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STEEL

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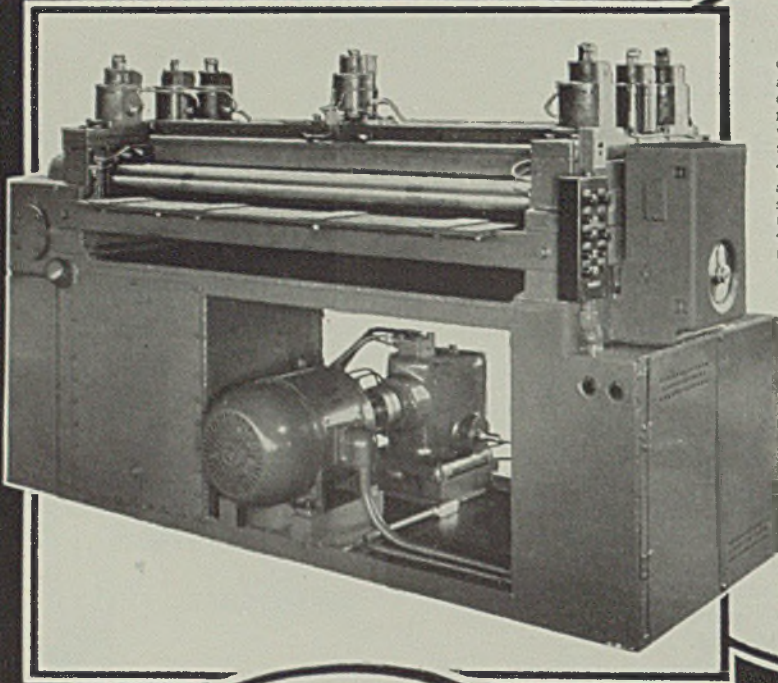
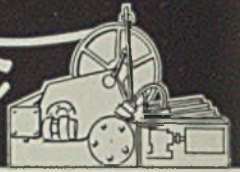


PRODUCTION • PROCESSING • DISTRIBUTION • USE

Automatic ROLL FEED



Automatic UNCOILER



Cleveland Automatic Roll Feeds, which are designed with five or seven straightening rolls and with two or four feed rolls, can be furnished to accommodate various widths and thicknesses of material up to and including 78" of $\frac{1}{4}$ ".

The spring loaded upper rolls are raised and lowered hydraulically and have screw adjustment for any desired setting.

The unit is driven by hydraulic motor operated by a hydraulic pump incorporating valving arrangement and this pump is driven by an electric motor. Both of these motors and the pump are located in the base.

The electric control, with the exception of the push button panel, is located in one end of the base and outlets have been provided for connecting in the Roll Feed with the Press and with the Uncoiler, or both, so that all may be operated simultaneously.

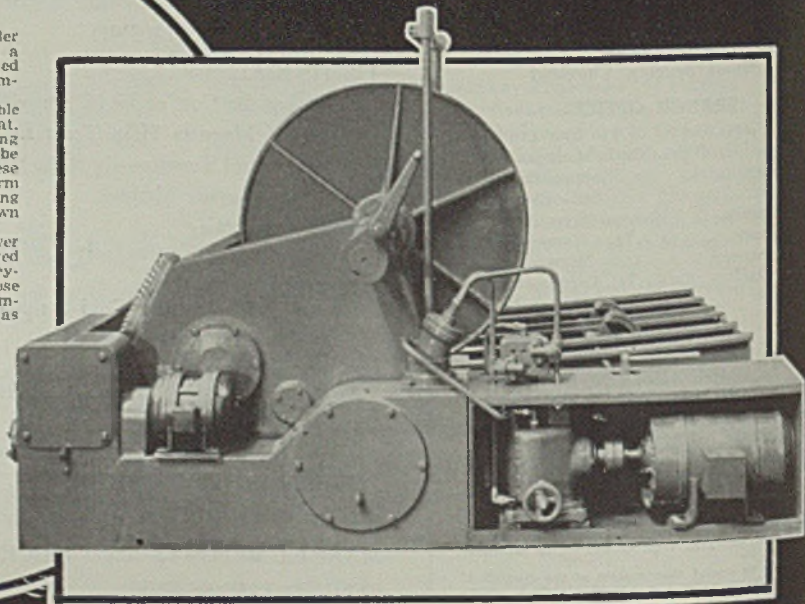
The dial, shown on the right hand side, indicates the length of feed, and the timer arrangement, with which this Roll Feed is equipped, operates with unusual accuracy regardless of slip on the feed rolls since the timer unit is driven independently by the sheet.

This Cleveland Heavy Duty Uncoiler takes a 13 ton coil, 78" wide as a maximum. However, it is provided with adjustable end guides to accommodate various widths of coils.

The Uncoiler is designed with a table arranged with locating stops so that, while the coil in the carriage is being fed into the Press, another coil can be loaded onto the platform behind these stops. When the coil on the platform is released by tripping the locating stops, it rolls into place of its own accord.

The carriage is raised by motor power to receive the coil and then lowered into its operating position and the cycle of loading repeated. The purpose of this method of loading is to eliminate shock on the carriage such as occurs when the coil is dropped into the carriage.

The raising and lowering of the carriage is controlled by means of limit switches and the coil loop is determined by an overrun limit switch which does not interfere with the loading of the carriage. Additional information on Cleveland Roll Feeds and Cleveland Automatic Uncoilers will be furnished on request.



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HIGHLIGHTING THIS ISSUE

■ **TESTIMONY** before the senate finance committee last week (p. 21) revealed clearly that recent delays in the national defense program have been due to uncertainty over profits and amortization. While the debate on the excess profits tax still is in progress, the senate is expected to make far-reaching changes in the house draft. These, it is expected, will enable manufacturers to take government contracts with a greater degree of assurance. Conversely, the house (p. 22) is expected to pass a military training bill with a much less drastic "draft industry" provision than that approved by the senate. Despite lack of final action on these bills, last week's armament awards (p. 27) were impressive.

• • •

In embryonic stage is a plan for large-scale defense industries (p. 38) in the Northwest. These would be based on low-cost electric power and would be aimed at taking

Defense In Northwest

care of our defense requirements in and along the Pacific ocean. In this and numerous other projects that would bring wide relocation of industrial activities, many manufacturers see cause for concern. Pittsburgh interests, for example, propose use of established plants (p. 38) before new ones are built . . . In one community alone, Paterson, N. J., 686 men trained under the government program (p. 32) have been placed in plants working on defense orders . . . Defense commission (p. 31) requests avoidance of hours in excess of 40 a week wherever possible.

• • •

Steel production last week (p. 23) averaged 82 per cent due to the Labor day lull but immediately snapped back. Demand tends to swell (p. 75) indicating maintenance of near-capacity production for an indefinite period. War and national defense remain important factors in current bookings. Structural awards, for example, moved to the highest level of the

Heavy Steel Output Seen

year with large orders for defense plants. Automotive specifications are brisk. England continues to take heavy shipments . . . New extras are out (p. 82) on hot-rolled, plain-carbon plates and floor plates and on hot-rolled alloy steel. Ferroalloy prices are reaffirmed. Scrap prices are up further. Prices on cemented carbide metals (p. 33) are lower.

• • •

Metal-spraying process is finding many new applications, says E. T. Parkinson (p. 46), because its usefulness has been enhanced. Costs have been reduced sharply,

Cut Metal Spraying Cost

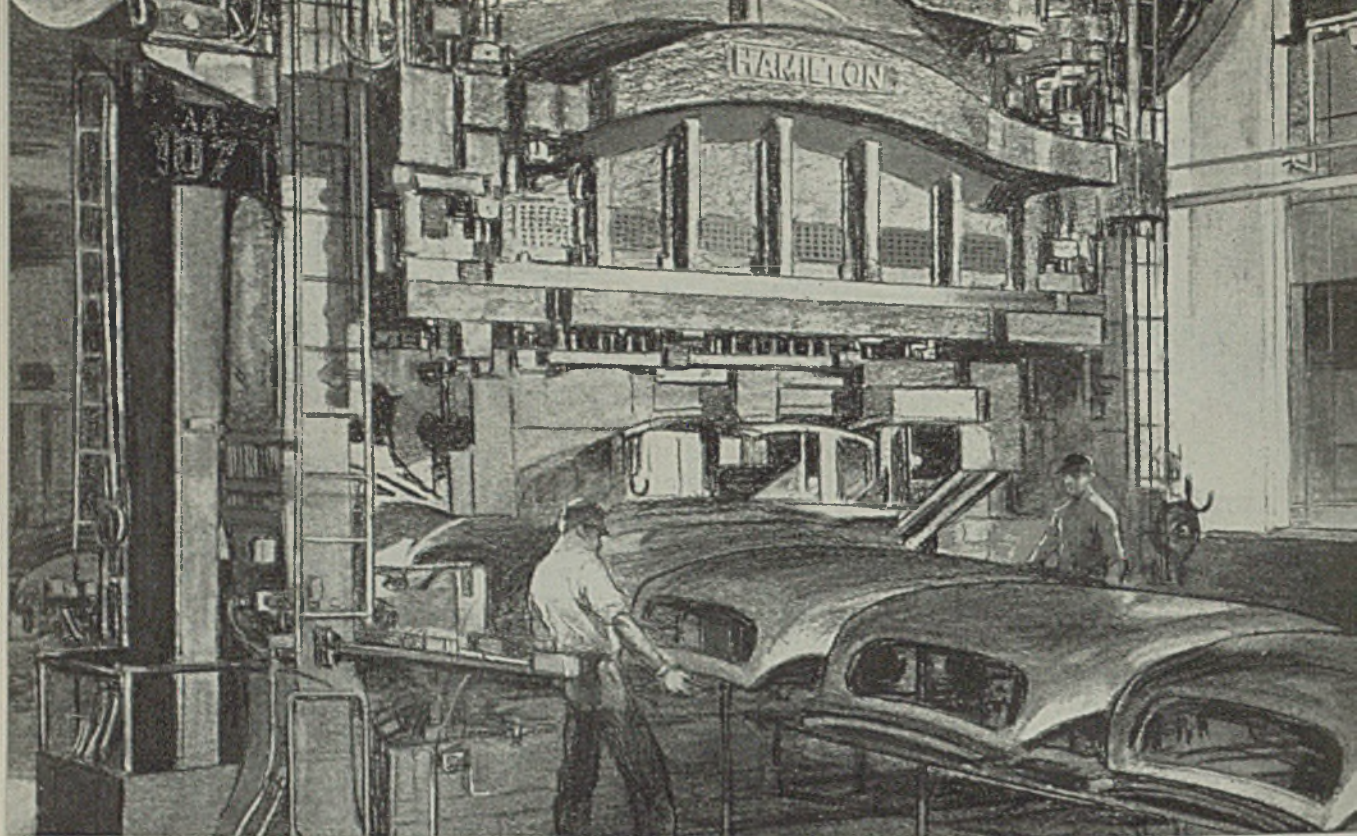
depositing efficiency has been improved through higher speeds and thicker deposits and strength of bond to the base material is greater. It now is possible to deposit a layer as thick as 1/2-inch with one pass of the metallizing gun. . . . A new chain conveyor finishing line at a Pittsburgh transformer case plant (p. 70) combines in regular sequence the operations of cleaning, rust-proofing, drying, painting and baking. . . . A new pig iron casting machine in Canada (p. 50) has interesting features.

• • •

Norman P. Goss and Curtis H. Vaughan (p. 52) discuss continuous normalizing of cold reduced strip steel. They reveal procedure for obtaining best results for deep drawing and other purposes requiring special properties. Grain size control, for example, depends on the speed

Cold Strip Normalizing

of the strip in transit through the furnace. . . . Standard resistance guns with suitable fixtures facilitate progressive welding assembly (p. 58) of some 52 separate parts that form the body of a well-known harvesting combine. . . . Due to importance of tooling under present conditions, repairing of tools when possible is essential; a broken broach (p. 66) recently was repaired by low-temperature brazing, a method which offers wide possibilities.



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SHEETS

How Excess Profits Tax Bill Is Slowing Defense Program

Witnesses, in Senate Committee Hearing, Point to Faults.

Measure Passed by House Meets Much Dissatisfaction.

House Will Moderate "Conscript Industry" Provision.

Week's Defense Orders Aggregate \$118,000,000.

WASHINGTON

■ FAR-REACHING changes in the excess profits tax bill passed by the house are likely to result from senate deliberations now under way. Most witnesses at the hearings held last week expressed dissatisfaction with the house measure. This dissatisfaction comes not only from business men but also from influential senators.

Senate finance committee may report the bill out early this week. As gag rule cannot be employed, it is hazardous even to guess how long the upper chamber will debate the bill. Following approval by the senate the measure must go to conference and then be repassed by both houses.

Delay in enacting a fair excess profits tax and amortization bill—coupled by Presidential insistence—is generally viewed as a major retarding influence in the defense program.

William S. Knudsen, Leon Henderson, John D. Biggers and Donald Nelson, of the defense commission, attacked the treasury-sponsored plan at committee hearings.

At the same time, Mr. Knudsen, emphasizing that he was speaking for himself alone, inferentially criticized the present bill's "penalty tax" provisions, which also have been attacked by some senators.

Pointing out that the levy is known as the "excess-profits tax," Knudsen declared that "it seems fair that this should be a tax on earnings above their normal past record, and not a tax based solely or largely on earnings above an arbitrary per cent or standard.

Mr. Knudsen also said: "I do not

think a penalty tax should be imposed on normal earnings. If the government needs more revenue, why not obtain it by flat increase in the corporation tax rate?"

The restrictions in the bill, which the defense commission unanimously disapproved both in testimony and in a formal letter to the finance committee, would apply to new plant facilities erected under a special amortization provision allowing their entire cost to be subtracted from taxable net income in five years.

The restrictions consist of a provision that these facilities could not be destroyed or even substantially altered unless the secretary of war or navy either gave written consent or bought the property at a reduced price.

Defeats Own Purpose

If this limitation remains in the bill, it would "tend to defeat the very purpose of the amortization provisions and thereby impede the defense program," Mr. Knudsen asserted.

Expressing full agreement with the treasury that the interests of the United States must be protected, Mr. Knudsen declared that this aim could best be achieved by individual contracts rather than the less flexible terms of a law.

Retention of the restrictions would "lead to a dearth of help from private capital," he said, but if the amortization provisions are accepted with the "strings," he predicted that there would be no trouble in carrying through plant expansion for the defense program very largely with private capital.

So far, one witness stated, most of the money has been put up by the government.

Mr. Henderson, securities and exchange commissioner, and one of the New Deal's leading economists, warned that "you might as well drop the amortization provisions" if the restrictions are retained on the subsequent use of the newly built plant facilities to which the liberal amortization privileges would apply.

"You would be saying that the manufacturer has to give up his facilities to the government."

Declaring that "the sole purpose in recommending the amortization provisions was to encourage the use of private capital," Mr. Biggers asserted the proposed restrictions "would in effect nullify" the amortization features.

"Considerably sharper negotiations" are being carried out on the part of the government than during the last war, Mr. Henderson asserted. Under the "alert procedure" now followed in watching prices, he said, the government has already obtained two articles in large quantities at a lower price than ever before.

Mr. Biggers informed the senate committee that three plans would be followed in respect to financing new plants for defense materials:

(1) Wholly by private capital, which is to be encouraged by the amortization provisions.

(2) By private capital, but repaid by the government, which at the end of the emergency period could sell the plant back to the private manufacturer.

(3) Entirely by the government,

which would retain the plant in the same way that it now owns arsenals.

With the "string" giving the government ultimate control even of the privately financed plants, "the private manufacturer will not avail himself of plan 1, and the whole load will fall on the government through plans 2 and 3," said Mr. Biggers.

John L. Sullivan, assistant secretary of the treasury, indicated in answer to questions that he thought it might be possible to work a provision for permissive filing of consolidated returns into the pending bill.

In reply to a question by Chairman Harrison as to whether some flat percentage above that paid by other industries should not be imposed on defense contractors and subcontractors, Mr. Sullivan said he would prefer to discuss the subject first with defense officials to determine whether such a provision would delay the armament program.

Mr. Sullivan expressed disagreement, contending that even those industries which realized no direct benefits from arms spending would realize indirect returns.

In response to a question by Senator Byrd, he said that the United States Steel Corp. would pay a tax of about \$7,500,000 on surplus profits of \$26,000,000 or \$28,000,000 in 1940 under the bill as it now stands.

The treasury witness expressed the opinion that it would be "exceedingly difficult" to impose a special differential tax on defense subcontractors because of the difficulty of determining what portion of their expenses and profits should be charged to government business.

"I think the American people feel that those who are going to make money out of these defense contracts ought to pay the big part of this," Senator Harrison remarked.

Taxes Normal Profits

A subcommittee on revenue legislation, United States Chamber of Commerce, holds that "enactment of the present measure would depress business activity and jeopardize the defense program, private financing and the payment of outstanding debts. It would disturb the markets for commodities and securities and produce other serious repercussions."

It also asserts that "under the guise of taxing 'excess' profits, the bill imposes disastrous taxes upon profits which are only normal and essential and not in any sense excessive, and not even remotely related to expenditures for national defense."

The committee repeats the recommendation that amortization should

be considered separately from the excess profits tax feature, and be promptly enacted, and that more time should be given to the drafting of a practical profits tax bill.

Discussing the major objections to the revenue bill the committee stated: "The bill as adopted by the house is practically impossible of comprehension. Unquestionably years of dispute and litigation would be necessary before tax liabilities could be determined, despite its declared purpose of making such liabilities definite and certain.

"Under the guise of taxing 'excess' profits, the bill imposes disastrous taxes upon profits which are only normal and essential, and not in any sense excessive, and not even remotely related to expenditures for national defense. Its drastic structure of rates is applied without regard to the relation of income to actual invested capital or the relation of excess profits to real normal profits. The measure makes no real effort to ascertain excess profits.

"It so applies the concept of average earnings over a period of years, as a basis for tax upon excess profits, as to preclude its use in most cases. It can be fairly said to have emasculated this idea which has been so widely supported as a fair basis of differentiating between normal and excess profits.

"The invested-capital base proposed is arbitrary and illogical, bearing little relation to realities. It requires impossible computations.

"The measure does not make adequate provision for special relief to those who, by reason of its involved and technical terms, will receive such harsh treatment as to amount to gross injustice.

"The expectation, encouraged by official announcement and the proposal of the ways and means subcommittee, of adequate provision for amortization to protect against capital losses in connection with defense facilities has not been fully realized because of the inclusion of some unnecessary restrictions," the committee said.

House Will Ease "Draft Wealth" Provision in Conscription Bill

■ ALTHOUGH the house of representatives will pass a military training bill which will contain some kind of a "draft industry" provision, it is expected this provision will not be as drastic as the senate bill.

The military affairs committee of the house has proposed an amendment modeled after the 1916 provision for drafting industry. Several other modifying amendments have been introduced in the house.

House military affairs committee which handled the bill adopted by a margin of one vote the substitute "draft industry" amendment giving the government priority or plant rental privileges for national defense contracts, in place of the senate provision to condemn and take over private plants. This amendment, offered by Representative Smith, Connecticut Democrat, carried 12-11.

The Smith proposal is copied from the existing national defense act, except that it would apply immediately upon passage of the draft bill, whereas the defense act is inoperative except during war or the imminence of war.

Amendment sets forth that the war or navy departments may require any firm to place ahead of all other orders the manufacture of arms, ammunition or any other necessary supplies for the army or navy.

It also authorizes the two depart-

ments to place such orders with any plant that may be readily transformed into a factory for the manufacture of such articles.

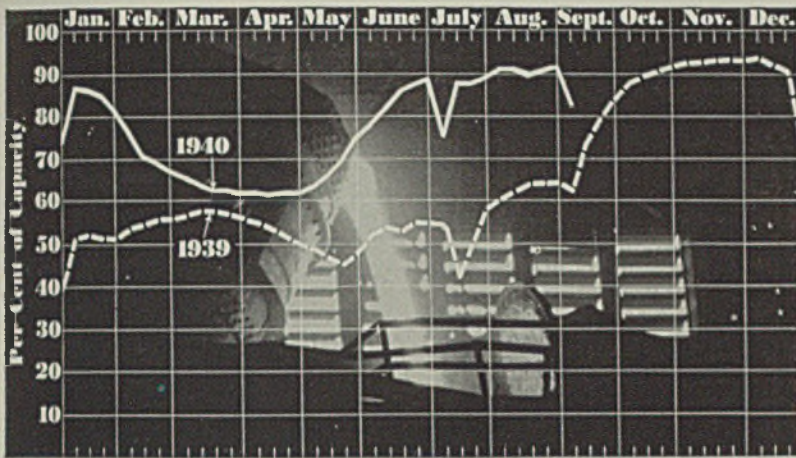
In event any company refuses to take such orders at reasonable prices, determined by the secretary of war or secretary of the navy, the President would be authorized to take immediate possession of the plants and proceed with the manufacture through an appropriate government bureau.

The amendment states that the compensation or rental for the use of any factory under these conditions "shall be fair and just."

Penalty for failure to comply would be imprisonment for not more than three years and a fine of not more than \$50,000. To protect the rights of labor, the following proviso is included in the amendment:

"Nothing herein shall be deemed to render inapplicable existing state or federal laws concerning the health, safety, security and employment standards of the employes in such plant."

Principal argument used against the Russell-Overton amendment in the Senate bill was that it authorized the government to institute condemnation proceedings at the time it took possession of a factory and thereby made the government eventually the owner of the plant.



District Steel Rates

Percentage of Ingot Capacity Engaged in Leading Districts

	Week ended	Change	Same week	1939	1938
Pittsburgh	72	-14.5	55	32	
Chicago	84.5	-14.5	51	38	
Eastern Pa.	79	-10	46	31	
Youngstown	75	-9	57	44	
Wheeling	80	-18	80	49	
Cleveland	81	-9	68	43.5	
Buffalo	90.5	None	60.5	49	
Birmingham	88	None	70	56	
New England	85	+5	70	60	
Cincinnati	68	-9	57	60	
St. Louis	80	None	62	42	
Detroit	94	+1	99	67	
Average	82	-9.5	62	41.5	

PRODUCTION... Down

■ STEELWORKS operations last week dropped 9½ points to 82 per cent, due to Labor day. Production the remainder of the week was as heavy as in the corresponding period in the previous week. Two districts gained slightly, seven declined, and three were unchanged. A year ago the rate was 62 per cent; two years ago it was 41½ per cent.

St. Louis—Steady at 80 per cent, 20 of 28 open hearths active.

Birmingham, Ala.—With 21 open hearths in production the rate held at 88 per cent. Republic Steel Corp. will light another furnace shortly.

Detroit—Labor day caused no interruption to production here and the rate advanced 1 point to 94 per cent. Ford Motor Co. operated all ten open hearths one day last week, the first time in several years.

Cincinnati—Slipped 9 points to 68 per cent because of the holiday in-

terruption. Recovery is scheduled for this week.

Cleveland—Dropped 9 points to 81 per cent, although some plants operated on Labor day. The rate will move higher this week.

Pittsburgh—Average operations for the week were 72 per cent, down 14½ points.

Wheeling—Output for the week was off 18 points to 80 per cent, though mills operated at 98 per cent except for the holiday.

New England—One open hearth

was added, raising the rate 5 points to 85 per cent in spite of Labor day closing.

Buffalo—Maintained 90½ per cent for the third week. Two mills will add open hearths this week.

Youngstown, O.—Off 9 points to 75 per cent. Republic Steel Corp. suspended one open hearth and Sharon Steel Corp. added one. Schedule for this week is 86 per cent.

Chicago—Steel production last week was at about 84½ per cent of capacity, down 14½ points.

Central eastern seaboard—Declined 10 points to 79 per cent, the week's average.

August Ingot Output Near Highest Records

■ Production of open-hearth and bessemer ingots in August totaled 6,033,037 net tons, according to the American Iron and Steel institute. This was the third highest monthly output in history, exceeded only by 6,080,177 tons in October and 6,147,783 tons in November, 1939.

August output was 8 per cent larger than July's and 40 per cent over August last year.

Daily average production in August was 1,361,859 tons, representing 89.72 per cent of capacity, compared with 1,265,853 tons, 83.40 per cent, in July. In August last year daily average output was 957,561 tons, 62.62 per cent.

Eight months production this year was 40,306,231 tons, compared with 28,765,544 tons in the corresponding period last year.

New Osborn Division

■ J. M. & L. A. Osborn Co., Cleveland, has purchased assets and good will of the Moise Steel Co., Cincinnati. This new Osborn division will be conducted by the former Moise personnel and from the same location, 3240 Spring Grove avenue, where stocks have been greatly increased.

Steel Ingot Statistics

Period	Calculated Monthly Production—All Companies—		Calculated		Weekly production, all companies in month	Number of weeks in month
	Open Hearth	Bessemer	Total	Per cent of Bessemer		
	Net tons	Per cent of capacity	Net tons	Per cent of capacity	Net tons	Per cent of capacity
1940 Reported by Companies which in 1939 made 97.97% of Open Hearth and 100% of Bessemer.						
Jan.	5,369,601	86.40	285,714	56.10	5,655,315	84.11
Feb.	4,203,508	72.37	205,527	43.19	4,409,035	70.16
March	4,073,196	65.54	191,539	37.62	4,264,735	63.42
April	3,798,371	63.11	176,335	35.76	3,974,706	61.04
May	4,582,694	73.74	258,709	50.50	4,841,403	72.00
June	5,228,529	86.88	304,381	61.72	5,532,910	84.97
July	5,272,708	85.03	322,362	63.44	5,595,070	83.40
Aug.	5,663,363	91.13	369,674	72.59	6,033,037	89.72
8 mos.	38,191,970	81.13	2,114,261	42.59	40,306,231	81.56
1939 Reported by Companies which in 1939 made 97.97% of Open Hearth and 100% of Bessemer.						
Jan.	3,413,783	55.33	165,080	27.22	3,578,863	52.83
Feb.	3,149,294	56.55	219,621	40.10	3,368,915	55.07
March	3,621,177	58.71	217,950	33.93	3,839,127	56.67
April	3,122,418	52.27	230,356	39.22	3,352,774	51.11
May	3,104,697	50.34	190,467	31.40	3,295,164	48.64
June	3,314,012	55.48	209,868	35.73	3,523,880	53.71
July	3,308,029	53.75	256,798	42.43	3,564,827	52.74
Aug.	3,963,515	64.20	276,479	45.58	4,241,994	62.62
8 mos.	26,998,925	56.43	1,766,619	34.28	28,765,544	62.62
Sept.	4,436,792	74.45	332,676	56.77	4,769,468	72.87
Oct.	5,626,685	91.22	453,492	74.77	6,080,177	89.75
Nov.	5,694,788	95.34	452,995	77.12	6,147,783	93.71
Dec.	5,468,880	88.87	333,134	58.35	5,822,014	86.13
Total	48,226,070	66.43	3,358,916	47.05	51,584,986	64.70

The percentages of capacity for 1939 are calculated on weekly capacities of 1,392,331 net tons open hearth ingots and 136,918 net tons Bessemer ingots, total 1,529,249 net tons; based on annual capacities as of Dec. 31, 1938, as follows: Open hearth ingots, 72,596,153 net tons; Bessemer ingots, 7,138,880 net tons.

The percentages of capacity operated for 1940 are calculated on weekly capacities of 1,402,899 net tons open hearth ingots and 114,956 net tons Bessemer ingots, total 1,517,855 net tons; based on annual capacities as of Dec. 31, 1939 as follows: Open hearth ingots, 73,343,547 net tons; Bessemer ingots, 6,009,920 net tons.

20 Per Cent of July Steel Products Exported

Steel products made for sale in July totaled 4,173,839 net tons, according to the American Iron and Steel Institute. This was nearly 10 per cent more than 3,802,485 tons made in June.

The amount exported in July was 835,385 tons, or 20 per cent of output. This is the highest proportion shown since the institute began to report figures monthly, beginning

with April this year. Comparisons:

	Output	Exported	Pct.
April	3,005,218	371,532	12.37
May	3,576,860	476,761	13.33
June	3,802,485	601,668	15.8
July	4,173,839	835,385	20.0

Output in the first seven months this year was 24,896,782 tons; comparative figures for the identical months last year are not available. The tonnage for the first nine months last year was 22,572,553, and for the 12 months, 34,687,861.

Exports in the seven months this year amounted to 3,606,186 tons.

Bessemer Flame Control Process Patented

Patents for manufacturing steel by the bessemer flame control process have been granted Jones & Laughlin Steel Corp., Pittsburgh. The process of controlling the end-point of the bessemer blow by an arrangement of photo-electric cells eliminates over and under blowing the bessemer charge, assuring uniformity of quality. (See STEEL, May 22, 1939, p. 54.)

AMERICAN IRON AND STEEL INSTITUTE
Capacity and Production for Sale of Iron and Steel Products

July - 1940

STEEL PRODUCTS	Number of Companies	Items	Annual Capacity Net tons	PRODUCTION FOR SALE—NET TONS								
				Current Month			To Date (7 Months 1940)					
				Total	Per cent of capacity	Shipments	Total	Per Cent of capacity				
Ingot, blooms, billets, slabs, sheet bars, etc.	33	1	xxxxxxx	551,332	xxx	353,880	91,124	2,578,300	xxx	1,074,433	609,640	
Heavy structural shapes	8	2	5,205,300	285,522	64.9	91,164	xxxxxxx	1,440,374	47.5	149,530	xxxxxxx	
Steel piling	4	3	328,000	13,027	47.0	1,478	xxxxxxx	92,029	48.2	9,375	xxxxxxx	
Plates—Sheared and Universal	20	4	6,095,450	360,564	70.0	68,209	xxxxxxx	2,146,790	60.5	312,147	12,264	
Skelp	8	5	xxxxxxx	83,821	xxx	15,875	xxxxxxx	376,288	xxx	56,507	144,939	
Rails—Standard (over 60 lbs.)	4	6	3,647,600	118,179	38.3	41,022	xxxxxxx	1,024,756	48.3	82,895	xxxxxxx	
Light (60 lbs. and under)	6	7	306,800	9,567	36.9	2,337	xxxxxxx	60,350	33.8	18,126	xxxxxxx	
All other (Incl. girder, guard, etc.)	2	8	118,000	401	4.0	-	xxxxxxx	16,901	24.6	2,382	xxxxxxx	
Splice bar and tie plates	15	9	1,300,200	39,828	36.2	1,604	xxxxxxx	353,887	46.8	6,149	xxxxxxx	
Bars—Merchant	35	10	xxxxxxx	400,200	xxx	58,277	33,205	2,339,875	xxx	269,731	183,537	
Concrete reinforcing—New billet	15	11	xxxxxxx	122,671	xxx	20,289	xxxxxxx	683,286	xxx	164,685	xxxxxxx	
Rerolling	18	12	xxxxxxx	13,258	xxx	259	xxxxxxx	81,879	xxx	4,517	xxxxxxx	
Cold finished—Carbon	18	13	xxxxxxx	57,619	xxx	1,599	xxxxxxx	360,922	xxx	8,570	xxxxxxx	
Alloy—Hot rolled	15	14	xxxxxxx	83,255	xxx	6,274	6,636	492,911	xxx	33,804	34,017	
Cold finished	14	15	xxxxxxx	7,381	xxx	132	xxxxxxx	50,014	xxx	1,492	xxxxxxx	
Hoops and baling bands	5	16	xxxxxxx	8,274	xxx	553	xxxxxxx	53,911	xxx	4,887	xxxxxxx	
TOTAL BARS	53	17	12,372,465	692,658	66.2	87,383	39,841	4,062,798	56.4	487,686	217,554	
Tool steel bars (rolled and forged)	15	18	110,220	5,319	57.1	518	xxxxxxx	38,201	59.5	2,907	xxxxxxx	
Pipe and tube—B. W.	13	19	1,815,860	104,108	67.8	4,773	xxxxxxx	540,103	51.1	44,990	xxxxxxx	
L. W.	10	20	1,246,340	14,261	32.5	3,340	xxxxxxx	192,588	26.5	21,126	xxxxxxx	
Electric weld	5	21	735,520	35,662	57.3	2,215	xxxxxxx	154,868	36.2	14,806	xxxxxxx	
Seamless	15	22	3,159,840	152,018	56.9	14,086	xxxxxxx	1,002,721	54.5	101,722	xxxxxxx	
Conduit	6	23	151,145	6,283	49.2	235	xxxxxxx	38,050	43.3	1,045	xxxxxxx	
Mechanical Tubing	13	24	554,825	24,353	51.9	2,906	xxxxxxx	152,570	47.2	10,465	xxxxxxx	
Wire rods	19	25	xxxxxxx	116,599	xxx	38,180	19,144	604,155	xxx	165,870	98,288	
Wire—Drawn	37	26	2,255,210	118,857	62.3	11,573	928	771,925	58.8	93,900	6,188	
Nails and staples	19	27	1,091,690	61,377	66.5	6,723	xxxxxxx	340,942	53.7	40,075	xxxxxxx	
Barbed and twisted	16	28	438,270	19,944	53.8	5,297	xxxxxxx	121,367	47.6	25,456	xxxxxxx	
Woven wire fence	15	29	772,790	20,657	31.6	194	xxxxxxx	149,980	33.3	1,404	xxxxxxx	
Bale ties	11	30	119,050	9,048	89.9	1	xxxxxxx	39,215	56.6	144	xxxxxxx	
All other wire products	6	31	27,030	2,025	88.6	-	xxxxxxx	8,250	52.4	-	xxxxxxx	
Fence posts	13	32	147,485	4,689	37.6	47	xxxxxxx	32,896	38.3	490	xxxxxxx	
Black plate	12	33	653,295	30,021	54.4	10,807	377	218,519	57.5	29,982	55,670	
Tin plate—Hot rolled	9	34	1,201,960	38,823	38.2	4,821	xxxxxxx	296,551	42.4	67,381	xxxxxxx	
Cold reduced	10	35	2,930,860	200,002	80.7	20,466	xxxxxxx	1,368,003	80.2	247,035	xxxxxxx	
Sheets—Hot rolled	26	36	xxxxxxx	476,206	xxx	51,415	16,031	2,960,589	xxx	307,187	85,946	
Galvanized	16	37	xxxxxxx	134,313	xxx	14,047	xxxxxxx	752,723	xxx	98,680	xxxxxxx	
Cold rolled	18	38	xxxxxxx	171,445	xxx	6,973	xxxxxxx	1,239,895	xxx	52,314	xxxxxxx	
All other	15	39	xxxxxxx	46,156	xxx	1,984	xxxxxxx	320,749	xxx	14,586	xxxxxxx	
TOTAL SHEETS	27	40	13,255,610	828,120	73.9	74,419	16,031	5,273,956	68.4	472,767	85,945	
Strip—Hot rolled	24	41	3,525,110	117,717	39.5	10,346	14,207	782,037	38.1	48,844	81,738	
Cold rolled	35	42	1,313,360	59,529	53.6	1,226	xxxxxxx	390,161	51.0	9,919	xxxxxxx	
Wheels (car, rolled steel)	5	43	424,385	13,495	37.6	84	xxxxxxx	107,787	43.6	2,416	xxxxxxx	
Axles	5	44	472,280	6,053	15.2	1	xxxxxxx	47,332	17.2	1,719	xxxxxxx	
Track spikes	11	45	327,275	9,050	32.6	173	xxxxxxx	66,306	34.9	2,491	xxxxxxx	
All other	3	46	9,100	803	104.4	-	xxxxxxx	5,616	106.0	-	xxxxxxx	
TOTAL STEEL PRODUCTS	134	47	xxxxxxx	4,173,839	xxxxxxx	835,385	210,202	24,896,782	xxxxxxx	3,606,186	1,312,176	
Estimated total steel finishing capacity based on a yield from ingots of 68.9%				48	53,946,300	xxxxxxx	86.9	xxxxxxx	xxxxxxx	75.1	xxxxxxx	xxxxxxx
Pig iron, ferro manganese and spiegel	26	49	xxxxxxx	506,175	xxx	91,679	178,295	3,053,676	xxx	269,102	88,324	
Ingot moulds	4	50	xxxxxxx	39,902	xxx	470	xxxxxxx	236,464	xxx	2,008	xxxxxxx	
Bars	10	51	160,600	2,488	18.3	11	274	16,201	17.3	105	1,411	
Pipe and tubes	3	52	109,277	3,989	43.1	40	xxxxxxx	21,598	33.9	581	2,017	
All other	3	53	71,180	1,369	22.7	479	373	7,261	17.5	1,477	3,459	
TOTAL IRON PRODUCTS (ITEMS 51 to 53)	12	54	276,247	7,842	33.6	530	647	45,060	28.0	2,163	xxxxxxx	

Total steel products produced for sale, less shipments to members of the industry for conversion into further finished products: Current month 3,963,637 N.T. 86.9% of Finishing Capacity.
To date 23,584,606 N.T. 75.1% of Finishing Capacity.
The above tonnages represent 68.9% of the ingots produced by companies whose products are included above.

Total Number of Companies Included - 153

Pig Iron Operating Rate Advances: Close to 90 Per Cent in August

■ UNITED STATES' production of coke pig iron in August averaged 136,599 net tons daily, highest since November, 1939, when daily output was 138,883 tons. It was more than 4 per cent greater than July's daily average, 130,984 tons, and compared with 96,122 tons in August a year ago.

With three more stacks put in blast during the month, the industry's operating rate increased 3.8 points.

Production in August totaled 4,234,576 tons, highest for any month since July, 1929, when output was 4,236,412 tons. It was 4.1 per cent greater than July's 4,060,513 tons. It exceeded that of any August since this publication started com-

MONTHLY IRON PRODUCTION

	Net Tons		
	1940	1939	1938
Jan.....	4,024,556	2,436,474	1,618,245
Feb.....	3,304,368	2,307,405	1,463,093
March....	3,270,575	2,680,446	1,646,636
April.....	3,139,043	2,301,965	1,554,569
May.....	3,497,157	1,923,625	1,412,249
June.....	3,813,092	2,373,753	1,188,037
July.....	4,060,513	2,638,760	1,358,645
Aug.....	4,234,576	2,979,774	1,674,976
Tot. 8 mo.	29,343,880	19,642,202	11,916,450
Sept.....		3,218,940	1,885,069
Oct.....		4,062,670	2,315,599
Nov.....		4,166,512	2,561,060
Dec.....		4,219,718	2,478,244
Total.....		35,310,042	21,156,422

paring monthly pig iron production statistics in 1918.

Production in the first eight months this year was 29,343,880 tons, approximately 50 per cent more than 19,642,202 tons produced in the period last year, and nearly two and a half times as large as in 1938. Total output for the first eight months in 1937 was 30,116,405 tons; for the period in 1938 it was 11,916,450 tons.

Average daily production for the eight months this year was 120,262 tons, well above 80,832 tons, the comparative figure last year. It was lower, however, than 123,935 tons, daily average for the eight months in 1937.

The industry's operating rate increased, for the fourth consecutive month from April's low of 68.9 per cent, to 89.9 per cent of capacity. This compared with 86.1 per cent operations in July this year, and 62.4 per cent in August last year. It was highest since November, 1939, when operating rate was 90.3

AVERAGE DAILY PRODUCTION

	Net Tons			
	1940	1939	1938	1937
Jan.....	129,825	78,596	52,201	116,327
Feb.....	113,943	82,407	52,254	120,800
March....	103,502	86,465	53,117	125,385
April.....	104,635	76,732	51,819	126,956
May.....	112,811	62,052	45,556	128,083
June.....	127,103	79,125	39,601	116,304
July.....	130,984	85,121	43,827	128,501
Aug.....	136,599	96,122	54,031	130,677
Sept.....		107,298	62,835	127,604
Oct.....		131,053	74,697	104,450
Nov.....		138,883	85,369	74,929
Dec.....		136,119	79,943	54,319
Ave.....	120,262	96,740	57,962	112,642

per cent, and exceeded the 85.7 per cent rate in August, 1937.

Stacks in blast Aug. 31 totaled 190, three more than in July, and highest since December, 1939, when 191 were active.

Five blast furnaces resumed in August, and two were blown out or banked. One merchant stack resumed and one was blown out. In the steelworks or nonmerchant classification, four stacks resumed and one was blown out. Furnaces resuming in August:

In Indiana: Madeline No. 5, Inland Steel Co. In New York: One Buffalo, National Steel Corp. In Ohio: Martins Ferry stack, Wheeling Steel Corp.; One Otis, Otis Steel Co., which had been down for rebuilding. In Pennsylvania: Bethlehem B, Bethlehem Steel Co.

Stacks blown out or banked: In Ohio: Hamilton No. 2, Hamilton Coke & Iron Co., for rebuilding. In Tennessee: Rockdale furnace, Tennessee Products Corp.

Twenty-five pig iron producers, both merchant and nonmerchant

AUGUST IRON PRODUCTION

	No. in blast last day of		—Total Tonnages—	
	Aug.	July	Merchant	Non-merchant
Alabama....	18	18	105,385*	193,751*
Illinois....	14	14	53,429	325,430
Indiana....	17	16	53	476,455
New York....	13	12	100,968	199,235
Ohio.....	42	41	130,789	824,157*
Penna.....	64	63	103,749*	1,217,253*
Colorado....	3	3		
Michigan....	4	4		
Minnesota..	2	2	24,659*	150,682*
Tennessee..	0	1		
Utah.....	1	1		
Kentucky..	2	2		
Maryland..	6	6		
Mass.....	1	1	17,020	306,563
Virginia..	0	0		
West Va....	3	3		
Total.....	190	187	541,050*	3,693,526*

*Includes ferromanganese and spiegeleisen.

and possessing an aggregate of 104 stacks, reported all their furnaces were in blast Aug. 31. Among the large producers included were: Bethlehem, Republic, Jones & Laughlin, Sloss-Sheffield, Inland, Wheeling, Tennessee Coal & Iron, and Colorado Fuel & Iron.

Develops Process for Making Powdered Iron

■ Process for making pure iron powder has been developed by the Glidden Co., Cleveland, according to announcement last week by P. E. Sprague, vice president. A plant has been built and is in operation at Hammond, Ind., headquarters for the Metals Refining Co., a Glidden division.

Considered a metallurgical triumph in the building and control of apparatus to produce a powder of the necessary particle size, purity and stability, it is said, the

RATE OF FURNACE OPERATION

(Relation of Production to Capacity)

	1940 ¹	1939 ²	1938 ³	1937 ⁴
Jan.....	85.4	51.0	33.6	76.6
Feb.....	75.0	53.5	33.6	79.5
March....	69.5	56.1	34.2	82.5
April.....	68.9	49.8	33.4	83.7
May.....	74.2	40.2	29.4	84.3
June.....	83.6	51.4	25.5	76.6
July.....	86.1	55.0	28.2	82.9
Aug.....	89.9	62.4	34.8	85.7
Sept.....		69.7	40.5	83.7
Oct.....		85.2	48.0	68.4
Nov.....		90.3	55.0	49.3
Dec.....		88.5	51.4	35.6

¹Based on capacity of 55,628,060 net tons, Dec. 31, 1939; ²capacity of 56,222,790 net tons, Dec. 31, 1938; ³capacity of 56,679,168 net tons, Dec. 31, 1937; ⁴first six months on capacity of 55,454,265 net tons, Dec. 31, 1936—last six months on capacity of 55,695,065 net tons, June 30, 1937. Capacities by American Iron and Steel Institute.

process may make available alloys not now known.

"It is a difficult and critical operation because of the high temperatures involved," Mr. Sprague stated. He described the process as continuous with raw materials going in one end of the apparatus and the powder coming out the other. The ore is not permitted to melt. A major problem is in keeping the powdered iron, after extraction of the oxygen, from reuniting with the oxygen of the air.

■ Malleable iron castings production in July totaled 38,872 net tons, compared with 34,700 tons in June and 28,836 tons in July, 1939, according to the bureau of the census. Production in seven months this year amounted to 287,028 tons, compared with 231,870 tons in the corresponding period last year.

MEN of INDUSTRY

■ CHESTER H. NORTON, purchasing agent, Boston works of Allis-Chalmers Mfg. Co., has been transferred to the company's main offices in the West Allis works at Milwaukee, as assistant general manager of purchases. H. W. Hauser, associated with the purchasing department in Milwaukee, will succeed Mr. Norton as purchasing agent, Boston works.

Warner G. Tilsher has been appointed factory manager, Taylor-Winfield Corp., Warren, O. He has been active in the development and manufacture of aircraft, streamline trains and other light weight structures fabricated by resistance welding.

E. Arthur Baldwin and Otto Pruessman, vice presidents and European and Far eastern managers of International General Electric Co., respectively, have retired.

R. E. Howe, president, Appalachian Coals Inc., Cincinnati, has been appointed a member of the resolutions committee, National Association of Manufacturers.

F. E. Barth, formerly associated with Graton & Knight Co., Worcester, Mass., has joined National Motor Bearing Co., Oakland, Calif., manufacturer of oil and grease seals and shims, as industrial sales manager.

Virgil Jordan, president, National Industrial Conference board, New York, has announced appointment of Fairfield E. Raymond as administrative assistant. Mr. Raymond has been director of a joint patent inquiry sponsored by the National



W. G. Tilsher

Association of Manufacturers, the Conference board, and the American Engineering council.

J. F. O'Donnell, assistant sales manager, merchandising division, Westinghouse Electric & Mfg. Co., East Pittsburgh, has been placed in charge of the division's Pacific coast sales operations. C. A. Meler, formerly Pacific coast manager, is now manager of utility sales in that district.

Wallace W. Leipner, active in architectural engineering 20 years, has resigned from Arthur G. McKee & Co., Cleveland, to become head of the porcelain enameled roofing and siding division, in charge of sales and engineering, Porcelain Steels Inc., Cleveland.

J. F. Brown has been appointed construction engineer, Chicago district, Carnegie-Illinois Steel Corp. He has been succeeded as chief engineer of South works by A. J. Hulse. Mr. Brown joined the South works in 1904 in the civil engineering department, and successively served as assistant chief civil engineer, chief civil engineer, construction engineer, acting chief civil engineer, and chief engineer. Mr. Hulse joined the corporation in 1936 as assistant chief engineer at South works. He was transferred to Pittsburgh as staff engineer three years later and remained there in that capacity until his present appointment.

Milton P. Higgins, the past two years resident manager of Norton Co.'s electric furnace plant at Chippawa, Ont., has been transferred to Worcester, Mass., as assistant manager of abrasive production and research. Mr. Higgins has been

with Norton about 12 years, and prior to the Chippawa post, was manager of sales research at Worcester and in special sales work in the Chicago territory. He is a director of Norton Co. and also of its Behr-Manning division.

E. C. Herrington, the past five years chief engineer, Herrington & Randall Inc., Detroit, industrial oven builders and designers, has joined Ferro Enamel Corp., Cleveland. He will head Ferro's industrial oven division, recently expanded to offer a complete line of ovens and finish production equipment.

George E. Smith, formerly general manager of operations, United Wall Paper Factories Inc., Chicago, has been elected a vice president and treasurer, Crosley Corp., Cincinnati. His prior associations include Nash Kelvinator Co., Budd Wheel Co., Edward G. Budd Mfg. Co. and Gimbel Bros., Philadelphia.

L. W. Reinken, electrical engineer, formerly with International Telephone Development Co., has joined W. Green Electric Co. Inc., New York. Mr. Reinken recently returned to the United States after eight years in Europe where he had been engaged in supervising the promotion of selenium rectifiers for International Telephone Development Co.

Thomas J. Moore has been appointed manager of sales, Hill-Chase & Co., Philadelphia. He was first affiliated with his father, then Philadelphia manager of Halcomb Steel Co., and when his father died he succeeded him as manager. In 1920



J. F. Brown



A. J. Hulse

he organized Rupp-Moore Co., distributing tool and cold finished steels. This business continued until 1927 when he became district manager for Columbia Steel & Shafting Co., and in 1929 took over additional duties as manager of Edgar T. Ward's Sons Co., Philadelphia.

Donald C. Schaffert is now assistant chief chemist at Copperweld Steel Co.'s plant in Warren, O. He was previously associated with Republic Steel Corp., Diebold Safe & Lock Co., Canton Forge & Axle Co., and Steel and Tube division of Timken Roller Bearing Co.

Russell W. Harris has been appointed district manager for Rustless Iron & Steel Corp., Baltimore, in charge of the northern Ohio district, with headquarters in the Society for Savings building, Cleveland. The past 13 years Mr. Harris had been identified with the Cleveland sales office of Colonial Steel Co. and Vanadium Alloys Steel Co.

Roy Hunter and P. Robert Foseid have been appointed to the sales staff of Gisholt Machine Co., Madison, Wis. Mr. Hunter will be in charge of the Cleveland office and will cover northern Ohio and northwestern Pennsylvania. He formerly was associated with International Machine Tool Co. Mr. Foseid is now a member of the eastern sales division. He will make his headquarters at Philadelphia and will cover eastern Pennsylvania, southern New Jersey, Delaware and Maryland.

