days in some cases, depending on the ore. No serious effect is looked for in total shipments, but some believe that more boats will have to be called into use to make up for lost time.

Philadelphia—Imports of principal interest to the iron and steel industry here during the week ended Oct. 24 included 1500 tons of chrome ore from British South Africa; 950 tons of pig iron from British India and 197 tons from Norway; 171 tons of structural shapes and 162 tons of steel bars from Belgium; 100 tons of ferromanganese from the Netherlands.

Other importations included five tons of ferromanganese, nine tons of steel billets, three tons of cold-drawn steel wire and three tons of steel forgings, all from Sweden; six tons of drill steel from Norway; 17 tons of steel bars and 31 tons of structural shapes from France; and

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28 tons of steel bands and five tons of steel hoops from Belgium.

Baltimore—Substantial ore importations continue to be noted here. Iron ore arrivals from Oct. 7 to Oct. 18, inclusive, comprise 21,500 tons from Cruz Grande, Chile, Oct. 7; 7776 Lulea, Sweden, Oct. 9; 11,500 tons from Daiquiri, Cuba, Oct. 10, 7153 Lulea, Sweden, Oct. 12; 22,350 Cruz Grande, Chile, Oct. 14, 21,500 tons from Cruz Grande, Chile, Oct. 17.

Manganese ore arrivals included 8070 from Poti, Russia, Oct. 11, 7980 Poti, Russia, Oct. 12; 2450, Calcutta, India, Oct. 11; 9500, Vizagatam, India, Oct. 15, and 8450, Poti, Russia, Oct. 16.

Chrome ore arrivals were 1605 tons, Bombay, India, Oct. 11 and 1000 tons, Mitylene, Greece, Oct. 18. Other shipments included 800 tons of ferromanganese from Heroen, Norway, Oct. 15; 762 barrels calcium silicon, Oct. 15, and 1860 tons, ferromanganese, Sanda, Norway, Oct. 15.

Steel in Europe

Foreign Steel Prices, Page 92

London — (By Cable)—Steel and iron demand in Great Britain in general is exceeding the supply and producers are booked fully to the end of the year. Substantial imports of Russian pig iron are reported. Producers are disinclined to accept business for 1937 beyond present commitments, owing to probable price increases. Larger imports of steel and iron from the Continent are helping steelworks and rolling mills. Heavy contracts are being entered by railroads and shipbuilders.

The Continent finds export trade expanding to markets in the Far East, the Near East and South America. Buying for shipment to the United States is quieter.

Metallurgical Coke

Coke Prices, Page 89

Blast furnaces which have contracted for beehive coke, in the last few months are accounting for 110,000 to 130,000 tons of standard furnace coke monthly from the Connellsville district. The present market on standard furnace coke is firm at \$3.75 to \$4 a ton, f.o.b. ovens, with common foundry sales reported within the \$4.25-\$4.50 level and premium foundry unchanged at \$5.50. Some car shortage has recently developed on some coal roads in the Pittsburgh district, a number of which are allocating cars to shippers.

Foundry coke shipments in the

Chicago district increased moderately during October, most of the gain being in the latter half. The price is unchanged. Cincinnati suppliers find specifications increasing to meet needs of melters. At Birmingham, Ala., output is steady and shipments are in heavy volume.

Sellers of foundry coke now quote to the Detroit and Michigan trade on the basis of \$7.75, Ashland, Ky., ovens, which figures out at \$10.70, delivered, Detroit. For a few consuming points in Western Michigan the delivered price is based on \$9.00, Chicago ovens, where the latter is lower than the price based on Ashland, Ky.

Semifinished

Semifinished Prices, Page 89

Pressure for semifinished steel deliveries appeared last week to be relaxing somewhat and sheet bars, billets, and skelp in particular were moving in better volume to consumers, leaving backlogs of producers in a more normal state. In fact, one important producer of semifinished steel at Pittsburgh emphasized the point that it could accept semifinished specifications for prompt shipment, meaning that

former delivery delays had been largely overcome.

Coke By-Products

Coke By-Product Prices, Page 89

New York—The price on naphthalene flakes and balls in barrels has been increased from 7.25 to 8.25 cents per pound to jobbers. Demand for this product is holding steady at the usual high level. Both demand and price of the distillates are unchanged. Sulphate of ammonia is still \$25.50 a ton, with western prices one-half cent above this level.

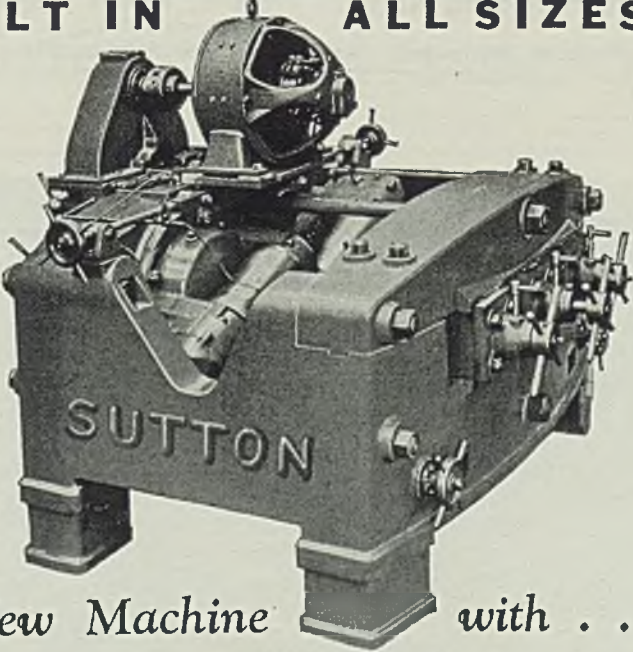
Nonferrous Metals

Nonferrous Metal Prices, Page 90

New York — Nonferrous metal markets spurted last week, both from the viewpoint of buying activity and prices. Copper and lead advanced to the highest levels since early in 1931 while the undertone of zinc was strong. Tin was higher, reflecting advances in London on speculative buying.

