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# STEEL

The Magazine of Metalworking and Metalproducing

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SEPTEMBER 23, 1946

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Use of Steel Marks Turning Point in Motor Design

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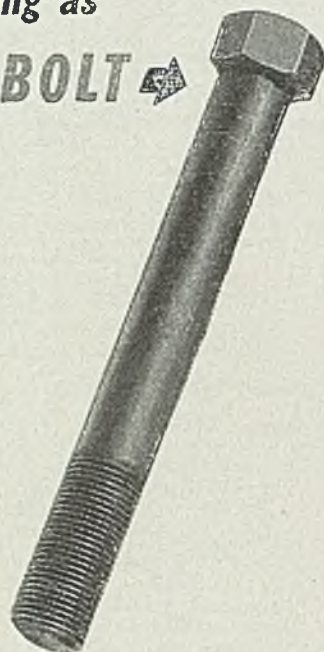


**This Bolt** →



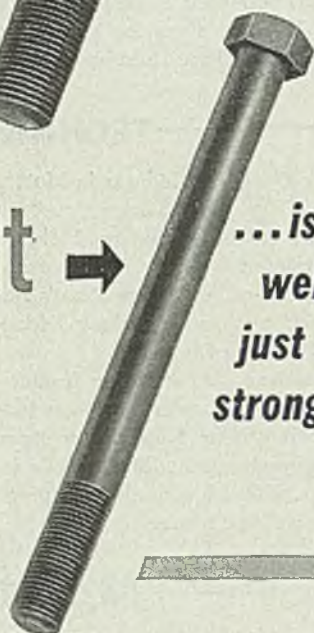
*...is the same size  
yet twice as strong as*

**THIS BOLT** →



*...and*

**This Bolt** →



*...is half the  
weight, yet  
just as  
strong as*

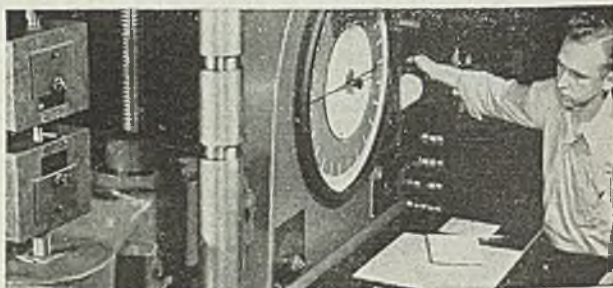
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# Leaderless Nation

VIEWS

the NEWS

On this page in the Jan. 29, 1945, issue, after President Roosevelt had ousted Jesse Jones as secretary of commerce to make room for Henry Wallace, we expressed the hope that Congress would not confirm the appointment, on the ground that Mr. Wallace was "unsuited by temperament, experience or native ability" for the job. Congress confirmed the appointment, although reluctantly.

Immediately word was passed out that Mr. Wallace had constructive plans for the Department of Commerce, that he hoped to be as good a secretary as Herbert Hoover had been and that he hoped to win the confidence of business. Most industrialists listened doubtfully and awaited results.

In November, 1945, Secretary Wallace issued a report stating that automobile manufacturers could increase wages 15 per cent in 1946 and 10 per cent in 1947 without raising prices and still earn profits greater than those realized prewar. For months this preposterous statement influenced the government's policy of raising wages freely while trying to hold down prices. Later Wallace admitted the report was a phony and President Truman repudiated it, but not before it had cost the nation dearly. This billion dollar blunder demonstrated Mr. Wallace's incompetence.

On Sept. 12, 1946, in a political speech to a New York audience so packed with pro-Soviet anti-Americans that they booed his mildest deviations from the Communist party line, the blundering Wallace proposed a foreign policy that clashes head-on with the principles of Roosevelt, Hull, Byrnes and others. His untimely outburst weakened the hand of every American diplomat, military officer or civilian working abroad. It embarrassed President Truman. It caused irreparable damage to American prestige. It threatens bi-partisan accord on foreign policy. It was inexcusable.

In spite of these colossal mistakes, President Truman refuses to fire Wallace. This should be a long overdue signal to the patient American public. In his reluctance to disown the support of the radical element of which Wallace is the nominal head, he practically forces decent citizens to forsake the weird collection of leftists, middle-roaders and rightists that is the incumbent party and to rally to a coalition of sane Democrats and sane Republicans in a desperate attempt to restore a semblance of orderly government to this leaderless nation.

In his clumsy way, Mr. Wallace may have dramatized the terrible consequences of his reckless behavior so effectively that the public will awaken to the menace of his blundering in time to save the country.

STEEL =

September 23, 1946

**PRICE OF FRUSTRATION:** General Motors and Ford Motor have decided to postpone plans for producing new low-priced automobiles. GM states that its action was prompted by the current shortage of basic materials such as lead, copper, pig iron and flat-rolled steel and the uncertainty as to when they will be available in sufficient quantities to support schedules for models already in production. The GM decision not only halts preparations for the manufacture of light Chevrolets but also slows plans for two large plants in the Cleveland area intended exclusively for the small car project.

Large corporations do not postpone carefully weighed plans of such magnitude without strong compelling reasons. The assumption is that the two largest motor car manufacturers surveyed the mess into which government ineptitude has plunged the nation and decided to wait until relief is in sight.

The pity of this situation is that a large segment of Washington officialdom still is unaware of the results of its bungling. The Automobile Manufacturers Association warned Washington that the acute shortage of lead threatened to curtail automobile production. Reconversion Director Steelman re-

(OVER)



plied in great detail as to why this or that remedy cannot be applied and declared "there is absolutely no prospect of an interruption of automobile production caused by unavailability of lead."

The GM and Ford postponements indicate the high price the nation is paying for frustration.

—pp. 80, 91

**POSTWAR MIRACLES:** The regularity with which scientists and engineers find solutions for difficult problems is a source of amazement to laymen. In this issue are numerous evidences of these achievements.

Pittsburgh Plate Glass has a coating for glass which conducts electricity, making it possible to heat a glass panel to prevent icing and fogging. Introduction of a fluxing agent into the oxygen cutting stream of an oxyacetylene torch permits an operator to cut stainless steel as if it were butter. Tubular lighting, developed at General Electric's Nela Park, has unusual functions of interest to industry. One is a tube that kills germs in a coolant. Another is a fluorescent lamp that brings shadowless daylight to drafting rooms. Installation of radar on vessels on the Great Lakes promises to reduce hazards of navigation in fog-bound narrow inland water channels.

These developments spell progress. They make for efficiency and safety in industrial operation.

—pp. 107, 115

**INDUSTRY LOOKS AHEAD:** Attention of those who attend the Iron and Steel Exposition and annual convention of the Association of Iron & Steel Engineers at Cleveland, Oct. 1-4, will be focussed largely upon postwar expansion and engineering progress.

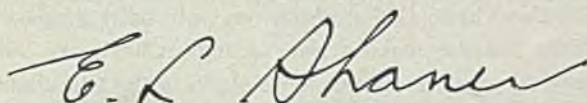
In spite of vast sums put into new facilities during the war, the industry in 1946 is spending \$327 million on expansion and modernization and some equipment builders are booked several years ahead.

This expansion is accompanied by significant technical development. The industry is alert to the need of improved methods of treating raw materials. Blast furnace men are weighing the advantages of blast conditioning, higher top pressures, carbon linings, insulation and oxygenated blast. Steelmakers are combatting alloy contamination and checking experience with open-hearth furnace linings. In regard to finishing operations the industry is going in heavily for research and for methods aimed at improving the quality of the product.

Industry's views on these pertinent developments are presented concisely in STEEL's "Special Report to Industry on The Steel Industry."

—pp. following p. 116

**SIGNS OF THE TIMES:** At present international relations are such that it is a safe assumption that manufacture of arms and ammunition will continue to be one of this nation's most important activities for some years to come. Qualified key men in Washington estimate (p. 85) that military requirements will amount to as much as \$4 billion annually. This calls for a tremendous volume of industrial activity. It is about equal to the entire annual output of the automobile industry in prewar years. . . . Of the 55 minerals exploration projects on the Bureau of Mines schedule for the current fiscal year, 32 or more than half (p. 88) are aimed at finding new sources of lead. The projects are widely scattered in 16 states. . . . Successful completion last Tuesday of the trial run of the completely rebuilt Inland Steel Co. ore carrier E. J. Block (p. 81) marks the first introduction of diesel-electric power to the ore fleet of the Great Lakes. The vessel also is equipped with radar, all-electric galley, hydro-electric steering gear and numerous other innovations. . . . Procedure policy of the Federal Trade Commission is undergoing a revolutionary change. Heretofore the practice has been to catch a number of antitrust law offenders each year and slap cease-and-desist orders upon them. The new policy (p. 84) calls for employing the trade practice conference method of formulating codes of behavior for whole industries as the primary means of insuring compliance with antitrust laws. The intent, according to Washington, is to make FTC the friend, not the enemy and persecutor, of industry. . . . New domestic storage water heater plant of A. O. Smith Corp. at Kankakee, Ill., (p. 112) has the largest radiant heating installation yet recorded. Hot water heated by 120 gas-fired volume heaters will be distributed through 40 miles of wrought iron, steel and copper tubing in floors and ceilings of the plant. . . . In view of the present tight situation in the supply of sheets and strip, it is significant that of the 46 new rolling mills scheduled for completion in 1946 or on order (p. 132) 27 are units for rolling flat rolled steel. . . . A study of financial statements of 50 representative companies in the metalworking field shows that 41 report lower net earnings in the first half of 1946 than in the first half of 1945 (p. 81) and that 15 operated in red ink.



EDITOR-IN-CHIEF



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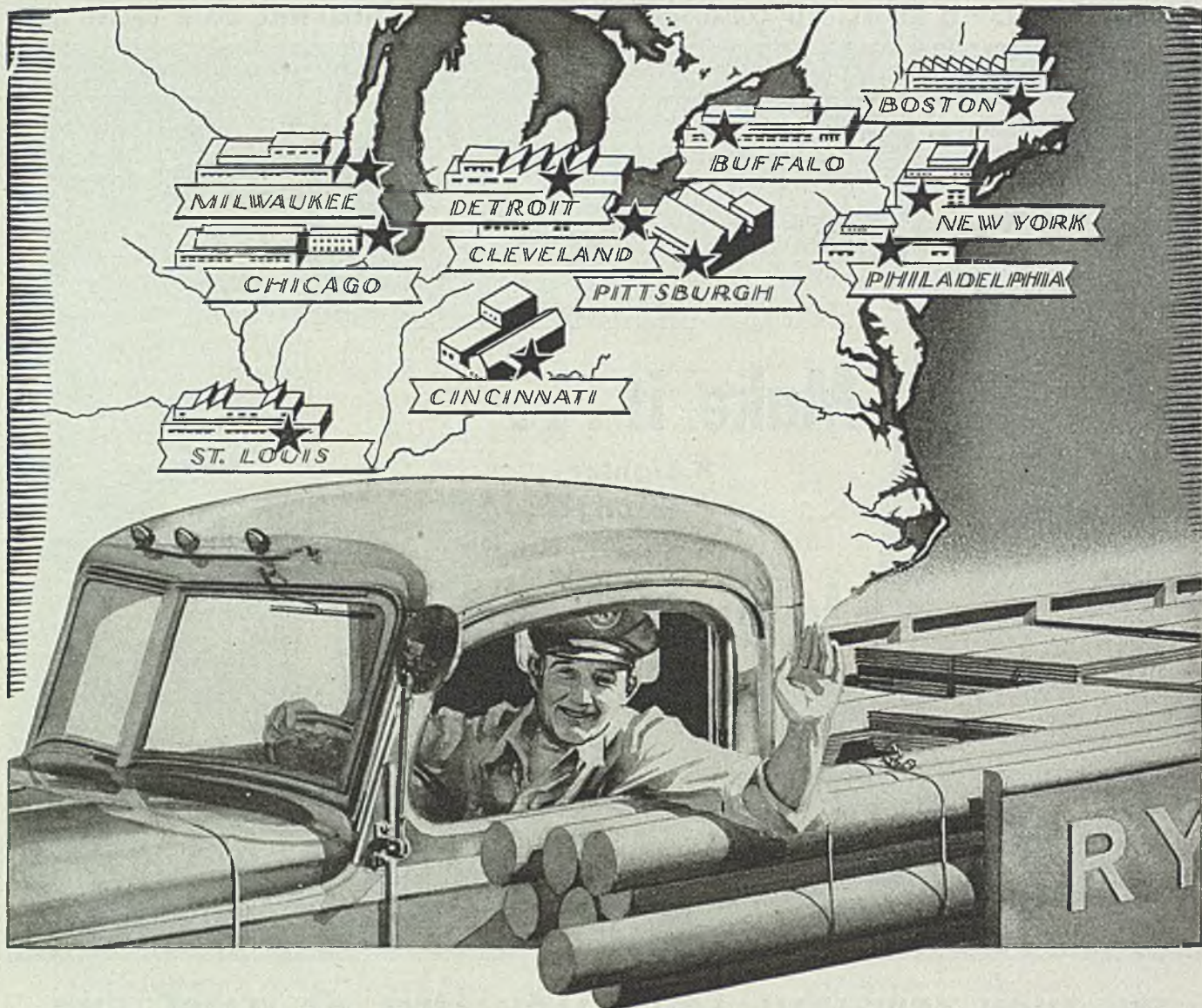
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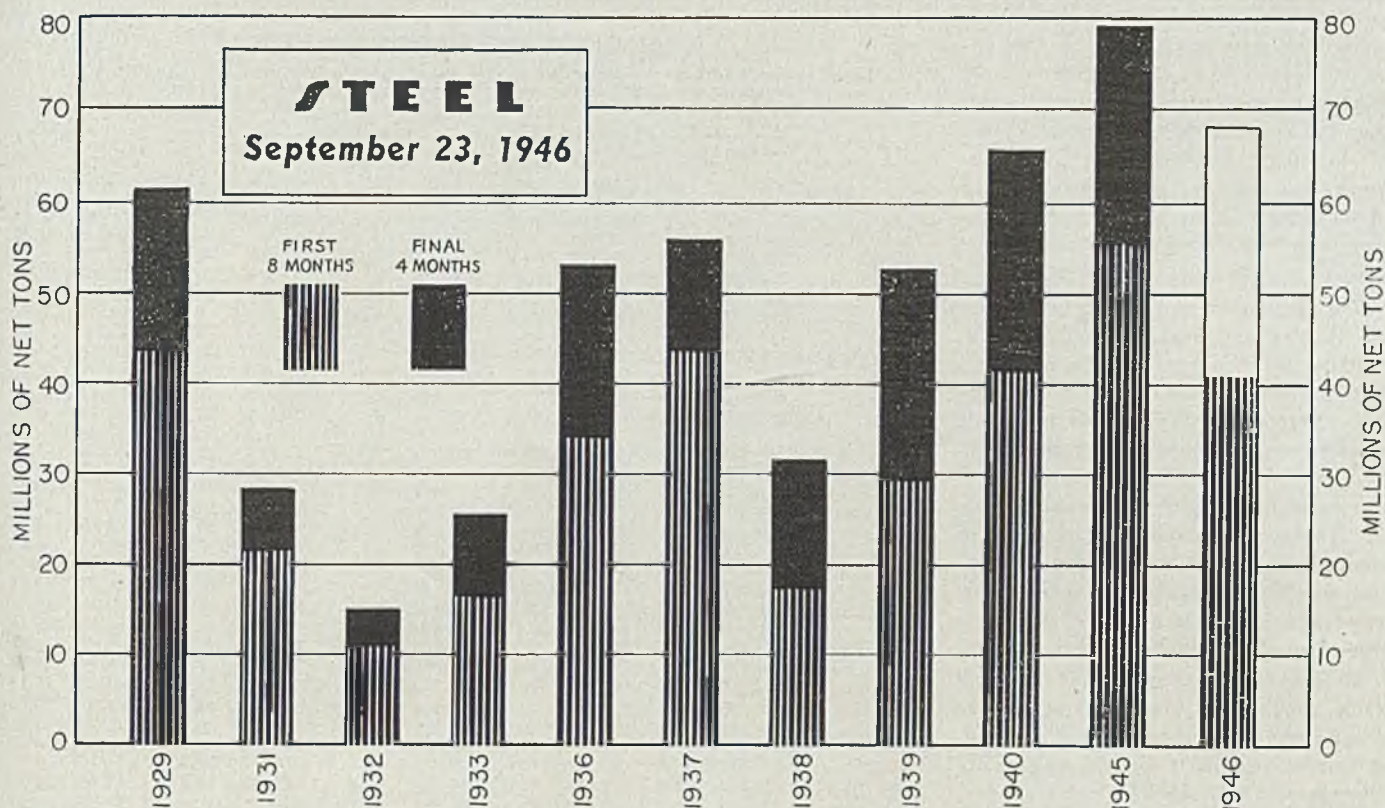
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# RYERSON STEEL





Eight months and annual steel ingot production for selected years since 1929. Production for last four months of 1946 projected on basis of 90 per cent operations, indicating total for year of more than 68 million tons

## Steelmakers To Seek Price Relief

*Producers to present request within few weeks. Uncertain whether arguments will be based on price relief formula of Price Control Act of 1942 or on Barkley amendment. Observers skeptical of across-the-board raise with production at peacetime high level*

By WILLIAM M. ROONEY  
News & Markets Editor, STEEL

WITHIN the next several weeks—possibly right after the end of the current month—steel producers will file a request with the Office of Price Administration for upward adjustments in ceiling price schedules to compensate for higher wage and other production costs not offset by price increases allowed since price control went into effect or recouped through increased efficiency resulting from volume output.

Exact filing time depends upon clarification of procedure under OPA interpretation of the amended Price Control Act. Up to late last week industry officials were still in the dark as to what formula to follow in developing their relief plea though OPA had announced early in the week it had issued procedural regulations. Lacking these, steel experts were stymied, since under the

existing price control setup it appears there are several alternatives from which to choose in seeking relief due to the peculiarities in control as a result of the amending last July of the Price Control Act.

One alternative would permit application for relief under the original pricing formula of 1942. Such procedure would allow for an across-the-board increase to assure a profit return to producers equal to their average in the 1936-1939 period, and, as interpreted in the industry, is made possible because the original price control law was simply amended, not repealed.

A second alternative, it appears, is provided by the Barkley amendment passed last July, which permits applications by industry advisory committees for individual product price relief to return a profit to producers equal to that which they had in 1940.

Procedural regulations issued last week

by OPA opens the way for taking up the steel price case by the industry committee. Under the Barkley amendment it is stipulated that upon application by industry advisory committees ceiling prices of manufacturers may be advanced when they fail to cover 1940 average prices, plus industry-wide average cost increase since then. Under the regulations OPA requires industry committees seeking price relief to provide complete and substantiated data to support claims of inability to equal 1940 earnings.

Procedures for obtaining price adjustments under the product pricing amendment (Section 6) of the Price Control Extension Act of 1946 are contained in supplementary order No. 183. The action followed discussions with industry representatives, and the order is based on requirements of the law and, has not been changed from that of the draft order released on Aug. 27, 1946.

These procedures set forth method and explain the rules governing preparation, filing and processing of applications for price increases. OPA is required to use the new pricing standards of the law only upon application by an approved industry advisory committee.

Section 6 of the act, referred to as the "product pricing amendment," pro-



vides that upon application by the appropriate industry advisory committee maximum prices may be increased when they fail to cover the 1940 average price of a product plus the industry-wide average cost increase since then. These applications, the law states, must be accompanied by "comprehensive evidence with respect to costs and prices."

Two limitations are placed by the act on this pricing standard. They state that maximum prices need be raised no higher than (1) the product's average current total costs plus the industry's average overall percentage profit on the sales in 1940, or (2) the product's average current costs plus a reasonable profit. This second limitation applies where the industry cannot show that a substantial increase in production and use is practicable without reducing the output of another equally needed product.

Expectations are, in view of the new OPA regulations, producers will likely file for specific product increases, though it was reported in trade circles recently that some OPA officials had expressed the opinion it would be more advantageous to base a plea for steel price advances on the original formula in the Price Control law since under the Barkley amendment considerable more detail would be involved, with consequent delay, in developing supporting arguments for relief. As a matter of fact, the feeling among steel price experts, it is said, is that the Barkley amendment is a "dud" insofar as it corrects conditions in pricing procedure in such an industry as steel which produces numerous products.

## To Be Based on June, July, August

Whatever formula is followed, it is understood price relief pleas of the industry, when presented, will be based on operating and sales experience during the three-month period, June-July-August, which the OPA is reported to feel is representative for demonstrating the industry's earning powers under volume production.

In the steel industry expectations largely lean in the direction of specific product increases, for example, on such items as galvanized sheets and reinforcing bars. Actually, some trade observers say they would not be surprised if OPA held advances to a few scattered items which are not being produced in sufficient volume to meet expanded current demand because of high production costs.

From the standpoint of the industry, volume production of steel attained during the summer months is likely to make the task of preparing its case for a price increase more difficult than would have been the case earlier in the year. In

## STEEL INGOT PRODUCTION STATISTICS

Based on reports by companies which in 1944 made 97.6% of the open hearth, 100% of the bessemer and 85.8% of the electric ingot and steel for castings production

	Estimated Production—All Companies—						Calculated		Num- ber of weeks
	Open Hearth Per cent of capac.	Bessemer Per cent of capac.	Electric Per cent of capac.	Total Per cent of capac.	Net tons	Net tons	weekly produc- tion all companies Net tons	in mo.	
1946									
Jan. ....	3,528,090	51.1	207,512	47.4	136,452	29.2	3,872,054	49.6	874,053 4.43
Feb. ....	1,300,944	20.9	25,905	6.6	65,668	15.6	1,392,517	19.8	348,129 4.00
March ...	5,946,698	86.2	363,949	83.1	196,400	42.0	6,507,047	83.3	1,468,859 4.43
1st qtr. . .	10,775,732	53.8	597,366	47.0	398,520	29.4	11,771,618	51.9	915,367 12.86
Apr. ....	5,333,139	79.8	286,088	67.5	241,031	53.3	5,860,258	77.5	1,366,028 4.29
May ....	3,699,979	53.6	153,409	35.0	219,064	46.9	4,072,452	52.2	919,289 4.43
June ....	5,145,594	77.0	251,253	59.2	227,979	50.4	5,624,826	74.4	1,311,148 4.29
2nd qtr. . .	14,178,712	69.9	690,750	53.7	688,074	50.1	15,557,536	67.9	1,195,814 13.01
1st 6 mos.	24,954,444	61.9	1,288,116	50.4	1,086,594	39.8	27,329,154	59.9	1,056,403 25.87
July ....	6,016,253	87.4	365,332	83.6	228,083	48.9	6,609,668	84.9	1,495,400 4.42
Aug. ....	6,261,941	90.7	373,819	85.4	259,705	55.6	6,895,465	88.3	1,556,538 4.43
1945									
Jan. ....	6,469,340	90.5	379,062	76.0	355,910	76.8	7,204,312	88.8	1,626,256 4.43
Feb. ....	5,968,326	92.4	347,227	77.1	337,212	80.6	6,652,765	90.8	1,663,191 4.00
Mar. ....	6,927,939	96.9	398,351	79.8	379,639	81.9	7,705,929	95.0	1,739,487 4.43
1st qtr. . .	19,365,605	93.3	1,124,640	77.6	1,072,761	79.7	21,563,006	91.5	1,676,750 12.86
Apr. ....	6,541,627	94.5	372,952	77.2	375,308	83.6	7,289,887	92.8	1,699,274 4.29
May ....	6,664,117	93.2	402,100	80.6	383,450	82.7	7,449,667	91.8	1,681,640 4.43
June ....	6,129,763	88.5	379,807	78.6	330,952	73.7	6,840,522	87.1	1,594,527 4.29
2nd qtr. . .	19,335,507	92.1	1,154,859	78.8	1,089,710	80.0	21,580,076	90.6	1,658,730 13.01
1st 6 mos.	38,701,112	92.7	2,279,499	78.2	2,162,471	79.9	43,143,082	91.0	1,667,688 25.87
July ....	6,318,975	88.6	381,832	76.7	284,764	61.6	6,985,571	86.3	1,580,446 4.42
Aug. ....	5,172,344	72.3	347,088	69.5	215,885	46.6	5,735,317	70.7	1,294,654 4.43
Sept. ....	5,435,799	78.7	352,247	73.2	193,829	43.3	5,982,475	76.3	1,397,775 4.28
3rd qtr. . .	16,927,118	79.9	1,081,767	73.1	694,478	50.5	18,703,363	77.8	1,424,475 13.13
9 mos. . . .	55,628,230	88.4	3,361,266	76.5	2,856,949	70.0	61,846,445	86.6	1,553,806 39.00
Oct. ....	5,146,787	72.0	242,122	48.5	207,867	44.8	5,596,776	69.0	1,263,381 4.43
Nov. ....	5,641,308	81.5	358,664	74.2	200,494	44.7	6,200,466	78.9	1,445,330 4.29
Dec. ....	5,523,277	77.4	343,266	68.9	191,394	41.4	6,057,937	74.8	1,370,574 4.42
4th qtr. . .	16,311,372	76.9	944,052	63.8	599,755	43.6	17,855,179	74.2	1,358,842 13.14
2d 6 mos.	33,238,490	78.4	2,025,819	68.5	1,294,233	47.1	36,558,542	76.0	1,391,646 26.27
Total ...	71,939,602	85.5	4,305,318	73.3	3,456,704	63.4	79,701,624	83.5	1,528,608 52.14

For 1945 percentages are calculated on weekly capacities of 1,614,338 net tons of open hearth, 112,658 tons of bessemer and 104,640 tons of electric ingots and steel for castings, total 1,831,636 tons; based on annual capacities as of Jan. 1, 1945 as follows: Open hearth 84,171,500 net tons, bessemer 5,874,000 tons, electric 5,455,890 tons.

For 1946 percentages are calculated on weekly capacities of 1,558,041 net tons open hearth, 98,849 net tons bessemer and 105,491 net tons electric ingots and steel for castings, total 1,762,381 net tons; based on annual capacities as of Jan. 1, 1946, as follows: Open hearth 81,236,250 net tons, bessemer 5,154,000 net tons, electric 5,500,290 net tons, total 91,890,540 net tons.

the three months, June-July-August, steel production averaged the highest rate in months. In fact, August output of 6,895,465 net tons was the largest for any peacetime month in history prior to 1941, and with prospects fairly promising for continued high monthly production over the remainder of the year unless serious labor trouble develops or the scrap shortage becomes more acute and forces furnace shutdowns, industry spokesmen may find it extremely difficult to convince OPA a general price increase in steel is necessary. Certainly, such high production may serve to cause OPA to procrastinate in arriving at a decision, anticipating better industry earnings as the year progresses.

Currently steelmakers are entertaining the largest volume business in peacetime history. Demand in most products is extended far into the future with shipments continuing to be strictly portioned out on the basis of customers' prewar normal demands. Despite the heavy production of the summer months and anticipated 90 per cent operations (allowing for absence of labor trouble and other interruptions) in the last quarter of the year, the indications are no appreciable easing in demand on the steelmakers is likely until at least early next year. This is particularly true in such

products as sheets and strip.

In high steel industry circles, however, the view is quite generally expressed that if steelmakers can maintain the current high operating rate and volume output of the past two months or so through the remainder of the year, the present extremely unbalanced situation with respect to demand and supply will ease noticeably. One prominent industry spokesman is of the opinion supply and demand on every major product with the exception of sheets and strip can be brought into closer balance by the end of the year and that by next spring the situation will be much healthier than at present especially should threat of steel labor trouble in the spring be dissipated. As a matter of fact, some thinking in steel circles is to the effect many orders now backed up on mill books represent insurance tonnage placed by consumers in anticipation of steel labor trouble and resulting mill shutdowns early next year.

In the first eight months of this year the industry produced a grand total of 40,834,287 net tons of ingots, which compares with 55,863,970 net tons in the like period of 1945 and with 41,316,410 net tons in the corresponding period of 1940, the last wholly prewar peacetime year. Should August production of 6,895,465 net tons be maintained through



the remaining four months of this year output would total 68,416,147 net tons, an alltime peacetime record (for comparisons see chart on page 75) and a surprising showing considering the loss of output by strikes and work stoppages in the first six months.

Aggravating steel distribution conditions currently are substantial steel allocations by government directive. Correction of this situation, it was said, would aid considerably in eliminating some of the turmoil now experienced in the steel market. Government control agencies have promised to hold allocations to a minimum but it is understood tonnage earmarked for allocation in fourth quarter amounts to around 1,000,000 tons, including H-H ratings of 250,000 to 300,000 tons. Civilian Production Administration is reported to have discussed advisability of knocking out Priority Regulation No. 28 which provides priority assistance for non-military purposes, and already is said to be denying many requests for priority assistance.

Whether OPA will act promptly on whatever request for price relief is presented by the steel industry is problematical. Past experience of the industry has shown price actions are long drawn out, and, while under the amended price control law OPA must make some answer to a request for relief within 60 days after filing, it is possible for final decision to be deferred beyond that period, it is said. In the steel industry the thought is most widely advanced that what would serve the industry, consumers and the national economy best would be for OPA and other government agencies to decontrol steel prices, production and other industry matters as quickly as possible, permitting producers to get back to normal methods of doing business as promptly as possible, thus restoring the traditional competitive conditions which have always prevailed in the marketing of steel.

## Maritime Commission Sets 43 Ships Up for Scrapping

The Maritime Commission last week earmarked 43 ships for sale as scrap to shipbreakers and hopes to begin advertising for bids within the next week or two. These ships contain scrap in the amount of approximately 172,000 tons. They are in addition to the 106 vessels the commission sold some time ago to shipbreakers. Approximately 100 more vessels have been earmarked tentatively for scrapping and the commission hopes to put them up for bids before the end of the year. These additional 100 ships represent approximately 400,000 tons of scrap.

# Government To Pay Premiums on Merchant Iron as Output Spur

*Operating stacks to receive \$8 premium and closed stacks resuming will be given \$12 extra under plan, effective as of Sept. 1, announced by Housing Expediter Wyatt. Hope to boost output of merchant stacks substantially by end of year*

PREMIUM payment plans designed to boost by one third production of merchant pig iron—foundry and malleable grades—was announced last week by Housing Expediter Wilson W. Wyatt. The plan, authorized under the Veterans Emergency Housing Act of 1946, calls for payment by the government of \$8 per gross ton for production above base period quotas by operating furnaces and \$12 per ton for production from plants which will be re-opened.

Payments will be based on shipments starting Sept. 1, and the plan ends on June 30, 1947. The base period for determining quotas is from Jan. 1 to Aug. 31 this year.

An immediate increase by operating plants—to a possible maximum of 75,000 to 100,000 gross tons a month by December—is expected as a result of the premium plan. It is believed another 35,000 to 80,000 gross tons a month will be produced by re-opening of closed plants but the full effect of this may not be felt until January.

By December total production of merchant pig iron under the premium payment plan is expected to reach 460,000 to 500,000 gross tons compared with an estimated 360,000 tons without the plan. By the first quarter of next year production should be up at least one-third above what could have been expected without the stimulus of premiums, according to Mr. Wyatt.

"I want to clear up a lot of misconceptions and erroneous reports that housing is taking too much of the nation's pig iron supply, thereby injuring other consuming industries," Mr. Wyatt said. "The facts are that in August only 130,000 gross tons were assigned producers of housing type items or approximately one-third of anticipated shipments to foundries during the month and a considerable amount of these items went into essential non-housing construction. About the same amount of pig iron was assigned housing type items in September and it should be remembered that a large portion of this 130,000 tons represents the normal 'take' for housing whether there had been a program or not."

It was pointed out the Civilian Pro-

duction Administration reported an average shipment of 360,000 tons a month might be expected for the remainder of the year. Average production of merchant pig iron for the first eight months of the year was 340,000 gross tons.

Another provision of the plan permits merchant iron producers to request producers of basic pig iron—the type manufactured into steel—to accept their orders for this material and pay a \$2 a ton bonus for the fulfillment of such orders.

The Office of Price Administration will permit bonus payments out of premiums collected by merchant iron manufacturers for expanded production. This enables basic pig iron producers to participate indirectly in the program by increasing their output to support the steel industry. Discussions with the industry indicate little diversion of furnace capacity from production of steelmaking grades of pig iron may be expected, according to Mr. Wyatt.

## Basis for Premium Payments

The premium payment plan does not apply to steelmaking pig iron nor to pig iron cast by a mill for its own use. However, if a plant had one or more furnaces in operation or contracted to reopen during the base period it may apply for the \$8 a ton premium. Its quota for each month will be based on 80 per cent of its merchant pig iron production during the highest month or the average production during the three highest base period months, whichever is lower. If a plant produced for only one or two months during the base period, its quota will be based on the months when it was in operation. If a plant was closed during the base period its quota is zero and application may be made for the \$12 a ton premium.

Management representatives of closed plants who conferred recently with the expediter's staff and the Civilian Production Administration include Republic Steel Corp., Gadsden, Ala.; the Sheffield Steel Corp. plant at Houston, Tex.; the Lone Star Steel Co. plant at Daingerfield, Tex.; Mystic Iron Co. at Everett, Mass.; and plants at Chester, Pa., and Martins Ferry, W. Va.



# New Wave of Wage Demands Feared

*Government's retreat on stabilization in maritime strike settlement seen arousing more labor unrest. Future of Wage Stabilization Board in doubt as President orders review of policies*

WILL the government's retreat from its stabilization front, as marked by the overriding of the Wage Stabilization Board in the maritime strike case, precipitate a second round of wage increase demands which in turn will touch off new price rises?

This question was being pondered in industrial and government circles as they awaited labor's reaction to Reconversion Director John Steelman's action in bypassing the WSB.

Effect of the ship strike settlement on the national economy and on labor-industry relations threatens to be broad and wide. Hardly was the ink dry on Mr. Steelman's formula for overriding the WSB before R. J. Thomas, vice president of the United Automobile Workers, served notice that if the settlement meant higher wages for the seamen his union would demand the same advantages.

Should this be the pattern for union labor leaders, more labor unrest is portended. New wage demands, inevitably accompanied by more work stoppages, would blast hopes for a considerable period of high production to counteract the inflationary forces now at work. Should the unions decide to press now for further wage concessions, the consequent spiral of wages and prices may be expected to result in still further confusion of the entire economy.

## Increase in Strikes Feared

In the opinion of many observers the settlement of the shipping strike will have an unsettling effect on labor relations during the weeks ahead as wage contracts expire and negotiations for renewal open. They fear that strikes will increase during the autumn months.

The effect of the shipping strike settlement, they believe, will be to renew immediately the question of price and wage stabilization. In view of Mr. Steelman's formula, they believe the government has given up on wage control by the designated government agency, the Wage Stabilization Board. It is difficult to see how the WSB can function effectively in stabilizing wages, if the recon-



*White collar workers jam the streets at entrance to Gary sheet and tin plate mill of Carnegie-Illinois while pickets stop cars and ask workers to turn back. Daily production loss is 6000 tons of sheet and tin plate. Company says strikers have presented no grievance. NEA photo.*

version director can step into any case and overrule the board by adopting a convenient amendment.

A brief review of the maritime strike may be necessary to understand what has happened to wage stabilization in recent weeks. Last June six CIO maritime unions won from ship operators a wage increase of \$17.50 over their previous base pay. In July, two AFL unions negotiated a contract with other ship operators, some of whom represented the War Shipping Administration, under which the operators agreed to pay increases amounting to \$5 and \$10 a month more than received by the CIO workers. The ship operators agreed to absorb the increased labor costs without raising shipping rates on their own vessels but refused to absorb the increase for WSA ships.

Before becoming effective, the AFL contract had to be approved by the stabilization board, inasmuch as the pay increases granted would mean higher costs to the government on the WSA ships. On Aug. 23, the WSB vetoed that part of the contract which applied to government shipping and which granted AFL seamen \$5 to \$10 a month more than the CIO workers had won. The board held that the stabilization line must be held in maritime wages. However, the veto did not apply to private shipping; those companies were permitted to grant the higher wages so long as they did not increase shipping rates.

The AFL maritime workers then struck

to force the board to reverse its decision. Of the 65,000 strikers, only a small percentage would be benefited directly by a reversal of the board's ruling—the workers on the WSA ships. Back of the strike, in addition to the demand for higher wages, was the rivalry between the AFL and CIO maritime unions and the desire of the AFL leaders to obtain a larger increase for their members than the CIO was granted.

After the strike had effectively tied up shipping on three coasts, the WSB met to review the case. On Aug. 11 it announced that its veto of the AFL contract held. "The issue," the board stated, "is whether a practice of 'that and a little more' is to be sanctioned in the shipping industry without the establishment of any limits whatsoever."

On the following day Reconversion Director Steelman announced a formula by which the WSB veto would be bypassed and the AFL maritime workers granted their increase. It was an amendment to the wage-price regulations which permitted the government to pay the same wage scale agreed upon by private ship operators without recourse to the stabilization board.

Technically this action saved faces all around the circle. The WSB was not forced to reverse its decision. The AFL strikers got what they wanted. The administration was able to say there had been no departure from its general wage-price stabilization policy.

Actually, however, the case is one more



where the government has not been able to stand up against a strike and has had to yield to the strikers' demands. The wage stabilization policy was revealed as a mythical thing which was not present when seriously challenged.

The sequel was not happy. On the day following announcement of Mr. Steelman's formula, CIO maritime workers struck to bring their pay increases up to those granted the AFL workers and there was talk on the West Coast that the CIO men would demand even greater increases.

What the future of the stabilization board will be is not yet clear. The board cannot be expected to maintain wage controls in the same sense that wages were kept within limits during the war by the War Labor Board.

That the board may pass out of existence soon was predicted last week after President Truman asked the advisory board of the Office of War Mobilization and Reconversion to review the government stabilization program. An OWMR spokesman said this action implied "no thought of scrapping WSB" but a member of the advisory board said privately that he believed Mr. Truman wanted the advisory board to consider whether the WSB should be dissolved and to make recommendations as to machinery to be set up in its place.

#### Labor Unrest Is Widespread

Elsewhere on the labor front, the usual amount of trouble was being experienced.

At Detroit, a strike by the United Automobile Workers at the Briggs Mfg. Co. plant, caused by the discharge of a shop steward, affected the Detroit operations of Briggs, Chrysler Corp. divisions and the Packard Motor Car Co. All final assembly lines of the Chrysler Division were closed as was Packard's due to lack of bodies produced at Briggs. More than 40,000 workers were idle.

At Chicago, a strike of 250 United Steelworkers salaried and clerical workers at the Gary sheet and tin mill of Carnegie-Illinois Steel Corp. was causing a loss of 6000 tons of steel sheets and tin plate daily. Company officials said the strikers had filed no grievance and that under the contract no arbitration of their claims can be made until they return to work.

At New York, the 3-week old trucking strike was broken as many operators signed compromise agreements providing for pay increases. The trucking strike and the shipping strike had caused scores of manufacturing plants in the area to close for lack of supplies and resulted in the layoff of tens of thousands of workers.

## Sewing Machine Industry Boosts Output Although Faced with Materials Shortages

THE SEWING MACHINE industry is making substantial headway in increasing production although it is still handicapped by materials shortages.

Spurring the industry to boost output as rapidly as possible is a backlog of demand for 3,450,000 machines, four times the 850,000 units sold in 1941, one of the industry's biggest prewar years. The backlog is based on four wartime years of nonproduction plus a marked increase in newly established homes and a new sewing machine consciousness growing out of wartime use of machines by housewives on war relief projects.

Hampering the industry in its efforts to increase production are scarcities of quality lumber for cabinets, electrical

parts containing copper, including motors, and castings of all kinds. Particularly short, however, are gray iron castings because of diversion of pig iron to housing needs.

One sewing machine producer said that despite reconversion troubles and materials shortages which have made a co-ordinated assembly of finished units practically impossible, monthly production figures have shown a steady increase since January. By the end of 1946 that company expects to reach a production rate that would yield an annual output twice that of 1941. However, that company's production for 1946 would be only slightly above the total 1941 output.

## Present, Past and Pending

### ■ OCTOBER PIG IRON AUTHORIZATIONS POSTPONED

WASHINGTON—Issuance of October authorizations to purchase pig iron for housing and railroad brakeshoes has been postponed to Sept. 30 by Civilian Production Administration because of delay in receipt of applications. Pig iron producers must accept orders for October delivery up to Oct. 5.

### ■ WAA OFFERS TO SELL \$1 MILLION WORTH OF SOLDER

WASHINGTON—War Assets Administration is offering for immediate sale about 2,500,000 pounds of surplus government lead and tin base solder, valued at nearly \$1 million. The offering is made at fixed prices based on current market for metal content less 1 cent per pound.

### ■ RFC INVENTORIES OF LEAD, COPPER DECLINE

WASHINGTON—Reconstruction Finance Corp.'s inventories of copper dropped 32,236 short tons during August to 232,613 while those of lead dropped 9000 tons to only 24,742 short tons.

### ■ OFFERING OF CHICAGO STEEL PLANT ADVANCED

CHICAGO—War Assets Administration has advanced the date for opening of bids on the \$34 million government-owned blast furnace and coke plant at East Chicago, Ill., from Oct. 15 to Sept. 24. The plant has been operated by Inland Steel Co.