Army, Navy Awards \$118,709,873: 85 Per Cent Is for Aircraft

■ NOTABLE contracts announced last week by United States war department were to Lockheed Aircraft Corp., Burbank, Calif., for 410 interceptor pursuit airplanes with spare parts, costing \$30,278,787, and to Boeing Aircraft Co., Seattle, for 277 heavy bombing airplanes with spare parts, costing \$70,449,955.20.

The number of airplanes now contracted for under 1940-41 appropriations is 2677, out of 4247 authorized.

Total of two contracts, \$100,728,742.20, is 85 per cent of all awards announced by the war and navy departments last week.

Other contract awards by the war department:

Ordnance Department Awards

Acme Machine Tool Co., Cincinnati, lathes, \$26,136.
Ajax Electrothermic Corp., Trenton, N. J., furnaces, \$9625.
Aluminum Co. of America, Washington, magnesium, \$20,416.
American Cyanamid & Chemical Corp., Maynard, Mass., ammunition components, weapons, \$53,375.
American Locomotive Co., Railway Steel Spring division, New York, springs, \$10,680.18.
American Locomotive Works, Schenectady, N. Y., artillery limbers, \$24,320.
American Saw Mill Machinery Co., Hackensack, N. J., painting machines, \$7200.
American Steel & Wire Co., Baltimore, steel, \$45,313.
Austin-Hastings Co. Inc., Cambridge, Mass., drill presses, drills, \$76,969.40.

Barret, Leon J., Co., Worcester, Mass., oil extractors, \$1119.50.
Bausch & Lomb Optical Co., Rochester, N. Y., telescopic sights, \$140,831.10.
Bergram Mechanical Eng. Co. Inc., New Britain, Conn., grinders, \$2856.
Bliss, E. W., Co., Brooklyn, N. Y., machines, presses, \$77,669.
Brown & Sharpe Mfg. Co., Providence, R. I., milling machines, gages, \$57,872.17.
Bryant Machinery & Engineering Co., Chicago, drill presses, \$5220.
Budd, Edward G., Mfg. Co., Philadelphia, ammunition components, \$18,157.91.
Chambersburg Engineering Co., Chambersburg, Pa., board hammers, \$40,302.
Chicago Pneumatic Tool Co., New York, air compressors, \$7195.
Cincinnati Milling Machine and Cincinnati Grinders Inc., Cincinnati, broaching, grinding, milling machines, \$118,985.92.
Continental Motors Corp., Muskegon, Mich., parts for motors, \$150,409.10.
Diamond T Motor Co., Chicago, trucks, \$104,584.
Doehler Die Casting Co., Pottstown, Pa., castings, \$1170.18.
DuPont, E. I., de Nemours & Co., Smokeless Powder division, Wilmington, Del., ammunition components, weapons, \$58,500.
Eastern Tool & Mfg. Co., Bloomfield, N. J., springs, \$7699.84.
Felipe Machine division, Bendix Aviation Corp., Elmira Heights, N. Y., ammunition, \$88,570.
Ex-Cell-O Corp., Detroit, grinding machines, \$2879.10.
Farquhar Co. A. B., Ltd., York, Pa., presses, \$13,650.
Firestone Tire & Rubber Co., Akron, O., outlet valve guards, \$3100.
Fitzsimons Co., Youngstown, O., steel bar, \$2453.62.
Frick Co., Waynesboro, Pa., machines, \$7361.
Gardner Denver Co., New York, air compressors, \$6430.
General Machinery Corp., Niles Tool Works division, Hamilton, O., parts for lathes, \$19,695.
Geometric Tool Co., New Haven, Conn., chasers, taps, \$2044.68.
Gisholt Machine Co., Madison, Wis., lathes, \$6615.
Greenfield Tap & Die Corp., Greenfield, Mass., gages, \$42,357.95.
Hanson-Whitney Machine Co., Hartford, Conn., milling machines, gages, \$28,821.69.
Hardinge Bros. Inc., Elmira, N. Y., lathes, \$10,856.10.
Hart, Earle, Woodworking Mach. Co., Chicago, planers, \$12,019.
Harvey Metal Corp., Chicago, ammunition components, \$90,930.
Heald Machine Co., Worcester, Mass., grinders and boring machines, \$15,731.84.
Hendey Machine Co., Torrington, Conn., lathes, \$21,525.
Hercules Powder Co., Wilmington, Del., ammunition components, weapons, \$453,000.
Illinois Gage Co., Chicago, gages, \$4,504.24.
International Tool & Engineering Co., Chicago, gages, \$2491.25.
Kearney & Trecker Corp., Milwaukee, milling machines, \$21,900.
Kessler Chemical Co. Inc., Philadelphia, ammunition components, weapons, \$13,140.
Kingsbury Machine Tool Corp., Keene, N. H., spindle machines, \$25,408.50.
Krueger, H. R., & Co., Detroit, drilling machines, \$82,635.
Lapointe Machine Tool Co., Hudson, Mass., broaching machines, \$140,151.35.

Plan Industrial Advertisers' Conference



■ Committee arranging for conference of advertising and marketing executives at Detroit, Sept. 18-20, under sponsorship of National Industrial Advertisers' association. Seated, left to right: Ralph L. Wolfe and T. B. Moule, Seiler, Wolfe & Associates Inc.; Lloyd R. Vivian, Ditzler Color Co., chairman; Henry G. Doering, the Truscon Laboratories; E. C. Howell, Carbology Co. Inc. Standing: Philip Linne, Owens-Corning Fiberglass Corp.; Charles M. Gray, Charles M. Gray & Associates; William J. Chappell, Timken-Detroit Axle Co.; A. F. Denham, Denham & Co., all of Detroit

Purchases Under Walsh-Healey Act

(In week ended August 24)

Iron and Steel Products

LeBlond, R. K., Machine Tool Co., Cincinnati, lathes, \$2060.
 Letz, E. Inc., New York, polishers, \$1450.
 Leland Gifford Co., Worcester, Mass., drilling machines, \$19,386.
 Levine, Samuel, New York, gate valves, \$4992.50.
 Lindberg Engineering Co., Chicago, furnaces, \$2088.
 Logansport Machine Inc., Logansport, Ind., shaving machines, \$44,200.
 Lukens Steel Co., Boston, steel plate, \$8117.87.
 Magma Mfg. Co. Inc., Haskell, N. J., ammunition components, weapons, \$34,242.
 Manhattan Perforated Metal Co. Inc., Long Island, N. Y., brass, \$1799.
 Marshall & Huschart Mach. Co., Chicago, straightening presses, \$4321.
 Midvale Co., Nicetown, Philadelphia, forgings, \$101,090.
 Monarch Machine Tool Co., Newark, N. J., lathes, \$21,350.
 National Pneumatic Co. Inc., Rahway, N. J., ammunition components, weapons, \$52,945.38.
 New York Thread Grinding Corp., New York, gages, \$1975.
 Niagara Machine & Tool Works, Buffalo, presses, \$1616.
 Oliver Instrument Co., Adrian, Mich., grinding machines, \$4284.
 Oliver Iron & Steel Corp., Pittsburgh, eyebolt lifting plugs, \$16,727.53.
 Peters Engineering Co., Philadelphia, machines, \$1850.
 Peterson Bros. Tool Co., Milford, Mass., gages, \$2089.
 Penn Supply Co., Jersey City, N. J., pipe, \$1994.69.
 Pratt & Whitney division, Niles-Bement-Pond Co., Hartford, Conn., reproducing machines, lathes, millers, \$109,983.75.
 Precise Tool & Mfg. Co., Farmington, Mich., gages, \$7884.
 Precise Tool & Mfg. Co., Springfield, Mass., gages, \$3632.
 Prentiss, Henry, & Co. Inc., Boston, revolving tables, \$1218.
 Production Machine Co., Greenfield, Mass., polishing machines, \$2150.
 Remington Arms Co. Inc., Bridgeport, Conn., ammunition, \$12,649.20.
 Revere Copper & Brass Inc., Rome division, Rome, N. Y., brass tubing, \$1777.10.
 Rivett Lathe & Grinder Inc., Boston, lathes, \$2905.
 Roberts, J. T. Bros. Inc., Baltimore, gage valves, \$1012.40.
 Rockwell, W. S. Co., New York, forge furnaces, \$49,450.
 Scintilla Magneto division, Bendix Aviation Corp., Sidney, N. Y., parts for magneto, \$8822.64.
 Seovill Mfg. Co., Waterbury, Conn., ammunition components, \$47,575.
 Shartle Bros. Machine Co., Middletown, O., filing sets, \$1881.
 Shipley, W. E., Machinery Co., Philadelphia, screw machines, \$7076.
 Smith, F. L., Machine Co. Inc., New York, machines, \$4800.
 Star Machine & Tool Co., Cleveland, gages, \$4287.
 Stedfast & Roulston Inc., Boston, shapers, \$2897.
 Stewart Bolting & Co. Inc., Cleveland, machines, \$3580.
 Stove Heating & Vent. Co., Washington, compressors, \$2820.
 Struthers Wells Titusville Corp., Titusville, Pa., forgings, \$207,575.
 Sturtevant, B. F., Co., Springfield, Mass., compressors, \$6789.14.
 Superior Sheet Steel Co., New York, terne plate, \$2570.
 Swind Machinery Co., Philadelphia, lathes, \$13,080.
 Taft-Pelree Mfg. Co., Woonsocket, R. I., gages, \$5700.
 Townsend, Samuel P., Lawn Mower Co., Bloomfield, N. J., ammunition, \$34,572.
 Torq Electric Mfg. Co., Cleveland, gaging machines, \$3870.
 Tray Tool & Gage Co., Detroit, gages, \$4112.
 United-Carr Fastener Corp., Cambridge, Mass., machines, \$3000.

American Car & Foundry Co., New York
 American Chain & Cable Co., Page Steel and Wire division, Monessen, Pa.
 American Brake Shoe & Foundry Co., American Forge division, Chicago
 American Rolling Mill Co., Middletown, O.
 American Type Founders Sales Corp., Washington
 Bethlehem Steel Co., Bethlehem, Pa.
 Budd Wheel Co., Detroit
 Carnegie-Illinois Steel Corp., Washington
 Chrysler Airtemp Sales Corp., Dayton, O.
 Colt's Patent Fire Arms Mfg. Co., Hartford, Conn.
 Crane Co., Washington
 Crucible Steel Co. of America, New York
 Dana Tool D-Nast Machinery Co., Philadelphia
 Dickglessler, Charles J., & Co., Derby, Conn.
 Erie Forge Co., Erie, Pa.
 Hibbard Spencer Bartlett & Co., Chicago
 Inland Steel Co., Chicago
 Jackes-Evans Mfg. Co., St. Louis
 Jessop Steel Co., Washington, Pa.
 Karp Metal Products Co. Inc., Brooklyn, N. Y.
 LaSalle Steel Co., Chicago
 Lukens Steel Co., Coatesville, Pa.
 Mergenthaler Linotype Co., Brooklyn, N. Y.
 Midvale Co., Philadelphia
 National Forge & Ordnance Co., Washington
 National Pneumatic Co. Inc., New York
 National Tube Co., Pittsburgh
 Parish Pressed Steel Co., Reading, Pa.
 Pennsylvania Forge Corp., Philadelphia
 Pittsburgh Steel Co., Pittsburgh
 Pittsburgh Steel Foundry Corp., Glassport, Pa.
 Reeves Steel & Mfg. Co., Dover, O.
 Scrimgeour, Wm., Washington
 Sheffield Steel Corp., Kansas City, Mo.
 Stewart-Warner Corp., Indianapolis
 Worthington Pump & Machinery Corp., Harrison, N. J.
 York Safe & Lock Co., York, Pa.

Commodity	Amount
Parts	\$29,580.90
Chain link fencing	13,007.99
Sheet forgings	624,000.00
Steel	60,988.39
Steel equip.	*15,796.11
Shell, forgings	123,507.30
Projectiles	1,193,339.50
Steel	76,078.52
Range cabinets	235,000.00
Pistols	56,737.50
Steel pipe	23,297.90
Steel, forgings	1,560,344.63
Taps, dies	21,722.96
Platform assemblies	36,832.60
Liner forgings	60,721.36
Pulaski tools	*9,615.00
Arrestors	32,038.40
Steel	13,060.21
Radio cabinet assem.	20,461.00
Steel	*126,608.39
Steel plates	*28,944.13
Telescope mounts	545,591.63
Gun forgings	2,357,561.15
Liner forgings	17,479.80
Mortars, mounts	10,312.88
Forgings, tubing	80,692.48
Range cabinets	278,750.00
Forgings	143,335.88
Wire, fence	67,218.70
Rack castings	32,600.00
Buckets, range equip.	32,221.99
Range parts	60,675.00
Steel	57,268.55
Fire units	237,480.00
Feed tanks	18,654.00
Gun carriages	794,300.00

Nonferrous Metals and Alloys

Aluminum Co. of America, Washington
 Aluminum Cooking Utensil Co., New Kensington, Pa.
 American Brass Co., Waterbury, Conn.
 Chase Brass & Copper Co. Inc., Waterbury, Conn.
 Gorham Co., Providence, R. I.
 International Nickel Co. Inc., New York
 Oneida Ltd., Oneida, N. Y.
 Phelps Dodge Refining Corp., New York
 Standard Pressed Steel Co., Jenkintown, Pa.
 Thompson Products Inc., Detroit

Aluminum ingots	\$15,375.00
Food containers	47,505.95
Hose, bands, cups	197,717.77
Cartridge cases	1,353,505.50
Silver-plated ware	38,053.25
Nickel	10,029.00
Silver-plated ware	13,643.75
Copper	54,700.00
Primer heads	65,730.00
Fuze adapters	121,282.50

Machinery and Other Equipment

Ajax Mfg. Co., Cleveland
 American Laundry Machinery Co., Cincinnati
 Austin-Hastings Co. Inc., Cambridge, Mass.
 Brown & Sharpe Mfg. Co., Providence, R. I.
 Bullard Co., Bridgeport, Conn.
 Caterpillar Tractor Co., Peoria, Ill.
 Cincinnati Milling Machine & Cincinnati Grinders Inc., Cincinnati
 Commercial Iron Works, Portland, Oreg.
 Essley, E. L., Machinery Co., Chicago
 Federal Machinery Sales Co., Chicago
 Food Machinery Corp., Los Angeles
 Foote-Burt Co., Cleveland
 Fulton Slyphon Co., Knoxville, Tenn.
 Georgia Iron Works, Augusta, Ga.
 Gisholt Machine Co., Madison, Wis.
 Harnischfeger Corp., Milwaukee
 Harris-Seybold-Potter Co., Cleveland
 Kearney & Trecker Corp., Milwaukee
 Lloyd & Arms Inc., Philadelphia
 Lodge & Shipley Machine Tool Co., Cincinnati
 Marshall & Huschart Machinery Co., Chicago
 Neff Kohlbusch & Bissell Inc., Chicago
 Niles-Bement-Pond Co., Pratt & Whitney division, West Hartford, Conn.
 Osgood Co., Marion, O.
 Prentiss, Henry, & Co. Inc., Boston
 Robbins & Myers Inc., Springfield, O.
 Sebastian Lathe Co., Cincinnati
 Smith, T. L. Co., Milwaukee
 Stedfast & Roulston Inc., Boston
 Timken-Detroit Axle Co., Wisconsin Axle division, Oshkosh, Wis.
 Waterbury Farrel Fdry. & Mach. Co., Waterbury, Conn.
 Watson-Stillman Co., Roselle, N. J.

Forging, bolt, mach.	\$21,768.00
Laundry equip.	39,370.00
Hydraulic planer	35,712.00
Grinding machines	25,251.00
Boring mills	136,614.25
Tractors	21,200.00
Grinding machines	17,003.15
Valves	11,794.00
Machine tools	17,822.28
Punch press	13,407.00
Pump, gear units	12,876.00
Broaching machine	12,875.00
Valves	16,412.00
Pumping units	18,586.00
Turret lathes	29,316.00
Crane bridge	22,625.00
Turning mach. tool	15,000.00
Milling machines	15,680.80
Drilling machine	10,340.00
Lathes	19,043.00
Boring machine	204,329.00
Shears	13,511.00
Drilling machines	38,008.00
Crawler crane	16,990.00
Radial drills	76,134.00
Hoists	12,627.00
Lathes	23,200.00
Tilting mixers	34,185.00
Lathes	19,288.90
Transmission parts	26,448.10
Gaging machines	30,000.00
Hydraulic equip.	52,832.40

GRAND TOTAL

\$12,131,580.93

*Estimated.

(Please turn to Page 29)

Army and Navy Awards

(Concluded from Page 28)

U. S. Tool Co. Inc., Ampere, N. J., milling machines, \$29,510.
Vince Corp., Detroit, gages, \$95,43.80.
Virginia Rubatex Corp., Bedford, Va., valves, \$6,972.
Waltham Watch Co., Waltham, Mass., ammunition components, weapons, \$21,250.
Warner & Swasey Co., Cleveland, lathes, \$41,953.50.
West & Dodge Thread Gage Co. Inc., Boston, gages, \$3,832.52.
Westinghouse Electric & Mfg. Co., Springfield, Mass., furnaces, \$7,485.
Wickwire Spencer Steel Co., New York, wire, \$1,204.
Wilder, R. S., Inc., Waltham, Mass., microprojectors, \$4329.60.
Willamette Hyster Co., New York, trucks, \$4,550.
Wisconsin Axle division, Timken Detroit Axle Co., Oshkosh, Wis., differential assemblies, \$16,075.
Zelss, Carl, Inc., New York, optical equipment, \$2953.20.

Quartermaster Corps Awards

Bray, F. L., Const. Co., Oklahoma City, Okla., Officers' quarters, Southeast Air depot, Mobile, Ala., \$60,208.
Diamond T Motor Car Co., Chicago, trucks, \$58,401.63.
Doehler Metal Furniture Co. Inc., New York, cots, \$86,500.
Fargo Motor Co., Detroit, trucks, \$255,614.
Fuller, George A., Co., New York, temporary buildings, Ft. Dix, N. J., \$5,531,000.
Hagstrom Construction Co., St. Paul, assembly line at Savannah Ordnance depot, \$949,319.
Holleman Motor Co., Washington, trucks, \$490.
Joseph Light Construction Co., Washington, temporary buildings, Ft. Geo. G. Meade, Md., \$235,963.
Lehr Construction Co., St. Joseph, Mo., temporary buildings, Ft. Leavenworth, Kans., \$126,766.
Oehler, Chas. H., Galveston, Tex., temporary buildings, Ft. Crockett, Tex., \$96,449.
Owen-Ames-Kimball, Grand Rapids, Mich., hospital buildings, Camp Custer, Mich., \$362,000.
Rife, A. J., Construction Co., Dallas, Tex., repair shop, Southeast Air depot, \$1,350,000.
Rommel, George H. Co., Louisville, Ky., storage warehouses, Jeffersonville, Ind., \$1,262,800.
Smith, A., & Co. of Illinois, Chicago, temporary housing, Ft. Sheridan, Ill., \$286,000.
Yellow Truck & Coach Motor Co., Chicago, trucks, \$921,343.72.

Corps of Engineers Awards

American Car & Foundry Co., Berwick, Pa., ponton equipment, \$241,976.
Wallace & Tiernan Co., Belleville, N. J., mobile water purification units, \$95,710.53.

Chemical Warfare Service Awards

Noland Co. Inc., Washington, plumbing supplies, \$4698.58.

United States navy department last week announced the following contract awards:

Alexander, Harry, Inc., New York, power plant improvement, \$185,000.
Phoenix Bridge Co., Phoenixville, Pa., structural steel for extension to building at Boston navy yard, \$14,045.

Bureau of Supplies and Accounts Awards

Austin-Hastings Co. Inc., Cambridge, Mass., planers, shaper, \$45,725.60.
Balfour, Guthrie & Co. Ltd., San Francisco, pig iron, \$5,377.
Brown & Sharpe Mfg. Co., Providence, R. I., automatic screw machines, \$10,384.05.

Carey Machinery & Supply Co., Baltimore, lathes, \$23,495.35.
Caterpillar Tractor Co., Peoria, Ill., tractor, \$5,922.
Cincinnati Milling Machine & Cincinnati Grinders Inc., Cincinnati, millers, grinders, \$18,039.10.
Cole Electric Products Co. Inc., Long Island City, N. Y., distribution panels, \$35,506.16.
Consolidated Machine Tool Corp., Rochester, N. Y., lathes, \$87,960.
Danforth, Richard S., San Francisco, anchors, \$40,824.
Eagle Electric Supply Co. Inc., Boston, wire, \$37,142.84.
Electric Boat Co., Bayonne, N. J., motors, controllers and spare parts, \$9519.
Electric Heater Co., Bridgeport, Conn., barrels, with rod and eye, \$7002.30.
Erie Foundry Co., Erie, Pa., forging hammer, \$27,570.
Gallmeyer & Livingston Co., Grand Rapids, Mich., grinding machines, \$8635.06.
General Machinery Corp., Hamilton, O., lathes, \$588,598.
General Motors Corp., Chevrolet division, Detroit, automobiles, \$53,040.86.
Gisholt Machine Co., Madison, Wis., turret lathes, \$45,678.
Gray, G. A., Co., Cincinnati, openside planer, \$45,913.
Hannibal Mfg. Co., Chicago, tool room type combination machines, \$5025.
Hendey Machine Co., Torrington, Conn., precision lathes, \$12,638.
Howe Fire Apparatus Co., Anderson, Ind., fire pumping engines, \$44,381.69.
Kollman Instrument division of Square D Co., Elmhurst, N. J., tubes, compasses, \$63,000.
Lloyd & Arms Inc., Philadelphia, drilling machines, \$6820.
Lockheed Aircraft Corp., Burbank, Calif., airplanes, \$114,235.97.
Micro-Westco Inc., Bettendorf, Iowa, internal grinder, \$21,119.15.
Mueller Brass Co., Port Huron, Mich., naval brass, \$9956.20.
Potter & Johnston Machine Co., Pawtucket, R. I., turret lathe, \$8526.50.
Pratt & Whitney division, Niles-Bement-Pond Co., West Hartford, Conn., milling machines, \$12,768.
Revere Copper & Brass Inc., Baltimore, brass, copper, \$14,498.54.
Ruckstell-Burkhardt Engineering Co., Detroit, auxiliary power units, \$114,154.80.
Schrader's, A., Son, division of Scovill Mfg. Co. Inc., Brooklyn, N. Y., parts for diving apparatus, \$13,487.75.
Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., pig iron, \$10,076.10.
Smith-Courtney Co., Richmond, Va., steam drop hammer, \$11,500.
South Bend Lathe Works, South Bend, Ind., engine lathes, \$75,125.85.
Steel Products Engineering Co., Springfield, O., aircraft propeller blades and hubs, \$103,486.72.
Struthers Wells-Titusville Corp., Titusville, Pa., warping capstan, \$11,217.
Watson-Stillman Co., Roselle, N. J., hydraulic pump, \$18,500.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., motor generators and electrical equipment, \$66,515.
White Motor Co., Cleveland, motor buses, \$31,110.

Awards in Canada

TORONTO, ONT.

Department of munitions and supply, Ottawa, last week announced the following contracts, amounting to \$14,500,000:

Aircraft Supplies; Packard Motor Car Co., Detroit, U. S. A., \$2,582,087; Chrysler Corp. of Canada Ltd., Windsor, \$16,131; British Aeroplane Engines Ltd., Montreal, \$252,235; Canadian Pratt & Whitney Aircraft Co. Ltd., Longueuil, Que., \$169,974.

Mechanical Transport; Ford Motor Co.

of Canada Ltd., Windsor, \$11,841; General Motors Products of Canada Ltd., Oshawa, \$11,816; Fort & Wood Co. Ltd., Smiths Falls, Ont., \$9,951; Juc Equipment Supply Co. Ltd., Montreal, \$8038.

Machinery and Tools; Gausche & Lomb Optical Co., Rochester, N. Y., \$1,000; \$157,429; T. E. Ryder Machinery Co., Montreal, \$13,880; Ontario Hughes-Hewens Co. Ltd., Ottawa, \$18,892; A. R. Williams Machinery Co. Ltd., Toronto, \$700.

Electrical Equipment; Canadian Marconi Co. Ltd., Montreal, \$258,606; C. C. A. Victor Co. Ltd., Montreal, \$19,000; Mis Can-Ada Mfg. Co. Ltd., Ottawa, \$2,232.

Munitions; Dominion Arsenal, Quebec, \$569,807; Defense Industries Ltd., Montreal, \$470,386; C. P. Fabien Ltd., Montreal, \$31,564; Merck & Co. Ltd., Montreal, \$9814.

Ordnance; Consolidated Mining & Smelting Co. Ltd., Montreal, \$61,287; Hudson Bay Mining & Smelting Co. Ltd., Winnipeg, Man., \$61,287.

Construction Projects; Standard Construction Co. Ltd., Beauport, Que., \$63,444; A. F. Byers Co. Ltd., Montreal, \$48,286; H. Dagenals, Ottawa, \$119,568; Frid Construction Co., Toronto, \$267,668; Scott Jackson Construction Co., Toronto, \$108,250; W. C. Brennan Contracting Co., Hamilton, Ont., \$193,686; Carter-Halls-Aldinger Co. Ltd., Winnipeg, \$205,229; Smith Brothers & Wilson Ltd., Regina, Sask., \$203,814; Bennett & White Construction Co., Calgary, Alta., \$407,166; Fraser MacDonald Co. Ltd., Winnipeg, \$441,500; Canadian Comstock Co. Ltd., Toronto, \$151,000; Ambrose Wheeler Ltd., Moncton, N. B., \$68,500; N. B. Roantrce Co. Ltd., Regina, \$68,500; Ontario Construction Co. Ltd., St. Catharines, Ont., \$70,500; Standard Construction Co., Halifax, N. S., \$175,500; Fundy Construction Co., Halifax, \$50,500; Carter-Halls-Aldinger Co. Ltd., Winnipeg, \$850,000; P. W. Graham & Sons, Moose Jaw, Sask., \$325,000; Hill-Clark-Francis Ltd., New Liskeard, Ont., \$825,000; E. J. Ryan Contracting Co. Ltd., Vancouver, B. C., \$290,500; Buchan Construction Co. Ltd., Calgary, \$195,500; Claydon Co. Ltd., Winnipeg, \$105,500.

"Industry Not Stalling," Hook Tells Radio Audience

Convincing answer to the whispered charge that industry is stalling national defense production for selfish reasons was given a nation-wide radio audience by Charles R. Hook, president, American Rolling Mill Co., Middletown, O., in an interview Aug. 30.

Mr. Hook, who also is chairman of the executive committee, National Association of Manufacturers, declared American manufacturers had volunteered their knowledge, experience and productive genius at the outset of the emergency. He quoted President Roosevelt, Secretary of Navy Frank Knox and others in denials of any "slidown" by industry.

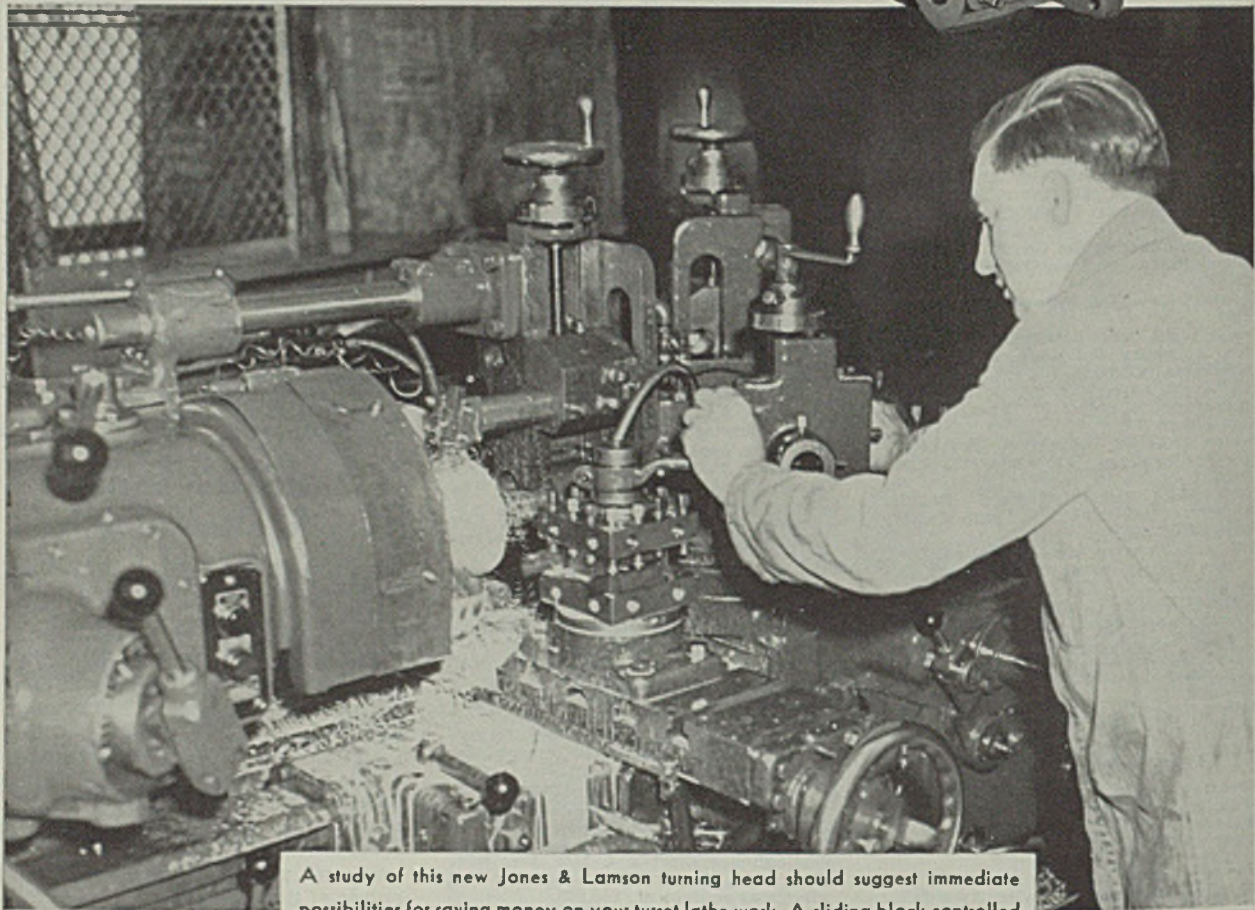
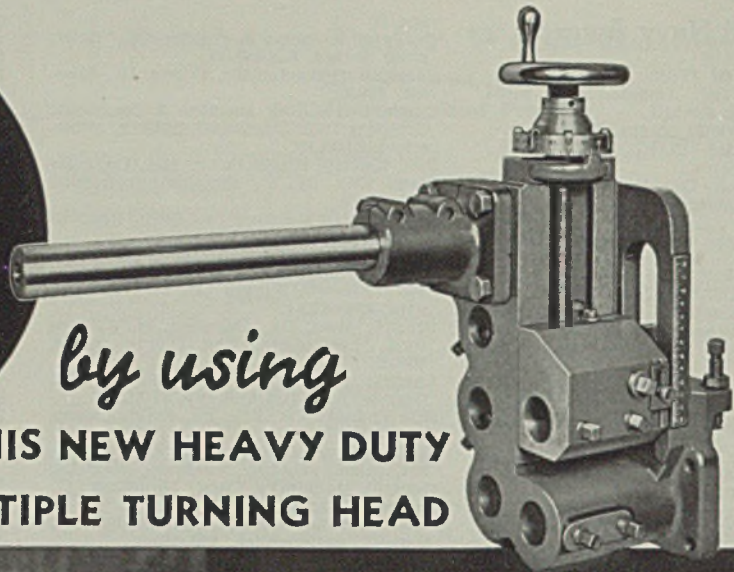
Further, he pointed out, more than 100 outstanding industrialists are serving the government without pay in the defense program; industry of its own accord is making a survey of industrial facilities, not only to aid the army and navy, but also to protect consumers and assure a supply of normal peace-time goods. Many companies have gone ahead with defense expansion despite tax and profit uncertainties, and continuation of legislative restrictions.

Save

**SETUP TIME
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By using

**THIS NEW HEAVY DUTY
ADJUSTABLE MULTIPLE TURNING HEAD**



A study of this new Jones & Lamson turning head should suggest immediate possibilities for saving money on your turret lathe work. A sliding block controlled by a graduated handwheel allows instantaneous micromatic tool adjustment that will save 20% to 60% in tool setting time, and a pointer and scale facilitate changes in setup. With a standard cutter holder in the Adjustable Block, it is possible to turn diameters from 1 3/4" up to the capacity of the machine.

We will gladly send more information about this adjustable multiple turning head along with our new Turret Lathe Tool Catalog if you will apply on your firm's letterhead.

Watch these pages for further announcements of new Jones & Lamson Turret Lathe Tools. A few minutes' reading may bring years of extra profit.



Manufacturers of: Saddle & Ram Type Universal Turret Lathes . . . Fay Automatic Lathes . . . Automatic Double-end Milling & Centering Machines . . . Automatic Thread Grinding Machines . . . Comparators . . . Tangent and Radial, Stationary and Revolving Dies and Chasers.

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"Profit Producing Machine Tools"

Windows of WASHINGTON



By L. M. LAMM
Washington Editor, STEEL

- National Defense Commission Defines Labor Policy.*
- Secretary Compton Praises Industry for Patriotism.*
- Two Jobs for Jesse H. Jones Favored in Congress.*
- Agricultural Department Approves Steel Corn Bins.*

WASHINGTON

■ PRIMARY among objectives of the advisory commission to the council of national defense is the increase in production of materials required by United States armed forces and the assurance of adequate future supply of such materials with the least possible disturbance to production of supplies for the civilian population. The scope of the present program entails bringing into production many unused resources of agriculture, manufacturing and manpower, the commission said last week in defining its policy. The commission continued:

"This program can be used in the public interest as a vehicle to reduce unemployment and otherwise strengthen the human fiber of our nation. In the selection of plant locations for new production, in the interest of national defense, great weight must be given to this factor.

"In order that surplus and unemployed labor may be absorbed in the defense program, all reasonable efforts should be made to avoid hours in excess of 40 per week. However, in emergencies or where the needs of the national defense cannot otherwise be met, exceptions to this standard should be permitted. When the requirements of the defense program make it necessary to work in excess of these hours, or where work is required on Saturdays, Sundays or holidays, overtime should be paid in accordance with

the local recognized practices . . .

"All work carried on as part of the defense program should comply with federal statutory provisions affecting labor wherever such provisions are applicable. This applies to the Walsh-Healey act, fair labor standards act, the national labor relations act, etc. There should also be compliance with state and local statutes affecting labor relations, hours of work, wages, workmen's compensation, safety, sanitation, etc. . . .

Retain Safeguards

"The commission reaffirms the principles enunciated by the chief of ordnance of the United States army, during the World war, in his order of Nov. 15, 1917, relative to the relation of labor standards to efficient production:

"In view of the urgent necessity for a prompt increase in the volume of production . . . vigilance is demanded of all those in any way associated with industry lest the safeguards with which the people of this country have sought to protect labor should be unwisely and unnecessarily broken down. It is a fair assumption that for the most part these safeguards are the mechanisms of efficiency. Industrial history proves that reasonable hours, fair working conditions, and a proper wage scale are essential to high production . . . every attempt should be made to conserve in every way possible all of our achievements in

the way of social betterment. But the pressing argument for maintaining industrial safeguards in the present emergency is that they actually contribute to efficiency.' "

"I definitely do not think that industry is hampering the national defense," Lewis Compton, assistant secretary of the navy, declared last week.

It is true, however, he said, that some of "our prime manufacturers are experiencing difficulty in getting some subcontractors to accept orders under the present terms of the profit limiting clause of the Vinson-Trammell act. In addition to this, some delay also has been experienced, particularly in connection with the procurement of aircraft, in situations where plant expansions are to be financed by private capital. This is caused by the fact that industry does not know under present conditions what rate of amortization it can apply until the end of the contract. Naturally business men want to know the rules of the game before the game starts."

Secretary Compton said he believes industrial leaders have been patriotic and spent their money on plant expansions without the assurance of legislation.

He said three steel companies making armor plate, for which there is no commercial market, financed their own plant expansions and increased the annual tonnage output. "These companies," he said, "were willing to take a chance on what amortization would be allowed at the end of the contracts. I know of another company engaged in the construction of so-called mosquito boats which, over a year ago, erected an \$800,000 plant."

Discussing the national defense spending program with reference to the navy, Secretary Compton said that, "We now have under contract \$1,435,000,000 in ships, aircraft, ordnance and public works. The re-

cently authorized 11 per cent increase in the navy as well as all other tonnage authorized was under contract within 24 hours after the enactment of the legislation.

This was possible because negotiations were tentatively consummated prior to the final enactment of the law. The same thing is true with the 70 per cent program now pending before the congress. In a very short time after this measure becomes law, the navy will be in a position to make awards of contracts for the vessels involved in this increase."

PROPOSE AUTHORIZATION OF DUAL JOB FOR JONES

Joint resolutions have been introduced in both houses of congress "that notwithstanding any provision of law to the contrary, Jesse H. Jones, federal loan administrator, may continue in such office and be appointed to, in the manner now provided by law, and may exercise the duties of the office of the secretary of commerce; provided, that the total compensation to be paid him as secretary of commerce and as federal loan administrator shall be that provided by law for the secretary of commerce." The resolution has been reported favorably by committees of both houses.

MCNUTT REPORTS PROGRESS IN LABOR TRAINING PLAN

Federal Security Administrator Paul V. McNutt has forwarded to the national defense advisory commission a report received from John W. Studebaker, commissioner of education, on the vocational education national defense program.

This report shows that in one month's time 80,614 persons were enrolled for defense training and that approximately 3000 men were placed in jobs by the end of July. In one community alone, Paterson, N. J., 686 persons have been trained and placed. These placements have been in three important national defense industries located in or near Paterson: Wright Aeronautical Corp., the Watson Flagg Co., and the Curtis Propeller division of the Wright Aeronautical Corp. Current reports of placement reaching the United States office of education indicate that 20,000 trainees may have moved out of the summer schools into defense jobs by Sept. 1.

"These figures have been gathered from 41 states," said Mr. McNutt. "They show that the training of workers in vocational schools in 283 cities is one of the swiftest moving phases of the national defense program."

Men and boys 18 to 60 are being trained in summer schools opened for the special purpose of training workers for defense industries. A

few women are enrolled in places where such industries require women workers.

Launched on July 1, four days after the President had signed the act of congress appropriating \$15,000,000 for the purpose, this program by July 15 had 30,000 men in training and by July 31 had over 80,000 men in training. By Sept. 1, 90,000 were in training.

Two types of training are provided by vocational schools in the national defense program. Re-employment short courses giving instruction in specific skills such as welding and riveting enroll 51,604 men. Supplementary courses that aid workers on the job, who attend school to extend or improve their skills, have 29,010 registrants.

PROJECTED SEA, AIR BASES WILL REQUIRE MUCH STEEL

Although details on the new sea and air bases to be constructed on leased British possessions in the Atlantic had not been revealed last week, it was indicated a heavy steel tonnage will be required. Work on the bases will start as soon as definite sites are selected, according to Chairman Carl Vinson of the house naval affairs committee.

The bases are to be located in British Guiana, Trinidad, St. Lucia, Antigua, Jamaica, the Bahamas, Bermuda and Newfoundland. Others are planned in the Pacific on the Galapagos and the Cocos islands in the Pacific.

Congressional action will not be necessary to start work on the bases as President Roosevelt has a "blank check" for \$200,000,000 which may be applied to this construction. In addition, congress has appropriated \$10,000,000 for auxiliary air bases.

GOVERNMENT BUYS MORE STEEL CORN STORAGE BINS

Agricultural department has announced contracts for 13,701 steel grain bins, having a total storage capacity of 37,403,730 bushels. (For the tonnages and supplies see page 81.) The bins will be used by Commodity Credit Corp. to store part of the corn which will be delivered by farmers in settlement of loans on 1938 and 1939 corn.

Cost of the bins, which will be of 2730 bushels capacity each, will be \$2,301,548, or an average of 6.15 cents per bushel of storage space, delivered at country points. This is 2.15 cents per bushel less than the delivered cost of steel bins purchased in 1939.

The purchase is a continuation of the department's program to keep a substantial part of the ever normal granary corn reserve stored in the country, where it will be available for livestock feed or for movement

into normal market channels when corn prices justify this.

Officials said a year of experience with steel bin storage has shown that ear corn which has been stored at least a year in cribs before shelling, can be placed in steel bins and kept for a longer period without deterioration. Less than 0.4 of 1 per cent of the corn stored in steel bins a year ago has been removed from bins because of damage.

NEW DEFENSE COMMISSION APPOINTMENTS ANNOUNCED

Sidney Hillman, member of the national defense advisory commission in charge of the labor division, announced the following appointments to his staff: Channing R. Dooley, manager of industrial relations, Socony Vacuum Oil Co., New York, as director in charge of the program of training workers within industry; J. S. Dietz, personnel relations manager, Western Electric Co., New York, as assistant to Mr. Dooley.

CROWELL RE-ELECTED HEAD OF ORDNANCE ASSOCIATION

Brig. Gen. Benedict Crowell, special consultant to Secretary of War Henry L. Stimson, has been re-elected president, Army Ordnance association, according to an announcement by Col. C. E. McRae, chairman of the association's committee on elections. General Crowell was a founder of the association 21 years ago and since has served as its president continuously. He was director of munitions in the World war cabinet of President Wilson and was the assistant secretary of war under Newton D. Baker.

Elected vice presidents of the association were Col. William W. Coleman, chairman, Bucyrus-Erie Co., Milwaukee, formerly special assistant to the chief of ordnance, United States army; and Col. Frederick H. Payne of Greenfield, Mass., assistant secretary of war under President Hoover and now chief of the Hartford, Conn., ordnance district.

\$5,000,000 ARMS BILL APPROVED BY CONGRESS

Both houses last week gave approval to the "two-ocean" navy bill, carrying defense appropriations of more than \$5,000,000,000, and the measure went to the White House.

The bill provides funds to start work on approximately 200 warships, to build nearly 15,000 planes for the army and navy and \$517,000,000 for plant expansion to carry out the program.

Total defense commitments made during this session now exceed \$15,000,000,000.

Carboloy Makes Sixth Price Cut Since 1929; Standardizes Tools

■ CARBOLOY CO. INC., Detroit, last week announced a further price reduction, the sixth since 1929, on cemented carbide metals and other products including special tools and tool bits, dies and wear-resisting inserts. The reduction is made possible, the company said, as result of an expanded manufacturing program and economies resulting from greater production efficiencies in Carboloy's new million-dollar plant.

Company also announced mass production on a standardized line of cutting tools, designed to cover 80 to 90 per cent of all applications for cemented carbide tools. The simplified line includes five styles in three different grades. The mass production program, it was said, has made possible a price of \$1.85 for a typical standard tool which earlier would have cost \$5.84 in lots of one. The new tools now cost only 90 cents in quantities of 50 or more.

The new standardized tools will be carried in stock, ready for shipment, completely ground and ready for use.

Availability of standard Carboloy round hole dies for drawing sizes of bar and tubing up to 3½ inches in diameter, and improvements in construction in the larger series, R7 to R16, of standard drawing dies, also were announced.

Denies "Secret Covenants"

Commenting further on the indictment returned against the company by a federal grand jury in New York Aug. 30, charging violation of antitrust laws, W. G. Robbins, Carboloy president, said:

"The alleged claim that we have 'secret covenants' with Krupp's is completely ridiculous. The only 'secret covenants' Carboloy has entered into are with the United States government and they consist of a pledge not to reveal the results of work our company has been and is doing in building up national defenses . . .

"Krupp has no control whatsoever over either manufacture or distribution or prices of Carboloy metal or any other tungsten carbide produced in this country that we know of. This was specifically provided for in our license agreement . . .

"As to the question of possible shortage of tungsten carbide for national defense, Carboloy's new plant alone has a metal production capacity that can fill all conceivable industrial and defense demands—a capacity many times the present

consumption of all tungsten carbides by industry—and from sources of raw material owned by us in the United States."

FAVORS "ACTION TO REMOVE RESTRICTIONS"

L. Gerald Firth, president, Firth Sterling Steel Co., McKeesport, Pa., one of the three American producers of tungsten carbide cutting materials licensed by Carboloy, stated his company looks with favor on any action taken to remove the restrictions on the manufacture of these materials.

"In our opinion, the development and use of these hard metal compositions have been very much restricted as a result of the regulations imposed by license stipulations. Moreover, authorized American manufacturers have been restrained from exporting . . .

"One striking example of the effect of these regulations is found in the relatively small volume of tools made from these materials in this country as compared with the European consumption . . .

"The effect of this federal action," Mr. Firth said, "should result in the correction of a condition in the carbide industry which will permit greatly increased amounts of these materials as a vital commodity in the national defense program, to be used by arsenals and by other armament manufacturers."

No German Control of Magnesium Manufacture

■ Absolutely no restriction on the unlimited fabrication of magnesium metal into armaments for national defense or industrial purposes exists in the United States, says Wiser Brown, first vice president and general manager, American Magnesium Corp., New York.

Mr. Brown denied department of justice assertions that there is German control in this country of magnesium manufacture and fabrication through patents. He explained his company operates under American patents which, although formerly owned by a German company, now are wholly unrestricted.

Early Delivery Asked On TVA Power Equipment

□ Three large waterwheel generators costing more than \$1,200,000 have been ordered by the Tennessee

Valley authority from General Electric Co., Schenectady, N. Y., for the Cherokee dam powerhouse. Construction of the dam, located on the Holston river near Jefferson City, Tenn., is being rushed to provide power for new national defense industries. Generators will produce 100,000 kilovolt-amperes. Each rated 33,333 kilovolt-amperes, 13,800 volts, and 94.7 revolutions per minute, the units will be furnished with General Electric exciters and air coolers.

Allis-Chalmers Mfg. Co., Milwaukee, has been awarded contracts for one hydraulic turbine for the Pickwick Landing dam project and two hydraulic turbines and two generators for the Wilson dam project, aggregating \$1,660,000. Generators are 28,000 kilovolt-amperes, 13,800 volts at 100 revolutions per minute. Turbines are rated at 35,000 horsepower at 100 revolutions per minute. Earliest possible delivery has been asked by the government.

Electro Manganese Corp. Offers Research Prizes

■ Electro Manganese Corp., Minneapolis, has announced a second electro manganese research contest for graduate and undergraduate students. Three prizes of \$300, \$200 and \$100 will be awarded for the winning papers.

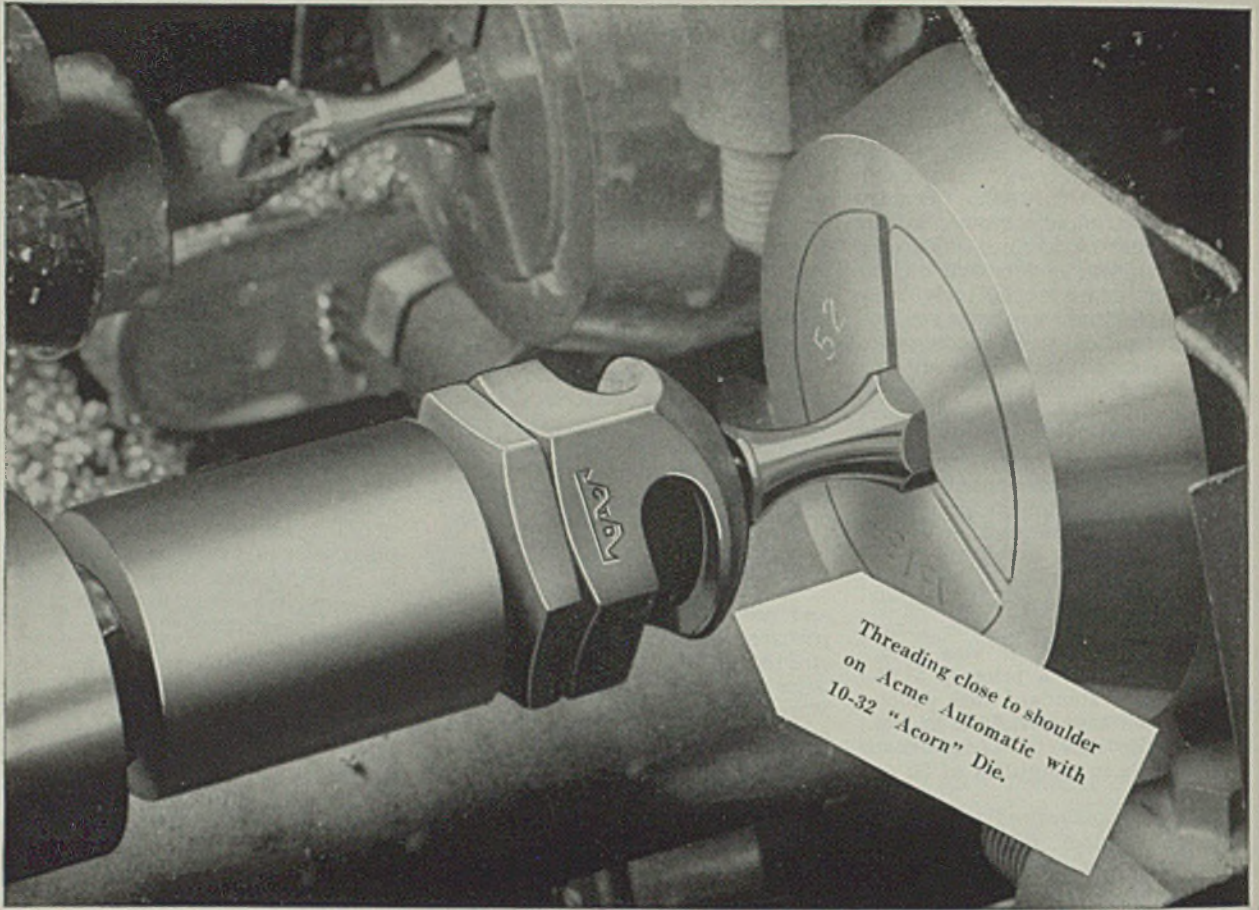
Company suggests the subjects of the research papers, which may be in the fields of metallurgy and metallography, chemistry, or physics, be submitted to the company as soon as possible in order that excessive duplication can be avoided. Contestants will be supplied with reasonable quantities of electro manganese without charge.