Copper—Electrolytic advanced ¼-cent Monday to 10.00c, Connecticut, on heavy consumer demand which carried sales for the month through

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Thursday to a new high for recent years at 175,734 tons. Demand at the higher level was greater than available supplies and the price situation was tense at the week end. Brass ingot prices advanced ½-cent during the week while advances of ¼-cent were posted on all mill products. Copper wire and cable and red metal scrap prices also advanced.

Lead—Following the lead of St. Joseph Lead Co., the price of lead advanced to 4.65c, East St. Louis, and 4.80c, New York, with that company asking \$1 premium per ton on the New York market. Still higher prices in the near future are expected by some observers.

Zinc—The tense situation existing in the zinc market early in the week was relieved and no price advance occurred. The undertone of the market continued strong however, on the basis of 4.85c, East St. Louis, for prime western.

Tin—Straits tin prices advanced to over 46.00c on spot despite light consumer buying. Higher levels reflected sharp advances in London where the market was lifted by speculative buying. The outlook continued clouded due to uncertainty regarding renewal of the tin restriction scheme.

Suspends Proposed Rates

The interstate commerce commission has suspended until May

21, next year, the operation of certain railroad schedules which propose to reduce rates on manufactured iron and steel articles, in carloads, from points in Alabama, Georgia and Tennessee to Monroe and West Monroe, La., to meet water competition.

Initial Issue of New House Magazine Contains History

First issue of a new house magazine just inaugurated by the Baldwin-Southwark Corp., Philadelphia, is devoted to the history of the three divisions of this company, the Southwark, I. P. Morris and De La Vergne divisions. The Southwark division this year is celebrating its 100th anniversary, while the I. P. Morris division was founded 108 years ago. The De La Vergne division dates back to 1880. The magazine is replete with illustrations, many from old prints, which trace in pictorial form the pioneering achievements of these three historic organizations.

The purpose of the new publication, to be issued quarterly, is to keep industry informed about the highly diversified products and facilities of the Baldwin-Southwark Corp. Descriptions of the fabrication of various products and performance records will be featured, together with articles by Baldwin-Southwark engineers and consul-

tants, and stress will be placed on the publication of data of an authoritative character. Graham Rohrer, a graduate of Haverford college, Haverford, Pa., is editor of the new publication. Individuals in industrial plants may have their names placed on the mailing list by making application.

Awards for Safety Won By Chicago Steel Plants

Awards were presented by the Chicago safety council recently to various plants in the Chicago district for safety records during the period Jan. 1 to June 30 of this year. Among the winners were the Morden Frog & Crossing Works, Victor Chemical Works, and the South Chicago works of the Youngstown Sheet & Tube Co. There were 14 winners among the 125 plants entered in the contest.

Equipment

Pittsburgh—Morgan Engineering Co., Alliance, O., recently shipped the first two 350-ton gantry cranes for the Bonneville, Oreg., dam. Dravo-Doyle Co., Pittsburgh, has received an order for three Lee unit heaters from Acme Steel Co., Chicago, two to be used for "defogging" the pickling room and the third for drying sheet steel as it comes from continuous pickling and washing equipment.

Chicago—Machine tool inquiries are heavier here, the increase being largely due to price requests from railroads for use in preparing 1937 budgets. Railroad inquiries are the heaviest since 1929 and are taken to indicate a similar comparison in machinery purchases next year, though it is thought unlikely that the equipment now on inquiry will be bought in its entirety. Other machine tool sales are expected to compare favorably with those of September but will show a decrease for some dealers. With deliveries lacking improvement, sellers find little tendency for the placing of orders to be postponed because of political considerations.

Seattle — Seasonal items have eased off but dealers report a continued good volume of sales, logging, lumbering and pulp mills being active. There is less call for mining and road machinery but pumping equipment, motors, tools and plant equipment are moving steadily. Manufacturers of marine diesel engines report active inquiry.

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Construction and Enterprise

Ohio

BARBERTON, O.—City will repair and enlarge Wolf avenue pumping station, construct new pumping station at old treatment plant site, construct force main from new pumping station to proposed sewage treatment plant and construct new treatment plant. Cost is estimated at \$420,000.

CINCINNATI — City has PWA grant of \$103,640.13 to be used for completion of sewer projects in various parts of the city.

CINCINNATI — Columbia Tool Steel Co. has leased property at 2716 Spring Grove avenue, and will remodel building for offices and warehouse.

CLEVELAND, O. — Iron Fireman Mfg. Co. has completed plans and will ask for bids soon on factory building at 3170 West 106th street. Albert M. Iligley Co., 3026 East Twenty-second street has contract for the foundation.

COLUMBUS, O.—City is taking bids until Nov. 10 for furnishing, installing, testing and painting a 150,000-cubic foot waterless type gas holder. Cost is estimated at \$50,000. L. Lewis is service director.