### ■ AUTO MAKERS INAUGURATE SCRAP DRIVE

DETROIT—Automobile manufacturers are appealing to their dealers to turn in every bit of scrap metal they can uncover. Scrap shortage has resulted in irregular deliveries of castings and a drop in sheet steel deliveries.

### ■ STRIKE ENDS AT ALLIS-CHALMERS PITTSBURGH PLANT

MILWAUKEE—First break in the 173-day Allis-Chalmers Mfg. Co. strike came last week when an agreement was made with the CIO-United Electrical Workers local at the company's Pittsburgh works. Back-to-work movements have been growing at three of the six plants still strikebound.

### ■ REPORTS PERSIST OF BLACK MARKET ACTIVITY IN NAILS

PITTSBURGH—Reports of black market distribution of nails continue. OPA is said to have information of a large tonnage in lots of one to ten kegs being sold for export up to \$50 a keg. Export licenses were refused recently on a lot of 200,000 kegs which were offered subsequently here at \$10 a keg, New York.

### ■ CONSTRUCTION OF NEW BEARING PLANT STARTS

NEW YORK—Construction has been started on a new plant at Niles, O., for the manufacture of railroad journal bearings by American Brake Shoe Co.'s National Bearing Division. The plant should be completed in six months.



# Setting Up of Ratings on Steel For Car Repairs Seen Deferred

*Voluntary co-operation of mills being counted upon to provide 250,000 tons, mostly plates, required for the program during last quarter. Material needed now reported not in particularly critical supply*

WITH CPA having recently sent out letters to producers of car steel asking for voluntary co-operation in the matter of supplying steel for fourth quarter, primarily for car repairs, it appears no early action at least will be taken toward the setting up of ratings for this work.

Although no specified requirements were mentioned in the letters which went out, it is understood that CPA would like to have the mills supply in the fourth quarter 250,000 tons, mostly plates.

It is the opinion of CPA officials, it is understood, that much of the steel required for repairs, meaning plates, is not in particularly critical supply and that therefore it could be shipped by close planning without resort to priorities.

Meanwhile, car builders who have orders on hand for 36,000 freight cars for the French government are hopeful that if such domestic repair requirements are to be met it will not necessarily be at the expense of steel orders on schedule for this program.

The program has long been delayed in getting started because of disruptions to steel production this year and the car builders have finally got sufficient steel on hand, they believe, to permit a start this month. In fact, some, it is estimated, have about 25 per cent of the materials they need on hand, and on the basis of present prospects, with the program extending over a period of eight months, they would like to start fabricating. This would mean about 4500 cars a month, and considering the fact that the cars are of relatively small capacity, it would prove quite uneconomical to extend the program any further.

Steel continues to be the principal bottleneck in the matter of car repairs and new construction, this situation having changed somewhat since the early part of the summer, when lumber was a greater bottleneck than steel.

## Oral Arguments on Freight Rate Increase Plea Start

Oral arguments on the railroads' request for a 25 per cent increase in freight rates will start before the Interstate Commerce Commission in Washington Sept. 23. These will be based on testi-

mony already in the record and introduction of no new material will be permitted.

Last week the railroads and other interested parties completed presentation of evidence supporting their plea for the 25 per cent rate increase to replace the 6½ per cent interim raise put into effect July 1.

During the past several weeks the ICC has been collecting testimony at a series of regional hearings on the rate petition.

In New York last week the directors of the American Railway Car Institute made a plea for "a living wage" for the railroads through prompt rate increases.

"The seriousness of the situation from a national economic standpoint cannot be overemphasized," the institute said. "Official government sources point out that the demand for freight cars for the past three months has exceeded the supply and that the actual peak of demand is not expected for several months.

"Moving parallel with this critical shortage is the steadily declining financial position of the railroads which will prevent them from buying the freight cars that are needed. New rolling stock cannot be obtained nor general rehabilitation of property undertaken with operating deficits."

## Revision in Lead Quota System Pends; Prices Hold

Battery manufacturers likely will be permitted to carry over 20 per cent of any unused quarterly allotments of lead into the next quarter as a means of allowing producers to utilize more fully their permitted quantities of that metal.

This action was recommended to the Civilian Production Administration by the battery manufacturers advisory committee last week which cited the permitted use of 58,000 tons of lead in the third quarter, of which only 54,000 tons were obtainable.

The committee's proposal for higher prices as the sole key to increased production was rejected, however, by the Office of Price Administration. An official of that agency maintained that price was not a factor and that discrepancy between current lead demand of over 1 million tons annually and indi-

cated supply of 750,000 tons would necessitate reduction in quotas for many lead users.

Reconversion Director John R. Steelman has informed automobile manufacturers that an investigation by CPA reveals "that there is absolutely no prospect of an interruption of automobile production caused by unavailability of lead" for batteries, solder or bearings. Pointing out that the lead shortage is worldwide, Mr. Steelman said the government is pressing vigorously an exploration and development program to increase production of primary lead and that the premium price plan will be modified soon to increase the incentives for mining lead ore. He also said that OPA and OWMR officials are convinced that "an increase in the price of scrap lead is not necessary to maintain the flow of scrap to secondary refiners."

## ASTE Convention Agenda Includes Planetarium Visit

Feature attraction of the semiannual national convention of the American Society of Tool Engineers, to be held in Pittsburgh, Oct. 10-12, will be tours through the Buhl Planetarium and Institute of Popular Science, where displays will be set up in five of the planetarium's galleries depicting the basic sciences—physics, chemistry and astronomy—which make up the tool engineering profession.

Concluding the convention on Oct. 12 will be a banquet at William Penn Hotel at which Alfred Marchev, president of Republic Aviation Corp., Farmingdale, Long Island, N. Y., will be the principal speaker. Mr. Marchev will speak on "What Price Airplanes" and will discuss cost-saving improvements in airplane manufacture as a result of mass production techniques.

## MEETINGS....

**Sept. 29-Oct. 1, Packaging Machinery Manufacturers Institute:** Annual meeting, Shawnee Country Club, Shawnee-on-Delaware, Pa.

**Sept. 30-Oct. 2, American Society of Mechanical Engineers:** Fall meeting, Boston. C. E. Davies, 29 West 39th St., New York 18, secretary.

**Oct. 1-4, Association of Iron & Steel Engineers:** Convention and Iron and Steel Exposition, Public Auditorium, Cleveland. Association headquarters are at 1010 Empire Bldg., Pittsburgh.

**Oct. 3-5, Society of Automotive Engineers:** National aeronautical meeting and display, Biltmore Hotel, Los Angeles. John A. C. Warner, 29 West 39th St., New York 18, secretary and general manager.

**Oct. 7-9, National Machine Tool Builders' Association:** Annual meeting, Chateau Frontenac, Quebec, Quebec. Frida F. Selbert, 10525 Carnegie Ave., Cleveland 6, is secretary.

**Oct. 7-11, American Gas Association:** Annual convention and exhibition, Auditorium, Atlantic City, N. J. Headquarters of the association are at 420 Lexington Ave., New York 17.



# Reconversion Problems Hold Down Metalworking Industry's Profits

*Survey of 50 metal consumers shows earnings position of 41 of them was poorer in first half of 1946 than in first half of 1945. Fifteen companies reported net losses, some of which were exceptionally heavy because of protracted strikes*

RECONVERSION problems of labor relations, prices, production costs, and materials shortages held down the metalworking industry's net profits in the first half of 1946.

Although the needs for durable goods had accumulated during the war years to tremendous and unprecedented pro-

portions and although physical plant reconversion had largely been completed, the metalworking industry's efforts to respond productively were choked down by labor strife, unbalance of costs and prices, and shortages of materials and components.

Reflecting effects of these handicaps,

a survey of 50 prominent metalworking companies covering a broad cross section of the industry shows that not only were net earnings of 41 of the firms down in the first half of 1946 compared with the first half of 1945 but that 15 of the companies actually had losses. Losses shown by some of the companies were exceptionally heavy because of protracted strikes.

While only nine of the 50 companies reported higher net profits in the first half of 1946 than in the first half of the previous year, 15 firms showed greater net profits in the first half of 1946 than in the first half of 1940.

Aggregate net earnings of the 50 metalworking firms in the first half of 1946 would have been lower had not some companies transferred substantial amounts from contingency reserve to income and had not some firms taken credits under the carry-back provision of the income tax law.

Net earnings and losses of the 50 companies are summarized in the accompanying table.

## Earnings Position of 50 Metalworking Companies

	First Half 1946	First Half 1945	First Half 1940
Allis-Chalmers Mfg. Co. ....	\$8,926,432°	\$3,950,946	\$2,809,758
American Bosch Co. ....	502,648°	419,402	383,651
American Brake Shoe Co. ....	1,346,127	1,347,992	1,226,637
American Chain & Cable Co. Inc. ....	704,585	1,511,513	1,169,112
American Locomotive Co. ....	3,950,016	3,359,469	1,178,469
American Machine & Foundry Co. ....	363,323	498,678	636,008
American Radiator & Standard Sanitary Corp. ....	1,757,652	2,258,065	1,535,905
Atlas Tack Corp. ....	98,567	87,471	53,186
Blaw-Knox Co. ....	1,054,064	1,432,718	307,099
Borg-Warner Corp. ....	1,914,800	3,528,470	2,529,961
Briggs Mfg. Co. ....	314,135	2,203,774	4,240,389
Briggs & Stratton Corp. ....	808,982	490,737	670,587
Caterpillar Tractor Co. ....	2,794,428	4,197,589	3,509,514
Chrysler Corp. ....	4,065,382	17,326,834	30,494,274
Cleveland Graphite Bronze Co. ....	620,095	807,321	804,921
Cutler-Hammer Inc. ....	459,625	634,374	742,364
General Cable Corp. ....	1,008,939°	1,378,601	1,495,581
General Electric Co. ....	5,980,179°	24,793,533	25,981,572
General Motors Corp. ....	19,804,090°	110,957,383	113,575,460
Holland Furnace Co. ....	331,008	393,688	262,384
Houdaille-Hershey Corp. ....	211,549	905,418	1,472,711
Ingersoll-Rand Co. ....	4,853,221	3,175,687	3,130,661
Kalamazoo Stove & Furnace Co. ....	123,195°	354,857	65,484
Le Tourneau, R. G. ....	445,274	1,003,192	1,152,043
Link Belt Co. ....	1,029,654	1,434,528	965,279
Marion Power Shovel Co. ....	49,015	110,438	201,639
Maytag Co. ....	1,131,676	294,494	698,465
Midland Steel Products Co. ....	667,542	760,611	1,091,124
Minneapolis-Honeywell Regulator Co. ....	1,630,666	1,894,391	603,921
Mullins Mfg. Co. ....	20,844	468,142	166,420
National Acme Co. ....	1,159,000	861,064	1,237,050
National Cash Register Co. ....	258,406	1,363,560	1,099,831
Noblitt-Sparks Industries Inc. ....	35,383	808,326	451,066
Philco Corp. ....	54,684°	1,644,623	519,394
Pittsburgh Screw & Bolt Corp. ....	128,589	516,832	277,370
Pressed Steel Car Co. ....	370,745°	730,217	974,414
Rheem Mfg. Co. ....	457,375°	1,114,062	323,783
Simonds Saw & Tool Co. ....	1,228,124	680,232	758,372
Skilsaw Inc. ....	281,208	146,080	111,142
Square D Co. ....	775,881	922,870	905,130
Stewart-Warner Corp. ....	408,712	860,807	677,245
Studebaker Corp. ....	300,800°	1,752,391	957,309
Symington-Gould Corp. ....	137,741°	508,061	603,284
Thompson Products Inc. ....	156,793	1,232,356	1,047,902
Timken Roller Bearing Co. ....	991,541°	2,931,865	4,996,546
Twin Coach Co. ....	732,800°	320,532	210,000
U. S. Hoffman Machinery Corp. ....	838,028	280,476	165,243
Walworth Co. ....	467,065	600,758	203,415
Westinghouse Electric Corp. ....	341,605°	9,046,172	9,837,012
Yale & Towne Mfg. Co. ....	718,604°	572,695	424,880

° Net loss.

## First Diesel-Electric Ore Carrier Tested at Lorain

Inland Steel Co.'s freighter *E. J. Block* underwent tests last week as the first diesel-electric ore carrier on the Great Lakes. Installation of diesel engines, built by the Cleveland Diesel Engine Division, General Motors Corp., will provide more economical transportation since the speed of the carrier is increased about 1 mile per hour, which will increase the tonnage carried over a navigation season by about two cargoes, or about 22,000 tons. This is in addition to the 800 tons in carrying capacity per trip gained by the conversion. New equipment speeds loading and unloading of the vessel.

The test run off Lorain, O., also revealed that in a "crash stop" the ship can be decelerated from full speed ahead at an estimated 13 miles an hour to a dead stop in 3 minutes and 29 seconds over a distance of 1650 feet.

Modernization of the ship at American Ship Building Co.'s Lorain yard, costing well over \$1 million, in addition to the new diesel-electric propulsion covered the following: All-electric galley, direct engine control from the pilothouse, radar, a large shortened smokestack in which the exhaust from the engines is deadened, hydroelectric steering, and several other developments which are new in the field of Great Lakes ship construction and operation.

The company plans to convert its steamer *Joseph Block* this winter into an oil burner.



# OPA Suspends Price Control Over Specified Industrial Equipment

*Effective Sept. 18, action covers certain electrical machinery and equipment, construction equipment, specified food processing machinery, all poultry farm equipment, and several miscellaneous machines and parts*

PRICE control has been suspended, effective Sept. 18, over specified types of industrial equipment and parts including much electrical machinery and equipment, construction equipment, specified food products machinery, all poultry farm equipment and several miscellaneous machines and parts.

Construction machinery and equipment covered by the suspension action is used largely in connection with highway building and maintenance and to a small extent on large building projects and includes: Aerial tramways; highway barricades; tank car boosters; road, construction and rotary brooms; concrete chutes; asphalt plant circulators; concrete aggregate dryers; aggregate feeders; street flushers; road and sidewalk forms; stone, sand and bitumen heaters; heaters for concrete mixers, asphalt, surface and tank car; mud jacks; heating, bituminous kettles; mortar boxes; plants, asphalt, bulk cement, soil stabilizers but not including portable concrete plants; floating pontoons; scaffolds and construction towers, stump pullers; street sweepers and wellpoint systems.

Also suspended are machinery and equipment covered by the general machinery regulation, MPR-136, when designed and sold primarily for the industrial processing or preparing of the following foods: Baking powder, cocoa, chocolate, coffee, flavoring extracts, spices, tea; confectionary products; macaroni, spaghetti, ravioli; nuts; popcorn; potato chips; salt, sugar and sugar products, including molasses and syrup. The processes include working, hulling, shelling, roasting, pressing, grinding, mixing, extracting and refining, but not farm machinery used in the producing or processing the foods for market. Machinery used in packaging, wrapping, filling, labeling, sealing also is not included.

Poultry farm equipment exempted by the suspension action includes all such equipment not previously decontrolled, such as egg graders and candlers, floor and battery brooders, fowl catchers, incubators, poultry feeders, waterers and water heaters.

Miscellaneous machinery covered by the action includes that used in the textile industry to convert flax plants to

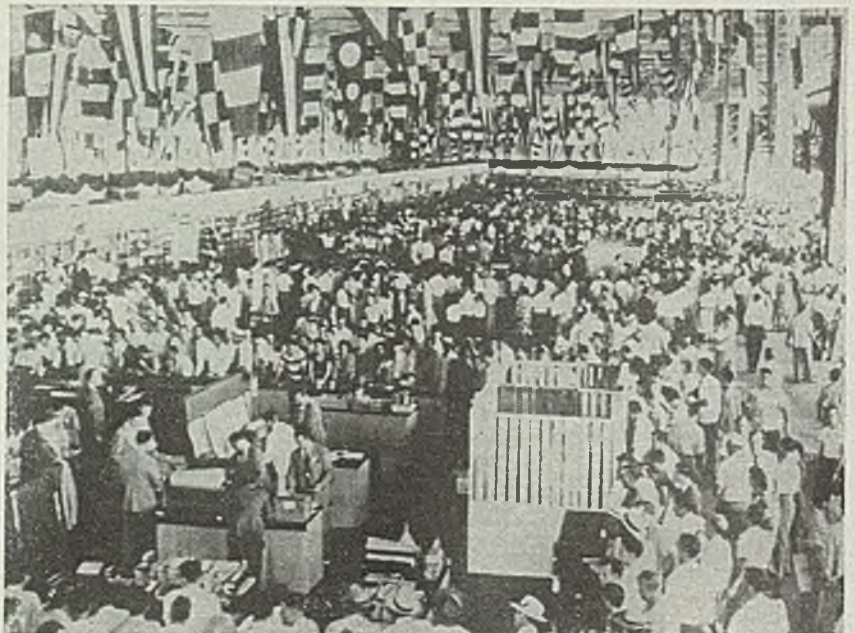
flax fiber, including breakers and scutchers; animal power-operated clipping and shearing machinery; belt lacing, fasteners, staples and other belting accessories; power-operated lumber carriers; charging equipment for coal and gas plants; grease cups, oil cups, diaphragms and industrial clutch facings, when covered by MPR-136; gas benches and retorts; for gas plants; power-operated garbage grinders, except those for domestic purposes; heat exchanger equipment of the shell and tube type with a heat transfer area over 50 square feet; industrial brake lining and mufflers and silencers, subject to MPR-136; machine parts in which perforated metal accounts for 90 per cent or more of the weight of the part; hand-operated pumps, including accessories which are integral and functional parts; industrial spark plugs; industrial and marine superheaters; brake testers, automotive maintenance and servicing; towers, bubble and fractionat-

ing; metal cooling towers; power-operated automobile washers.

Electrical equipment suspended from price control but the sales of parts of which remain under control follow: Electrostatic charge eliminators, electronic heat generators, electronic precipitators, high-voltage testers or test equipment, impulse testing equipment, including surge generators and cathode ray oscillographs, oscillograph and radar assemblies. Other electric equipment covered by the suspension action consists of control transformers specially designed for precipitation service; photoelectric cells, except those used in exposure meters for photography; terminal and stuffing tubes, marine type; electrical coils and fabricated coil rewinding supplies for meters, generators, transformers and related items decontrolled in the past or by this latest action.

## Machinery Prices Advance Further in May-July Period

Prices of general and auxiliary machinery and equipment increased 7 per cent during the three-month period, May through July, according to the Bureau of Labor Statistics. More than half of the entire increase took place in May when prices averaged nearly 4 per cent above those for April. Subsequent increases of about 2 per cent in June and 1 per cent in July brought prices for



**VETS' SURPLUS STORE:** More than 10,000 veterans patronized the first surplus goods store operated exclusively for veterans on its first day of operation. Opened by the War Assets Administration in the former Consolidated-Vultee plant in New Orleans, the store offered a wide variety of merchandise to veterans. NEA photo



this type of machinery and equipment to 111.3 per cent of their prewar average. Since the end of World War II, these prices have risen about 9 per cent.

Prices of all types of machines included in the index rose during the period. Prices of cutting tools and machine tool attachments, which had remained virtually unchanged since August, 1939, rose over 15 per cent from May through July. Prices of machines which rose from 8 to 10 per cent included stationary engines, lubricating equipment, and industrial heat-treating furnaces. Mechanical and testing instruments, and heat exchangers and water and oil coolers rose about 12 per cent. Air compressors showed the smallest increase (less than 1 per cent) and industrial scales, the largest (20 per cent).

Price advances resulted from higher prices granted to manufacturers to offset increased wage and material costs, and from decontrolled prices on a number of machines.

Based on 100 for August, 1939, the preliminary price indexes for cutting tools and machine tool attachments for July are as follows: Metal saw blades, 106.5; reamers, 109.9; twist drills, 112.7; hand taps, 112.9; dies, 115.3; wood saw blades, 115.7; machine knives, 116.1; milling cutters, 116.2; files, 116.9; and grinding wheels, 118.6.

## Machine Tool Bookings Hold Up in Cincinnati Market

Cincinnati—Recent developments in the stock market failed to create a direct reaction on machine tool bookings. It is possible, however, that the turn in stock prices might bring a lag in the orders coincident to automobile model changes.

Deliveries are being slowed by transportation troubles and, as heretofore, shortage in electrical equipment.

Foreign inquiry is active but in many cases financing problems are unsolved.

## WAA Surplus Stocks Moving Gradually in Detroit Area

Detroit—Surplus stocks of machine tools and equipment in War Assets Administration warehouses are gradually being assimilated by buyers and although the situation is still far from satisfactory, machinery interests report that it is better than either Chicago or Cleveland. A completely new system of pricing these items is expected next month.

## Surplus Machine Tool Sales By Approved Dealers Rise

Sales of surplus machine tools through approximately 3000 "approved dealers"

increased by more than \$1 million during the first two weeks of August as compared with the last two weeks of July, War Assets Administration reported recently. Machine tools which cost the government nearly \$100 million new were sold by "approved dealers" from Jan. 1 to Aug. 15. Return to the government on these sales was \$46,839,065, or about 45 per cent of the original cost.

## Machine Tool Distributors Elect Habicht President

George Habicht Jr., Marshall & Huschart Machinery Co., Chicago, was elected president of the American Machine Tool Distributors' Association at the group's

twenty-second annual meeting at the Homestead, Hot Springs, Va., Sept. 18-19. He succeeds A. B. Einig, Mutch & Merryweather Machinery Co., Cleveland.

D. N. Macconel, Machinery Sales Co., Los Angeles, was elected first vice president, and R. L. Giebel, Giebel Inc., New York, was elected second vice president.

Two new members were elected to the executive committee, terms to expire in 1949. They are: George M. Harrower, Brown & Zortman Machinery Co., Pittsburgh; and George E. Young, C. H. Gossiger Machinery Co., Dayton, O.

Thomas A. Fernley Jr. was re-elected executive secretary.

# GOVERNMENT CONTROL DIGEST

## OFFICE OF PRICE ADMINISTRATION

**Control Suspension:** Price controls has been suspended over all motorcycles, motorcycle parts, motor toboggans, and trucks of 30,000-pound and over gross weight, effective Sept. 10.

Effective Sept. 11, control was removed from: Power lawn mower parts; ladder accessories and attachments, such as paint hooks and extension racks; fraternal ware; and insignia, emblems and ornaments for decorative purposes. Effective Sept. 11, the following were indefinitely suspended from price control: Scythes; hand operated insecticide sprayers and dusters; hand operated lawn mowers; oilers; air conditioning equipment, portable, under 1 horsepower; motor scooters; buckles and parts, such as fasteners and clamps, but not including slide fasteners; baby carriages, strollers and walkers; dry batteries; fountain pens and mechanical pencils and sets; razor blades and razors, except electric razors.

Effective Sept. 18, price control is suspended over specified types of industrial equipment and parts including much electrical machinery and equipment, construction equipment used largely for highway building and maintenance, specified food processing machinery, all poultry farm equipment and several miscellaneous machines and parts. (SO-126 129 and MPR-188; OPA-6775, 6778 and 6809)

**Automobiles:** Temporary price adjustments on new passenger cars are available on application to all passenger car manufacturers who are currently in an overall loss position. New pricing formula makes the following provisions: (1) Use of the general level of materials prices as of Aug. 31, 1946, in computing a new materials increase over 1941 costs; (2) use of an increase factor for labor costs based on increases in average hourly earnings rather than increases in basic schedules; (3) allowance of the increased costs of workmen's compensation expense, vacation pay allowances and social security taxes on the higher cost base; (4) allowance of actual increases in general and administrative salaries over 1941 levels up to the level of the increase in direct and indirect labor costs; (5) continued use of the previous profit allowance factor which is either the company's own profit rate or one-half the industry's profit rate on sales in the years 1936-39.

OPA also granted an increase in ceiling prices of Ford, Mercury and Lincoln automobiles, averaging about 6 per cent. Both actions are effective Sept. 16. (MPR-594; OPA-6804)

**Upholstery Springs:** Manufacturers of metal upholstery springs, constructions and accessories granted reconversion price increase of 3.5 per cent, effective Sept. 23. This is in addition to an Apr. 25 increase of 8 to 10 per cent. Adjustable pricing that was permitted for sales made on and after Apr. 30, 1946, is revoked. (MPR-548; OPA-T-5014)

**Electric Appliances:** The following small electric appliances have been added to the "low-end" order that permits manufacturers to apply for increased prices on goods in their lowest price lines: Some types of low-cost electric fans, electric irons and hot plates and all low-cost sandwich grilles, toasters and bowl-type space heaters. The authorized low-end increases restrict the manufacturer to the lowest of the following prices: (1) the dollar-and-cent price given in the order for sales to jobbers, (2) his current ceiling price plus a stated percentage increase, or (3) his total cost to make and sell the item plus a stated per cent for profit. (SO-148; OPA-6779)

**Machinery:** Manufacturers of construction and road maintenance machinery and equipment granted price increase factor of 13.5 per cent over base date prices replacing an interim increase factor of 10 per cent granted on Apr. 10, 1946. The latest action, effective Sept. 17, is actually only an additional 3.5 per cent advance in ceiling prices. Resellers of this equipment, which includes cranes, loaders, road maintainers, graders, mixers, pavers and many similar products are authorized to pass on the manufacturers' price increase by increasing their prices the same percentage amounts as their costs are raised. (MPR-136; OPA-T-5009)

## CIVILIAN PRODUCTION ADMINISTRATION

**Priorities:** "CC" priority ratings are now available to producers of the following goods in order to sustain or increase production of items required for essential construction. Items added to schedule 1 (critical products) of priorities regulation 28 are: Low-pressure boilers for residential heating; specified builders' hardware items; furnace pipe, fittings and duct work; specified classes of screwed pipe fittings; registers and grilles for heating systems; and woodworking machinery, including power-driven saw blades and saw bits, for the production of logs, lumber, millwork, flooring and plywood; portland cement.

"Cast iron pressure pipe" was added to the list of castings on schedule 1. Cast iron radiation and convector radiation were consolidated into one listing.

Portland cement producers are eligible for "CC" ratings to obtain production materials; construction materials at existing plants; maintenance, repair and operating supplies; capital equipment for replacement.

"Steel industrially-made houses, panels and sections" have been added to the list of materials for which "CC" assistance may be granted to get steel in the fourth quarter, if the items produced are suitable for low-cost housing. Manufacturers of such items should apply to CPA immediately on form CPA-4491 for their November and December steel requirements. (PR-28; CPA-LD-270)



*Secretary Wallace's Madison Square Garden speech may culminate in retirement from cabinet, to the relief of businessmen. Invasion of spheres of other departments often has been disturbing to administration*

THAT Henry A. Wallace has been living on borrowed time in his post as Secretary of Commerce has long been felt in certain Washington circles. It would not be surprising if the chain of developments started by his Madison Square Garden speech of Sept. 12 were to culminate in his retirement from the cabinet. At least, he will make no more speeches for the duration of the Paris peace conference.

Mr. Wallace never has refrained from invading territory other than his own, and frequently has delivered speeches which rightly might be expected from the Secretary of Labor, the Attorney General or some other executive head. This time he criticized the Truman administration's "get-tough-with-Russia" policy, and he advocated recognition of Russian spheres of influence. The Wallace speech threw the State Department into consternation, particularly when it developed that President Truman had told his press conference that he had approved the Wallace speech in advance. This later was repudiated. But the Wallace speech needs some tall further explaining unless the United States foreign policy that was evolved with so much difficulty is to stand discredited.

## Altruistic Policies Alarm Many

As Secretary of Commerce, Mr. Wallace has displayed considerable more initiative than some previous secretaries but unfortunately his ideas often have been along altruistic rather than practical lines. He tends to think in terms of employment rather than business prosperity. He wants to lift the economy by improving the lot of the weak and downtrodden. This objective is one with which every decent citizen can sympathize. The trouble is that Mr. Wallace launches his programs in such a way as to alarm many people.

Many instances might be cited but there is one that is particularly pertinent because the issue still is live and is due to be revised in the 80th Congress. This involves the Fulbright bill, S. 1248, to set up a Wallace-sponsored Bureau of Scientific Research in the Department of Commerce on a permanent basis.

The bill would give to the Secretary of Commerce power to socialize or communize the creative ideas of a large percentage of the American people. Through a field staff and other means, the secre-

tary would obtain a record of all available ideas. Those which he considered promising he could have developed with the use of public funds—so as to bring about new products and processes that would benefit the economy. The striking feature of the Fulbright bill is the unexampled power it would give to the Secretary of Commerce. He could take over inventions on a royalty-free basis, and grant nonexclusive royalty-free licenses to utilize the inventions. Or he could allow such exceptions to the non-



HENRY A. WALLACE

exclusive, royalty-free arrangement as his "judgment" dictates.

The secretary would have a host of powers, as to initiate and sponsor with government money, research and technological campaigns; offer to the public "on such terms as he may prescribe, such inventions, products and processes as he determines to be fitted for private development;" "bring to the attention of inventors, scientists and research institutions technical problems requiring solutions;" maintain a corps of field men to conduct various activities including regular visits to all sorts of manufacturing establishments with the aim of gathering information that in the secretary's judgment should be communicated to industry in general.

The bill is one that should be fought by all friends of private enterprise. It is another of the recent attempts—one of which has won through to victory—to regiment invention and technological research and to stifle the free enterprise system by denying to inventors the fruits of their inventions. The one that won through, the Atomic Energy Act, provides that no patents hereafter may be issued on inventions relating to production or use of fissionable materials whenever the public interest is concerned, and that patents heretofore issued are to be acquired by the government. The net result, scientists agree, is that atomic research will be on a far smaller scale than would be the case if inventors were allowed to enjoy the fruits of their inventions.

Even were the Fulbright bill, if passed, to be administered with the best will in the world, without thought of ideological, political or other factors, the bill would give the secretary just too much power in a country like the United States. He would have too much latitude in "guessing" at the future possibilities of each new idea or invention submitted to him. He would have to depend on the advice of many assistants possessed with dubious competence.

(Incidentally, so there will be no misunderstanding, the Office of Technical Services recently organized in the Commerce Department is not the full-fledged, permanent Bureau of Scientific Research envisioned in the Fulbright bill. The present Office of Technical Services was organized by the secretary with a special congressional appropriation of \$1,500,000 to be spent in completing projects inherited from the wartime Office of Production Research and Development.)

## FTC Policy Undergoing Change

As a result of a Presidential policy statement of several months ago, the procedural policy of the Federal Trade Commission is undergoing a revolutionary change. Hitherto it has been the policy of the commission to catch a certain number of antitrust law offenders each year and slap cease-and-desist orders on them. The new policy calls for employment of the trade practice conference method of setting up codes of behavior for whole industries.

The reasoning is that the setting up of trade practice codes will reduce non-compliance from 100 per cent in many industries to possibly 2 to 3 per cent. The administration recently was persuaded to believe that the great majority of companies pay comparatively little at-





**HONORED BY NAVY:** Citations praising their contributions to the war effort in facilitating movement of military personnel and war materiel were presented recently to J. Monroe Johnson, left, director of the Office of Defense Transportation, and J. J. Pelley, center, president of the Association of American Railroads. The presentation was made by Vice Admiral Louis E. Denfield, chief of Naval Personnel, U. S. Navy. NEA photo

tention to the antitrust laws on the theory that their chances of being caught in violation were on the order of their chances of being struck by lightning. In fact, in most cases the nature of competition leads to consistent violation. When trade practice codes are set up, experience amply has demonstrated, the great majority of units in an industry comply. Noncompliance is very easily detected and it becomes a simple matter to apply correctives.

The change in the FTC policy is so profound that its full implications have not yet developed. Hence there are a lot of questions at this time whose answers will not become apparent until later. One is: What could be done to end the steel basing price case by the trade practice conference method?

This question is of universal interest. Whatever limitations eventually may be placed on the competitive ability of Steel Corporation subsidiaries would naturally be applied to other steel companies in the course of time.

Here is a case which in course of time will apply to the biggest economic sector in the United States—that comprising the manufacture of steel and its fabrication into many thousands of products. If allowed to develop along purely legalistic lines it probably will take years to get it through the courts; the Federal Trade Commission, in fact, seems to

want to defer further court action in the "Pittsburgh plus" case until it gets a decision in the cement case.

Many companies, therefore, might like to get this case settled at once. There is nothing whatever to prevent them, individually or in groups, from asking the Federal Trade Commission to call a trade practice conference to go into the matter. Should such a request be received, the FTC of necessity would be forced to give it the most careful attention. The worst that could happen would be a negative answer. Even this seems unlikely since the purport of the recent White House directive is that the Federal Trade Commission hereafter is to be the friend, not the enemy and persecutor, of industry.

### CPA Nears End of Road

Although the Civilian Production Administration is due to pass out of existence on Mar. 31, 1947, with the termination of the Second War Powers Act, it is expected that many priority controls will be terminated much earlier. Administrator John Small feels that if production in general is maintained at the present levels for another two to three months the real danger of inflation will have been weathered. CPA now is planning to discontinue a host of priority controls as of Dec. 31.

One of CPA's chief stumbling blocks is the attitude of large numbers of manufacturers. They all agree that government controls should be ended as rapidly as possible—and then usually add: "Of course it is different in my case; I need a priority." In its plan to end controls, therefore, the CPA expects to get a lot of criticism alleging too hasty action.

For a long time to come controls should be needed in the field of building materials; most commodities that come under this head will continue scarce next year. The Second War Powers Act extender contains authorization to continue building materials controls until June 30, 1947. Present expectations are that building material controls will be the concern of the National Housing Expediter, Wilson Wyatt, after Mar. 31.

Presently the tightest materials are the whole range of flat-rolled steel, scrap, pig iron, carpenters' nails, tin, lead, natural rubber, hardwood flooring, asphalt roofing and siding and paper and pulp. Alleviation is being sought through setting up a premium payment plan to encourage production of nails, through deals to bring in more metallic tin and tin concentrates, through a deal to bring in pulp from Sweden, through an expanded lead exploratory program of the Bureau of Mines, through sending out some 600 men to inspect scrap inventories all over the country, etc.

### Munitions To Remain Big Business

One of the principal activities in the War and Navy Departments at present is a series of meetings to determine what appropriations requests for the next fiscal year will be taken up, first this fall with the Bureau of the Budget and then next spring with the appropriations committees of Congress.

At this writing it seems safe to assume that arms manufacture will be one of the country's most important peacetime activities for at least some years to come. There are no means of knowing what the requests will be—and military men do not yet have the answers even if they were permitted to make them public. At the same time, many observers have some basis on which they can put two and two together and get an approximate answer. On this basis there are outside estimates in Washington that military requirements will be contracted for on an average yearly scale of around \$4 billion. That would be a business about equal to the value of automobile production annually over the ten prewar years.

As a part of this program, the job of earmarking all standby facilities for the production of different types of armament is proceeding under direction of Donald M. Nelson.



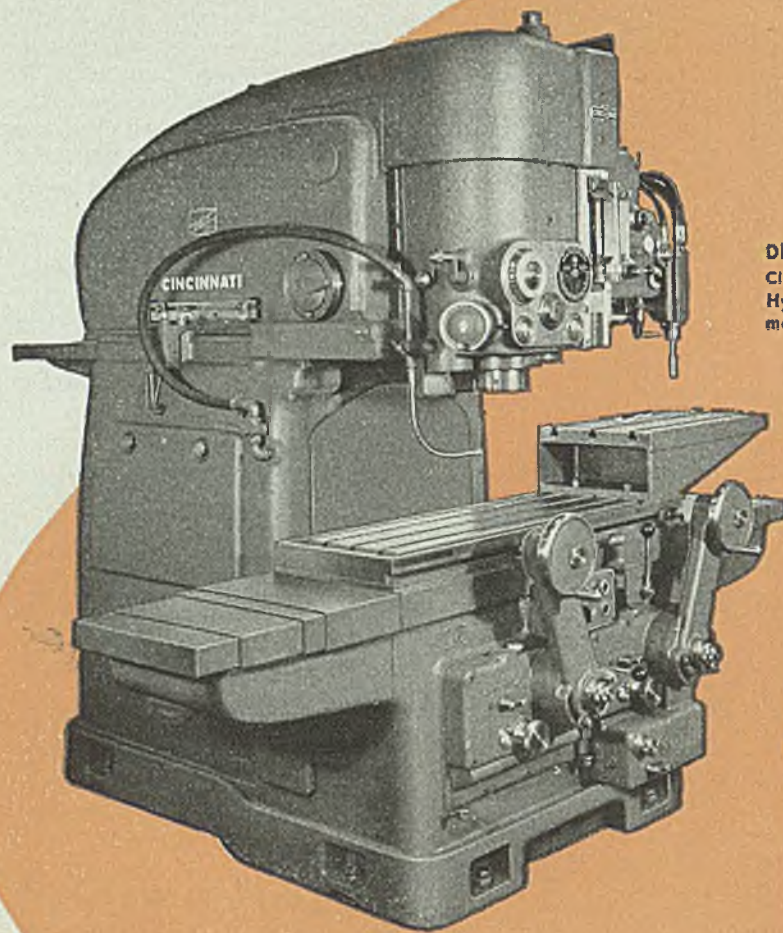
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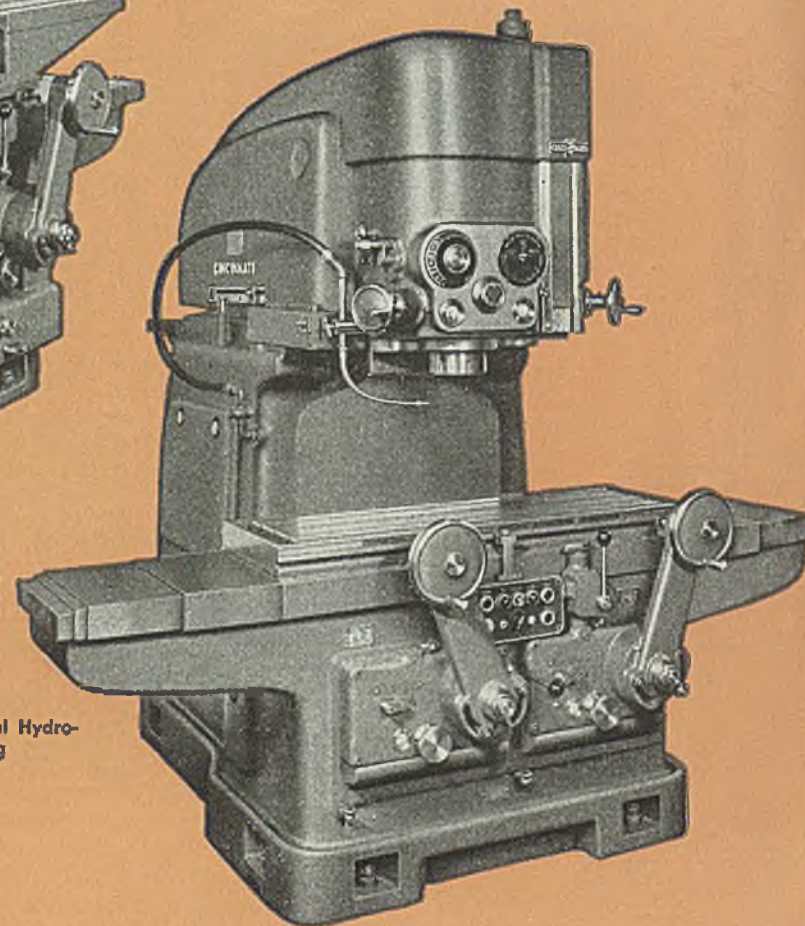
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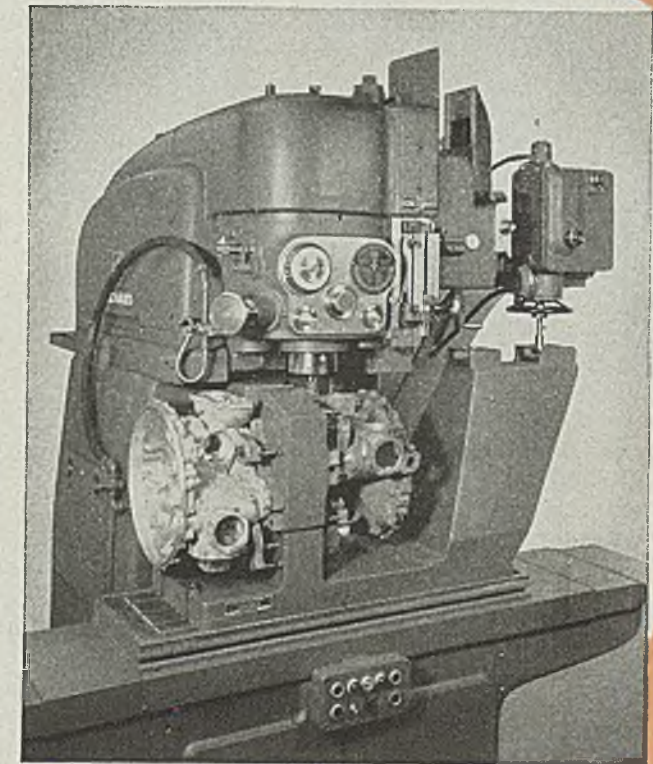
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September 23, 1946



## Bureau of Mines Seeks New Sources Of Lead in 32 Exploration Projects

*Program also will help increase available zinc deposits as two metals usually occur together. Possibilities of bloating clays and popping lavas being studied at Boulder City. Six projects concerned with iron ore*

OF SOME 55 minerals exploration projects to be worked on by the Bureau of Mines this fiscal year, 32 are aimed at finding new sources of lead. The program also will help swell available zinc deposits, since lead and zinc usually occur together. The lead-zinc projects are located as follows:

Arizona 1, California 3, Colorado 4, Idaho 4, Illinois 1, Missouri-Kansas-Oklahoma district 4, Montana 3, Nevada 4, Wisconsin 1, New Mexico 2, Tennessee 1, Texas 1, Utah 2, Washington 1.