Papers should be submitted to the company's research department, 730 Rand Tower, Minneapolis, before July 1, 1941. Company's first research contest will be concluded Sept. 20.

Agreement Reached in Steckel Patent Suit

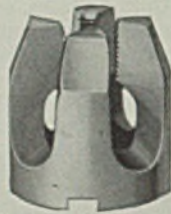
■ Carnegie-Illinois Steel Corp., Pittsburgh, last week announced settlement with the Cold Metal Process Co. of patent litigation pending in the federal courts involving the Steckel patents for equipment and processes for rolling in the cold reduction of steel products.

Agreement provides Carnegie-Illinois and other United States Steel Corp. subsidiaries are licensed to operate under the patents on a royalty basis. Equally favorable terms and royalties will be available to other steel companies.



MORE PRODUCTION with "ACORN" DIES

Every year more manufacturers turn to genuine "Acorn" Dies because of the way they handle jobs like this one. This 10-32 High Speed Steel "Acorn" Die on a multiple spindle automatic is threading safety razor handles. Sustained accuracy and ability to cut close to a shoulder are essential requirements. "Acorn" Dies fill the bill, to the tune of over 15,000 threaded parts per die! G. T. D. Greenfield was



the originator of the "Acorn" Die—the die with positive concentric adjustment. G. T. D. Greenfield engineers know how and where "Acorn" Dies can be most advantageously used. This picture shows how compact the "Acorn" Die is—shows how close to a shoulder it will cut. Remember, too, they operate equally well on fixed or live spindles. Ask your supply house or G. T. D. Greenfield for full data.

GREENFIELD TAP & DIE CORPORATION, Greenfield, Mass.

Detroit Plant: 2102 West Fort St. Warehouses in New York, Chicago, Los Angeles and San Francisco. In Canada: Greenfield Tap & Die Corp. of Canada, Ltd., Galt, Ont.



TAPS • DIES • GAGES • TWIST DRILLS • REAMERS • SCREW PLATES • PIPE TOOLS

Mirrors of MOTORDOM



By A. H. ALLEN
Detroit Editor, STEEL

General Motors' Model Integration Carried Further.

Manufacturers Overcoming Kinks in 1941 Production.

Stainless Steel Trim Used More Extensively.

Forging Steel Scoured by Blasting with Grit.

Inquiries for Armsmaking Equipment Increasing.

DETROIT

■ NOT readily discernible to the layman, yet quickly apparent to anyone who makes a practice of studying motor car designs closely, is the unusual job of integration which has been worked out among the General Motors divisions for 1941 models. It is a tribute to effective engineering, but most of all to co-ordination and correlation of the requirements of the different divisions.

There are two triumvirates which control 97 per cent of the car output of GM. They are known as the C-O-P group—Chevrolet, Olds and Pontiac—and the B-O-P group—Buick, Olds and Pontiac. Fisher, of course supplies bodies for all four makes, and it is in the body field where co-ordination of design has been worked out so neatly.

First, in the C-O-P group a body style was developed for Chevrolet, but the same body shell, with possibly minor revisions in a cowl stamping or some such similar part, is furnished to Olds for its 60 series and to Pontiac for its Torpedo deluxe series. Olds and Pontiac designers, however, effectively disguise the resemblance by using differently shaped fenders, incorporating some "speed lines" here and there, highlighting a body panel with stainless steel molding, or placing some ornamental trim here and there.

Olds and Pontiac further expand this small line for 1941 by offering either 6 or 8-cylinder power plants at a price differential of only \$25 to \$35.

Now, consider the B-O-P line.

Fisher this fall is introducing its new body style with fast back and concealed running boards and equal in width and roominess to the Torpedo body introduced last fall. This body is used on the Buick Special and Century series, the Olds 70 or Dynamic Cruiser, and the Pontiac Torpedo Streamliner. Again, minor embellishments and decorations differentiate the three separate makes, and again Pontiac and Olds offer either 6 or 8-cylinder engines.

Finally, last year's Torpedo body, made only in coupe and four-door sedan styles, is continued unchanged on the Buick Super and Roadmaster series, the Olds 90 or Custom Cruiser and the Pontiac Torpedo custom. New fenders, new trim, new moldings maintain the individuality of the three lines of cars.

Independents Emulate GM

This practice is nothing new to the motor industry but, like the new higher octane fuels available for motor cars this fall, bodies have been refined just a little further. The enviable position in which the plan places General Motors can be appreciated when it is realized how many different lines of cars it is possible to produce from what may be considered almost standard basic body dies and tools. By the same token, this co-ordination of manufacturing makes the battle of the independent manufacturers just a

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little tougher, just a little more hazardous.

The independents have had to combat this blanketing of the entire price field by attempting to do a little blanketing of their own and by emulating, in varying degrees, the new body styling introduced by GM a year ago. It remains to be seen whether the new body style introduced by GM this fall will come in for the same degree of emulation. Chances are it will not, because the new design does not boast any radical innovations. The so-called fast back has been used by Lincoln Zephyr, Chrysler lines, Nash and others before, though not accentuated as much as in the new Fisher treatment. Concealed running boards were introduced on the Zephyr two years ago, in fact were scorned by designer Henry Dreyfuss who dubbed the doors "club-footed."

Cadillac Output Small

No slighting of Cadillac was intended in this round-up of GM cars. Cadillac also used the Torpedo body last year, likely will continue it this year, as well as other body styles. Cadillac appears to be receding, however, in its relative position with other GM makes. In the first six months of this year, for example, Cadillac turned out 20,120 cars out of General Motors' total of 1,104,942, or 1.8 per cent. With additional emphasis being placed on Buick's Limited series this year, which is in competition with Cadillac, the latter is going to need some added sales promotion if it is to retain its share of the GM total.

General Motors in the first six months of this year captured 43.52 per cent of the industry's total output. Conceivably the corporation could push this figure to 50 per cent for the 1941 model year, a feat which no auto company has achieved since 1921 when Ford garnered 55.67 per cent of the 1,518,000 output total for that year. Never before or since has any manufacturer come close to this figure, although General Motors has had

as high as 44.84 per cent of the business in 1938.

Imminence of important defense contracts with General Motors Corp., is said to have led to the resignation of W. S. Knudsen, president. He also resigned as a member of the board of directors and of the policy and administration committees. No action has been taken with regard to his successor.

C. L. McCuen, vice president, has been elected a member of the administration committee, and Harley J. Earl, director of the styling section, has been elected a vice president of the corporation.

■ PRODUCTION delays and troubles have been more numerous in the past few weeks than has been the case in other years. Plymouth and Dodge have been beset by kinks in scheduling and in assembly operations. Plymouth because of its new system of body and chassis assembly instituted this year. Congestion of new cars requiring minor touching up before receiving OK tags and delays in receiving certain parts have resulted in complete shutdowns on two occasions.

Last week Pontiac assembly line was shut down because of shortage of bodies from the Fisher plant in Pontiac, and the Fisher body lines were compelled to shut down on three different occasions because of "the accumulation of an excessive number of bodies requiring repairs and reworking of operations resulting from the failure of employees in the trim and final assembly departments to perform their operations correctly," according to the plant manager.

This immediately led to reports of another "slowdown" by union employees which was emphatically denied by Walter P. Reuther, GM division director for the UAW-CIO, who said, "This is the sort of thing that every body plant experiences during the start of a new production season. Certain bottlenecks always appear due to lack of stock or engineering difficulties. A number of timing standards are in dispute but they have nothing to do with the corporation's difficulties in getting production started properly."

Pontiac schedules called for around 3800 cars in four working days. Meanwhile Buick was turning out about 5000 units, Olds 3000. Plymouth was the only one of the Chrysler divisions to produce in any volume, turning out around 3000 cars.

This week will see three more previews of new models—Chevrolet on Tuesday, Ford on Wednesday, and Chrysler-Dodge-DeSoto on

Thursday. This about winds up the preview season with the exception of Packard on the sixteenth. Packard situation is a strange one, inasmuch as the company was the first to complete tool and die work on new models, yet the last to display new cars to the press and to dealers.

Plymouth models for 1941 have engine horsepower stepped up to 87 and torque increased over the entire speed range. Booster-type gearshift is optional equipment. A new wheel design is claimed to re-

chamber concentric with the oil inlet tube. Around the settling chamber is an inverted cup and between the cup and the settling chamber is a cylindrical screen. Oil passes first through the screen and then enters the inlet pipe, being drawn upward against the bottom of the inverted cup. This changes direction of the stream and causes it to flow downward around the outside of the inlet pipe to a flat baffle. The latter again changes the direction of flow and throws out dirt particles into settling chamber.

Engineers in the new Olds forge shop in Lansing continue their experiments with new forging techniques. One development which may prove to be of practical importance is the cleaning of heated stock before forging by means of blasting with grit. It has been found possible to scour off scale from the hot steel by this means, but there is danger of the abrasive becoming imbedded in the steel which of course would spoil the forging. However, by carefully grading the size of the abrasive, using only larger and well rounded particles, and by slowing down the speed of the wheel which throws the abrasive against the stock, sticking can be overcome.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1938	1939	1940
Jan.	226,932	356,692	449,492
Feb.	202,597	317,520	422,225
March....	238,447	389,495	440,232
April....	237,929	354,266	452,433
May....	210,174	313,248	412,492
June....	189,402	324,253	362,568
July....	150,450	218,494	246,171
7 mos....	1,455,951	2,274,348	2,785,611
Aug.	96,946	103,343	.....
Sept.	89,623	192,678	.....
Oct.	215,286	324,688	.....
Nov.	390,405	368,541	.....
Dec.	406,960	469,120	.....
Year....	2,655,171	3,732,608	.....

Estimated by Ward's Reports

Week ended:	1940	1939†
Aug. 10	11,635	26,125
Aug. 17	20,475	15,705
Aug. 24	23,732	18,365
Aug. 31	27,645	25,240
Sept. 7	39,665	26,865

†Comparable week.

duce hazard of blowout or puncture, a completely flat tire giving the same driving effect as a tire inflated to 10 pounds pressure on a standard wheel.

Bodies are better sealed against dust, water, heat and noise. Rear spring leaves of Amola steel are grooved for softer spring action. Hood is of one-piece construction, controlled from an inside lock. Oil bath air cleaner is standard equipment. Front doors open wider and have a check strap to hold the door in the open position if desired.

Second gear ratio in the transmission has been increased, permitting two-speed shifting under normal driving conditions.

Built-in oil cleaner which cleans 100 per cent of the engine oil before it goes through the pump and into bearings is standard on Pontiac engines for the next year. The cleaner is built into the engine and never has to be removed and serviced. Located at the inlet to the oil system in the bottom of the crankcase, the cleaner comprises a settling

More Stainless Steel

Stainless steel moldings really have come into their own on the 1941 models; in fact, there has been a generous increase in the amount of stainless steel strip for trim, decorative effects, louvres and other body accoutrements. Belt moldings generally are about twice as wide as last year and in some cases are given a flash chrome plate to insure a perfect match with other chrome plated trim. The idea of chrome plating stainless steel may sound like gilding the lily, but it is true that stainless does not match too well with chromium plating, but has the advantage of being a hard, resistant material which stands up better in moldings than brass or mild steel strip.

Preliminary activity on armament programs in this area is building up gradually but steadily. Inquiries for large volumes of equipment are out for the Chrysler tank plant, and the Ford and Packard engine plants. Addition to the Saginaw Steering Gear plant for mass production of machine guns is contemplated.

■ Stainless steel plaque for "the most beautiful movable bridge built in 1939" was unveiled Sept. 4 on the Second avenue bridge, Alpena, Mich., by the American Institute of Steel Construction, New York. The bridge was fabricated and erected by R. C. Mahon Co., Detroit.

6th Carboloy Announces PRICE REDUCTION!

Plus New "Universal" Standard Tools For 80% of all Turning, Boring, Facing Jobs

Since the year when Carboloy tools were first introduced it has been the expressed aim of Carboloy Company to pass on to industry savings resulting from increased consumption and manufacturing efficiencies. As a tangible result of this policy, five major price reductions were put into effect between 1929 and 1939.

For a number of years, however, we have realized that if our ultimate goal of reducing the price of Carboloy cutting tools to a level that would make them available for the widest possible use, mass production methods of manufacture, through greater standardization, would have to be effected.

Towards this end one of our major activities has been to determine the minimum number of grades and the simplest line of tools that would be applicable to a substantial majority of carbide tool applications.

New \$1,000,000 Plant Part of Program

Concurrent with this we inaugurated a long range program of manufacturing development to establish maximum efficiency for standardized production. This culminated in the expenditure of a million dollars on a new plant and equipment completed last spring, having a production capacity of ten times the amount of cemented carbide then consumed by industry, with provisions for expanding metal production to many times that amount.

Mass Production of Standard Tools Now Possible

Today we are happy to announce that this program has been completed. One of the outstanding results of this program now made available to industry is a line of standardized tools at prices that would have seemed beyond the realm of possibility only a few years ago. Indicative of the extent to which standardization has been developed is the fact that these tools—covering 80 per cent of all carbide tool requirements—comprise but five styles in only three grades—two for cast iron, and one for steel.

General Price Reduction on Carboloy Metal

A further result of this standardization program is that—because of the anticipated wider scale use of carbide tools—the cost of producing basic cemented carbides can be reduced to such an extent that we are able to announce the sixth general price reduction on carbide metals. This affects special tools, dies for working wire, bar, tubing and sheet metal, Carboloy wear-resistant inserts, etc., in proportion to the amount of Carboloy metal used in each product.

CARBOLOY COMPANY, INC., DETROIT, MICH.

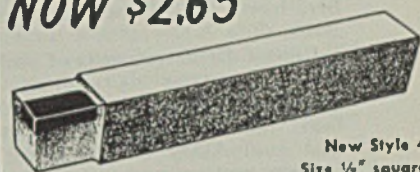
CHICAGO • CLEVELAND • NEWARK • PHILADELPHIA • PITTSBURGH • WORCESTER, MASS.

Canadian Distributor: Canadian General Electric Company, Ltd., Toronto

✓ Check These NEW
Standard Tool Prices Against
Any Other Cutting Alloy!

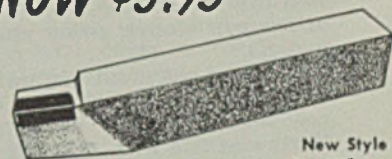
(Three styles illustrated)

~~\$6.82~~
NOW \$2.65



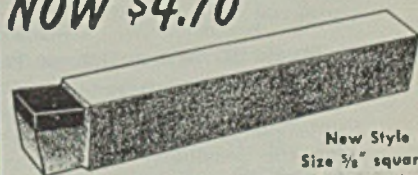
New Style 4
Size 1/4" square
(1/8 x 3/16 x 3/8 Carboloy Tip)

~~\$8.66~~
NOW \$3.95



New Style 13
Size 3/8" square
(1/16 x 3/8 x 3/8 Carboloy Tip)

~~\$9.58~~
NOW \$4.70



New Style
Size 1/2" square
(1/16 x 3/8 x 3/8 Carboloy Tip)

ALL TOOLS GROUND READY FOR
USE (STEEL CUTTING TOOLS INCLUDE
GROUND-IN CHIP BREAKER)

Write for New Price Sheets

CARBOLOY

TUNGSTEN CARBIDE
TITANIUM CARBIDE
TANTALUM CARBIDE

Urge Industrial Development of Northwest as Aid to Defense

WASHINGTON

■ **ADVANTAGES** accruing to speedy and adequate defense of the Pacific coast and United States' Pacific possessions through establishment of basic industries in the Northwest were emphasized in a report recently submitted to the national defense advisory commission.

Prepared by Paul J. Raver, Bonneville power administrator, the report was submitted by Harold L. Ickes, secretary of the interior. It points out the advisability of decentralizing defense industries and refers to natural and power resources readily available. Edward R. Stettinius Jr., defense commissioner, and Gano Dunn, commission member, have studied its recommendations.

Report discusses needs of such defense industries as aircraft, ordnance, munitions and shipbuilding; basic industries essential to these, and availability of Northwest resources and raw materials. According to Mr. Raver, "High grade iron and alloy steels, ferroalloys, electrolytic magnesium, nitrates and military explosives, calcium carbide and its derivatives, chlorine and chlorates are materials the Northwest can produce due to availability of low cost electric power and raw materials."

It further points out that owing to low-cost Columbia river power, three new industries have come to the Northwest this year. These include Aluminum Co. of America, whose Vancouver, Wash., plant starts production of pig aluminum this month; Pacific Carbide and Alloys Co., expected to manufacture calcium carbide this year; and Sierra Iron Co., which will produce pig iron from regional ores.

Would Strengthen Defense Plan

"Industries have entered preliminary discussions with the Bonneville power administration indicating the possibility that production of ferrochrome, magnesium, chlorates and high grade and alloy steels may be initiated in the near future," said Mr. Raver. "Aluminum from Northwest raw materials is also likely to be produced in the next few months. All these active industrial prospects fall in the fields of electrochemistry and electrometallurgy, fields that ordinarily would be expected to develop in the Northwest because of the great importance to them of cheap power and the availability of minerals."

In calling attention to necessity

for advance expansion of the Bonneville-Coulee power network facilities, Mr. Raver pointed out industrial development in the Northwest would be of major assistance in strengthening the nation's defense position. Outlining the situation, the report said:

"In appraising possible contributions of the Northwest, an important fact must be noted about the present location of the war industries of the nation. Most of them lie in the northeastern states east of the Mississippi, occupying 13 per cent of the land area of the country. In contrast, the 11 western states, covering 40 per cent of the land area, are not equipped with industries to provide adequately for defense of the Pacific coast and Pacific possessions, nor with industries to supplement, when necessary, production of eastern plants for defense of Atlantic outposts.

"These western states lack munitions and ordnance plants. They have only some shipbuilding and aircraft manufacturing facilities; but even for these industries the West

"Use Present Capacity Before Building Plants Elsewhere"

■ **PRODUCTION** facilities in established industrial areas should be utilized fully before the federal government spends more money to buy new defense plants in other districts. This opinion has been expressed by the Pittsburgh Industrial commission in a letter to William S. Knudsen, member of the national defense advisory commission.

Commenting on the proposal by congressmen to "drive by political pressure" government defense plants into nine midwestern states, Charles E. Robinson, acting manager of the Pittsburgh commission, said:

"Production facilities, where political pressure has not been a factor, have in overwhelming numbers selected a location in the relatively small area east of the Mississippi and north of the Ohio rivers. The 14 states in this area account for almost 62,000,000 or nearly 48 per cent of the population of the United States.

"In these 14 states are located 102,000 manufacturing concerns, or ap-

proximately 62 per cent of the total in the United States.

proximately 62 per cent of the total in the United States. "These circumstances do not contribute to the speedy and most effective defense of the United States and its possessions. Products of western mines, vital to war industries in the East—copper, lead, zinc, mercury, tungsten, molybdenum, etc.—have to move east 2000 miles for processing and fabrication.

"Part of this obviously has to return 3000 to 6000 miles in the form of materials and supplies for defense outposts of the Pacific coast, Alaska and Hawaii. These movements take time and transportation costs, and burden railroads and ships. Some could be eliminated . . .

"It is not widely known that power projects at Bonneville and Grand Coulee will provide, by July, 1942, over 600,000 kilowatts of capacity. In addition, total ultimate installations of both projects that can be expedited according to the nation's needs amount to over 2,400,000 kilowatts capacity. Here is an enormous reservoir of low-cost power awaiting the nation's command to serve whatever uses may be dictated by the interests of national defense. The nation should therefore be concerned with an appraisal of how it may best make use of what the Northwest can offer."

proximately 62 per cent of the total in the United States.

"Their products are valued at \$42,000,000,000, or 69 per cent of the total valuation of all products manufactured in the United States. . . . In these 14 states live 6,000,000 wage earners who receive annually in excess of \$7,500,000,000, or 75 per cent of all the wages paid in manufacturing industries in the United States.

"Taxes paid by corporations and individuals in these 14 states exceeded \$1,697,000,000, or nearly 70 per cent of the total, last year.

"Within this area, the fundamental requirements for low-cost production are located, i.e. raw materials, markets, trained labor, capital and managerial intelligence. . . ."

The Pittsburgh industrial district, comprising only five counties, Mr. Robinson said, produces manufactured goods of greater value than any one of the nine midwestern states mentioned and greater than the total produced in North and South Dakota, Nebraska, Kansas,

Arkansas and Oklahoma. Other comparisons of industrial statistics are similar.

"These facts indicate clearly," Mr. Robinson concluded, "that a satisfactory prosecution of the national defense program might well lie in having each man, each district and each state do that for which it is best suited, whether it be the raising of foodstuffs, mining, or production of airplanes, tanks or guns."

The Pittsburgh commission and the industrial development division, Emergency Committee of the Pittsburgh District, are jointly conducting a survey of the district's existing manufacturing facilities capable of participating in the defense program. Manufacturers are being questioned as to plant capacities, type of work done, available equipment, working conditions and expansion possibilities.

Sponsors of the survey "feel certain existing plant facilities here have nowhere near reached their capacities yet. It would be the height of folly to think about building more plants as long as this condition prevails."

Applications for mortgage insurance on homes to be built under FHA inspection totaled 4904 in the week ended Aug. 24, exceeding by 60 per cent the corresponding week in 1939.

FINANCIAL

KEYSTONE STEEL'S FISCAL YEAR NET TOTALS \$1,418,221

Keystone Steel & Wire Co., Peoria, Ill., reports net profit for fiscal year ended June 30 was \$1,418,221 after depreciation, interest, federal income taxes and all other charges. This was equal to \$1.87 per capital share, and compared with net income of \$897,299 or \$1.18 per share in the preceding year.

Earnings in the last fiscal year were second largest in the company's history, exceeded only in 1936, when net income totaled \$1,501,493. Net sales, however, were greater last year, aggregating \$13,279,520, against \$10,598,645 in 1936. Dollar sales for the period were 20 per cent greater than the preceding year's \$11,040,319.

Sales totaled 241,139 net tons, a 16.2 per cent gain over 207,669 tons in year ended June 30, 1939.

Keystone's profit-sharing plan has resulted in distribution of \$240,723 among its employees in past four years. This was equal to 5.7 per cent of the company's total net profit for the period. In last fiscal year \$112,308 accumulated under the plan and was distributed among 1630 eligible employees. Flat participation of 6 per cent in all net profit

made on sales of Keystone products, exclusive of subsidiaries, is provided in a new plan, effective July 1, 1940.

Total payroll in last fiscal year, profit-sharing and vacation pay excluded, was \$2,632,122, against \$2,556,687 in preceding year. Employees totaled an average of 1462, against 1294.

Taxes accrued in the period totaled \$544,857, compared with \$410,448 in fiscal year ended June 30, 1939.

MONARCH MACHINE TOOL PLANS STOCK ISSUE

Directors of Monarch Machine Tool Co., Sidney, O., recently voted to increase the total of authorized no par shares from 200,000 to 250,000. Special shareholders' meeting has been called for Sept. 10 to act on the proposal.

Wendell E. Whipp, president, last week declared the action was contemplated that the number of outstanding shares might more nearly reflect Monarch's large plant and equipment extensions. The company recently completed a 20,000-square foot addition, its sixth plant expansion in six years.

"If the shareholders approve the increase," declared Mr. Whipp, "60,000 of the then unissued shares would be used to present stockholders 0.4 per cent of a new share for each share held of record at the close of business on Sept. 20. The company would then have 216,000 shares issued and outstanding, of which 6000 shares are held in the company treasury, with 34,000 shares authorized but unissued."

DIVIDENDS DECLARED

Allegheny Ludlum Steel Corp., Pittsburgh, 25 cents per share on common, payable Oct. 1 to record of Sept. 11.

Sharon Steel Corp., Sharon, Pa., regular quarterly of \$1.25 per share on the company's \$5 preferred, payable Oct. 1 to record of Sept. 20.

M. A. Hanna Co., Cleveland, 30 cents per share on common, payable Sept. 13 to record of Sept. 7. This will make a total of 70 cents per common share paid this year. Company's directors likewise declared the usual quarterly of \$1.25 per share on \$5 cumulative preferred, payable Dec. 1 to record of Nov. 15.

Production of brass and aluminum alloy castings by a new process, said to give much greater accuracy and a better finish, reducing the amount of finish machining necessary, will be started in December by Briggs Mfg. Co., Detroit, in a remodeled plant at 12825 Taft avenue, Cleveland.

Steel Consumers' Earnings Statements

AGGREGATE first half net income reported by 232 iron and steel consumers totaled \$198,567,388, compared with \$102,010,445 earned by the same companies in corresponding period last year. Increase was 94.6 per cent. Only 16 companies incurred a loss for the six months, while 46 reported deficits in first half, 1939. Prior tabulations in STEEL (July 22, p. 29; July 29, p. 14; Aug. 12, p. 41; Aug. 19, p. 40 and Aug. 26, p. 33) listed 205 companies; the following includes 27. All figures are net earnings except where asterisk denotes loss:

	Second 1940 Quarter	Second 1939 Quarter	First 1940 Half	First 1939 Half
Aero Supply Mfg. Co. Inc., Corry, Pa.	\$	\$	\$281,142	\$48,233
Alloy Cast Steel Co., Marion, O.			16,372	27,068
American Bosch Corp., Springfield, Mass.	212,900	15,752*	383,651	49,058
American Safety Razor Corp., Brooklyn, N. Y.	76,375	219,800	212,447	426,473
Pullard Co., Bridgeport, Conn.			1,200,810	43,992
Callite Tungsten Corp., Union City, N. J.			102,787	14,715
Chicago Flexible Shaft Co., Chicago (a)	161,372	317,174	478,546	413,339
Continental Cushion Spring Co., Chicago	6,084	2,968	6,913	4,786
Foster-Wheeler Corp., New York			354,876	135,154*
Fuller Mfg. Co., Kalamazoo, Mich.	\$1,390	60,479	168,650	102,268
Fyr-Fyter Co., Dayton, O.			11,639	12,111
Graham-Paige Motors Corp., Detroit	225,810*	954,320*	546,652*	716,342*
Hayes Mfg. Corp., Grand Rapids, Mich.	58,162*	66,788*	138,125*†	162,115*†
Howard Aircraft Corp., Chicago			73,191*	19,752*
Industrial Brownhoist Corp., Bay City, Mich.	109,295	32,485	160,726	253
Jaeger Machine Co., Columbus, O.			166,282	298,833
Lockheed Aircraft Corp., Burbank, Calif.			2,022,619	508,860
Pantex Pressing Machine Inc., Central Falls, R. I.			30,624	46,120
Roney-Bowes Postage Meter Co., Stamford, Conn.	134,850	133,731	238,926†	246,576†
Reynolds Spring Co., Jackson, Mich.	269,644	42,688	501,895	114,388*
Sheller Mfg. Corp., Portland, Ind.			114,675	142,078
Sparks-Withington Co., Jackson, Mich.			70,593**	70,658**
Sperry Corp., New York			4,028,294	2,469,576
Starrett (L. S.) Co., Athol, Mass.			500,090	226,482†
Timken Roller Bearing Co., Canton, O.	2,109,028	1,514,977	4,966,546	3,422,970
Warren Foundry & Pipe Co., Phillipsburg, N. J.			201,630	184,081
Weston Electrical Instrument Corp., Newark, N. J.	217,776	100,920	501,896	153,726

* Loss; † indicated; ‡ period ended May 31; † net before federal income taxes; (a) period ended June 15.

Activities of Steel Users, Makers

■ AN INDIANA charter has been granted to L&J Press Corp., which has taken over the Loshbough-Jordan Tool & Machine Co., Elkhart, Ind. Principals of the new corporation are J. M. Hartgering and D. R. Grossman, of Detroit. The past 20 years Mr. Hartgering has operated a consulting engineering business in Detroit, while Mr. Grossman was for 13 years general manager of Studebaker Corp. of Canada Ltd., Windsor, Ont.

John's Engineering Co., Cleveland, has moved to new quarters at 4017 Payne avenue.

Granite City Steel Co., Granite City, Ill., has moved its western district office to 1016 Baltimore avenue, Kansas City, Mo.

Ekstrand & Theland Inc., New York, have been appointed selling agents in the United States and Canada by Metal Hydrides Inc., Beverly, Mass., for its line of alloy powders.

Engineering Service Inc., manufacturer of tool grinders, attachments and other precision tools, has moved from 12005 Linwood avenue, Detroit, to 6303 Pacific boulevard, Huntington Park, Calif.

Chain Belt Co., Milwaukee, has moved its Minneapolis office from 803 LaSalle avenue to larger quarters at 1645 Hennepin avenue. R. X. Raymond, associated with Chain Belt over 20 years, is Minneapolis district manager.

Wayne Davies Packings Inc., Chicago, recently organized, is now in production on its new reinforced hydraulic "U" packing, which can be furnished in section sizes from 1/2 to 3/4-inches, inclusive, for any plunger diameter from 9 to 90 inches. Equipment is being installed for manufacturing all section sizes from 1/4 to 1 3/4-inches.

Harnischfeger Corp., Milwaukee, has appointed Columbia Supply Co., Columbia, S. C., exclusive agent for its line of P&H welders and electrodes. Columbia will operate under supervision of Harnischfeger's Washington office.

Orders for two gas-driven turbines, the first to be built for sale, have been received by General Electric Co., Schenectady, N. Y. One unit will be used by a California

oil refinery, and the other by a Texas refinery.

Salem Engineering Co., Salem, O., has been awarded contract for carburizing furnace equipment to be installed at the Berwick, Pa., plant of American Car & Foundry Co.

Foxboro Co., Foxboro, Mass., has appointed firm of Bumstead-Woolford as exclusive sales representative in the Oregon and Washington territory. Recently formed by Dale Bumstead and O. H. Woolford, the new company has established headquarters at 1411 Fourth avenue, Seattle, and has also taken over the former Foxboro office at Portland, Oreg.

Ferro Enamel Corp., Cleveland, will erect an addition to its color oxide plant which will double present floor space and more than double output. The company's industrial oven division also has been expanded to offer a complete line of ovens and finish production equipment.

Kirk & Blum Mfg. Co., Cincinnati, manufacturer of dust control, ventilating and cooling systems, and drying and baking ovens, is now celebrating its thirty-third anniversary. Organized in 1907, the company now occupies a plant comprising two acres of floor space, and employs over 200 workers.

Wm. G. Wetherall, iron and steel warehouse firm, has completed erection of a brick warehouse at 303-305 President street, Baltimore, adjoining its present warehouse.

Roots-Connersville Blower Corp., Connersville, Ind., announces sale, effective Sept. 1, of its turbine pump business, consisting of water systems, condensate units and turbine pumps for general industrial applications, to the Sterling Pump Corp., Hamilton, O., which will hereafter manufacture and sell this line of pumps under its name.

Pratt & Whitney Aircraft division of United Aircraft Corp., East Hartford, Conn., celebrated its fifteenth anniversary Aug. 1. In 1925, F. B. Rentschler, D. L. Brown and G. J. Mead pioneered in the design and construction of a 400-horsepower radial air-cooled aircraft engine for the United States navy's bureau of aeronautics. Employing 25 persons, they began work in an idle building

of the Pratt & Whitney machine tool plant in Hartford, and by December that year their engine, the first of the "Wasp" series, had been completed and passed the navy acceptance tests. The present plant covers more than 1,250,000 square feet in area and employs over 10,000 workers.

George Birkenstein, president, George Birkenstein Corp., Chicago, nonferrous metal interest, has purchased the Anker-Holth Mfg. Co., Port Huron, Mich., and its wholly owned subsidiary, Anker-Holth Co. Ltd., Sarnia, Ont. The company has manufactured cream separators, milking machines, patented hose reels and sprinkler nozzles for 36 years. Materials purchased for manufacture include steel sheets, steel castings, stainless steel, and brass rods, forgings and castings. Operation of the newly acquired plant will not interfere with the Birkenstein nonferrous business of which Mr. Birkenstein will continue as president.

Died:

■ GEORGE A. DARBY, 75, for 25 years chief engineer, Orange Roller Bearing Co., Orange, N. J., in Fanwood, N. J., Aug. 31. He was a member, Society of Automotive Engineers.

Alfred E. Wiener, 73, formerly a professor of electrical and mechanical engineering at Union college, Schenectady, N. Y., and for 20 years an employe of American Machine & Foundry Co., Brooklyn, N. Y., Aug. 29, in that city. He had been chief instructor, American Institute of Electrical Engineers, New York.

Richard McCulloch, 71, St. Louis, public utilities operator, Aug. 28 in Milwaukee. He was a leader in the development of electric lines in St. Louis, Chicago, France and Switzerland. Until 1904, he was chief engineer, Chicago city railway.

William F. Lyon, 72, president, Kay Machinery Co., Cleveland, Aug. 27, in that city. He organized the Kay company about 15 years ago.

George N. Van Sweringen, 65, vice president, Chicago Railway Equipment Co., Sept. 3 at his home in Evanston, Ill. He had been with the company 31 years.

William Stevens Buttles, 42, a development engineer specializing in metallurgy, Sept. 2, in Chicago.

MEETINGS

NATIONAL SAFETY CONGRESS HAS DIVERSIFIED PROGRAM

■ OVER 160 sessions will be held during the five-day congress and exposition of the National Safety Council, Stevens hotel, Chicago, Oct. 7-11. Industrial and public safety equipment will be staged in Exhibition hall, lower level of the hotel.

Principal speaker at the luncheon of the metals section Tuesday noon will be E. T. Weir, chairman, National Steel Corp., Pittsburgh. At the afternoon session L. C. Wilson, general manager, Reading Steel Casting division, American Chain & Cable Co., Reading, Pa., will speak on "Maintaining Safety Interest in the Small Plant" and P. E. Rentschler, president, Hamilton Foundry & Machine Co., Hamilton, O., on "How To Build a Safety Program for the Small Foundry."

MINING GEOLOGISTS TO VIEW UTAH DISTRICTS FROM AIR

A feature of the one hundred and fifty-third meeting of American

Institute of Mining and Metallurgical Engineers, Salt Lake City, Utah, Sept. 10-13, will be a number of trips over the Utah mining districts in 21-passenger mainliner planes. Two important papers dealing with production of molybdenum, and another on "Future of the Lead-Zinc Industry", by C. H. Crane, president, St. Joseph Lead Co., will be presented.

LIGHTING CONFERENCE TO REVIEW LAMP PROGRESS

An editorial lighting conference will be held at the GE institute, Nela Park, Cleveland, Sept. 30. Recent advances in lamp development and lighting research will be discussed by research engineers. Topics will deal with a panorama of lamps and lighting, and various types of lighting such as office, industrial, store, school, and home lighting and wiring. Business perspectives will be presented by Dr. Zay Jeffries. C. W. Maedje will be chairman.

EQUIPMENT MAKERS TO STUDY DEFENSE PROGRAM

Questions to be considered at the annual meeting of the Foundry

Equipment Manufacturers association, at the Homestead, Hot Springs, Va., Oct. 25-26, include relationship of equipment manufacturers to the country's defense program, taxes, amortization, etc. A feature will be individual executive reports on present and future business.

Convention Calendar

Sept. 9-13—American Chemical society. Hundredth national meeting in Detroit. Charles L. Parsons, 728 Mills building, Washington, is secretary.

Sept. 10-13—American Institute of Mining and Metallurgical Engineers. One hundred and fifty-third meeting, Hotel Utah, Salt Lake City, Utah. A. B. Parsons, 29 W. 39th street, New York, is secretary.

Sept. 12—Gray Iron Founders' society. Annual meeting at Hotel Cleveland, Cleveland. W. W. Rose, 1010 Public Square building, Cleveland, is executive vice president.

Sept. 16-19—American Mining congress. Seventh annual metal mining convention and exposition, Colorado Springs, Colo. Julian D. Conover, 209 Munsey building, Washington, is secretary.

Sept. 18—University of Pennsylvania. Symposium on "Development of Metal as a Structural Element in Architecture," at the university, Philadelphia.

Sept. 18-20—National Industrial Advertisers association. Eighteenth annual conference at Hotel Staller, Detroit. Mildred R. Webster, 100 East Ohio street, Chicago, is secretary.

Sept. 19-20—Concrete Reinforcing Steel Institute. Semi-annual meeting at Skytop Lodge, Skytop, Pa. H. C. Delzell, 2257 Builders building, Chicago, is executive secretary.

Sept. 20 — Chicago section, American Ceramic society, and Department of Ceramic Engineering, University of Illinois. Symposium on acid, basic and neutral refractories at auditorium, Civic Opera building, Chicago.

Sept. 24-25—Society of Automotive Engineers. National tractor meeting at Schroeder hotel, Milwaukee. John A. C. Warner, 29 West Thirty-ninth street, New York, is general manager.

Sept. 24-27—Association of Iron and Steel Engineers. Thirty-sixth convention and exposition at Stevens hotel, Chicago. Brent Wiley, 1010 Empire building, Pittsburgh, is managing director.

Sept. 26-29—National Association of Foremen. Seventeenth annual convention at Hotel Gibson, Cincinnati. H. G. Evans, Goodyear Tire & Rubber Co., Akron, O., is secretary.

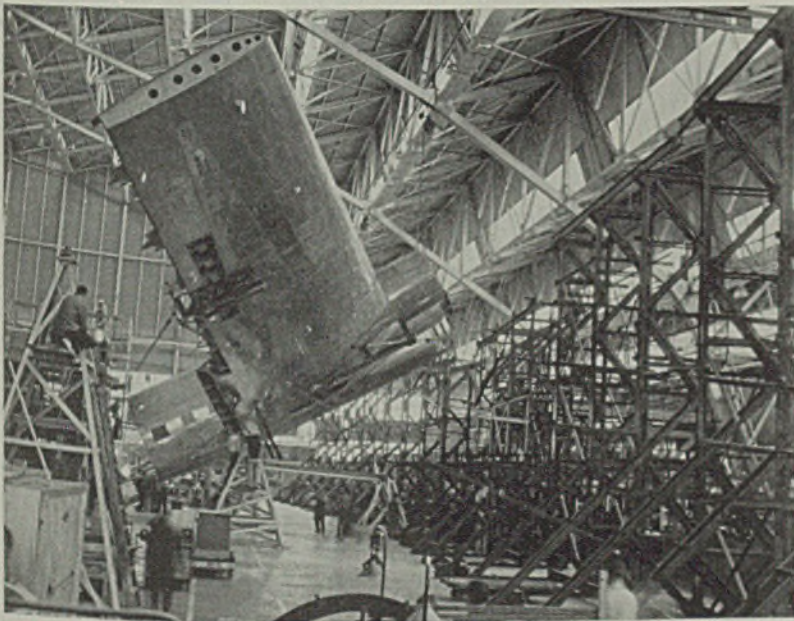
Sept. 30-Oct. 1 — National Lubricating Grease Institute. Eighth annual convention at Stevens hotel, Chicago. George W. Miller, 498 Winspear avenue, Buffalo, is executive secretary.

Oct. 2-5 — Electrochemical Society Inc. Seventy-eighth general convention at Chateau Laurier, Ottawa, Canada. Dr. Colin G. Pink, 3000 Broadway, New York, is secretary.

Oct. 7-11 — National Safety Council. Twenty-ninth national safety congress and exposition at Stevens hotel, Chicago. W. H. Cameron, 20 N. Wacker Drive, Chicago, is managing director.

Oct. 8 — Army Ordnance association. Twenty-first annual meeting at the Waldorf-Astoria hotel, New York.

"Largest Jig for Largest Bomber"



■ To assemble its new 70-ton B-19 army bomber, Douglas Aircraft Co., Santa Monica, Calif., designed what is claimed to be the largest steel jig ever used in the aircraft industry. Two of the four sections are shown in the accompanying photograph just after the wing and forward fuselage section of the plane was removed. Complete jig is 200 feet long, 48 feet high and weighs 105,000 pounds. Douglas uses standard-

ized shapes and salvages about 90 per cent of the members from discarded jigs.

The bomber for which the jig was built measures more than 210 feet from wing tip to wing tip, will be powered by four 2000-horsepower Wright Duplex engines. Scheduled for ground tests within the next several weeks, the plane will have a range of more than 7000 miles and a load capacity of 56,000 pounds.

One Bad Egg Spoils the Omelet

■ WHO is to blame for the delay in setting up national defense on a volume production basis? It was to be expected that this question, sooner or later, would be widely asked. It now is being asked—and answered.

Most of those who undertake to answer the question—including the President—place the blame on congress for its failure to act promptly on the draft and tax bills and on requests for additional defense appropriations.

Army and naval procurement officers made it quite plain, in testifying before congressional committees, that a large number of contracts have failed of placement because of uncertainty on the part of the manufacturers as to where they would stand if they accepted them.

Blame for the Delay Is Beginning To Be Placed on Industry

While congress received most of the blame, some of it recently began to be directed at industry. For example, Senator Walsh said that the defense airplane program was being held up by subcontractors who refused to take orders for parts for American airplanes because on such business they would make considerably less profit than they now are making on parts for British planes. He proposed that the President be given authority to take over these plants if a real emergency develops.

Later, on the President's inquiry, William S. Knudsen reported that he had not yet seen any evidence of delays from this cause. However, other accusations of the same general tenor have emanated from other quarters and recently the column of Raymond Clapper, Washington commentator, had this to say:

"There is a suspicious amount of haggling going on by industry over defense contracts with the danger that it will provoke

the administration into a drive for greater control over industry in the interest of the national defense. . . . It isn't all industry that is causing the trouble. It never is. It is that some are jeopardizing all of the others. . . . The most dangerous thing for our system of free enterprise now would be for business to allow itself to be blamed by this administration for a breakdown in defense preparations."

Favorable Publicity Should Be Sought In Connection with Defense Program

This warning is one that should not go unheeded by industry. This is no time to invite accusations that industry puts dollars ahead of patriotism. The wise manufacturer will do all that he can to aid the national defense program. He will accept contracts for defense equipment with the minimum amount of delay, when it is possible for him to do so. When he finds that acceptance of a contract might lead him into an undesirable or dangerous situation, he should resort to publicity so that the public will have a proper understanding. At the least he should inform his representatives in congress as to the reasons why he cannot accept an order. Such action, will be doubly necessary if the house concurs in the senate's enactment authorizing the President to conscript manufacturing plants.

American industry should bend every effort to encourage and generate favorable publicity for itself in connection with the national defense program. First, however, every individual unit in industry must make sure that it has no "skeleton in the closet" to be embarrassingly revealed in the strong glare of this defense program publicity.

EC Kreutzberg

The BUSINESS TREND



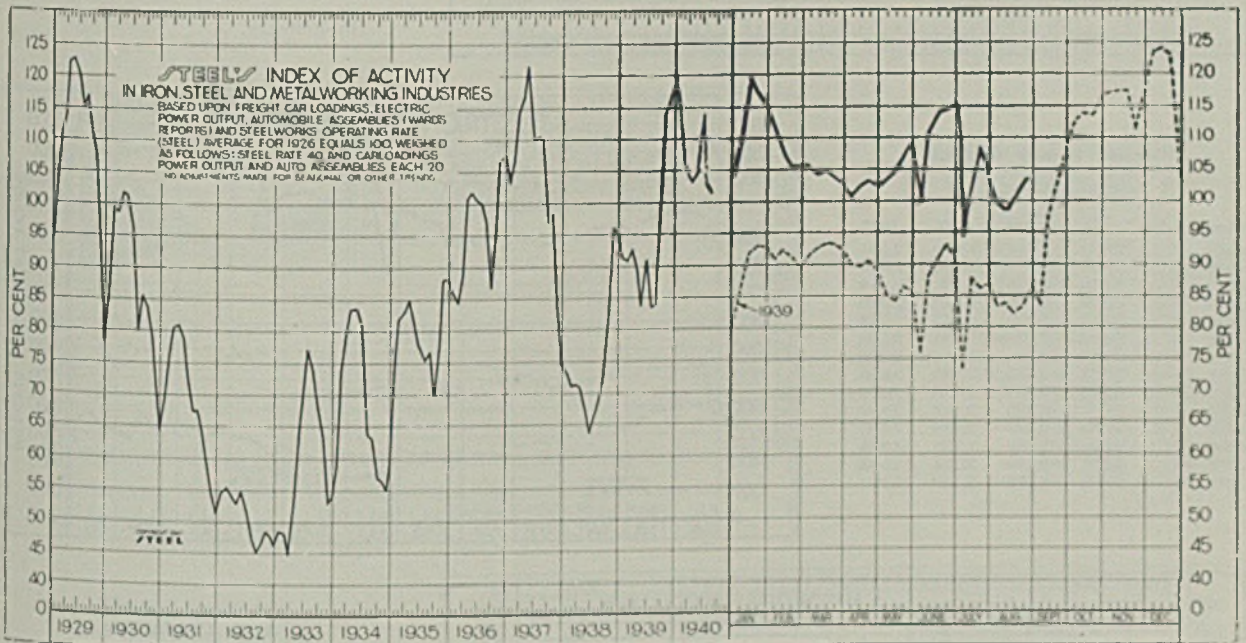
Activity Index Extends Recent Upward Trend

■ **BOLSTERED** by expanding purchases for defense and large order backlogs accumulated in recent months, operations in the durable goods' industries were sustained at near capacity levels during August. Further expansion in output is indicated through the fall months, reflecting increased production facilities in many instances.

In some consumers' goods lines a slight seasonal gain has been recorded lately, but in general activity has lagged considerably behind the advance for industry as a whole. The normal seasonal factors

which generally develop after Labor Day, should favorably influence the pace of industrial operations in the weeks immediately ahead.

STEEL'S index of activity in the iron, steel and metalworking industries for the week ended Aug. 31, gained 2.3 points to 103.7, reflecting the steady seasonal upturn in automobile production and revenue freight carloadings. A moderate dip will be recorded by the index for the Labor Day week ended Sept. 7, but a definite upward trend should develop throughout the fall months.