DEFIANCE, O.—Northwestern Electric Co-operative Inc., Arthur Sherman, Hicksville, president, plans to construct 289 miles of rural transmission lines in Defiance and Williams counties. Carl Frye, care Ohio Farm Bureau, 620 East Broad street, Columbus, O., is engineer.

DEGRAFF, O.—Village has PWA allotment of \$60,000 for construction of waterworks. The project includes well, motor-driven turbine pump, pumphouse, 100,000-gallon elevated steel tank, complete distribution system.

DELAWARE, O.—Delaware County Rural Electrification Co-operative Inc., W. O. Ziegler, president, will erect 244 miles of lines at a cost of \$229,120. Carl Frye, care Farm Bureau, 620 East Broad street, Columbus, O., is engineer.

EUCLID, O. — Chase Brass & Copper Co. plans \$15,000 addition to its factory buildings. Austin Co., 16112 Euclid avenue, Cleveland, is engineer and general contractor.

LAKEMORE, O.—Village is preparing preliminary plans for construction of waterworks plant. Plans include water softener, wells, 100,000-gallon tank and tower and distribution system, buildings, etc. Total cost is estimated at \$110,000. Paul Elwell, 5005 Euclid avenue, Cleveland, is engineer.

LOWELLVILLE, O.—Village has adopted ordinance authorizing preparation of plans and specifications for electric light and power plant. Bryan & Sigmon Engineering Co., Box 111, Newton Falls, O., is engineer.

NELSONVILLE, O.—Town is taking bids until Nov. 9 for construction of boiler house, 32 x 55 feet; installation of two new boilers and stokers, boiler water heater and pump, two 200-KW steam electric generating units and auxiliary equipment. (Noted Oct. 26.)

NEW MADISON, O.—City will take bids until Nov. 4 on construction of \$8500 water treatment equipment. Carl Simon, Van Wert, O., is engineer.

QUAKER CITY, O.—Village plans construction of sewage plant and system at

a cost of \$35,000. Project has been approved by WPA. Burgess & Niple, 568 East Broad, Columbus, are consulting engineers.

PIQUA, O.—City has joint allotment with Troy, O., of \$18,450 for construction of transmission line connecting municipal electric systems of the two cities at an estimated cost of \$41,000.

RIPLEY, O.—Village has PWA allot-

ment of \$11,454 for erection of three-story addition to factory building.

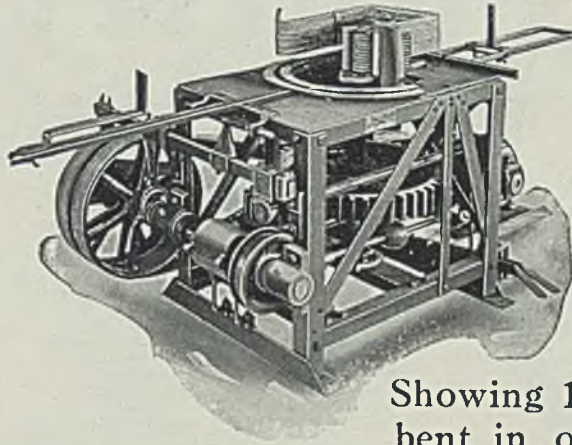
SYLVANIA, O.—Village council will meet Nov. 6 to vote on ordinance for construction of municipal power plant and distribution system. Plans include three 300-horsepower diesel engines, three 200-kilowatt generators, supplementary equipment, new distributing system, to cost \$158,000. Carl Simon, Van Wert, O., is consulting engineer.

Michigan

BAY CITY, MICH.—City commission has been advised that a three-unit generating plant can be built for \$800,000. Report was tendered by Ayres, Lewis, Norris & May, Ann Arbor, Mich., who are consulting engineers. (Noted Aug. 10.)

BENTON HARBOR, MICH.—House of

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David is having plans prepared for \$150,000 cold storage plant to be erected in Benton Harbor fruit market.

BENTON HARBOR, MICH.—City plans additions and improvements to waterworks system. Improvements include well, filter plant, 500,000-gallon elevated storage tank and additional mains.

BROWN CITY, MICH.—Brown City Mfg. Co. will be incorporated by chamber of commerce and local businessmen to establish a foundry and machine shop here. M. D. Smith is chairman of the committee.

DETROIT — Preclison Spring Corp. plant, now under construction on Wilson avenue between Oakman and Puri-

tan avenues, is expected to be completed by Nov. 5.

DETROIT—Proctor-Keefe Body Co. has let contract to R. H. Hidey for erection of \$11,000 addition to its plant.

DETROIT—Wolverine Tube Co. will erect an addition to its factory building. Charles Noble is architect.

DETROIT—Partool Machine Co., 1000 Penobscot building, has been incorporated by Ora A. Montgomery to manufacture machinery.

DETROIT—Durant Parts & Service Co. has been incorporated here, to manufacture machinery, by Francis B. McKalg, 1351 Holden avenue.

DETROIT—Fenkel Beef Co. will con-

struct a packing house, 45 x 110 feet, in Hamtramck, Mich. Henry Kohner, Detroit, is taking figures for the work. Bids will be due Nov. 15.

DETROIT—Leonard Refrigerator Corp., 1926 Dime Bank building, has been formed by G. V. Egan, 14260 Plymouth road, to manufacture refrigeration equipment.