Six projects have to do with iron ore—2 in Alabama, 1 in the New York-New Jersey-Pennsylvania magnetite area, 1 in the Cranberry magnetite district in Tennessee, 1 in northern New York state, and 1 in Minnesota.

Other projects started or about to be started include: 1 mercury in Alaska, 1 mercury in Nevada, 1 or more tungsten in North Carolina, 1 or more high-grade asbestos in Alaska, 1 pegmatite in South Dakota, 1 barite in Arkansas, 2 copper in Arizona, 1 copper in Nevada, 1 fluor spar in Colorado, 1 fluor spar in Kentucky.

### Pure Metals Being Studied

The Metallurgical Division of the bureau this year is concentrating on pure metals—both in developing or improving processes for their production and in finding uses for the pure metals.

At Salt Lake City the uses of pure electrolytic manganese will continue to be studied, particularly as a substitute for nickel in stainless steels of various types.

At Boulder City metallic titanium is being produced in quantities up to 100 pounds per day; various production methods are being studied, and samples of the pure metal are being sent to various companies interested in ascertaining uses. Boulder City now is producing up to 5 pounds daily of electrolytic cobalt and up to 100 pounds daily of electrolytic chromium, and the product in both cases is being studied for commercial uses.

Boulder City also is conducting an interesting study of the possibilities of eastern bloating clays and the young "popping" lavas of the West. The objective is to produce artificial punices with controlled cell sizes and controlled thickness of walls, to serve for such purposes as heat insulation and decreasing the

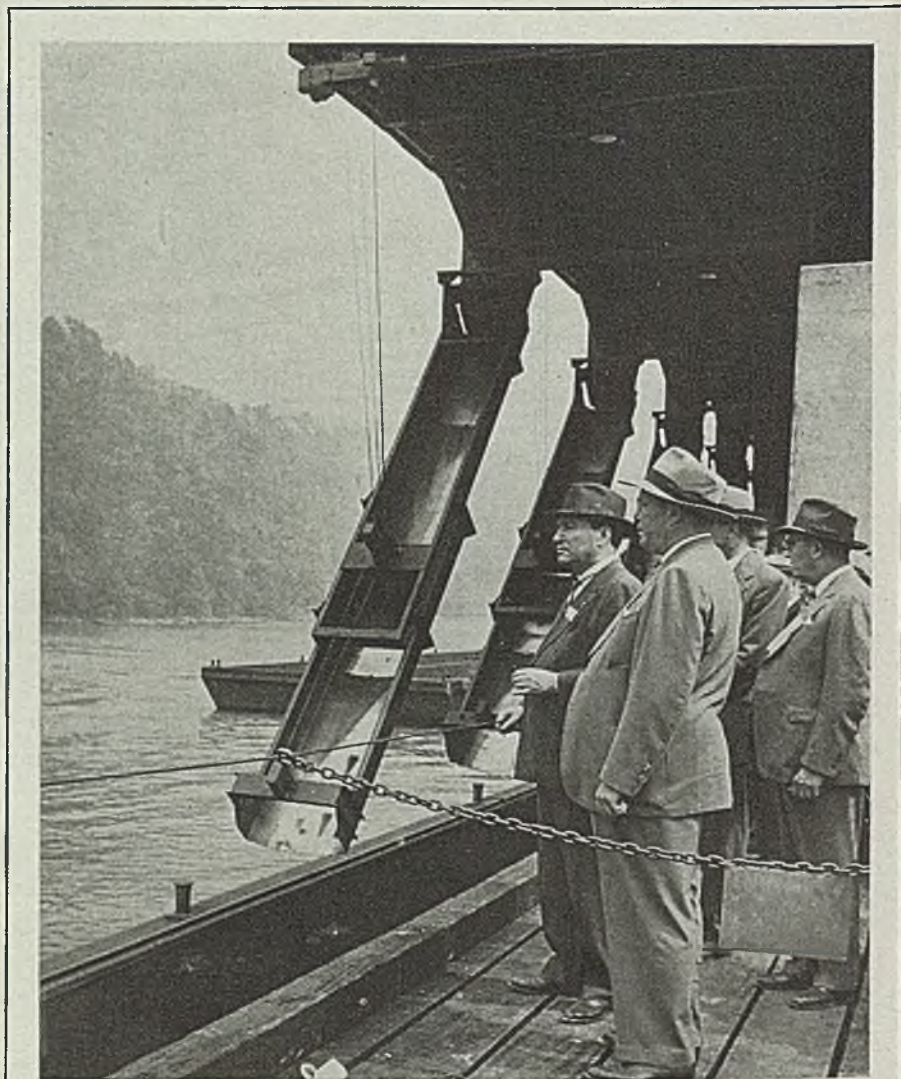
weight of concrete. A good many advantages might result from the development of light concrete—as reduction in the tonnage of steel required for reinforcing purposes.

At Albany, Oreg., the bureau is producing 1 to 2 pounds daily of zirconium but still has a problem of producing clean metal. It recently has been able to roll thin zirconium sheets up to 10 feet long and 4 inches wide from single large pellets. These sheets are being studied

for uses. Albany is seeking to develop methods of utilizing the nickel-copper-iron ores of Oregon, the nickel-chromium ores of Washington, and the high-phosphorus ores of Oregon and Iowa. The aim is to develop methods now which will be ready for immediate use in case of another period of minerals scarcities in the future.

At Berkeley, Calif., the bureau continues to accumulate precise thermal data on various ores and metals. At Rolla, Mo., it is working on extraction of cobalt and nickel from the ores of Madison county. At College Park, Md., it continues to work on a process for reclaiming pure aluminum from aluminum alloy scrap.

Sponge iron work has fallen off for the present. The main effort is at a tunnel kiln installation at Salisbury, N. C., operating on ore from Cranberry, Tenn. Some sponge iron work also is being done on fines at Minneapolis.



INSPECT NEW TIPPLE: B. F. Fairless, front, president, United States Steel Corp., views the new river front tippie at Robena Mine of the H. C. Frick Coke Co., located 80 miles south of Pittsburgh. Next to camera is Harry M. Moses, Frick president; at rear is J. L. Sullivan, Frick general superintendent



## Price Increases Announced on Foreign Steel

*Belgian and Luxemburgian prices may be raised less on export items. Export trend generally rising*

BELGIAN and Luxemburgian steel prices were increased Aug. 1. The increase, which is generally heavy, is caused by the rise of coal prices resulting largely from the removal of government subsidies. Foundry pig iron, 2.5 to 3 per cent Si., is now 1920 Belgian francs (\$43.60) per metric ton, as against the previous price of 1550 francs (\$35.20). Billets 2450 francs (\$55.65); merchant bars 3150 francs (\$71.60), against 2200 francs (\$50.00); structural steel 3050 francs (\$69.30), against 2200 francs (\$50.00); plates 3250 francs (\$73.85), against 2635 francs (\$59.90); rails 3600 francs (\$81.80). The increase in the price of steel bars includes the extra for special qualities that was not included previously. The present level of Belgian prices is well above the French level and also above certain British prices. It is not expected, however, that export prices for Belgian and Luxemburgian steel will be raised to the same extent as domestic prices. Export demand is still on the increase and most makers are out of the market, but it is felt that the level of export prices must be kept at a competitive level in regard to other exporting countries. Early in August Belgian merchant bars were quoted for export at £22 17s 6d f.o.b. Antwerp (\$91.60) for delivery in February-April, 1947.

Iron and steel exports from the Belgo-Luxemburg union for the first six months of the year amounted to 673,040 metric tons. The main items were merchant bars, 180,611 tons, structurals 123,072, plates and sheets 119,102 tons, wire rods 30,975 tons. For practically all products the trend of exports has been rising, pig iron being the exception. A recent policy of the Belgian government has been to remove certain products from export and import control, a simple declaration being all that is required; this policy has just been extended to many iron and steel products, including pig iron, ingots, merchant steel, rails and track material, hoops, wire products, etc.

### Poland

The Polish iron and steel industry is producing about 75 per cent of its 1938



**COURTESY CALL:** Enroute to the International Labor Organization conference at Montreal, Canada, George H. Isaacs, left, British Minister of Labor and National Service, pays a courtesy call on Secretary of Labor Lewis B. Schwellenbach. NEA photo

output, measured in value in Polish currency, according to French reports. Poland is importing ore from Sweden.

### Sweden

This country is making large extensions to its steel industry. The Swedish parliament has voted a credit of 100,000,000 kroner for expanding the state owned works of Luea, where it is planned to erect two rolling mills with an annual capacity of 300,000 tons.

### Norway

A new company has been formed in Norway under the style of "Norsk Jernverk A/B," in which the state is taking the majority of shares. It is planned to construct blast furnaces, steel plant, rolling mills and a foundry; the scheme is expected to be completed in four years, but it is anticipated that some products will be in production by the end of 1948. The final capacity of the works is estimated at 200,000 tons of rolled products a year.

### Steel Fabricating Plant Planned near Mexico City

Plans are being made for construction of a joint American and Mexican general steel fabricating plant which is to be built near Mexico City, the Department

of Commerce has been notified through consular channels.

To be known as the Pacific Bridge Co. of Mexico, the plant will be equipped for general fabrication, but will specialize in structural steel buildings, bridges and other structures.

An acute shortage of structural steel fabricating and erecting capacity has been reported in Mexico, with only two large firms operating in this field. One of the obstacles for further development has been lack of engineering personnel for design, detailing, fabrication and erection of bridges. Under Mexican law, this type company cannot engage in structural design, but the new company will co-operate with local engineers and architects and will perform structural detailing and furnish finished plans.

### African Iron, Steel Imports Freed from Special Duties

Special duties on iron and steel products formerly in effect in the Union of South Africa have been withdrawn or suspended until further notice, according to the Department of Commerce.

These special duties were drafted in 1937 to counteract a threat of dumping of steel on the South African market in competition with the then infant domestic industry there.



# MORE!

# MORE!

# MORE!

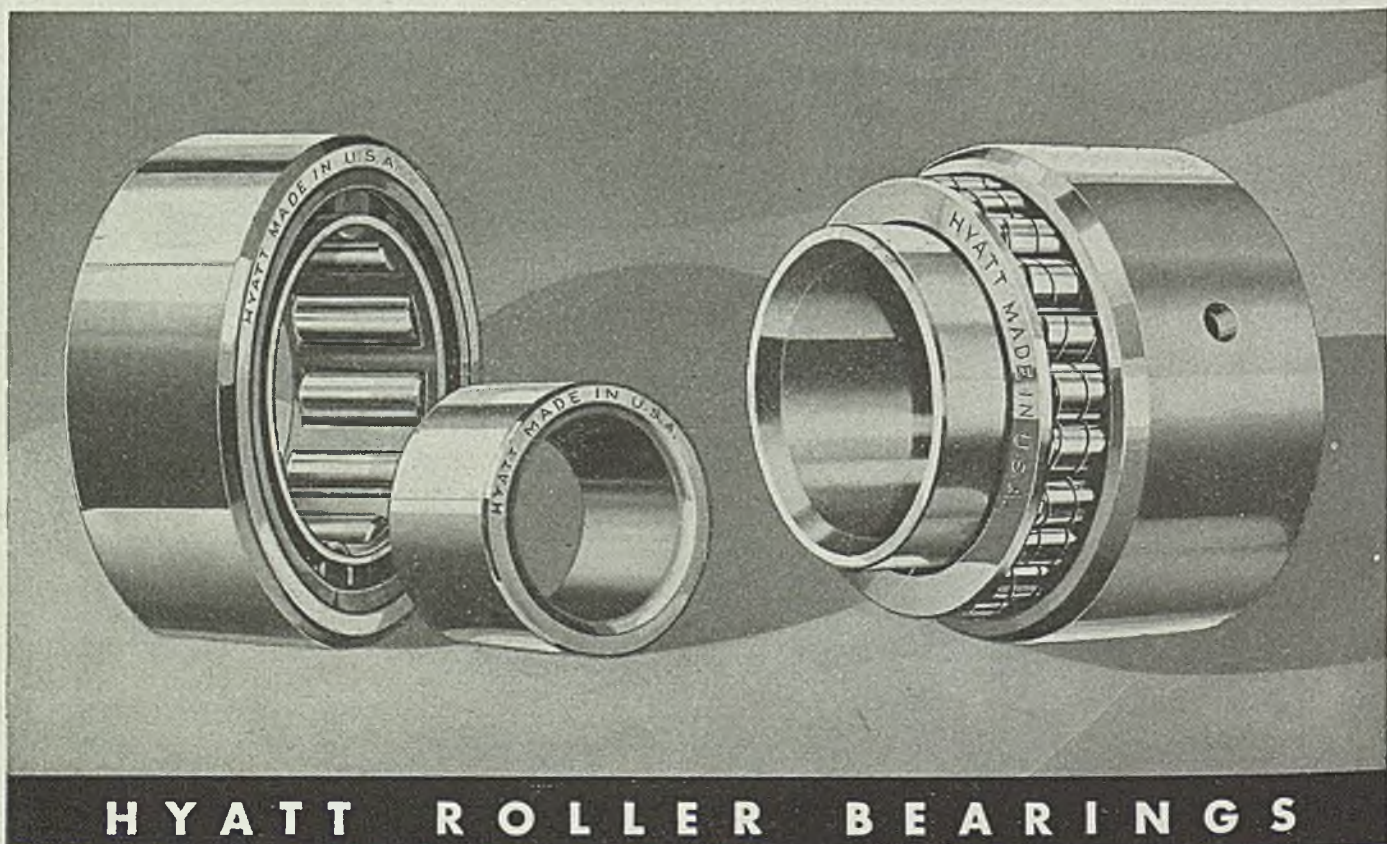
Peace — War — Peace — it is always the same story. We could get out more of this or that if we could get more steel.

Hyatt Roller Bearings gladly help to shoulder the load by reducing "down time" due to bearing failure.

Always specify Hyatt

Roller Bearings for new equipment or change-overs and see us in spaces 286 and 287 at the Iron and Steel Exposition in the Cleveland Public Auditorium on October 1-2-3-4.

Hyatt Bearings Division,  
General Motors Corporation,  
Harrison, New Jersey.





**Light car plans shelved by General Motors and Ford. GM blames shortage of materials for postponement, but resumption may hinge on policies followed by Washington. Willys-Overland going ahead with planning for new light-weight utility car**

## DETROIT

SOBER reflections on the probable course of events in this country over the next six months have brought about some major changes in the production planning of two of the largest automobile builders—General Motors and Ford—and their decisions are bound to influence the thinking of the rest of the industry which has historically kept its collective finger on the pulse of the "big fellows." The decisions involve the postponement, possibly the abandonment, of plans to produce new light-weight low-price passenger car models.

Officially, GM has stated that because of current shortage of basic materials such as lead, copper, pig iron and flat-rolled steel, and the uncertainty as to when they will be available in sufficient quantities to carry schedules for models already in production, all preparations for the manufacture of the Chevrolet light car have been stopped until such time as this material situation may have been clarified. The preparations referred to include about a year's work on the part of several hundred engineers, designers and purchasing people in Detroit, as well as the development of plans for two enormous plants in the southwest Cleveland area for machining, stamping, assembling and other operations, exclusively on the light car project. The latter was estimated to involve expenditure in the neighborhood of \$100 million.

### Rumors Say Some Work To Continue

A project of this stature, as far along as it was, is not just discarded like an old shoe. One of Chevrolet's top engineer-executives, Arnold Lenz, is in charge of the program here, and under his direction considerable progress has been made both on design of the car itself and the layout of production processes and purchasing of equipment. Unofficial word from some of those on the staff is that a 60-day stop order has been issued by GM management, but engineering personnel will continue at work, perhaps at a more leisurely pace, in the hope that by Nov. 15 the materials picture will look a little brighter.

Approval had been given by the CPA for the two Cleveland plants which were scheduled to cover 2,500,000 sq ft of floor space and to provide employment

for 10,000. The construction industry, of course, is muddled by materials shortages, soaring costs and dozens of other abnormal conditions, so a stop order on this project will probably be a welcome relief to those in charge. Meanwhile the abandonment of an expansion of this size can be calculated to demonstrate forcibly to the economic scramblers in Washington just how seriously their conflicting rules and regulations are affecting the nation's largest industries. Conceivably the Chevrolet light car program

price car began to crystallize along in 1944 and pretentious plans were being drawn for new manufacturing facilities, all now apparently being thrown in the discard. On the face of it, the Ford program appears more likely to be interred for good than the Chevrolet activity. If, as many believe, the precipitate dive in security prices over the past few weeks is the portent of serious economic dislocations six months or so hence, then both new low-price cars probably will be in for long-time deferment.

Willys-Overland in Toledo apparently is going ahead undisturbed with its planning for a new light-weight 6-cylinder "utility" passenger car, but its situation is somewhat different from GM or Ford in that the days of the Willys jeep as a high-volume sales performer look to be numbered; in fact, the company is not looking for much from the present jeep design beyond 1947. Already in its advertising Willys is hinting the jeep will be superseded by a better-riding and more attractive vehicle.

Alexis de Sakhnoffsky and Brooks Stevens, consulting stylists for Willys, developed three suggestions for front end designs to be used on the forthcoming 6-cylinder passenger car. Plaster mockups were made and company executives were equally divided in opinion as to which one to approve. President James D. Mooney wanted a design which "would provide the individual owner with a stylish car which would not be automatically out of date after the first year of possession." This is a naive statement from a gentleman who has been in the automotive business for as long as Mr. Mooney has, but anyway that is what his publicity man said.

### Employees Select Design

Finally, a display of the three front-end conceptions was set up against a black fabric backdrop in the company's research building, and 1000 of the company's 4500 employees were selected to express their choice. One proved to be the favorite, so Mr. Mooney and his staff decided to string along with the majority opinion and the design is now being tooled for production.

The whole subject of the light-weight low-price car has interesting connctations. In the first place, lightness itself is not a guarantee of low cost—in fact, may often predicate higher costs due to the necessary extra tooling or the need for higher-cost materials, such as aluminum to replace steel. In the second place, no one knows for sure today just what low cost means. There has been a 40-50

## Automobile Production

Passenger Cars and Trucks—U.S. and Canada

Tabulated by Ward's Automotive Reports

	1946	1941
January .....	121,861	524,037
February .....	83,841	509,332
March .....	140,777	533,878
April .....	248,318	489,856
May .....	247,620	545,321
June .....	214,511*	646,278
July .....	330,764*	468,897
August .....	364,046*	164,793

Estimates for week ended:

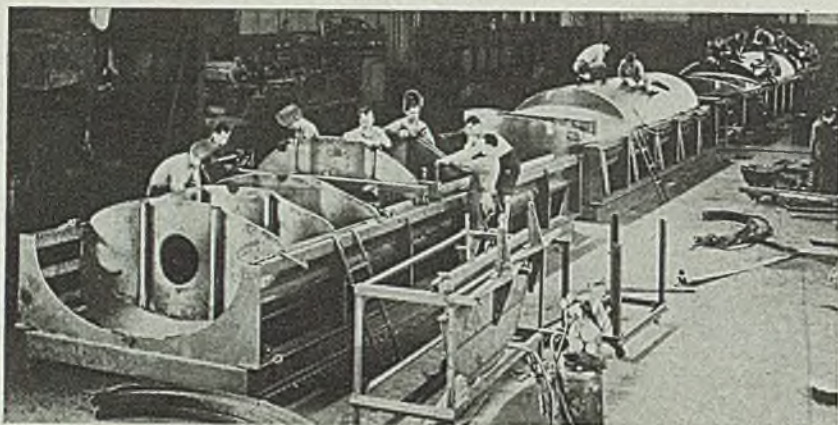
Aug. 31 .....	74,960	39,965
Sept. 7 .....	72,535	32,940
Sept. 14 .....	87,078	53,165
Sept. 21 .....	90,000	60,615

\*Preliminary

could be left on the shelf until there is a complete abrogation of all artificial government controls over the economy. If that is the way Washington wants it, that is the way it will be.

Meanwhile, the Ford low-price car division, organized early this year and actively planning a new car along the lines of the Chevrolet light car, was discontinued a month ago, according to belated announcement from the company. As detailed in STEEL for April 22, A. B. Pease had been named manager of the new division and C. H. Carroll, assistant manager. Now Mr. Pease has been transferred to the head of a new Ford sales region with headquarters in Dearborn, while presumably Mr. Carroll will return to his former work in the purchasing department. Details of the Ford low-





**FEATHERWEIGHT TRAILERS:** Fruehauf Trailer Co., Detroit, has started production of a new line of light tank-trailers at its Ft. Wayne, Ind., plant. Tanks are constructed of high-strength nickel alloy steel to provide a high strength-to-weight ratio

per cent increase in car prices since 1939, just as there has been a 40 per cent inflation in currency (or decline in purchasing power of the dollar) and a similar increase in money wages. Hence if the 1939 version of a low-price car might have been one priced at \$700, then that car today would have to carry a tag of \$1000.

Both Chevrolet and Ford were understood to be aiming at under \$1000 for their new designs, but the problem was how to get it engineering-wise, or more basically, how to know what the price was going to be in the face of a completely unbalanced economy. Savings can be made by cutting down on engine size and horsepower, but here must be kept in mind the fact most owners in this country insist on a certain minimum performance in respect to acceleration and speed which means the maintenance of a horsepower-to-weight ratio close to that of present passenger cars. Failure of the Ford 60 model ever to attain a high sales volume is considered partial proof of this line of reasoning. Supercharging and automatic transmissions are two means of maintaining performance characteristics with lowered horsepower-to-weight ratio, but they both involve appreciable increases in cost.

It may be that engineers are despairing of reaching a design compromise which holds any attractive possibilities for providing high performance with light weight and low cost, until there have been some major advances in fuels or basic forward steps in engine design. If they have, then the low-price light-weight car must be wrapped up and put away for a while. After all, there is nothing new about this outlook, for the industry has been talking off and on for the past ten years about such cars. Just when they

appeared to be getting hot they got a quick freeze and were forgotten.

### Ford for Steady Employment

Some clear thinking on the goal of steady employment in the automotive industry was furnished members of the Economic Club of Detroit last week in a speech by Henry Ford II. The unfortunate part of his studied comment was that his audience probably echoed his sentiments to a man, but the people who should have heard it were either busy on the production line or surging around picket lines in front of several plants where walkouts were being staged over such apparently trumped-up charges as "speed-up, maligning labor, discrimination, etc."

Commenting on the guaranteed annual wage, Ford said the words come a little too close to being a political phony in that they suggest someone is in a position to guarantee an annual wage and is merely refusing to do so. What all companies fondly desire is a method to stabilize employment, but the seasonal desires of automobile buyers—when new models are introduced and in the spring—plus preferences for something new every year, have mitigated against much stabilization. The problem is essentially one, not solely of the automotive industry, but of a vast cross section of all American industry, according to Ford, since his company for one has nearly 6000 major and minor suppliers of materials, parts, goods and services rendering annual bills of over \$600 million.

Any sound plan to stabilize employment, Ford observed, must increase production and reduce the cost of cars, something a guaranteed annual wage cannot assure. Beyond this, there must be "fresh thinking" on the part of both manage-

ment and labor. Management, for its part, must conceive and adopt methods to step up the productivity of machines by new approaches to design and manufacturing. Labor, for its part, must realize its policies of stretching out the job, slowing down to the pace of the least efficient and demanding more money for less work, with the strike threat widely misused as a means of entrenching labor monopolies, will need major overhauling.

Finally, said Ford, it is futile to expect the government, the public or some fact-finding board to come up with a solution to these problems. At stake "is the very force which has made the nation great—the tremendous power of competition in a nation of free people." A choice must soon be made between democratic freedom and the "seductive promises of security."

### Survey Lists Strike Losses

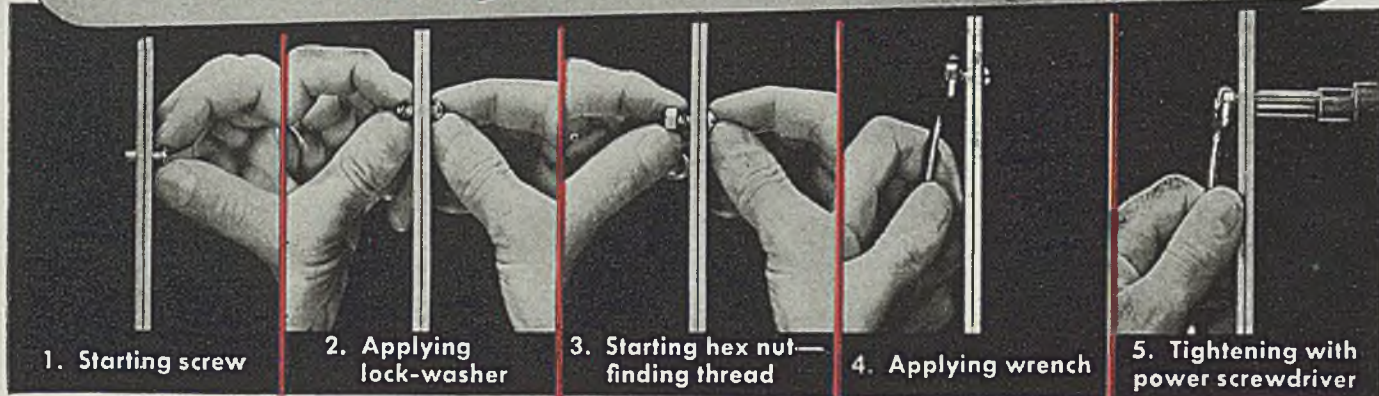
Common understanding and working together between management and labor are the "consummations devoutly to be wished" but only the most unqualified optimist could see much chance of their attainment over the near-term future. Thus, a survey recently conducted of 229 automotive parts plants currently employing more than 137,000 showed 86 of them, employing 73,400, had experienced 178 strikes between V-J Day and Labor Day this year. Resulting loss was 16,260,000 man-hours of scheduled work. Of the 178 work stoppages, 84 lasted more than one day, 94 were "quickies" lasting less than one day. CIO unions figured in 151 of them. The survey covered only those strikes within the employer's own plant involving his own workers and did not include any man-hours lost due to stoppages in other industries where strikes, because of the "chain reaction" in mass production industries, forced layoffs on a large, but unascertained scale. Likewise the figures do not include parts manufacturing operations of vehicle manufacturers.

### Autos, Trucks To Remain Under Export Control

New American automobiles and trucks will continue under strict export control, Civilian Production Administration announced last week. Of total passenger car production of 727,286 units in the ten months from Sept. 1, 1945, to June 30, 1946, only 36,696 cars, or 5 per cent, were permitted to go to foreign countries on quota authorizations. During the same period, the military forces exported not more than 200 per month. Of the total production of trucks of all types in this period, totaling 494,559 units, exports accounted for 78,910, or 16 per cent.



# Why 5 Operations?



1. Starting screw

2. Applying lock-washer

3. Starting hex nut—finding thread

4. Applying wrench

5. Tightening with power screwdriver

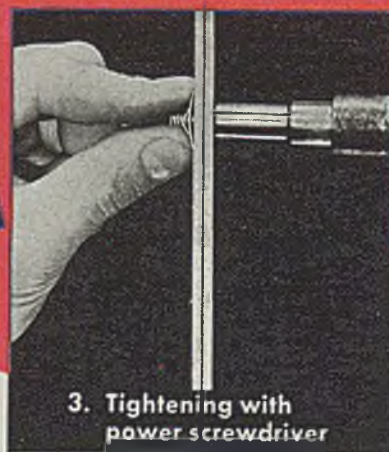
## Speed Nuts will do it in 3



1. Starting screw



2. Positioning SPEED NUT



3. Tightening with power screwdriver

Why go through 5 hand operations when only 3 are necessary? Why handle 3 parts when only 2 are required? For an eye opener on the economies of the SPEED NUT system just multiply this 40% motion-saving by the millions of fasteners you use per month. Then add to that the saving by eliminating  $\frac{1}{3}$  of the parts. Your figures will amaze you. And your product will be protected against loosening from vibration besides. Engineers who move up faster are those who know how to make assembly lines move faster. Please send your assembly details as SPEED NUTS are made in over 3,000 shapes and sizes.

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In Australia: Simmonds Aerocessories, Pty. Ltd., Melbourne

**Speed**

MORE THAN 3000



**Nuts**  
PATENTED

SHAPES AND SIZES

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**F A S T E S T T H I N G I N F A S T E N I N G S**



## New Company Will Produce Alloy Castings

*Engineering Castings Inc., organized at Marshall, Mich., to serve the automotive trade. Production started*

AS THE INITIAL step in development of production facilities for a variety of specialty alloy castings, principally for the automotive trade, Engineering Castings Inc., 600 South Kalamazoo Street, Marshall, Mich., has been organized by A. E. Rhoads and David W. Boyd, two former associates in the Detroit Electric Furnace Division of Kuhlman Electric Co., Bay City, Mich. Fred J. Walls, International Nickel Co. Inc., Detroit, serves as a third director.

Mr. Rhoads, active with Detroit Electric Furnace since its inception in 1918, served as vice president in charge of sales and service until 1938 when the company became a part of Kuhlman Electric. For five years he was manager of the Detroit Electric Furnace Division of Kuhlman and then was named executive vice president and general manager of Kuhlman, a post from which he has now resigned. He is president of the new organization.

Mr. Boyd has been manager of sales and service of the furnace division since 1939, and will be works manager and secretary-treasurer of the new company.

Kenneth Loer, service engineer for Detroit Electric Furnace, has joined Engineering Castings as superintendent.

Initial operations at Marshall have been started on an order for 100,000 high-alloy iron automotive engine parts. Two 200-pound indirect arc rocking furnaces have been installed for melting. Molds will travel on a small conveyor loop and manual labor will be reduced.

## Metal Stamping Company Observes 25th Anniversary

Dayton Rogers Mfg. Co., Minneapolis, is celebrating its 25th anniversary as a manufacturer of metal stampings. The company was formed by its president, Dayton A. Rogers, to manufacture stampings with an unconventional type of die. Improvements in the process have been developed and now the company offers a completely rounded service on metal stampings in short runs, including blanking, drawing, piercing and forming.



INSTITUTE REOPENED: Mrs. Thomas Alva Edison, widow of the inventor, holds a replica of the first incandescent lamp as she compares it with the world's largest lamp (50,000 watts) at the reopening of the General Electric Lighting Institute at Cleveland. The institute remained dark during the war. With Mrs. Edison are M. L. Sloan, a vice president of General Electric Co., and C. E. Wilson, president. NEA photo

## BRIEFS . . .

*Paragraph mentions of developments of interest and significance within the metalworking industry*

Pennson Corp., New York, has purchased McIntyre Co., Newton, Mass., manufacturer of industrial hydraulic pumps and fluid motors.

Electric Welding Division, General Electric Co., Schenectady, N. Y., has opened a branch office in Houston, Tex., with F. C. Neal Jr. as manager.

Cooper-Bessemer Corp., Mt. Vernon, O., has begun construction of 98 engines with a total capacity of more than 110,000 hp for pipeline use. Delivery of most of the engines is scheduled for 1947 and 1948.

Consolidated Steel Corp., Los Angeles, has announced formation of Philippine Consolidated Shipyards, Manicani island, P. I., which will engage initially in ship repair operations.

Colorado Fuel & Iron Corp., Denver, has established a general export sales office at 500 Fifth Ave., New York 18.

Alfred M. Best Co. Inc., New York, has published its 1946-47 Edition of

*Best's Safety Directory* which covers information on over 1000 products, devices and equipment used in safety, first aid, hygiene, health conservation and fire protection.

International Harvester Co., Chicago, will be granted exclusive selling right on Nov. 1 of Whirlwind terracers, which will continue to be manufactured by Servis Equipment Co., Dallas, Tex.

Voss Machinery Co., Pittsburgh, has been appointed exclusive representative for Thriftmaster Products Division, Thomson Industries Inc., New York, to engineer and service the latter company's line of multiple spindle drillheads in western Pennsylvania, West Virginia, eastern Ohio and western Maryland.

Peabody Engineering Corp., New York, has begun construction of additional plant facilities at its works in Stamford, Conn.

Krich-Radisco Inc., Newark, N. J., has begun a sales program in co-operation with dealers and local banks by



which the banks display the complete line of home appliances carried by the dealers.

J. L. Vergilio Co., Cleveland, manufacturers representative, has changed its name to L. H. Waldrip Co.

Barker & Williamson, Upper Darby, Pa., has leased a new plant in Bristol, Pa., which will be devoted exclusively to special and development work.

Monsanto Chemical Co.'s Clinton Laboratories, Oak Ridge, Tenn., has begun a one-year staff training program in advanced nuclear physics for a group of 35 scientists and engineers.

Jessop Steel Co., Washington, Pa., has completed an order for 700 tons of stainless-clad steel for use in building 44 storage tanks for Welch Grape Juice Co., Westfield, N. Y. The tanks will be used to store 6,500,000 gallons of grape juice.

Vierling Steel Works, Chicago, has entered the only bid for the surplus East Chicago, Ind., steel foundry plant operated during the war by Continental Foundry & Machine Co. The Vierling company proposes to rent the plant without machinery at \$1200 a month for ten years with an option to buy the plant for \$307,500.

Electric Storage Battery Co., Philadelphia, has developed a new battery weighing five tons and having a capacity of 1500 ampere-hours, which is designed to power 30,000 pound electric industrial ram trucks.

Oil Well Supply Co., subsidiary of United States Steel Corp., New York, has opened a branch division sales office at 544-A Russ Bldg., San Francisco.

Pennsylvania Flexible Metallic Tubing Co., Philadelphia, has announced that its engineering department is now offering a piping layout design service.

American Heat Corp., Lowell, Mass., has developed a new-type industrial oil burner which is said to greatly increase heating efficiency.

Marion Electrical Instrument Co., Manchester, N. H., has established a special consulting service department to determine whether parts of products can be soldered by the company's induction soldering unit. Sample parts successfully soldered to date include: Small motors, metal toys, transformers, radios, phonograph turntables, radio dial pointers, jack springs, variable condensers, brass picture frames, steam radiator valves, elec-

trical fixtures, automotive parts and home appliances.

Metallurgical Laboratory, Babcock & Wilcox Tube Co., Beaver Falls, Pa., has announced that its straight nickel steel tubing has been trade named Nicloy.

General Purchasing Agency, Portland, Oreg., has been formed to offer purchasing advice and buying service to small manufacturers in the Portland area.

## High Quality Steel Spring Wire Now American-Made

Success in making quality steel wire for valve springs was achieved by American Steel & Wire Co., Cleveland, a subsidiary of United States Steel Corp., after the war cut off the main source of this product, the company has announced.

Sweden had produced virtually all of the steel rods for these springs and was able to make extremely fine quality rods by virtue of its high grade ore, its utilization of charcoal rather than coke, and its operation of small rolling mills, which permitted rods with virtually no seams or scratches to be manufactured. When this supply was cut off, the American steel industry faced the problem of replacing this type of steel.

American Steel & Wire has revealed how this was done by using extreme care in choosing raw materials, by using only carefully graded pig iron and steel scrap, and finally by developing improved steel-making practices which include special heat-treating methods and close rolling and drawing controls, all of which contributed toward producing a high-quality steel wire free from surface imperfections.

## Youngstown Steel Car Corp. Completes Plant Addition

Youngstown Steel Car Corp., Niles, O., has completed a \$250,000 addition to its Niles works.

Truck trailer frames will be made in the new building. Employment of 100 to 125 people in the new addition will boost the firm's total employment to 550 or 600 workers.

The addition, 80 x 260 feet, cost about \$100,000. An additional \$150,000 was spent for equipment.

During the war, the company made short special frames for trailers used on the Ledo road between China and Burma. L. C. Wilkoff, president of the company, said it has a large volume of orders for truck trailer frames, railroad car repair parts and other fabricated steel.

# Dallas Notes Industrial Rise With New Plants

*Eighty-four new manufacturing firms enter area since first of year. Employment shows gain*

DALLAS, TEX.

INFLUX of 84 new manufacturing concerns into Dallas so far this year has increased the total number of plants here to 1259, it is revealed in a new directory of manufacturing plants in Dallas county recently published by the Dallas Chamber of Commerce. These plants cover a broad range of manufacturing operations.

Coincident with the marked industrial expansion in progress in the area, it has also been announced that 1161 new businesses of all kinds have started operations since the first of the year.

Nineteen of the plants in operation here employ 500 or more workers; 74 of Dallas' manufacturers have international distribution of their products.

The new concerns have been a contributing factor to the unprecedented postwar high level of employment attained in Dallas during August. An overall gain of 6500 job placements during the month was reported by the U. S. Employment Service, with an estimated total employment in non-agricultural pursuits of over 190,850 persons.

## Steelstrapping Uses Shown At Industrial Museum

Three dimensional moving displays of steelstrapping applications feature the exhibit recently presented the Museum of Science & Industry, Chicago, by Acme Steel Co., Chicago. These models, viewed through polarized filter windows, present 15 different uses of steelstrapping for all types of products.

Center piece of the exhibit is a cut-away view of a freight car in which half of the cargo is braced by the conventional method and the rest is steelstrapped. Miniature hoboos seated on top of the two loads show different reactions as the freight car bounces along the track. The man seated on the conventional fixed load gets noticeable jolts, whereas his buddy, seated on the unit-loaded freight, shows hardly a quiver.

At another point in the exhibit cartoons are actually steelstrapped by a demonstrator.



# Fabricators Press for More Steel

*San Francisco manufacturers urge CPA allocate sheets to prevent threatened widespread shutdown of facilities Oct. 1*

## SAN FRANCISCO

THE San Francisco Chamber of Commerce, through its Iron & Steel Section, has started an intensive campaign to increase the supply of steel sheets available for San Francisco Bay area fabricators.

The chamber, in conjunction with representatives of sheet metal contractors and manufacturers, is petitioning the Civilian Production Administration to adjust its allocation of sheets in order to increase deliveries to many bay area shops which face shutdowns unless the supply is increased.

It was reported by the Chamber of Commerce that approximately 75 per cent of the sheet metal fabricators in this area will be forced to close by Oct. 1, unless some relief is obtained. Although there is a nation-wide shortage of steel sheets, it is claimed that the scarcity here is as acute, or more so, than anywhere in the country because local demand is three times greater than before the war.

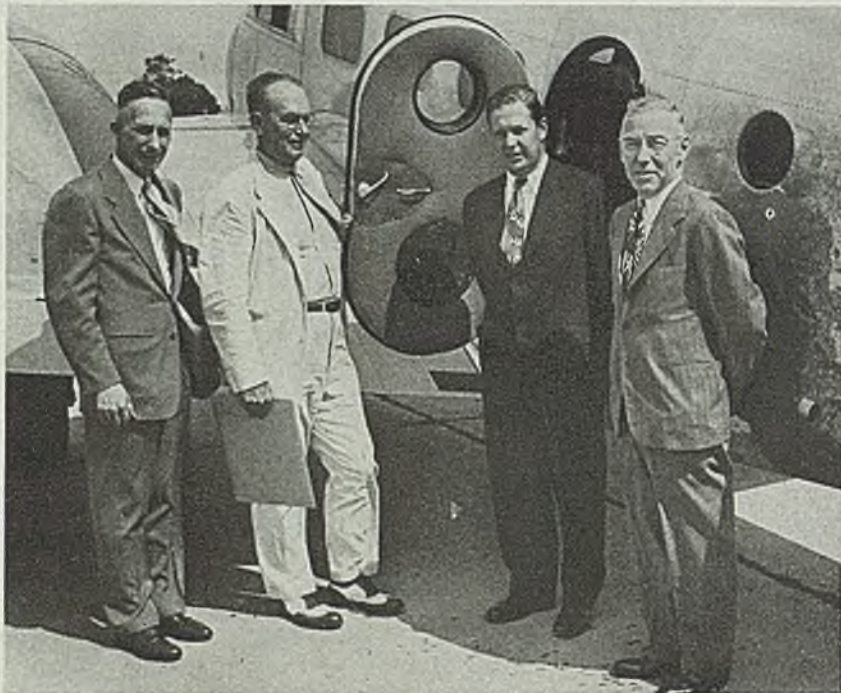
## Housing Causes Much of Demand

Much of the abnormal demand, the chamber pointed out, is caused by the veterans housing program, 20 per cent of which is concentrated on the West Coast.

Nat Lipman, representative of sheet metal contractors, said that members of that association here need more than \$50,000 of steel sheets per week to meet demand for products used in home building.

No relief from local sources is expected until some time next year when Columbia starts operation of its new rolling mill facilities at Pittsburg, Calif. The plant now is in the early stages of construction. Approximately 100,000 tons of sheets annually will be produced by Columbia at the new mill.