STEEL'S index of activity gained 2.3 points to 103.7 in the week ended Aug. 31:

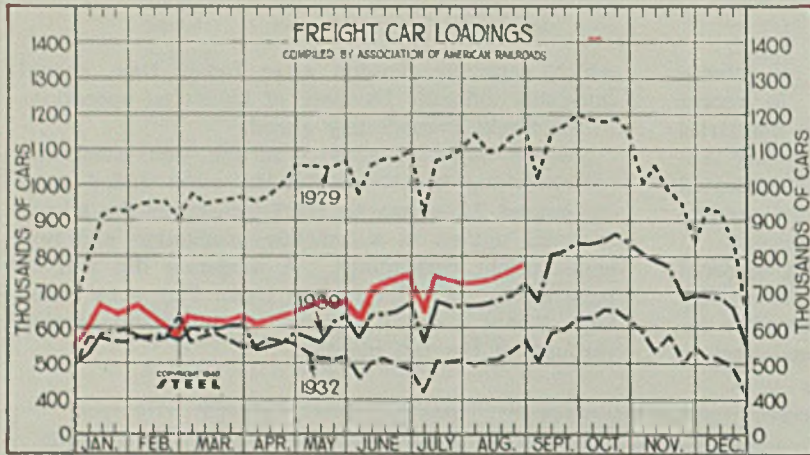
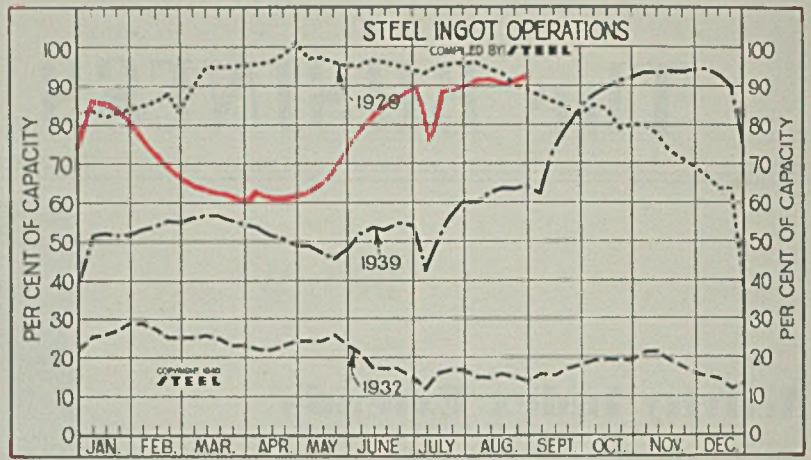
Week Ended	1940	1939	Mo. Data	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
June 22	114.8	93.0	Jan	114.7	91.1	73.3	102.9	85.9	74.2	58.8	48.6	54.6	69.1	87.6	104.1
June 29	115.3	91.0	Feb	105.8	90.8	71.1	106.8	84.3	82.0	73.9	48.2	55.3	73.5	99.2	111.2
July 6	94.2	73.4	March	104.1	92.6	71.2	114.4	88.7	83.1	78.9	44.5	54.2	80.4	98.6	114.0
July 13	108.5	87.8	April	102.7	89.8	70.8	116.6	100.8	83.0	83.6	52.4	52.8	81.0	101.7	122.5
July 20	106.0	86.0	May	104.6	83.4	67.4	121.7	101.8	81.8	83.7	63.5	54.8	78.6	101.2	122.9
July 27	103.4	86.8	June	114.1	90.9	63.4	109.9	100.3	77.4	80.8	70.3	51.4	72.1	95.8	120.3
Aug. 3	99.7	83.5	July	102.4	83.5	66.2	110.4	100.1	75.3	63.7	77.1	47.1	67.3	79.9	115.2
Aug. 10	98.5	83.9	Aug.	101.1	83.9	68.7	110.0	97.1	76.7	63.0	74.1	45.0	67.4	85.4	116.9
Aug. 17	100.8	82.2	Sept.	.....	.....	98.0	96.8	86.7	69.7	56.9	68.0	46.5	64.3	83.7	110.8
Aug. 24	101.4	83.4	Oct.	.....	114.0	83.6	98.1	94.8	77.0	56.4	63.1	48.4	59.2	78.8	107.1
Aug. 31	103.7†	86.3	Nov.	.....	116.2	95.9	84.1	106.4	88.1	54.9	52.8	47.5	54.4	71.0	92.2
			Dec.	.....	118.9	95.1	74.7	107.6	88.2	58.9	54.0	46.2	51.3	64.3	78.3

†Preliminary.

Steel Ingot Operations

(Per Cent)

Week ended	1910	1939	1938	1937
June 1	78.5	52.0	25.5	75.0
June 8	81.5	53.5	25.5	74.0
June 15	86.0	52.5	27.0	75.5
June 22	88.0	54.5	28.0	74.0
June 29	89.0	54.0	28.0	77.5
July 6	73.0	42.0	24.0	74.0
July 13	88.0	50.5	32.0	82.0
July 20	88.0	56.5	36.0	81.0
July 27	89.5	60.0	37.0	84.0
Aug. 3	90.5	60.0	40.0	84.5
Aug. 10	90.5	62.0	40.0	84.0
Aug. 17	90.0	63.5	41.5	81.0
Aug. 24	90.5	63.5	43.5	83.0
Aug. 31	91.5	64.0	44.5	83.0



Freight Car Loadings

(1000 CARS)

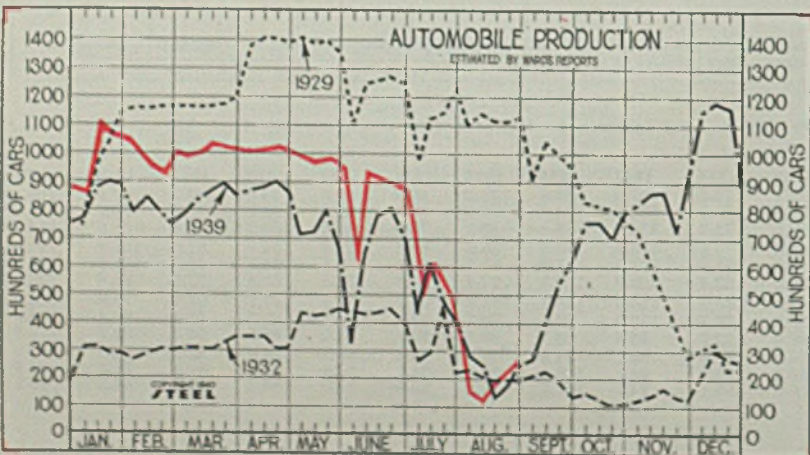
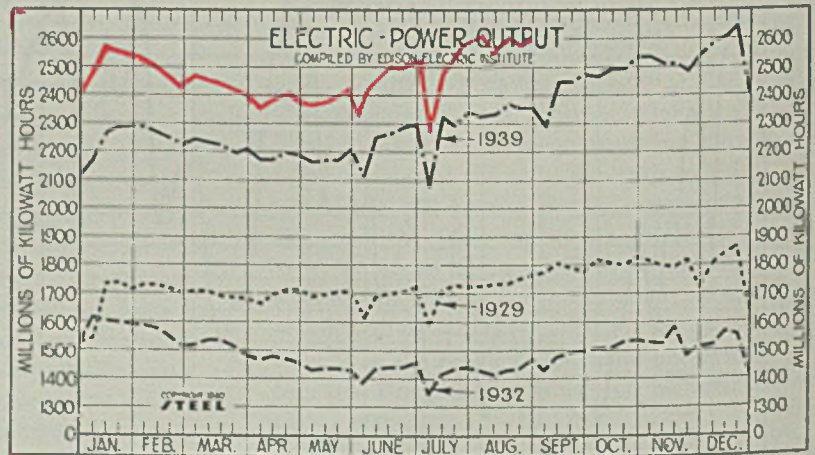
Week ended	1910	1939	1938	1937
June 1	639	568	503	692
June 8	703	635	534	754
June 15	712	638	556	756
June 22	728	643	559	774
June 29	752	666	589	806
July 6	637	559	501	682
July 13	740	674	602	770
July 20	730	656	581	771
July 27	718	660	589	783
Aug. 3	718	661	584	770
Aug. 10	727	665	590	777
Aug. 17	743	674	598	781
Aug. 24	761	688	621	787
Aug. 31	780†	722	648	805

†Preliminary.

Electric Power Output

(Million KW/H)

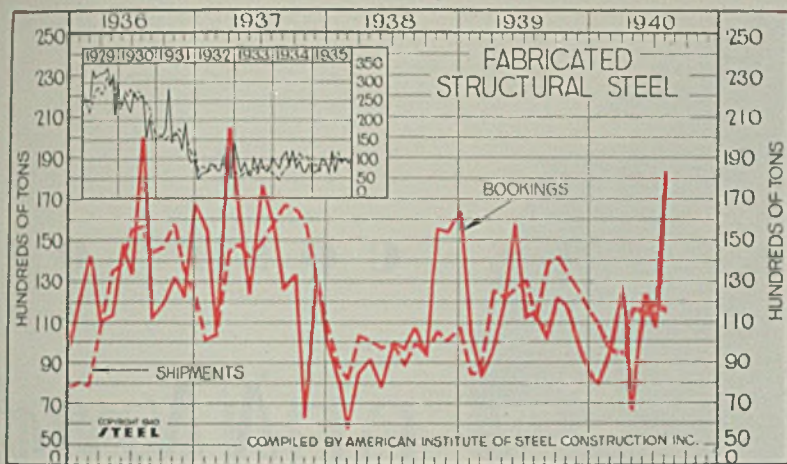
Week ended	1910	1939	1938	1937
June 1	2,332	2,114	1,879	2,131
June 8	2,453	2,257	1,992	2,214
June 15	2,516	2,265	1,991	2,214
June 22	2,509	2,285	2,019	2,238
June 29	2,514	2,300	2,015	2,238
July 6	2,265	2,088	1,881	2,096
July 13	2,483	2,324	2,084	2,208
July 20	2,524	2,295	2,085	2,259
July 27	2,601	2,312	2,094	2,256
Aug. 3	2,605	2,325	2,116	2,262
Aug. 10	2,589	2,333	2,134	2,301
Aug. 17	2,606	2,368	2,139	2,304
Aug. 24	2,571	2,354	2,134	2,295
Aug. 31	2,601	2,357	2,149	2,321



Auto Production

(1000 Units)

Week ended	1910	1939	1938	1937
June 1	61.3	32.4	27.0	101.7
June 8	95.6	65.3	40.2	118.8
June 15	93.6	78.3	41.8	111.6
June 22	90.1	81.1	40.9	121.0
June 29	87.6	70.7	40.9	122.9
July 6	52.0	42.8	25.4	101.0
July 13	62.2	61.6	42.0	113.4
July 20	53.0	47.4	32.1	88.1
July 27	34.8	40.6	30.4	85.4
Aug. 3	17.4	28.3	14.8	78.7
Aug. 10	12.6	24.9	13.8	103.3
Aug. 17	20.5	13.0	23.9	93.3
Aug. 24	23.7	17.5	18.7	83.3
Aug. 31	27.6	25.2	22.2	64.2



Fabricated Structural Steel

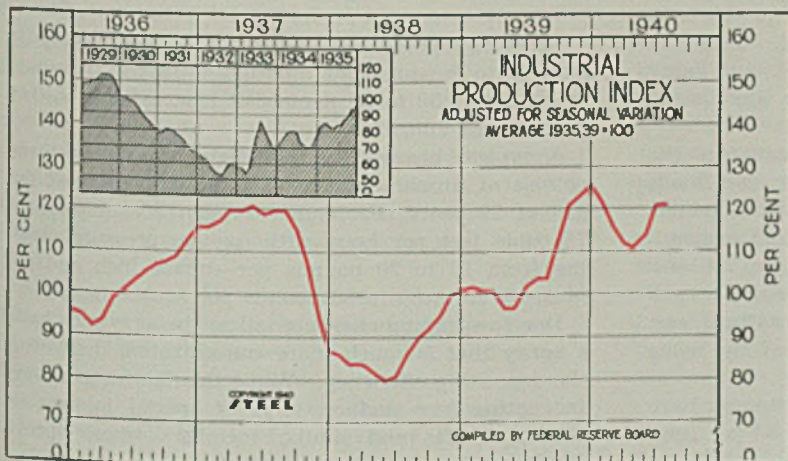
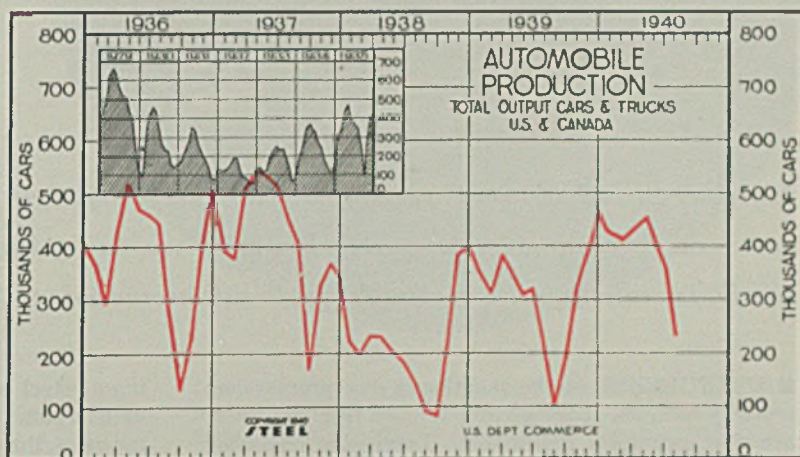
(1000 tons)

	Shipments			Bookings		
	1936	1937	1938	1936	1937	1938
Jan.	110.9	84.3	81.5	81.7	101.7	80.3
Feb.	97.2	84.4	81.2	98.9	82.7	57.1
Mar.	95.9	125.3	103.3	128.3	95.1	84.3
Apr.	116.3	130.9	103.0	75.8	118.3	91.2
May	115.6	125.9	97.4	126.8	155.9	77.3
June	119.1	170.1	98.6	109.7	111.6	90.9
July	117.4	110.5	88.0	184.5	114.1	95.0
Aug.	.....	139.7	88.0	.....	100.9	106.8
Sept.	.....	140.8	91.5	.....	121.4	92.5
Oct.	.....	131.8	103.0	.....	118.8	154.5
Nov.	.....	128.2	99.9	.....	99.3	153.1
Dec.	.....	116.2	106.5	.....	84.4	163.4
Total	.....	1440.1	1158.8	.....	1305.0	1256.6

Automobile Production

(Unit: 1000 Cars)

	1936	1937	1938	1939	1940
Jan.	449.3	357.0	277.1	290.2	377.2
Feb.	421.8	317.5	202.6	383.9	300.8
March	440.2	389.5	235.0	519.0	438.9
April	452.4	354.3	238.1	553.4	527.6
May	412.5	313.2	210.2	540.4	480.5
June	362.6	324.2	189.4	521.1	469.4
July	246.2	218.5	150.4	456.9	451.2
Aug.	.....	103.3	96.9	405.1	275.9
Sept.	.....	192.7	89.6	175.6	139.8
Oct.	.....	323.0	215.3	338.0	230.0
Nov.	.....	370.2	390.4	376.6	405.8
Dec.	.....	469.0	407.0	346.9	519.1
Ave.	.....	311.0	221.3	418.0	384.7



Industrial Production Federal Reserve Board's Index

(1935-39 = 100)

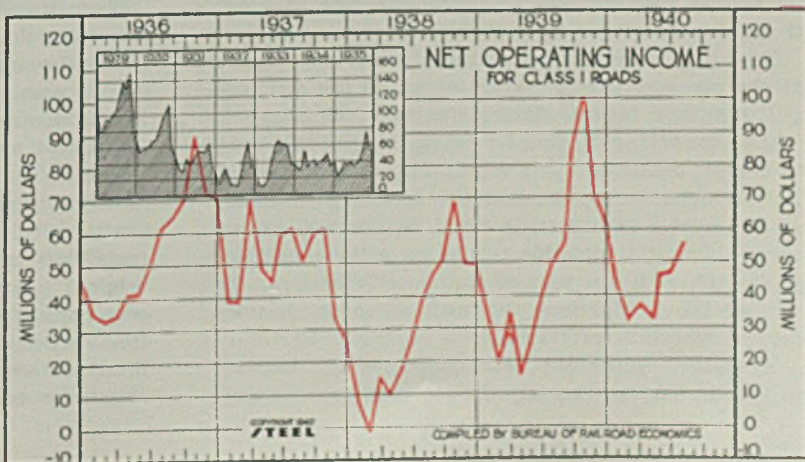
	1936	1937	1938	1939	1940
Jan.	122	102	86	116	95
Feb.	116	101	84	117	92
March	112	101	84	120	94
April	111	97	82	120	99
May	114	97	80	121	101
June	121	102	81	119	103
July	121	104	86	110	105
Aug.	.....	104	90	120	107
Sept.	.....	113	92	115	108
Oct.	.....	121	95	107	109
Nov.	.....	124	100	95	113
Dec.	.....	126	101	87	118

Class I Railroads Net Operating Income

(Unit: \$1,000,000)

	1936	1937	1938	1939
Jan.	\$45.57	\$32.89	\$7.14	\$38.87
Feb.	32.62	18.59	1.91*	38.78
Mar.	36.73	34.32	14.73	69.88
April	33.82	15.32	9.40	48.36
May	47.08	25.10	16.67	44.24
June	47.42	39.10	25.16	59.35
July	57.08	49.01	38.43	60.99
Aug.	.....	54.59	45.42	50.76
Sept.	.....	86.43	50.36	59.62
Oct.	.....	101.62	68.57	60.86
Nov.	.....	70.35	49.67	32.44
Dec.	.....	60.95	49.37	25.99
Average	.....	\$49.02	\$31.02	\$49.18

*Indicates deficit.



REDUCING THE COST OF

Metal

More economical fuel consumption, faster spraying rates cut costs more than 50 per cent. Deposits up to ½-inch thick are made in one pass. Strength of bond increased to 15,000 p.s.i.

■ **USEFULNESS** of the metal-spraying process has recently been enhanced greatly for two reasons: Costs are now extremely reasonable. Depositing efficiency is greatly improved by the higher speeds and thicker deposits possible. Strength of the bond to the base material also has been greatly increased. Thus the process becomes increasingly important for many jobs, at the same time new applications are opened up.

Seeking reduced costs and wider application of the process, Metallizing Co. of America, Inc. has made developments that permit steel or nonferrous metals to be sprayed at high rates of deposition and economical utilization of available industrial gases. A new gun with a special head sprays economically and successfully with acetylene, propane or natural gas. In fact, steel has been sprayed successfully using coal gas at only 12 pounds pressure.

These new developments in certain instances have reduced the cost of metal spraying over 50 per cent. Now it is possible to spray metal successfully at an hourly cost for gas of 25 to 30 cents or lower if piped natural gas is available.

Too, it is easy to control these newer spray guns as the pressure can be varied about 50 per cent and still obtain a neutral flame. Another advantage in many operations is that it is no longer necessary to deposit metal in layers to build up a thick deposit. This eliminates the laminations formerly necessary where only a thin deposit could be sprayed at one time. Now it is possible to put on a layer as thick as ½-inch with one pass of the metallizing gun. By eliminating laminations, a much stronger, heavier, denser deposit is produced.

A further important development is the increase in speeds. Approximately 30 per cent faster spray-

ing of steel can be accomplished, with a denser metal as a result. The added speed is most important in much of this work. For instance, eight crankshafts were sprayed, averaging 40 minutes a crank using propane.

Spraying speeds now permit 8 to 10 pounds of steel, 7 to 9 pounds of aluminum, 15 to 20 pounds of bronze or 30 to 35 pounds of zinc to be deposited in an hour's run.

A typical heavy-duty metallizing gun uses three pounds of propane per hour at an average cost for gas of 22 cents per hour. Oxygen consumption is 75 cubic feet per hour with oxygen pressure ranging from 15 to 20 pounds per square inch and air pressure from 60 to 80 pounds per square inch.

Due to spraying characteristics, the new guns have a spray that is much more concentrated, increasing the depositing efficiency. While this is of importance in coating any surface, it is of special interest in coating shafts and similar members where spraying losses are apt to be greatest.

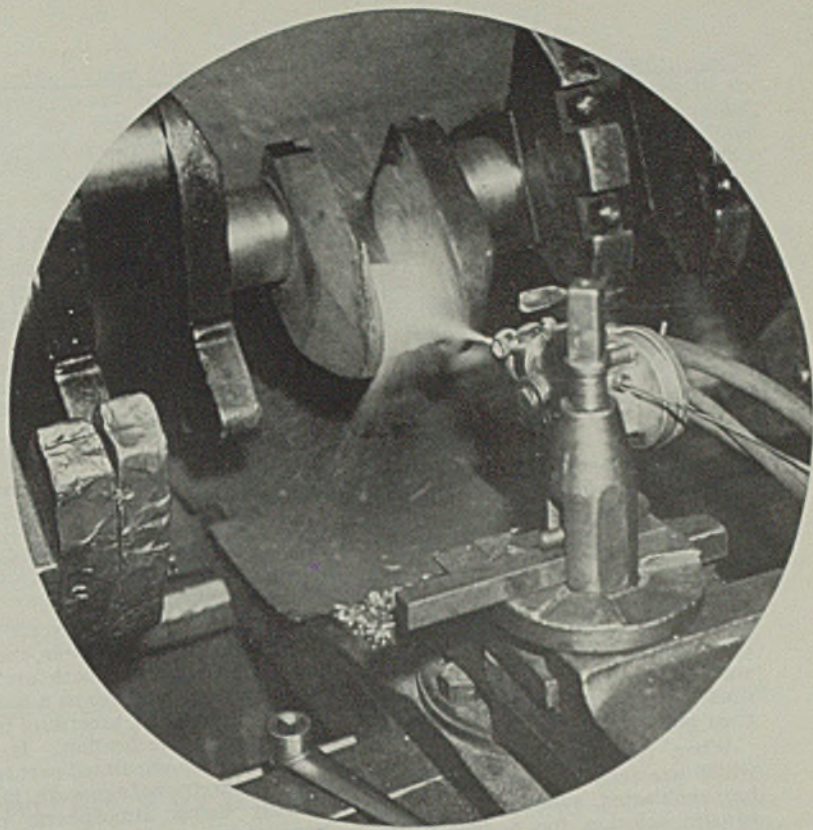
When metal spraying was first inaugurated, there was some doubt as to the strength of the bond between the applied metal and the base. However, it now is possible to obtain bonds between 12,000 and 15,000 pounds per square inch. These are ample for almost any type of metal-spraying operation.

One of the particularly advantageous applications of metallizing is in the rebuilding of worn crankshafts. It is not difficult to make the journals of metallized crankshafts three times as hard as the original journals. Since the sprayed steel is 10 per cent porous and oil absorbent, as well as containing free carbon, the bearing properties of such metallized surfaces are extremely high. Increased wear resistance is afforded by the porous structure and

Spraying

By E. T. PARKINSON

Metallizing Co. of America, Inc.
562 W. Washington Boulevard
Chicago



the free carbon. The surfaces take on the high glaze peculiar to forged steel. The satiny finish that characteristically stays on sprayed steel makes the bearing last much longer and decreases friction as well, especially on heavy loads and at high speeds.

However, there are many other applications of the process. For instance, the United States Naval Air Station, San Diego, Calif., in local process specification No. 96 presents procedure details for sandblasting and metallizing aircraft parts including engine cylinders, tubular structures, main floats, wing-tip floats, fuel tanks, oil tanks, cowling, steel wheels, aluminum alloy wheels, oleo pistons, as well as steel shafts.

Engine cylinders, for example, are to be sandblasted with extreme care due to the different pressures necessary in blasting the steel and aluminum alloy sections. If the high blasting pressure used with aluminum alloy sections is not confined exclusively to those areas and is allowed to overlap on the steel fins nearby, their thickness will be reduced and they will curl or warp. The elapsed time between sandblasting and metal spraying must be a minimum. In sandblasting steel cylinder barrels, air pressure of 40 to 50 pounds is recommended, holding the nozzle 6 to 8 inches from the work and using No. 60 flint shot for blasting material. When sandblasting aluminum alloy parts of cylinders, air pressure of 80 to 90 pounds is specified with the same nozzle distance mentioned.

For metallizing steel parts of engine cylinders, oxygen pressure is from 22 to 23 pounds, air pressure at 60 pounds with 16-gage pure aluminum wire being fed at rate of 10 to 11 feet per minute, using a No. 2 nozzle held 3 to 4 inches from the surface. In metallizing cylinder fins, the gun should be held

One of largest uses of metal spraying at present is in re-conditioning worn crankshafts. Sprayed journals are three times as hard as originals. An excellent bearing surface is afforded because the sprayed metal is about 10 per cent porous and contains free carbon

2 to 2½ inches from the top of the fin and at an approximate angle of 15 degrees to the fin and the spray gun kept moving with a uniform motion. For spraying aluminum alloy material on cylinder heads, procedure is same as for steel parts above.

Metallizing engine cylinders has proved superior to all paint methods heretofore used to prevent rust and corrosion. Metallizing steel tubular structures affords an excellent base for paint and also is far superior to the usual practice of painting with primer coat followed by a finish coat of paint in preventing corrosion.

In preparing such tubular structures for metallizing, the same practice recommended above is to be applied. In every case it is most important to clean the surfaces thoroughly of all oil. In metal spraying, acetylene pressure is 15 pounds, oxygen pressure at 17 to 18 pounds, air pressure 60 pounds with wire set to feed at 9 to 10 feet per minute using a No. 3 nozzle, holding the nozzle from 4 to 6 inches from the surface and using No. 15 gage aluminum wire containing 1 per cent zinc.

As in other work mentioned above, the minimum time possible should elapse between the cleaning and spraying. In no case should more than 2 hours elapse. Care should be taken to see that all oiling holes, bushings, etc., are plugged. Use a 12 to 18-inch stroke and deposit from 0.002 to 0.003-inch film.

In sandblasting main floats, wing-tip floats, fuel tanks, oil tank and cowling, care should be taken as

TABLE I
Approximate Hardness of Sprayed Metals

Metal	B. Inell	Scleroscope
Copper	97.7	28.0
Brass	89.0	24.2
Bronze	82.6	18.0
Phosphor Bronze	92.8	26.0
Monel Metal	171.0	37.4
Nickel Silver	100.0	29.3
0.70 Carbon Steel	.....	16.0
0.40 Carbon Steel	24.0	49.9
0.80 Carbon Steel	420.0	70.0
1.70 Carbon Steel	460.0	75.0
Metco No. 1 Stainless Steel	267.0	49.7
Metco No. 2 Stainless Steel	.....	70.0

too much pressure or holding the nozzle too close to the surface will cause the skin to stretch and distort. Following sandblast instructions as mentioned above, however, will be found safe with an inexperienced operator. Watch the heat in metallizing as too much will cause distortion. When filling scored or worn places with two or more coats, dress down to a smooth surface and then polish with steel wool and oil.

When the rims of steel wheels which are seriously corroded are to be sandblasted, submerge first in a caustic solution for a few hours, steam clean and then blast.

To prepare oleo pistons and certain steel shafts for metallizing, a light thread 0.062-inch deep should be cut their entire length. Most shafts are rough threaded. All shoulders and flanges should be dovetailed 15 degrees, sandblasted lightly and then metallized as described above. They then can be reground to the desired diameter. Use nothing coarser than flint shot No. 60. In no case should parts be handled without gloves before being metallized. Take care to remove all paint, rust, etc. as presence of these materials will cause pockets and crawling of the metal film. Wire entering the gun should be lubricated. This can be done by securing a knotted cloth saturated with "tule" grease around the wire where it enters the gun.

Deposits Wear Slowly

In sandblasting walkways of aircraft, these same naval specifications direct that using an air pressure of 60 to 80 pounds the nozzle be held 10 to 12 inches from the surface. Conditions for metallizing are approximately the same as described above except wire feed is increased to 12 to 13 feet per minute, using a No. 3 nozzle held 6 to 10 inches from the surface with 15-gage aluminum wire containing 1 per cent zinc. After a smooth coat of metal has been applied, both the gas and air pressure are reduced, causing the aluminum wire to be deposited on the surface in small lumps of metal that will adhere to the surface as well as a smooth coat and give walk-

ways of a superior finish compared to that heretofore obtainable. A sample of such material placed on a busy thoroughfare was in good condition after approximately 30 days and passage of 20,000 men.

The metallizing of aircraft parts is a great improvement in the prevention of corrosion both on parts left unpainted and also as a base for parts later painted, according to this same naval specification. It adds that unless the unpainted part is subjected to extreme exposure in continually damp atmospheric conditions or in salt water spray, subsequent painting has been found unnecessary in many instances. Where paint has been applied over metal spray, the adherence is far superior to that of paint applied on anodic treated surfaces.

While the metallizing process does not add strength to material, it is used to build up corroded spots where pits have occurred.

One of the improved guns, known as the "Mogul" has a number of outstanding features. The gun is compact with all moving parts enclosed in a dust-proof case packed with lubrication. The case is one-piece construction to eliminate leaking joints. A single-control taper valve simultaneously turns on the air, gas and oxygen in proper sequence and proportion in a single movement and likewise turns the gases off completely in a single movement. The large taper valve affords a more perfect gas mixture and makes it possible to spray an extremely fine coat of metal even with a 1/8-inch wire. Wire nozzle is hard faced to withstand abrasive action of the moving rod.

Feed rolls are exceptionally large and the air turbine driving the feed rolls also is larger than usual to give more power, assuring positive feed without wire interruption. A 75-pound pull is exerted on wire going through the gun.

A large number of tests have been made as to the lasting qualities of sprayed metal. For instance, in checking quality of metal sprayed on piston rods to rebuild them in comparison with qualities of new rods, one new rod and one metallized

rod were placed in a pump and a stroke counter attached. In a pump checked after 32,690 strokes, the metallized plunger was worn only 0.0050-inch compared with the new plunger which had worn 0.0072-inch. A second pump checked after 121,319 strokes showed the metallized plunger had worn only 0.0030-inch compared with the new plunger which had worn 0.0064-inch. It is evident the metallized plungers give superior performance over a new replacement. This lower rate of wear, of course, means correspondingly longer life, less frequent replacements and lower maintenance expense.

Frequently it is valuable to know the hardness of sprayed metal. Accordingly Table I is included, giving hardness values on both brinell and scleroscope scales. While this table of course does not list all the possible metals that can be sprayed, it does afford a guide to the hardnesses obtainable.

Users of advanced metallizing equipment report many important savings not limited to any one particular type of metal.

For example, a refrigerating company making equipment for cold storage trucks, rooms for cooling, lockers for food storage, etc., is using a metal spray gun and propane to spray some 1330 square feet of zinc daily, with three men being employed in the blasting room. It is not unusual to spray 7500 square feet weekly. Of course most of this is flat work.

On a performance test to check the new guns, 9332.5 square feet of zinc surface was deposited using 17 tanks of oxygen, one tank of propane and 759.5 pounds of zinc.

Good Bearings Obtained

Many other users employ the metallizing process in rebuilding bearings. One user reports that he employs two methods in such maintenance work. Where the bearing indicates excess clearance due to normal wear but otherwise is in good condition, enough old babbitt is removed by machining to allow a sufficient amount of new diesel marine babbitt to be sprayed, anchorage provided by previous sandblasting. The bearing then is finished in the usual manner.

Second method is employed where the bearing is found to be in a condition which makes it necessary to rebabbit completely. In this case all the old babbitt metal is removed, a special effort being made to remove any oil that may be entrained in any porous material remaining. The bearing casting then is thoroughly sandblasted and immediately a coat of tin is sprayed on this clean surface. The thickness of the sprayed tin apparently does not affect the an-

chorage one way or another as long as 0.003-inch is not exceeded. Bearing subsequently is rebabbited in the usual manner. This user reports that after employing this procedure for 7 years, no failures have been encountered from mechanical faults. Size of these journals is 1 1/4 inches to 2 1/4 inches, length of bearings ranging from 4 to 6 1/2 inches with speed of rotation from 1750 to 2800 revolutions per minute. These bearings are used in centrifugal pumps and turbines.

An oil refiner reports successful metallizing applications include pump plungers and impellers, interior of pump casings, centrifugal spindles, various slipper shoes and guides, valve and cam gear parts, pressure valve stems, seal rings, piston rods and many other applications on parts subjected to wear.

A large manufacturer of electric machinery employs sprays 0.25 per

cent carbon steel to build up bearing brackets and bearing cartridges, builds up collector rings with sprayed copper and replaces galvanizing on many items by spraying zinc.

Often metallizing extends equipment life amazingly. For instance, a 2-inch blowdown valve on a certain power-plant application had a normal life of one year. When the valve parts are metallized with 18-8 stainless, they withstand three years of service. It takes only 15 minutes to prepare a valve, 30 minutes to spray and 30 minutes to finish at an approximate cost of \$3.50 for the job.

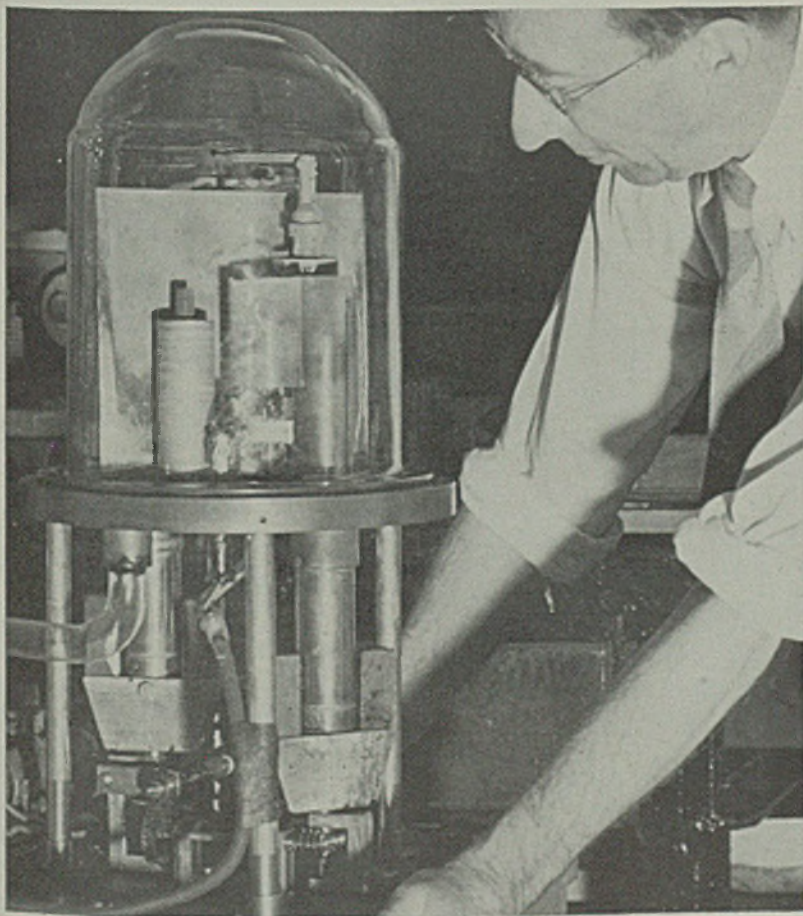
Another instance where metallizing has proved especially valuable is in the plant of a southern power company. Turbine runners available only in cast bronze are worth several hundred dollars and wear rapidly because of water cavitation

which renders them useless so a method has been developed to extend their service life. A liner, 5/32-inch thick, is machined out and applied to the runner. The surface is sprayed with 1/32-inch stainless. When this liner cavitates, another is made and placed in the bronze runner. These stainless steel liners extend the service life of the runner and permit important savings.

Another power plant application is spraying of aluminum on superheater nipples and tubes and outside of water tubes. Here the sprayed aluminum furnishes an effective protection against high-temperature oxidation. It has been found an extremely satisfactory protection.

With the greatly lowered cost of metal spraying now possible, it is expected applications of the process will be extended to many other fields for which it is well suited but where costs heretofore prevented.

"Geared" Magnets Solve Vacuum Problem in Treating Disks



■ IN COATING aluminum disks with selenium, General Electric Co., Schenectady, N. Y., employs a vacuum chamber containing a disk-moving mechanism which is operated by alnico magnets. The disks, used in photoelectric cells, must be treated separately, and the use of alnico "gears" has made it possible to load as many as 100 of them in the vacuum chamber simultaneously, and to treat them consecutively in the small vapor chamber located in the vacuum jar.

In operation, one of the magnets is revolved around a protruding brass tube sealed to the base of the vacuum chamber. Within the tube is another alnico magnet attached to the mechanism. As the outside magnet is revolved, the one within the vacuum-sealed chamber also rotates. Thus, without any shaft extending from the vacuum chamber, it is possible to control the mechanism. One set of "gears" raises the disks one at a time, whereupon a second set of "gears" operates the mechanism which transports the single disks to the vapor chamber—holds them there the specified length of time—then removes them to the stack of completed disks.

A high vacuum is necessary since the air in the selenium would oxidize. Besides, in a vacuum the vaporizing temperature is decidedly lowered, and vaporization in a vacuum gives the operator a control in directing the path of the vapor particles. In addition to vaporizing selenium, the equipment also is applicable in vaporizing and depositing other materials.



Continuous Pig Casting

Unusually well-designed handling facilities feature highly efficient continuous pig-casting setup at Canadian plant, fifty 45-pound pigs produced per minute—70 tons hourly

■ THE PRODUCTION of pigs and certain other shapes by use of continuous casting methods is growing rapidly as such setups permit exceptionally high output from the equipment and, being completely mechanized, involve a minimum amount of supervision and hand labor. Thus the workmen are enabled to turn out a superior product at a greater volume and with less effort.

An excellent example of one of these mechanized units and the excellent work they do is the layout at plant of Canadian Furnace Limited, Port Colborne, Ontario, which turns out some of the finest pig in the Dominion—fifty 45-pounders every minute day in and day out—close to 70 tons of Victoria pig iron each hour.

The pigs, cast in heavy conveyor

By REGINALD TRAUTSCHOLD

molds, are dusted with lime to facilitate the gravity discharge of the congealed iron and are not only produced at this speed but also are cooled and hardened in transit.

Within four or five minutes from pouring, the pigs are delivered to waiting railroad cars some 140 feet distant—delivered by a single 20-horsepower conveyor-drive motor at a handling cost of less than a Canadian cent for 75 pigs discharged at the car side.

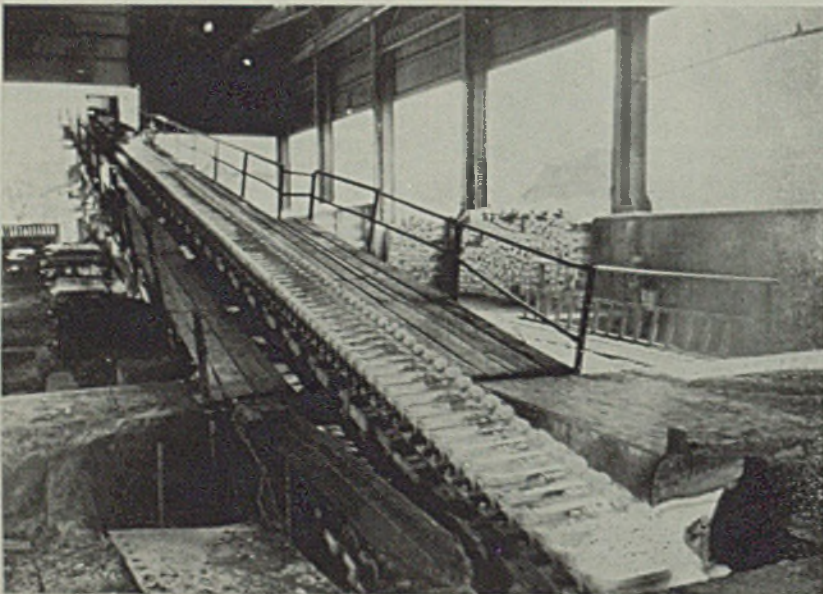
To perform this materials-handling task, driving motor of the conveyor is called upon to move constantly between 40 and 45 tons—four to five times as much dead weight as the poundage of pig which travels on the loaded conveyor up

a moderate incline at a speed of 33 feet per minute. Each of the molds carrying a cast-iron pig weighs 160 pounds and each of the two strands of high-carbon bushed roller chains weighs about 118 pounds.

Two pig molds are mounted on each of the 16-inch links of the conveyor chains to form a continuous series of troughs into which the blast furnaces discharge without interruption, thus continuously casting to give a tremendous output with a minimum of handling equipment. Molds are supported by single-flange rollers with 6½-inch tread diameter and running on 80-pound T-rail tracks. Thus, a total load of approximately 250 pounds is placed on every link of the double strand chain.

An interesting and highly important drive detail of this conveyor is the "wave line" spur gear and eccentric pinion transmission assemblage employed to maintain constant speed of mold travel and to avoid the dangerous repetitive strains that would otherwise be placed on the conveyor chains by the variances in diameter of the long-pitch sprocket wheels. The gear member is somewhat polygonal in form, with pitch circumference elevations and depressions conforming to the number of teeth in the conveyor sprocket wheels, while the offset of the pinion member is so proportioned that full tooth engagement is secured at all times by the

(Please turn to Page 72)



General view of pig-casting conveyor in which iron is poured continuously to make pigs which harden and are delivered while still on the conveyor—all at rate of 50 pigs per minute—24 hours a day. Output is 70 tons per hour, 1680 tons per day

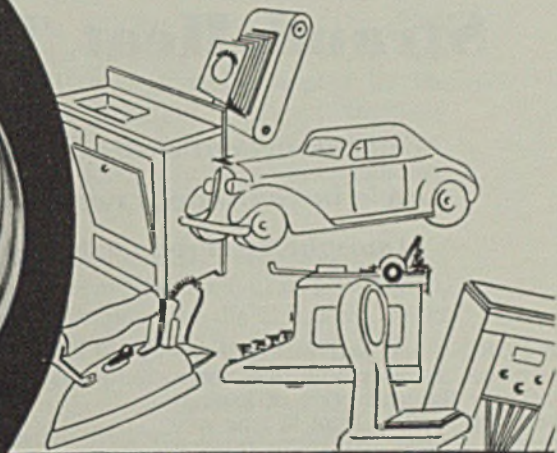
Here's Proof
of **PRODUCTION SAVINGS**
for Stainless Users!

TODAY the easier working qualities of Carpenter Stainless Steel make it economically practical for use in almost any product. These typical everyday applications suggest how much can be done with this modern Stainless Strip—how easy it is to give your product extra sales appeal, and still keep costs within the limits set by competition. Deep drawing, bending or forming of Stainless parts is no longer a difficult problem. Uniform temper and clean blanking qualities permit faster blanking and punching and help reduce press troubles. Why not investigate Carpenter Stainless now? Ask the Carpenter man to help you pick the most economical type for your needs.

THE CARPENTER STEEL COMPANY
Reading, Pa.

NO SCRAP

Ordinarily bezels are made by blanking the rings from a wide strip, which leaves a high percentage of scrap. This Stainless bezel, available in any size up to that used for an automobile headlight rim, is made in the form of a rolled molding without scrap and then formed into a ring. There is a tremendous saving in material. Made from Carpenter Stainless No. 6. The ends can be welded if desired. Can you use a Stainless bezel in your product?



NO PROCESS ANNEALING

This difficult deep drawing job is as much a tribute to the fabricator's ability as it is to the ductility of Carpenter Stainless Steel. Made of Carpenter Stainless No. 6, the cup was deep drawn without any process annealing. The finish was ball burnished. Doesn't this ability to deep draw suggest some application in your own shop?

NO FINISHING

This rosette demonstrates the ability of Carpenter Stainless No. 6 to respond readily to embossing operations. No final finishing was applied after stamping. Maybe you have an embossed job that would be "a natural" for Stainless . . . name plates, for example.

Carpenter STAINLESS STEELS

BRANCHES AT Chicago, Cleveland, Detroit, Hartford, St. Louis, Indianapolis, New York, Philadelphia

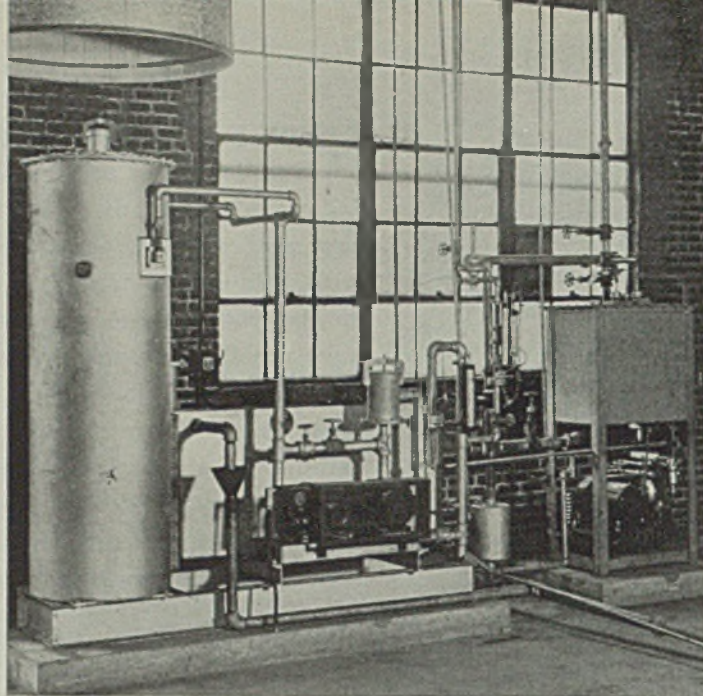


Fig. 1—Special producer for generating the atmosphere for the heating and cooling chamber of the electric annealing furnace

Strand Heat Treating Cold Strip

Coil throughout entire length subjected to same time-temperature cycle in continuous normalizing furnace operated with controlled atmosphere. Product has uniform grain size and physical values

■ DURING the past decade a tremendous advancement has been made in the production of low-carbon steel in strip form in long continuous lengths and widths ranging from about 24 to 108 inches. Demand for these widths has come principally from the automotive industry and tin plate fabricators. The quantity used for tin plate alone is rapidly approaching 2,000,000 tons.

The large increase in production has been made possible by two major developments during the period from 1926 to 1936, namely, the continuous 4-high hot and cold strip mills. These made possible the production of coils of long length and of wide width and afforded for the first time strip with improved surface and accurate gage. Its introduction also revolutionized the grain structure with the result that strip steels of unusual physical values are now available. In the latter half of the period 1926 to 1936 the use of the lighter gages for tin plate requirements was initiated.

Older Forms of Heat Treatments

Usually in the processing of cold rolled strip some heat treatment is required at one or more points. In

By **NORMAN P. GOSS**
Cold Metal Process Co.
Youngstown, O.

and

CURTIS H. VAUGHAN
Electric Furnace Co.
Salem, O.

general these may consist of process anneals to put the material in shape for further cold rolling, and final heat treatments in the form of annealing or normalizing operations, or sometimes a combination of both to make available the proper physical and structural conditions for stamping, or other fabrication, into the final product.

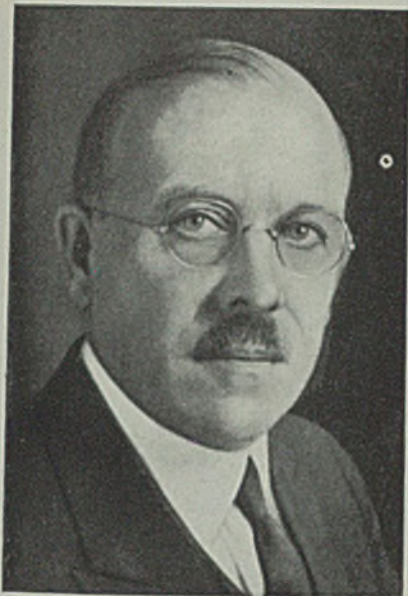
Annealing practice may vary in that the strip may either be annealed in coil form or sheared and then annealed in the flat; at the present time this is principally accomplished in batch type furnaces of one form or another. Normalizing may be considered fundamentally as a continuous furnace operation and is carried out in most mills with the material—generally cut in lengths—being carried between rider and cover sheets through the ordinary direct-fired furnace.

It would appear logical that, having accomplished the rolling of the strip in long lengths continuously, the necessary heat treatments might be accomplished in like manner; that is, the coil would be unreel at one end of the furnace, passed continuously through the equipment, and recoiled at the discharge end.

Continuous Heat Treatment

Batch annealing requires heating through the mass of a coil or stack of cold rolled strip. This, of course, consumes time, and cooling to a temperature at which the steel may be safely exposed to the air requires a further and much longer period. As compared to this, the continuous strand method requires only a few minutes in the furnace equipment.

Theoretically, at least, it would appear that the most uniform possible method of heat treatment is in continuous strands where every unit of length of the strip throughout the entire length of the coil passes through exactly the same time-temperature cycle. In batch annealing either coils or flats, it is obvious that the outside of the mass comes to temperature earlier and cools in a shorter time than the



Announcement

H. A. Brassert & Company, Consulting Engineers for the steel industries, are moving their engineering and sales offices, located at present at Chicago, to Pittsburgh, and after August 15th will be located in the First National Bank Building there. The decision to move to Pittsburgh was prompted by the increasing concentration of steel company

headquarters in Pittsburgh. The company's executive offices are in the Lincoln Building, 60 East 42nd Street, New York, from which office their foreign business will be handled. An office will be retained at 310 South Michigan Avenue, Chicago.

The firm of H. A. Brassert & Company has served practically every iron and steel company in this country and many abroad. It has offices in New York, Chicago, London, Paris, Lima and Buenos Aires. Herman A. Brassert, President of the Company, states that the organization in these branch offices established new industries by the development of new sources of raw materials, constructing new plants, introducing in existing works modern practice and machinery throughout the world. Outside of the United States, this firm has done business in Australia, Austria, Belgium, Brazil, Canada, Chile, China, Columbia, Denmark, Egypt, England, France, Germany, Holland, India, Italy, Japan, Manchuria, Mexico, New Zealand, Norway, Peru, Poland, Scotland, Spain, Switzerland, Turkey, U. S. S. R., Yugoslavia, and others.