DETROIT—Industrial Pattern & Engineering Co., 1650 Hart avenue, has been incorporated by Arthur Woolley, 3560 Kensington avenue, to carry on manufacturing.

EAST DETROIT, MICH.—Kabin Koach Co. has been incorporated by L. R. Worden, 21813 Gratiot, to manufacture camp trailers.

FERNDALE, MICH.—Pratt-Wright Machine Products Co. has been incorporated to deal in manufacturers' supplies, by Fred J. Pratt, 1956 Burdette street.

FLAT ROCK, MICH.—Detroit, Toledo & Ironton railroad has awarded contract for construction of foundations for engine house and machine shop to be erected here to W. H. Mueller, Detroit. Shreve, Anderson & Walker, Detroit, are architects. (Noted Oct. 12.)

FLINT, MICH.—Preliminary plans for Burton township waterworks system are being completed by Ora Gould, engineer.

FLINT, MICH.—Chevrolet Motor Co. has awarded general contract for construction of addition to its plant to Sorensen & Gross, Flint.

GRAND RAPIDS, MICH.—Hayes Body Corp. is taking bids on the general contract for alterations to its factory building.

GRAND RAPIDS, MICH.—Armour & Co., Chicago, has awarded general contract for construction of packing plant here to Owen-Ames-Kimball Co.

HOMER, MICH.—Vulcan Foundry Co. has recently been established here by James A. Murphy and James T. Wadsworth.

LANSING, MICH.—Daylight Baking Corp. will erect a \$15,000 addition to its plant.

MT. PLEASANT, MICH.—Auto Plane Corp., Harry E. Miller, chairman, plans construction of an airplane factory here.

MUSKEGON, MICH.—Anaconda Wire & Cable Co. has broken ground for construction of its \$40,000 plant addition here. Strom Construction Co., Grand Rapids, Mich., has general contract.

PORT HURON, MICH.—Huron Engineering & Construction Co. has been incorporated to design, build and repair, by Mark M. Collins, 506 1/2 Huron avenue.

SAGINAW, MICH.—Saginaw Hardware Co. building was damaged by fire last week to the extent of \$75,000 to \$100,000.

TRAVERSE CITY, MICH.—L. F. Mike-sell has awarded general contract for construction of factory building and sales offices to Koenig Construction Co.

Illinois

ANNA, ILL. — City will soon take new bids on filtration plant, pumps, and distribution system for its waterworks. Bids taken Aug. 30 were cancelled. Warren & Van Praag, Decatur, Ill., are engineers.

CHICAGO—Patterson Mfg. Co., 2100 Fullerton avenue, has been incorporated by R. B. Patterson and associates, to deal in machinery, motors, etc. Helle, Cavender, Milchrist & Kaiser, Burnham building, are correspondents.

CHICAGO—Krebs Mfg. Co., 341 East



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Ohio street, has been incorporated by Eva Dolora Krebs and associates, to manufacture machinery, machines, tools, etc. Peden Melaniphy, Ryan and Andreas, 1410 City Hall Square building, are correspondents.

CHICAGO—Machinists Tool Grinding Co., 3038 Van Buren street, maker and grinder of tools, reamers, hobs, etc., has acquired property adjacent to plant and will expand facilities. Samuel E. Liponi is general manager.

GENEVA, ILL.—Modern Steel Equipment Co., 722 James street, has been incorporated by F. L. Guertner and associates, to deal in metal, etc.

WESTERN SPRINGS, ILL.—Village will replace steel water tank with new 169,000-gallon tank costing \$8776.

Alabama

TUSKEGEE, ALA.—City plans construction of new waterworks system, estimated to cost \$112,727, consisting of dam, niter plant and building, pumps, 75,000-gallon elevated tank and distribution system. (Noted Oct. 12.)

WILTON, ALA.—Town will construct waterworks and distribution system, including pipes, pumps and 100,000-gallon tank. Cost is estimated at \$30,909.

Maryland

BALTIMORE — United States Engineer office, 332 Postoffice building, will accept bids until Nov. 10 on construction of sheet steel pile bulkhead, 1000 feet long, at Wroth point, in Elk river, near the mouth of Pearce creek, Maryland.

SPRINGFIELD, MD.—Springfield City Water Co. applied to public service commission, for approval of proposed \$250,000 improvements to waterworks.

District of Columbia

WASHINGTON — Construction service, veterans' administration, takes bids until Nov. 17 for alterations to elevator in building No. 30, Veterans' administration facility, Bath, N. Y.

WASHINGTON — Veterans' administration, construction service, will receive bids until Nov. 24 for addition to refrigeration and construction of ice cream plant at Veterans' administration facility, Bath, N. Y.

WASHINGTON — Bureau of supplies and accounts, Navy department, will receive bids until Nov. 3 for two hydraulic shaper-planers, schedule 9122; two boring machines, schedule 9132; one boring, drilling and milling machine, schedule 9133; one openside hydraulic planer, schedule 9134; one high-frequency melting equipment, schedule 4147, all for delivery Washington; miscellaneous castings for turbine casings, schedule 9166, for delivery Brooklyn. Bids will be received until Nov. 6 for one boring, drilling and milling machine, schedule 9146, for delivery Washington; and until Nov. 10 for miscellaneous iron and steel pipe and tubing, schedule 9139, for delivery various east and west coast points.