Meantime, despite Columbia's attempts to solve problems of local fabricators, it is claimed that a high percentage of Colum-



**FLY TO CUSTOMERS:** John A. Roebling's Sons Co., Trenton, N. J., has purchased a 5-passenger airplane for closer contact with its customers, distributors and branch offices. Shown ready to start a 10,000-mile flight to western and southern industrial centers are, left to right: Forest S. Burtch, manager of wire rope sales; Charles M. Jones, vice president in charge of public and industrial relations; Charles R. Tyson, president; and Ernest C. Low, vice president in charge of sales

bia's production for the third and fourth quarters of this year from its present facilities have been taken by CPA certification.

The present Columbia sheet mill is scheduled to be shut down around the first of this year to make way for installation of the new mill.

Directors of U. S. Steel Corp. are scheduled to meet in San Francisco for the first time in the company's history on Sept. 24.

While in the San Francisco area, the board members will spend two days in-

specting Columbia Steel's Pittsburg works, the Alameda plant of United States Steel Products Co. and the Oakland plant of the Cyclone Fence Division of American Steel & Wire Co., all subsidiaries.

Following the San Francisco meeting, the board will visit plants of the company in the Los Angeles area.

On the way to the West Coast the U.S. Steel party will inspect the properties of Geneva Steel Co. in Utah, and company facilities at Ironton, Utah. The Utah tour is scheduled to last three days.

## Acute Materials Shortage Aggravated in Pacific Northwest Area by Shipping Strike

### SEATTLE

INTERRUPTION of intercoastal water service is a severe blow to the West Coast steel industry, aggravating an acute shortage of materials and adding to current difficulties. It is particularly severe on fabricating plants which are unable to accept allocations as they come due unless shipping space is available.

Demurrage is accruing on cars at water terminals and if shipments are diverted to rail, where car space is tight, additional

freight of \$15 from Pittsburgh and \$11 from Chicago must be assumed. Consequently the industry in this area is being heavily penalized.

One local warehouse has 1000 tons en route while a local fabricator estimates an equal tonnage is either at shipping point or aboard ship. Deliveries are uncertain and pending contracts are being greatly delayed.

**Portland**—It is expected that the Kaiser Co.'s manufacturing activities, forced out



of Shipyard No. 3 at Richmond, Calif., will be centered here at the Swan Island shipyard. This was indicated by Edgar F. Kaiser who added that his firm had begun fabrication of aluminum passenger-bus bodies at Richmond. In this operation aluminum will be furnished by the Trentwood plant, under lease to Kaiser.

From a wartime peak of 131,000, shipyard employment in the Portland-Vancouver area has now declined to 4500 persons. Some are in repair yards, the others employed in completion of three cargo-passenger vessels.

Warning that private utilities in this area must depend more on their own resources is sounded by D. L. Marlett, assistant administrator of the Bonneville project. He urges that private firms use their auxiliary steam plants to avoid an anticipated power shortage. He states that the federal system has reached a peacetime peak of 2,114,000 kws and with the rapid increase in power demand he believes that production will be below requirements during the coming winter unless auxiliary plants are pressed into service.

Vancouver, Wash.—Local interests advised a subcommittee of the Mead National Defense Investigating Committee, at a hearing here, that they hoped to retain the Kaiser shipyard for industrial use. Civic leaders told U. S. Senator Hugh Mitchell and his colleagues that several requests had been filed by private concerns desiring to use the facilities of the plant.

## Foreign Trade Movement at Los Angeles Up in August

Exports and imports during August exceeded by \$2,735,103 the value of cargoes moving through Los Angeles harbor in July, the Marine Exchange of the Los Angeles Chamber of Commerce reported last week.

Value of all cargoes was \$16,373,444, which represented an increase despite a drop from 225,752 tons in July to 193,842 in August in actual goods handlings.

Exports, including the first shipments of cargoes moving directly to Greece since the war's end, totaled 165,989 tons, with a value of \$10,156,580.

Trans-Pacific exports topped the list with a value of \$4,217,814, compared to \$2,315,134 moving to points in the Western Hemisphere and \$3,623,632 to Europe and Africa.

The exchange report disclosed that August import shipments represented 27,853 tons with a value of \$6,216,864, of which \$1,556,423 were in trans-Pacific trade, \$3,665,313 from Western Hemisphere ports and \$995,128 from Europe and Africa.

# High-Level Operating Pace Held By Southern California Industry

*Index of general business in area reported at 140 per cent above prewar levels. Industrial employment still rising with unemployment claims declining. Consolidated-Lockheed merger reported considered*

## LOS ANGELES

INDUSTRY in southern California last week was operating at a high level of activity which has been accelerating since last August, according to the Research Department, Security-First National Bank, Los Angeles.

Index of general business has remained at about 140 per cent above prewar levels for the past six months, the report discloses. New population figures for Los Angeles were estimated at 1,870,000 and for the county 3,650,000. Total increase over populations in 1940 is thus set at 865,000, or 31 per cent.

Industrial employment has increased slightly during the six month period, although not in proportion to retail trade. Chief reason given by manufacturers for this condition is that steel and other basic metals are still difficult to obtain in quantity.

The number of persons in southern California filing claims for unemployment payments has declined substantially, the bank report discloses, concluding with an opinion that this trend will continue.

## Aircraft Merger Discussed

While details of a proposed merger of Consolidated Vultee Aircraft Corp. and Lockheed Aircraft Corp. have not been officially announced, it is understood that such a merger has been under discussion for some months and will be effected soon through exchanges of Lockheed and Consolidated stocks.

When such a program is effected it will give southern California the largest single airframe plant in the industry.

According to reports last week the basic arrangement for the merger is complete. With the working out of fiscal details the plan will be submitted to stockholders of the two concerns. Victor Emanuel, chairman of Aviation Corp., a holding company which reportedly owns 26 per cent of the common stock of Consolidated, disclosed that the program is receiving continuing and favorable attention.

Lockheed Aircraft management long has been identified with the view that merging action is indicated by the fact that there are a large number of companies in the aircraft industry in proportion to the amount of available business.

Lockheed attention is said to be concentrated on the San Diego and Ft. Worth operations of Consolidated where military type aircraft and commercial twin engine transports are made, as well as on the Stinson Division at Wayne, Mich., where personal planes are the chief product.

Maturity of the plan would give Lockheed unprecedented facilities for the manufacture of transport planes and big military ships. Commercial craft, it is apparent, would vary in size from feeder-line types as developed by the company, to the projected Model 37 Consolidated transport with capacity for several hundred passengers.

Backlog of Consolidated Vultee orders as reported last May was \$265,000,000. At about the same time Lockheed announced a backlog of approximately \$200 million.

Combined assets of the two companies, according to latest fiscal advices, is about \$300 million with total working capital of about \$90 million.

Comparatively, in 1932, Lockheed assets were listed as being \$42,744, when Robert E. Cross, president, assumed its management.

## Consolidated Steel Corp.'s Annual Report Delayed

Alden G. Roach, president, Consolidated Steel Corp., Los Angeles, told company stockholders last week the concern's annual report will be delayed because of accounting contingent on war contract terminations and other matters. He predicted an income of not less than that reported for the year ended Aug. 31, 1945. Earnings as of that date were \$3,505,746, equal to \$13.58 a share on common stock.

## Western Metal Congress To Be Resumed in Spring

Resumption of the Western Metal Congress & Exposition, which will be held in Oakland, Calif., Mar. 22-27, has been announced by W. H. Eisenman, managing director. Sponsored by the American Society for Metals, the show will be the first since 1941.



# Men of Industry



WALTER B. BRIGGS

Walter B. Briggs has been appointed general manager, Power Transmission Division, Lovejoy Flexible Coupling Co., Chicago. Mr. Briggs had been manager, Power Transmission Division, Ideal Industries Inc., Sycamore, Ill.

—o—

William J. Morris has retired as active executive head of Continental Supply Co., Dallas, Tex., having completed 40 years with Youngstown Sheet & Tube Co.; Youngstown, and its sales subsidiary. He will continue as chairman of the board of the Continental company, and will be available when needed in an advisory capacity. Mr. Morris joined the Youngstown Sheet & Tube Co. in 1906, as a cost clerk in the accounting department. Within a few years he became vice president in charge of finances. He was president of Continental since the early 1930s.

—o—

Harold N. Ewertz has been appointed sales manager, Electrode Division, McKay Co., York, Pa. From 1938 until 1944, he was sales manager, Arcos Corp., Philadelphia. Mr. Ewertz was recently released from the Army. He is a member of American Welding Society which his father, Eric Ewertz, helped found.

—o—

I. R. Mockrin and W. A. Blum have accepted appointments to the research and development department, Pennsylvania Salt Mfg. Co., Philadelphia. Mr. Mockrin was research engineer with Battelle Memorial Institute, Columbus, O., and Mr. Blum was with the Tennessee Valley Authority. Other additions to the technical staff at Pennsalt's White-marsh Research Laboratories include W. A. Millsaps, A. J. Baldi and Miss A. L. Nicholson. Mr. Millsaps was with chemi-



M. T. HERREID

cal warfare service, Edgewood Arsenal, Md. Miss Nicholson was librarian, development department, Naugatuck Chemical Division, United States Rubber Co., New York. Following their release from the service, J. H. Koob, L. C. Dormuth, R. A. Sprout, S. D. Loomis, and C. W. Hagerman, members of the company's research and development staff, recently returned to their old positions.

—o—

M. T. Herreid, vice president of Koppers Co. Inc., Pittsburgh, has been appointed manager of Koppers plants at Granite City, Ill., and St. Paul. J. F. Byrne, vice president of the company, has been appointed to a special assignment for the Engineering & Construction Division. Mr. Herreid will maintain his offices in St. Paul, and Mr. Byrne in New York. Stanley N. Brown, vice president of Koppers, has been appointed manager of the new finance department, and J. N. Forker, vice president, has been named general manager of the new Tar Products Division. Dan M. Rugg and W. Reed Morris, both vice presidents, have been appointed general managers of the new Chemical Division and the new Gas & Coke Division, respectively. George M. Walker has been named manager of the company's new control section, attached to the president's office.

—o—

Homer A. Size and Arthur X. Nelson have been appointed representatives in the application of Bryant gas combustion elements to industrial and process heating equipment, Industrial Division, Bryant Heater Co., Cleveland. Mr. Size will represent the division in California, and Mr. Nelson, Operating Plant Equipment Inc., will serve the Minneapolis area. For the last 2 years, Mr. Size has



T. L. KISHBAUGH

been partner and manager of Immersion Heating & Equipment Co., Los Angeles. He will continue this association, in addition to serving as Bryant representative in Los Angeles. Mr. Nelson has just been released from the Navy.

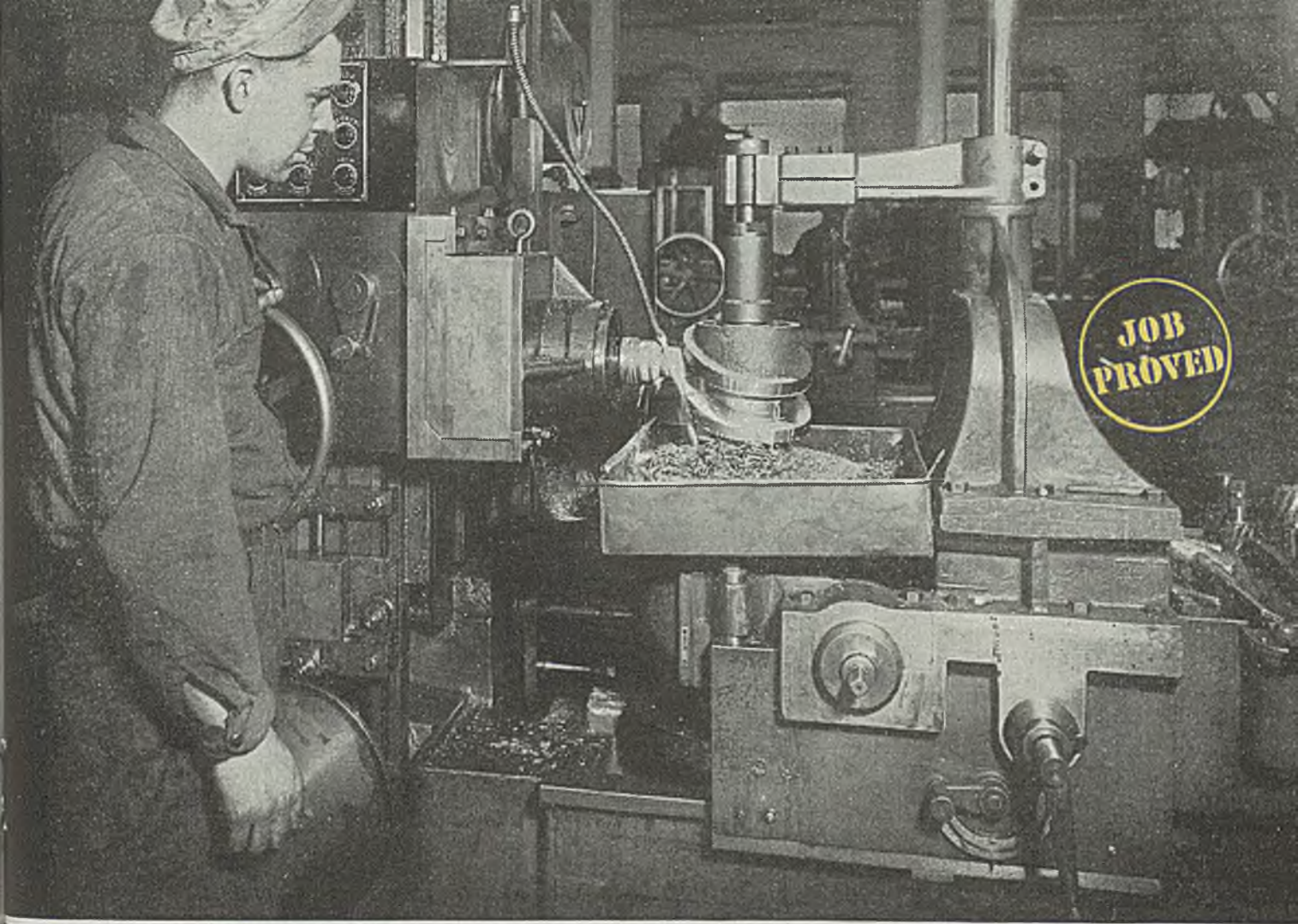
—o—

T. L. Kishbaugh has become associated with the new Los Angeles plant of Joseph T. Ryerson & Son Inc., Chicago. It is expected that the Los Angeles plant will be placed in operation this fall. Mr. Kishbaugh recently spent several months at the Chicago headquarters of the company, where plans for the new plant were formulated. He had been vice president and merchandising manager with Earle M. Jorgensen Co., Los Angeles, until early 1946. In 1942 and 1943, he headed the Alloy Division, Warehouse Branch, Steel Division of the War Production Board, Washington.

—o—

Wendell Richards has been promoted to the post of market research manager, R. G. Le Tourneau Inc., Peoria, Ill. The position had been vacant for the last few months. Mr. Richards joined the company in 1935, and handled government sales and assisted sales managers until 1940, when he was sent to Washington as representative. In 1944 he was made district sales representative in Pittsburgh, Philadelphia and Baltimore. Cloyd Richards has been named general service manager of the company. He joined Le Tourneau in 1937, and had been assistant service manager since February, 1945. O. A. Williams has been appointed eastern sales manager, succeeding Harry Conn, resigned. He had been district sales representative in Ohio, Indiana and Michigan for the last 3 years. Replacing Mr. Williams is C. F. Zimmerman, former general service manager,





**CUTTER LIFE DOUBLED ...** *Costs cut 25%*

## **SUNOCO EMULSIFYING CUTTING OIL**

**Used for Milling Cams, Eliminates Stains and Odor, Produces Better Finish**

A well-known machine-tool builder, in the cam-milling operation shown above, was not obtaining satisfactory finish. The cutting emulsion had an objectionable odor and had to be changed every two weeks.

**Lubrication costs** were cut 25% when they changed to Sunoco Emulsifying Cutting Oil for both milling and grinding. The new oil lasts more than four times as long. Cutter life has doubled. Finish has improved. Objectionable odor eliminated.

**The facts:** Machine: Rowbottom cam miller  
Operation: Milling cams  
Material: Air-cooled alloy steel casting  
Depth of cut:  $\frac{3}{16}$ "

Tool: High-speed Weldon end mill  
Cutting Lubricant: 1 part Sunoco to 15 parts water

In hundreds of shops Sunoco Emulsifying Cutting Oil has been "Job-Proved." It mixes easily with water. Its high cooling and lubricating qualities are important wherever ferrous or non-ferrous materials must be cut with precision and at high speed.

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Sponsors of the Sunoco News-Voice of the Air — Lowell Thomas

**SUN**  
— **SUNOCO** —

**INDUSTRIAL  
PRODUCTS**



who has been with the firm since 1937. He became general service manager in 1939. Harold R. McQuarrie has been appointed to the newly created post of assistant to the domestic sales manager. His duties will include serving as departmental co-ordinator. Mr. McQuarrie had been eastern credit manager.

Paul C. Kimball has been elected a director of Federal Mfg. & Engineering Corp., Brooklyn, N. Y. Mr. Kimball is syndicate manager of Sills, Minton & Co., Chicago, and secretary and treasurer of Ampco Metal Inc., Milwaukee.

Maxwell V. Miller has been elected president, Royal Typewriter Co. Inc., New York, succeeding the late E. C. Faustmann. Mr. Miller had been vice president in charge of sales of the company. Arthur E. Davis, treasurer of the firm, has been named vice president.

Russell Strickland has been appointed vice president in charge of sales, Bower Roller Bearing Co., Detroit.

Richard S. Hoover has been elected treasurer, Hoover Co., North Canton, O. He has been active in the company since 1932.

Robert W. Barker, manager of the accounts payable and receivable department at Bethlehem Pacific Coast Steel Corp.'s San Francisco headquarters, has retired after 39 years with the company.

H. C. Stone, metallurgist, Belle City Malleable Iron Co., Racine, Wis., has been appointed chairman, for 1946-47, of the inspection of castings committee of American Foundrymen's Association. F. L. Bender, chief inspector, Chicago Hardware Foundry Co., North Chicago, Ill., has been named vice chairman of the committee. H. R. Youngkrantz, assistant chief metallurgist, Apex Smelting Co., Chicago, will serve as secretary.

New officers of Potter & Johnston Machine Co., Pawtucket, R. I., are as follows: Jacob Ziskind, president; J. Earle Makant, vice president in charge of plant operations; J. Potter Cunningham, vice president in charge of sales; Norman R. Earle, vice president; Carl A. G. Birke-dal, treasurer; and Abraham Ziskind, secretary.

John S. Hegeman, Detroit district manager of sales for Bethlehem Steel Co., Bethlehem, Pa., since 1911, has retired. W. D. Pittman, formerly assistant manager of sales at Detroit, has been named to succeed Mr. Hegeman as manager. Mr. Hegeman joined Bethlehem in 1904

as a machine operator, and after entering the sales department was assigned to Detroit in 1911. Mr. Pittman joined Kalman Steel Co., Chicago, in 1923 as an engineer, and was transferred to Detroit a year later. He joined Bethlehem in 1931 when Kalman became affiliated with Bethlehem Steel.

T. A. Peebles, vice president in charge of engineering, Hagan Corp., Pittsburgh, has retired after 30 years with the company he helped to found. While he relinquishes his connection with the organization, Mr. Peebles remains financially interested in the enterprise and will function as an engineering consultant. F. W. Richardson has been appointed to cover British Columbia for Northwest Filter Co., Seattle, representative for Hagan Corp., Hall Laboratories, and Bull & Roberts. An office has been established in Vancouver to cover all of British Columbia.

Wilson N. Pratt has been appointed to supervise all powder metallurgical engineering activities of Charles Hardy Inc., New York. Charles J. Hardy, son of the late founder and former president of the company, has joined the engineering staff.

J. W. Burdick has been named sales manager, New York district, Washington Steel Corp., Washington, Pa. He will maintain a temporary sales office in Hartford, Conn. Mr. Burdick has been associated with steel sales work in the New York and New England district since 1938.

Earnest V. Haines has been appointed head of the newly created patent department, International Minerals & Chemical Corp., Chicago. He will work in the Chicago headquarters of the company under Dr. Paul D. V. Manning, vice

president in charge of the Research Division, and will handle all details relating to patent developments for the corporation. Mr. Haines was recently released from the Army.

Alfred W. Dodd, vice president, American Zinc, Lead & Smelting Co., St. Louis, will resign, effective Oct. 1. Mr. Dodd has been connected with the company and its subsidiaries during the last 30 years. He served as eastern manager of sales, vice president and director.

Stewart Bates has been appointed director general of Economic Research Branch, Department of Reconstruction and Supply, Canada, succeeding Dr. W. A. Mackintosh who has resigned. Mr. Bates had been deputy director general of the Economic Research Branch.

D. D. Reichow, manager of industrial relations, B. F. Goodrich Co., Akron, since 1941, has been named assistant to the vice president in charge of employee relations. He joined the company in 1925, and was named manager of industrial relations in 1941. Clyde O. DeLong has been appointed merchandise manager of the company's Industrial Products Sales Division, succeeding Fred A. Lang, recently appointed general manager of a newly created Shoe Products Sales Division. J. R. Thompson, with B. F. Goodrich since 1930, has been named Denver district manager of the Industrial Products Sales Division. He succeeds John Gullledge, who has been acting district manager in Denver, and will now be assigned other duties in the division. Mr. Thompson was recently released from the Army.

Robert D. Evans has joined the Sales Development Division, Caterpillar Tractor Co., Peoria, Ill. He will be civil engineering consultant on earth-moving equipment and its applications. He had been chief field engineer with R. G. Le Tourneau Inc., Peoria.

Nelson Forsyth Caldwell, of Cincinnati Milling Machine Co., Cincinnati, has received the insignia of honorary officer of the Civil Division, Most Excellent Order of the British Empire. The award was in recognition of his services as director, Machine Tool Division, British Army Staff, British Ministry of Supply Mission.

John L. Gillis, vice president, Johnson & Johnson International, subsidiary of Johnson & Johnson, New Brunswick, N. J., will join Monsanto Chemical Co., St.

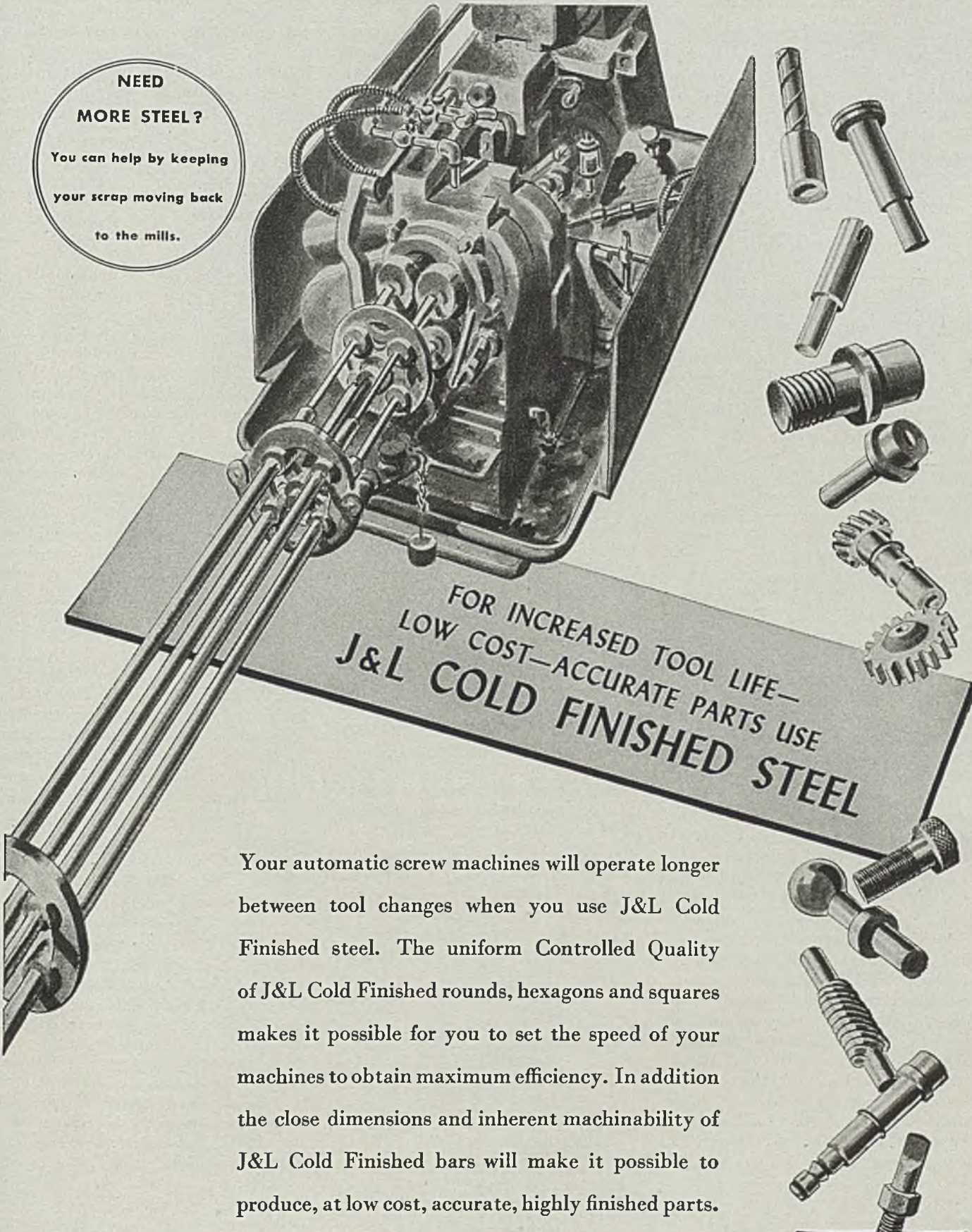


J. W. BURDICK



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You can help by keeping  
your scrap moving back  
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FOR INCREASED TOOL LIFE—  
LOW COST—ACCURATE PARTS USE  
**J&L COLD FINISHED STEEL**

Your automatic screw machines will operate longer between tool changes when you use J&L Cold Finished steel. The uniform Controlled Quality of J&L Cold Finished rounds, hexagons and squares makes it possible for you to set the speed of your machines to obtain maximum efficiency. In addition the close dimensions and inherent machinability of J&L Cold Finished bars will make it possible to produce, at low cost, accurate, highly finished parts.

**JONES & LAUGHLIN STEEL CORPORATION**

PITTSBURGH 30, PENNSYLVANIA

**J&L  
STEEL**



Louis, on Oct. 1. Mr. Gillis was formerly connected with the Monsanto foreign department as general export manager and assistant director of the department, having left in June, 1944, to go with Johnson & Johnson. He originally joined Monsanto in 1933.

Kenneth A. Helmly has been promoted to manager of mail order sales, Southern States Iron Roofing Co., Savannah, Ga., succeeding E. C. Boyce who recently became director of advertising for the company. Mr. Helmly joined the company in 1938. Following service in the Army, he entered the company's sales department, and became assistant manager of the Mail Order Sales Division in November, 1945.

James R. Reed has been named manager of the commercial research department, Allis-Chalmers Mfg. Co., Milwaukee. Jerome F. Fitzsimmons has been appointed supervisor in charge of research, and Anson J. Bennett Jr., supervisor in charge of sales analysis. Mr. Reed has been with the company in a statistical capacity since 1941. Mr. Fitzsimmons joined the concern in 1943. Mr. Bennett has been with the company nearly 3 years.

E. A. Tice has been appointed a corrosion engineer with the corrosion engineering section, Development & Research Division, International Nickel Co. Inc., New York. He was an engineer in the field of corrosion in the research department of Bethlehem Steel Co., Bethlehem, Pa. Mr. Tice is a member of American Society for Testing Materials, National Association of Corrosion Engineers, and Electrochemical Society.

Walter L. Seelbach has been appointed president and general manager, Superior Foundry Inc., Cleveland, which organization recently acquired Superior Foundry Co., Cleveland. Mr. Seelbach formerly was secretary-treasurer of Forest City Foundries Co., Cleveland. Other officers of the new company are: Vice president, Charles F. Seelbach; secretary-treasurer, Philip Frankl; and assistant secretary, Irene Grentzer. George J. Feiss, formerly president of Superior Foundry Co., will remain in a consulting capacity.

The following have been appointed to serve on the technical committee of Gray Iron Founders' Society: Chairman, George Johnstone, president and general manager, Lawrence Foundry Co., Grove City, Pa.; Dr. R. A. Flinn, Mahwah, N. J., factory, American Brake Shoe Co., New York; Harry W. Dietert, Harry W.

Dietert Co., Detroit; J. D. Judge, Hamilton Foundry & Machine Co., Hamilton, O.; and J. S. Vanick, International Nickel Co. Inc., New York.

J. P. Martel has been appointed manager, Design Division, engineering department, E. I. du Pont de Nemours & Co., Wilmington, Del., succeeding Melvin F. Wood, recently appointed assistant chief engineer of the company. F. W. Pardee Jr. has been named assistant manager of the Design Division, and R. P. Genereaux, assistant to Mr. Pardee on special assignment. Mr. Martel joined the Du Pont company in 1919, and had recently been assistant manager of the Design Division. Mr. Pardee came to the company in 1928, and Mr. Genereaux in 1929. Both were supervising engineers in the division.

Hugh S. Morris has been appointed purchasing agent, Paragon Electric Co., Two Rivers, Wis. Mr. Morris was assistant to the director of purchases and electrical buyer for Leathem D. Smith Shipbuilding Co., Sturgeon Bay, Wis.

Ralph Livsey has been appointed manager, Air Control Division, Gordon Armstrong Co., Cleveland. Mr. Livsey was manager of special products sales, Berger Mfg. Division, Canton, O., Republic Steel Corp., Cleveland. He had been with the division for 28 years.

Ferdinand H. Raab has been appointed industrial relations manager, Copperweld Steel Co., Glassport, Pa.

Harry W. McQuaid, Union Commerce Building, Cleveland, has opened a consultant service covering process and product development in electric furnace melting, steel processing, automotive metallurgy, farm implement metallurgy, oil production metallurgy, plated and hot dip

coatings, free machining steels, and metallurgical factors in design. Mr. McQuaid was with the metallurgical department of Republic Steel Corp., Cleveland, which he joined in 1933. Earlier, he was a metallurgist with Timken Roller Bearing Co., Canton, O. At the National Metal Congress and Exposition in 1938, Mr. McQuaid received the Albert Sauveur Achievement Award.

E. D. Riordan has been named director of industrial relations, Lukenheimer Co., Cincinnati. He was formerly with Kaiser-Frazer Corp., Willow Run, Mich.

H. J. Wollner has resigned as secretary in charge of the New York office of the United Nations Standards Co-ordinating Committee. In undertaking the job of organizing western hemisphere activities of the committee in 1944, Mr. Wollner understood that he would stay with the organization until June 30, 1946, by which time it was hoped a new international standards body, permanent in character, would have been created. It is expected that when all of the national bodies meet in London in October, the new organization will have been launched.

Albert A. Bauer has been appointed district representative in Philadelphia for Sawhill Mfg. Co., Sharon, Pa. He will handle the sale of Sawhill steel pipe nipples in a portion of Pennsylvania, New Jersey, Maryland, Delaware, and Washington.

J. Paul Carroll has been appointed advertising manager, American Brake Shoe Co., New York. He has been with the company since February, 1943.

C. W. Baker has been appointed assistant chief engineer, Lewis Foundry & Machine Division, Blaw-Knox Co., Pittsburgh. His new duties will include specializing in design of Lewis products. He has been on the engineering staff of the division since 1929.

John L. Newell has been appointed sales representative in the eastern territory for C. M. Smillie & Co., Ferndale, Mich. His headquarters will be in Livingston, N. J.

Harvey P. Barnes, Euclid, O., has been appointed sales engineer, Cleveland and northern Ohio territory, Hannifin Mfg. Co., Chicago.

John W. Mighton, recently released from the Navy, has joined the magnesium sales staff of Dow Chemical Co., Midland, Mich. He is working on sand and



FERDINAND H. RAAB





HAROLD J. O'NEILL

Assistant to the vice president and co-ordinator of national accounts, General Detroit Corp., Detroit, STEEL, Sept. 16, p. 88.



CARL W. MYERS

Who has been elected president, Colorado Fuel & Iron Corp., Denver, noted in STEEL, Sept. 16 issue, p. 93.



GEORGE W. PUTNAM

Appointed district manager, Central District, Republic Steel Corp., Cleveland, noted in STEEL, Sept. 16 issue, p. 92.

permanent mold casting orders. Ray H. McLeod, also recently released from the Navy, has joined the company's cathodic protection sales staff, and is working in the Chicago office. Howard P. Atkin, recently released from the Army, has become a member of the firm's cathodic protection sales staff, and works in the Los Angeles office.

Hutson Colcock has resumed his duties as field representative in the New Orleans territory for Curtis Lighting Inc., Chicago, after 5 years in the Navy.

Dr. George B. Hatch, who has specialized on detergents and threshold treatment for the last 10 years on the research staff of Calgon Inc., Pittsburgh, has been assigned to research on Banox, the company's new product for protective treatment of metal surfaces. He will also continue to be associated with research in threshold treatment.

C. E. Frudden, a consulting engineer for Allis-Chalmers Mfg. Co., Milwaukee, has been elected to the 1947 national presidency of Society of Automotive Engineers. He will take office at the end of January, and will succeed L. R. Buckendale, of Timken-Detroit Axle Co., Detroit.

James G. Graham has been appointed district manager, Railroad Division, Fairbanks, Morse & Co., Chicago. He will contact railroads in Chicago and the West. Mr. Graham had been general manager of railroad sales, Oliver Iron & Steel Corp., Pittsburgh.

R. J. Leckrone has been appointed chief engineer in charge of engineering and machinery sales, Pittsburgh Steel Foundry Co., Glassport, Pa. Mr. Leck-

rone had been with Lewis Foundry & Machine Division, Pittsburgh, Blaw-Knox Co., as chief engineer. In his new position, he will head the company's engineering activities for both its plants, at Glassport and McKeesport, Pa., as well as sales activities in the general machinery field. He will maintain headquarters in Pittsburgh.

J. W. O'Brien has been appointed chief engineer, United Engineering & Foundry Co., Pittsburgh. Mr. O'Brien, formerly assistant chief engineer, has been with the company 13 years. Howard N. Fry, who has 24 years of service with the company, has been appointed assistant chief engineer.

Norris J. Clarke, senior vice president, Republic Steel Corp., Cleveland, left Sunday, Sept. 22, on the *Queen Mary*, for a European tour to survey the situation there as regards trade prospects, for his company. He recently made a similar tour of South America.

Cleve H. Pomeroy has been appointed president, National Malleable & Steel Castings Co., Cleveland, succeeding the late Charles H. McCrea. Mr. Pomeroy has been with the company since 1920. Originally credit manager, he advanced to assistant treasurer, treasurer, secretary and treasurer, and in 1944 was made vice president in charge of finances. He has been a director since 1938. Mr. Pomeroy will retain the duties of treasurer.

J. S. Fluor Jr. has resigned as executive vice president and general manager of Fluor Corp. Ltd., Los Angeles.

J. W. LeRoy has been appointed manager of special products sales, Berger Mfg. Division, Canton, O., Republic

Steel Corp., Cleveland. Mr. LeRoy previously traveled as a sales engineer for the special products department of Berger.

William Dean has been appointed safety director, Morse Chain Co. Inc., Ithaca, New York. He had been safety director for a number of years with Ithaca Gun Co., Ithaca, where he will continue to serve temporarily in a consulting capacity.

A. E. Vallier, former officer in charge of the Lansing, Mich., regional office, Detroit Ordnance District, has joined Ford Motor Co., Dearborn, Mich., as assistant to V. Y. Tallberg, administrative engineer.

## OBITUARIES . . . .

Royden P. Whitcomb, 64, personnel director, New Jersey Zinc Co., Franklin, N. J., died recently at his home in Westfield, N. J.

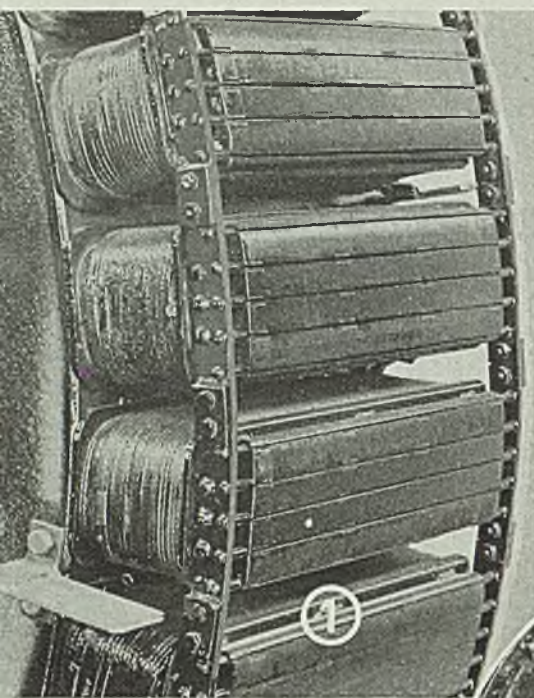
Brownrigg L. Norton, 45, assistant vice president and eastern representative, Scullin Steel Co., St. Louis, died recently at his home in Larchmont, N. Y.

Harold A. Prest, 48, president, Prest Pattern Works, Chicago, died in that city, Sept. 13.

Brice A. Buckingham, 46, salesman, National Sheet Steel Co., Chicago, died Sept. 15 in an airplane crash at Niles, Ill., a Chicago suburb.

Frank B. Neefus, 83, who retired 20 years ago as New York representative of Wheeling Corrugating Co., Wheeling, W. Va., died at his home in Laurel, L. I., N. Y., Sept. 12.





# Braze Welding DAMPER

Steps and principles used in joining damper windings to insure permanence of electrical characteristics in large synchronous motors and generators which must start high torque loads

By GLENN STANGLAND  
Electrical Engineer  
Electric Machinery Mfg. Co.  
Minneapolis

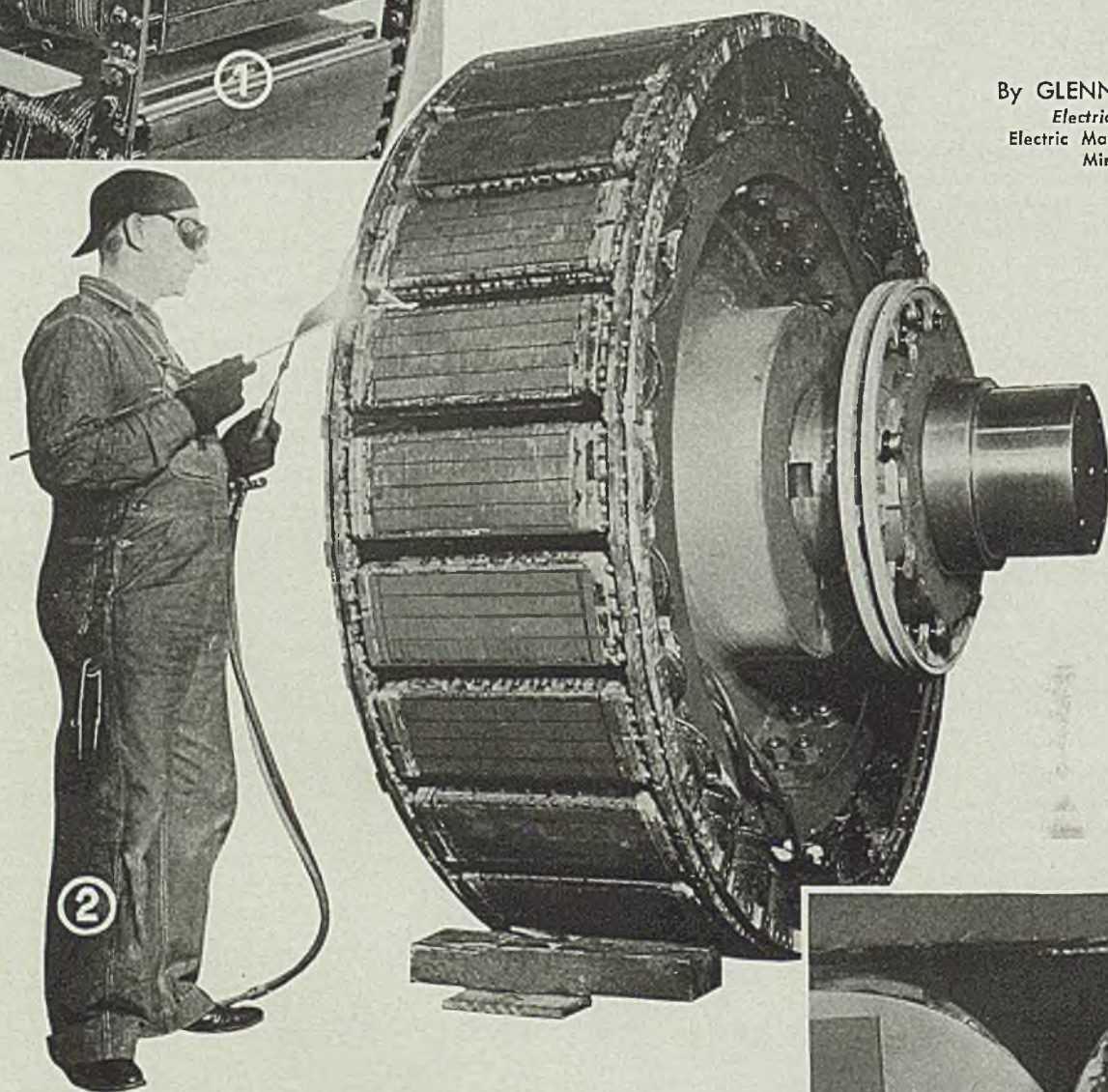


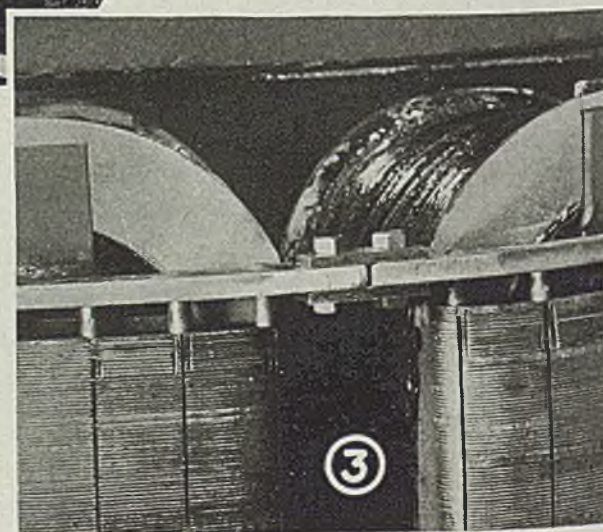
Fig. 1—Complete end ring on a motor with upper and lower amortisseurs, but a common end ring

Fig. 2 — Braze-welding end rings of rotor with double deck end ring  
Fig. 3—End-ring section construction before braze-welding the damper winding of a 3125-kva generator. Phos-copper shims are place on either side of bolted end ring joint

Fig. 4—Joint shown in Fig. 3 after braze-welding

Fig. 5—Double-deck end ring constructions for severe starting duty motor

Fig. 6—Damper bars being braze-welded to individual end ring sections before rotor assembly



# WINDINGS

ELECTRIC motor and generator fabrication has long utilized the techniques of welding for such ferrous applications as frames, spiders and bearing pedestals. Now the welder has reached the inside of the machine as well, having a great deal to do with insuring permanence of electrical characteristics of the machine.