Recently this firm constructed and built three large iron and steel plants in Great Britain, the most prominent one being the steel works at Corby, located about 80 miles from London. This plant consumes high sulphur native ores, which were formerly considered unsuitable for the production of steel but are now being processed, using the new method developed by H. A. Brassert & Company. This development is, of course, at the present time of great value to England because it makes these plants independent of the importation of foreign iron ores. Plants were built in Germany and Austria employing similar methods. These plants, however, were not completed on account of the outbreak of the war, at which time Mr. Brassert dissociated himself from this undertaking.

H. A. BRASSERT and COMPANY

FIRST NATIONAL BANK BUILDING
60 E. 42nd STREET

PITTSBURGH
NEW YORK

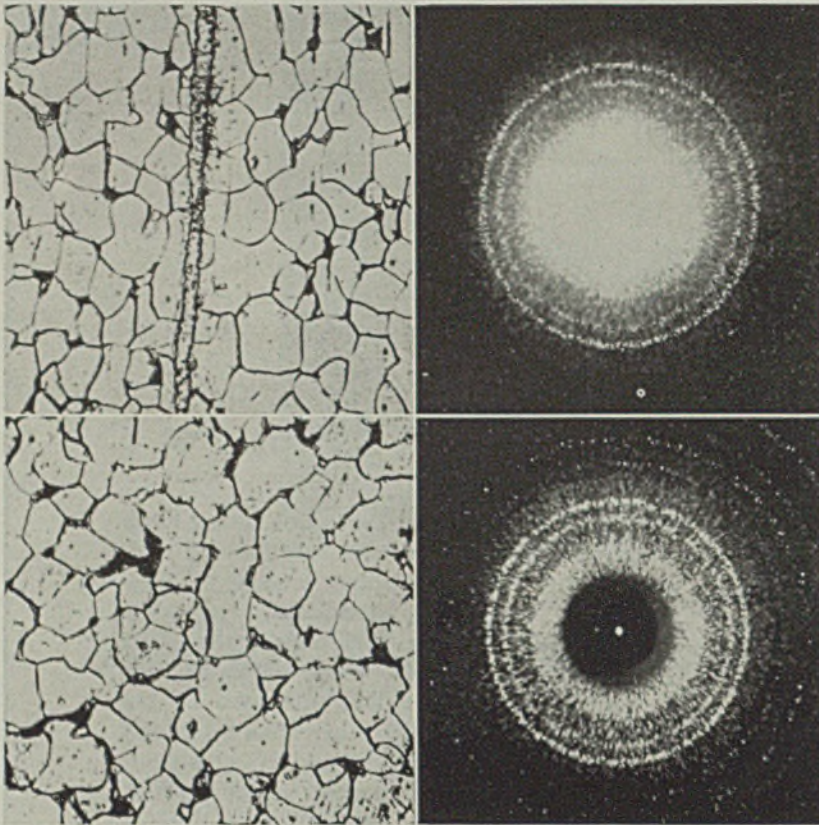


Fig. 2—Rimmed cold rolled strip as normalized. X-ray view at right. Fig. 3—Killed cold rolled strip as normalized. X-ray view at right

inside, and thus no two portions of the coil, or the stack of sheets, or plates, go through exactly the same time-temperature cycle.

The results of the batch heat treatment may therefore be expected to vary in certain respects. Usually there will be found throughout the coil some variation in structure, causing a similar variation in the yield point and even the elongation, though as far as hardness is concerned the coil will be fairly uniform.

Hardness is not the only factor to be considered in the annealed metal and in its subsequent fabrication. It would appear that uniform grain size, completeness of recrystalliza-

tion, and uniform yield point (provided of course that the hardness values are reasonable), are more important guides than hardness alone in determining the drawability of the metal.

Although in batch annealing the directional properties can usually be eliminated by keeping the cold reduction below 50 per cent, these properties cannot be removed if the metal has been subjected to reductions of over 50 per cent. In contrast, with continuous annealing at temperatures above A_1 , heavy reductions are permissible, since with

such heat treatment the directional properties can be easily removed, because of the allotropic transformation¹ taking place when the strip cools through A_2 .

Surface Conditions

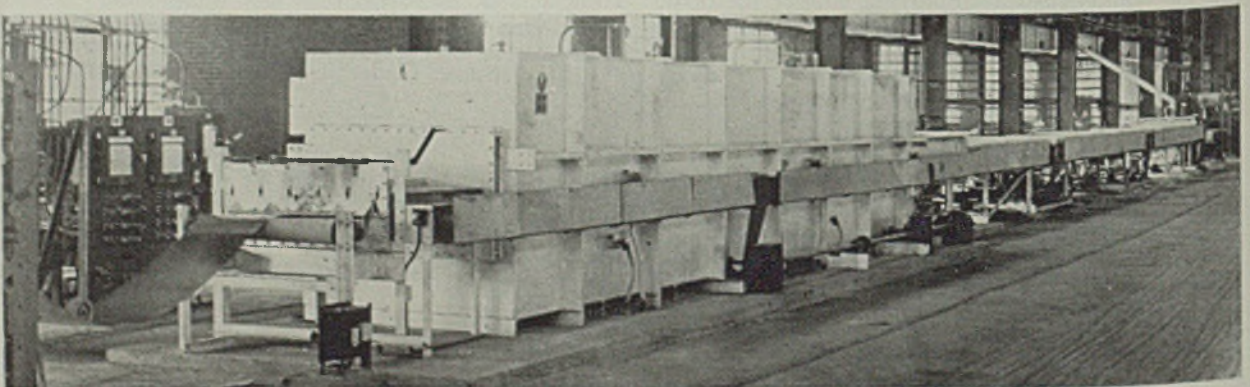
Inasmuch as cold reduced strip has a high surface finish before annealing it is essential that the material be delivered from the furnace with its surface free from scale or even discoloration. The economies of the case dictate also that the means for accomplishing the bright annealing or bright normalizing be of reasonable cost. These problems of brightness and low cost are answered by the economically-produced controlled atmospheres which have been developed during the past eight years, thus eliminating the need of rider and cover sheets.

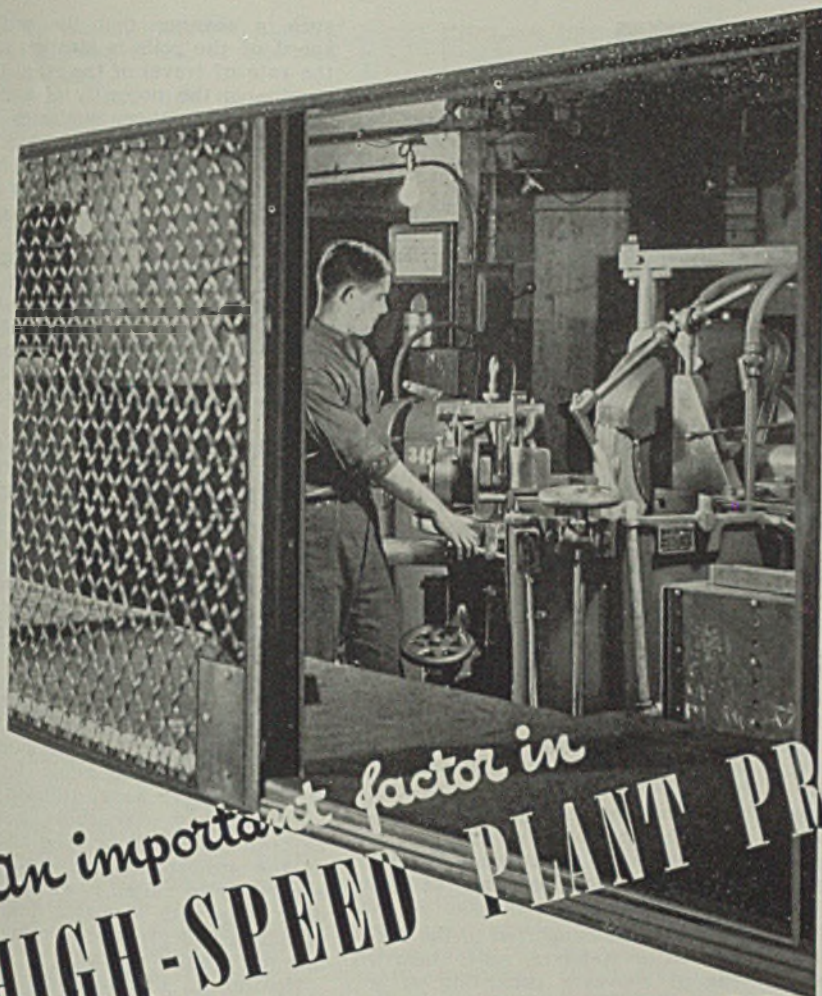
It becomes apparent that in the continuous furnace, relatively large in size and with ends open at all times to permit ingress and exit of the strip, appreciable quantities of the controlled atmosphere must be supplied continuously. Expensive gases such as hydrogen would serve but are far too costly for such applications. Hence, the continuous heat treatment of the strip in its most desirable form at least was dependent upon the development of a low-cost controlled atmosphere, and with such atmosphere commercially available the way became cleared for economical continuous furnace applications.

In 1932 the Cold Metal Process Co., Youngstown, O., hearing of this atmosphere development, investigated its possibilities in two directions, namely: its use in the bright annealing of both cold rolled steel strip and of electrical (high-silicon) strip both in the hot and

¹Allotropic transformation:—When the grains are transformed from the austenitic to the ferritic state, or from face-centered to a body-centered lattice. This, therefore, involves a transformation of the grain structure.

Fig. 4—Electric furnace designed for annealing and normalizing 40 tons of low-carbon strip up to 36 inches wide in 24 hours





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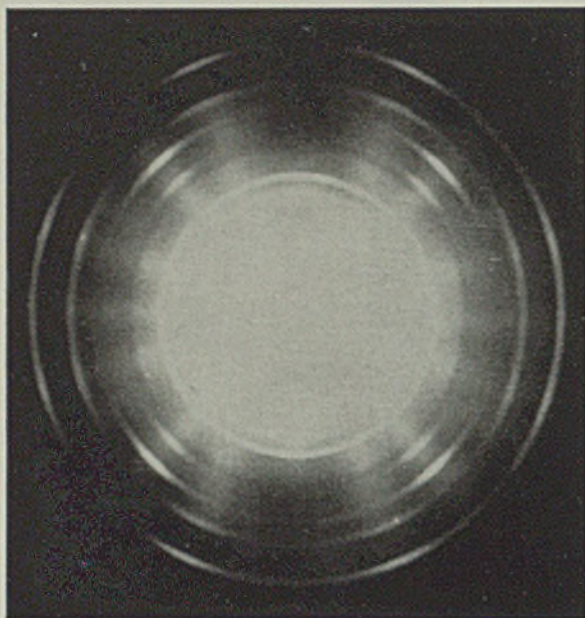


Fig. 5—X-ray of low-carbon cold rolled strip before annealing showing grains oriented in rolling direction

cold rolled forms.

These investigations, supplemented by considerable experimental work in a small continuous furnace at Salem, O., resulted in a decision early in 1933 to install a continuous controlled atmosphere furnace of large enough size for moderate production requirements at the company's plant in Youngstown, O. This furnace was placed in operation several months later.

This strip normalizing furnace was destroyed by the fire that leveled the company's plant in 1936 but was subsequently replaced with a new and larger furnace unit which provides for a wider range of annealing and normalizing capacities.

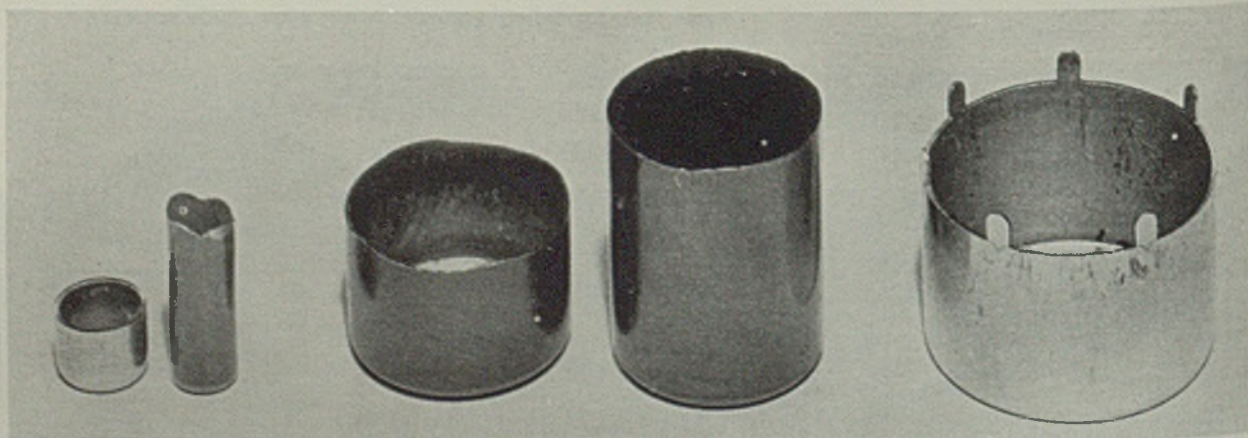
The furnace, shown in Fig. 4, has an effective heating chamber 3 feet 8 inches wide by 30 feet long, powered at 420 kilowatts for a productive capacity of 40 tons of low-carbon steel strip per 24-hour day in widths up to 36 inches.

A sectionalized cooling chamber separated approximately 10 feet

from the heating chamber is cooled by circulating water through a flattened helical pipe coil provided throughout the 72-foot length of the furnace. Connecting the water-cooled chamber to the heating chamber is an insulated, or lined, cooling section for heat economy and to delay the cooling rate of the strip.

The strip is supported in the furnace on a standard roller hearth type of conveyor consisting of a series of rollers spaced throughout the length of the equipment. The rollers in the heating chamber and in a portion of the cooling chamber are of heat-resisting alloy with a polished surface. The remainder of the rolls in the cooling chamber are of brass construction. All rolls are individually driven with a chain and sprocket drive from a motor-operated, variable-speed drive unit in

Fig. 6—Examples of severe deep drawing operations



such a manner that the surface speed of the rolls is identical with the rate of travel of the strip. This eliminates the necessity of a rider sheet and further eliminates the possibility of scratching which of course is fundamental in the heat treatment of cold rolled strip; this had not been previously accomplished.

All rolls are carried in bearings located completely outside the furnace shell, in such a manner that any roll may be easily removed for maintenance purposes. These bearings are self-aligning and are carefully sealed to prevent entrance of air to the equipment.

Equipment for uncoiling the strip at the charging end of the furnace and for recoiling after treatment at the discharge end of the cooling chamber were designed and built by the Cold Metal Process Co. This equipment incorporated the necessary mandrels, pinch rolls, stitcher and shear, speed control devices, and other details.

Atmosphere for use within the heating and cooling chambers is generated in the special producer shown in Fig. 1. This unit provides approximately 2500 cubic feet of atmosphere per hour, utilizing only approximately 300 cubic feet of natural gas per hour. The analysis of the atmosphere can easily and accurately be varied in order to produce strip with a mirror finish or of different degrees of coloring similar to "temper colors".

Heating in the heating chamber is accomplished by heavy cast heat-resisting elements located both above and below the strip. The heating units are separated longitudinally into two control zones, with potentiometer type controllers accurately controlling and recording the temperature in both zones.

Since the advent of the use of radiant tubes in connection with gas firing, particularly of the recuperative type, and because of recent metallurgical improvement in the tubes, large savings in heating cost can be realized. The savings will

of course vary in different plants due to the relative cost of electric power and gas.

In the all-electric unit of a size to produce say 5 tons of tin plate per hour, 0.010-inch x 36 inches wide, the power requirements are approximately 195 kilowatt hours per ton, which at an assumed rate of 1 cent per kilowatt hour gives a heating cost of \$1.95 per ton of material. Comparable equipment heated with radiant tubes requires about 1500 cubic feet of natural gas per hour which with an assumed gas rate of \$0.50 per 1000 cubic feet brings the heating cost with gas down to \$0.75 per ton.

While the figures for both electric and gas heating of continuous normalizing are for a unit with a productive capacity of 5 tons per hour it is not feasible to provide a bell furnace unit for handling coiled material which would even approach this capacity. Therefore, the figures on batch annealing will be given for a unit of approximately 1 ton per hour capacity. Such a furnace requires a gas consumption of approximately 1400 cubic feet of gas per ton of net material. Using the same unit gas rate of \$0.50 per 1000 cubic feet this gives a cost for heating of \$0.70 per ton.

While there are several other tangible items of expense which enter into the total heat treating cost these have been found to be comparable on a "per ton" basis. In other words, the difference in heat treating cost is \$0.05 per ton favoring the batch anneal.

This small difference is reduced or completely eliminated by intangible items such as reduction of scrap loss and the elimination of coil set by the continuous method.

In addition to the foregoing it has been found that the initial cost of equipment is less on a "per ton" basis for continuous equipment than for batch equipment.

Character of Product

The product of continuous heat treatment is characterized by uniform grain size and uniform physicals. Typical structures are illustrated in the photomicrographs and their corresponding X-ray diagrams in Figs. 2 and 3, for rimmed and aluminum killed strip steel. Both the rimmed and killed hot rolled strip were cold rolled from 0.105-inch to various gages; the strips were then heat treated at 1700 degrees Fahr. for about 15 to 20 seconds. The structures in Fig. 2 show that recrystallization is completed rapidly. This is definitely shown by comparing the X-ray diagrams of Figs. 2 and 3, the latter showing the structure of a strip just as cold rolled. The microstructure of the normalized strip shows that the grains are uniform in size and the

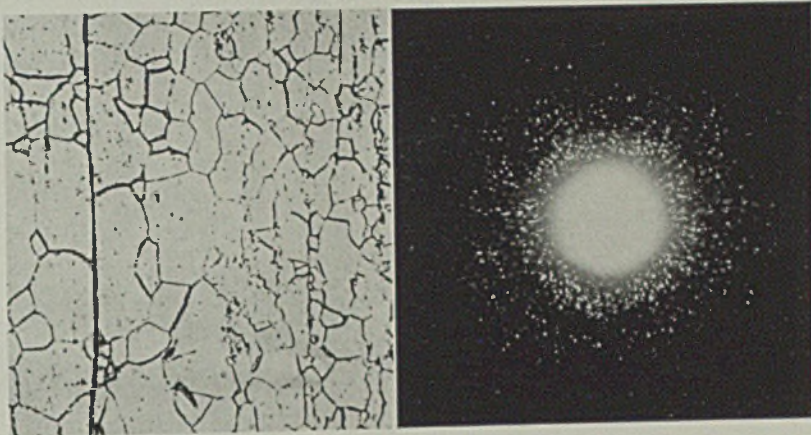


Fig. 7—Rimmed cold rolled strip as batch annealed. X 500. X-ray view at right

carbides appear sorbitic.

On the other hand, in batch annealing there is a wide variation in the time required for the outer layers of the coil and those in the center of the mass to reach temperature; this causes some variation in the grain size, but the tensile properties show a greater variation. The microstructure and X-ray diagram of a pot annealed rimmed steel strip is shown in Fig. 7.

By heating the strip to a temperature above A_3 coupled with proper time at temperature, steels having unusual deep drawing properties can be developed. Examples of severe deep drawing operations are shown in Fig. 6. These clearly show that normalized strip steels are suitable for deep drawing requirements. In some instances one or more operations could be eliminated without intermediate anneals. This could not be accomplished with the batch annealed strip or sheet.

In one of the cups shown in Fig. 6 it was absolutely necessary that it be drawn uniformly and without ears; this was accomplished with strip steels normalized above A_1 . Also, the normalized cold reduced strip required but one heat treatment, whereas the pot annealed strip requires at least two. In another instance it was necessary to obtain a perfect rim due to the small projection required on the upper rim; strip steel heat treated above A_1 made this possible for the first time.

Importance of Grain Size

Tests made on a large number of coils of rimmed and killed strip steels normalized above A_1 and run through the furnace at various speeds, so that the time at temperature was varied, proved that the time at temperature controls the grain size. Larger grains, though not always uniform in size, can always be obtained in the rimmed steels. The grains in the killed steels are smaller and more uniform in size. Killed strip steels require a

longer time at temperature in order to attain the desired size; however, only a few seconds at temperature are required to complete recrystallization of the cold rolled structure in either case.

Numerous tests show that the grain size and the yield point are related. Also, deep drawing tests show that grain size, yield point, uniformity of structure, and completeness of recrystallization are of more importance than hardness. For example, Otis' states that a 0.040-inch strip annealed in the coil in the bell type furnace gave an Olsen cup value of 0.410 and 0.430 and Rockwell "B" hardness numbers ranging from 31 to 40. The same Olsen cup values have been obtained in strip heat treated continuously above A_3 but the Rockwell "B" hardness numbers ranged from 48 to 55. This is accounted for by the difference in grain size and the microstructure (see Figs. 2, 3, 7).

The grain size can be controlled for all deep drawing requirements by simply changing the speed of the strip through the furnace, that is, varying the time the strip is held at the temperature. The longer the holding time, the larger the grains will be. However, it must be pointed out that the grains reach their maximum size in only a fraction of a minute; increasing the time at temperature beyond a certain time limit will not cause a further increase in the grain size.

Excellent deep drawing properties are usually obtained when the grains of the aluminum killed strip are about 0.0005 to 0.00075-inch diameter. For a rimmed strip steel the grain size should be slightly larger. The grains are never as uniform in size, the grains near the surface tending to be larger. A typical rimmed strip steel, normalized at 1700 degrees Fahr., is shown in Fig. 3.

If the strip is run through the

Iron and Steel Engineer, Feb. 1936.
(Please turn to Page 72)

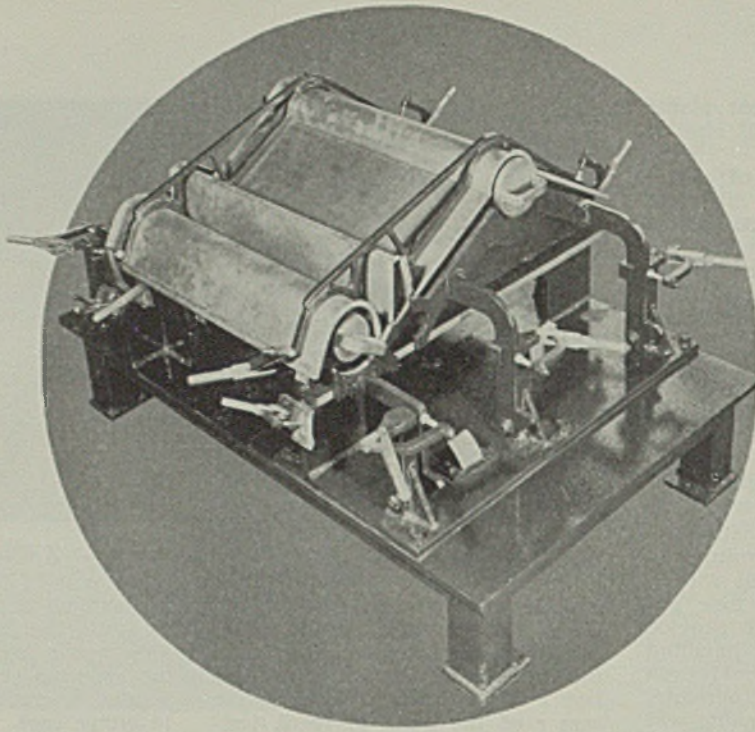


Fig. 2—Auger housings are welded to lower side panel subassembly in this fixture

Progressive Assembly

Some 52 separate parts are assembled in sequence to form entire body of harvesting combine. Effectively illustrates how standard resistance welding guns with suitable fixtures permit efficient assembly

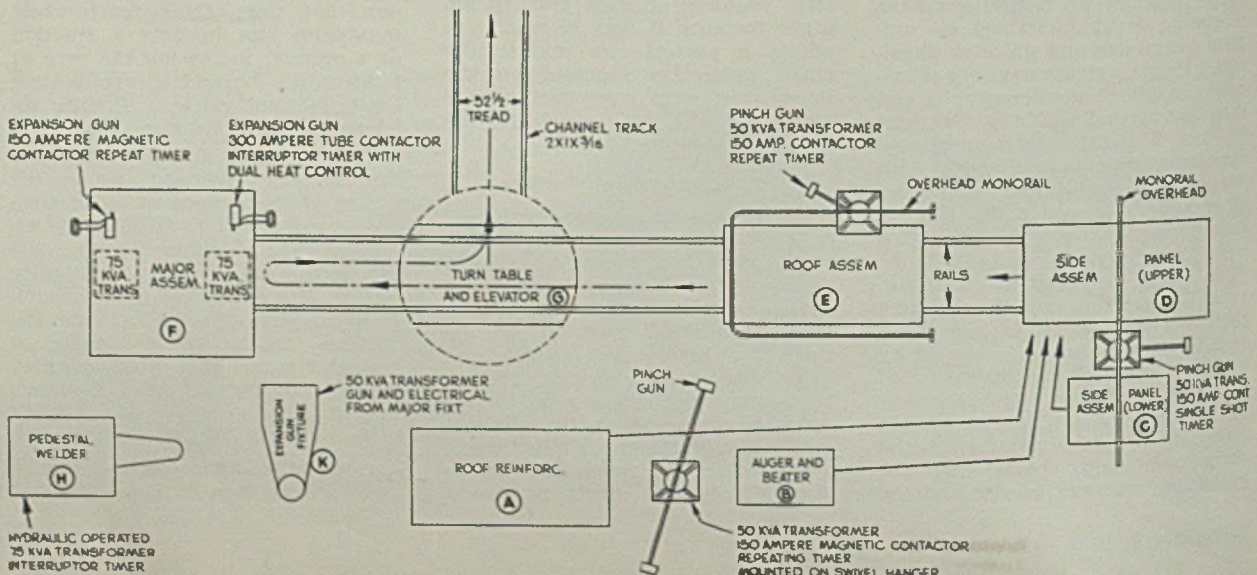
■ A COMPLETE welding department designed for progressive assembly welding of the entire body of two sizes of harvesting combines has been put into operation at the East Moline, Ill. plant of John Deere Harvester Co.

The body assembly comprises some 52 separate parts including auger housing, beater cover, top,

upper and lower side panels, reinforcing plates, collars and brackets. All these parts are assembled by spot welding at nine progressive stations, using only seven transformers, seven welding guns and a new spot welder of the air-hydraulic type.

Each "gun" includes a U-shaped clamp holding the two welding electrode tips and an air or oil cylinder by means of which pressure is applied to the work inserted between jaws of the gun. Entire unit is connected by flexible cables to the weld-

Fig. 1—Layout diagram of arrangement of welding guns and fixtures for the production line described



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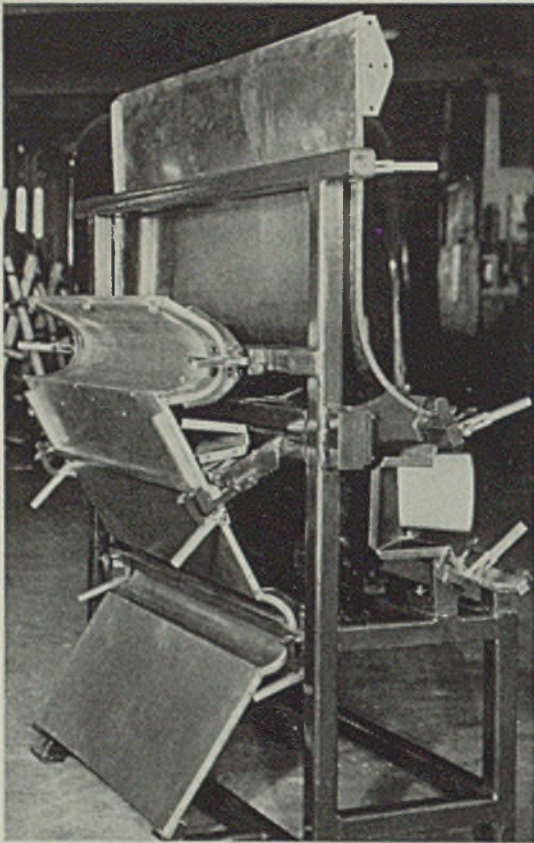


Fig. 3—Cylinder and top subassemblies, previously assembled on conventional stationary spot welders, are put together in this fixture using a "pinch" type spot welding gun

ing transformer, timer and air or hydraulic equipment.

The floor plan layout of this equipment in Fig. 1 shows flow of work through the various units. It will be noted the top-reinforcement fixture A and the auger and beater-housing fixture B employ spot-welding guns swiveled on an arm to permit their being revolved to reach the two fixtures. The top-reinforcement fixture, moreover, is of the turntable type so all parts can be reached with the gun from one side. Another single gun is used for

the lower side-panel assembly C and the upper side-panel assembly D. Transformer, booster and gun here are hung from an overhead monorail and are moved between the two fixtures as needed.

A similar monorail permits welding both sides of the roof assembly to the side panels with but a single

gun, the monorail being U-shaped and located directly above the assembly station at E, Fig. 1.

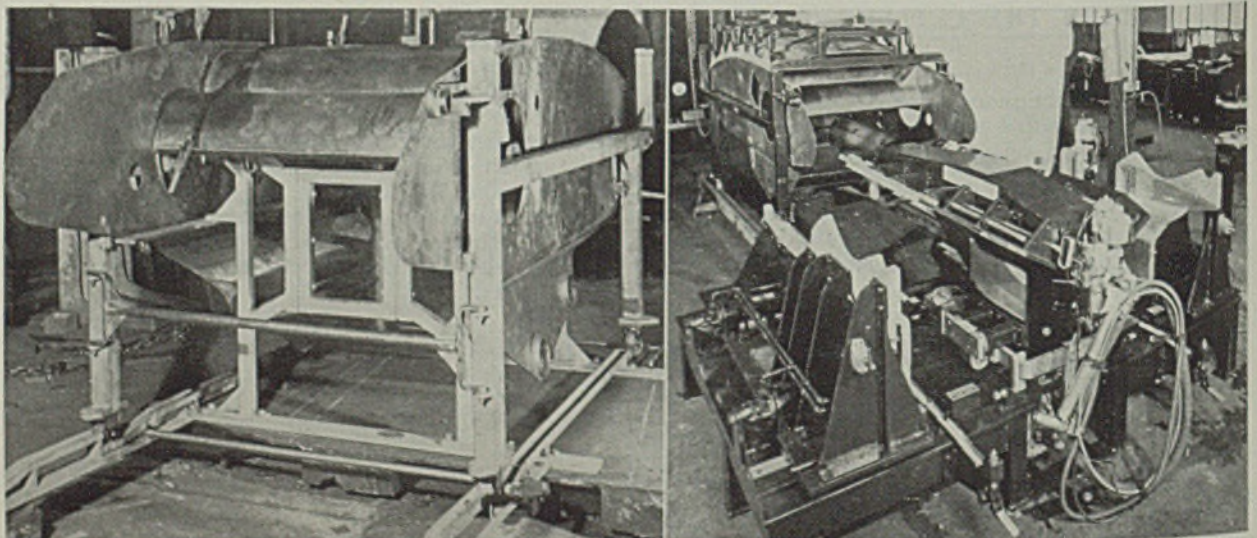
Two more guns at the "major" assembly station F, each with its own transformer, complete the actual welding equipment. It should be mentioned that each gun, with the exception of the first mentioned swiveled installation has its own timer and transformer. These automatic timers operate through electronic tubes and are adjustable as to welding time, cooling time, etc., for each spot.

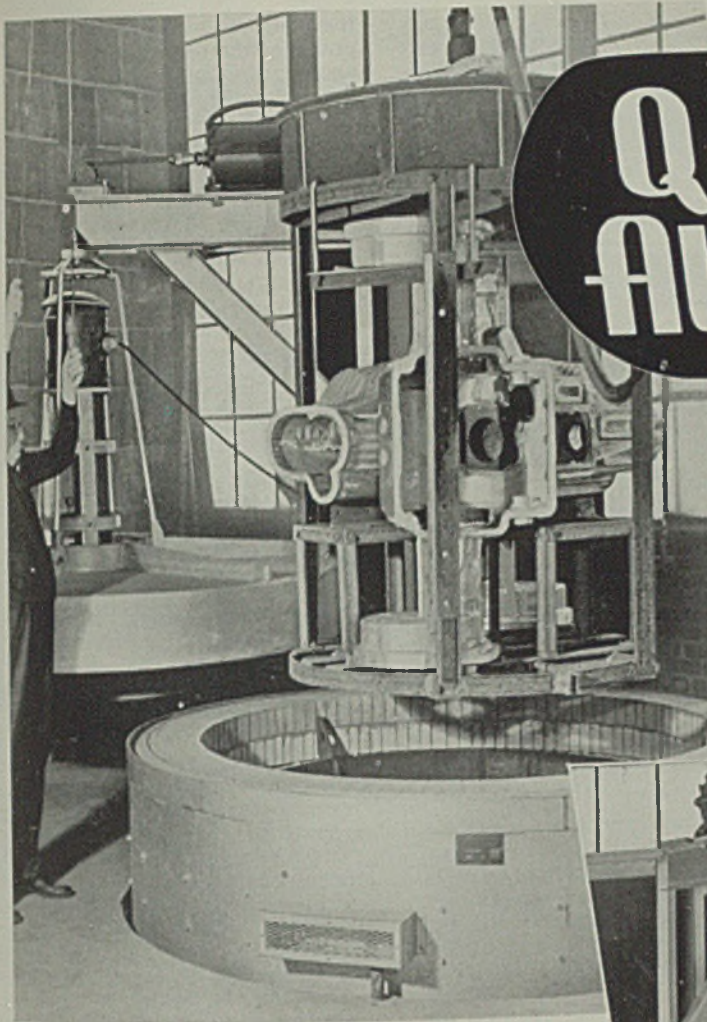
The entire installation was worked out with the co-operation of the Progressive Welder Co., Detroit, which supplied fixtures, transformers and guns.

The various sheet metal parts range from 0.030 to 0.125-inch in thickness. Fixtures are so designed and equipment selected that no spots show on the outside of the completed shell. In general this has been achieved by the use of water-cooled dies fitting the contour of the body at the weld. These dies, known as "coppers," bear against the outside of the body and serve as conductors for the welding current.

Primary assemblies (subassemblies) are welded first on a spot welder. Then these subassemblies are in turn assembled on the series of fixtures shown here as will be detailed. Auger housings are welded to the lower side panel subassembly in the fixture in Fig. 2. (B, Fig. 1) the side panel being located on the right of the fixture shown. Note use of quick-acting hand clamps on many of these fixtures. A "pinch" type of spot welding gun is used here. The assembly

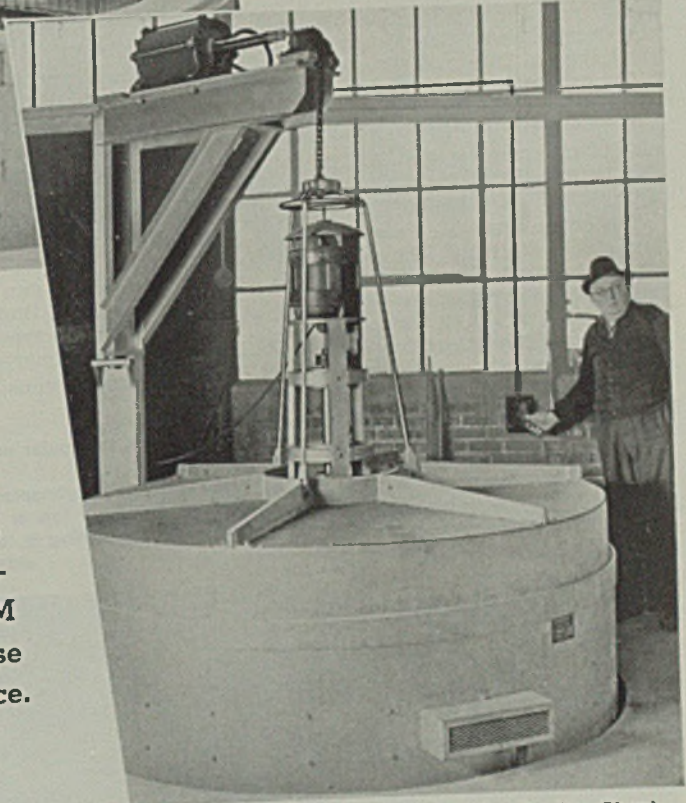
Fig. 4. (Left)—This telescoping fixture is used in welding side panels to the cylinder and top cover assembly. Fig. 5. (Right)—In background, top panel is being welded in position. Foreground shows "major" assembly fixture open. Note here the two sets of hydraulic cylinders used to open and close dies at each side of the fixture





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then goes to the fixture in Fig. 3 (C, Fig. 1) where cylinder and top cover subassemblies are spot welded, using another pinch gun.

Upper side panels are welded to the cylinder and top cover assembly in the telescoping fixture shown in Fig. 4 (D, Fig. 1). The cylinder and top cover assembly first is mounted in the inner fixture. Upper side panels are located inside the outer part of the fixture, which is then rolled into position over the inner fixture on the guide rails shown. The operation requires about 80 spots with a pinch type gun welder. This same welder also serves C, being hung on a mono-rail over both fixtures. A hand raising device is used to elevate the rails and outer fixture to clear the inner fixture, when welding is completed. This lifts the entire assembly off the inner fixture, permitting it to be rolled on the rails to the following operation.

This next operation, the fixture for which is shown in rear, Fig. 5 (E, Fig. 1), consists in welding the top panel in position. With the assembly rolled forward to station E on rails extending from D, the top panel and assembly locating fixture are dropped into place from overhead, the top fixture piloting in four holes in the ends of posts of the main fixture. With the combine body assembly in this fixture, drip moldings are pinch gun welded to side panels after the roof panel has been welded into the assembly.

The entire assembly then is rolled forward to station F, the major assembly location. Here, Fig. 6, upper and lower assemblies are welded together. Fixture used here is shown in open position in foreground of Fig. 5. First, the lower side panel and auger housing subassembly from Fig. 2, are slid into the fixture. Then the assembly from Fig. 5 is rolled over the fixture to nest the assemblies. Four pilot pins are raised into holes in brackets on the legs of the outer fixture. Four air

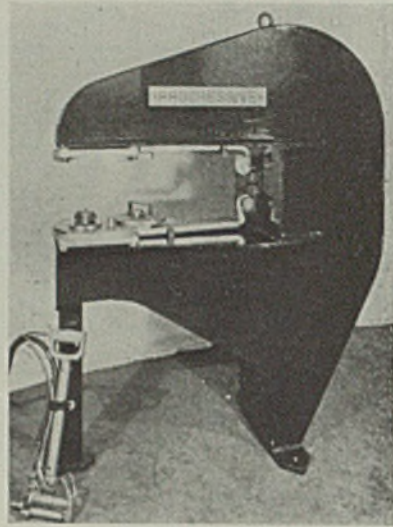


Fig. 7—One of the subassembly fixtures built to use one of the standard "push" type guns and timer from the final assembly station

cylinders on either side then move in the locating coppers, pilot plungers engaging holes in the lower assembly to locate it horizontally and vertically.

Two hand expansion guns are used to weld the assemblies together, working from both ends at station F. Each gun has its own transformer and power unit, the former located in the base of the major assembly fixture, the latter mounted on the fixture as shown. Air-hydraulic boosters are used for the guns. Each gun is provided with an individual timer, one being of the interrupted type and one being a repeating timer.

The expansion guns bear against

the back-up plates shown on the center of the fixture, pressure being against the outer coppers, which, incidentally, are water cooled. With this setup no spot weld marks appear on the outside of the finished body.

An unusual operation now follows in this same setup. Axle brackets of $\frac{1}{2}$ -inch hot-rolled stock are welded on the outside of the body panel and reinforcement panels of 0.060-inch pressed steel are simultaneously welded on the inside to the 0.030-inch stock body panel between them—a thinner section between two heavier gages.

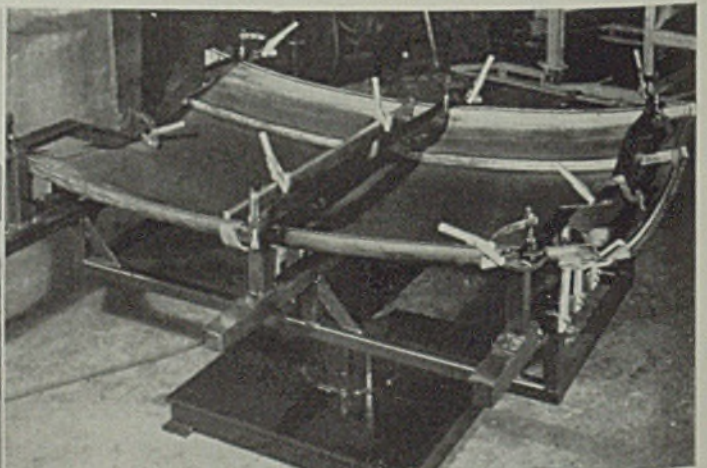
In addition to welding through these three thicknesses, the same gun, transformer and timer are used to make other welds between body and reinforcement panel where only two thicknesses of metal are involved. This is made possible by the provision of a dual-heat pushbutton arrangement on the gun. These push buttons operate dual heat relays on the interruptor timer. This arrangement permits some 40 spots per side to be welded through three sections with 60 more per side through two sections, switching back and forth as required.

Contributing to the success of this setup is the provision and design of coppers to fit the reinforcement brackets exactly. These brackets require welding both at an angle and horizontally. To provide for this, using the same guns, the back-up plates on the fixture are designed so they may be swung manually to a position parallel with the surfaces being welded together.

After removal from the major fixture at F, the last operation on the combine body is to weld in a
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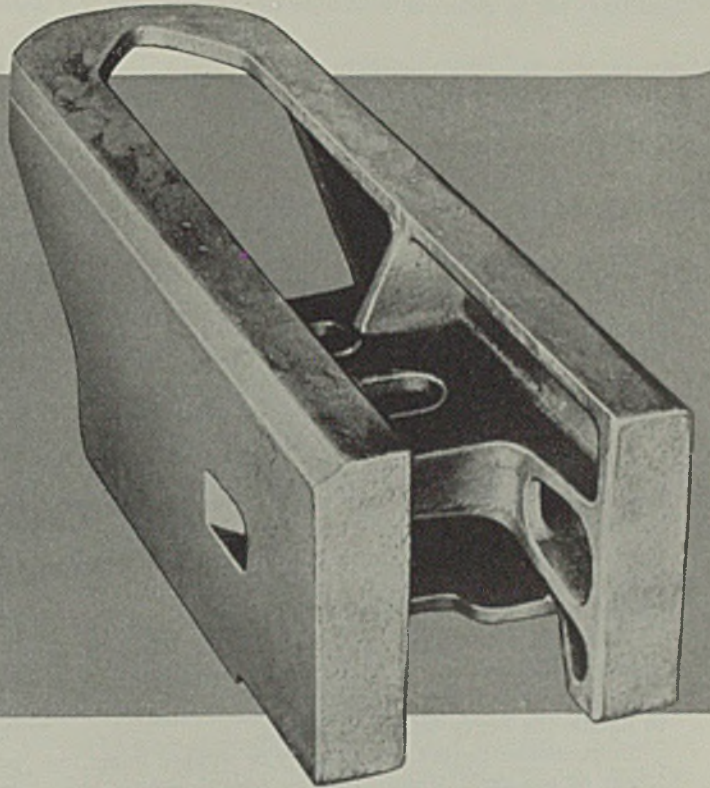
Fig. 6—Here the major assembly fixture has work inserted and dies closed ready for welding

Fig. 8—Another subassembly fixture. This one is used to weld reinforcements on both ends of the top or cover and a baffle in the middle. Note fixture is on a turntable, permitting it to be revolved so operator can make all welds from one side using a deep-throated pinch gun



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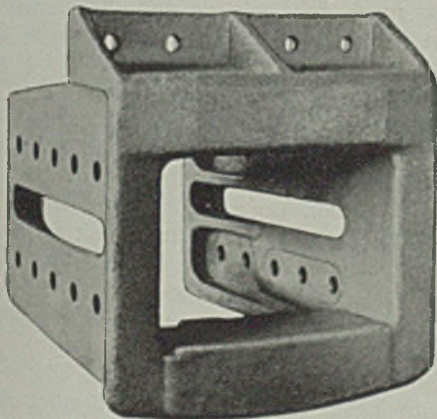


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Erecting Steel Towers

By F. L. SPANGLER

■ AN IMPORTANT item in the final cost of a steel tower is the cost of field erection. A tower may comprise several hundred individual pieces of steel, welded, riveted or bolted together. These pieces can be drilled and assembled on a bench in a shop much more quickly and at much less cost than required to drill or assemble them in the field.

Except in the case of comparatively small towers, it is impracticable to deliver the structure complete to the field site because of limitations affecting shipment of such large structures and difficulties of handling large heavy assemblies in the field. Without careful consideration given to all factors involved, the savings made by using shop labor may be offset by higher field erection costs caused by investment in high-capacity hoisting equipment or by larger crews to handle the heavy bulky assemblies.

Short slender towers or poles may be shipped intact, if not of too great length, thereby requiring no field assembly. One company supplies poles up to 50 feet in length, fully assembled. Longer poles are shipped in two sections and require a field splice.

Steel towers serving as radio antennae have been erected with heights as great as 750 feet. Radio towers are of two types, those that are rigidly anchored at the base, and those that are pivoted at the base. The latter is necessarily a guyed structure, while the former is not. Towers may have either three or four uprights tied together by diagonal and horizontal members, giving a cross section like an equilateral triangle or a square.

In the erection of these structures, it is usual practice to employ a gin pole or boom, usually made of wood and about 50 feet long, which is lashed to one of the legs of the tower structure. Gin poles also are used in the erection of power transmission towers. They may be lashed to a leg of the structure or, if the base is quite wide, they may be guyed in the center of the structure with the bottom of the pole in a basket supported by cables passing over sheaves on the structure.

These gin poles are preferably of some soft wood such as pine or fir so the pieces of cable by which they are lashed to the structure will bite into the pole and prevent slipping. Where the gin pole is of

steel, it is necessary to provide the pole with clips or other means for resting against the cable and preventing the pole from slipping when hoisting a load.

Of course, wire rope is essential in the erection of these steel structures. It is used to lift the loads from the ground and also to raise the gin pole. Where guys are required, a considerable amount of rope must be employed for this purpose.

Field erectors have found that some ropes handle easier than others and so speed the erection job and cut labor costs. Some ropes will twist and tend to throw themselves into loops which may be pulled into destructive kinks. Other ropes will lie straight and handle with much the same ease as manilla ropes. The difference is brought about in manufacturing the rope itself. Ropes whose strands are preformed before being closed onto the rope center normally contain no internal twisting stresses and so are the easiest to handle. Such rope does not fly apart or unravel when cut.

Since saving in time is important in keeping field erection costs low, erectors generally have adopted preformed ropes for hoisting and lifting purposes. Ropes not preformed still are being used for guys. For temporary guys that later will be used as hoist ropes, the preformed type may be preferred.

The footing design for steel towers depends on local soil conditions. Light-weight poles set directly in the earth may be provided with earth-bearing angles at the bottom. Concrete, however, is generally used as a footing, the structure being set in the concrete or anchored on top of a concrete pedestal.

The following sequence of operations is typical for erecting a three-sided radio tower rigidly connected to its base.

First, the lowermost section of one of the legs is bolted in place on its foundation, after which diagonals are bolted on. Then the first sections of the other two legs are erected, and diagonals and horizontal members are added. A sheave is then attached to the top of one of the leg sections for hoisting the gin pole so it can be lashed to the leg. The gin pole is made to extend about 25 feet beyond the top of the leg so that its sheave can be used for

hoisting succeeding sections of legs as well as diagonal and cross members into place for bolting.

The second and each succeeding section of the tower is erected in a similar manner to the first section. After the erection of each section the sheave that was attached to the top of the last section is moved to the top of the new section, allowing the gin pole to be lifted and lashed in a higher position. Thus, by using a gin pole to hoist the leg sections and diagonal and cross members into place, and a sheave to hoist the gin pole as the erection of the tower proceeds, section after section is added to the tower.

The leg sections of these towers are generally of some standard length—20, 22, 25 feet or some other convenient length.

As erection of the radio tower proceeds, the tower legs converge closer and closer to the center of the structure until finally they meet, and the rest of the tower then consists of prefabricated sections set one on top of the other until the last section is in place. In the erection of these sections, the gin pole is used in the same manner as for the erection of the lower part of the tower.

Fastening one leg section or one tower section on top of another may be done by providing plates at the top and bottom of the section, the bottom plate of an upper section resting on the top plate of a lower section, with the plates bolted together by the field erectors.

Where the radio tower is of the guyed type, with its base pivoted on an insulator bearing, the tower may consist of long, slender sections delivered to the site in standard lengths. These are erected one on another, in much the same manner as the erection

of the upper sections of the three-legged tower just described, with the exception that the pivoted structure must be guyed at all times. Hence as erection proceeds, new guys are attached to hold the structure plumb. Most of these guys are temporary and are removed after the permanent guys have been put in place.