Florida

PLANT CITY, FLA.—City voted to issue \$55,000 bonds for erection of gas plant and distribution system. Project includes \$100,000 PWA loan. Ivy H. Smith Co., Barnett building, Jacksonville, is general contractor.

MIAMI, FLA. — City will apply for \$109,000 PWA loan and grant for waterworks improvements. Project includes two 2,500,000-gallon steel reservoirs,

pressure pump unit and lime storage tanks. William Sydow is public service director.

PORT ST. JOE, FLA.—City plans construction of \$156,408 sanitary sewer system consisting of pipe, manholes and septic disposal tank.

Georgia

ALBANY, GA.—City, chamber of commerce, W. B. Haley, president, has completed negotiations with New York company for establishment of full-fashioned hosier mill; investment of \$550,000.

ATLANTA, GA.—International Harves-

ter Co., O. A. Kruger, industrial engineering and construction department, 606 South Michigan avenue, Chicago, will have plans ready soon for construction of building, Whitehall street S. W., adjoining present building. Cost is estimated at \$35,000.

SAVANNAH, GA. — Industrial committee of Savannah announces Resin Products Corp., a Delaware Corporation, has completed negotiations with Union Bag & Paper Corp., for utilizing fatty substances from that company's plant in the manufacture of soap. Resin Products Corp. plans to erect a \$100,000 plant adjacent to the other corporation's property here.

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Kentucky

HARTFORD, KY.—City will extend and improve existing waterworks system at a cost of \$78,181. Construction will include additional filter, installation of one chlorinator and erection of 75-000-gallon steel tank on 100-foot tower.

LANCASTER, KY.—City plans to install sewer system and disposal plant at a cost of \$72,727. Proposed disposal plant will be of chemical precipitation type, with separate sludge digestion and sludge drying on sand beds.

LEXINGTON, KY. — Lexington Brewing Co., care John C. Bruckmann, Bruckmann Brewing Co., Ludlow street and Central parkway, Cincinnati, plans installation of power equipment in proposed local brewery, at a cost of \$150,000.

LOUISVILLE, KY. — Atlas Boller & Welding Works Inc. has been incorporated by G. Jefferson Lentz and E. W. Elliott.

MAYSVILLE, KY. — Purchase of \$80,000 generator by Kentucky Power & Light Co., has been approved by state public service commission. Specifications call for purchase and installation of 2500-KW generator.

Louisiana

DONALDSONVILLE, LA. — Evan-Hall Sugar Co-operative plans improvements and additions to its sugar mill. Cost, including equipment, is estimated at \$37,000.

CENTRAL, LA.—Helvetia Sugar Mill plans improvements to its plant at an estimated cost of \$40,000.

KILLONA, LA.—Waterford Sugar Mill will improve and expand its plant. Cost is estimated at \$37,000.

LAKE CHARLES, LA. — City plans installing sewerage system, including series of four septic tanks, pumping station and lines. J. H. Handley is mayor.

NEW ORLEANS — Sewerage and wa-

ter board applied for grant of \$211,227, for laying 48-inch water main at an estimated cost of \$469,395.

Mississippi

CLEVELAND, MISS.—City plans construction of \$227,273 sewage collection and disposal plant system. Plant will consist of chlorinator, Imhoff tank, filtration and sludge beds, pumping stations will be erected and extensive mains laid.

North Carolina

ALBEMARLE, N. C.—Town has PWA allotment for construction of sewage treatment plant and incinerator for garbage disposal. Project is estimated to cost \$280,000; sewage plant will have a normal daily capacity of 1,200,000 gallons.

CHARLOTTE, N. C.—Biltmore Dairy Farms, Asheville, plans \$25,000 expansion program at West Morehead street, including construction of \$15,000 ice cream plant. E. W. Slye, 1901 Plaza, Charlotte, is manager.

PILOT MOUNTAIN, N. C. — Town receives bids Nov. 6 for furnishing labor, materials and equipment for constructing one or more deep wells for water supply. Spoon & Lewis, Jefferson building, Greensboro, are engineers.

SHELBY, N. C.—City will build new 3150 horsepower diesel-electric generating station at a cost of \$294,000. The plant will include three 1050-horsepower diesel engines directly connected to 60-cycle, 2400-volt three-phase generators, all auxiliary equipment, and power house.

South Carolina

SULLIVAN'S ISLAND, S. C.—Township has PWA allotment of \$132,727 for construction of waterworks system. The project includes installation of three sets of wells, 100,000-gallon elevated tank, two large fire pumps and two station pumps, with extensive distribution system.

Tennessee

COLLIERVILLE, TENN.—Town will spend \$70,909 to construct sanitary sewer system and disposal plant. Disposal plant will include primary sewage treatment plant and an Imhoff tank for sludge digestion. It will also have a chlorinator and a portable gasoline-driven sludge pump.

JACKSON, TENN.—City will build overhead electric distribution system to serve entire city. Equipment will include 5517 meters, 225 transformers. Allotment of \$663,000 has been approved by PWA.

KNOXVILLE, TENN. — Tennessee valley authority receives bids until Nov. 16 for designing, furnishing, fabricating, delivering and erecting generators for Pickwick Landing power house. C. H. Garity is director of purchases.

KNOXVILLE, TENN. — Tennessee valley authority let contract for machinery to operate locks and segmental valves at Guntersville dam and Chickamauga dam, to Foote Bros. Gear & Machine Corp., 5301 South Western avenue, Chicago, at \$131,000.