This article briefly describes some of the steps and principles in braze-welding the amortisseur or damper windings of synchronous generators and of large synchronous motors which must start high torque loads. The term "braze-welding" is used with reference to a hard solder process carried out in the temperature region of 1300° F, in which either similar or dissimilar nonferrous materials are joined in adhesion.

According to definitions of the American Standards Association, an amortisseur (or damper) winding is a permanently short-circuited winding, usually uninsulated, so arranged as to oppose rotation or pulsation of the magnetic field with respect to the pole shoes. The term is commonly limited to forms having the conductors arranged in individually short-circuited groups with bolted or otherwise separable connections between the various groups.

Permanence of starting and pull-in torques in synchronous motor and damping torque in synchronous generators operated in parallel requires a form of construction unaffected by temperature changes and mechanical stresses during machine operation. Braze-welding is a superior method of satisfying the requirements.

Construction of Amortisseur Windings: The synchronous motor is started without field excitation, and utilizes the amortisseur type of winding on the rotor to start and accelerate the motor to near synchronous speed, whereon field excitation is applied. After the motor has syn-

chronized, the amortisseur ceases to produce torque except as angular oscillations of the rotor may require damping.

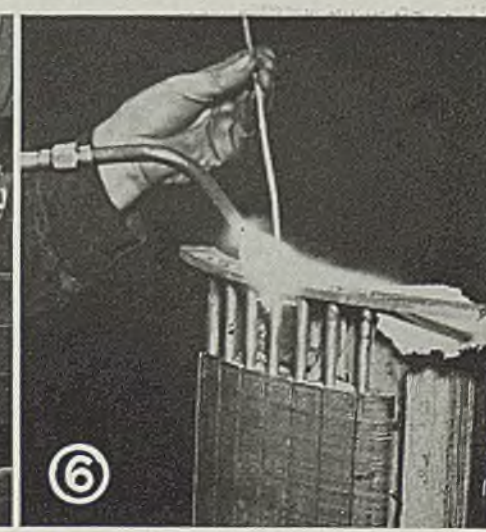
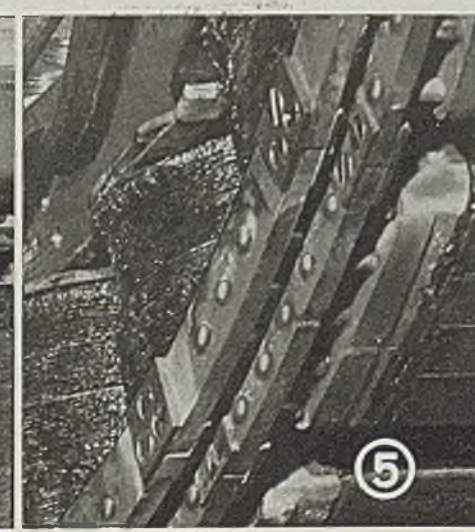
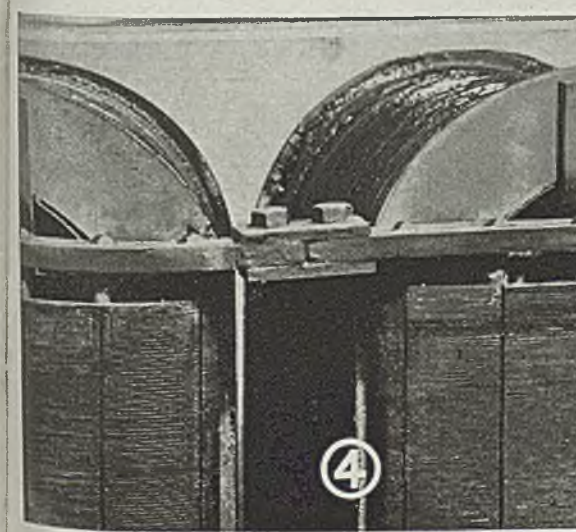
The amortisseur winding for starting is built up of heavy nonferrous bars imbedded in the pole faces, in semiclosed or closed slots. The groups of bars in each pole are joined at their ends by a copper ring (Fig. 1). Good electrical conductivity between the bars and the end ring is essential for unimpeded circulation of starting current.

As a matter of convenience in construction the end ring is usually built in sections which are braze-welded to the amortisseur bars of each pole piece before assembly of the poles on the rotor (Note Fig. 6). Then the assembled end ring sections are lapped, or butted and spliced.

The phos-copper used is about 94 per cent copper and 6 per cent phosphorous, with a melting point of about 1305° F, flowing at about 1400° F—below the melting point of copper. Since the material is self-fluxing on copper, no flux is used when a copper bar is joined to a copper ring. Some bars used for amortisseurs are of a copper alloy. With some alloys, flux must be used. The joining of end ring sections on the assembled rotor may be by bolting, and/or braze-welding, so that poles may easily be removed. Mechanical capacity of bolted joints may be adequate, but does not insure the retention of electrical characteristics which are essential to the maintenance of proper starting torques through the life of the machine. For this reason, braze-welding is considered a necessary adjunct to the bolting. Although present technique in braze-welding may permit omission of bolting for mechanical reasons, bolts are frequently employed as an additional safety factor.

In braze-welding amortisseur bars to end rings, the phos-copper is applied in the form of a rod. When braze-welding flat joints between pole end sections, the phos-copper is applied in the form of a thin shim. The shim or preplaced strip insures that the welding material will flow by capillary action into crevices which cannot be reached directly, since the material flows when the copper is at cherry red heat. As mentioned previously, flux need not be applied with the preplaced piece when copper is joined to copper although it is necessary to clean the surfaces thoroughly in order to insure self-fluxing.

For deep penetration of the brazing alloy in amortisseurs which have heavy starting (Please turn to Page 170)





Cutting and threading difficulties with 8600 series found to be more closely related to microstructure than hardness. Best results are obtained with fine lamellar structure resulting from proper annealing

# Machinability

## OF TWO NE STEELS

By ROBERT C. GIBBONS

Metallurgical Engineer  
Eclipse-Pioneer Division  
Bendix Aviation Corp.  
Teterboro, N. J.

MOST popular and interesting groups of National Emergency steels are the 8600 and 8700 series, especially those with carbon content of 0.28 to 0.43 per cent. Physical properties are excellent; processing, including forging and heat treating has caused no particular trouble; the Independent Research Committee on cutting fluids reports these steels as being readily machinable. In general, satisfaction has been such that the AISI adopted the 8600 and 8700 series as standard alloy steels.

However, one factor in the machining of certain of these steels is hindering their general adoption as postwar grades. That factor is the comparatively poor finish that is frequently obtained in automatic machines, particularly in threading operations. Also, as a normal result of poor finish, there are complaints of poor tool life.

The two steels with which the writer has had most experience are NE-8630 and NE-8740. These have generally been purchased under AMS specifications AMS-6280 and AMS-6322 respectively. For simplicity and conformation with the present AISI designation, these steels will be referred to by their new AISI numbers, C-8630 and C-8740.

When the NE steels were first introduced, machinability ratings reported by Prof. O. W. Boston and others indicated that the NE-8600 and NE-8700 series of steels were similar to the AISI 3100, 4100 and 4600 steels. For general machining with single point tools, this was found to be true but periodic complaints began to be reported from some machining departments in our shop which were encountering poor surface finish and poor tool life. Similar complaints were reported by other fabricators.

These complaints were all investigated and all led to three general conclusions:

1. When the E-8600 and E-8700 steels having 0.28 to 0.43 per cent carbon content were received with a uniform medium to coarse lamellar pearlite microstructure, with hardness of 187-217 brinell, no trouble was encountered in machining, and both surface finish and tool life were satis-

(Please turn to Page 174)

Fig. 1—Medium to fine lamellar structure. Best machinability.  
All micrographs are X750

Fig. 2—Coarse lamellar structure. Fair to good machinability

Fig. 3—Mixed spheroidized and lamellar structure. Machinability is variable, depending on type of cutting operation

Fig. 4—Slightly banded 75 per cent lamellar. Machinability fair to good on most operations

Fig. 5—Fine spheroidized. Machinability fair on most operations

Fig. 6—Coarse spheroidized. Machinability poor on most operations



**MEN GO TO MOUNTAIN:** When this page goes to press, I will be at The Homestead, Hot Springs, Va., "sitting in" at the 22nd annual meeting of the American Machine Tool Distributors' Association.

This is an association of capable men of broad experience, all of whom contributed much to the success of America's war production program. Upon their shoulders rests the responsibility for the domestic sale of a large proportion of America's output of machine tools and other metalworking machinery. In peacetime—or any other time for that matter—that involves a lot more than ringing door bells.

It has been figured out that a fairly substantial machine tool sale in normal times involves, on the average, more than 30 calls. In view of that, here is a fitting keynote for this convention: "I will lift up mine eyes to the hills, whence cometh my strength".

**MACHINE VISITS PROSPECTS:** When an old-time Yankee mechanical genius got up something, he didn't hang around his shop door waiting for prospects to beat a pathway to it. Mousetrap inventors may have done that, but Connecticut machinery builders loaded their creations into wagons and brought them to their prospects' doors—even out in the "Western Reserve" where Cleveland is located.

Edward P. Bullard III, vice president in charge of research, Bullard Co., Bridgeport, Conn., now has revived that practice by making a "swing-around-the-circuit" with his Man-Au-Trol spacer for accurate hole location without jigs. Using a truck instead of a wagon, he showed up with his creation at Motch & Merryweather's plant in Cleveland during the week of September 9; went on to the H. K. Porter shop in Pittsburgh for the week of the 16th; and will be at the Cincinnati Bickford plant in Cincinnati this week of the 23rd.

As one of many interested observers of Ed Bullard's demonstration here in Cleveland (in what used to be the "Western Reserve of the State of Connecticut"), I really was amazed at the speed and precision with which his hydraulically-actuated mechanism translates dimensions from a drawing to work under the spindle of a drilling machine—in this case a large radial.

Drilling, reaming and spotting a production run of bearing brackets used by one of the Cleveland machine tool builders, the Bullard spacer went through a prescribed cycle again and again, with the "snap" of an automatic gun and the precision of a jig borer. As Eli Whitney said of his musket lock plates, "Every part was exactly like every other part". But in addition to that, all these "spaced" parts were exactly like the drawing—that is, within a few "ten-thousandths". That last is something that stumped Eli and a lot of his successors right down to this year of 1946.

**UNIVERSITY OF LIGHT:** If you want to see the next thing to Shangri-La, visit Nela Park next time you come to Cleveland. Nela Park is the administrative and laboratory headquarters of the Lamp Department of the General Electric Co. There, in 20 buildings on a 100 acre "campus" overlooking Cleveland and Lake Erie, more than 1000 people are busily engaged in research, development, engineering and testing of new and improved light sources and methods of their application.

Through the courtesy of Ward Harrison and W. H. Rob-

## Seen and Heard in the Machinery Field

By GUY HUBBARD  
*Machine Tool Editor*

inson, Jr., who respectively head up engineering and advertising activities at Nela Park, I spent a day out there during the recent rededication ceremonies of the rebuilt and re-equipped Lighting Institute.

For 25 years this Institute has co-operated with city engineers and architects and industrialists in demonstration of how modern lighting best can be applied to cities and highways and homes and offices and factories and individual machines. Incidentally, if you as a machinery builder have lighting problems, the "old masters" (and the young ones too) at Nela Park stand ready to help you.

Since I was out there last, there have been tremendous strides in "tubular lighting". I was shown tubes whose rays will kill germs—in coolant for example. I saw other installations of fluorescent tubes which bring the equivalent of shadowless daylight to drafting rooms—cool light with none of the sickly green cast which formerly was associated with tube installations.

I saw tubes in circular form which can be "built in" around the spindles of drilling machines and similar machine tools. I also saw some pottery lamps of early Roman manufacture which look almost exactly like the little "teapot" oil lamps that I used to see hanging on wires over engine lathes in machine shops of the early 1900s—and I do mean A.D.

Dr. Matthew Luckiesh, director of the lighting research laboratory contends that artificial light no longer should be thought of "as something which competes with darkness", but rather "as something which competes with daylight." After my session at his University of Light at Nela Park I am inclined to agree with Dr. Luckiesh.

**SYNCHRONIZER:** Continuous cycling, automatic drill cleaning or deep hole drilling, and operations of one, two or more feeds synchronized with a single work-holding fixture are possible with the use of a drill press feed being manufactured by Bellows Co. of Akron. The air powered, hydraulically checked and electrically controlled unit assures utmost smoothness of feed. Independent speed controls permit infinite variation of feed and traverse rates. The feed is readily adaptable to millers, theaders and grinders, substantially increasing production wherever used.



# Upsetting Aluminum Heads

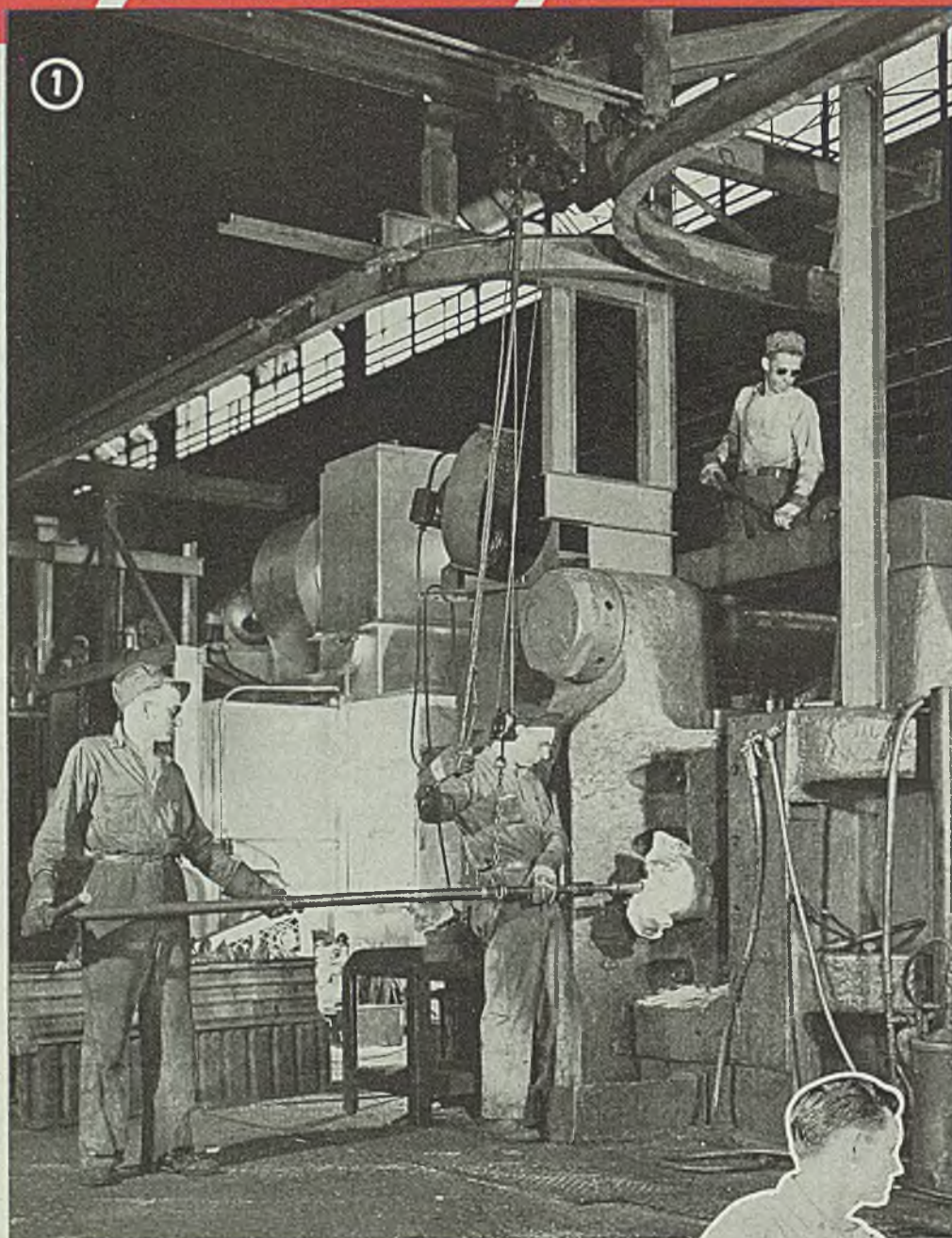
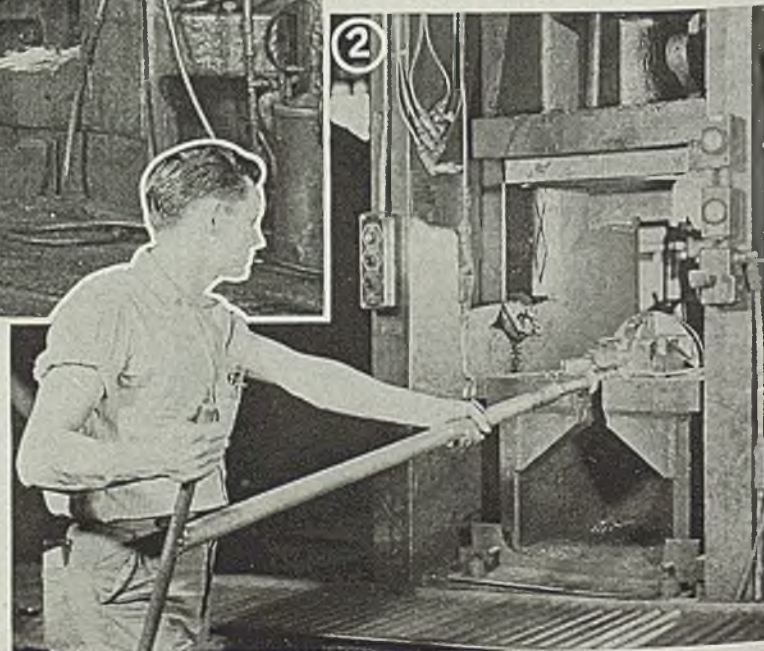


Fig. 1—Billet moves by monorail hoist to 8-in. Ajax up-setter and receives two forging passes

Fig. 2—Flash is removed in 215 trim press, following second forging pass

Fig. 4—Operator removes cylinder head billet from gas-fired, conveyor type furnace where it remained for 3½ hours and was brought up to 850° F



*Highly developed forging, heat treating and finishing practice described here is used in production of cylinder heads for radial aircraft engines*

By HARRY G. HOWELL  
Vice President in  
Charge of Production  
Tube Turns Inc.  
Louisville

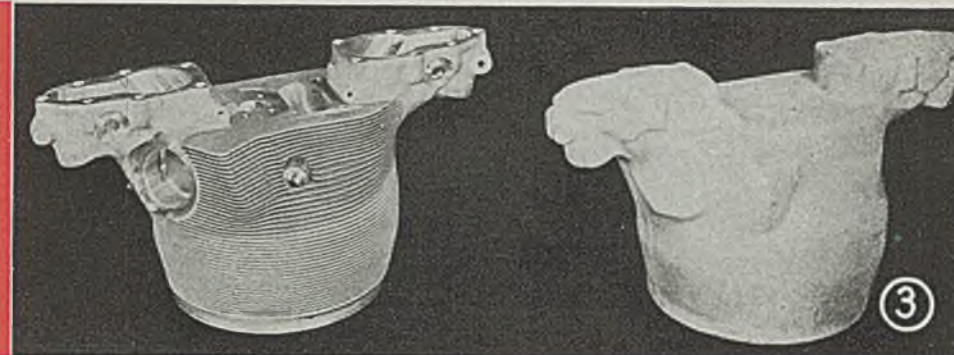


Fig. 3—Left, finished cylinder head, and shown at right, forged head

FORGED aluminum cylinder heads can be stressed in practice closer to the theoretical strength limit, permitting the development of as much as 30 to 50 per cent more power from radial aircraft engines of the Pratt & Whitney and Wright Whirlwind types. Flow lines in the forged part can be arranged to take care of the greatest stresses, in turn aiding more efficient use of material. Ductility differs also, being 1 to 3 per cent for a cast head with forged units of heat-treated 18S showing 8 to 14 per cent with the grain, 3 to 6 per cent across the grain.

These air-cooled engines have heat-dissipating fins cast integral with the head when the part is made in the foundry. Forged units must have fins machined in (Fig. 3). This extensive machining is facilitated by changing the material slightly. Cast units are made from 18S aluminum, containing 3½ to 4½ per cent copper, 0.49 to 0.90 magnesium, 1.7 to 2.3 nickel, remainder aluminum plus maximum limits of 0.9 per cent silicon, 1.0 iron, 0.25 zinc. To improve machinability, additions of 0.3 to 0.5 per cent lead plus 0.3 to 0.5 per cent bismuth are made, producing what is called XA18S aluminum alloy.

Best material for forged heads, however, appears to be Y-alloy, the same as 18S but with magnesium content ranging from 1.3 to 1.8 and with the lead-bismuth additions for improved machinability.

Practice in forging aluminum cylinder heads of this type

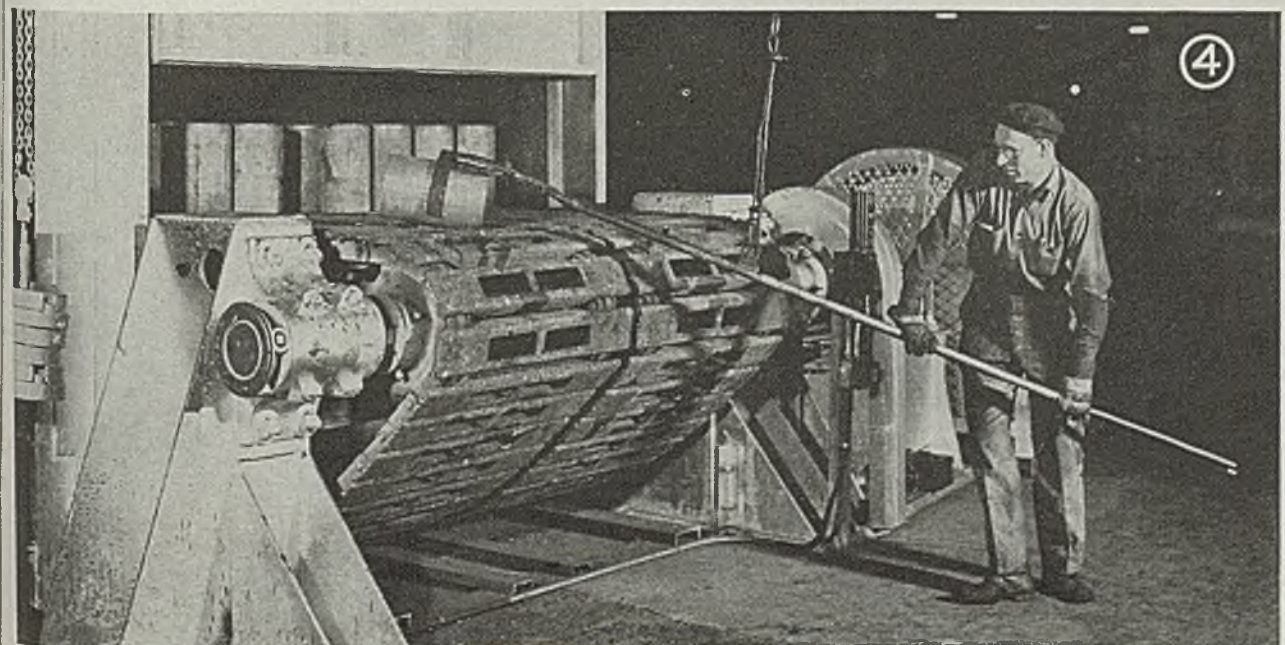
involves the following four operations: First, form ears on slug, then semi finish, next finish and finally (in upsetter) extrude and form cavity—"doming."

Extensive experience with large upsetters at Tube Turns Inc., Louisville, resulted in this method being selected for all four of the forging operations when, during the war, expanding aircraft production required setting up additional facilities for producing these cylinder heads. And so successful and technically advantageous was the method that, with slight variations, it is being used by the company for large-scale manufacture of heads for radial engines that are powering peacetime aircraft.

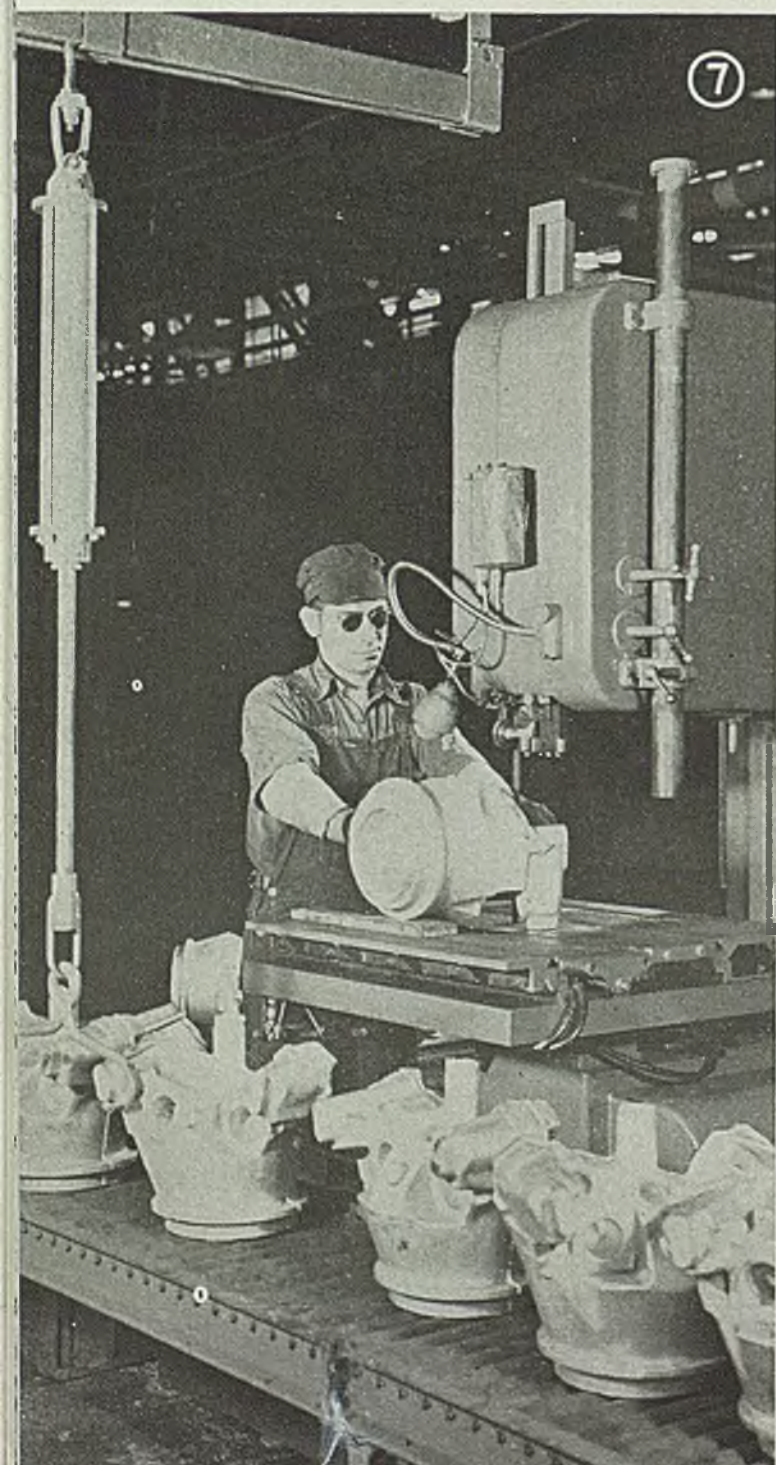
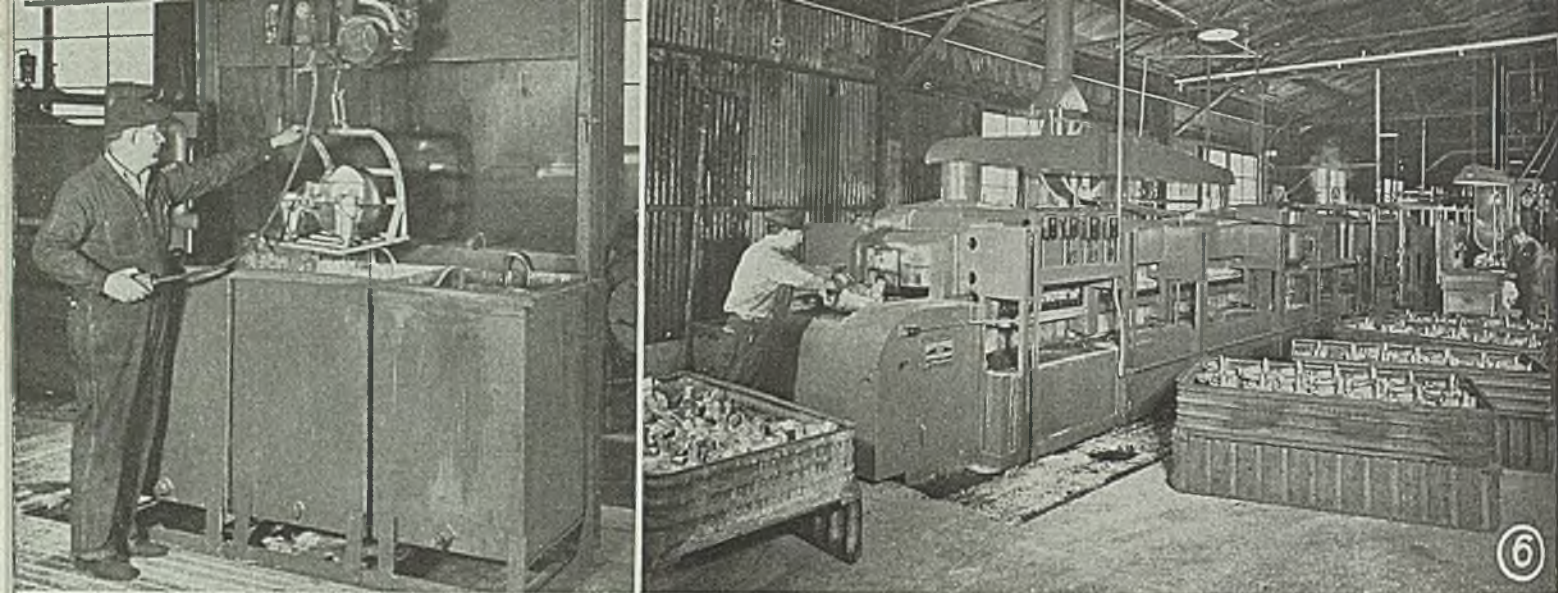
**Preparation for Forging:** A total of seven different types of cylinder heads are made in this modern plant, differing slightly in dimensions and contour. All are made from round forging stock 8 in. in diameter. Length of billets for forging varies from 11 to 15 in.

First step is to cut the billets to the length required; this is done on cold saws that will cut an 8-in. diameter bar in 11 sec. Saws use 32 or 36-in. diameter blades. A 1-in. radius is then turned on one end of the billet as an aid in controlling flow of metal during forging.

**Forging Sequence:** As mentioned, the company employs upsetters for all four of the forging passes instead of three press operations and a single upset. All four operations could be handled consecutively on a single up-







setter if die space were sufficient. However, dies for this job require that the work be broken up into two stages. Two forging passes are made in the first stage; then the dies are changed and the remaining two forging passes are made.

For details of construction and operation of these large hot upset forging machines (8 to 9-in. units are used here), see *STEEL*, Dec. 31, 1945, p. 52.

Billets are heated to a temperature of 850° F in a gas-fired furnace. This unit employs a slat type conveyor hearth 6 ft wide, 35 ft long. Billets are loaded onto this conveyor in rows, 8 to a row. They are cut and chamfered in a small adjacent building, loaded on skids and moved into the forging shop by power trucks. Furnace conveyor is loaded by hand. Heating period is 3½ hours.

Billets are unloaded from the heating furnace individually by means of tongs suspended from an overhead monorail conveyor as shown in Fig. 4. From this point, the operator moves the work on down the monorail to the 8-in. Ajax upsetter, Fig. 1.

The work goes through two passes in rapid succession. A novel arrangement of detachable porter-bar head and porter bar is used here to facilitate handling during these and subsequent forging and trimming operations. As work goes in first die impression, a porter bar with a detachable head is also inserted in such a manner that the metal is forced to flow around the porter-bar head, securely locking the work on the head for further handling. Billet from the heating furnace is placed on cross bars and the dies are so designed as to pick up the work from this support for this first forging operation.

Work is moved from first to second die impression by means of the porter bar shown engaging the detachable porter-bar head in Fig. 1. Another monorail fitted with an electric hoist helps the operators in manipulating the work.

Following the second die impression, the heads are carried to the trimming press, Fig. 2, for removal of flash, and reheated. Meanwhile, the dies are changed for the second stage of the operation. The work is handled by means of a porter bar that engages the short porter-bar head imbedded in the forging in the first pass. The third pass is made in the lower die impression and the fourth pass in the upper die impression. Then the heads are re-





*Fig. 5—Heads are spot-checked during forging operation. Here inspector is putting a cylinder head through caustic soda, nitric acid and hot water rinses preparatory to visual examination*



*Fig. 6—When heads reach finishing department they are first put through this continuous type Ransohoff cleaning machine, where they are drenched in hot caustic, hot water rinsed, drenched in nitric acid, and again hot water rinsed*

*Fig. 7—Next step is to trim off bosses and bases. Air-operated hook lifts heads off conveyor and swings them onto saw, expediting operation and relieving operator of continual physical strain*

*Fig. 8—View of section of conveyorized finish line where heads are ground and buffed with air-driven hand tools*

*Fig. 9—Brinell inspection is on production-line basis, as shown here*

*Fig. 10—Rough-finished heads are loaded carefully to prevent damage in transit*



turned to the trim press for the second and final removal of flash, and from there are sent either to the etching and clean-up departments or to the heat treat department.

During the forging operation, the work is spot-checked to make sure that proper tolerances and quality are being maintained. Following caustic soda, nitric acid and hot water rinses, (Fig. 5) the heads are subjected to both visual and dimensional inspections. First, the inspectors examine all elevated areas, making sure that they are properly filled out, and look for smears and laps. Then measurements are made of the dome, skirt, port holes, flash, overall height, and the overall length of the rocker arm boxes.

**Solid Type Dies:** All dies for the upsetters are solid type, made in the company's own tool and die shop. Before starting up operation in the morning, dies are preheated by means of gas burners placed in them. A temperature of 250-400° F is attained before forging is begun. The reason for this practice, of course, is that aluminum must be forged within a rather narrow temperature range and dies must be heated to be sure the metal is not worked outside that range.

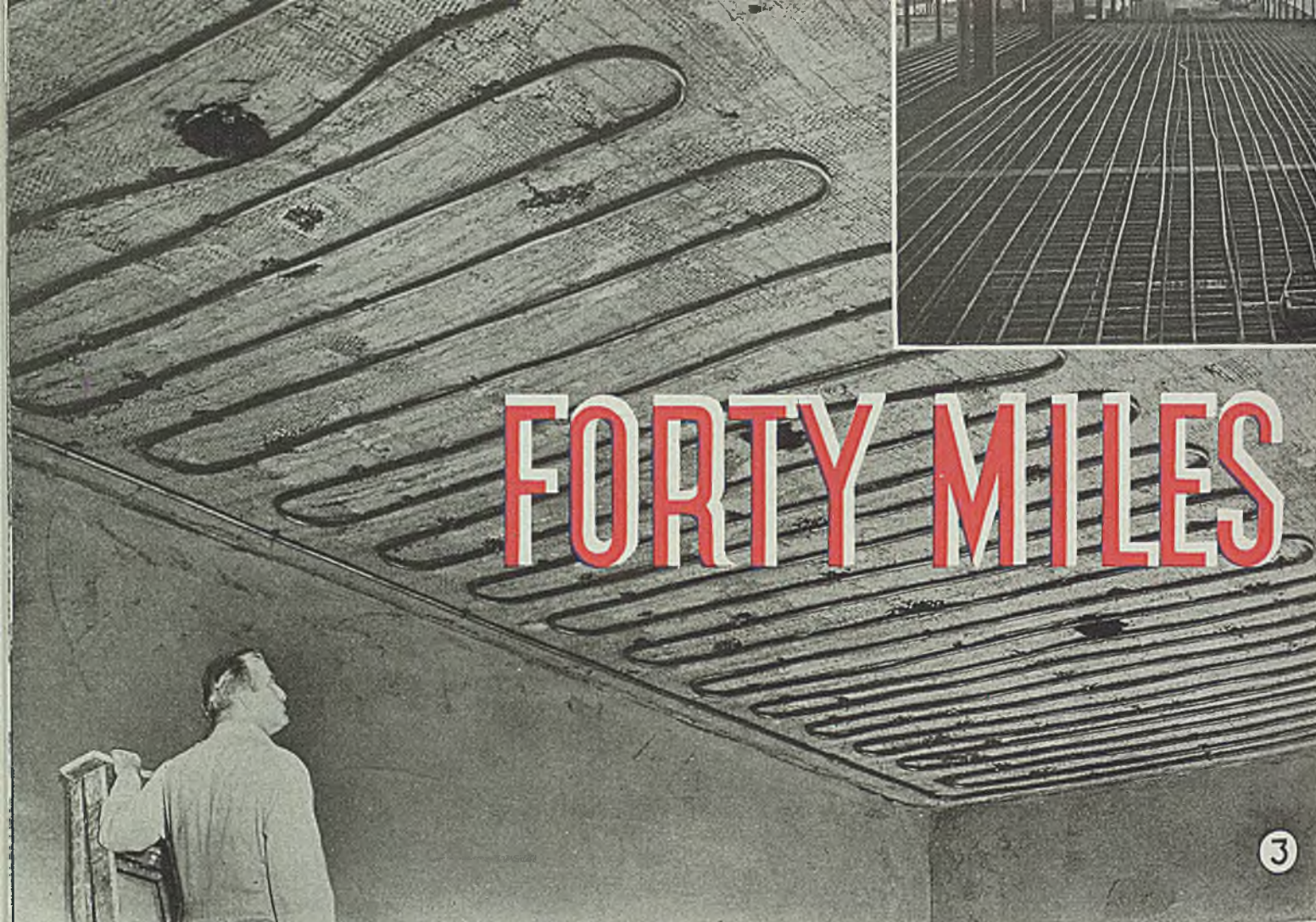
Dies handling the first and second passes are lubricated by swabbing before each pass. Dies handling the third and fourth passes have a lubricant sprayed on them before each pass.

**Heat-Treating Cycles:** Since the cylinder heads are made for several different engine builders, some of whom have a number of different plants with varying production processing arrangements, some of the heads are now finished up and shipped from Tube Turns' plant, while others receive one of two different heat-treating cycles before finishing operations. Where one engine builder prefers to have his heads water quenched, another desires an air quench. Physical properties resulting from the two different treatments are quite similar, as can be seen from the following data:

Water quench is perhaps the treatment most generally employed. It involves heating the work to 950° F and holding for 10 hours at that temperature, then quenching in boiling water. Following this, the work is aged by heating at 340° F for 10 hours. Some of the heads are overaged by holding for 8 hours at 470° F.