These tower sections may comprise a combination of angles with connecting members, all assembled in the shop, so the only field assembly is the making of the field joints.

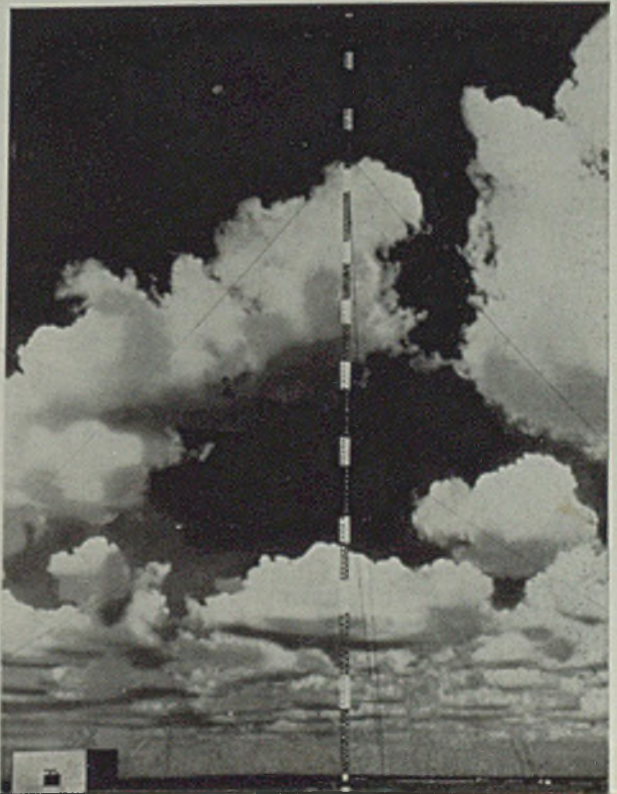
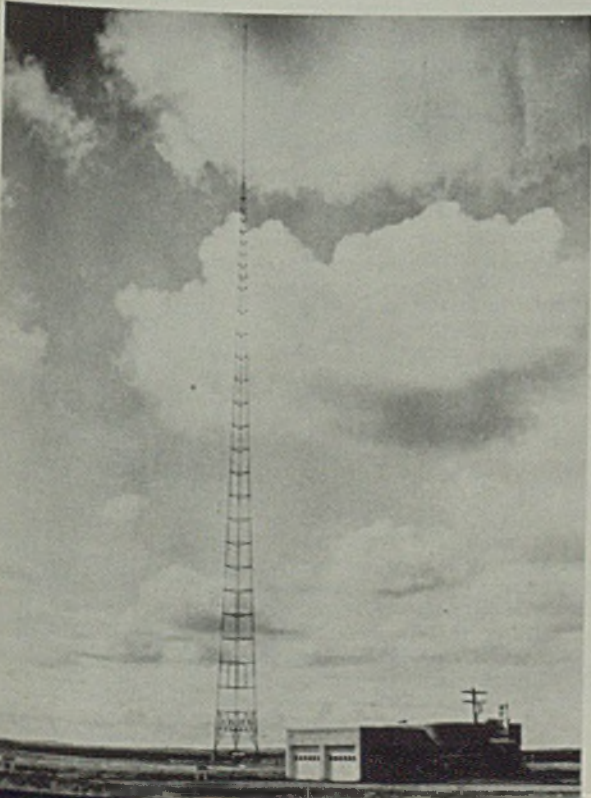
The procedure for erecting power line transmission towers is much the same as that for a radio tower rigidly supported by legs. A gin pole is used to hoist the individual steel members in place for bolting and a sheave which is moved up step by step as erection proceeds is used to hoist the heavy gin pole to enable it to be lashed at a higher position.

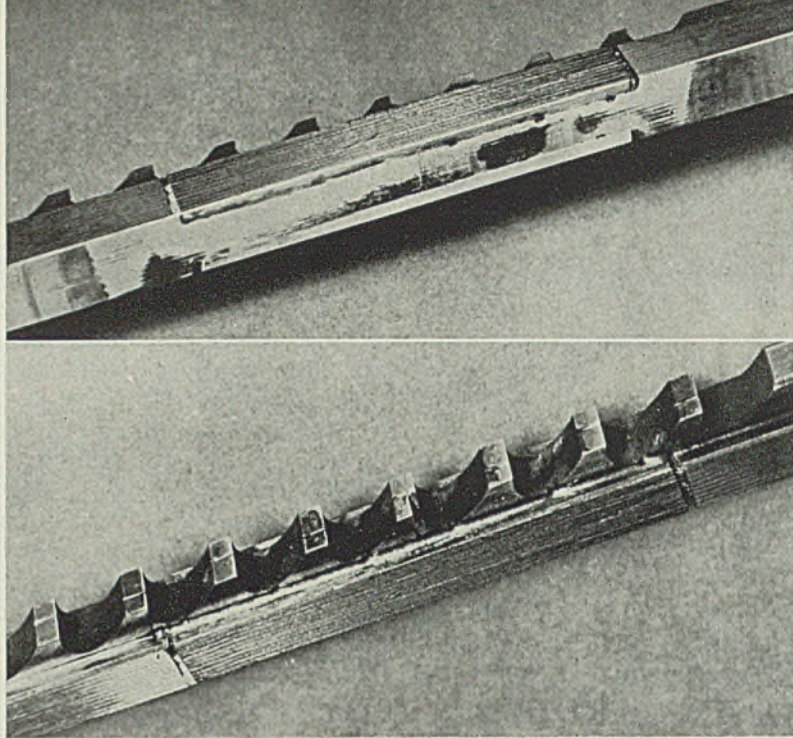
Where a guyed gin pole is used in the center of the tower, its base rests in a basket supported by ropes passing over sheaves atop each of the four legs. The gin pole is raised by pulling on two of these ropes passing over sheaves on opposite legs, after these sheaves have been raised. With the gin pole in its new position, the other two sheaves are raised and the ropes pulled taut. The guy wires always are kept taut, but they are played out as the gin pole is raised to allow for the increased elevation of the pole.

To avoid setting up a high bending moment in the gin pole when hoisting sections, a fairlead sheave is located below the pole and attached to one of the tower legs near the ground. From the fairlead, the rope feeds to a power winch.

Whatever the erection method to be used, it should be studied carefully and all details planned in advance. Only by careful planning can field erection costs be kept low.

Left, this type of tower is rigidly anchored at the base, uses no guy wires, has triangular cross section. Right, towers like this are pivoted at the bottom on a single support, employ guy wires to hold them upright





A Broach Repair Method

❑ MUCH is heard these days about the importance of tooling. At the same time grave concern is being expressed over the growing shortage of skilled toolmakers. Therefore, any practical means by which expensive tools which are difficult to make can be repaired quickly and put back into service after accidental breakage is of particular interest at this time. One such method is shown here.

At the S. & S. Corrugated Paper Machinery Co. Inc. plant, Brooklyn, N. Y., a high-speed broach used in cutting $\frac{3}{8}$ -inch keyways broke in service. This tool is used constantly on a variety of work. While a new one costs \$72.75, the delay in getting it was more serious as it meant disrupted production schedules.

Inspection showed that the break was clean and about 14 inches from the drawbar end where the broach is attached to the machine. As the high-speed steel from which the broach was made is of the air-quenched type, hardness had to be kept in mind in determining the best repair. Also, to maintain size in the broach, the joint had to be made by a method which would not warp the tool out of shape. Many broaches would involve similar restrictions.

It was felt that the job would be greatly simplified if the repair could be made without affecting the hardness of the cutting edges. This meant a low-temperature process had to be used, eliminating welding. Therefore, it was decided to braze

Above illustrations show two views of the high-speed broach repaired by the silver soldering technique described here using two reinforcing strips, one on each side

the break together with a low-temperature silver alloy supplied by Handy & Harman, 82 Fulton street, New York. This material flows freely at 1175 degrees Fahr. It was used to join two reinforcing strips of tool steel to the sides as shown in the illustrations above.

First, the sides of the broach were undercut $\frac{1}{8}$ -inch for a distance of $1\frac{1}{2}$ inches each way from the break, using a surface grinder. These surfaces then were cleaned thoroughly and covered with a special flux designed for use with this silver solder. It is completely liquid and active at 1100 degrees Fahr. Two high speed steel reinforcing strips were formed to fit the recesses cut in the sides of the broach. After these also were fluxed, the joint was assembled with inserts of the silver solder brazing alloy in sheet form 0.005-inch thick between the reinforcing strips and the body of the broach. The assembly then was clamped securely together.

Using an oxyacetylene torch having a No. 5 tip and regulated to give a soft reducing flame, heat was applied to the side of the broach opposite the cutting teeth. Care was taken to heat evenly until a faint red appeared in the met-

al. The brazing alloy insert then flowed and penetrated into the fracture, securely joining the broken parts which had been butted together closely. At the same time it permanently united the reinforcing pieces to each side. The job then was air cooled because of the type of steel which was joined.

An inspection of the finished job showed a sound joint. Tests indicated that hardness had not been affected, and the broach did not warp to a harmful degree. The small amount of warpage which did occur was attributed to the hurriedly arranged clamping methods which of course would be corrected on a future job.

After slight finish grinding, the broach was tested in regular service. It has now been in use for over three months and is doing its job as well as a new tool. The hardness of the cutting edges appears not to have been impaired by brazing in any way.

In checking costs of materials and labor for this job, the results added up as follows: Undercutting and grinding labor, 2 hours, \$4.00; gases, 50 cents; brazing alloy and flux, less than 10 cents; brazing and fluxing labor, one-half hour, \$1.00; finishing labor, one-half hour, \$1.00; total, \$6.60.

Thus low-temperature brazing not only relieved a production jam but saved the difference between \$72.75 and \$6.60 in doing it. The wider use of brazing like this offers an opportunity of saving many an expensive tool from the junk pile.

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Photograph Courtesy of American Tool Works Co.

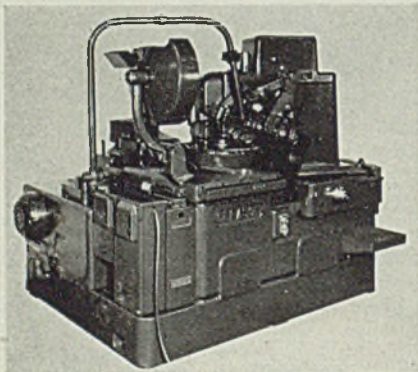


PETROLEUM PRODUCTS FOR ALL INDUSTRIES



Cutting Machine

■ Gleason Works, Rochester, N. Y., announces the Revacyle, a new mass-production machine for cutting straight bevel gears such as those used in automotive differentials. It provides a fast method of cutting straight bevel gears, the gear teeth being both roughed and finished in one operation with a single disk cutter. While normally arranged for the continuous production of one particular gear or pinion, the machine also can be arranged to handle several jobs consecutively. Typical production for an 11 x 16 combination, 5 diametral pitch is 70 pinion or 50 gears per hour. The machine's cutter has a number of radially arranged roughing blades followed by a number of similarly arranged finishing blades with a gap between the last finishing and the first roughing blade. The cutter is mounted on a reciprocating slide, and, as the cutter rotates in engagement with



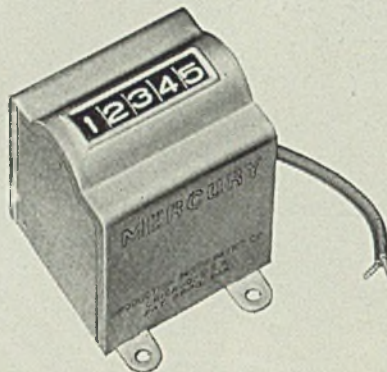
the gear blank, it moves along the lengthwise direction of the tooth space. As the cutter moves from the small to the large end of the blank, the roughing blades rough out a tooth space. On the return stroke the finishing blades finish the tooth space which has just been roughed.

The blank is held stationary during cutting, and at the end of each return stroke of the cutter, the blank is indexed at the gap in the cutter blades. Conjugate tooth forms are

produced as a result of the cutter motions and the profile shapes of the cutter blades. Except for chucking, the machine is entirely automatic. It is provided with a rotary work holding turret with three spindles. Thus, gears are removed and blanks loaded at two stations, while cutting takes place at the third. While the machine is in operation a built-in conveyor deposits chips outside the machine. Lubrication of all moving parts other than the spindle is provided by a circulating oil system. The work is held in place by a heavy spring and is released by a hydraulic piston.

Electric Counter

■ Production Instrument Co., 706 West Jackson boulevard, Chicago, has introduced a small, compact mercury electric counter which requires only a small amount of energy (about 2 watts at rated volt-

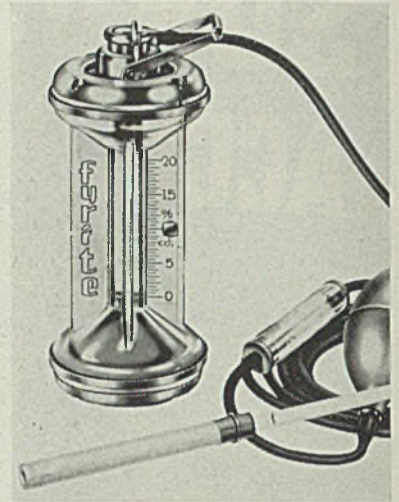


age). It is particularly suited for electric eye operation and is capable of providing 600 counts per minute. Five number wheels record up to 99,999 and repeat. Large white figures on black wheels located close to the window provide easy reading. The counter features tamper-proof construction, and is available for any 60-cycle alternating-current voltage up to 230 and for any direct-current voltage up to 115.

Carbon Dioxide Analyzer

■ Bacharach Industrial Instrument Co., 7000 Bennett street, Pittsburgh, announces a chemical type carbon dioxide analyzer known as Fyrite for measuring the percentage of carbon dioxide in the flue gases of boiler furnaces. It features a gas sampling unit which includes a primary flue filter with a replaceable filtering thimble. Other improvements are said to make the instrument faster and more fool-proof. Its operation is simple. A flue gas sample of known volume is pumped to the instrument by hand with a rubber bulb and trapped in the instrument. The instrument is then

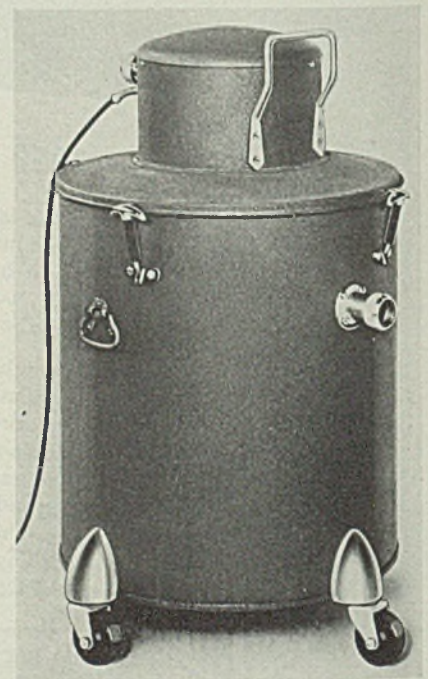
turned upside down and back again to mix the gas sample with the absorbing reagent. The suction created due to the complete absorp-

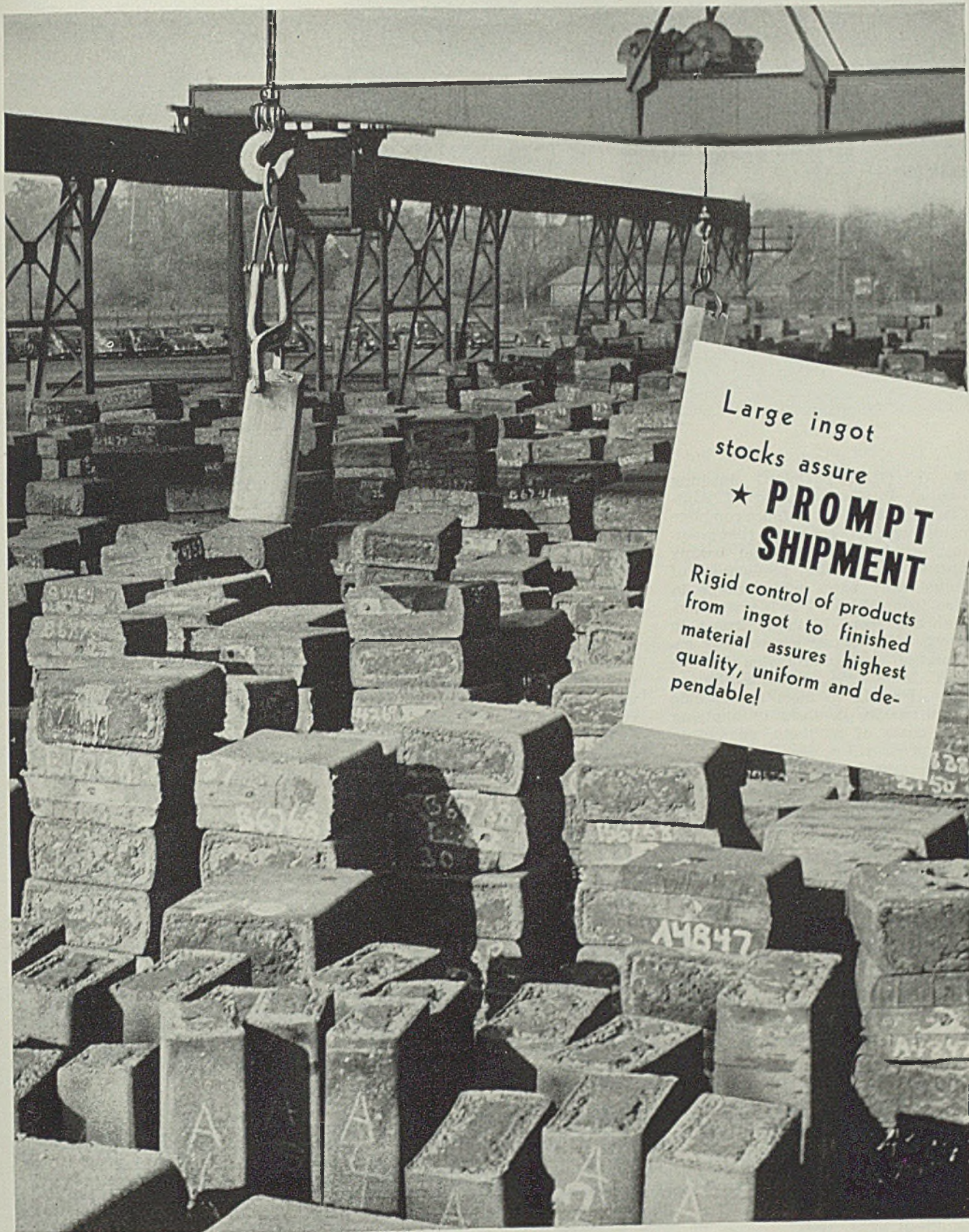


tion of the carbon dioxide pulls the absorbing fluid up an amount equal to the carbon dioxide absorbed. The instrument gage fits snugly into the hand and its proportions are balanced so that it is not easily upset when placing it on a table.

Industrial Cleaner

■ Electric Vacuum Cleaner Co. Inc., 1734 Ivanhoe road, Cleveland, has introduced two models of a new 1-horsepower portable industrial cleaner for industrial use. Model 184 has a 2-bushel capacity and model 184-A has a 1½-bushel capacity. Both are equipped with a 1-horsepower air-cooled motor. The new type crinkle-finish on the container is durable and long-wearing.





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WORTH STEEL COMPANY
CLAYMONT, DELAWARE

Finishing Transformer Cases

After being thoroughly cleaned and rustproofed, transformer cases receive two coats of baked-on synthetic enamel in highly mechanized finishing line. Chain conveyor runs continuously

■ AN OUTSTANDING finishing line at Pittsburgh plant of Allis-Chalmers Mfg. Co. includes complete equipment for cleaning, rust-proofing, drying, painting and baking operations in the production of transformer cases which range in size from 31 to 41 inches in diameter and from 38 to 44 inches in depth. The entire system was engineered and co-ordinated by the R. C. Mahon Co., 86 Mt. Elliott avenue, Detroit, to meet the specific requirements involved in applying two coats of synthetic enamel to this product.

The transformer cases are carried through the system on a mono-rail conveyor at three levels as shown in the accompanying elevation diagram, Fig. 2. The cases are suspended from hooks moved along by a continuous chain conveyor, in an inverted position. The cases are loaded on the chain conveyor at the unload-load station at lower center of the plan diagram, Fig. 1. This station also is shown at the extreme right in Fig. 3.

First after loading, the cases are lifted to the second level where they pass through the alkali wash

station seen in the plan view, Fig. 1. Here sprays are set to cover effectively the entire interior and exterior surfaces of the case. The alkali wash solution is maintained at a temperature of 180 degrees Fahr. by means of gas immersion-type heaters in which the gas is burned in tubes submerged in the solution in the tank.

From the alkali wash, work passes to the adjacent hot-water rinse which is also heated by immersion-type gas burners to 180 degrees Fahr. An important advantage obtained by using immersion-type gas burners is that this method of heating completely eliminates considerable buildup of scale on heating equipment which is apt to occur with conventional heating systems.

All solutions are pumped through sprays and drained from the work back into the solution tanks directly below as shown in elevation diagram, Fig. 2. Drain boards adjoining each tank return spray and drip to the correct tank.

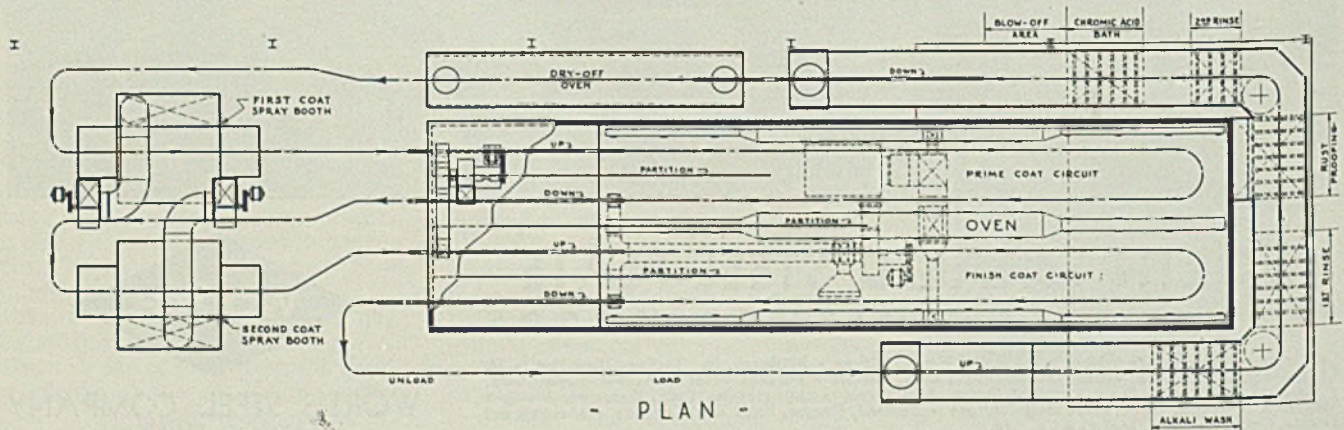
Rust-proofing section is heated by

direct-fired gas burners. As the gas is burned directly in the processing chamber, the atmosphere in this unit is partially reducing in nature. This feature has been found to increase the effectiveness of the rust-proofing obtained. Even though the conveyor entry at extreme right, Fig. 3, is open, sprays from the preceding washes and the fact that the work is elevated help to trap this atmosphere which has been made partially reducing because of the large percentage of oxygen that is burned in the process stage. The gas burners on all of the tank heating units are fitted with complete automatic safety and temperature control systems.

All these process and rinse tanks operate at a temperature of 180 degrees Fahr., the automatic control switching the gas burners from a high to a low position as may be necessary to maintain the temperature. The automatic safety control cuts off main gas supply valves in case the pilot lights are extinguished, or electric current fails, or gas pressure drops below a predetermined point.

After passing through a second

Fig. 1—Plan view of the highly efficient setup which applies two coats of synthetic enamel to the transformer cases



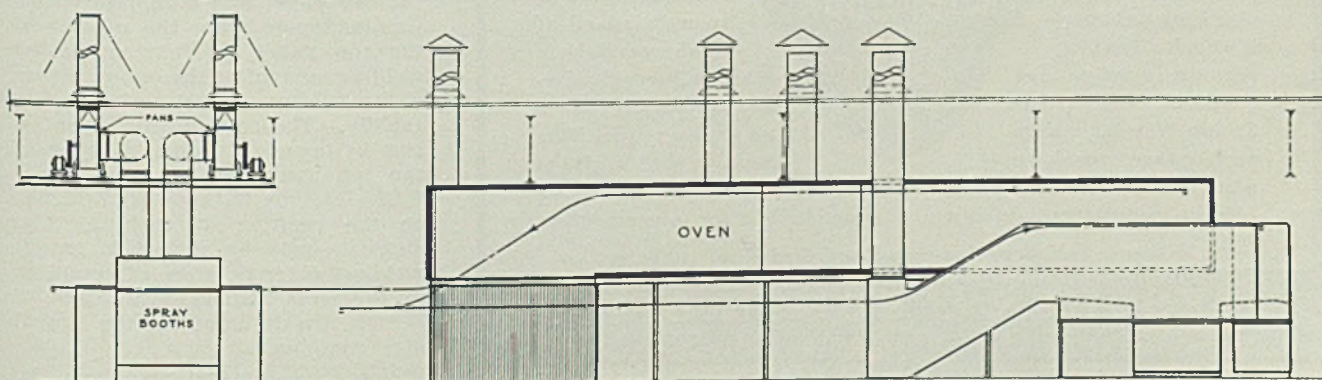
rinse and a chromic acid bath, the cases go through an automatic blow-off where any entrained water is removed before the transformer cases pass on to the dryoff oven. The blowoff air is furnished by the same blower that supplies combustion air to the gas burning equipment. From the blowoff area, the work passes down to the lower level and exits from this series of processing units to enter the adjacent dryoff oven.

This oven is heated by a line of direct-fired gas burners mounted on the floor and designed to operate at two levels. By use of a high and a low level, automatic controls switch the burners from one setting to the other to maintain an operating temperature of 350 degrees Fahr. Complete safety controls also are incorporated here.

Now the rust-proofed and dried cases are passed to the first-coat spray booth—one of two Mahon hydro-filter spray booths of the open-top down draft type provided with full water curtains which flood the entire back side of the booth with water to remove all overspray and pigment from the air before the air is passed out through the exhaust fan. Overspray and excess pigment entrapped in the water curtain are removed in the centrifuge section of the hydro-filter. Both first and second-coat spray booths are pictured at the left in Fig. 3.

From the first spray booth, the transformer cases pass into the baking oven where a temperature of 350 degrees Fahr. is maintained by means of direct-fired gas heaters. Both heated air and products of combustion are circulated throughout the entire oven. This oven is arranged so a considerable amount of the air heated by the gas burners is recirculated through the oven, thus keeping down fuel requirements and increasing efficiency of the unit. The gas burner and

Fig. 2—Elevation view showing the three levels at which conveyors carry the work through the equipment



- E L E V A T I O N -

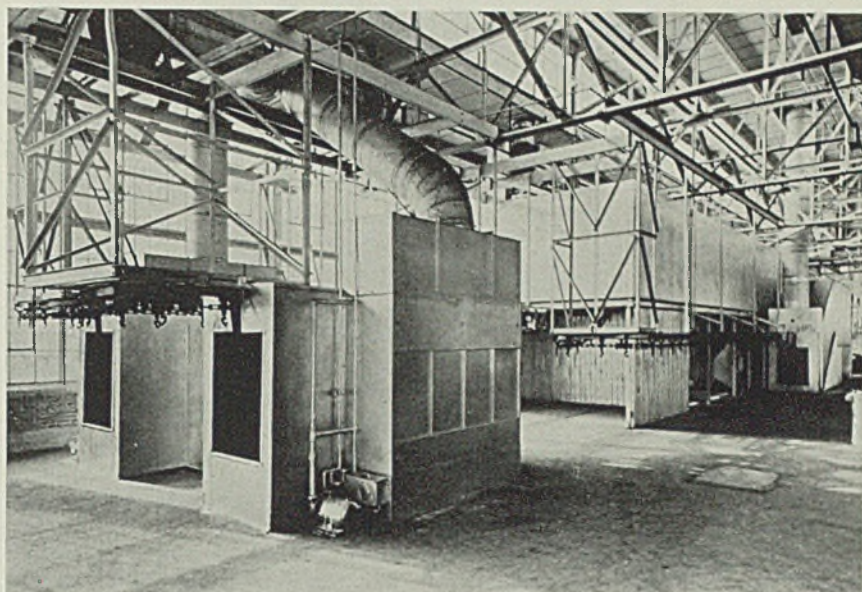


Fig. 3—Double entrance and exit from furnace. Note opening is below furnace level, thus trapping heated air and maintaining thermal efficiency

blower equipment is installed on the floor directly below the raised oven. Complete safety and automatic temperature control is provided.

It will be noted in the plan diagram, Fig. 1, that work passes in and out of the oven at the same end. In Fig. 3, this entrance and exit is seen to be at a lower level than the oven proper. This is also shown in the elevation diagram, Fig. 2. Here the oven section of the monorail is shown plainly on a third level at a considerable distance from the floor. This allows the work to enter and leave the oven continuously, yet assures high thermal efficiency because the hot air and gases are trapped in the upper portion of the oven—the entrance and exit being through the oven "bottom."

The plan diagram, Fig. 1, shows clearly the three partitions employed in the oven to break up side drafts. One partition separates the entrance and exit line of the prime-coat circuit

and a second partition separates ingoing and outgoing lines of the finish-coat circuit, while a third larger partition extends past the center of the oven to separate the prime coat from the finish-coat circuit.

After the prime coat or first coat has been baked, the work passes through the second-coat spray booth, returns to the oven where the finish coat is baked.

Emerging from the oven for the second time, the transformer cases go to the unload-load station where they are removed from the conveyor.

This finishing system was especially designed to do a specific job thoroughly and economically at its normal conveyor speed of 3 feet per minute. However, the conveyor is equipped with a variable-speed drive which permits conveyor speed to be increased or decreased approximately 50 per cent above or below normal operating speed. Each transformer case receives two coats of synthetic enamel over a thoroughly cleaned and rust-proofed base. The finish produced is hard, tough and highly abrasion resistant as well as being practically immune to weathering.

Continuous Casting

(Concluded from Page 50)

meshing gears.

This distinctive transmission construction imparts a pulsating motion to the gearing that exactly compensates for, or counteracts, the variations in conveyor speed caused by long link chains driven by conventional circular gearing. The strain on the conveyor chains thus is held uniform and the rate of conveyor travel kept constant—essential requirements for the satisfactory operation of a conveyor doing this type of work.

Engineers of Canadian Furnace Ltd., Dominion Foundries & Steel Ltd. and Link-Belt Co. collaborated in the design and construction of this cost-reducing pig-casting conveyor.

Chart Indicates Steels For Various Uses

■ A steel recommendation chart giving brands of tool steels recommended for various tools, dies and other applications, is announced by Jessop Steel Co., Washington, Pa. It lists over 150 applications in alphabetical order, with the recommended tool steels indicated at the right of each application.

Two different symbols are used to identify the steels recommended. One indicates recommendations for average runs, the other for long runs. The bottom of the chart gives the correct heat treatment for the principal brands of Jessop steel.

Copies of the new chart are obtainable upon request to the company at the address noted.

Welded Steel Grating Made in Several Types

■ Pressure welded steel floor grating and running boards are now supplied in a number of types and sizes by Whitehead & Kales Co., Detroit. Grating is made in standard widths of 24 inches and in lengths up to 20 feet, of structural quality mild steel, copper bearing, if desired, and developing an ultimate strength of 55,000 to 65,000 pounds per square inch.

The mesh is formed of longitudinal bearing bars of rectangular section, crossed by round bars electric pressure welded at the intersections. The round crossbars have deeply knurled upper surfaces, with the knurled area slightly increased at the intersections. Standard size has clear space between longitudinal bars of 1 inch and clear space between cross bars of 3 11/16 inches. Close spaced and wide-spaced types also are made, the former having 0.73-inch between longitudinals and 3 11/16 inches between crossbars, the latter having 2 1/16 inches between longitudinals and 8 11/16 inches between cross bars. The material also may be obtained in the form of stair treads.

Running boards and brake steps for railroad applications are similar in design except that the longitudinal members have deeply serrated edges on the upper side to present a nonskid surface and prevent ice formation or dirt clogging. Cross bars are round but not knurled.

Strand Heat Treating

(Concluded from Page 57)

furnace too rapidly the grain size will be small, recrystallization may not be completed, and the directional properties and fragmentation of the grains introduced during cold rolling will not be removed. Such a strip would not be suitable for deep drawing.

In normalized strip steels the finer the grain, the higher the yield point and the elastic limit; and the larger the grain, the lower the yield point. However, either type of strip will deep draw, but the dies must be constructed to take into consideration the variations in physical properties.

Progressive Assembly

(Concluded from Page 62)

box reinforcement assembly immediately above the axle pads across and between the major reinforcement plates. A push-gun with the actuating cylinder pushing against a backup plate is used for this operation. It is connected to the transformer and timer in the spot welder, eliminating one more transformer and timer.

Alongside of the major assembly station is located a subassembly fixture, Fig. 7, (K, Fig. 1), where collars and small brackets are welded to upper and lower side sheets before starting the subassemblies. The lower electrode of this fixture is fitted with copper alloy inserts, and adaptors are provided for locating the different collars. The transformer is mounted in the column of the fixture. Welding is done with one of the expansion guns and timer from the final assembly station.

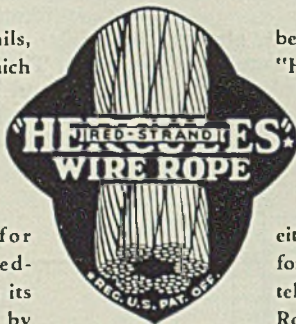
To weld reinforcements on either end and the baffle in the middle of the top, a separate turntable type of fixture is provided as shown in Fig. 8, (H, Fig. 1). The operator stays on the same side of the fixture, using a deep-throated pinch gun for the welds. Welding is done through the copper forms shown. These rest against the outside of the top panel and eliminate visible welding spots from the outside of the top panel by distributing the welding current at the outer surface as well as by conducting heat away rapidly. The copper forms also assist in insuring proper shaping of the top assembly.

The various fixtures are designed so the position of their locating supports may be altered to permit welding different sizes of combines on the same fixtures. The bases, of course, are designed for the largest size combine.

Note the illustrations show the equipment on test and before installation in the actual production line diagramed in Fig. 1.

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< < HELPFUL LITERATURE > > >

1. Multiple Speed Motors
 Howell Electric Motors Co.—4-page illustrated bulletin No. M-50 gives operating characteristics of "Multi-Speed" motors in open type with ratings from ½ to 150 horsepower and in closed types from ½ to 100 horsepower. These motors are built for two, three, and four speed drive service.

2. Carbide Tipped Tools
 Super Tool Co.—24-page illustrated catalog No. 40 deals entirely with cemented tungsten carbides and carbide tipped tools. It contains specifications and data on tipped reamers, lathe centers, special tools, standard carbide blanks, bits and tools.

3. Chain Drives
 Link-Belt Co.—96-page illustrated "Link-Belt Silverstreak Silent Chain Drive Data Book" No. 125 shows in detail design and construction of this power transmission method. Engineering data for drive selection, applications, lubrication, dimensions, list prices, and drive accessories are presented.

4. Electric Heating
 Hevl Duty Electric Co.—6-page illustrated folder No. HD-740 is descriptive of "Hevl Duty" radiant heat element construction for all types of electrically heated industrial furnaces. Details of constructions, as well as typical applications, are shown.

5. Lubrication
 Gulf Oil Co.—12-page illustrated booklet, "Gulf Periodic Consultation Service", explains consulting service available to manufacturing, utility, transportation, mining and construction industries relative to industrial lubrication problems.

6. Jaw Crushers
 Allis-Chalmers Manufacturing Co.—28-page illustrated bulletin No. B-6034 covers four general types of jaw crushers; namely, fine reduction, "Dodge," "Blake," and "Superior." Sketches show principle of operation. Construction features, capacity and dimension tables and list of ores, rocks and other materials on which jaw crushers are used are given.

7. Dust Collection
 American Foundry Equipment Co.—Illustrated circular No. 42 describes assembled type "Dustube" dust collector for industrial application. This unit is equipped with a bin hopper and hand operated shaker. Sizes range from 90 to 360 square feet of cloth for handling up to 1440 cubic feet of air per minute.

8. Thermocouples
 Leeds & Northrup Co.—40-page illustrated catalog No. N-33A(6) lists a comprehensive line of thermocouple assemblies with their parts and accessories. Tabulated information aids correct selection of couples for specific applications. Illustrations and listings are arranged for easy identification of assemblies, parts and accessories.

9. Diamond Wheels
 Norton Co.—24-page illustrated booklet No. 388 thoroughly discusses uses and applications of Norton metal bonded diamond wheels. This is stated as, "A handbook on reconditioning and sharpening single point cemented carbide tools rapidly and economically."

10. Bearing Lubrication
 New Departure, Div. General Motors Sales Corp.—16-page illustrated booklet No. A-120 is an aid to the choice of correct lubricants for ball bearings. It covers selection and application of oils and greases and provides a simple method of determining proper grade and viscosity for various operating temperatures and bearing speeds.

11. Atmosphere Furnaces
 Lithium Corp.—6-page illustrated folder, "Lithco Atmosphere Furnaces," gives full information on these furnaces which provide for the heating of ferrous metals in a chemically neutral atmosphere, without carburization, decarburization or scaling.

12. Motorized Reducers
 D. O. James Manufacturing Co.—28-page illustrated catalog No. 17 and price list covers helical gear type motorized speed reducers with ratios of 1.2 to 9:1, from ¼ to 50 horsepower; planetary type with ratios 10 to 1200:1, ¼ to 75 horsepower; and worm gear type with ratios 5-2/3 to 70:1, from ¼ to 30 horsepower.

13. Gasoline Arc Welder
 Hobart Brothers Co.—4-page illustrated bulletin, "Actually 5 Years Ahead", presents complete information on the new Jr. gas drive 200-ampere "Streamliner" arc welder. Features include close heat control, polarity control, remote control and stabilization.

14. Fluorescent Fixture
 Westinghouse Electric & Manufacturing Co.—Illustrated leaflet No. 61-152 gives full data on type FPR twin lamp fluorescent luminaire, designed especially for illumination of low bay industrial areas. Characteristics, mounting instructions, construction details and accessories are described.

15. Hydraulic Equipment
 Hannifin Manufacturing Co.—28-page illustrated bulletin No. 53 describes Hannifin "Hy-Power" hydraulic riveting, punching and pressing equipment. Applications, operating features and cycles, and specifications on various equipment are given.

16. Air Compressors
 Curtis Pneumatic Machinery Co.—10-page illustrated bulletin No. C-4-C presents description and data on model "C", two and four cylinder air compressors in sizes ranging from 24.6 to 351.5 cubic feet per minute displacement. These water cooled units are available with or without motor or engine drive.

17. Overhead Handling
 Cleveland Trolley Division, Cleveland Crane & Engineering Co.—12-page illustrated bulletin No. 2004-A is entitled, "How to Determine Where Overhead Materials Handling Equipment Can be Used Profitably." Illustrations of equipment and installations are shown.

18. Grinding Machines
 Cincinnati Milling Machine & Cincinnati Grinders, Inc.—18-page illustrated bulletin No. G-455, "Better Grinding in Your Toolroom", shows features of the hydraulic universal grinding machine. Use of color, close-up views and illustrations aid in telling the story of this machine.

19. Hydraulic Power
 Blackhawk Manufacturing Co.—16-page illustrated catalog section No. M-40 describes "Porto-Power" portable hydraulic power units for pushing, pulling, lifting, pressing, spreading, bending and clamping operations in all types of industries. All equipment and accessories are described.

20. Speed Reducers
 Abart Gear & Machine Co.—88-page illustrated general catalog, "Abart Speed Reducers", is descriptive of motorized offset drives, double worm reduction units, fractional horsepower worm units, spur gear units, and flexible couplings. Complete specifications and prices are included.

21. Unit Heaters
 Grinnell Co.—48-page illustrated catalog No. 4 presents complete details of "Thermoller" unit heaters for factory, industrial, and general applications. Advantages and economy of unit heating, specifications, installation and control data, and typical installations are shown. These heaters are made in 30 sizes for practically all purposes.

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22. Braided Packing

Garlock Packing Co.—12-page illustrated bulletin No. AD-131 describes features of "Lattice-Braid" coil packing in types for rotary pumps handling hot or cold water, caustic solutions or weak acids; on rods operating against acids, steam, gas, lye or caustic soda; against high pressure steam and hot oil; and other solutions.

23. Carbide Tool Grinder

Ex-Cell-O Corp.—16-page illustrated bulletin No. 46101 discusses increased production and economy in use of cemented tungsten carbide tipped tools. In addition to descriptions of complete line of carbide tool grinders, data on chip curling, grooving, combination wheel set-ups, and rapid grinding technique are also included.

24. Flame Hardening

Alr Reduction Co.—10-page illustrated bulletin No. ADC-624 gives details on considerations and apparatus involved in flame hardening surfaces of various forms. Water cooled flame hardening torch with its available extensions and tips is featured.

25. Nickel

International Nickel Co.—20-page illustrated bulletin No. T-15 deals with the engineering properties of nickel. Composition, physical constants, mechanical properties, corrosion resistance, working instructions, mill products, and special alloys are some of the subjects covered.

26. Abrasives

Sterling Grinding Wheel Co.—36-page illustrated catalog, "Bricks and Sticks", presents applications, specifications and prices of abrasive bricks and sticks, sharpening stones, wheels and blocks for floor surfacing machines, rubbing blocks, and resinoid cutting wheels.

27. Voltage Regulator

General Electric Co.—16-page illustrated bulletin No. GEA-2022C presents complete data on type GDA "Diactor" generator-voltage regulators for alternating current machines. Details of operation, accessories, and applications are shown.

28. Hoist Buckets

Blaw-Knox Co.—4-page illustrated catalog No. 1696 presents features, uses, construction details of hook-on, direct reeved, hook-on type, and ship's tackle clamshells, and of dump buckets and ingot tongs. Service hints and application data are furnished.

29. Portable Compressor

Worthington Pump and Machinery Corp.—Illustrated bulletin No. H-850-M4 gives specifications and design features of the model 105 "Streamlined" portable compressor incorporating a balanced angle compressor and a Hercules 6-cylinder engine.

HELPFUL LITERATURE

(Continued)

30. Springs

Wallace Barnes Co.—52-page handbook, "Springs", includes torsion spring design chart, formulas, typical computations, charts to find safe load, calculate weight of helical extension and compression springs, table of decimal equivalents. Effect of non-central loading and design suggestions are discussed.

31. Turret Lathe Data

Gisholt Machine Co.—Illustrated performance data sheets Nos. 50 to 53 give actual operating data on typical jobs employing turret lathes. These case studies describe problem and results attained, as well as showing method of machining and briefly describing machine equipment.

32. Plating Rack Coatings

Hanson-Van Winkle-Munning Co.—Illustrated bulletin No. WR-101 gives specifications and shows applications of "Wrap-Rax" tape, a covering for electro-plating racks. This product is synthetic thermoplastic resin in tape form and is resistant to cleaning, pickling and plating solutions.

33. Lubrication System

Farval Corp.—4-page illustrated bulletin No. 7450 describes Dualine, Jr., centralized system of lubrication which provides distribution of either oil or grease to bearings on smaller machines. Schematic drawings, dimensions, and discussions of proper lubrication are included.

34. Wire Strippers

Ideal Commutator Dresser Co.—4-page illustrated bulletin, "Solves All Wire Stripping Problems," is descriptive of "Ideal" brush wire stripping machines for removing all types of insulation from wire and cables preparatory to use. Hand and machine operated strippers are shown.

35. Insulated Cable

Okonite Co.—8-page illustrated bulletin No. OK-2007A presents features of "Okonite" insulated cable for high voltage application. This cable is applicable for use on all voltages up to 35,000 volts for underground, underwater, and overhead service and on equipment.

36. Stainless Steel

Republic Steel Corp.—24-page illustrated bulletin No. 362 presents complete data and physical properties of "Enduro" 18-8 types of stainless steel. Available types, corrosion data, recommended applications, analyses, fabrication, machining, and working suggestions are included.

37. Metal Band Saw

Armstrong-Blum Mfg. Co.—8-page illustrated bulletin No. 800-A presents features of large capacity metal band saw that is efficient on most delicate work and cuts at any angle up to 45 degrees without moving the work. Construction details, specifications and improvements are discussed.

38. Flexible Coupling

American Flexible Coupling Co.—4-page illustrated bulletin No. 3428 tells how to select the proper flexible coupling for various machines. Price lists and dimensions of junior, light and medium duty couplings are given. Heavy duty couplings for severe operating conditions are featured.

39. Recording Meters

Bristol Co.—Illustrated bulletin No. 555 describes features of portable recording voltmeters and ammeters which make them moisture proof and rugged enough to withstand transportation and rough use. Two and three pen instruments are also shown.

40. Contour Machines

Continental Machines, Inc.—4-page illustrated bulletin, "Eminent Engineering," describes "Doall" contour machines for internal and external contour sawing and band filing. Features and construction details of these machines are shown.

41. Shovel

Byers Machine Co.—24-page illustrated catalog 939 shows "Bear Cat Jr." shovel in use as a shovel, clamshell, crane, dragline, trencher, and backfiller. Three forward speeds, intermediate swing shaft, three-quarters swing, mast held free and other features are described or illustrated.

42. Crane Brakes

Electric Controller & Manufacturing Co.—8-page illustrated broadside, "EC&M Type WB Brakes," presents complete data on these electrically operated brakes for cranes, hoists and mill machinery. Features are shown.

43. Turret Lathe Tools

Jones & Lamson Machine Co.—3 illustrated data sheets Nos. 2, 3, 6, 7, 8 and 9, for insertion in the catalog, "Tools for Jones & Lamson Turret Lathes." General specifications for ram and saddle type universal turret lathes are given.

STEEL

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STEEL

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Steel Demand Heavier; Defense Needs Expand

Structural awards increase sharply. Scrap prices higher. Ingot rate rebounds after holiday. Pig iron production up in August

■ BUSINESS in most steel products is tending upward, following a moderate dip in some directions during August. All indications point to maintenance of near-capacity production for an extended period.

Ingot output this week is scheduled to return to near the level prevailing prior to the Labor Day interruption. Although all plants did not close for the holiday, shutdowns were sufficiently general to cause a 9½-point drop in the national average last week to 82 per cent. The rate a year ago was 62 per cent.

Pressure for raw material supplies continues heavy. Pig iron production in August totaled 4,234,576 tons, largest for any month since July, 1929. Daily average output of 136,599 tons compares with 130,984 tons in July and 96,122 tons a year ago. Production the first eight months this year was 29,343,880 tons, against 19,642,202 tons a year ago and 30,116,405 tons in the 1937 period. Net gain for the month of three blast furnaces brought the total number of stacks in blast on Aug. 31 to 190. This compares with 138 a year ago and with the most recent peak of 191 last December.

War and national defense remain important factors in steel demand. A sharp increase in structural shape awards last week to near the year's best level resulted partly from large orders for plants to be devoted to armament manufacture. These included 3920 tons for Consolidated Aircraft Corp., San Diego, Calif.; 3495 tons for navy yard work at Norfolk, Va.; 3000 tons for Pratt & Whitney division, United Aircraft Corp., Hartford, Conn.; 1500 tons for Bath Iron Works Corp., Bath, Me., and 1000 tons for Allison Engine division, General Motors Corp., Indianapolis.

Among other large structural orders were 14,000 tons for a Brooklyn subway and 4380 tons for two New York high schools.

Heavy steel needs of Great Britain, particularly for semifinished material, largely are responsible for continued active exports. Rolled steel production for export recently has averaged 20 per cent of total output, and of this foreign tonnage more than 40 per cent has consisted of semifinished products. In recent months a larger percentage of total steel production has been destined for abroad than was true during 1917 or 1918.

MARKET IN TABLOID ★

Demand

Tending upward for majority of products.

Prices

Generally firm; scrap continues to strengthen.

Production

Down 9½ points to 82 per cent because of holiday.

Railroad equipment buying is far from brisk, but fairly large steel tonnages are moving to car interests and railroad shops for repair work or new units. The Erie has ordered 4000 tons of rails, and the Union Pacific is inquiring for 2000 underframes for box cars it will build. Equipment orders include 18 diesel-electric switchers for the Milwaukee road, 125 logging cars for the Atlantic Coast Line and 325 gondolas for the Erie.