West Virginia

BELLE, W. VA. — Carbon Fuel Co., Kanawha Valley building, Charleston, is installing modern equipment for passing coal across Kanawha river, east of Lens creek, to take care of fuel contract with E. I. du Pont de Nemours & Co., at Belle. Construction includes tipples, side tracks and river piling.

TILTONSVILLE, W. VA. — Wheeling Steel Corp. has begun work on expansion of its Yorkville mill.

Virginia

HERNDON, VA.—City voted bond issue for installation of sewage system and purchase and expansion of Herndon Water Co. waterworks. Cost is estimated at \$90,000.

NORFOLK, VA.—Hampton Roads sewerage disposal commission, 115 Bank street, R. B. Preston, chairman, is having surveys and cost estimates drawn by Greeley & Hansen, 6 North Michigan avenue, Chicago, for nine proposed disposal plants in this territory.

SALEM, VA.—Board of supervisors of Roanoke county will receive bids until Nov. 6 at office of Roy K. Brown, clerk for sanitary sewage system, docket No. Va. 1131-R. J. B. McCrary Co. Inc., Atlanta, Ga., is engineer.

SOUTH NORFOLK, VA.—City plans construction of municipal electric utility, including 2500 kilowatt generating station, overhead distribution system and street lighting facilities. Allotment has been approved by PWA.


TAPPAHANNOCK, VA.—City receives bids Nov. 5 for sewer system, disposal plant and extension to waterworks. R. Stuart Royer, Builders' Exchange building, Richmond, Va., is engineer.

Missouri

BUCKLIN, MO. — City has plans for \$40,000 waterworks system, and will call an election soon to vote on the project. PWA aid will be applied for. W. B. Rollins & Co., 339 Railway Exchange building, Kansas City, Mo., are engineers.

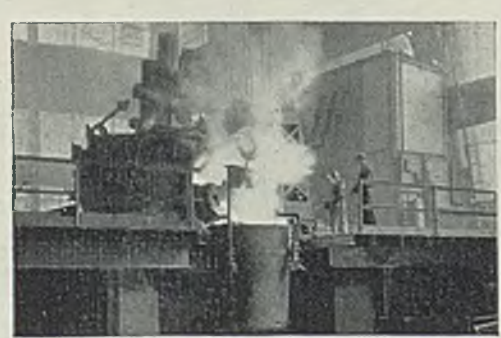
CASSVILLE, MO.—City plans construction of sewer system and disposal plant at a cost of \$47,900. Disposal plant will

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include pumps, Imhoff tank, filter, sludge bed and settling basin.

GOLDEN CITY, MO.—City plans construction of waterworks plant and distribution system. Project includes drilling of deep well, erection of pump house, installation of pump and chlorinator. Cost is estimated at \$52,726.

KANSAS CITY, MO. — Air Conditioning Equipment Inc. has been formed by Ralph M. Russell, Commerce building, and Robert J. Coleman.

OAKLAND, MO.—Village will vote in November on \$40,000 sewer bonds to construct trunk and lateral line system and disposal plant at a cost of \$235,000. Federal aid has been applied for.

POPLAR BLUFF, MO.—City plans improvements and additions to municipal electric light and waterworks system. Project includes installation of 400-horsepower boiler and additional auxiliaries and equipment. Cost is estimated at \$44,500.

ST. LOUIS — Progressive Litho-plate Co. Inc., Edwin W. Schaeffer, president, has been formed to engage in lithography and plate-making.

ST. LOUIS—Ozark Foundry Co., maker of kitchenware and stoves, has acquired a lease on former O'Neil foundry at 3600 South Second street and has let contracts for plant alteration and improvement.

ST. LOUIS—Monsanto Chemical Co. has let contract for construction of warehouse building at 139 Lesperance street, and for a factory building at 2000 South street. Total cost is estimated at \$35,000.

ST. LOUIS — Anheuser-Busch Inc., 721 Pestalozzi street, has recently let contracts for construction of new fermenting cellars costing \$650,000; and for remodeling present cellars, at a cost of \$350,000. An additional \$42,000 is being expended for alteration of plant building.

Arkansas

BENTON, ARK. — City will vote Nov. 10 on \$26,000 bonds for waterworks improvements. R. E. Williams, Little Rock, is engineer.

DOVER, ARK.—Town plans to construct waterworks system at a cost of \$23,637, including well, motor-driven pump, 30,000-gallon steel tank 100 feet high, cast iron pipe, pump house, hydrants and service connections.

STEPHENS, ARK.—Town will build sewage collection system and disposal plant to cost \$36,364.

Oklahoma

CHICKASHA, OKLA. — City made preliminary plans for construction of waterworks on Saddle Mountain creek, near Carnegie. Cost is estimated at \$2,000,000. R. O. Bradley, Chickasha, is engineer.

PAWNEE, OKLA.—City has grant of \$24,545 from PWA for construction of a sewage disposal plant at an estimated cost of \$54,545.

Texas

GALVESTON, TEX.—Houston Lighting & Power Co. will extend transmission line westward of Galveston Island for 17 miles. W. J. Aleklen, 20 Cedar Lawn street South, is manager.

STAMFORD, TEX. — City receives bids Nov. 5 for waterworks improvements, including addition to water-softening plant, extension of mains, etc. Powell & Powell, Republic Bank building, Dallas, are engineers.