Physicals resulting from the (Please turn to Page 176)





# FORTY MILES

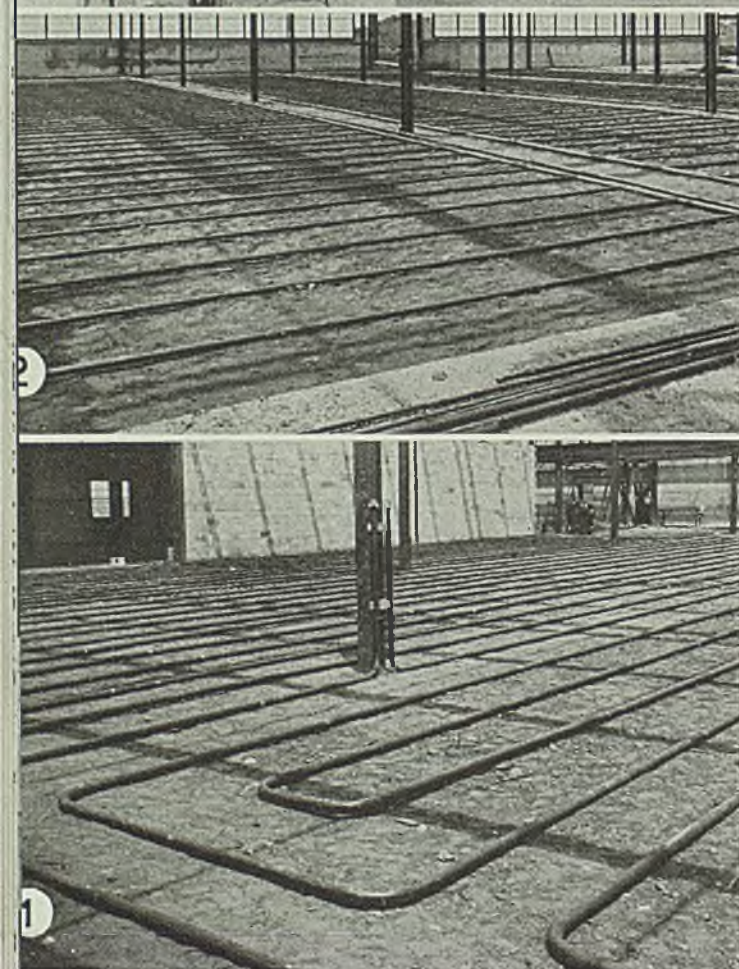


Fig. 1—Construction for radiant heating system at this point consists of 2-in. wrought iron pipe on 36-in. centers in continuous coils

Fig. 2—Typical grid of wrought iron pipe consisting of long 2-in. headers (140 ft) and short 1½-in. laterals (20 ft), with varying center-to-center spacings determined by rate of heat loss change

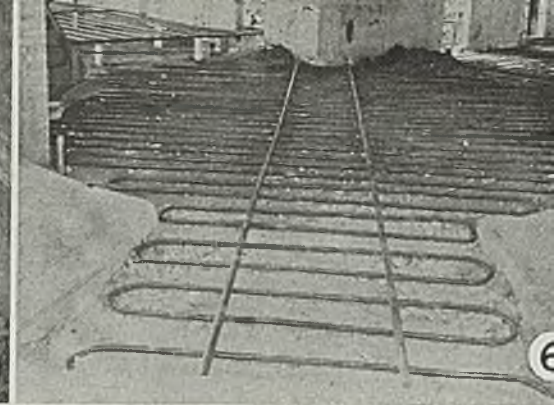
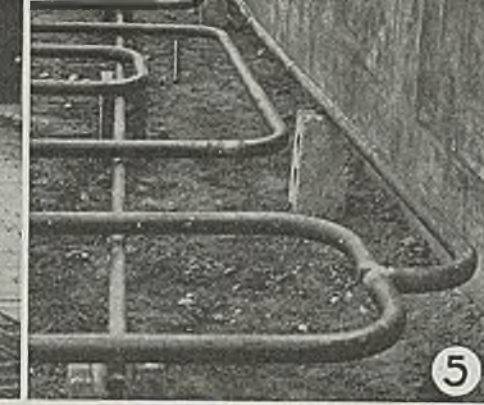
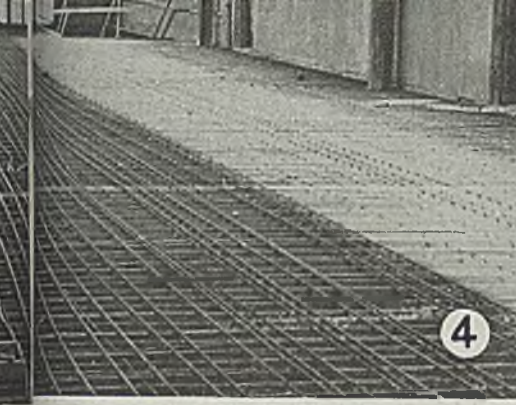
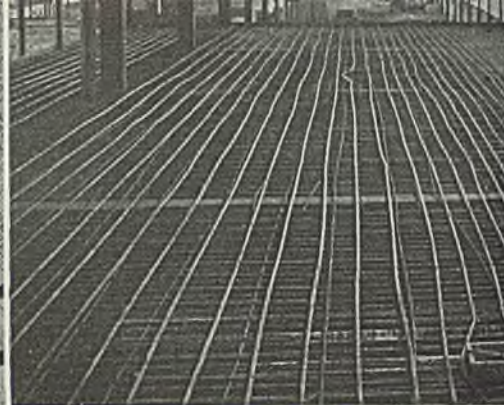
Fig. 3—Three-eighths-in. (nominal) copper tubing on second floor office ceiling, installed on "scratch" coat of plaster. Over this is applied about ¼-in. brown coat and then about ½-in. acoustical plaster. Tubes are ½-in. OD and are on 4-in. centers at outside exposure, changing to 5 in., then 6 in., 8 in., and 10 in., as required concentration decreases

Fig. 4—Bundy tubing in loops approximately 100 ft long in the 3-in. thick roof decking and concrete floor construction of appliance testing laboratory, mezzanine floor

Fig. 5—Two-in. wrought iron pipe used in a combination of grid type and continuous coil construction, with concentration of surface at outside wall

Fig. 6—Special wrought iron grid to apply to circular type area served

Fig. 7—Smithway-Burkey water heater, 120 of which will supply hot water for the system. A by-pass hookup is used so full capacity of each heater can be utilized



# OF PIPING

..... *Used in new plant's radiant heating system*

Combination grid and continuous coil construction of wrought iron pipe permits rearrangement of machines and even new foundations. Wrought iron, steel, and copper tubing, requiring almost 27,000 brazed and welded joints, will circulate 180,000 gallons of hot water per hour to heat 415,188 square feet

FORTY miles of wrought iron, copper and steel piping laid in cement floors and embedded in plaster ceilings soon will circulate 180,000 gal of hot water per hour for radiant heating the new domestic storage water heater plant of A. O. Smith Corp. at Kankakee, Ill.

The decision to adopt radiant heating for the Kankakee Works, embracing a total of 415,188 sq ft in a building 1200 ft long and 315 ft wide, was made by A. O. Smith management only after the most careful calculation of risks involved in this, the largest system of its kind on record. There was little question of the efficacy of this mode of heating when properly applied, but the difficulty of obtaining pipe and tubing in the volume required was considerable, and at times, a seemingly insuperable obstacle.

Primarily, the use of the three materials chosen was dictated by engineering logic, but exigency played its part. The wrought iron finally obtained and installed ranged in size from ¾ to 1 in., while the steel was ⅝-in. Bundy tubing.

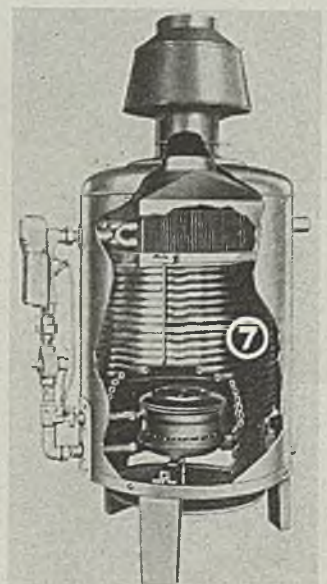
Aside from anticipated economies in initial installation costs, and maintenance and operating expense, the company had another incentive—the opportunity to study at first hand under practical operating conditions a radiant heating system supplied with hot water by Smithway-Burkey volume heaters, a product distributed by Smith and built by Burkay Co. of Toledo, O. One hundred and twenty of these heaters, burning natural gas, can supply 15,000 gal of water at maximum temperature of 140° F 12 times per hour to maintain average dry-wall temperature throughout the building of 65° F. The system will serve laboratories and offices on mezzanine floors as well

as ground floor space. It should afford answers to many questions which today are puzzling the radiant heating industry.

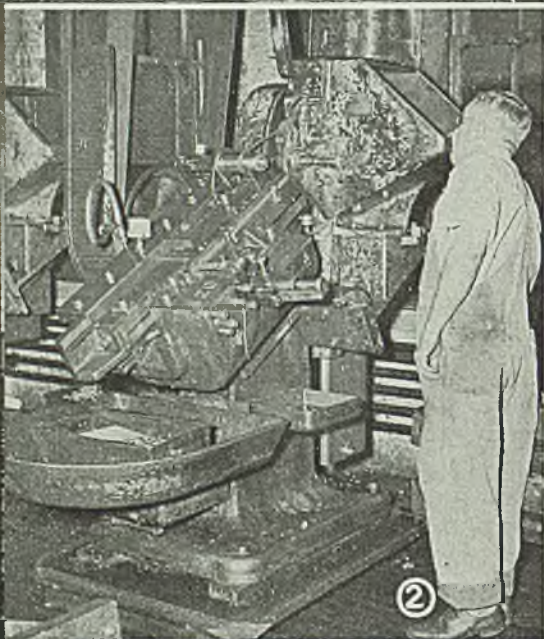
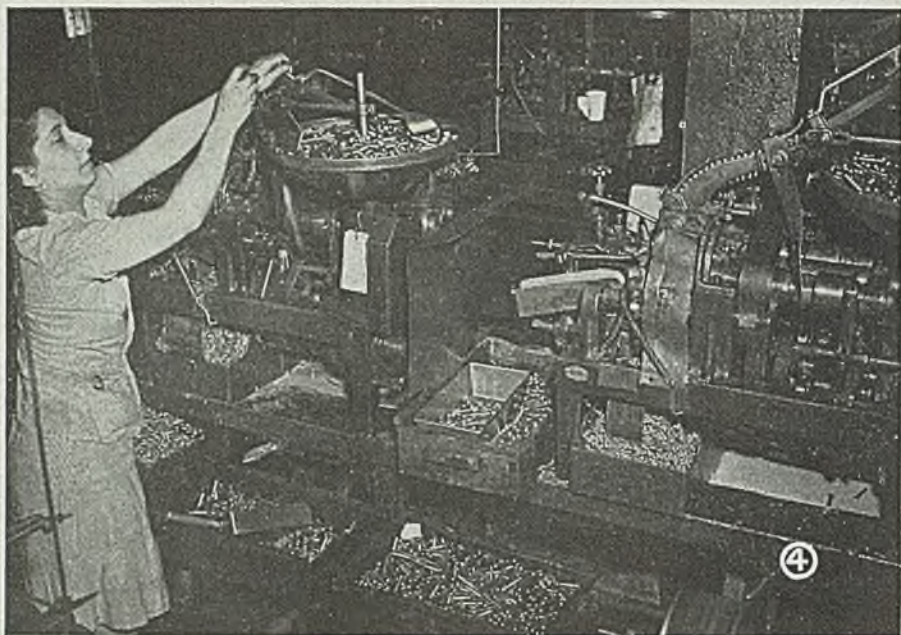
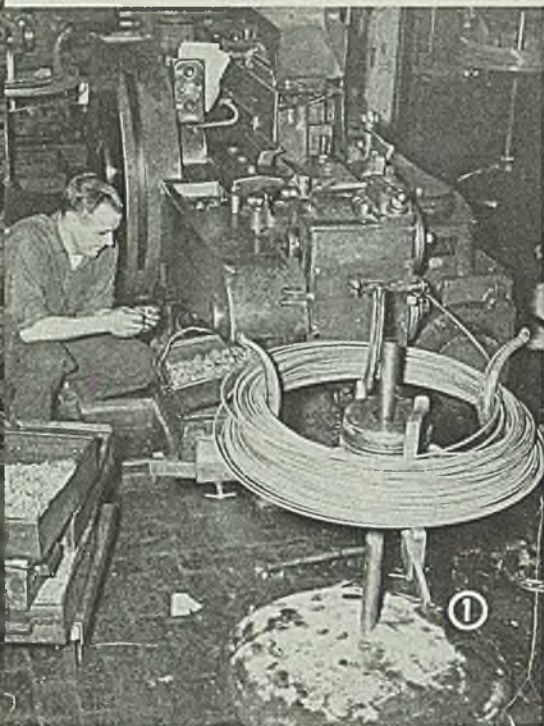
Plant: The plant is divided into 48 bays, each of which runs clear across the 315-ft width of the plant and is 25 ft wide. Two heaters serve each bay, each heater serving panels which cover half a bay. The first step was to construct a concrete roadway down the center of the plant to allow industrial trucks to bring in the supplies that were required.

Eighty per cent of the installation in the floor of the plant is of grid type construction, consisting of headers and laterals of wrought iron pipe. Some grids have long 2-in. headers (140 ft) and short 1½-in. laterals (20 ft), while others consist of 20 ft headers and 140 ft laterals. Center-to-center dimensions range from 4 ft down to 8 in.

There are obvious advantages to the grid type construction. It is the best type to meet possible future changes in floor arrangements and foundations because new headers can be installed as needed around the new foundations for heavy ma-







## 60 Per Cent Savings in Screw Manufacture

ONE application of the upsetting operation entailing special manufacturing economies is that which permits National Screw & Mfg. Co., Cleveland, to make a hose clamp screw as an integral unit which is stronger and more adaptable to volume production.

Originally the screw, which works in the hose clamp on the worm-gear principle, was produced by screw machine. The slotting of head and cutting of threads was followed by inserting a stamped thumb piece in the slot and peening to make a one-piece assembly. This method required a large battery of screw machines and additional handling for stamping, assembling and peening.

To make the new type screw, a coil of wire is fed into an upset machine, producing a blank with a ball at one end and a two-diameter shank which is held to a close tolerance (Fig. 2). The shank is then grooved and the pilot formed in one automatic operation, done by the machine in Fig. 1.

A special buttress type thread is produced on hose clamp screws by roll threading in a third operation (Fig. 3) and the upset ball is flattened to form thumb piece in a final punch press operation as shown in Fig. 4.

Manufacturing the screw by these four operations has reduced production costs by 60 per cent, according to the company.



EXCLUSIVE license was granted recently by Bailey Meter Co., Cleveland, to Monarch Machine Tool Co. of Sidney, O., to build and market to the machine tool field a contour turning mechanism first introduced by the former concern two years ago, Wendell E. Whipp, Monarch's president announced. The development, which may be attached to a wide range of machine tools, combines one or more air tracers with a hydraulically operated power circuit to produce work pieces with contours that match with extreme accuracy those of a master template. Monarch's immediate application of the mechanism will be on four of the company's lathes—the 14, 16, 18 and 20-in. machines, Mr. Whipp said.

METHOD of heat dissipation in form of a spray lubricator attachment developed by DoAll Co. of Minneapolis, in connection with high-speed band saws is slated to result in faster cutting rates, improved finish and increased saw life. Operating from a standard air pressure line, the spray head straddles the saw blade from the back, and directs twin streams of lubricated air against the saw teeth. Lubricant is thus forced under pressure in form of meter mist into the saw teeth as it enter the work. Although the attachment was devised for use in cutting nonferrous metals, it works equally well on many types of plastics and laminated material where friction between blade and work softens the material to a gummy state.

SEEKING improved techniques for storage of strategic *matériel*, Navy Bureau of Supplies and Accounts is conducting dehumidification tests on four warehouses at the Naval Supply Depot at Mechanicsburg, Pa. Two methods of eliminating deteriorating effects of moisture from buildings are at present being tested. In wood buildings, existing heating systems are used to maintain year-around control of the interior humidity. In buildings of concrete or cinder block construction, machines which dry the moist air by passing it over a bed of desiccant are used. Refrigeration-type dehumidification equipment also is being considered for future tests. Thus far, it was found, the effectiveness of the processes is improved if the surfaces of the buildings are first sprayed with a "vapor barrier" of compound asphalt or liquid cement to prevent moisture penetration.

SOME 80 drilling, reaming and spotfacing operations required on engine mounts are being done by one manufacturer with the use of two machines furnished by W. F. & John Barnes Co., Rockford, Ill. These operations formerly required the use of 27 standard type machines. Now, in 20 min, including setup time, 48 holes on one side of each engine mount are automatically drilled, reamed or spotfaced on one No. 914 vertical machine equipped with two 8-spindle multiple heads. Part is held in a special fixture on a manually-operated rotary table. Tolerances of 0.002-in. between holes are held accurately.

Other side of engine mount also is machined in 20 min. Here, 32 holes are drilled, reamed or spotfaced by a second machine of the same type, but provided with two standard hydraulic units. Vertical unit is equipped with an 8-spindle multiple head and the angular unit with a 2-spindle multiple head.

AT Rochester, N. Y., Eastman Kodak Co. revealed development of a new engineering material for use with optical comparators of the contour projection type. Product consists of a transparent green-dyed gelatin coating applied on a glass plate, and on which tolerance lines can be scribed. The scribed plate may be used directly with a contour comparator, or for making small photo templates on metals, plastics and other materials. Use of the plate with precision grinders equipped with contour comparators permits the machine operator to see exactly how much material must be cut away to attain desired dimensions.

GOOD wheel specification for internal grinding of chromium-plated work according to F. J. Benn of Norton Co.'s sales engineering department, writing in "Grits and Grinds", is a 38A60-J8VBE Alundum vitrified wheel. In this application, the depth of cut is very important. Roughing cut should not exceed 0.0005-in. per pass, while for finishing, it should be reduced to 0.00025-in. per pass. As with most other internal grinding jobs, the wheel should be allowed to spark out. Wheel speeds from 4000 to 5000 sfpm are suggested for use with work speeds of around 125 sfpm.

COVERING of transmission lines for gas and gasoline to protect them from deterioration due to soil corrosion can be done on a mass production basis with the aid of a Stearns electronic holiday detector, according to "Bitumastic Bulletin," published by Wailes Dove-Hermiston Corp. of Westfield, N. J. In corrosion-proofing a 24-in. pipe line for United Gas Pipe Line Co. with Bitumastic enamel, engineers used the detector to test the coverage of the enamel coating for holidays or flaws. When detected by the device, the flaws were immediately touched up on the spot to assure protection. In applying the covering—enamel, together with a 15-lb coal tar saturated felt wrapper bonded to the enamel while it was hot—line traveling, cleaning, priming, coating and wrapping machines were used.

NARROW channels that connect the Great Lakes constitute some of the busiest waterways in the world, and pose a particular problem of close-in navigation. To overcome hazards, tests involving marine radar are now being conducted by the Lakes Carriers Association with the co-operation of the Coast Guard and a committee representing the various manufacturers. A recent test installation—one of six to be made by leading manufacturers on as many lake fleets for comparative performance studies



during the current shipping season—is the Westinghouse radar unit on the *William G. Mather*, fleet flagship of the Cleveland-Cliffs Iron Co., plying ports along the 1000 miles between Buffalo and Duluth. The installation is of the plan position indicator type which provides a continuous picture of ship traffic and shoreline conditions throughout a range of 100 yards to 32 in. of the vessel.

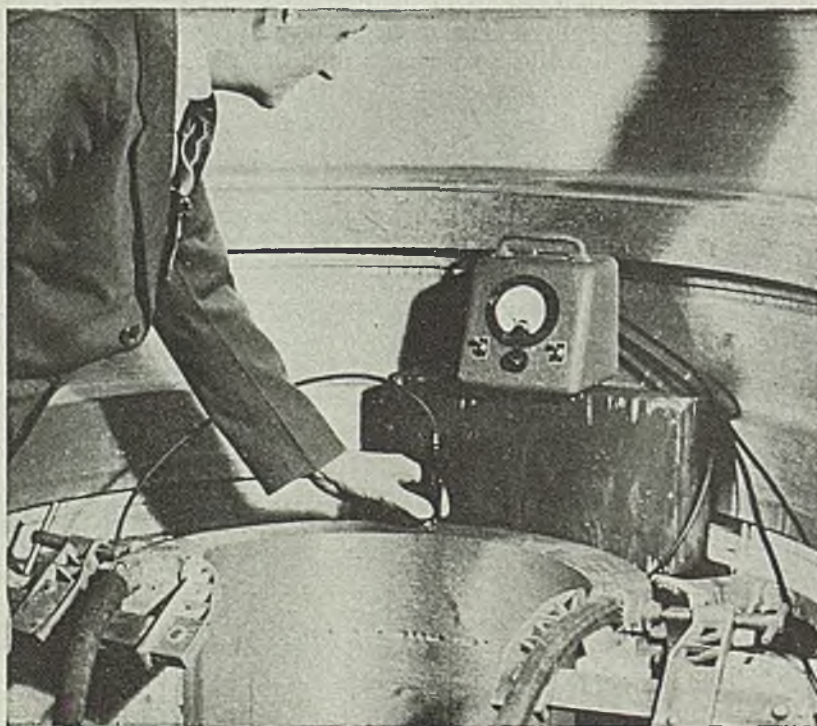
ICING of aircraft windshields and interior fogging—perhaps even those of automobiles, for that matter, may be a thing of the past since the development of a transparent coating for glass that successfully conducts electrical current over the glass surface. According to Richard B. Tucker, vice president, Pittsburgh Plate Glass Co., Pittsburgh, who revealed the development, the coating makes it possible to heat the entire area of a glass panel by a uniform flow of current. Tests at the company's lab fail to show distortion of vision through treated glass, and no material reduction in the intensity of light transmission through the coating is apparent. The development also is said to strengthen the glass against impact at low temperatures.

UNIFORM, high-quality welds, free from inclusions are obtained by an operator of average experience, after short practice in welding stainless, high-carbon and other alloy steels, aluminum and magnesium with the Heliarc process, it was learned through the Linde Air Products Co., New York. This is because the protecting shield of argon gas used prevents oxidation or contamination of the molten weld metal. In Heliarc welding, an arc is struck between the work and a tungsten electrode while inert gas is allowed to flow around the weld area. The arc melts the material to be welded, and the gas shields the metal. A welding rod may be fed into the weld in much the same manner as in oxyacetylene welding, but no flux is required.

As the name of the process implies, helium was originally used as the shielding gas, but it was found the heavier argon gas had a slower rate of dispersion, thus a smaller amount of the latter is required to maintain a gas shield in the weld area.

STAINLESS steel at the big Baltimore plant of Rustless is now cut like butter since the company adopted a method developed by George Linnert, a research welding engineer, according to the "Arm-Co-Operator", publication of American Rolling Mill Co., Middletown, O. Method consists of injecting a fluxing agent into the oxygen cutting stream of a regular oxy-acetylene torch. This results in continuous removal of the slag as quickly as it is formed. Fluxing material can be added at any convenient point in the hose line, and is composed of inexpensive, noncombustible materials developed at the plant after much research.

MANUFACTURERS of carbon and alloy open-end and box wrenches recently adopted simplified practice recommendations, through regular procedure of the National Bureau of Standards, Washington, to meet requirements of users in every industry throughout the country. Previous to the adoption of the new recommendations, the industry produced 340 different sizes and varieties of carbon and alloy open-end and box wrenches. New recommendations provide for the elimination of 85 superfluous items, bringing the total down to 255, or a reduction of 25 per cent. Items eliminated represent excessive varieties which crept into the line over a period of years, and for which there was little or no demand. The recommendations were developed by Service Tools Institute, which includes in its membership 55 manufacturers of mechanic's hand service tools located in all parts of the United States.



RELATIVE strength of the magnetic field in large castings and forgings examined for flaws by the magnetic-particle method is indicated by above gage developed recently by General Electric Co., Schenectady, N. Y. In testing for flaws, a magnetic field is first set up in the part. Then magnetic particles are distributed over the surface of the part, and these line up along any crack or flaw. The GE instrument is said to assure a magnetic field strong enough to bring out the particle pattern so defects of the same size give similar indications—factors which are inconsistent if the magnetic field is not powerful enough.



# The Steel Industry

• • • presented in conjunction with a  
preview of the 1946 Convention and Exposition of  
**THE ASSOCIATION OF IRON AND STEEL ENGINEERS**  
at Cleveland, October 1-2-3-4

## CONTENTS:

- 1 **Convention and Exposition** — Operating executives of the steel industry, which is spending \$327,000,000 on improvements in 1946, gather in Cleveland, October 1-4 to attend technical discussions and view new developments in equipment.
- 2 **Technical Program** — Well-planned program includes 39 technical papers plus several round-table discussions on current steel industry operating problems.
- 3 **Exhibitors** — Well over 100 leading companies display latest equipment.
- 4 **Floor Plan** — Cleveland Public Auditorium floor plan shows where booths of exhibitors are located.
- 5 **Raw Materials** — In a special study made by the editors of STEEL, the steel industry reports on its plans with respect to raw materials.
- 6 **Blast Furnace Practice** — Furnace operators reveal current thinking on present practice, including blast conditioning, furnace top pressures and insulation.
- 7 **Steelmaking Practice** — Melt shop operators report views on open-hearth vs electric furnace steels, "Dephosphorized" bessemer steel, alloy contamination and preferences on brick.
- 8 **Finishing Operations** — Operators report on trends in automatic controls, continuous reheating and annealing, power requirements, handling of materials, tolerance and finish specifications, rolling of special shapes, composite steels and other pertinent subjects.





1

# Convention and Exposition



L. R. MILBURN,  
AISE First Vice President  
President-Elect—1947

*First exposition of steelmaking and processing equipment in four years plus full technical program draw operating executives to Cleveland meeting.  
Kelly award and Old Timers' meeting are added attractions*

THIS year's Iron and Steel Exposition, being held in conjunction with the forty-second annual convention of the Association of Iron and Steel Engineers, Oct. 1, 2, 3 and 4, presents the first opportunity since the beginning of World War II for manufacturers of steel plant and mill equipment to demonstrate the rapid strides that have been made during intervening years in development of new methods and new products.

Steel mill operators, despite the vast expenditures for equipment during the war as shown in accompanying chart, are decidedly "progress" conscious. In this first full year of peace since World War II, \$327,000,000 is being spent for expansion and modernization. Some equipment

builders are booked 2½ to 3 years ahead and additional projects are in the planning stage. Steelmakers also are actively thinking about revolutionary new developments in practice, as reported on the following pages.

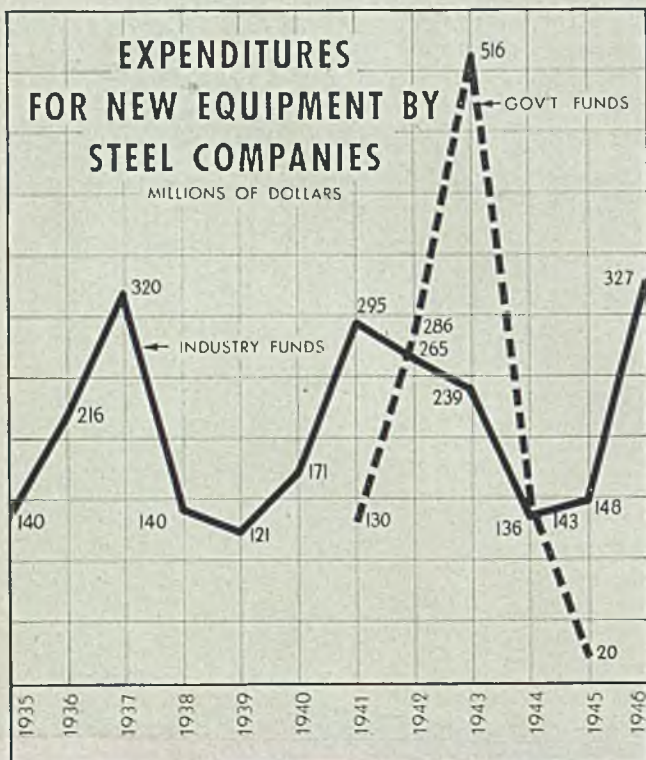
In displaying at the Cleveland show their latest designs and equipment, exhibitors are utilizing nearly 30,000 square feet of space in Cleveland's Public Auditorium. Over 100 manufacturers have exhibits. One feature of the exposition is a working model of a continuous butt-weld steel tube mill. This model mill simulates every phase of the manufacture of continuous butt-weld steel tubing. Small tubes are made from skelp in the same manner as those made on full-size mills.

Other exhibits feature mills, mill drives and electrical controls, materials handling equipment, steel cutting and fabricating equipment, lubricating systems, bearings, safety devices and accessories, furnaces and heating equipment, etc. The exposition is sponsored by the AISE.

Attendance at the convention is expected to reach 10,000 before it ends, as this is the first combined convention and exposition in 4 years and there are no travel limitations and other restrictions typical of the war years to keep members away from the meeting. Also an inducement is a full technical program.

In all, 66 authors and chairmen will participate in making this one of AISE's most complete technical programs. Subject matter of the convention will be devoted to technical and engineering phases of the latest methods of producing and processing iron and steel. Each of the 14 sessions will be led by two co-chairmen.

Registration of members and guests in the main lobby of the Cleveland Public Auditorium, at East Sixth street and Lakeside avenue, begins at 9:00 a.m. on Tuesday, Oct. 1, with registration of the ladies taking place simultaneously in Parlor M of Hotel Statler. All social functions of the convention are being held at this hotel. Holding great interest for veteran engineers and steel men is the Old Timers' Luncheon on Wednesday in the Statler's Euclid Ball Room. Two dances also are scheduled.







F. H. DYKE  
AISE President—1946



C. H. WILLIAMS  
AISE Treasurer—1946



A. S. GLOSSBRENNER  
AISE Secretary—1946

Presiding over the entire program will be Freeman H. Dyke, president Association of Iron and Steel Engineers and assistant general manager, Wheeling Steel Corp., Steubenville, O. He will be assisted by other officers of the association and leading engineers from the operating end of the industry. The only nontechnical session on the program will be the annual business meeting at 9:15 a.m. Tuesday in the auditorium ball room.

It has been customary but not without exception in the association to choose each year's incoming president from the top tier of officers experienced in directing the work of the AISE. In conformity with this precedent, L. R. Milburn, 1945-6 first vice president and electrical engineer, Great Lakes Steel Corp., Detroit, will succeed Mr. Dyke as 1947 president. Mr. Dyke will join other past presidents on the board of directors. Other officers who have served the association over the past year are: Second vice president A. J. Fisher, fuel engineer, Beth-

lehem Steel Co., Sparrows Point, Md.; treasurer C. H. Williams, chief engineer, Pittsburgh District, Carnegie-Illinois Steel Corp.; and secretary A. S. Glossbrenner, general superintendent, Youngstown District, Youngstown Sheet & Tube Co.

A highlight of the technical sessions will be the Kelly Award, founded by the Association of Iron and Steel Engineers to perpetuate the memory of its first managing director, John F. Kelly. This award has been amended so that it now will provide annual cash prizes of \$300, \$200 and \$100, respectively, for the three papers selected as most valuable to the industry from those published in the "Iron and Steel Daily News," a 24-page tabloid newspaper which traditionally records events and activities of technical and social interest during each meeting. Mr. T. J. Ess, managing director of the association, is the editor and James D. Kelly is publication director of the paper.



# ② Program

*Tuesday, October 1, 1946*

9 a.m.—Registration—Main Lobby

9 a.m.—Ladies' Registration—Parlor M, Hotel Statler

9:15 a.m.—Business Meeting—Ball Room

Conducted by President F. H. Dyke

9:30 a.m.—Electrical Session—Ball Room

Chairmen: F. W. Cramer, Carnegie-Illinois Steel Corp.; V. E. Schlossberg, Inland Steel Co.

"Gearing for Steel Mill Auxiliaries and Cranes," by L. J. Collins, General Electric Co.

Discussion of Mill Type Motor Ratings, by Frank Cramer, Carnegie-Illinois Steel Corp.

*All events with exception of the  
social functions will be held in  
Cleveland Public Auditorium*

Standardization Committee Reports, by chairmen of various subcommittees.

2 p.m.—Operating Practice Session—Ball Room  
Chairmen: C. L. McGranahan, Jones & Laughlin Steel Corp.; J. L. Tatman, Wheeling Steel Corp.

"Scale Removal and Surface Preparation by Reduction with Sodium Hydride," by H. L. Alexander, E. I. du Pont de Nemours & Co.

"Roller Leveling and Processing of Flat Rolled Products," by A. J. Wardle, Jr., McKay Machine Co.

"The Corrugating of Sheet Metals," by Joseph E. Kiefer, Streine Tool & Mfg. Co.

2 p.m.—Combustion Session—Club Room B  
Chairmen: P. F. Kinyoun, Bethlehem Steel Co.; E. C. Hite, Timken Roller Bearing Co.



"Heating and Melting Furnace Controls," by C. G. Bigelow, Jr., Loftus Engineering Corp.

"Economics of High Pressure Steam for Steel Plant Power," by F. A. Sawyer, Stone and Webster Engineering Corp.

"Heat Problems in the Steel Industry," by Victor Paschkis, Columbia University.

## *Wednesday, October 2, 1946*

### 9 a.m.—Safety Session—Ball Room

Chairmen: R. H. Ferguson, Republic Steel Corp.; James Farrington, Wheeling Steel Corp.

Symposium on Safety:

"Industrial Health Problems in the Steel Industry," by J. William Fehnel, Metropolitan Life Insurance Co.

"Recommended Practice in Connection with Fire Prevention and Safety in By-Product and Benzol Plants," by R. W. Schirmer, Hendricks Engineering Corp.

"Suggested Methods Which May be Used to Prevent Accidents from Asphyxiation and Explosions of Various Types of Gases," by J. M. Lewis, Mine Safety Appliance Co.

12:15 p.m.—Old Timers' Luncheon, Euclid Ball Room, Hotel Statler

### 2 p.m.—Electrical Session—Ball Room

Chairmen: E. L. Anderson, Bethlehem Steel Co.; M. B. Antrim, Lukens Steel Co.

"Latest Trends in Commutation," by Leon D. Cook, Commonwealth Edison Co.

"Comparison of A-C and D-C Power Distribution," by G. A. Kaufman, Jones & Laughlin Steel Corp.

"Spot Conversion for Adjustable Speed Drives," by R. A. Geuder and W. R. Hough, Reliance Electric & Engineering Co.

### 2 p.m.—Combustion Session—Club Room B

Chairmen: C. J. Wyrrough, Jones & Laughlin Steel Corp.; H. S. Hall, Lukens Steel Co.

"Submerged Combustion in Industry," by W. G. See, Submerged Combustion Co. of America.

"Recent Improvements in Cover Annealing," by A. J. Fisher, Bethlehem Steel Co.

"A New Method of Strip Coil Annealing," by H. H. Armstrong and F. F. Schlitt, Lee Wilson Eng. Co. Inc.

## *Thursday, October 3, 1946*

Iron and Steel Exposition—10 a.m. to 5:30 p.m.

### 9 a.m.—Electrical Session—Ball Room

Chairmen: I. N. Tull, Republic Steel Corp.; A. D. Howry, Alan Wood Steel Co.

"Electrical Equipment for the Sendzimir Cold Strip Mill," by H. W. Poole, General Electric Co.

"Schemes and Methods for the Control of Plugging," by E. J. Posselt, Cutler-Hammer, Inc.

"Power and Power Factor in Arc Furnace Operation," by Earle H. Browning, Westinghouse Electric Corp.

### 9 a.m.—Lubrication Session—Club Room B

Chairmen: C. E. Pritchard, Republic Steel Corp.; C. R. Hand, Bethlehem Steel Co.

"Surface Activity of Lubricants," by J. M. Wilson, Shell Oil Co. Inc.

"Analysis of Centralized Lubricating Systems," by J. P. Gravenstreter, Carnegie-Illinois Steel Corp.

"Rust Preventive Compounds," by H. Carpenter, Standard Oil Co. of New Jersey.

### 2 p.m.—Mechanical Session—Ball Room

Chairmen: L. J. Gould, Bethlehem Steel Co.; T. R. Moxley, Wheeling Steel Corp.

"Automatic Welding in Steel Plant Maintenance," by H. E. Holman, Jones & Laughlin Steel Corp.

"Storage Yard Material Handling," by Frank C. Weir, Timken Roller Bearing Co.

"Scheduling of Maintenance Shops," by L. E. Fuller, Jr., Carnegie-Illinois Steel Corp.

### 2 p.m.—Combustion Session—Club Room B

Chairmen: E. C. McDonald, Republic Steel Corp.; B. B. Bargman, Carnegie-Illinois Steel Corp.

"Improved Design of Metallic Recuperator," by Frank D. Hazen, Hazen Engineering Co.

"Relation of Refractory Economy to Combustion in Steel Mill Furnaces," by Edwin N. Hower, Carnegie-Illinois Steel Corp.

"Heating Rate Tests of Slab Reheating Furnaces," by J. W. Percy, United States Steel Corp.

7:30 p.m.—Formal Dinner-Dance, Grand Ball Room Hotel Statler

## *Friday, October 4, 1946*

Iron and Steel Exposition—10 a.m. to 4 p.m.

### 9 a.m.—Operating Practice Session—Ball Room

Chairmen: W. H. Collison, Great Lakes Steel Corp.; J. B. Hill, Bethlehem Steel Co.

"Iron Ore Reserves of the Mesabi Range," by E. W. Davis, University of Minnesota.

"The Chemical Removal of Scale, Sludges and Oxides from Blast Furnace and Allied Steel Mill Equipment," by B. H. McDaniel, Dowell, Inc.

"The Manufacture of Oxygen in Large Quantities for Industrial Uses," by Martin J. Conway, Consulting Engineer.

### 2 p.m.—Rolling Mill Session—Ball Room

Chairmen: Alex Montgomery, Jr., Carnegie-Illinois Steel Corp.; Louis Moses, Bethlehem Steel Co.

"Modern Seamless Tube Mills," by William Rodder, Aetna-Standard Engineering Co.

"The Use of Tension in Sizing Small Diameter Seamless Pipe and Tubing," by S. W. Stouffer, National Tube Co.

"Rod Mills and Rod Mill Roll Design," by Ross E. Beynon, Carnegie-Illinois Steel Corp.

### 2 p.m.—Lubrication Session—Club Room B

Chairmen: D. N. Evans, Inland Steel Co.; R. A. Barta, Republic Steel Corp.

Symposium on Soluble Oils:

"Quenching and Processing," by Steven Smith, Air Reduction Sales Co.

"Cold Reduction of Strip," by J. R. Powell, Jones & Laughlin Steel Corp., and R. W. Piper, Apex Alkali Products Co.

"Cutting and Grinding," by C. M. Larson, Sinclair Refining Co.

"Bacterial Deterioration," by L. Liberthson, L. Sonneborn Sons, Inc.



# Exhibitors

(The 1946 AISE Exposition is being held Oct. 1-4 in Cleveland Public Auditorium, East Sixth street and Lakeside avenue. Booths may be located by referring to the floor plan on the following pages.)