Automotive steel releases are active, contributing to better movement of sheets, strip and bars. New model assemblies are expanding steadily, increasing 12,000 units last week to 39,665. This compares with 26,865 a year ago.

New schedules of extras have been issued on plates and hot-rolled alloy steel. The latter becomes effective Oct. 1. These revisions result in slightly higher charges on certain grades and sizes of the products involved. Changes in extras on other products are reported under consideration.

Tin plate orders and production continue to decline, output last week being off 6 points to 48 per cent. Shipments are steady, but heavy stocks and the approach of a quieter consuming period result in lower mill operations.

Pig iron deliveries are increasing gradually, influenced by improved foundry operations. Users are fairly well covered and forward buying continues light, although tonnage for fourth quarter shipment is being accepted at current prices. A leading seller has reaffirmed present quotations on ferromanganese and other ferroalloys for next period. Scrap prices continue to rise, boosting the composite 24 cents last week to \$19.50.

Most steelmaking districts experienced curtailed operations last week. Both Pittsburgh and Chicago showed losses of 14½ points, to 72 and 24½ per cent, respectively. Other reductions were 9 points to 75 at Youngstown, 12 points to 20 at Wheeling, 9 points to 21 at Cleveland, 9 points to 62 at Cincinnati and 10 points to 79 in eastern Pennsylvania. Unchanged were Birmingham at 28, Buffalo at 20½ and St. Louis at 20. Detroit increased 1 point to 94 and New England was up 5 points to 25.

Pig Iron

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

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

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

Delivered from Basing Points:

Akron, O., from Cleveland	24.39	24.39	23.89	24.89
Baltimore from Birmingham	24.78	.....	23.66	.....
Boston from Birmingham	24.12	.....	.....	.....
Boston from Everett, Mass.	24.50	25.00	24.00	25.50
Boston from Buffalo	24.50	25.00	24.00	25.50
Brooklyn, N. Y., from Bethlehem	26.50	27.00	.....	.....
Canton, O., from Cleveland	24.39	24.39	23.89	24.89
Chicago from Birmingham	23.22	.....	.....	.....
Cincinnati from Hamilton, O.	23.24	24.11	23.61	.....
Cincinnati from Birmingham	23.06	.....	22.06	.....
Cleveland from Birmingham	23.32	.....	22.82	.....
Mansfield, O., from Toledo, O.	24.94	24.94	24.44	24.44
Milwaukee from Chicago	24.10	24.10	23.60	24.60
Muskegon, Mich., from Chicago, Toledo or Detroit	26.19	26.19	25.69	26.69
Newark, N. J., from Birmingham	25.15	.....	.....	.....
Newark, N. J., from Bethlehem	25.53	26.03	.....	.....
Philadelphia from Birmingham	24.46	.....	23.96	.....
Philadelphia from Swedeland, Pa.	24.84	25.34	24.34	.....
Pittsburgh district from Neville Island	Neville base, plus 69c, 84c, and \$1.24 freight.			
Saginaw, Mich., from Detroit	25.31	25.31	24.81	25.81
St. Louis, northern	23.50	23.50	23.00	.....

Ferromanganese, 78-82% , carlots, duty pd.	\$120.00
Ton lots	130.00
Less ton lots	133.50
Less 200 lb. lots	138.00
Do., carlots del. Pitts.	125.33
Splegeisen, 19-21% dom. , Palmerton, Pa., spot.	36.00
Do., 26-28%	49.50
Ferrosilicon, 50% freight allowed, c.l.	74.50
Do., ton lot	87.00
Do., 75 per cent	135.00
Do., ton lots	151.00
Spot, \$5 a ton higher.	
Silicomanganese, c.l., 2% per cent carbon	118.00
2% carbon, 108.00; 1%, 133.00	
Contract ton price \$12.50 higher; spot \$5 over contract.	
Ferrotungsten, stand., lb. con. del. cars	1.90-2.00
Ferrovanadium, 35 to 40%, lb., cont.	2.70-2.80-2.90
Ferrophosphorus, gr. ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, \$3 unitage, 58.50; electric furn., per ton, c. l., 23-26% f.o.b. Mt. Pleasant, Tenn., 24% \$3 unitage	75.00
Ferrochrome, 66-70 chrome, 4-6 carbon, cts. lb., contained cr. del. carlots	11.00c

Do., ton lots	11.75c
Do., less-ton lots	12.00c
67-72% low carbon:	
Car-loads	11.75c
Ton loads	18.25c
Less ton	18.75c
2% carb.	17.50c
1% carb.	18.50c
0.10% carb.	20.50c
0.20% carb.	20.25c
Spot ¼c higher	
Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb.	0.95
Calcium molybdate, lb. molyb. cont., f.o.b. mill	0.80
Ferrotitanium, 40-45%, lb., con. tl., f.o.b. Niagara Falls, ton lots.	\$1.23
Do., less-ton lots	1.25
20-25% carbon, 0.10 max., ton lots, lb.	1.35
Do., less-ton lots	1.40
Spot 5c higher	
Ferrocolumbium, 50-60%, contract, lb. con. col., f.o.b. Niagara Falls.	\$2.25
Do., less-ton lots	2.30
Spot is 10c higher	
Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill.	0.80
Ferro-carbon-titanium, 15-18%, tl., 6-8% carb., carlots, contr., net ton.	\$142.50

St. Louis from Birmingham	\$23.12	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Paul from Duluth	25.63	.....	.....	22.62	.....
†Over 0.70 phos.					26.13

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

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

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

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

Refractories

Per 1000 f.o.b. Works, Net Prices	Ladle Brick (Pa., O., W. Va., Mo.)	
Fire Clay Brick	Dry press	\$28.00
Super Quality	Wire cut	26.00
Pa., Mo., Ky.	Magnesite	
First Quality	Domestic dead-burned grains, net ton f.o.b. Chewelah, Wash., net ton, bulk	22.00
Pa., Ill., Md., Mo., Ky.	net ton, bags	26.00
Alabama, Georgia	Basic Brick	
New Jersey	Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.	
Second Quality	Chrome brick	\$50.00
Pa., Ill., Ky., Md., Mo.	Chem. bonded chrome	50.00
Georgia, Alabama	Magnesite brick	72.00
New Jersey	Chem. bonded magnesite	61.00
Ohio		
First quality		39.90
Intermediate		36.10
Second quality		31.35
Malleable Bung Brick	Fluorspar	
All bases	Washed gravel, duty pd., tide, net ton \$25.00-\$26.00	
Silica Brick	Washed gravel, f.o.b. Ill., Ky., net ton.	
Pennsylvania	carloads, all rail	20.00
Joliet, E. Chicago	Do. barge	20.00
Birmingham, Ala.	No. 2 lump	21.00

Ferroalloy Prices

Do., spot	145.00
Do., contract, ton lots	145.00
Do., spot, ton lots	150.00
15-18% tl., 3-5% carbon, carlots, contr., net ton	157.50
Do., spot	160.00
Do., contract, ton lots	160.00
Do., spot, ton lots	165.00
Alsifer, contract carlots, f.o.b. Niagara Falls, lb.	7.50c
Do., ton lots	8.00c
Do., less-ton lots	8.50c
Spot ¼c lb. higher	
Chromium Briquets, contract, freight allowed, lb. spot carlots, bulk	7.00c
Do., ton lots	7.50c
Do., less-ton lots	7.75c
Do., less 200 lbs.	8.00c
Spot, ¼c higher	
Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb.	\$2.50
Do., smaller lots	2.60
Vanadium Pentoxide, contract, lb. contained	\$1.10
Do., spot	1.15
Chromium Metal, 98% cr., 0.50 carbon max., contract, lb. con.	84.00c
Do., spot	89.00c
88% chrome, contract	83.00c
Do., spot	88.00c
Silicon Metal, 1% Iron, contract, carlots, 2 x ¼-in., lb.	14.00c
Do., 2%	12.50c
Spot ¼c higher	
Silicon Briquets, contract carloads, bulk, freight allowed, ton	\$69.50
Ton lots	79.50
Less-ton lots, lb.	3.75c
Less 200 lb. lots, lb.	4.00c
Spot ¼-cent higher.	
Manganese Briquets, contract carloads, bulk freight allowed, lb.	5.00c
Ton lots	5.50c
Less-ton lots	5.75c
Spot ¼c higher	
Zirconium Alloy, 12-15%, contract, carloads, bulk, gross ton	102.50
Do., spot	107.50
34-40%, contract, carloads, lb., alloy	14.00c
Do., ton lots	15.00c
Do., less-ton lots	16.00c
Spot ¼c higher	
Molybdenum Powder, 99%, f.o.b. York, Pa. 200-lb. kegs, lb.	\$2.60
Do., 100-200 lb. lots	2.75
Do., under 100-lb. lots	3.00
Molybdenum Oxide Briquets, 48-52% molybdenum, per pound contained, f.o.b. producers' plant	80.00c

Sheets, Strip

Sheet & Strip Prices, Pages 76, 77

Pittsburgh—Automotive releases are somewhat heavier and the volume of bookings in September is expected to exceed the August figure. August totals were slightly under July. Initial buying by automobile companies is heavier than last year, although some major producers have yet to be heard from. Prices are steady, with all new business being placed at the full price.

Cleveland—Shipments are expanding, influenced largely by increased automotive needs. While there is some evidence of stocking on the part of consumers, early requirements constitute the principal stimulus to demand. Comparatively early delivery still is available on most grades, although backlogs are growing in some instances.

Chicago—Award by the department of agriculture of contracts for steel bins totaling \$2,301,548 for storing corn delivered by farmers in liquidating loans on the 1938 and 1939 crops, as announced from Washington Wednesday, opens up a sizable piece of steel sheet business. The contracts announced went to Butler Mfg. Co., Galesburg, Ill., 10,000 bins; Columbia Steel Tank Co., Kansas City, Mo., 1500 bins, and the same number to A. N. Eaton Metal Products Co., Omaha, Nebr.; while the Beatrice Steel Tank Mfg. Co., Beatrice, Nebr., got 700. The bins contracted for are sufficient to store 37,403,730 bushels. Since each manufacturer has his own bin-building plan, the average sheet steel requirement per bin is figured around 2800 pounds, this making a matter of total sheets needed of between 19,000 and 20,000 tons. The Rock Island government arsenal, Rock Island, Ill., has an inquiry for 1000 tons of 16-gage sheets, possibly for gun stampings, to close shortly.

Boston—Narrow cold strip orders are heavier, with an increasing volume for fourth quarter delivery being booked by rerollers. Improvement in demand is well diversified and automotive specifications are more active. Mill operations are at capacity in most instances, but inroads on backlogs are slight, despite heavy and increasing shipments. Deliveries on the more standard run of material are from three to four weeks, but on some specialties are slipping backward gradually. Sheet buying is slack, due to accumulated low-priced inventories, but on the small volume being placed hot-rolled and galvanized appear to be moving at listed prices, although it is admitted these are not subject to much test. New buying of special finished sheets in

small lots, notably stainless, tends to improve.

New York—Sheet shipments here continue to expand moderately. For most leading sellers deliveries in August were somewhat ahead of those in July and indications now point to a still larger movement this month. Stovemakers, who have been operating at a fairly good rate all summer, are expected to become much more active before the end of this month in further preparation for the fall and winter season. Household appliance manufacturers

continue to broaden their requirements, with few notable exceptions such as refrigerator manufacturers, whose production has been sagging recently due to seasonal influences. Deliveries on hot and cold-rolled sheets range from three to six weeks, depending upon gage and size.

Deliveries on some strip specialties are slightly more extended, but three to four weeks can be done on the more standard runs. Backlogs remain large despite high production and shipments. Except for

SUCCESS STORY

SAW BREAKAGE
Drastically Reduced

Sales, customer good-will and profits jumped when a smart band saw manufacturer tried Ampco Metal for troublesome saw guides. Hardened steel had been galling and sticking, causing excessive breakage of blades. . . . AMPCO METAL reduced breakage drastically and improved performance.

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ARE there places in either your product or your production tools where *metal failure* is causing trouble? . . . If so, AMPCO METAL can help you . . . as it has helped an impressive number of prominent manufacturers. There's no other bronze like it. AMPCO METAL is unequalled in its resistance to wear, impact, fatigue, and corrosion. It can be supplied in a wide range of properties and forms.

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Tell us what you're up against, and we'll send complete data sheets and recommendations.

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AMP CO METAL

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some alloy and specialty items, hot strip deliveries are not materially extended.

Philadelphia—Most sheet sellers expect a larger movement this month as shipments against low-priced contracts close Sept. 30. There is seasonal slackening in some specifications, particularly from stovemakers. Defense requirements are more noticeable, a recent inquiry calling for several hundred tons of hot-rolled sheets from a district fabricator of powder drums. The 2.10c base on hot-rolled sheets is being quoted generally.

Buffalo — Current demand for sheets and strip is the best in some time. Some sellers report buying is surpassing the surge which followed declaration of war a year ago. Increased automotive demand is coupled with a sustained brisk flow of orders from miscellaneous sources.

Cincinnati — Covering of sheet needs for fourth quarter, following the reaffirming of prices, has been considerable but not in such volume as to indicate anxiety over deliveries. Automotive specifications are expanding. A heavy ton-

nage for Canadian delivery has been booked.

Birmingham, Ala. — Sheets are in good demand although some slackening has been in evidence over the past several weeks. Output currently is estimated at above 80 per cent. Strip production has been stepped up slightly.

Toronto, Ont.—Despite the fact that Canadian mills are booked almost solid to the end of the year on sheets and strip orders are heavy and current booking is for delivery early in 1941. Local representatives of United States companies state that large orders are being placed for Canadian consumption. The automotive industry is ordering heavily and other branches of industry also are active.

Plates

Plate Prices, Page 76

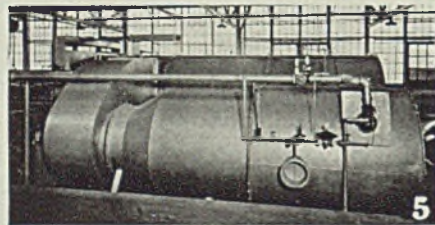
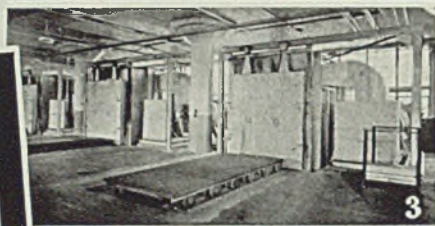
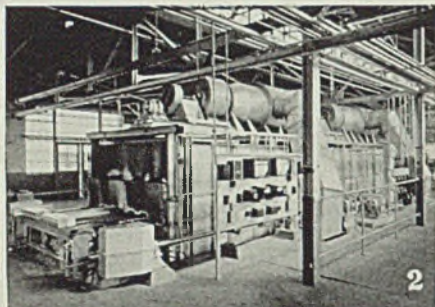
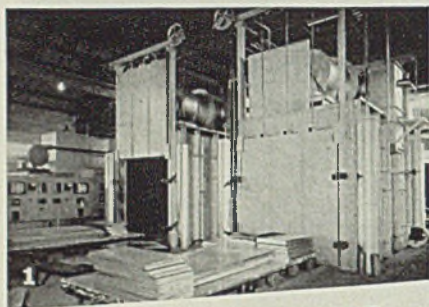
Pittsburgh—Revised extras have been announced on hot-rolled carbon steel plates and floor plates, the new list being dated Sept. 1. Numerous changes have been made in plain plate extras, affecting charges for size, shearing, flame cutting, heat treatment, chemical requirements and quality.

On specified widths or diameters up to 24 inches, plates ¼-inch thick or over take the base price as before, provided universal mill plates are ordered or the mill is given the option of furnishing a sheared or universal mill product. If the buyer's specifications require that a sheared mill product be furnished, extras of 25 cents on widths under 24 inches to 12 inches and 50 cents on widths under 12 inches to 6 inches are applicable.

Plates 36 to 48 inches in diameter and ¼-inch thick or more formerly were base but now take a 15-cent extra. Diameters over 48 to 72 inches also were base on the old card, but base now applies on 60 to 72 inches, with diameters 48 to 60 inches taking a 15-cent extra. The base length has been changed from 3 to 80 feet to 5 to 80 feet, with a 15-cent extra applied on lengths 3 to 5 feet.

Revisions in quantity extras on floor plates result in higher charges on small lots. Base quantity has been increased from 2500 pounds or over to 4000 pounds or over, with small-lot extras raised slightly.

Boston—Revised extras on hot-rolled alloy and carbon steel plates and floor plates have brought out little additional buying traceable to these changes. Shipments are maintained and buying since the holiday has increased slightly. Aside from shipyard specifications,



"SALEM"

Announces
a NEW LINE of
**CONVECTION
FURNACES**

For all types of low temperature heat treating of aluminum alloys, bronze, brass and steel—rods, plates, sheets and shapes "Salem" has developed and put into operation a group of modern, streamlined, highly efficient and surprisingly economical Convection Type Furnaces. Highly applicable to the manufacture of small arms ammunition.

Convection Units may be gas, oil or electric.

Photo 1—Car Type Furnace for annealing aluminum sheets and plates for aircraft parts.

Photo 2—Continuous Chain Conveyor Furnace for heating aluminum billets for rolling.

Photo 3—Car Type Furnaces. Convection unit located along side furnaces.

Photo 4—Tubular Hardening Furnace including quench, fully automatic.

Photo 5—Shows the new type convection unit.

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which are outstanding, orders are mostly for less than car lots. The latter, however, are more numerous from miscellaneous fabricators and users. Railroads are releasing small lots for maintenance. Scattered demand for floor plates is fair.

New York—Plate buying is well sustained. Tank and boiler shops are active and increasing tonnage is being released by smaller shipyards, formerly building pleasure craft, now engaged on defense contracts.

Philadelphia—Eastern plate mills are planning to put into early effect the new plate extras announced early in the week by a Pittsburgh producer. This may stimulate some anticipatory buying and later accelerate purchase of multiple sizes for cutting by purchasers. It is pointed out there already is shortage of larger sizes. The navy has postponed the opening date originally scheduled for Sept. 6 on bids for 118,000 tons of plates, shapes and bars, but has not set the new date. Deliveries range from two to four weeks on smaller sizes and six to eight on larger.

Birmingham, Ala. — Plates are being produced at capacity, largely because of car business, shipbuilding and demand from tank manufacturers. Tonnage is moving in large volume and deliveries are scheduled several weeks in advance.

Seattle — Demand for plates is more active. Some fabricators complain of slow deliveries from eastern mills. Largest project pending, 800 to 1300 tons, depending on alternate bids, is at Bellingham, Wash., bids opened Sept. 5, for 20,000 feet of 36 and 48-inch industrial water line. Puget Sound Bridge & Dredging Co., Seattle, will build several steel lighters for navy department, involving about 300 tons.

Toronto, Ont. — Demand for plates continues brisk and orders are coming in at a rapid rate for ship construction, tanks and armored vehicles for war purposes. Practically all the new demand, however, is going to the United States and additional large tonnages are pending.

Plate Contracts Pending

4400 tons, two mine-layers, 4700 tons displacement each; bids Oct. 16, navy department, Washington.

1500 tons, five 80,000-barrel tanks, New London Terminal Co., New London, Conn.; Leo F. Caproni, New Haven, engineer.

800 to 1300 tons (depending on alternates) 36 and 48-inch industrial water line, Bellingham, Wash.; bids Sept. 5.

300 tons or more, open lighters for navy department; Puget Sound Bridge & Dredging Co., Seattle, general contractor.

200 tons or more, discharge pipes for flood control projects near Portland, Oreg.; King Bros., Portland, low to

United States engineer. Unstated, 16,000 feet 14-inch steel pipe and fittings; bids in at The Dalles, Oreg.

Unstated, four C-3 type maritime commission steam freighters; Seattle & Tacoma Shipbuilding Co., Seattle, general contractor.

Bars

Bar Prices, Page 76

Pittsburgh—New extras to become effective Oct. 1 have been announced on hot-rolled alloy steel.

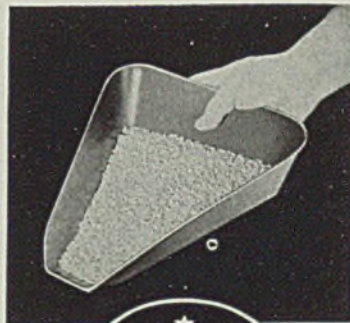
Principal changes from the previous card, issued early this year, result in higher charges for alloy content on several grades. These include advances of 15 cents per 100 pounds of finished products or \$3 per gross ton of semifinished products in S.A.E. grades 2300 and 4800; 30 cents per 100 pounds or \$6 per gross ton on S.A.E. 2500 and 10 cents per 100 pounds or \$2 per gross ton on S.A.E. 4600. The nickel-chrome-vanadium grade has been dropped from the card.

Chicago—The present broadening of the government rearmament pro-

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S-9

gram is bringing out surprising trade angles for steel bar producers. From companies that are awarded contracts for government material but which never before bought steel bars, large inquiries are coming out. Since some of these inquirers are strangers to the usual steel bar trade, mills have to instruct them on materials specifications. Bar mills are busy, have fair backlogs and are speeding up to care for steadily increasing demand.

Boston—Additional purchases of alloy bars by government shops at

Watertown and Springfield, Mass., are paced by expanding specifications and consumption by miscellaneous fabricators, small firearms, tool makers, forging shops and machine tool builders accounting for substantial releases. Hot-rolled carbon bar demand is less heavy, but tends upward despite the flurry in buying by most leading consumers recently. Covering against estimated fourth quarter needs has developed more momentum and some buyers are seeking protection beyond that period. Specifications by

secondary distributors are steady and a substantial volume is being handled by the latter, who are pressing for delivery on some alloy sizes.

Philadelphia—Small forging shops are more active as defense work continues to expand, imparting new stimulus to steel bar demand. Virtually all large forging shops are booked to capacity with much marine tonnage on order. Machine tool builders and government shops are operating at a high rate and specifying freely, particularly on cold-finished and alloy bars.

Birmingham, Ala. — Bar production, largely for concrete reinforcing, is heavy. Output is at 80 per cent or slightly better.

Buffalo—An increase in automotive specifications is forcing mills farther in arrears on bar delivery. Mills report it is becoming more obvious that needs for defense products are spurring demand. Mills continue to roll at capacity.

Toronto, Ont. — Rapid expansion of industrial activities is responsible for increasing demand for merchant bars and bookings show steady improvement. Producers report large orders to the end of the year with demand well sustained. Toolmakers have been heavy buyers recently and there has been improvement in demand from the automotive industry as well as from concerns engaged in war work.

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Pipe

Pipe Prices, Page 77

Boston—Resale prices on merchant steel pipe continue mixed and weak in some districts, despite slightly improved demand for building needs and a somewhat firmer stand by mills for published quotations. Manufacturing requirements for tubing are maintained, but buying is curtailed by forward covering with consumer stocks better balanced by recent deliveries. As to the latter a possible exception includes alloys. Recent purchases of cast pipe approximate 750 tons in small lots, but releases against blanket contracts drag with utility buying light.

New York—Despite pressure being exerted by resellers, mill prices on merchant pipe continue generally firm. Meanwhile, demand is fairly active, notwithstanding absence of large building projects. The La Guardia housing project in Brooklyn is one of the few larger projects now pending.

Cast pipe buying continues slack with contracts mostly for small lots. Early improvement in demand, however, is expected to re-

sult from extension of facilities at numerous army camp sites in the East. New York city is expected to buy at least 5000 tons additional this fall and close to 500 tons will be placed for a sewer and water lines, State school, Staten Island, N. Y.

Birmingham, Ala. — Cast iron pipe production is on a five-day basis, in most instances, with government naval bases, west coast points and scattered tonnage accounting for most business.

Seattle — No important tonnages are up for figures but agencies report a fair demand for small lots. Seattle has approved several system extension proposals and bids will be asked soon.

Cast Pipe Placed

200 tons, 6 to 20-inch for Spokane, Wash., universal pipe, to Marekmann & Williams, Seattle, for Central Foundry Co., Birmingham, Ala.

Wire

Wire Prices, Page 77

Chicago—This being usually between seasons for the general wire trade, it is not surprising to find current business largely routine, although the mills are operating at a good rate. Manufacturers' wire is the current backlog, fence wire and nails moving at about expected rates.

Boston—Supplies of semifinished alloy steels for the manufacture of wire specialties are tight and finishing departments in some instances could use more tonnage if available. While there is no definite shortage, current stock is being worked off steadily. Production schedules at wire mills approximate 95 per cent and backlogs are increasing on some items despite heavy shipments. Deliveries on some specialty items requiring fixed processing periods are more extended. Releases to the automotive trade are gaining and new buying is well diversified, more orders appearing for defense order products. Rope mills and electrical cable plants have large backlogs and demand by makers of screw machine products is substantial.

New York—Wire bookings, largely for prompt delivery, are fully up to 90 per cent or practical capacity. Backlogs are gaining on some mills. Spring wire is improving moderately with specifications against early 1941 automotive requirements heavier. Link spring low carbon wire for army cots is in good demand. Strong demand for wire rope for usual domestic needs, including marine, is bolstered by export buying which includes a large cable order

for balloon barrages for Great Britain and substantial volume of elevator rope for South America.

steel underframes for cars to be built in its own shops. Other inquiry and awards are for small lots to meet pressing needs.

Rails, Cars

Track Material Prices, Page 77

Railroads continue to add to rolling stock but rail buying has not yet started. Chicago, Milwaukee, St. Paul & Pacific has awarded 18 diesel-electric switchers to three builders. Union Pacific is inquiring for 2000

Rail Orders Placed

Eric, 4000 tons rails, to Carnegie-Illinois Steel Corp., Pittsburgh, and Bethlehem Steel Co., Bethlehem, Pa.

Locomotives Placed

Chicago, Milwaukee, St. Paul & Pacific, 18 diesel-electric switching locomotives; three 1000-horsepower and nine 600-horsepower to Electro-Motive Corp., La Grange, Ill.; four 1000-horsepower



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to American Locomotive Co., New York; two 1000-horsepower to Baldwin Locomotive Works, Philadelphia.

Car Orders Placed

Atlantic Coast Line, 125 logging cars, to Greenville Steel Car Co., Greenville, Pa. Erie, 325 seventy-ton gondolas to own shops at Dunmore, Pa.

Car Orders Pending

DuFuth, Missabe & Iron Range, 100 fifty-ton gondolas; in addition to ballast and hopper cars pending.

Union Pacific, 2000 underframes for box cars which will be built in own shops; bids asked.

Shapes

Structural Shape Prices, Page 76

Pittsburgh — Inquiry last week was slightly heavier, with awards steady. Backlogs hold at about the same level and deliveries are still behind in varying degrees, depending on the products.

Boston—Except for a mild flurry in small-tonnage contracts, district fabricating shops have not to date shared heavily in stronger demand for fabricated structural steel, most

of the larger work going to Pennsylvania. An exception is a 750-ton award to the Holyoke, Mass., shop for new buildings at the Springfield, Mass., armory. Inquiry and tonnage being estimated is substantial, government and defense program expansions being supplemented by more private work of a general type.

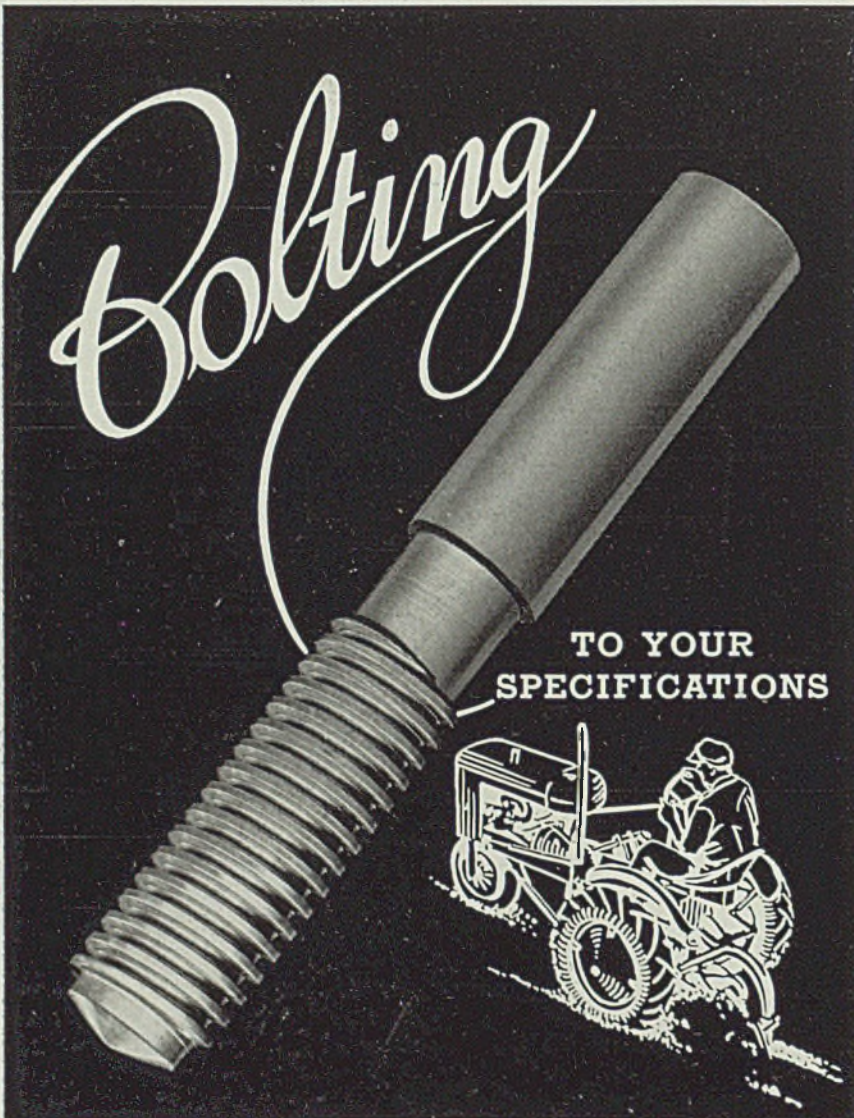
New York — Despite mounting structural steel contracts, tonnage continues to come out for estimates in much larger volume, notably for aircraft plant expansions, shipyards and scores of projects connected with the defense program. Bridge needs, which include awards for New York, New Haven & Hartford railroad spans, 600 tons, are heavier and bids close Sept. 17 on a Long Island railroad grade crossing section in Brooklyn, 2600 tons. For hangars especially, structural steel requirements will be impressive for the newly acquired leased bases from the British in the Atlantic. Structural mills are already pressed to expedite delivery on plain material entering into defense contracts, although fabricating shop capacity is not yet taxed to fill needs.

Philadelphia—Structural steel demand is increasingly active, with orders again expanding and considerable work pending. Of particular note is 7600 tons for the St. Georges, Del., bridge for the war department, bids Sept. 9.

Buffalo — Some slowing up of shape awards was noted during the past week, but additions to pending tonnage appeared. Plans for several large industrial projects definitely announced to be carried through, have not yet come out.

Seattle — New projects are developing and fabricating shops, already with backlogs, will book ample tonnages to carry over the year end. Bethlehem Steel Co., Seattle, has the contract for 250 tons steel sheet piling for a flood control project at Coeur d'Alene, Idaho. Truscon Steel Co., Youngstown, O., will supply 300 tons for doors for the army air base, Fairbanks, Alaska.

Toronto, Ont. — Demand for



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Shape Awards Compared

	Tons
Week ended Sept. 7.....	49,247
Week ended Aug. 31.....	29,909
Week ended Aug. 24.....	23,819
This week, 1939	13,816
Weekly average, year, 1940.	22,312
Weekly average, 1939.....	22,411
Weekly average, August....	29,403
Total to date, 1939.....	789,761
Total to date, 1940.....	804,237

Includes awards of 100 tons or more.

—The Market Week—

structural shapes is taxing fabricating plants and orders are increasing. Construction work on projects connected with Canada's war effort for the past week totaled in value upwards of \$4,500,000 for which some 5000 tons of steel will be required, while a similar tonnage is in prospect for various other undertakings for immediate closing. New contracts run upwards of 8000 tons weekly.

Shape Contracts Placed

- 14,000 tons, subway, route 110, section 10, Brooklyn, to American Bridge Co., Pittsburgh; George H. Flinn Corp., New York, contractor.
- 2000 tons, shop building, Pratt & Whitney division United Aircraft Corp., Hartford, Conn., to R. C. Mahon, Detroit.
- 2600 tons, Benjamin Franklin high school, New York, to Lehigh Structural Steel Co., Allentown, Pa., through Psaty & Fuhrman Inc., New York.
- 2160 tons, machine shop, navy yard, Norfolk, Va., to Virginia Bridge Co., Roanoke, Va., Rust Engineering Co., Pittsburgh, contractor.
- 2110, addition, final assembly building, Consolidated Aircraft Corp., San Diego, Calif., to Consolidated Steel Corp., Los Angeles.
- 1810 tons, manufacturing shop addition, Consolidated Aircraft Corp., San Diego, Calif., to National Iron Works, San Diego, Calif.
- 1780 tons, Woodrow Wilson high school, New York, to Bethlehem Fabricators Inc., Bethlehem, Pa., through Psaty & Fuhrman Inc., New York.
- 1550 tons, grade separation, East Twelfth street, contract E-3, Brooklyn, N. Y., for Triboro bridge authority, to American Bridge Co., Pittsburgh.
- 1525 tons, building, Durham Life Insurance Co., Raleigh, N. C., to Dietrich Bros. Inc., Baltimore.
- 1500 tons, factory building and boiler house, Delco-Remy division, General Motors Corp., Anderson, Ind., to Indiana Bridge Co., Muncie, Ind.
- 1500 tons, additional tonnage, shipyards extensions, Bath Iron Works, Bath, Me., to American Bridge Co., Pittsburgh, through Morton C. Tuttle Co., Boston.
- 1335 tons, glass plant, Libbey-Owens-Ford Glass Co., Rossford, O., to Mississippi Valley Structural Steel Co., Decatur, Ill.
- 1150 tons, quartermaster's depot, Philadelphia, to Belmont Iron Works, Eddystone, Pa., through Wark & Co., Philadelphia.
- 1000 tons, extension to buildings, for Allison engine division, General Motors Corp., Indianapolis, to R. C. Mahon Co., Detroit.
- 750 tons, shop building and laboratory, armory, water shops, Springfield, Mass., to Haarmann Steel Co., Holyoke, Mass.; Ley Construction Co., Springfield, Mass., contractor.
- 670 tons, bridge, state project FASH-40-2, Rensselaer county, New York, to American Bridge Co., Pittsburgh, through Frank E. Antolick, Schaghticoke, N. Y.
- 600 tons, factory addition, Robinson Clay Products Co., Pottstown, Pa., to Roy Robinson, Philadelphia, through Barclay White Co., Philadelphia.
- 600 tons, bridges, New York, New Haven & Hartford railroad, Bay Chester, N. Y., and southern Connecticut points to American Bridge Co., Pittsburgh.

- 530 tons, state highway bridge RC-40-68, Laphams Mills, N. Y., to American Bridge Co., Pittsburgh.
- 490 tons, seaplane hangar, Annapolis, Md., to Fort Pitt Bridge Works, Pittsburgh.
- 475 tons, seaplane hangar, Quantico, Va., to Fort Pitt Bridge Works, Pittsburgh, through John McShain Co., Philadelphia.
- 445 tons, paint shop, American Car & Foundry Co., St. Louis, to Superior Structural Steel Co., St. Louis.
- 430 tons, alterations, Spear Co., Pittsburgh, to Keystone Engineering Co., Pittsburgh.
- 415 tons, factory building No. 1, American Cyanamid Co., Wallingford, Conn.,

- to Bethlehem Steel Co., Bethlehem, Pa.
- 410 tons, two buildings, National Distillers Products Corp., Louisville, Ky., to International Steel Co., Evansville, Ind.
- 380 tons, processing plant, General Chemical Co., River Rouge, Mich., to Pittsburgh Bridge & Iron Co., Pittsburgh.
- 350 tons, Federal Reserve bank addition, Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa.
- 325 tons, projection stage, for R. K. Pictures Corp., Los Angeles, to Pacific Iron & Steel Co., Los Angeles.
- 300 tons, building, for R. C. A. Mfg. Co., Indianapolis, to Pittsburgh Bridge & Iron Works, Pittsburgh.



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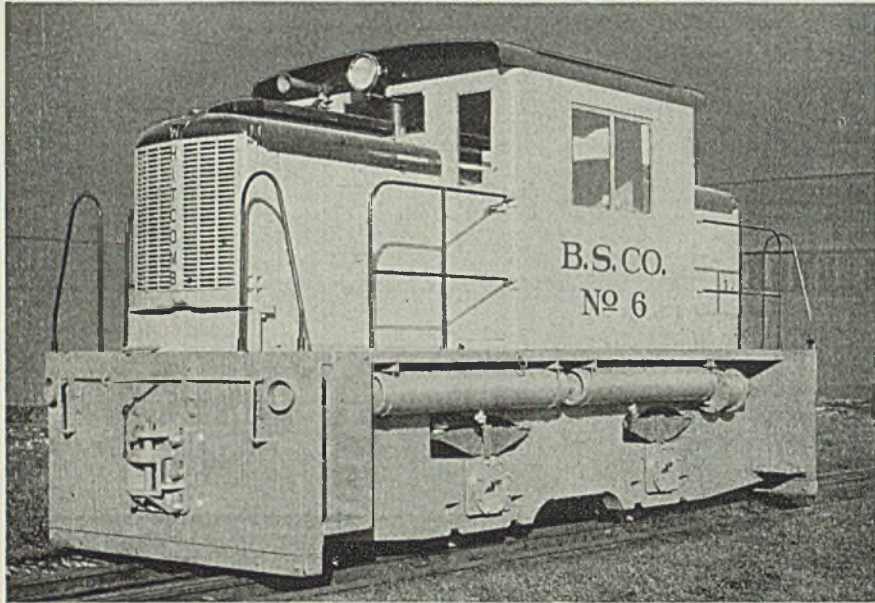
AMERICAN
Heavy-Duty **ROLLER BEARINGS**

—The Market Week—

300 tons, hangar doors, Fairbanks, Alaska, army air station, to Truscon Steel Co., Youngstown, O.
 300 tons, bridge, proj. 233-A-B-C, Mississippi, to Vincennes Steel Corp., Vincennes, Ind.
 285 tons, building, for Northwestern Bell Telephone Co., Waterloo, Iowa, to Pittsburgh-Des Moines Steel Co., Pittsburgh.
 280 tons, addition, warehouse, Ecusta paper mill, Pisgah Forest, N. C., to Dave Steel Co., Asheville, N. C.
 255 tons, bridge, route 353, section 3, Lycoming county, Pennsylvania, to Phoenix Bridge Co., Phoenixville, Pa.
 250 tons, garage and bakery building, National Biscuit Co., Syracuse, N. Y., to Syracuse Engineering Co., Syracuse.

250 tons, steel sheet piling, flood control project, Coeur d'Alene, Idaho, to Bethlehem Steel Co., Seattle; Sather & Son, Seattle, general contractor.
 250 tons, state highway bridge, Lycoming county, Pennsylvania, to Phoenix Bridge Co., Phoenixville, Pa.
 245 tons, bridge, Tloga county, Pennsylvania, to Fort Pitt Bridge Works, Pittsburgh.
 235 tons, bridges, Habersham and Chatham counties, Georgia, to Virginia Bridge Co., Roanoke, Va.
 215 tons, warehouse, for Douglas Aircraft Co., El Segundo, Calif., to Bethlehem Steel Co., Bethlehem, Pa.
 210 tons, state highway bridge, Burwell, Nebr., to Omaha Steel Works, Omaha.

Nebr.
 190 tons, addition to plant, for Ceco Steel Products Corp., Clyde, Ill., to Gage Structural Steel Co., Chicago.
 170 tons, roll storage building, Armstrong Cork Co., Lancaster, Pa., to A. B. Rote, Lancaster.
 165 tons, tunnel ribs, McKees Rocks, Pa., to Fort Pitt Bridge Works, Pittsburgh.
 160 tons, reconstruction bridge, Shippenville, Pa., for state, to Keystone Engineering Co., Pittsburgh.
 150 tons, extension to building 187, Boston, for government, to Phoenix Bridge Co., Phoenixville, Pa.
 135 tons, bridge, state highway project RC-40-68, Caledonia-Avon highway, Livingston county, New York, to Bethlehem Steel Co., Bethlehem, Pa.; Potter-DeWitt Corp., Pavillon, N. Y., contractor, \$149,752.82, bids Aug. 21, Albany.
 125 tons, two-span WF beam and I-beam bridge, Halifax, Vt., to Bethlehem Steel Co., Bethlehem, Pa.; Lockwood-Young Corp., Concord, N. H., contractor; 30 tons reinforcing bars awarded same fabricator.
 115 tons, shapes and bars, grade crossing elimination, state highway project, Onondaga county, New York, 60 tons to American Bridge Co., Pittsburgh; 55 tons, to Concrete Steel Co., New York; Arzani & Gessler, Syracuse, N. Y., contractor.
 112 tons, United States engineer, Memphis, Tenn., inv. 1092-41-28, to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., bids Aug. 9.
 110 tons, bridges 7-6, Angelica, N. Y., to American Bridge Co., Pittsburgh.
 110 tons, stores and offices, Indiana, Pa., to Keystone Engineering Co., Pittsburgh.
 110 tons, highway bridge, Covington, Va., to Roanoke Bridge & Iron Co., Roanoke, Va.
 105 tons, bridge, FAGM-118-A(1), Mitchell county, Texas, to Virginia Bridge Corp., Roanoke, Va.
 105 tons, bridge, B1 of 77-17-23, Port Huron, Mich., to Yeager Bridge & Culvert Works, Port Huron, Mich.
 100 tons, furnace building, Carborundum Co., Niagara Falls, N. Y., to Lackawanna Steel Construction Co., Buffalo.



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PLANT AT ROCHELLE, ILLINOIS

Shape Contracts Pending

7300 tons, tank plant, for Chrysler Corp., Centerline, Mich.
 6700 tons, state bridge over Connecticut river, Hartford-East Hartford, Conn.
 4500 tons, bridge over Mississippi river at Chester, Ill.; preliminary plans for bids Sept. 21.
 2600 tons, grade elimination, section 5, contract 4, Atlantic avenue, Brooklyn, Long Island railroad; bids Sept. 17.
 1700 tons, sheet piling, East River drive east Forty-first to Forty-ninth streets, New York; Weiss & Weinsler, New York, low.
 1100 tons, warehouses M-20 and M-26, Philadelphia, for government.
 1000 tons, radio transmitter building, for General Electric Realty Corp., Schenectady, N. Y.
 900 tons, bridge, route 124, Boston Post road, Bronx, N. Y.; J. Leopold & Co., New York, low, \$199,345.
 758 tons, also 625 tons steel sheet piling, 107½ tons rails and steel pipe foundations Bonneville powerhouse; Puget Sound Construction Co., Tacoma, low.
 750 tons, addition, Spencer Lens Co.,

Cheektowaga, N. Y.; Gilmore-Carmichael-Olson Co., Cleveland, contractor.

665 tons, bridges, Chatauqua county and Westfield, N. Y.

550 tons, grandstand, for Queens County Jockey club, New York.

550 tons, grade elimination, section 5, contract 4, Atlantic avenue, Brooklyn, Long Island railroad; bids Sept. 17.

450 tons, East River drive, 41st to 49th streets, contract 34, New York; Weiss & Weinsner, New York, low.

440 tons, factory and warehouse addition, for Republic Steel Corp., Gary, Ind.

350 tons, addition, engineering building, Vought-Sikorsky division, United Aircraft Corp., Stratford, Conn.

330 tons, welding shop, Manitowoc Shipbuilding Corp., Manitowoc, Wis.; bids postponed from August 26.

330 tons, state highway bridge, Westfield, N. Y., John B. Schultz, Buffalo, low on contract.

325 tons, warehouse, General Foods Corp., Dorchester district, Boston.

275 tons, underpass, Kettle Falls, Wash., for bureau of reclamation.

260 tons, bridge, Fairmount boulevard, Cuyahoga county, Ohio, for city of Cleveland.

260 tons, state highway bridge, Allegheny county, Pennsylvania; bids Sept. 6.

250 tons, grade separation, Kettle Falls, Wash.; bids Sept. 10, to interior department.

225 tons, state highway bridge, Jefferson county, Pennsylvania; bids Sept. 6.

220 tons, intake and service bay, Kentucky dam, Gilbertsville, Ky., for Tennessee Valley authority, Knoxville, Tenn.

190 tons, tunnel shield for subway, Danville, Ill., for state.

170 tons, bulkhead wall, contract 34, Marginal street, New York, for city.

165 tons, maintenance building, O'Hara township, for Allegheny county, Pennsylvania.

165 tons, hangar, for Roscoe Turner Aeronautical Corp., Indianapolis, Ind.

160 tons, state bridges 694, 695, 766, Caryville, Wis.

150 tons, state bridge PSC-4667, Erie county, New York.

150 tons, Greyhound Bus terminal, Buffalo.

140 tons, state bridge RC-4075, Ulster county, New York.

140 tons, state highway bridge, Hamburg, N. Y., C. B. Whitmore, Lockport, N. Y., low.

135 tons, truss bridge, Northumberland county, Pennsylvania; bids to state highway department, Harrisburg, Pa., Sept. 13.

125 tons, garage and storehouse, naval station, Newport, R. I.

120 tons, state bridge PSC-5341, Ontario county, New York.

120 tons, mezzanine stations, subway, contract D-2-C, Chicago.

120 tons, Greyhound Bus terminal, Syracuse, N. Y.

115 tons, garage and storehouse, Newport, R. I., for navy.

115 tons, boiler house, for Citizens Gas & Coke Utility, Indianapolis, Ind.

110 tons, alterations to school building, Norwich, N. Y.

110 tons, building, for Faxon hospital, Utica, N. Y.

100 tons, three stations, Chicago subway; bids Sept. 12.

100 tons, building addition, Mathieson Alkali Company, Niagara Falls, N. Y.

Unstated, drum gate control equipment, Coulee dam; Willamette Iron & Steel Corp., Portland, Oreg., low.

Unstated, steel windows, doors, screens, etc., army air station, Fairbanks, Alaska; bids in at Fort Mason, Calif.

Unstated, 60-ton traveling crane; bids in to Bonneville project, Portland, Oreg.

Reinforcing

Reinforcing Bar Prices, Page 77

New York—While most of the largest reinforcing steel projects have been closed, new inquiry is coming out in good volume and a heavy tonnage is nearing the bid stage. Multiple housing work looms and the Felix Field project at Newark, N. J., is being rebid. Highway and bridge inquiry is heavier, 550 tons being involved in

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Speedier handling and increased durability under high speed operation characterizes the Progressive Welder line of lightweight, hydraulic guns. Single bolt type cable connection at cable clamp permits ready inter-change-

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Swivel Balancer

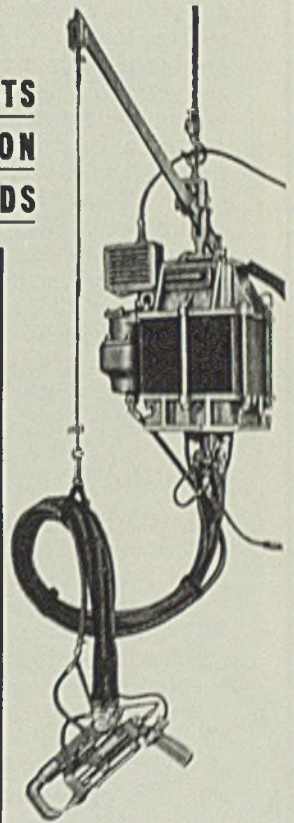
Safety type swivel suspension for complete welding unit permits greatest range of operation. Balancer arm supports both cable and gun to reduce lifting effort.

Wider Range of Welding Pressures

A wider range of closely adjustable welding point pressures is now possible with the Progressive "Hydro-Booster." This unique unit utilizes factory air line pressure to develop a range of from 300 to 1200 lbs. hydraulic pressure.

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—The Market Week—

Country Life

■ We definitely should never have moved to the country. Another week off to fool around home and play some golf and what do we get out of it? A swell case of poison ivy all over again. Live and learn—and we just live.

So What?

■ "Chase out to the steel works and get the story of an accident," said the staff chief of a Chicago evening paper to a cub reporter and erstwhile lifeguard. Forgetting the assignment for the rest of a busy day, the chief spotted the item in the Home edition "Man Falls in Vat of Molten Steel. John Kacewicizi, a rigger, while engaged in construction work at the— Steel Works met with a fatal accident this afternoon when he fell into a vat of molten steel. Kacewicizi was a good swimmer, too."