Wisconsin

ANTIGO, WIS. — Antigo Milk Products Cooperative Co. has plans for new addition to steam power house at local plant, including boiler unit and auxiliary equipment.

CLINTONVILLE, WIS.—City will construct sewage disposal plant, at a cost of \$67,273. Plant will be of activated sludge type and will include pump well and pumping equipment, bar screen, primary settling tanks, aeration tanks, final settling tanks, sludge pumping equipment, sludge digestion tanks, etc.

DE PERE, WIS.—City will construct intercepting sewer system and sewage

disposal plant. Provision will be made for both primary and secondary treatment of sewage. Cost is estimated at \$376,085.

DRESSER JUNCTION, WIS.—Village has PWA allotment of \$25,455 for construction of waterworks system, including well, pump house and pump, reservoir and distribution mains.

SHEBOYGAN FALLS, WIS.—City will spend \$100,000 for sewage disposal plant with provision for primary and secondary treatment of sewage. A pumping plant will also be built.

Minnesota

DULUTH, MINN. — United States En-

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—Construction and Enterprise—

glineer office, will take bids until Nov. 17 for 1600-foot breakwater extension and lighthouse structure in connection, at Presque Isle Harbor, Mich. Project includes use of 14,000 pounds of steel armor plate, 15,200 pounds of reinforcing steel, and 2300 pounds of iron and steel fittings.

HOUSTON, MINN.—Village plans construction of sanitary sewer system and disposal plant. Plan includes 50,000-gallon Imhoff type tank and service building, sludge bed, chlorinator and mechanical equipment. Cost is estimated at \$48,000.

PINE CITY, MINN.—Village has PWA allotment for sewage disposal project estimated to cost \$27,529. Construction will include primary settling basin, sludge digestion tank, chlorinating plant, necessary connections and additional sewer pipe.

STILLWATER, MINN.—State of Minnesota will build a sewage disposal plant consisting of valves, pump house, clarifier, digester, trickling filter, chlorinator tank and sludge bed. Cost of project is estimated at \$59,960.

ST. PAUL — United States Engineer office, 615 Commerce building, will receive bids until Nov. 17 on power, control and lighting system for dam No. 9, Mississippi river, Lynxville, Wis.

Kansas

ATTICA, KANS.—City will construct sewer system and disposal plant, affording both primary and secondary treatment of sewage. Plant will include Imhoff tank, dosing chamber, sand filter and sludge bed. Cost estimated at \$50,000.

BURRTON, KANS.—City plans construction of sewer system and disposal plant to cost \$54,589. Disposal plant will afford both primary and secondary treatment of the sewage and consists of one Imhoff tank with dosing tank and trickling filter.

EL DORADO, KANS.—City plans improvements and extensions of existing waterworks system, at an estimated cost

of \$143,650. New equipment will include 180-horsepower gasoline engine, new filter plant consisting of three new filters, building for filter plant, mechanical sludge collector and a 30,000-gallon elevated steel tank.

KISMET, KANS.—City plans construction of waterworks improvements, providing well, well-house and pumping facilities for present system, at a cost of \$5454.

LENEXA, KANS.—City plans construction of waterworks system to cost \$69,091. Project includes erection of 50,000-gallon elevated tank on 110-foot tower, construction of pumping station with booster pumps and cast iron supply line.

LEONARDSVILLE, KANS.—City will construct waterworks improvements and extensions at a cost of \$34,857. These improvements include construction of well, with pump house and deep well pump, erection of steel tank on steel tower and installation of cast iron mains.

LEROY, KANS.—City plans construction of complete waterworks system at a cost of \$55,900. System will include filter plant, service connections and 50,000-gallon water storage tank on 100-foot tower.

MT. HOPE, KANS.—City plans complete domestic and fire protection water system at a cost of \$42,425. System will include well, pump, pump house, 50,000-gallon overhead storage tank, pipe, fire hydrants, meters and house connections.

OLATHE, KANS.—City plans to construct three miles of 6-inch cast iron supply line to the city of Lenexa. Cost is estimated at \$23,000.

North Dakota

BEACH, N. DAK. — City will construct improvements to waterworks plant, replace existing pump house and reservoir roofing. Cost is estimated at \$3,636.

DICKINSON, N. DAK.—City plans improvements and extensions to waterworks system at a cost of \$18,181. Improvements will include gravel-packed

well, deep well turbine pump, pump house and connecting line to main plant.

SCRANTON, N. DAK.—Village will spend \$25,454 on construction of waterworks system, including erection of pumping station, standpipe and water tower.

South Dakota

FLANDREAU, S. DAK.—City will build new municipally owned generating station and general distribution system. Project will include three 320-horsepower diesel engines and distribution system designed to serve approximately 500 customers. Cost is estimated at \$168,770.

LENNOX, S. DAK.—City plans to spend \$20,909 on improvements to waterworks system.

RELIANCE, S. DAK.—Town has PWA allotment of \$26,364 for construction of waterworks improvements. Plans include three-level filtration plant and necessary pumps and equipment.

Iowa

AVOCA, IOWA—Town plans construction of complete new water supply, consisting of gravel packed well, pump and motor, pump house and cast iron supply main. Cost estimated at \$11,818.

CALAMUS, IOWA—Town has PWA grant for construction of \$26,000 complete waterworks system, including deep well, pump, pump house, elevated storage tank and distribution system.