## A

	Booth No.
Air Reduction Sales Co., New York	100-3
Allen-Bradley Co., Milwaukee	308-9
Allis-Chalmers Mfg. Co., Milwaukee	33-7
Aluminum Co. of America, Pittsburgh	262-3
American Car & Foundry Co., Valve Dept., New York	321
Amsler-Morton Div., Union Industries Inc., Pittsburgh	317
Askania Regulator Co., Chicago	57
Automatic Transportation Co., Chicago	38-9, 66-7

## B

Bailey Meter Co., Cleveland	274-5
Baker-Raulang Co., Cleveland	1-3
Bantam Bearings Div., Torrington Co., South Bend, Ind.	318
Barrett-Cravens Co., Chicago	248-9
Bearing Service Co., Pittsburgh	320
Benjamin Electric Mfg. Co., Des Plaines, Ill.	127
James G. Biddle Co., Philadelphia	206
Blaw-Knox Co., Blawnox, Pa.	276-7
Charles Bruning Co. Inc., Chicago	314-6
Buckeye Laboratories Corp., Cleveland	117-8
Burndy Engineering Co. Inc., New York	138-9

## C

Carbone Corp., Boonton, N. J.	273
Clark Controller Co., Cleveland	30-2
Cleveland Crane & Engineering Co., Wickliffe, O.	50-5
Cleveland Worm & Gear Co., Cleveland	244-6
Crocker-Wheeler Div., Joshua Hendy Iron Works, Ampere, N. J.	242-3
Crouse-Hinds Co., Pittsburgh	134
Cutler-Hammer Inc., Milwaukee	46-7, 58-9

## D

De Laval Separator Co., Pittsburgh	344
Joseph Dixon Crucible Co., Graphite & Lubricants Div., Jersey City	
N. J.	119
Dougherty Lumber Co., Cleveland	68-9

## E

Thomas A. Edison Inc., Edison Storage Battery Div., West Orange, N. J.	110
Electric Controller & Mfg. Co., Cleveland	328-31
Electric Products Co., Cleveland	83-4
Electric Service Mfg. Co., Philadelphia	271-2
Electric Storage Battery Co., Philadelphia	143
Elwell-Parker Electric Co., Cleveland	94-5
Eutectic Welding Alloys Corp., New York	63-5

## F

Farval Corp. (See Cleveland Worm & Gear Co.), Cleveland	244-6
Federal Electric Products Co. Inc., Newark, N. J.	25-27
Forker Corp., Cleveland	218-23
Furnace Engineers Inc., Pittsburgh	284-5

## G

Garlock Packing Co., Palmyra, N. Y.	6-7
General Allied Metals Co., Burbank, Calif.	327
General Electric Co., Bridgeport, Conn.	147
General Electric Co., Advertising and Publicity Dept., Schenectady, N. Y.	278-81
Gould Storage Battery Co., Depew, N. Y.	24

## H

Heil Process Equipment Corp., Cleveland	310
Hodson Corp., Chicago	259-60
Holophane Co. Inc., New York	42
Homestead Valve Mfg. Co. Inc., Coraopolis, Pa.	264-5
C. B. Hunt & Son Inc., Salem, O.	40-1
Hyatt Bearings Div., General Motors Corp., Harrison, N. J.	286-7
Hydropress Inc., New York	352

## I

Ideal Industries Inc., Pittsburgh	268-9
Industrial Heating, Pittsburgh	216
International Nickel Co. Inc., New York	236
Iron Age, New York	348-9
I-T-E Circuit Breaker Co., Philadelphia	240-1

## J

Jefferson Electric Co., Bellwood, Ill.	253
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## K

	Booth No.
Kennametal Inc., Latrobe, Pa.	148
Keystone Lubricating Co., Philadelphia	201
Koppers Co. Inc., Pittsburgh	306-7

## L

Lincoln Engineering Co., St. Louis	290-1
Linde Air Products Co. (Unit of Union Carbide & Carbon Corp.), New York	80-2
Lintern Corp., Berea, O.	85
Lovejoy Flexible Coupling Co., Chicago	23

## M

Markal Co., Chicago	247
Mesta Machine Co., Pittsburgh	288-9, 304-5
Mine Safety Appliances Co., Sales Engineering and Sales Planning Dept., Pittsburgh	282-3
Morganite Brush Co., Long Island City, N. Y.	202
D. J. Murray Mfg. Co., Wausau, Wis.	252

## N

National Carbon Co. Inc. (Unit of Union Carbide & Carbon Corp.), New York	78-82
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## O

Ohio Electric Mfg. Co., Cleveland	237
Okonite Co., Chicago	308
Otis Elevator Co., New York	261
Owens-Corning Fiberglass Corp., Toledo, O.	230-2

## P

Penton Publishing Co., Cleveland	311-2
Philco Corp., Trenton, N. J.	96
Post-Glover Electric Co., Cincinnati	77
Powermatic Ventilator Co., Cleveland	350-1
Progressive Systems Inc., Chicago	8
Pyle-National Co., Chicago	22

## R

Ready-Power Co., Detroit	4-5
Reliance Electric & Engineering Co., Cleveland	44-5, 60-1, 76
Rockbestos Products Corp., New Haven, Conn.	56

## S

Safety Clothing & Equipment Co., Cleveland	319
Salem Engineering Co., Salem, O.	265
Shell Oil Co. Inc., New York	333-4
SKF Industries Inc., Philadelphia	71-2
Sucony-Vacuum Oil Co. Inc., New York	266-7
South Bend Lathe Works, South Bend, Ind.	9-10
Speer Carbon Co., St. Mary, Pa.	270
Square D Co., Milwaukee	73-5
STEEL Magazine, Cleveland	311-2
Steel Publications, Pittsburgh	254
Stewart-Warner Corp., Chicago	250-1
Superior Carbon Products Inc., Cleveland	302

## T

Texas Co., New York	242-3
Thomas & Betts Co. Inc., Chicago	323-4
Thompson Electric Co., Cleveland	42-3
Thomson Industries Inc., Long Island City, N. Y.	322
Tide Water Associated Oil Co., New York	108-9
Timken Roller Bearing Co., Canton, O.	105-6
Tool Steel Gear & Pinion Co., Cincinnati	238-9
Trabon Engineering Corp., Cleveland	28-9
Trufo Fan Co., Harmony, Pa.	62
Trumbull Electric Mfg. Co., Plainville, Conn.	234

## U

Union Carbide & Carbon Corp., New York	80-2
United Engineering & Foundry Co., Pittsburgh	144-6

## W

Wagner Electric Corp., St. Louis	203-5
Waldes Koh-I-Noor Inc., Long Island City, N. Y.	224-5
John Waldron Corp., New Brunswick, N. J.	232
Wellman Engineering Co., Cleveland	233
Lee Wilson Engineering Co. Inc., Cleveland	235-6

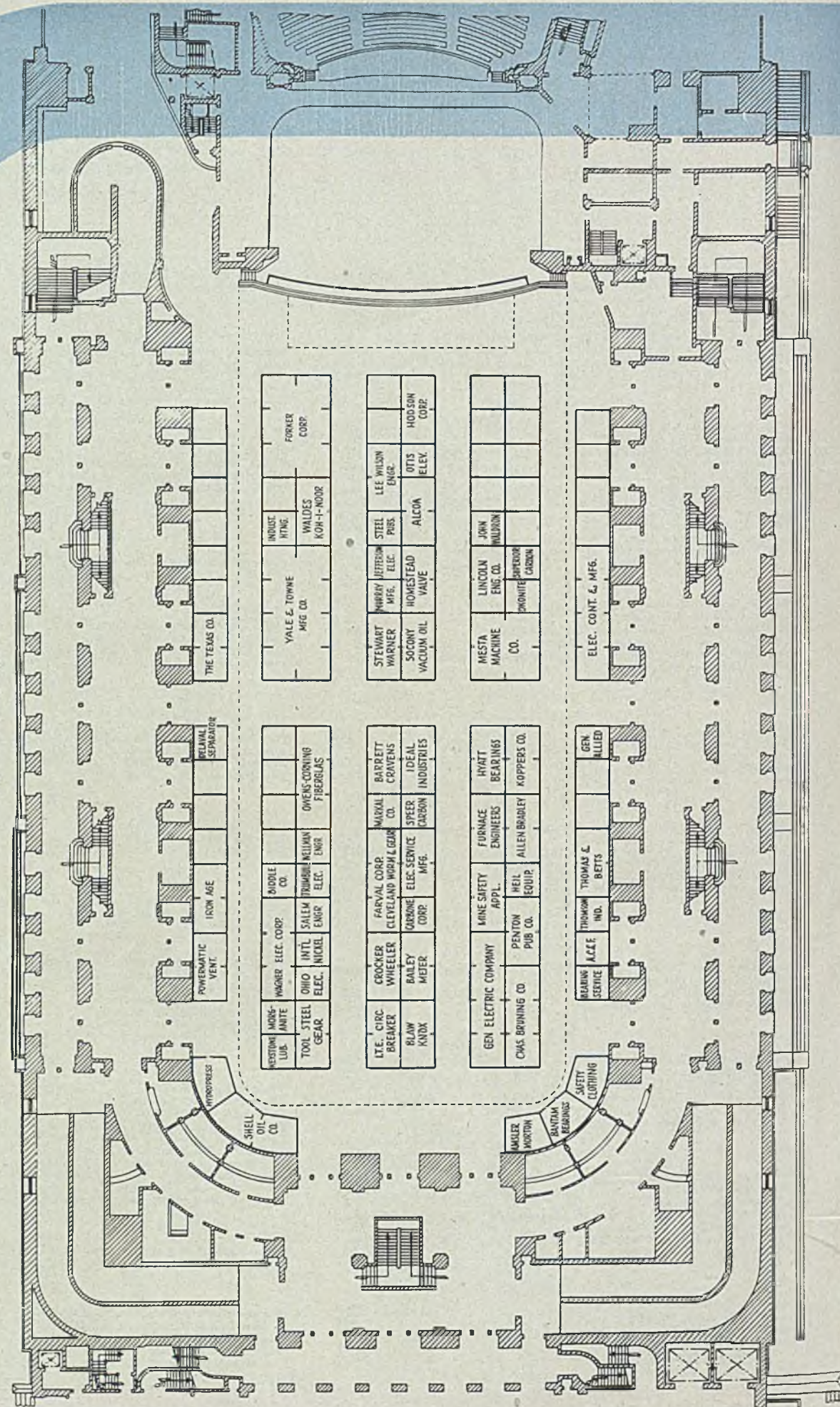
## Y

Yale & Towne Mfg. Co., Philadelphia	211-2, 214-5, 226-9
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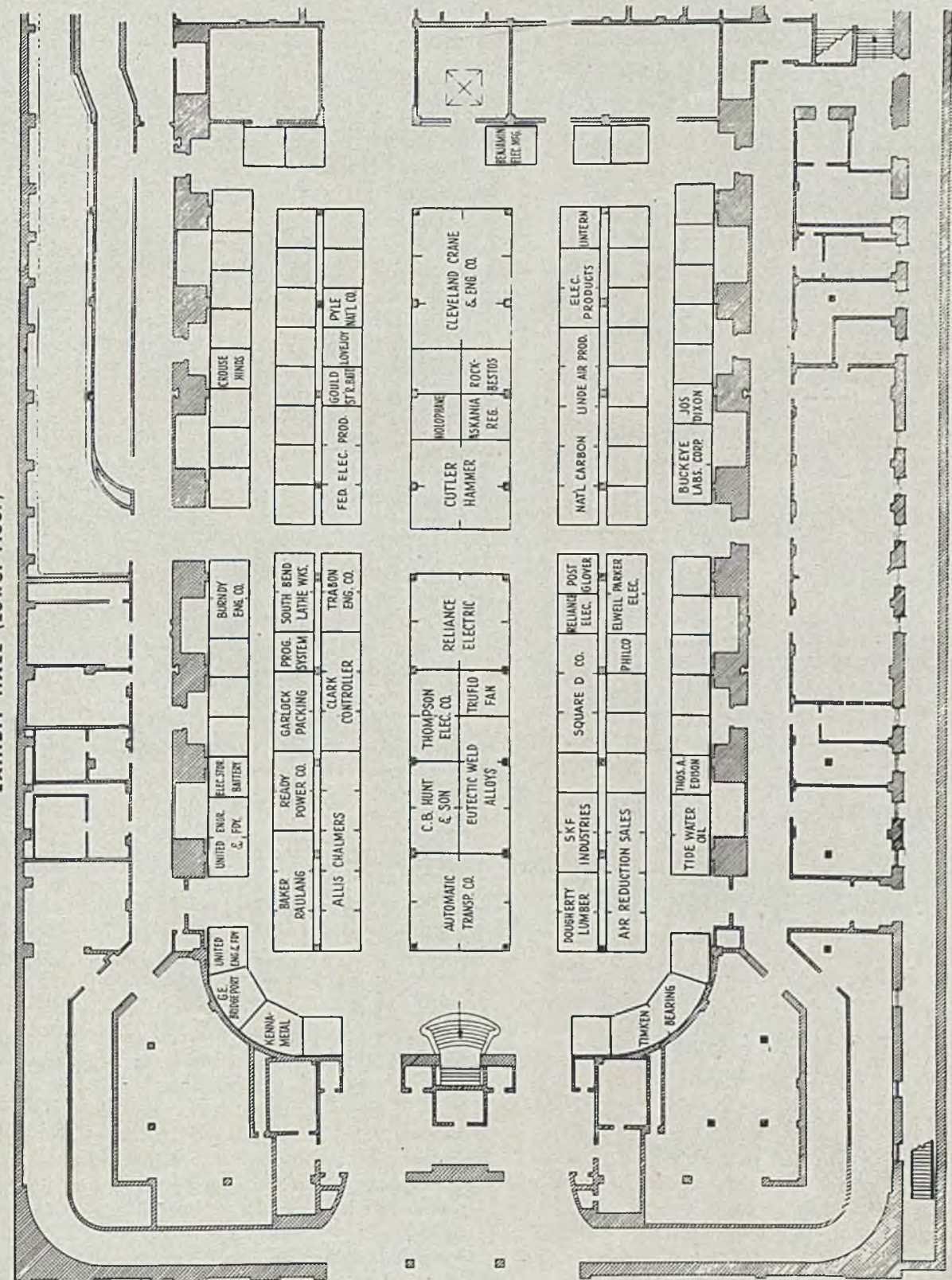
ARENA (Top Floor)



# 4 Exposition Floor Plan

Cleveland Public Auditorium, East Sixth and Lakeside Avenue. Exposition Hours: Tuesday, Oct. 1—10:00 a.m. to 10:00 p.m.; Wednesday, Oct. 2—10:00 a.m. to 10:00 p.m.; Thursday, Oct. 3—10:00 a.m. to 5:30 p.m.; Friday, Oct. 4—10:00 a.m. to 4:00 p.m.

EXHIBIT HALL (Lower Floor)





High grade iron ore reserves are dwindling but beneficiating methods are expected to open up vast new supplies. Foreign sources also will aid. More ore treatment plants to be built in next decade. Mechanical cleaning of coal cuts costs

# 5 Raw

# Materials

## LAKE SUPERIOR IRON ORE SHIPMENTS AND RESERVES

SHIPMENTS	TONS
Through 1860 .....	516,547
1861-1870 .....	3,597,014
1871-1880 .....	11,246,045
1881-1890 .....	42,378,390
1891-1900 .....	114,237,008
1901-1910 .....	321,661,102
1911-1920 .....	513,896,362
1921-1930 .....	507,517,041
1931-1940 .....	336,729,556
1941-1945 .....	417,536,629

TOTAL SHIPMENTS . . 2,269,315,694

### ESTIMATED RESERVES OF ALL GRADES

JAN. 1, 1946  
1,177,370,270 TONS

ORIGINAL RESERVES  
3,446,685,964 TONS

IRON ORE reserves available to the steel industry in the United States have been the subject of no little difference of opinion for years. Some pig iron producers foresee an early exhaustion of free-shipping high-quality ore from the Lake Superior District. Others feel that the steel industry, through beneficiation of low grade ore and the development of new ore bodies, has little to fear for many generations to come.

In the more than 90 years since mining of Lake ore began, about 2¼ billion tons have been shipped to furnaces, leaving an estimated 1177 million tons of open-pit and underground ore of higher grade in the Minnesota and Michigan ranges, sufficient for 20-25 years' consumption at "normal" rates. Thus in less than a century, a large portion of the richest resources of the district have been consumed, as may be seen by the accompanying chart based on figures compiled by the Lake Superior Iron Ore Association. The Second World War period alone accounted for over 400 million gross tons.

**Domestic Reserves:** The latest Bureau of Mines estimate places the total domestic reserves of usable grade iron ore at slightly under 5½ billion tons. Of this, 33 per cent is in the Lake Superior district, 39 per cent in the southeastern district, 7 per cent in Northeast states, and Western and Central and Gulf states contain 7 and 4 per cent, respectively. New York, New Jersey and Alabama produce most of the ore coming from the East and South.

Much of this total reserve is of lower iron content, known as "lean" ore or taconite. Because use of lean ores will necessitate drastic changes in preparation, STEEL questioned blast furnace operators on this subject, with results as follows:

- (1) Ten per cent of the plants reported they now were beneficiating ore.
- (2) The majority indicated that if beneficiation were to become general, it would not be before the end of the present decade. Replies suggest a gradual adoption of beneficiating methods during this period.

There does not appear to be much agreement on location of beneficiation plants. One group of experts holds that concentration of large tonnages of Lake ore should be done at the mines, with shipment of the concentrate by rail and vessel to blast furnaces. Others favor sintering at the mines; although fuel would have to be transported to them. Moreover, blending of concentrate from two or more mines would not be possible without a rail haul.

**Research Is Promising:** Some benefit will derive from the flurry of research and investigation now going on to

conserve what is left of top grade ore and utilize ores of a lower caliber. Mesabi (Minnesota) taconite fines have been successfully concentrated in laboratory and pilot plant.

It has been estimated that 5 to 10 billion tons of high grade concentrates can be made available from low grade Minnesota taconites with present concentrating methods. Battelle Memorial Institute has been working for Lake Superior operators on concentration methods which may make another large supply of concentrates available from 50 billion tons of nonmagnetic taconite.

Wisconsin and Michigan iron formations also have proved worthy of pilot plant treatment. Here fine grinding is necessary, plus sintering or agglomerating the ore to bring it up to standard. The reserves of Wisconsin, not included in the Lake Superior district, total about 6 million tons.

Re-examination of known and partially worked deposits in the eastern United States and exploration in the Adirondack Mountains may add to the total tonnage being produced in the latter area and in New Jersey. During 1943 and 1944, New Jersey produced between 1 and 1½ million tons of magnetite annually, while New York and Pennsylvania together mined and shipped over 5¼ and 6½ million tons. This ore is all of the type which must be concentrated, but there is much more of it in reserve, albeit hard to get at and expensive to produce. Alabama continues as another source of iron ore, its hematite (some sintered before shipment) and brown ore production averaging about 6 million tons annually. Ore from California, Utah, Wyoming and Texas is caring for the requirements of Western steel mills.

**Foreign Sources:** The alternative to beneficiation of remaining domestic supplies, but more likely a supplementary course, will be greater importation of foreign iron ores. American steel companies long ago began to lay plans to insure their continued high production. A long-term lease to mine Amapa iron ore in Brazil has been granted one firm. If exploited, the project will be an open-pit operation on large tonnages of high-quality ore. Other companies are either prospecting or have concluded contracts with South American nations for mining privileges. Chile, of course, has been an important source for U. S. furnaces for years. Rich ore properties in Mexico were acquired recently by one large steel producer.

Canadian deposits mapped in Quebec and Labrador are thought to contain at least 300 million tons of readily available ore, but future disposition of these reserves depends to a great extent on Canadian government's attitude toward conservation on a nationalistic basis. However, shipments from the Michipicoten district and from the new Steep Rock mine on the Atikoken range con-

tinue to come to American furnaces. Steep Rock soon will produce close to ½ million tons of ore monthly.

Shipments from Sweden are being resumed but volume shipments from abroad are reported to be awaiting ocean freight rate reductions, possibly as much as 20 per cent. Leading shippers in addition to Sweden are North Africa and Spain. Philippine mines are not in bad shape, but lack of adequate transportation from mines to ports and high water rates are hindrances.

**Coking Coal:** Progress in the mechanical cleaning of coal used for the manufacture of coke has been steady in recent years. In fact, nearly one-third of the coking coal used in the Pittsburgh district now is cleaned.

The magnitude of overall savings in pig iron costs possible in the Pittsburgh district are shown by the experience of one company. The refuse content in its raw coal amounted to only 3 per cent, yet cleaning showed the following advantages:

- (1) Increased yields of metallurgical coke and by-products.
- (2) A 10 to 15 per cent improvement in the physical and chemical qualities of the metallurgical coke and a 20 per cent reduction in the hydrogen sulphide in the gas.

This better coke made from cleaned coal has produced the following benefits, based on various tests:

- (1) Coke consumption reduced from 5 to 8 per cent.
- (2) Flux reduced from 5 to 10 per cent.
- (3) Slag volume reduced from 7 to 12 per cent.
- (4) Iron output increased from 5 to 8 per cent with a lower sulphur content.
- (5) Substantial reduction in power required for blowing the stacks.

Mechanical loading of coal is affording reductions in mining costs though it invariably results in a large increase in the refuse content of the run-of-mine coal so that mechanical cleaning is essential for the production of satisfactory furnace coke.

One of the greatest advantages of clean coal for metallurgical coke is its greater uniformity in qualities which are directly reflected in greater uniformity in the physical and chemical qualities of the coke. Various studies show that the cleaning of coking coals has reduced the variability of the coal as to ash, sulphur, phosphorus and refuse content from one-half to one-sixth that of the raw coal.

Coal washing plants in the South employ a variety of methods and equipment in their operations. At southern plants, breakers are used in handling large rock, while at others picking tables are employed; in some cases Elmore jigs are used and in other cases, Baum and diaphragm jigs. Both screens and classifiers are employed in removing solids from the circulating systems.

Limestone presents no problem as far as supply is concerned. Alloying elements, such as chromium and manganese, were produced in the United States at high cost during the war but may be obtained more economically from other countries. Molybdenum is freely available. Tin reserves are dangerously low and will be short for months. Zinc is comparatively less critical.



# Blast Furnace

*Blast furnace operators, while greatly increasing capacity, also study innovations in practice. Blast conditioning found to result in higher output and lower coke consumption. Tests indicate operation of furnaces under higher top pressure metallurgically sound. Interest in carbon linings and insulation grows. Use of oxygen in blast under study*

THE immediate prewar and war years witnessed the construction and enlargement of some 48 blast furnaces which was accompanied by improvements in equipment and constructional methods. At the same time, blast furnace men have been evaluating a number of innovations in blast furnace practice.

**Blast Conditioning:** Blast conditions is one of the developments of the past few years which has intrigued operators. Now 20 out of 227 furnaces are equipped to control moisture content of the blast. Such control is not regarded essential by some furnace men but the matter is being given considerable thought. The editors of STEEL checked with the operators of a number of plants representing a substantial cross section of the industry. Of those not employing blast conditioning at present, 54.5 per cent said they felt it would be advantageous to their operation while 45.5 per cent said it would not.

Blast furnace operators also were asked whether they favored high moisture content (3 grains and over per cu ft) or low moisture content (under 3 grains). Sixty-six per cent said they favored high moisture content and 34 per cent favored low moisture content.

Many furnace men believe there is much to be gained by removing the humidity in the blast air. Furnace operation is smoother, the stack drives with more regularity and the volume of wind blown is more constant. Moreover, the heat and burden are more uniform, which affords more uniform temperature of iron as well as analysis.

One ironmaker whose blast furnaces are air conditioned states better iron is being made at his plant at lower cost and the return on the investment has been highly satisfactory. During the war this particular plant made more iron than ever before and with a lower coke rate.

At another plant equipped with air conditioning unit the officials report annual production almost 8 per cent higher and with the coke rate 33 lb lower per ton of iron.

Fundamentally, dry blast is a means for eliminating one of the major variables in blast furnace operation and serves to promote fuel economy, smoothness of operation, uniformity of product and low cost. It provides air to the blowers at a constant temperature and constant humidity so that there is no need to readjust the speed of the blowing engine in order to make it deliver a constant supply of oxygen.

**Carbon Linings:** Considerable interest is apparent in application of carbon linings for blast furnace hearth and hearth walls. At least seven of the 224 stacks in this

country are equipped with carbon linings in the hearth area and three stacks may be added to the list in the near future.

Other furnace operators are actively considering use of carbon block refractories. In checking with a large group of these operators, 53.3 per cent told STEEL's editors they were thinking about using carbon block while 46.7 per cent said they were not.

Linings of carbon paste tamped into place hot are the cheapest form of carbon for blast furnaces. Carbon paste itself is cheaper than formed and baked carbon blocks but it is questionable whether the tamped carbon lining is sufficiently lower in cost than brick or block lining to be of consequence.

While it may be said that the carbon lining for the hearth and hearth walls of a blast furnace will be more costly than a clay brick lining, nevertheless the important point is that if, at the end of a campaign no salamander is found in the carbon-lined hearth, then the extra cost of the carbon is of little consequence.

In England experimental use of preformed carbon as a blast furnace runner lining has been attended with success. As much as 40,000 tons of iron has passed over carbon

# Practice

runners without the runners having any attention beyond clay washing. At the end of this run, less than half of the brick had been worn away. The carbon always has had to be removed because of trouble in the adjoining lengths of clay or sand runners. By using carbon runners a cleaner iron will be delivered to the open hearths and the amount of cleaning up after the cast is minimized at the furnace.

Massive, preformed, baked carbon blocks are still favored by German metallurgists; others contend that as good or a better lining can be made more cheaply by ramming carbon paste (coke plus tar). One argument in favor of the blocks is that any lead reduced out of certain ores will seep out of the lining.

**Furnace Insulation:** Considerable thought is being given to improvement in operating efficiency through the use of insulating materials between blast furnace inwall and shell. Sixty per cent of a large group of furnace operators checked by STEEL said they were planning on using such insulation, while 40 per cent said they were not.

**Elevated Top Pressure:** Blast furnace practice employing elevated top pressure has resulted in comments from furnace men which are particularly pertinent at the moment in view of the effort to step up pig iron production—even through special price subsidies.

A large cross section of the industry was asked to answer this question: "Do you favor use of higher top pressure as a means of increasing furnace capacity?" In reply, 18 per cent said "yes"; 65 per cent said "no" and 17 per cent said "don't know".

According to those working with elevated top pressure,

higher hot blast temperatures can be carried on the stack with no trouble being experienced with the stock movement. Top temperatures average below 300° F. Flue dust production is in the neighborhood of 90 lb per ton of iron compared with 350 to 375 lb under current practice.

The dustcatcher and gas washing system handle a lower volume of gas for a given rate of blow. By means of elevated top pressure practice a blast furnace with a large hearth diameter will afford an output per square foot of hearth area comparable to that now produced on small hearth furnaces.

From test runs so far recorded, data indicate the furnace moves steady and takes more heat under elevated pressure. Lower top temperatures are noted. With wind volume unchanged, flue dust production declined from 350 to below 90 lb per ton of iron; however, when the wind volume increases to the point of equal gas velocities rising from the burden, the flue dust make again increases though not in the same proportion as with elevated pressure.

Those in charge of the test runs made so far are of the opinion that the process is sound metallurgically and that there is considerable to be gained by operating the stack with reduced volume of gas which results under elevated top pressure operation. Moreover, large hearth furnaces are now in a position to compete with small hearth stacks on the basis of output per square foot of hearth area.

**Oxygen in Blast:** Three blast furnace operators are studying the use of oxygen for enriching the blast. The prevailing question in regard to its use seems to center around the cost of the gas.

If it proves to be economically possible to work with pure oxygen, the production of carbon monoxide and, therefore, the reduction of the furnace charge could be effected quickly which would result in reduced consumption of fuel, greater speed in smelting and a more uniform product. There also would be no necessity for heating the blast, thereby eliminating the stoves.

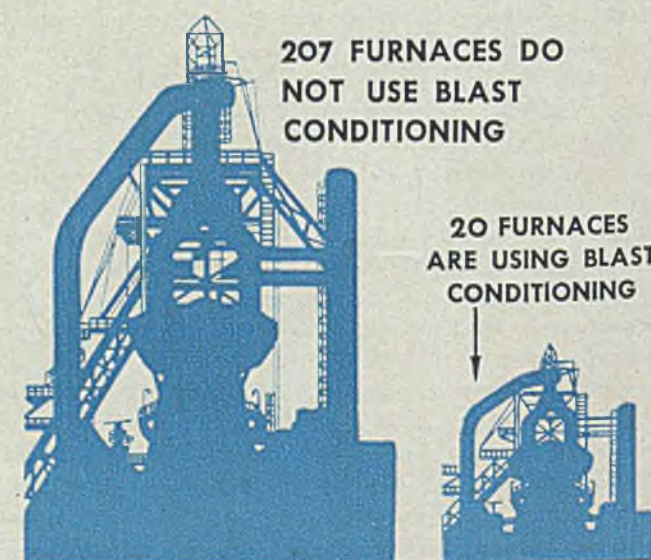
Condensation of oxygen from the atmosphere is a simple matter mechanically. Briefly stated, it is accomplished by liquefying the air, allowing the nitrogen and other gases, which are more volatile, to pass off, and finally compressing the oxygen into tanks or holders.

At a plant in Germany enriched blast is strongly favored and it is proposed to proceed with the construction of the necessary facilities as soon as practicable. It is planned to produce oxygen as a 75 per cent product by the Linde process and to introduce it into the blast below the bustle pipe, just above the tuyere connection. The blast will carry only 26 to 30 per cent oxygen, compared with the normal 20 per cent in air, and will be heated to 1400 to 1650° F.

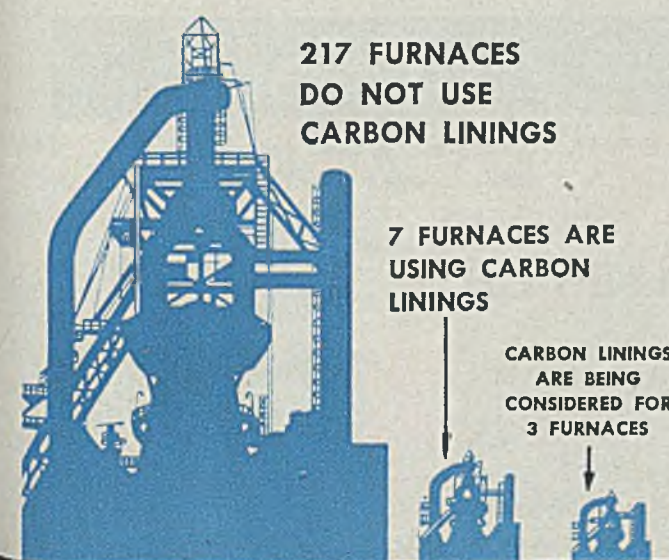
From a practical standpoint, however, the use of much over 30 per cent introduces complications, including the possibility of explosion. Moreover, if the oxygen content rises too high, calcium carbide tends to form in the furnace which of course consumes fuel and flux to no useful purpose.

Advantage of oxygenated blast is said to be greater with acid than with ordinary burdening. At least one other German plant is reported to have decided to adopt it on a commercial scale. In addition to a 10 to 15 per cent saving in coke, this change was supposed to allow the furnace to work at higher temperatures and with more lime in the charge and thus to make better iron.

## BLAST CONDITIONING



## CARBON LININGS





# Steelmaking Practice

*Alloy contamination acknowledged as major problem by more than three-fourths of the steelmakers. Fifty-six per cent combat it with more rigid scrap inspection, 6 per cent rely on improved melting practice, while 37 per cent use both methods. Over 51 per cent of open hearth shops make alloy steels and another 7 per cent intend to do so. Linings get front-line attention*

A RESPLENDENT, streamlined steel plant of the future has been envisioned among the steelmaking fraternity wherein reduction from ore and conversion to steel would be done in one stage in batteries of electric melting furnaces. This would eliminate present intermediate stages of reduction in the blast furnace and conversion in the open hearth, which in turn would eliminate the prime need for coke, the coke plant and coal.

Closer study would be made of metallurgical reactions, slag compositions and deoxidation. Analysis of heats in the first stages of melting would be of second importance because resulting heats would be blended in either a last-stage furnace or hot-metal mixer for required chemical analysis. From the mixer, fluid steel would be conveyed through refractory-lined ducts with exit ends shaped somewhat like the ultimate product, and from there led to rolls, or presses, or to extrusion dies for final shaping.

While this conception of future steelmaking is intriguing, the open hearth remains a very real factor in production; its influence in terms of steel produced—especially of alloy steels—is growing, and problems connected with its operation and maintenance, like those of the

contemporary electric furnace, are problems to be solved both today and tomorrow.

**Open-Hearth Alloys:** Since 1940 the production of high-grade alloy steel made by the open-hearth process has increased at a rapid pace. Basic open hearths in 1940 supplied 3,674,926 net tons compared with 1,286,716 net tons made in electric furnaces. By 1942, open-hearth tonnage had climbed to 8,133,076 net tons, and electric furnace steel in the same year rose to 3,392,776 net tons. In 1943, open hearth production reached its peak of 9,216,939 tons, against a rise of only slightly over ½ million tons of electric furnace alloy steel.

With the decline in war demand, 1944 alloy tonnage made in open hearths showed a loss of about 2¼ million tons, whereas electric furnace alloy output dropped a little over 300,000 tons. Last year, however, total production of both types again resumed proportions characteristic of the prewar period, or a ratio of 2:1; over 2 tons of open hearth steel to 1 ton of the electric furnace product.

Although electric furnace operations in 1945 were ahead of other peacetime years, some of the gain in output can be ascribed to the almost insatiable demands of

## PRODUCTION OF ALLOY STEELS IN OPEN-HEARTH FURNACES

**51.7%** NOW PRODUCE ALLOY STEELS  
IN OPEN HEARTHS

100% of this group will continue.

**48.3%** DO NOT

7.15% of this group plan to produce alloy  
steels in open hearths.

## ALLOY CONTAMINATION

**78%** OF STEELMAKING PLANTS ARE CONFRONTED WITH  
PROBLEM OF ALLOY CONTAMINATION

**22%** ARE NOT

### OF THIS GROUP:

56.25% are combatting the problem through more rigid scrap inspection only.

6.25% are combatting the problem through improved melting practice only.

37.50% are employing both methods.



converted consuming industries, as in the war years considerable new tonnage was assigned to them because of faster output and comparable quality. Also some steels have such a large percentage of alloys that they must be made in the basic arc-electric furnace under a single basic slag process. With all this, a substantial alloy tonnage once produced in electric furnaces was given open hearth producers during the emergency and much of this market may be retained.

This trend toward production of alloy steels by the open-hearth method is substantiated by replies of producers questioned by STEEL's editors. Of the great majority of steelmaking plants reporting, 51.7 per cent produce open-hearth alloy steels; and of equal significance, 100 per cent of that group intend to continue this practice. The balance of 48.3 per cent of open-hearth operators produce only carbon steels at present but 7.15 per cent of this group are planning open-hearth alloy steel production, as shown in the chart.

**Steelmaking Costs:** A large group of steelmakers were asked: "Do you believe it will be possible to reduce the cost of making electric furnace steel so as to compete with open-hearth steel?" Significantly, the answers were: "Yes" 32.3 per cent, "no" 64.5 per cent and "don't know" 3.2 per cent.

**Alloy Contamination:** Alloy contamination in steel-making grades of scrap has been a source of trouble for open-hearth operators for many years, but with the outbreak of World War II, the difficulty became more acute. War material specifications called for high grade alloy steels with the result that scrap finding its way back to the open-hearth stockhouse is contaminated with residual elements to a degree threatening control of new heats in which the scrap is used.

That the problem of alloy contamination is one faced by the majority of steelmakers is shown by affirmative replies of 78 per cent of the plants, as will be noted by referring to the chart. Furthermore, reports to STEEL show that, without exception, plants admitting this difficulty find it serious enough to take vigorous counter-

measures—56.25 per cent through more rigid scrap inspection only; 6.25 per cent through improved melting practice only; and 37.50 per cent by employing both methods to combat alloy contamination.

**Bessemer Steel:** Since investigation in the late thirties of the use of killed bessemer steel for the manufacture of seamless tube, about 1,000,000 tons of this grade of steel has been made for the purpose. Prior to this time metallurgists held the view that the better the steel is deoxidized, the better the quality of the seamless that could be produced. However, when bessemer steel was subjected to conventional methods of deoxidation, the desired results were not obtained.

Carbon was found to be the best deoxidizing agent, especially when added to the vessel after the flame indicated the end point of the blow had been reached. Pig iron in molten form is considered the most efficient deoxidizer for this purpose.

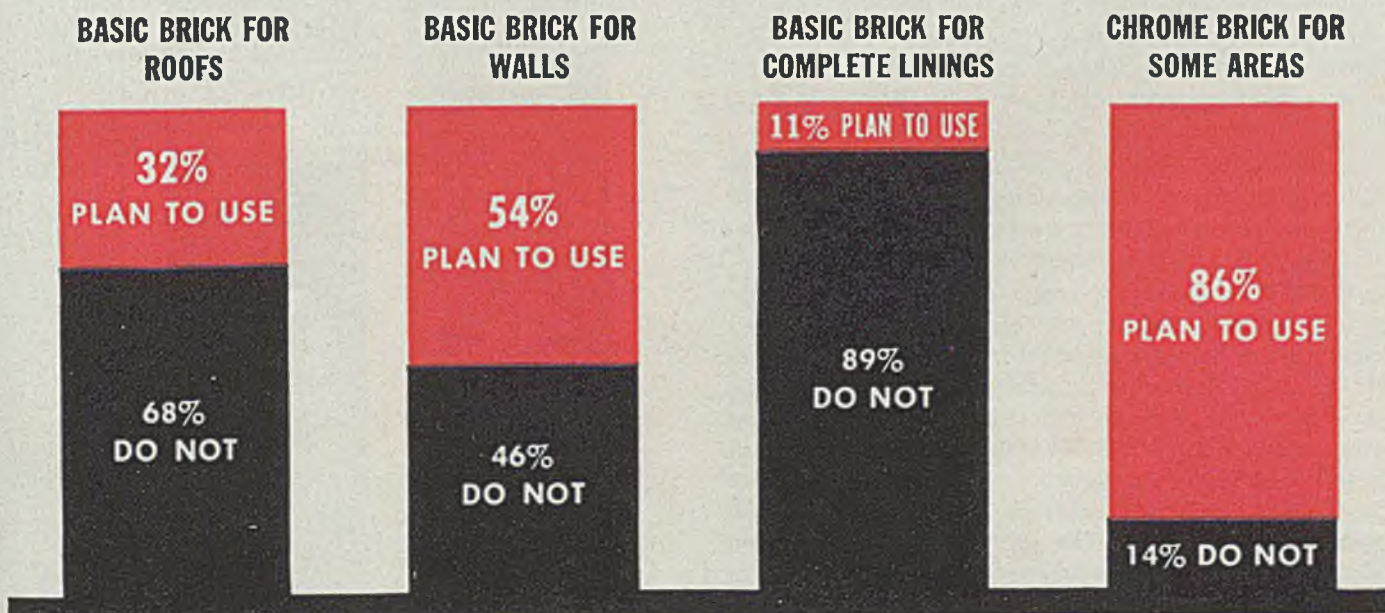
Seamless tubing from ½ to 24 in. outside diameter has been made from killed bessemer steel. Because of its high elastic limit the tubes have a high collapse value which makes them suitable for deep well drilling.

Dephosphorized bessemer metal in 28 gage is being used for corrugated galvanized roofing and siding, the bottom for pails in 28 to 32 gage black plate. Considerable tonnage is being drawn into rods, wire and bars.

**Furnace Linings:** Steelmakers are following with keen interest the operating practice at four open-hearth shops in this country and Canada where steel is being made either in the all-basic furnace or in furnaces lined in one or more areas with basic brick.

As shown in the chart below, 32 per cent of open-hearth shops have in mind going to basic open-hearth roofs just as soon as sufficient evidence is at hand to warrant making the change, against 68 per cent who are still on the fence. As for open-hearth walls, 54 per cent have made known their intention of employing basic brick. Basic brick may soon be used for complete linings by 11 per cent of the plants, while 86 per cent plan to use chrome brick for lining some areas.

## VIEWS ON OPEN HEARTH FURNACE LININGS





Steel industry is widening its research program, expanding and modernizing its facilities to provide products in a wide variety of shapes and with improved physical properties and finishes. Largest expansion in flat-rolled products. Action being taken on improved handling of materials and lighting

# 8 Finishing Operations

IN these days of pressure for deliveries of steel, unprecedented in any previous peacetime year, the steel industry also is giving a full measure of its attention to modernization and expansion of its finishing equipment and the many auxiliaries such as laboratories, power plants and the like.

**Facilities:** New mills are being built. Old mills are being speeded up and refurbished with new drives, more accurate electrical controls, automatic screw downs and new runout tables. Materials handling setups, special painting methods, etc. are being studied to make working conditions easier and more pleasant for the individual worker. Attention is being given to shapes, sizes, physical properties and finishes of the products needed by customers.

Last, but by no means least, the steel industry is engaging in the the most ambitious research and development program in its history. In reporting to the editors of STEEL, 66.2 per cent of the industry said large expenditures were being made for such facilities. These facilities are being used in developing new products and in making old products better. Naturally, they are being used to meet competition, also, as for example in the case of a steelmaker who discovered that the coal industry was using glass coal chutes because of their abrasion resistance.

An accompanying table lists an imposing number of new mills being installed this year or which are on order. The list does not include a number of important projects in the active stage, such as 56-in., 4-stand sheet mills being contemplated for the Chicago and Birmingham districts and a 5-stand strip mill for Chicago. An 83-in. sheet mill near Chicago may be rebuilt. Still another project contemplated is the rebuilding of a Pittsburgh district tin plate mill.

In an appreciable amount of the new work, there is a trend toward centralization of facilities to cut down inter-plant hauls and to be in a more favorable location to serve the maximum number of customers.

**Flat-Rolled:** In checking over the new finishing facilities, it will be seen that the emphasis is on flat-rolled facilities, the hottest spot in the present shortage of materials. It is impossible to relate the new mills accurately to added available capacity. But, if the current estimated capacity of 16,000,000 tons annually for flat-rolled is fairly close, consumers may find that this figure has been expanded by as much as 25 per cent in the next 6 to 24 months. The expansion in facilities now indicated should be somewhat comforting to consumers now considering setting up additional facilities requiring

large tonnages of sheets and strip in late 1947 and 1948. A number of new mills will go into production early in 1947, and others will come along on schedule, particularly if material and component bottlenecks are unplugged. This month, operation of a new 10-in. bar mill was held up for lack of a 1 hp and a 2 hp motor.

The emphasis on light, flat-rolled products is not at all surprising. During the war, sheet mills were converted to the rolling of ship plates and requirements otherwise were largely for heavier materials such as structurals and forging billets. It was necessary to switch mills back to strip and catch up on expanded consumer demand.