Tails Up

■ J. C. Farrel, genial v. p. of Easton Car & Construction, passes along this interesting letter just received from his good friend, J. A. Kinnaird, managing director of England's largest builder of truck bodies

Probably things are going a bit more peaceably with you than they are here, but you can take it as an absolute statement of fact that we have got our tails very much up and Mr. Hitler is going to get what he damn well deserves and that before he's much older. In thirty-eight hours they've lost 126 planes and if they keep on at that rate, it won't be long before we control the air in the same way as we control the seas and then, heaven help them! I understand there is a lot of "bunk" appearing in your newspapers about us starving and such like nonsense. Don't you believe it. If you saw our fruit shop windows, for instance, packed full of fresh fruit all brought from abroad, you would appreciate what command of the

seas really means and thank God for the Royal Navy and Merchant Navy.

Written August 13, 1940.

The Pay-Off

■ It's time now to look over the damages to the billfold for that headstrong offer of two bucks for every real slip found in the August 26 issue. Our cockiness was quite justified, however, because the only real boner was on page 15 where it was claimed that Bethlehem's additional ovens would make Buffalo the second largest coke-producing area in the country. It took a Carnegie-Illinois man to spot that one since his own Gary Works is a good second to Clairton, the tops. Two smackers are on their way to Carl G. Hogberg. R. J. Schuler, Asst. Mgr. of Sales for Republic's Bolt & Nut division, writes "in flight" on an American Airlines flagship demanding \$32.00 (American money) because an extra 16-page form slipped into his issue. We hope to settle with Mr. Schuler for two dollies, which will be immediately charged against the bindery. Shrdlu, the office cat at J. F. Bingham Mfg. Co., is turned down cold for insisting that a "penny" is really two cents according to Hoyle. If Hoyle ever played penny-ante that way, he took an awful beating.

Top Job

■ That lets us off pretty easy and STEEL is just that accurate every week. And at about this stage it's high time someone does a little bragging on the job being done up front every week on the National Defense Program. Nowhere else, to our knowledge, will you find such complete listings of Army and Navy contracts awarded nor a more complete report each week of the Government procurement plans and policies. Another feather, please, for the editors' caps, and make them red, white and blue.

SHRDLU

grade crossings, Brooklyn, for the Long Island railroad, bids Sept. 17. Concrete bar prices are firmest in months with scattered shading, although weakness continues in high-way mesh.

Pittsburgh — Inquiries and placements over the past week were on about the same basis as a week before. Prices are firmer in most sections and practically all jobs in mill quantities are reported placed at full price. Sellers here expect steady business until weather interferes, and they do not anticipate delivery difficulties this fall.

Philadelphia—Reinforcing bar demand is improving with prices increasingly strong.

Seattle — Puget Sound Construction Co., Tacoma, Wash., is low at \$3,131,606, to United States engineer for units 7 to 10, Bonneville powerhouse foundations, involving 7000 tons of reinforcing bars, the largest award pending in this area. Bethlehem Steel Co., Seattle, has a blanket contract for 1000 tons or more, for various navy projects in the Puget Sound district, The Austin Co., general contractor.

Reinforcing Steel Awards

1000 tons or more, naval projects Puget Sound area, to Bethlehem Steel Co., Seattle; The Austin Co., Seattle, general contractor.

435 tons, Wheatley Courts, housing project Tex. 6-4, San Antonio, Tex., to Alamo Iron Works, San Antonio, Tex.; H. H. Moeller, San Antonio, contractor.

400 tons, seaplane hangar, Quantico, Va., for bureau of yards and docks, through John McShaane Co., Philadelphia, to Rosslyn Steel Co., Washington.

400 tons, quartermaster's depot, Philadelphia, to Truscon Steel Co., Youngstown, O., through Wark & Co., Philadelphia.

400 tons, defense and aviation facilities, Guantanamo Bay, Cuba, to Jones & Laughlin Steel Corp., Pittsburgh; Frederick Snare Corp., New York, contractor.

280 tons, parking garage, Philadelphia, to Truscon Steel Co., Youngstown, O., through S. H. Levin, Philadelphia.

260 tons, construction work, Tongue Point, Oreg., naval base, to Poole & McGonigle, Portland; Western Con-

Concrete Bars Compared

	Tons
Week ended Sept. 7.....	3,910
Week ended Aug. 31.....	23,817
Week ended Aug. 24.....	8,509
This week, 1939.....	13,750
Weekly average, year, 1940.....	9,091
Weekly average, 1939.....	9,197
Weekly average, August....	14,186
Total to date, 1939.....	362,973
Total to date, 1940.....	327,408

Includes awards of 100 tons or more.

- struction Co., Seattle, general contractor.
- 185 tons, highway, route 49, section 16, South Dennis, N. J., to Bethlehem Steel Co., through Harry Eisenberg Inc., Collingwood, N. J.
- 140 tons, covered water reservoir, Norfolk, Va., to Hall-Hodges Co., Norfolk, Va., through C. W. Lockwood, Hampton, Va.
- 110 tons, Dixie-Vortex Co., Easton, Pa., to Concrete Steel Co., New York, through Lauter Construction Co., Philadelphia.
- 100 tons, operations hangar and annexes, Hill field, Utah, to Bethlehem Steel Co., Bethlehem, Pa.; Mead & Mount Construction Co., Denver, contractor.
- 100 tons, flood control project, Coeur d'Alene, Idaho, to Bethlehem Steel Co., Seattle; Sather & Son, Seattle, general contractor.
- 100 tons, Vernita substation, Bonneville project, to un stated Portland house; West Coast Construction Co., Seattle, general contractor.

Reinforcing Steel Pending

- 7000 tons, Bonneville powerhouse foundations, Puget Sound Construction Co., Tacoma, low.
- 800 tons, war department bridge, St. Georges, Del.; bids Sept. 9.
- 200 tons, Allen housing development, Philadelphia; bids Sept. 17.
- 200 tons, training school, St. Petersburg, Fla., for federal works administration, Washington; bids Sept. 18.
- 195 tons, two reinforced structures, Beaver Falls, Pa.; bids to state highway department, Harrisburg, Pa. Sept. 13.
- 100 tons, addition to Anchorage, Alaska, federal building; McCarthy Bros. Construction Co., St. Louis, low.

Pig Iron

Pig Iron Prices, Page 78

Pittsburgh — Pig iron production during August was greater than during July, although the same number of furnaces were in blast. Tonnage this month will probably run about the same and it is possible the current 40 active stacks will remain. Prices are steady. Demand is slightly better for foundry iron. Chief tonnage continues to come from non-integrated steel plants. Coke supply apparently is now adequate, with production up slightly in the beehive district around Connelsville.

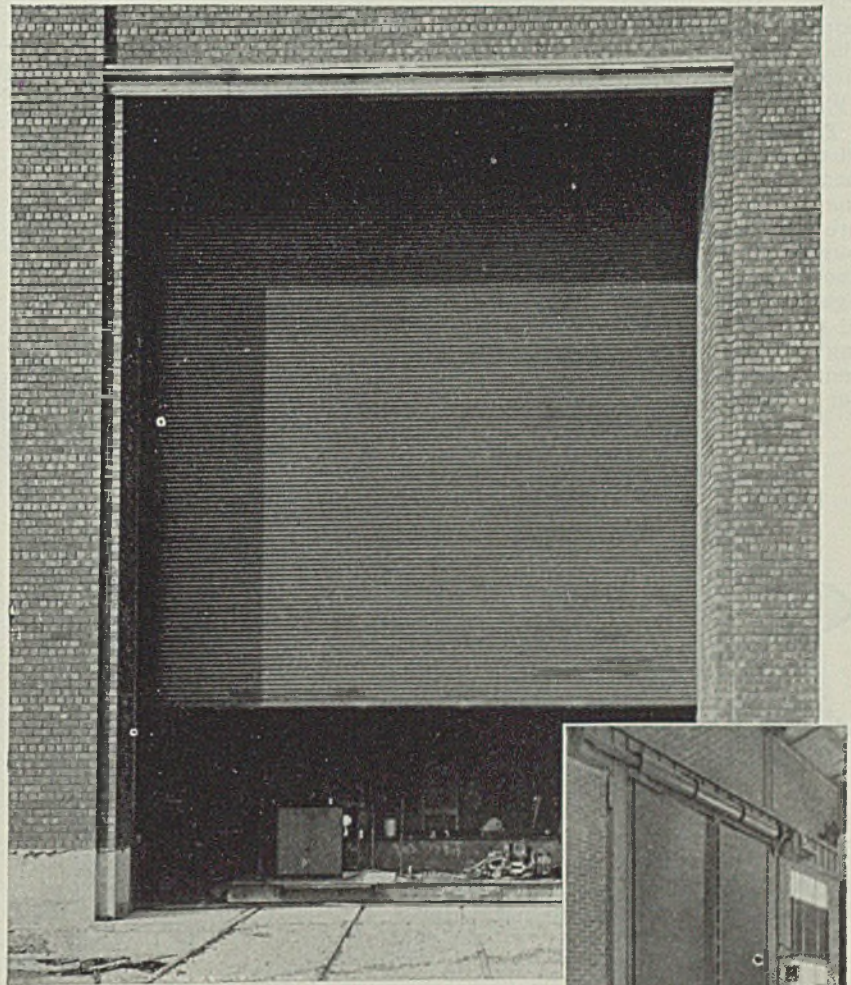
Cleveland—Current and prospective improvement in foundry operations promises to extend the recent upturn in pig iron shipments during September. Consumption is expanding seasonally in some instances. Rumors in the East of a possible price advance by next month are discounted, but in the absence of active forward buying producers have little occasion to make formal announcement regarding fourth quarter quotations. Meanwhile the market is being continued at unchanged levels.

Chicago—Buying of pig iron is

largely in scattered lots of foundry and malleable, as foundries begin to feel automotive revival and some from the armament program. In neither instance is this approaching the volume expected to shape up shortly. Shipments in August exceeded July and September starts at a rate promising to exceed August. The gain in pig iron appears divided equally between gray iron and malleable foundries. Charcoal iron producers are said to be shipping production, this going largely to rollmakers. These in

turn feel the stimulus of roll renewal demand from rolling mills.

Boston — Pig iron bookings for fourth quarter shipment are being taken at unchanged prices, although covering for that period thus far is limited. Consumers in some instances have underestimated third quarter needs and are amplifying specifications for immediate shipment. This is notably true in southern New England where more unexpected orders for castings have appeared in connection with the defense program. Foundries supply-



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KINNEAR

ROLLING DOORS

ing the machine tool industry are maintaining melt, which is on the increase and covering a broader field, although some jobbing shops tend to lag behind the general average.

New York—While some tonnage has been booked for fourth quarter, pig iron sellers generally are making no effort to stimulate such future buying. Shipments have continued brisk. Some sellers report August deliveries were the heaviest for any month this year and declare there is little or no let-up in the case of shipments so far this month, notwithstanding the Labor Day holiday. Machinery equipment manufacturers continue the most active. In the export field there has been further heavy buying recently by Great Britain.

Philadelphia—While at least one district mill has placed a fair tonnage of basic pig iron recently, buying is limited as most consumers are protected by contracts. Such buying as appears seems stimulated more by desire for protection against scarcity later than by fear of price advance. Sellers are booking fourth quarter tonnage at current prices but are making no drive for business. Most sellers report

incoming tonnage greater than production.

Buffalo—A mild buying flurry has developed but producers seem more interested in the present spirited pace of shipments. Merchant iron sellers have cleared most of third quarter bookings, but there will likely be some carryover of orders to fourth quarter. Motor and building equipment melt is increasing. Buying is well spread over diversified consumers.

Cincinnati — August shipments were the heaviest of the year with indications that September will be equal or better. Tonnage is being booked for fourth quarter delivery at current prices, but buying is light.

Toronto, Ont. — New business in merchant pig iron holds steady but lacks special feature. Melters are taking iron as demands dictate and orders and shipments against contract are responsible for deliveries of about 5000 tons weekly. Basic iron is more active, running about 500 tons per week, the balance made up of foundry and malleable grades. Current demand largely is confined to spot needs with future delivery backing at a standstill. Production is holding, with nine stacks blowing out of ten in Canada.

Scrap

Scrap Prices, Page 80

Pittsburgh—No. 1 heavy melting steel has been advanced \$1 a ton to \$19.50 to \$20 on a sale to a down-river mill. The market also derives added support from dealer offerings for material to be shipped out of the district, principally to Youngstown. Current railroad offerings are fairly heavy, although they do not come up to the figure of last month. Closings thus far have shown prices slightly better on most items, with specialties particularly active. Demand from steel foundries continues good and specialty prices are firm.

Cleveland—Prices have strengthened further here and in the Valley. Leading steelworks grades here are up 50 cents, with No. 1 steel at \$19 to \$19.50. Demand is active, with supplies relatively moderate.

Boston — Iron and steel scrap prices are stronger, several grades advancing 25 to 50 cents a ton. Buying and shipments for domestic melt are moderate with some increase in activity developing. Boat loading against export orders is steady with quotations firm at the top range of the recent advance. Most exports are going to Britain. While heavy melting steel grades for Pennsylvania shipment are up 50 cents, shipping point, the price is still too low, considering transportation charges, to attract much tonnage in view of the better prices available for dock delivery.

New York—Shipments against orders are steady, with foundry grades slightly more active. Domestic consumer buying is limited to scattered lots. Prices generally are unchanged, although for export brokers have advanced No. 2 steel to \$15, barge. Loadings for shipment to England are maintained. A. A. Volk Co., New York, is low on the contract for scrapping the Ninth avenue elevated line, involving 65,000 tons of steel scrap. Bids close Sept. 17 for wrecking part of the Second avenue elevated structure, containing about 30,000 tons.

Cincinnati—Iron and steel scrap prices are up 50 cents, and dealer-broker trading is active. Wanted grades are none too plentiful, considering the rapid absorption at the present steelmaking rate, and dealers are trying to augment stocks. Sentiment is bullish.

Philadelphia—A strong undertone continues in scrap, with sellers moving cautiously in anticipation of higher prices. This is particularly noticeable in all grades of steel mill scrap and increasingly so in some foundry grades. Little export scrap is moving from this district as do-

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STAINLESS and COMPOSITE STEELS

mestic prices are the more attractive. At the moment more scrap is coming in than going out by water, as the last of three cargoes loaded at a South Atlantic port for Italy prior to her entry into the war is being unloaded here for the account of a leading Pennsylvania consumer.

Buffalo—Sweeping price gains of \$1.50 a ton have been posted on steelmaking grades, following a sale of approximately 25,000 tons on the basis of \$19.50 to \$20 a ton for No. 1 heavy melting steel. The entire tonnage was placed with local dealers and did much to further strengthen sentiment. The customary \$2 differential prevailed on No. 2 steel and allied grades. Shipments by water continue substantial. Higher prices have also quickened collection activity. Dealers report supplies ample to cover commitments.

Birmingham, Ala. — Re-entrance of Republic Steel Corp. into the market for first of the month purchases has raised No. 1 heavy melting to \$16, with other minor price changes.

Steel in Europe

Foreign Steel Prices, Page 79

London—(By Cable)—In raw materials and semifinished steel the position of Great Britain at present is quite satisfactory. Delivery of ore from Mediterranean sources continues. Pig iron is being strictly rationed, especially to light foundries. Heavy rolling mills and sheet mills are working to capacity.

Exports of tin plate are quiet, partially due to diminished Australian and South American inquiry and partly to limitation of export permits.

Tin Plate

Tin Plate Prices, Page 76

New business in tin plate is very light, with the off season approaching. Producers see little possibility of any increase in production this fall, with the rate last week at 48 per cent, off 6 points. There is a possibility general line can business will increase somewhat during the fall months, as is generally the case. Export buying continues slow.

Freight Rates Reduced

Boston—To provide a basis of rates for export, reduction in freight rates on coiled wire rods and billets from Worcester to Boston is proposed, \$1.25 per gross ton against a present rate of \$1.65 for

rods and \$2.88 for billets. Reduction will also become operative on rates for these commodities from Worcester to New York harbor lighterage points, \$3.00 a gross ton on rods and billets from \$3.85.

Warehouse

Warehouse Prices, Page 79

Chicago — August sales were greater than July's in case of most local warehouses. Demand was well spread as to products. Prices are steady and unchanged.

Philadelphia — Warehouses are experiencing a brisk business, some having the largest trade of the year in August and September is expected to better this record. Prices are steady.

Buffalo — Sales continue to scale

new peaks for year with further improvement expected. Consumers working on defense orders are leading buyers. Deliveries from mills are slowing up especially on certain items in the specialty category.

Seattle — The jobbing trade is active, buying diversified and volume steady from both public and private sources. Prices are unchanged and firm, plates, shapes and mild steel bars still below Portland tariffs.

Navy Buying Aluminum

Boston—Bids close Sept. 10 under schedule 2972, bureau of supplies and accounts, navy department, Washington, on 150 tons of aluminum alloy ingots for delivery at the Portsmouth, N. H., navy yard.



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Nonferrous Metal Prices

	Electro, del. Conn.	Copper Lake, del. Midwest	Casting, refinery	Straits Tin, New York Spot	Tin, Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Alumi- num 99%	Anti- mony Amer. Spot, N.Y.	Nickel Cath- odes
Aug. 31	11.00	11.00	10.62 1/2	50.50	50.12 1/2	4.90	4.75	6.50	18.00	14.00	35.00
Sept. 2—Holiday.											
3	11.00	11.00	10.62 1/2	50.50	50.12 1/2	4.90	4.75	6.50	18.00	14.00	35.00
4	11.00	11.00	10.62 1/2	50.50	50.12 1/2	4.90	4.75	6.50	18.00	14.00	35.00
5	11.50	11.50	11.12 1/2	50.37 1/2	50.05	4.90	4.75	6.85	18.00	14.00	35.00
6	11.50	11.50	11.12 1/2	50.25	50.05	4.90	4.75	6.85	18.00	14.00	35.00

MILL PRODUCTS
F.o.b. mill base, cents per lb., except as specified. Copper brass products based on 11.50c Conn. copper

Sheets

Yellow brass (high)	18.65
Copper, hot rolled	20.12
Lead, cut to jobbers	7.15
Zinc, 100 lb. base	11.50

Tubes

High yellow brass	21.40
Seamless copper	20.62

Rods

High yellow brass	13.67
Copper, hot rolled	16.62

Anodes

Copper, untrimmed	17.37
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Wire

Yellow brass (high)	18.90
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OLD METALS
Nom. Dealers' Buying Prices

No. 1 Composition Red Brass

New York	7.25-7.50
Cleveland	7.37 1/2-7.62 1/2
Chicago	7.25-7.50
St. Louis	7.75

Heavy Copper and Wire

New York, No. 1	8.87 1/2-9.12 1/2
Cleveland, No. 1	8.50-8.75
Chicago, No. 1	8.50-8.75
St. Louis	8.75

Composition Brass Turnings

New York	6.87 1/2-7.12 1/2
----------	-------------------

Light Copper

New York	6.87 1/2-7.12 1/2
Cleveland	6.50-6.75
Chicago	6.50-6.75
St. Louis	6.75

Light Brass

Cleveland	3.75-4.00
Chicago	4.25-4.37 1/2
St. Louis	4.25

Lead

New York	4.25-4.35
Cleveland	3.60-3.75
Chicago	3.75-4.00
St. Louis	3.50-3.75

Zinc

New York	3.75-4.00
Cleveland	3.25-3.50
St. Louis	3.50-3.75

Aluminum

Misc., cast, Cleveland	8.50
------------------------	------

Borings, Cleveland	6.50
Clips, soft, Cleveland	14.00
Misc. cast, St. Louis	7.75-8.00

SECONDARY METALS

Brass ingot, 85-5-5-5, less carloads	11.75
Standard No. 12 aluminum	14.00-14.25

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Nonferrous Metals

New York—A spurt in copper sales and a further tightening in the zinc supply situation resulted in price advances in these markets and tended to strengthen the general price tone of all nonferrous metal markets last week.

Copper—Sales jumped to 113,106 tons on Thursday, representing a \$25,000,000 turnover and a new record high for any single day's business. These sales are equal to one and one-half months' production so a period of comparatively light buying is expected now. Copper and



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—The Market Week—

brass rolled product, copper wire and cable, brass ingot and red metal scrap prices generally advanced in line with the higher ingot price.

Lead—A moderate amount of business was done and prices held firm at 4.75c, East St. Louis. The market remained depressed, however, by the threat of heavy importations of Mexican metal.

Zinc—Sellers continue to urge buying caution so that consumers who actually need metal for nearby consumption will be able to obtain it without needlessly bidding up the price on themselves. Offerings continued light, even at 6.85c, East St. Louis, the level which was established on Thursday.

Tin—Demand in the domestic market was dull and prices eased fractionally. Straits spot closed at 50.25c compared with the previous week's close of 50.50c.

■ Hazard Wire Rope division of American Chain & Cable Co., Wilkes-Barre, Pa., has acquired a unit of the former Sheldon Axle Co. plant in Wilkes-Barre. The building, 60 x 350 feet, will be equipped for the manufacture of torpedo nets for the federal government.

Ferroalloys

Ferroalloy Prices, Page 78

New York—Prices on ferromanganese and ferrochrome in general have been reaffirmed for fourth quarter. Thus ferromanganese, 78-82 per cent, in car lots, will continue to be quoted at \$120, duty paid, Atlantic and Gulf ports.

Ferromanganese specifications have shown some improvement this month, following general dullness over July and August because of heavy buying in June in anticipation of the \$20 increase which became effective July 1 on contracts. In point of actual shipments, this month may also prove better than August and possibly even better than July, when there was some carryover at the old prices, due to the rush of buying in June. However, there is some doubt concerning the latter possibility.

Iron Ore

Iron Ore Prices, Page 80

New York — While private demand has continued slack there has been further heavy buying of manganese ore by the government. It is estimated in some trade quarters that government reserve purchases now aggregate between 800,000 and 900,000 tons. In some cases

BETTER WELDS—LOWER COSTS

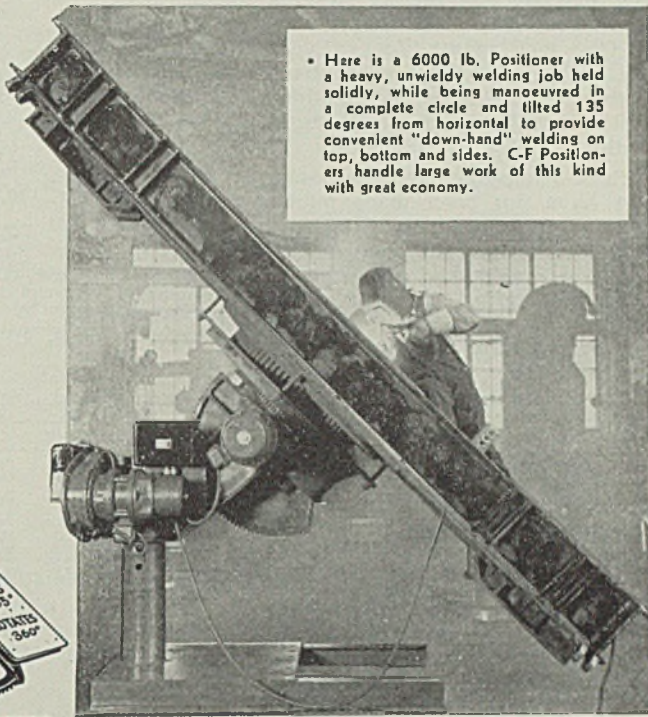
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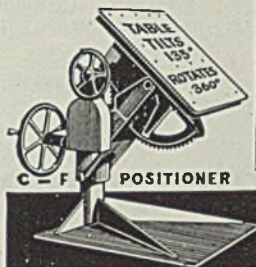
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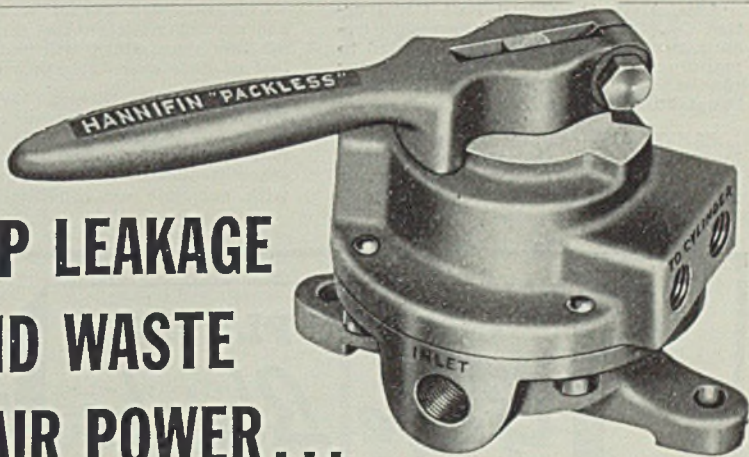
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AIR CONTROL

contracts call for extended delivery, at least over two or three years. For instance, there is the contract for 240,000 gross tons entered into by the Metals Reserve Co. with the Anaconda Copper Mining Co., last month for delivery over a period of three years from the time production is begun, which should be within five to eight months.

Prices being paid by the government have not been made public, but in some quarters it is regarded as significant that the open market prices on manganese ore continue unchanged, with Caucasian, 50-52 per cent, holding at 60 cents per unit, before duty, and South African, 50-52 per cent, at 58 to 59 cents. Cuban manganese, 50-51 per cent, duty free, is holding at 71 to 73 cents.

Cleveland—Shipments of iron ore from upper lake ports in August totaled 10,534,431 gross tons, an increase of 3,579,851 tons over 6,954,580 tons in August, 1939. In July shipments were 9,535,494 tons.

Cumulative tonnage to Sept. 1 was 38,236,609 tons, compared with

22,495,767 tons, an increase of 15,740,842 tons.

Comparisons by ports for August are as follows:

	Gross Tons	
	August 1940	August 1939
Escanaba	5,724	457,806
Marquette	823,269	709,484
Ashland	945,931	903,576
Superior	3,848,461	2,227,166
Duluth	2,838,059	1,312,268
Two Harbors.....	1,546,534	1,344,280
Total U. S. Ports..	10,479,978	6,954,580
Michipicoten	54,453	.....

Total	10,534,431	6,954,580
Increase from 1939	3,579,851	.....

Comparisons by ports for the season to Sept. 1, are as follows:

	Gross Tons	
	To Sept. 1 1940	To Sept. 1 1939
Escanaba	1,950,700	1,336,399
Marquette	3,341,991	2,044,127
Ashland	3,540,976	2,620,747
Superior	1,183,609	6,953,409
Duluth	9,075,120	4,730,460
Two Harbors.....	6,571,042	4,810,625
Total U. S. Ports..	38,059,447	22,495,767
Michipicoten	177,162	.....

Total	38,236,609	22,495,767
Increase from 1939	15,740,842	.....

Morse & Co., 1500 Superior avenue, probably will prepare plans.

CLEVELAND—Ace Boiler & Repair Co., 3360 West Eighty-eighth street, Michael Schurger, secretary, plans new

■ **Additional Construction and Enterprise leads may be found in the list of Shapes Pending on page 88 and Reinforcing Bars Pending on page 91 of this issue.**

plant with 2500 square feet floor space on Triskett road near West 139th street.

CLEVELAND—Cleveland Welding Co., H. W. Kranz, president, Berea road and West 117th street, has let contract to H. L. Vokes Co., 5300 Chester avenue, for addition to its shop.

CLEVELAND—Fulton Foundry Co., 7325 Morgan avenue, is building a one-story addition 21 x 30 feet for additional core room facilities. A. C. Denison is in charge.

CLEVELAND—Reliance Electric & Engineering Co. has given general contract to J. L. Hunting Co., Ninth and Chester, for one-story addition to factory and office building at 1088 Ivanhoe road, to provide about 12,000 square feet floor space. This is third addition within past year. Cost will be about \$60,000.

CLEVELAND—Eaton Mfg. Co., 739 East 140th street will build one-story 100 x 400-foot addition with second story 40 x 120 feet for manufacture of new item for national defense. General contract to Sam W. Emerson Co., 1836 Euclid avenue.

CLEVELAND—Wilbur Watson & Associates, 4614 Prospect avenue, have been appointed by United States war department to design \$14,000,000 arsenal to be built near Ravenna, O. Construction contract has been let to Hunkin-Conkey Construction Co., 1740 East Twelfth street, on cost-plus basis.

CLEVELAND—Cleveland Pneumatic Tool Co., 3734 East Seventy-eighth street, will build three manufacturing units with 20,000, 36,000 and 40,000 square feet floor space. Construction to be handled by Ernest McGeorge and W. R. Hargett, 9400 Quincy avenue, contract to be let about Sept. 10.

CLEVELAND—H. K. Ferguson, Hanna building, has taken contract from Kimble Glass Co., Vineland, N. J., to design, construct and equip a manufacturing building at Vineland, 60 x 177 feet, 12 reinforced concrete storage bins 24 x 55 x 60 feet and remodel existing coal-handling equipment.

SANDUSKY, O.—Sandusky Foundry & Machine Co., Devereux Lake, president, is building a shop addition and has purchased adjoining realty for further expansion to provide added facilities for government work.

Connecticut

BRIDGEPORT, CONN.—Bridgeport Brass Co., R. E. Day, president, 774 East Main street, will build a one-story addition to its plant at Pembroke and Walter streets.

Massachusetts

NORTHAMPTON, MASS.—W. Hall, chairman sewer committee, plans sewage disposal plant to cost \$300,000. Tighe & Bond, 189 High street, Holyoke, Mass., are engineers.

WORCESTER, MASS.—Heald Machine Co., New Bond street, R. N. Heald, president, has let general contract to E. J.

Construction and Enterprise

Ohio

ASHLAND, O.—Guard Rail Construction Co., Guy Priest, 712 Claremont avenue, president, has been incorporated to manufacture guard rail and bridge planks. Francis R. O'Brien, Richland Trust building, is attorney.

CLEVELAND—Champion Machine & Forging Co., L. W. Greve, president, 3693 East Seventy-eighth street, is having plans drawn by E. McGeorge, 9400 Quin-

cy avenue, for a forge and machine shop building to cost \$40,000.

CLEVELAND—Warner & Swasey Co. has started work on the third addition for this year, which will provide 30,000 feet of floor space at cost of \$600,000.

CLEVELAND—Hickok Electrical Instrument Co., 10514 Dupont avenue, will build an addition 80 x 50 feet and a new building 80 x 100 feet to increase space for assembly operations, probably with complete air conditioning. H. M.

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—Construction and Enterprise—

Cross Co. Inc., 150 Prescott street, for two-story boiler plant 52 x 106 feet, at cost of about \$100,000. Albert Kahn, New Center building, Detroit, is architect.

WORCESTER, MASS.—Wyman Gordon Co., 105 Madison street, has let general contract for a one-story 106 x 300-foot forge shop to E. J. Cross Inc., 150 Prescott street, costing about \$135,000.

New York

NIAGARA FALLS, N. Y.—Union Carbide Co., 137 Forty-seventh street, will take bids in September for a one-story factory 90 x 148 feet, estimated to cost over \$40,000 with equipment.

Pennsylvania

GREENVILLE, PA.—Bessemer & Lake

Erie railroad, F. R. Layng, chief engineer, Greenville, will build a one-story machine and erecting shop addition to cost \$40,000.

WARREN, PA.—Pennsylvania Furnace & Iron Co., Pine street, will take bids soon on the first unit of a steel and concrete plant addition to cost \$40,000.

Michigan

BENTON HARBOR, MICH.—City plans sewer disposal plant to cost about \$340,000. Consoer, Townsend & Quinlan, 211 West Wacker drive, Chicago, are engineers.

DETROIT—De Vlieg Machine Co., 10232 Woodward avenue, has been incorporated with \$25,000 capital to deal in machine tools and machinery by Charles B. De Vlieg, 10232 Woodward avenue.

FLINT, MICH.—Flint Machinery Co., 1403 Union Industrial building, has been incorporated with \$50,000 preferred and \$1250 common stock to deal in machinery, by Murray T. Polley, 905 Belmont avenue, Flint, Mich.

JACKSON, MICH.—Jackson crankshaft division, Muskegon Motor Specialties Co., has given general contract to North-Moller Co., Jackson, for a factory building. Russell Allen Jackson, is architect.

KALAMAZOO, MICH.—Security Metal Products Inc., 1015 American National Bank building, has been incorporated with \$50,000 capital to deal in metal products, by Wilfred C. Miner, Holland, Mich.

KALAMAZOO, MICH. — Borroughs Mfg. Co., 2002 Lane boulevard, has been incorporated with \$50,000 capital to deal in machinery, by Allan Smith, Plainwell, Mich.

LANSING, MICH.—Duplex Truck Co. has awarded contract for concrete and steel plant addition 72 x 160 feet, to cost over \$50,000 with equipment.

PONTIAC, MICH. — Yellow Truck & Coach Mfg. Co. has given contract for a plant addition to Darin & Armstrong Inc., Detroit, one story 120 x 500 feet. Alfred Kahn, New Center building, Detroit, is architect.

YPSILANTI, MICH. — Ypsilanti Screw Products Inc., 310 River boulevard, has been incorporated with \$25,000 capital to deal in screw machines and their products, by Ray R. Buckman, 18667 Cherry-lawn avenue, Detroit.

Illinois

CHICAGO — Central Screw Co., 3501 Shields avenue, has let general contract to B. W. Handler Construction Co., 1261 South State street, for a one-story plant and warehouse addition 108 x 208 feet, costing about \$40,000.

HARVEY, ILL.—Buda Co. has let general contract for a one-story diesel engine plant to Continental Construction Co., 340 North Central avenue, Chicago, to cost about \$300,000.

MILLSTADT, ILL. — City plans construction of a sewage disposal plant, auxiliary piping and appurtenances at cost of \$60,000. Hirst-Rosche Engineering Co., Hillsboro, Ill., is engineer.

MOLINE, ILL.—City, A. H. Asp, mayor, plans construction of a sewage disposal plant costing about \$300,000. Will seek WPA funds.

TAYLORSVILLE, ILL.—Peabody Coal Co., Taylorville, will build a coal-washing plant at No. 7 mine at cost of \$1,250,000.

Indiana

ANDERSON, IND.—Delco Remy Corp., Twenty-fourth street and Columbus av-

enue, will build a foundry for aluminum castings and airplane engine parts, to cost \$300,000, with equipment.

INDIANAPOLIS—Radio Corp. of America, J. N. Smith, resident vice president, 501 North LaSalle street, will take bids soon on four one-story brick and steel manufacturing buildings, to cost about \$1,000,000, Albert Kahn, New Center building, Detroit, is architect.

District of Columbia

WASHINGTON—Bureau of supplies and accounts, navy department, will take bids as follows: Sept. 13, schedule 2868, fourteen portable electric saws; schedule 2906, motor-driven universal tool and cutter universal grinding machine for

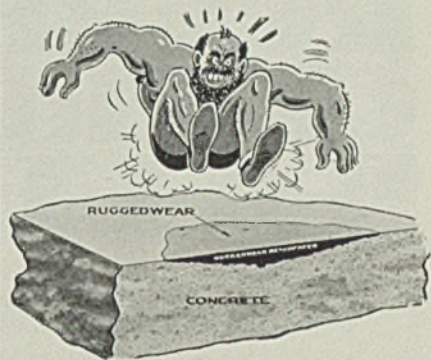


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air station, San Diego, Calif.; schedule 2915, two motor-driven ram-type universal milling machines for Brooklyn, N. Y., and Mare Island, Calif.; schedule 2990, three motor-driven universal tool and cutter grinders for Brooklyn, N. Y.; schedule 2998, motor-driven hydraulic open-side planer for Charleston, S. C.; schedule 3002, two motor-driven slotter machines for Philadelphia; schedule 2947, motor-driven horizontal internal cylinder grinding machine for Brooklyn, N. Y.; schedule 2983, three motor-driven

hacksaw cutting-off machines for Washington; Sept. 17, schedule 2919, two motor-driven radial drilling machines for Puget Sound, Wash.; schedule 2950, two motor-driven sensitive precision lathes for San Diego, Calif.; schedule 2986, five motor-driven milling machines for Portsmouth, N. H., and Mare Island, Calif.; schedule 2954, motor-driven vertical boring mill for Mare Island, Calif.; schedule 2956, three motor-driven universal tool and cutter grinding machines for Puget Sound, Wash.

Missouri

MARYVILLE, MO. — Nodaway-Worth electric co-operative is taking bids on 412 miles of rural transmission line to serve about 1075 customers. Paulette & Wilson, 1006 Topeka avenue, Topeka, Kans., are engineers. (Noted Aug. 19.)

ST. LOUIS — Curtiss-Wright Corp., 30 Rockefeller plaza, New York, is considering plans for an \$8,000,000 expansion at Lambert-St. Louis field, increasing its plant to seven times present size, for construction of its new stratosphere plane.

Oklahoma

PAWNEE, OKLA. — City, W. C. Williams, clerk, takes bids to Sept. 12 for improvements to municipal power plant and waterworks, including a 500-kilowatt diesel generating unit and auxiliaries, two waterworks pumps, etc. O. F. Sewell, Pawnee, is consulting engineer.

Wisconsin

BELOIT, WIS. — Nonferrous metals foundry to be built by Fairbanks, Morse & Co., noted Sept. 2, will be 80 x 220 feet, between pattern shop and north foundry, capacity three times present nonferrous department. Includes sand-cleaning and handling equipment, core ovens, pattern storage. Bids will be asked as soon as plans are completed by O. D. Conover, architect, Cleveland.

FOUNTAIN CITY, WIS.—United States Engineering Corps, St. Paul district, will build machine shop and mills shop building, one-story 50 x 80 feet. General contract to Johnson & Kramer, St. Charles, Minn.

MILWAUKEE — Chain Belt Co., 1600 West Bruce street, is having plans prepared by Eschweiler & Eschweiler, architects, Milwaukee, for a plant addition 31 x 123 feet, two stories.

MILWAUKEE—E. Brielmaier & Sons Co., architect, Milwaukee, is preparing plans for a four-story engineering building for Marquette University on West Wisconsin avenue between Fifteenth and Sixteenth streets, to cost about \$300,000 for building and \$150,000 for equipment.

MILWAUKEE — Geuder, Paeschke & Frey Co. is building a two-story addition 70 x 74 feet, to cost about \$35,000, at its plant, 405 North Fifteenth street. Meredith Bros. Inc. has general contract.

RACINE, WIS. — Modine Mfg. Co., Charles T. Perkins, vice president, will build addition to house sheet metal, press work and other departments for radiator production, one story, 60,000 square feet, saw-tooth, brick, steel and concrete. Additional unit with 15,000 square feet floor space will be built to house wind tunnel to test gas motor radiators. (Noted Sept. 2.)

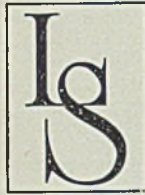
Minnesota

ANOKA, MINN.—Anoka light and power co-operative, George L. Morris, superintendent, has let contract to L. A. Baumgardner & Co., St. Paul, for 210 miles of rural transmission lines to serve 679 customers. General Engineering Corp., 2944 Cedar avenue, Minneapolis, is engineer.

BENSON, MINN.—Stevens-Big Stone power co-operative, Victor Hanson, superintendent is about to take bids on 219 miles of rural transmission lines to serve 465 customers. General Engineering Corp., 2944 Cedar avenue, Minneapolis, is engineer.

GRANITE FALLS, MINN. — Minnesota valley power co-operative, Oscar W. Swanson, superintendent, has given contract to Acme Construction Co., St. Paul, for 441 miles rural transmission lines;

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—Construction and Enterprise—

United Engineering Service, 1406 West Lake street, Minneapolis, is engineer.

NOPEMING, MINN.—St. Louis county sanatorium commission, Dr. A. T. Laird, secretary, is taking bids on stoker, garbage incinerator and coal-handling equipment at county sanatorium. Charles Foster, 316 Medical Arts building, Duluth, is consulting engineer.

OWATONNA, MINN. — Steele-Waseca electric co-operative, L. P. Zimmerman, superintendent, is preparing plans for 154 miles rural transmission lines to serve 355 customers. United Engineering Service, W. W. Culliff, engineer, 1406 West Lake street, Minneapolis, are engineers.

PLAINVIEW, MINN.—Village, Walter A. Kulawske, recorder, is taking bids for

sewage disposal plant. Burlingame, Hitchcock & Estabrook, 521 Sexton building, Minneapolis, engineers.

ST. CHARLES, MINN.—City, Oscar N. Linden, clerk, is taking bids for a vertical turbine-type deep well pump.

Texas

BORGER, TEX. — Phillips Petroleum Co., Bartlesville, Okla., will build gasoline pipe line from its refinery at Borger to San Antonio, Tex., and gulf ports, at cost of \$300,000.

Iowa

ALGONA, IOWA—City, Adah Carlson, clerk, is having plans prepared for a light and power plant to cost about \$100,000. Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, Mo., are engineers.

GALVA, IOWA—City, I. E. Baumgardner, clerk, is taking bids on sewage disposal plant, including pumping station, filter, tank, etc. Currie Engineering Co., Webster City, Iowa, engineer.

KEOKUK, IOWA—Dryden Rubber Co. plans a plant addition to cost about \$100,000.

LAKE VIEW, IOWA—Village, Katherine Monroe, clerk, is seeking WPA aid for sewage disposal plant to cost \$25,000. Buell & Winter, 508 Insurance Exchange building, Sioux City, Iowa, are engineers.

WAPELLO, IOWA—City, C. M. Donaldson, clerk, has received WPA allotment to aid in financing sewage treatment plant and storm sewers costing about \$99,000. Consoer, Townsend & Quinlan, 211 West Wacker drive, Chicago, are engineers.

Oregon

MARSHFIELD, OREG.—Bond issue of \$20,000 has been approved for a municipal water system enlargement. WPA assistance has been given, entire project to cost \$35,000.

PRINEVILLE, OREG.—City, J. E. Adamson, clerk, will receive bids Sept. 16 for construction of sewage disposal plant and sewers. R. H. Corey, Portland, Oreg., is engineer.

Washington

BELLINGHAM, WASH.—Puget Sound Pulp & Timber Co., Ossian Anderson, president, has submitted proposal to stockholders for erection of \$1,500,000 plant addition to increase sulphite pulp production from 100,000 to 150,000 tons annually.

KENNEWICK, WASH.—Local interests are negotiating with Reynolds Metal Co., Richmond, Va., for establishment of an aluminum plant here. Company is reported to have applied for RFC loan of \$15,000,000.

Canada

BROCKVILLE, ONT.—Phillips Electrical Works Ltd. has given general contract to Bremner, Norris & Co., 2049 McGill College avenue, Montreal, for a plant on Kingston road, here, to cost about \$75,000. J. Charles Day, 630 Dorchester street West, Montreal, is engineer.

CORNWALL, ONT.—Howard Smith Paper Mills Ltd. has given general contract to A. F. Byers & Co. Ltd., 1226 University street, for \$25,000 chemical plant here.

HAMILTON, ONT.—Dominion Found-

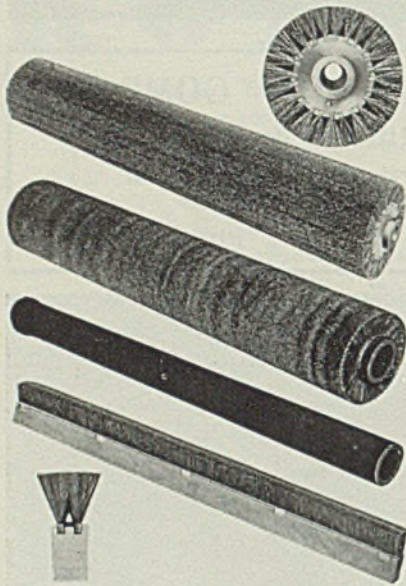
ries & Steel Ltd., Depew street, has let general contract to Frid Construction Co. Ltd., King street East, for plant addition 600 feet in length.

LONG BRANCH, ONT.—Weston Industries plans plant on Lake Shore road at Brown's Line, four buildings, to cost about \$350,000, for which equipment will cost an additional \$400,000. Will be used for battery division.

PAMOUR, ONT.—Hoyle Gold Mines Ltd., 25 King street, Toronto, is having plans prepared by H. S. Munroe for milling plant here to cost about \$400,000.

MONTREAL, QUE.—Liberty Smelting Works, 269 Prince street, is taking bids for a \$25,000 plant addition. Ellasoph & Greenspoon, 1403 Bleury street, are architects.

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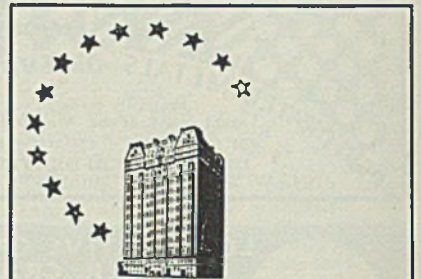
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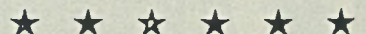


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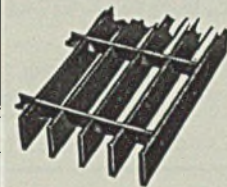
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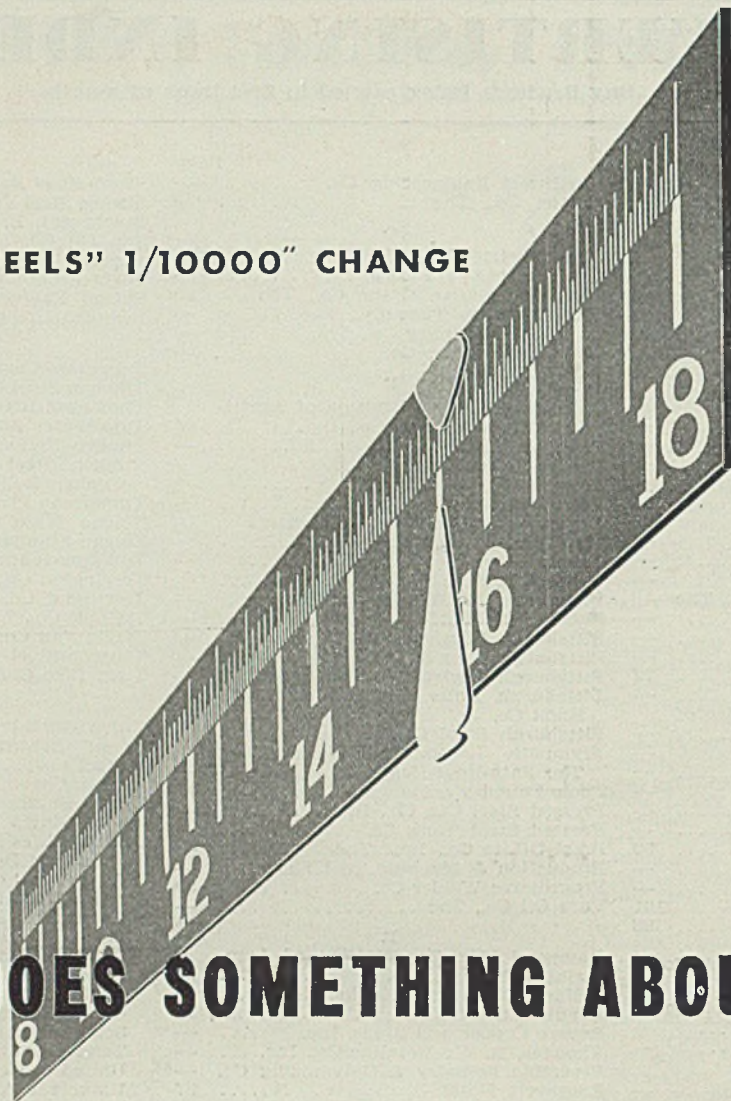
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Niles Steel Products Div., Republic Steel Corp.	—	Yale & Towne Mfg. Co.	—	Zeh & Hahnemann Co.	—
Nitralloy Corp., The	—	Youngstown Alloy Casting Corp.	—		
Norma-Hoffmann Bearings Corp.	—	Youngstown Sheet & Tube Co., The	—		
North American Manufacturing Co.	—	Youngstown Welding & Engineering Co., The	—		
Inside Front Cover					
Northern Engineering Works	—				

"FEELS" 1/10000" CHANGE



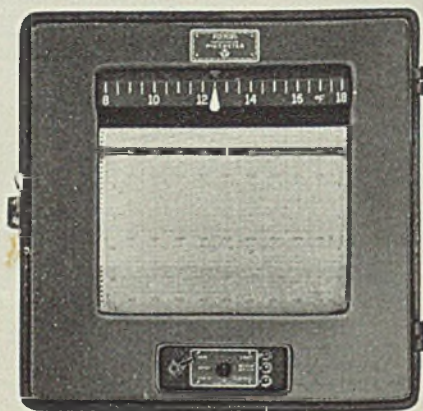
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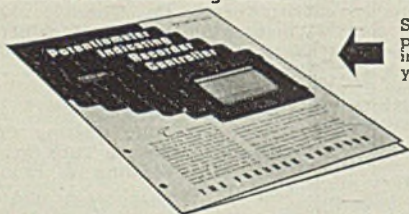
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