DES MOINES, IOWA—Dave M. Reese Co. has been formed here, to manufacture the Raber Fuel Saver, by Dave M. Reese, 406 Walnut building. The device was formerly made in Perry, Iowa, but all operations are to be transferred to Des Moines.

IOWA CITY, IOWA—Iowa State university will construct extension to its steam, water and power service, including water clarifier, water mains, pumping equipment, repairs to well and steam power lines.

OAKLAND, IOWA—Town will improve present water supply by installing turbine well pump, booster pump and supply mains, at a cost of \$13,636.

Nebraska

COLUMBUS, NEBR.—Loup river power district has additional PWA allotment of \$2,314,000 for construction of 164 miles of 115-KV line, 50 miles of 66-KV line, convertible to 115-KV, and necessary substations at Lincoln, Fremont, Columbus, Norfolk, Madison and Seward.

McCOOK, NEBR.—McCook public power district plans construction of complete primary and secondary distribution system at a cost of \$227,300. This distribution system will include three primary feeder circuits, with necessary transformers and a 115/230-volt secondary system.

Montana

CIRCLE, MONT.—City has PWA allotment of \$36,364 for construction of waterworks system, including deep well, pump, 75,000-gallon tank and hydrants.

HARDIN, MONT. — Holly Sugar Corp., Colorado Springs, Colo., plans construction of power house at new beet sugar mill at Hardin. Cost is estimated at \$700,000.

JOLIET, MONT.—Town plans extensions and improvement of its water supply line at a cost of \$50,911.

POLSON, MONT.—Montana Power Co.

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★

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HOTEL CARTER

FAY M. THOMAS, Manager

CLEVELAND

—Construction and Enterprise—

has work under way on the Newell tunnel project, preparatory to construction of dam and powerhouse.

Nevada

WINNEMUCCA, NEV.—City has PWA allotment for municipal power plant and distribution system project, estimated to cost \$120,800. Plant will consist of two 300-horsepower diesel engines and direct connected generators with all necessary switchboards, etc. Distribution system will be overhead, with wood poles, overhead transformers, conductors and meters to serve approximately 700 connections. (Noted Oct. 19.)

Idaho

BOISE, IDAHO—Machine shop of the Morrison-Knudson Construction Co. was destroyed. Loss is estimated at \$25,000.

McCALL, IDAHO—City council will open bids Nov. 7 for construction of sewer system and settling tank at an estimated cost of \$31,500.

Utah

SYRACUSE, UTAH — Town plans installation of complete new water system, at a cost of \$52,727. R. G. Harding, Bountiful, Utah, is engineer.

Pacific Coast

CARPINTERIA, CALIF. — Carpinteria Water Co. plans to improve its waterworks by construction of well, pumps, derrick and pump house, three settling tanks and 5000 feet of cast iron mains. Cost of project is estimated at \$14,000.

LOS ANGELES — Pittsburgh Plate Glass Co., Main avenue, plans installation of electric power plant equipment in three-story addition to paint and enamel manufacturing plant, at a cost of \$80,000. Albert C. Martin, Higgins building, is architect. Company headquarters is Grant building, Pittsburgh, Pa.

MARYSVILLE, CALIF. — City, L. J. Smith, chairman special committee, will consider plans for water system, including pumping plant, reservoir, and two auxiliary pumping plants. Estimated cost is \$272,916.

OAKLAND, CALIF. — United Auto-graphic Register Co., Nineteenth and Union streets, plans installation of a power plant in its one and two-story manufacturing plant at Beach and thirty-fourth street, to cost \$150,000. Pereira & Pereira, 333 North Michigan avenue, Chicago, are architects.

WASCO, CALIF.—Wasco public utility district plans construction of sanitary sewer system and treatment plant at a cost of \$61,363, two and a half miles west of the city.

PENDLETON, OREG.—Smith Canning Co., Utah, has completed negotiations for construction of a pea cannery here. Building of warehouse is proposed immediately.

PORTLAND, OREG.—Davidson Baking Co. has awarded contract for construction of 50 x 100 plant addition. A second addition, 32 x 138, is proposed. Plans are by Jones & Marsh.

ISSAQUAH, WASH.—Town has PWA allotment for construction of additions and repairs to waterworks systems at a cost of \$18,182.

SEATTLE—Tiger Mountain Coal Co. has been incorporated by A. W. Morgan

and associates, 504 Orpheum building, with a capital of \$100,000.

SEATTLE—Lake Union Foundry Co. suffered damage by fire amounting to \$1500 to its plant at 1703 Westlake avenue North, on Oct. 22.

SEATTLE—City, Alderwood district, is having plans prepared for water system, to include 31 miles of pipe and cost \$23,000, by Parker & Hill, Smith Tower, engineers.

SEATTLE—Shell Oil Co. has applied for city franchise to extend pipe lines to seven-acre tract adjoining present terminals on Eleventh avenue S. W. Plans include construction of several 80,000-barrel storage tanks early in 1937, at a

cost of \$300,000. W. A. Worth is designing engineer.

WHITE SALMON, WASH.—Town plans construction of addition and improvements to its waterworks system at a cost of \$89,090.

Canada

FAIRVILLE, N. B.—Port Royal Pulp and Paper Co. Ltd. plans to construct an addition to its mill and to purchase additional equipment.

TORONTO, ONT. — Colgate-Palmolive-Peet Co., 105 Hudson street, Jersey City, N. J., plans installation of electric power equipment in branch soap manufacturing plant here.

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