Among the highlights in advancements in rolling mill equipment was the introduction in 1945 of individual generators. These have been applied to four tandem mills, three of the installations having speeds of 4000 fpm and higher. A 5-stand, 40-in. high-speed tin mill now under construction will be operated by double-armature motors on all stands. Should occasion demand, all armatures can be made to operate in series at

reduced speed from an emergency power source. Application of amplidyne regulators for synchronizing the speed lever rolls and master pinch rolls is a feature of new combination annealing and pickling lines for stainless steel.

Processing lines of the electrolytic and hot-dip types have been equipped with newly designed and unique facilities. In fact, many of the older lines will have to be modernized to include these new facilities to compete with the modern plants from the standpoint of costs. For instance, one modern unit will employ a 9600-cycle induction and resistor-type heating furnace divided into a series of adjustable cooling zones. At another plant the annealing and galvanizing line employs an electronic-amplidyne system on its shear as a start and stop control thus eliminating the usual gage table with its contactors, solenoids and brakes. An adjustable voltage control of the amplidyne type also is a part of a 48-in. continuous terne plate line which will be ready for operation in 1947.

**New Gages:** During the war the development work

on an X-ray thickness gage for strip and sheets was discontinued. However, work on this instrument has been completed and if field tests prove its value the first unit will be installed on a commercial mill installation in a few months. Then, too, the new width gage for hot strip mills, a device which stripmakers have long desired, has gone into initial operation.

The editors of STEEL asked steel producers a number of questions relating to finish products. The answers to some of these are shown graphically in the charts. Twenty-six per cent of the companies said present rolling mills are not adequate to meet customer requirements as to tolerance and finish. Judging from the number of new mills now being placed in operation and contemplated, this situation will be rectified.

Development of even higher speed equipment for making stampings from coils of strip has resulted in the question as to whether longer and larger coils should be produced. When questioned on the subject, 40.5 per cent of the mills said they planned production of such coils; 59.5 per cent said they were not.

Equipment for automatically controlling adjustment of rolls between passes has come in for considerable attention. This is indicated by the fact that out of the large number of mills questioned by STEEL, 26.2 per cent said they planned to use such automatic screwdown controls.

**Special Shapes:** Considerable discussion has arisen regarding the desirability of making more special shapes available which would be especially suited to welding. Plants with large welding shops have favored this move since less work would be required in forming the steel prior to joining by welding. To obtain the views of producers on this subject a large cross section of the steel industry was asked: "Do you expect to make available an increasing number of special shapes as a result of widespread increase in welded construction?" Twenty-four per cent of the plants said they expected to do so, while 76 per cent plan no action. One Eastern steelmaker has installed 30-in. 2-high reversing mill for the conversion of slabs to special sections in order to reduce the machine time involved in making them from slabs.

**Reheating and Annealing:** Considerable progress already has been made in developing continuous equipment for reheating and annealing steel during processing. Most of these developments have involved wire, rod, strip and similar lighter sections. Engineers feel that the day is not too far off when such continuous methods will be adapted to practically all types of products—heavy or light—so that the ingot will be converted into its ultimate shape without an interruption in its movement. Induction, gas or oil heat may be applied. It already has been shown in commercial applications that such heat may be made to penetrate thick sections in a matter of minutes, while thinner sections can be penetrated in a few seconds. Both gas and induction heat are used in heating billets prior to forging and find many applications in the heat treating field.

Considerable interest is shown in induction hardening steel bar stock because of the high hardness developed, and freedom from warpage, scale, quench cracking and decarburized surfaces.

It is necessary to employ a steel with a carbon content of about 0.50 per cent in order to secure a surface hardness of 60 Rockwell "C" or higher. As a result

## IMPROVEMENTS IN FACILITIES

Special Shapes for Welded Construction

24%  
WILL MAKE MORE AVAILABLE

76%  
WILL NOT

High Speed Reheating & Annealing Equipment

20.7%  
ARE CONSIDERING INSTALLATIONS

13.8%  
ARE UNDECIDED

65.5%  
WILL NOT

Improved Materials Handling Setups to Cut Costs

74.7%  
PLAN TO REVAMP SETUPS

25.3%  
DO NOT

## VIEWS OF STEEL PLANTS ON

Research and Development Laboratories

66.2%  
PLAN SUBSTANTIAL EXPANSION

33.8%  
DO NOT

Closer Tolerances and Better Finishes

74%  
SAY PRESENT ROLLING MILLS ARE ADEQUATE TO MEET CUSTOMER REQUIREMENTS

26%  
SAY THEY ARE NOT

Longer and Larger Coils for Stamping and Forming

40.5%  
PLAN TO PRODUCE

59.5%  
DO NOT



many consumers no longer use the low-carbon carburizing grades, nor the heat treating steels of 0.40 to 0.45 per cent carbon. The fact that any decarburized surface must be removed in order to obtain the full surface hardness, either from the bar stock or the manufactured parts, has overloaded the turning and grinding facilities of numerous cold finishing shops, so that methods are being studied whereby cold finished bars can be rolled and treated more economically to eliminate the process of decarburizing.

At one plant, 52101 steel containing 1.00 per cent carbon and 1.50 per cent chrome and in the form of ball bearing race rings, 3-in. diameter and  $\frac{3}{8}$ -in. thick, involved a delicate heating procedure. Induction heating brought it to temperature in  $\frac{1}{2}$ -min. When the assembled bearings were subjected to accelerated life tests the rings heated by induction showed higher life values than those hardened by conventional methods.

Advancement has been made in the rapid heating of metals with gas fuel. Continuous annealing of stainless

metallic coatings, such as lacquer phosphate and the like. To this question, 14 per cent answered "yes" and 86 per cent "no."

**Clad Steels:** The steel industry also was questioned on clad or composite steels, which usually involve a backing of low-priced carbon steel for a higher priced material like stainless steel. A total of nine companies reported making such steel. The balance of the industry displayed no interest in entering this field with the exception of one company which is undecided.

**Higher-tempered Strip:** Apparently the trend in demand for higher tempered strip as related to other materials is upward, based on opinion in the steel industry itself. Fifty-six and a half per cent expect such an upward trend, compared with 34.8 per cent who do not and 8.7 per cent who are not certain.

**Electric Power:** The steel industry, of course, is a large user of power, part of which is produced within or adjacent to its own plants and the balance is purchased from public utilities. Sources break down as follows:

## NEW ROLLING MILLS

(Scheduled for completion in 1946 or on order)

Company	Number	Size & Type
Acme Steel Co., Riverdale, Ill.	1	22" 5-st cold strip
Allegheny Ludlum Steel Corp., W. Leechburg, Pa.	1	28" 4-st cold strip
American Rolling Mill Co., Butler, Pa.	1	54" 4-st sheet
Bethlehem Steel Co., Lackawanna, N. Y.	1	56" 4-st sheet
Bethlehem Steel Co., Los Angeles	1	30" billet
Bethlehem Steel Co., Los Angeles	1	12" merchant bar
Bethlehem Steel Co., Sparrows Point, Md.	1	88" hot strip
Bethlehem Steel Co., Sparrows Point, Md.	1	56" 4-st sheet
Bethlehem Steel Co., Sparrows Point, Md.	1	42" 5-st tin
Byers Co., A. M., Ambridge, Pa.	1	bar
Carnegie-Illinois Steel Corp., Gary, Ind.	1	54" 4-st sheet
Carnegie-Illinois Steel Corp., Gary, Ind.	1	42" 5-st tin
Cold Metal Products Co., Youngstown, O.	2	strip
Columbia Steel Co., Pittsburg, Calif.	1	54" 5-st sheet
Crucible Steel Co., Midland, Pa.	1	24" 6-st billet
Eastern Stainless Steel Corp., Baltimore	1	54" sheet
Granite City Steel Co., Granite City, Ill.	1	56" 4-st sheet
Great Lakes Steel Corp., Ecorse, Mich.	1	93" 5-st sheet
Great Lakes Steel Corp., Ecorse, Mich.	1	54" 3-st sheet

\* Additional roll stands to increase present bar capacity.

† 3-stand addition to convert plate mill to coiled strip and skelp production.

Company	Number	Size & Type
Inland Steel Co., Indiana Harbor, Ind.	1	54" 5-st sheet
Jessop Steel Co., Washington, Pa.	1	strip
Jessop Steel Co., Washington, Pa.	1	12" 5-st bar
Jessop Steel Co., Washington, Pa.	1	10" 6-st bar
Jones & Laughlin Steel Corp., Aliquippa, Pa.	1	42" 5-st tin
Jones & Laughlin Steel Co., Cleveland	1	56" 4-st sheet
Kaiser Co., Fontana, Calif.	1	24" 4-st strip
Laclede Steel Co., Alton, Ill.	1	rod
McLouth Steel Corp., Detroit	2	strip
National Tube Co., Gary, Ind.	1	36" piercing
National Tube Co., Lorain, O.	1	46" blooming
National Tube Co., Lorain, O.	1	35" bar
National Tube Co., Lorain, O.	1	26" billet
National Tube Co., Lorain, O.	1	20" billet
National Tube Co., Lorain, O.	1	42" piercing
National Tube Co., Lorain, O.	2	sizing
Pacific States Steel Corp., Niles, Calif.	1	22" breakdown
Republic Steel Corp., Youngstown, O.	1	84" hot strip
Republic Steel Corp., Youngstown, O.	1	36" edging
Sheffield Steel Corp., Kansas City, Mo.	1	rod
Tenn. Coal, Iron & R.R. Co., Fairfield, Ala.	1	56" 4-st sheet
Washington Steel Corp., Washington, Pa.	1	strip
Weirton Steel Co., Weirton, W. Va.	1	5-st strip
Youngstown Sheet & Tube Co., Struthers, O.	1	welded tube

steel bars and tubing in seconds and minutes has demonstrated the commercial advantage of production line heat treatment in terms of uniformity, distortion, surface finish and cost.

Bar stock 1-in. diameter can be heated to the hardening temperature desired in about  $1\frac{3}{4}$  min, instantly quenched and then drawn in about 2 min time. Such periods and speeds of heat treating are insufficient to permit any noticeable amount of decarburization or oxidation.

Interest already generated within the steel industry is well demonstrated by the chart which shows that 20.7 per cent are considering installations and 13.8 per cent are still undecided.

**Trend in Annealing:** Steel producers also were asked whether they expected to anneal a greater percentage of hot rolled material as compared with before the war. Fifty per cent said they planned to anneal the same amount; 41.6 per cent will anneal more and only 8.4 per cent will anneal less.

Nonmetallic coatings for steel have made considerable headway in the past few years and apparently the trend is still upward. Makers of sheets and strip were asked: "Do you intend to supply sheets and strip with non-

69 per cent buy all required, 21.3 buy some and 9.7 produce all required.

The trend is decidedly toward purchase of outside power, taking the industry as a whole. In answer to the question: "Is your organization considering greater use of public utility power or production of your own power?", there were the replies: 87.7 per cent, public power; 12.3 per cent, own power.

**Materials Handling:** The steel industry is truly cognizant of the necessity for reducing the costs of doing business. Seventy four and seven tenths per cent of the industry plans to revamp its materials handling setup while only 25.3 per cent does not. In checking on the types of motive power used for industrial floor trucks in steel plants, it was found that 51.8 per cent were gasoline engine powered, 23.6 per cent acid battery powered and 14.6 per cent alkaline battery powered.

**Plant Lighting:** In addition to improvements in its mechanical equipment, the steel industry also is giving some attention to good housekeeping and plant efficiency through lighting. Modernization of plant lighting is planned by 51.8 per cent of the industry. Use of special painting methods for plant interiors and machinery will be used by 52.6 per cent.



*let lacquer do it*

*let lacquer do it*

**LET**  
*let iacquer do it*

# let lacquer. **LAC**

# LACQUER

*let lacquer do it*

*let lacquer do it!* **DO IT!**

let lacquer de it



*If you want the fastest drying of all finishes  
--that can be applied with ease on virtually*

*any type of surface by any method—let lacquer do it!*

*If you want the most colorful of all finishes—crystal clears, rich opaques, gleaming pearl tones, sparkling metallic iridescents—let lacquer do it!*

*If you want all these versatile characteristics in your finishes—plus the even greater economy made possible with new formulations that can be sprayed, hot or cold, in fewer coats—only lacquer can do it!*

*Ask your Lacquer Supplier . . .*

for details and application data on time-and-money-saving lacquer. Hercules does not make lacquers, but supplies the high-quality nitro-cellulose and other base materials from which they are made.

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Cellulose Products Department  
**HERCULES POWDER COMPANY**  
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*let lacquer do it*

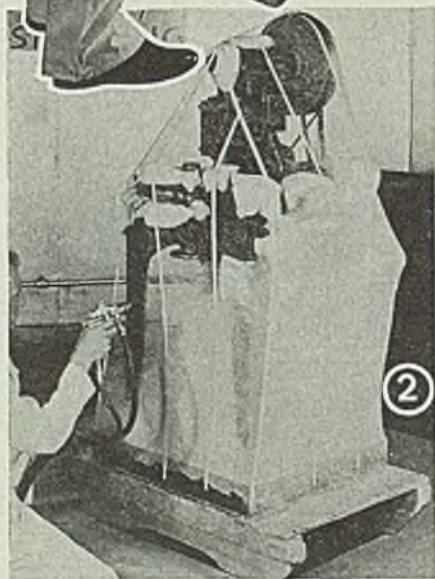
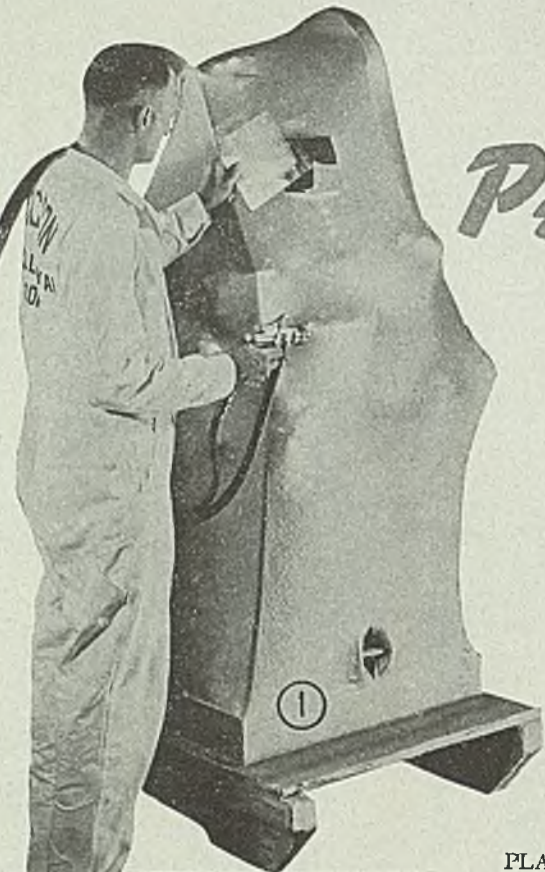
*let lacquer do it*

CL-66a



# PACKAGING Equipment

*Method developed for preparing machines for shipment or storage involves use of vinyl resin and asphalt-gilsonite spray coatings*



PLASTIC packaging methods adopted by the Army and Navy for preserving aircraft, guns, tanks, ships and the like for use in the next war, should it occur, are encountering a rapidly growing list of applications.

One of the biggest jobs recently reported is for the packaging of 1400 B-29 bombers for the Army Air Forces. This work will be done under the direction of the R. M. Hollingshead Corp., Camden, N. J. Another job involves the packaging of a considerable number of machine tools used in the production of aircraft engines in the plant of the Lycoming Division of the Aviation Corp. These tools were purchased by the Chinese government which will set up an engine plant in China.

The Hollingshead corporation has developed a spray coating which, in a demonstration before technical press editors, proved to be an improvement over the OS 3602 coating used by the Navy in preserving the Sixteenth Fleet, as described in detail in *STEEL* (April 29, 1946, p. 90).

The basic Navy coating is vinylite

chloride plus vinylite acetate and ordnance oil. In preparing guns, fire control instruments and the like, the Navy pads all sharp corners, a steel base ring is welded to the deck and a scotch tape frame work is built up horizontally and vertically. A webbing solution is added to the basic OS 3602 material, the mixture then being sprayed from conventional spray guns in long spidery webs which quickly bridge the openings to form a complete covering.

The web-coat is followed by four coats of OS 3602 brought to a wet spraying consistency by the addition of a thinner, methyl ethyl ketone, or a retarder, methyl isobutyl ketone, depending upon the temperature. The first three coatings are dyed yellow, red and blue for identification purposes. In making up the fourth coat, 6 oz of aluminum paste are added per gallon. Contents of the packages are protected from oxidation through the use of silica gel which reduces relative humidity to 30 per cent or less.

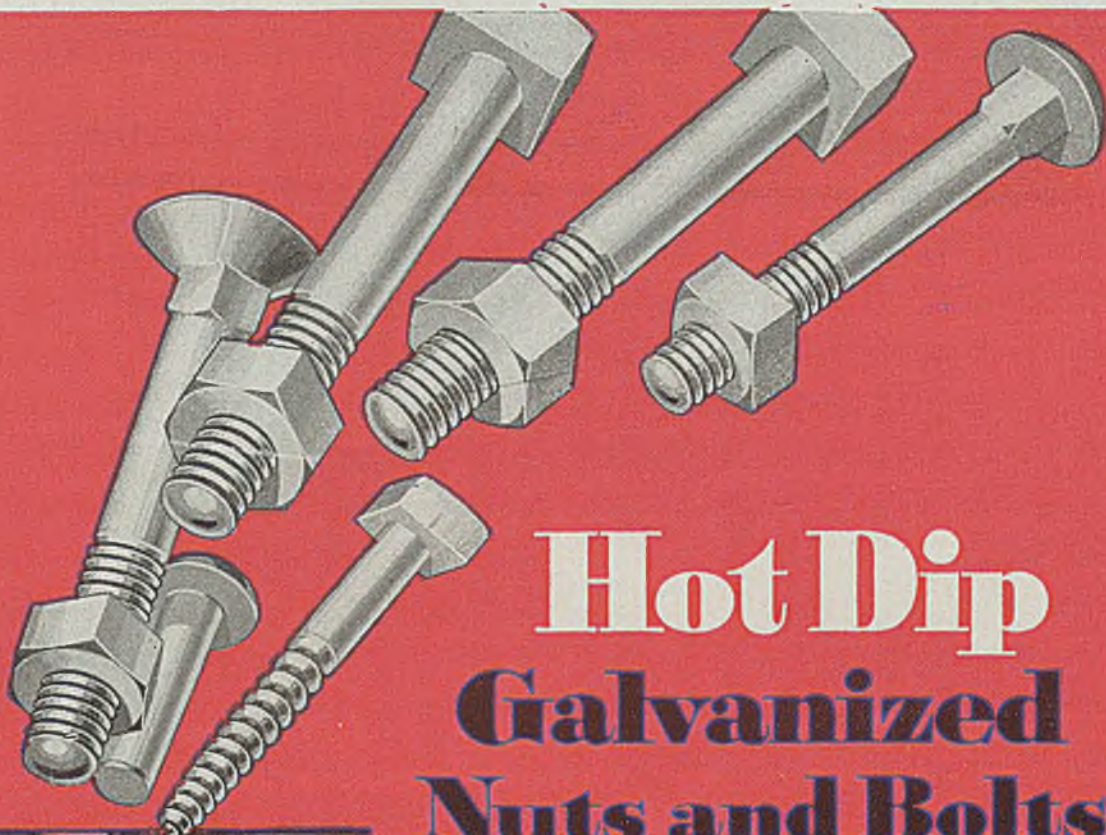
The new Hollingshead coating, trade-named "Cocoon", is a modification of

*Fig. 1—As shown here, additional coats are sprayed on wet to form moisture-proof cover. Entrapped solvents are blown out through slits and silica gel placed inside to reduce moisture content. Slits are patched with the coating material. A window may be inserted for visual inspection, if desired*

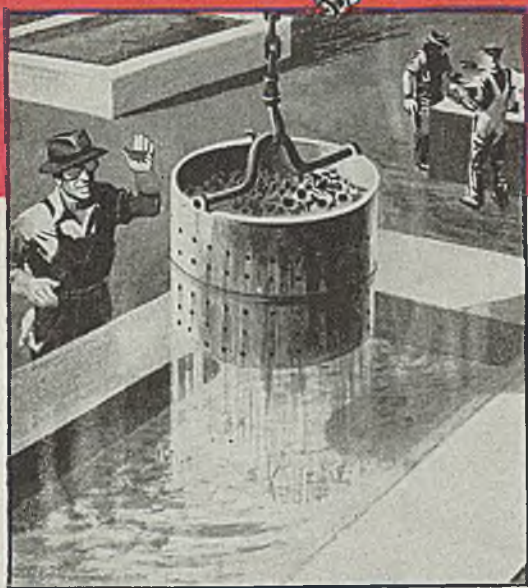
*Fig. 2—In preparing machine for packaging, it is placed in sheet metal pan, sharp corners are padded and tape framework is built up. Operator is shown applying first web coat. Webs bridge gaps between tapes but do not touch the machine*

*Fig. 3—Cover may be stripped from machine in only a few minutes. Coating does not adhere to the machine parts*





# Hot Dip Galvanized Nuts and Bolts *Last Longest*



Nuts, Bolts, Turnbuckles, Lag Screws—all *metal fasteners* that are exposed to the ravages of rust—give longer, uninterrupted service when dipped in molten zinc by the Hanlon-Gregory method of Hot Dip Galvanizing.

The World's Largest Job Galvanizing Plant is equipped to provide you the "utmost in rust prevention" for your products, in any quantity from truckload to carloads.

*and Fastest*

THE WORLD'S LARGEST **JOB GALVANIZING PLANT**

In the heart of the  
**STEEL INDUSTRY**

## HANLON - GREGORY GALVANIZING COMPANY

HANLON-GREGORY  
GALVANIZING CO.

Pittsburgh,



Pennsylvania



OS 3602 and was developed by Russell Hersam, director of the company's Coatings Laboratories and Dr. William Holst, of the same laboratories. Both men formerly were associated with the Naval Ordnance Laboratory at Silver Spring, Md., in connection with the development of plastic coatings. Procedure used in packing equipment such as the machine shown in the accompanying illustrations is essentially as follows:

- 1—Projections are padded and tape framework is built up. Sheet metal pan is used for base.
- 2—Basic solution, to which webbing solution has been added, is sprayed on to form a cover.
- 3—Basic solution, without webbing agent but with yellow dye added, is sprayed on to thickness of about 0.040-in.
- 4—Basic solution, with red dye, is sprayed on to thickness of 0.040-in.
- 5—Holes are cut in package and a desiccant, usually silica gel, is placed inside. Holes are patched with the coating material.
- 6—A light aluminum top coat is added where protection is required for less than a year. If added protection is desired, an additional coating of the basic material may be put on prior to adding the aluminum.
- 7—For storage under extreme conditions, such as outside for extended periods, top coating comprising 50 per cent asphalt and 50 per cent gilsonite (Insul-Mastic, made by the Insul-Mastic Corp. of

America, Pittsburgh. Gilsonite is a hard, lustrous, brittle mineral composed of highly complex hydrocarbons) is added.

- 8—Final coating of aluminum is sprayed over the asphalt-gilsonite coating to provide better wearing qualities and for protection against actinic rays of the sun.

The vinyl resin material has tensile strength of about 2000 psi; elongation of 200 per cent at room temperature; will not soften or become tacky at 180° F plus; remains flexible at minus 40° F; has extremely low rate of moisture-vapor transmission; is bacteriostatic and fungistatic, providing resistance against mildew and mold and may be stripped off in a few minutes. It may be applied to a 90 mm gun, as an example, in 10 manhours, compared with 30½ manhours for OS 3602. The asphalt-gilsonite material has been used for freight car roofs and other purposes for years and has a life expectancy of over 50 years.

Hollingshead is selling the coating materials to users and provides technical assistance until operators are trained.

According to R. P. Hendron, director of sales, Coatings Division, one of the best markets in the next few years will be in packaging machine tools for exports. Other applications include scuff coats for highly polished metals, auto parts, outdoor furniture, spark plugs, electrical equipment, instruments and gages, wash-

ing machines, refrigerators and farm equipment.

## Quality Steels Considered From Metallurgical Angle

*Metallurgy of Quality Steels*, by Charles M. Parker; cloth, 248 pages, 6 x 9 inches; published by Reinhold Publishing Corp., 330 West 42nd St., New York, for \$6.

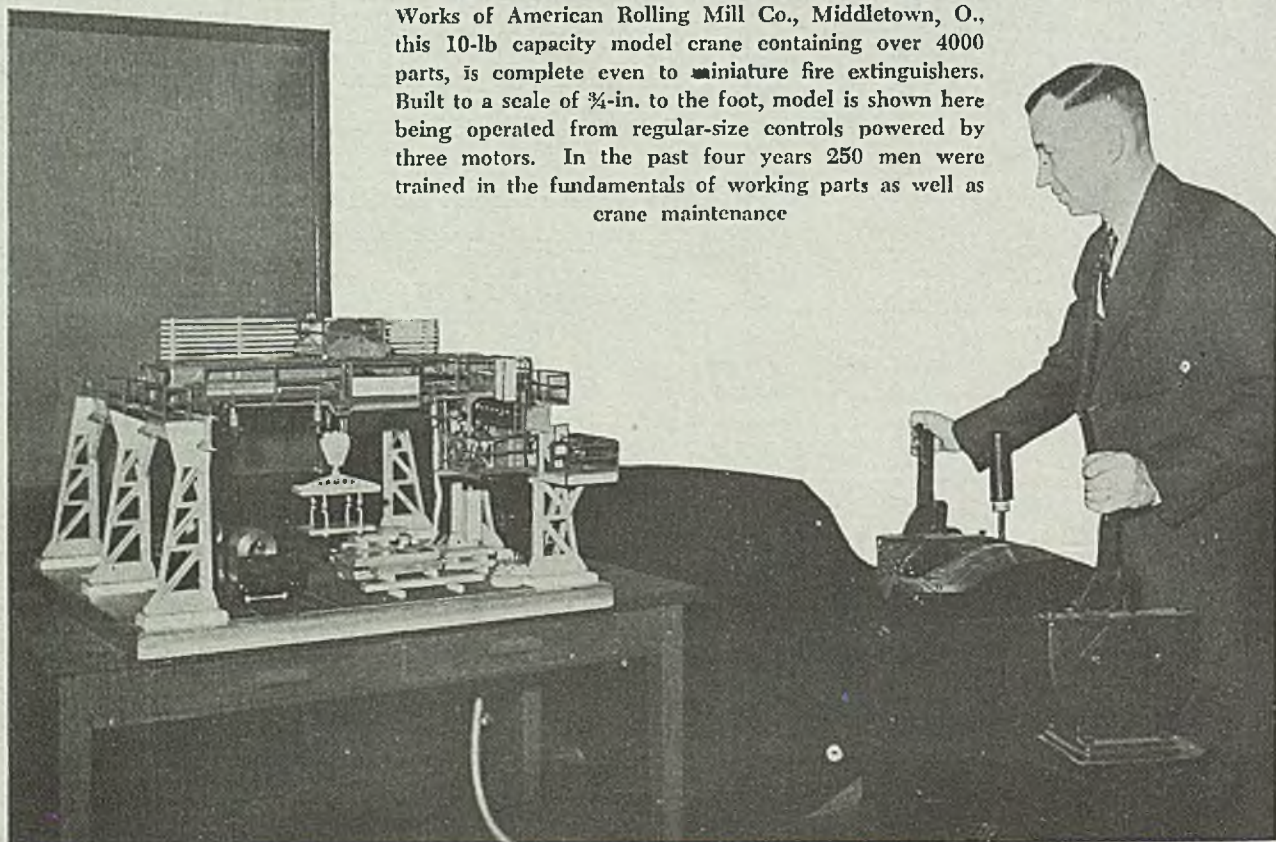
Material from which this volume was evolved was used during the war training period in educational lectures before the New York chapter of the American Society for Metals and the Army Air Force School of the eastern district.

Following these lectures demand arose for the material to be augmented and published. The work is not intended to be a substitute for other texts, usually more detailed. It is intended rather as an introduction to them in the hope the point of view presented will stimulate interest in the metallurgical sciences.

The text keeps close to fundamentals and in controversial subjects the author has kept to the conservative side.

Subjects covered include discussion of steel quality as related to method to manufacture, ingot practice and rolling practice, mechanical testing, annealing, normalizing and spheroidizing; effects of alloying, hardening, hardenability; special and general characteristics of steel.

**CRANE TRAINER:** Used to train operators at the East Works of American Rolling Mill Co., Middletown, O., this 10-lb capacity model crane containing over 4000 parts, is complete even to miniature fire extinguishers. Built to a scale of ¼-in. to the foot, model is shown here being operated from regular-size controls powered by three motors. In the past four years 250 men were trained in the fundamentals of working parts as well as crane maintenance





# do results like these give you ideas?



**BEAD-CUTTING** shears used in the tire-making industry take a tough beating. For longer-lasting cutting edges, which stay sharp longer, a major tire company now tips the blades with Carboloy Cemented Carbide Hard Metal.



**A NAVY YARD**—finding steel blades wear out too fast in fly cutters used for scraping concrete floors—turned to Carboloy Cemented Carbide Hard Metal, with amazing increase in blade life.



**IN SOLAR PHOTOGRAPHY** a leading observatory sought a metal (for spectro-heliograph slit-jaws) able to withstand constant abrasion and the heat of the sun's rays concentrated 10 times, yet maintain extremely accurate edges. Carboloy Cemented Carbide Hard Metal proved to be the answer.



**SWINGING FAUCETS** for kitchen sinks are machined the full length of the brass faucet-body with Carboloy Cemented Carbide form tools. Besides greatly increased tool life, this company cut polishing time considerably due to the high surface finish obtained.

**if** results like those above "ring the bell" in your thinking . . .

. . . start ideas forming on how you can bring similar improvements to *your* products and methods . . . and make you want to *do something about it* . . .

. . . then you ought to get acquainted with Carboloy Cemented Carbide Hard Metal!

This "versatile" metal's accomplishments in hundreds of industries have been little short of spectacular. Scoring rolls that outlast others 35 to 1—extrusion dies that produce 5,000,000 feet of abrasive carbon rod against steel dies' best of 75,000—spray nozzle discs that last the life of the sprayer . . .

. . . these are typical of the results Carboloy Cemented Carbide Hard Metal is bringing about daily, and will accomplish in *your* operations. Why not write us today, outlining your ideas; our engineers will be glad to advise you, without obligation.

Put this "Versatile Metal" To Work  
For You—6 Useful Properties Combined  
in One Metal.

High Red Hardness • Extreme Density •  
High Abrasion Resistance • High Modulus  
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# OPERATION-*to*-OPERATION handling

*Small fleet of battery-powered trucks reduces transportation costs, helps to increase production through interdepartment service, and stands up well despite constant overloads*



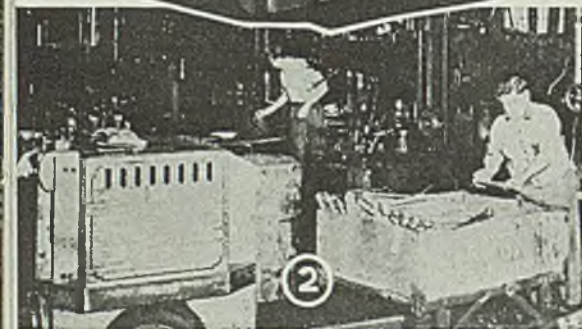
WHEN Duff-Norton Mfg. Co., Pittsburgh, makers of manual and powered lifting jacks, and drop forgings, first adopted the use of mechanical aids for moving and expediting materials in its plant, its management soon became convinced the step was in the right direction. In fact, company has remained convinced for more than 2 years because the economic advantages derived from these aids were realized and appreciated.

Today, 6000-lb capacity electric-powered platform trucks, with few exceptions, handle the bulk of the material in this plant—from receipt of rough stores through process to shipment. Materials such as rough castings, bars, rods and round and square steel tubing, wrought, gray and malleable iron, brass, bronze and aluminum are among some of the items brought into the receiving yard of the plant by freight car and truck. This material is moved into the storage yards, and then to shears and saws by overhead crane. All further movement, however, is by electric truck. Other items are handled manually upon receipt and are counted and weighed. Subsequent movement into and out of rough storage, into process and into shipment, is by battery truck.

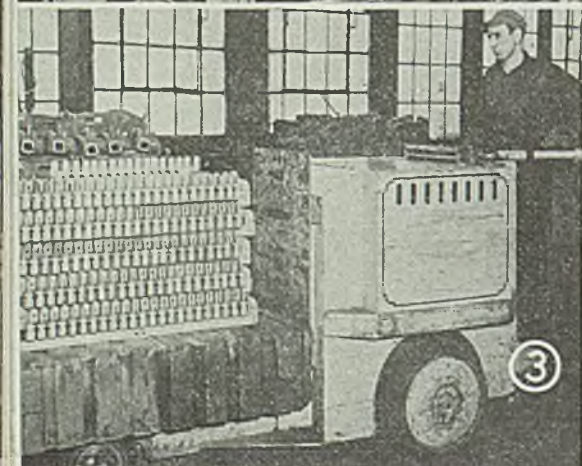
Truck operators, except in isolated instances, do not load or unload their vehicles—their task is confined to the movement of material. In addition, the operators are so familiar with the plant's operations that no dispatching is necessary unless a handling job outside the usual routine is required.

Of the six trucks used by the company, four of them are of the low-lift platform type. The other two are of the high-lift, 61-in. lift, platform type. The latter generally are used in the forge shop where, in addition to movement of material from rough stores into process, they are used to tier skid bins, or skids loaded with material. Sometimes they are used to move annealing cars in and out of annealing ovens, and also to change and transport dies, of different weights and sizes between storage areas and the hammers.

In the machine shop some 6000 to



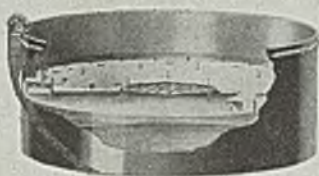
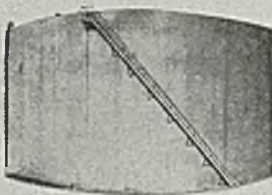
*Fig. 1—Skid-load of mine jack housings weighing 3500 lb is transported to stores department. Note stacking of cumbersome parts. Photos courtesy of Electric Industrial Truck Association*



*Fig. 2—View showing operation-to-operation movement of materials. Loads ranging up to 8000 lb are shifted in a matter of minutes*

*Fig. 3—Here machined rack forks are being moved along the processing line. Weight of this load is about 3900 lb*





## **SPECIAL or ROUTINE**

### **YOU CAN COUNT ON**

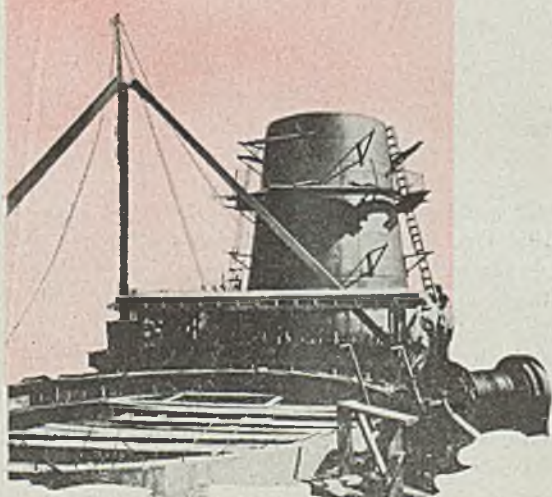
## **GENERAL AMERICAN**

Steel and alloy plate fabricated equipment, some designed, fabricated and installed by us, some precision fabricated by us to specifications submitted by steel mill engineers, is meeting performance requirements in many steel mills.

Next time a problem involving steel or alloy plate fabrication arises, call in a General American engineer. His knowledge and experience, backed by modern shops, excellent X-ray facilities, heat treating and stress relieving furnaces, assure you of a satisfactory installation.

#### **OTHER GENERAL AMERICAN EQUIPMENT**

Annealing Covers	Accumulator Tanks — High Pressure
Bases — Welded	Large Diameter Pipe and Mains
Bins	Steel Stacks
Charging Boxes	Weldments
Pressure Vessels	Pots — Tin or Galvanizing
	Steel and Alloy Plate Fabrication
Storage Tanks — oil — water — acid — propane — butane	



# **General American**

**TRANSPORTATION CORPORATION**  
process equipment • steel and alloy plate fabrication

#### **SALES OFFICE:**

519a Graybar Bldg., New York 17, N. Y.  
WORKS: Sharon, Pa.; East Chicago, Ind.



**OFFICES:** Chicago, Louisville, Cleveland,  
Sharon, Orlando, St. Louis, Salt Lake City,  
Pittsburgh, Washington, D. C.



7000 items are handled by the electric trucks from time of original receipt through final shipment. Here an average of five operations is performed on every piece, with movements between processes synchronized by electric trucks. Low-lift trucks are used in this shop for moving and positioning bin, or skid-loads of material to spots adjacent to the machine operators. The latter remove the pieces, perform the work operations and, in turn, place the pieces on other skids for further movement by electric truck along the processing line.

System of handling in the machine shop is so worked out that only four men are required to handle and move the material. Effects of the system were felt, economically, even in the early days when labor costs were low. At that time, the cost of labor for handling was reduced between 45 and 50 per cent.

According to the company, two of the original trucks were scrapped after well over 20 years of service, but the fault did not lie with the trucks. With rated capacities of only 6000 lb, each truck consistently handled loads of 8000 lb or more—a feat formerly requiring about 20 moves to reach the same volume. This overloading was necessitated in order that essential orders be filled. Now, while the plant is operating on one shift, overloading is the rule rather than the exception, as production is geared

so that any lessening of the loads would slow the plant down.

Under the company's system, trucks are withdrawn from service weekly for greasing, inspection and general servicing. Only six batteries are used, with an extra on hand for emergencies. During the single-shift operation of the plant, the batteries are charged each night by an automatic charger.

## German Windboxes Improve Foundry Pouring Practice

Unusual design for windboxes on cupolas used in a German foundry, of potential value to American foundries where continuous pouring is necessary, is described in a report released recently by the Office of the Publication Board, Department of Commerce, Washington.

The report deals with melting and casting practice in the Fried Krupp plant at Blankenburg. The plant produced high-quality cylinder liners for internal combustion engines. Gray, unalloyed iron was used in the melting process. A unique system, involving a specially designed windbox, was used to keep tuyeres clear and maintain uniform air volume.

Diesel engine valve seats also were produced in this plant. Metal was melted in one-piece resistance electrode furnaces, which were arch free and tilting, but did not rotate during the melting.

Furnace electrodes, probably composed of graphite and some highly resistant material, were not satisfactory for melting steel. Only austenitic iron was used.

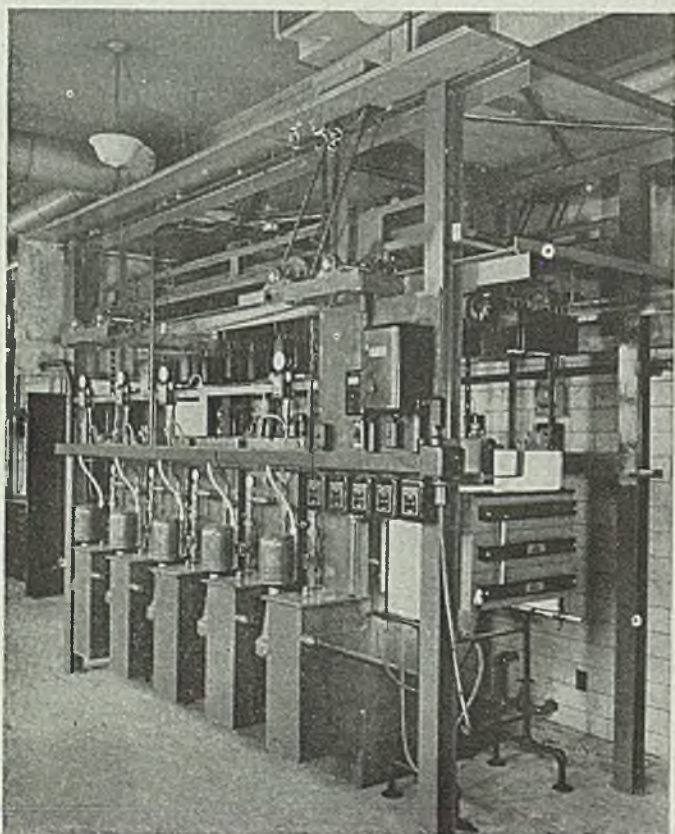
Casting was done in ten centrifugal casting machines placed in a row in front of the furnaces. Metal was carried by hand ladles from the furnaces to the machines. After heat treatment, castings were turned and cut in sections for valve seats.

Four machines in constant operation produced 10,000 castings per month. According to the managers of the plant, valve seats were used with great success by all diesel manufacturers because of their stability and long wear under high temperatures.

## Short Length Drills For Screw Machines

Wasteful process of cutting off, resharpening and otherwise adapting full length drills to fit machines can be eliminated by use of new short length drills manufactured by Whitman & Barnes, Division of United Drill & Tool Corp., 2108 West Fort street, Detroit.

New drills are said to be properly proportioned in length, web thickness, degree of spiral and flute contour. They are available in fractional sizes 1/16 to 2 in., in wire gage sizes 1 to 60 and in letter sizes A to Z.



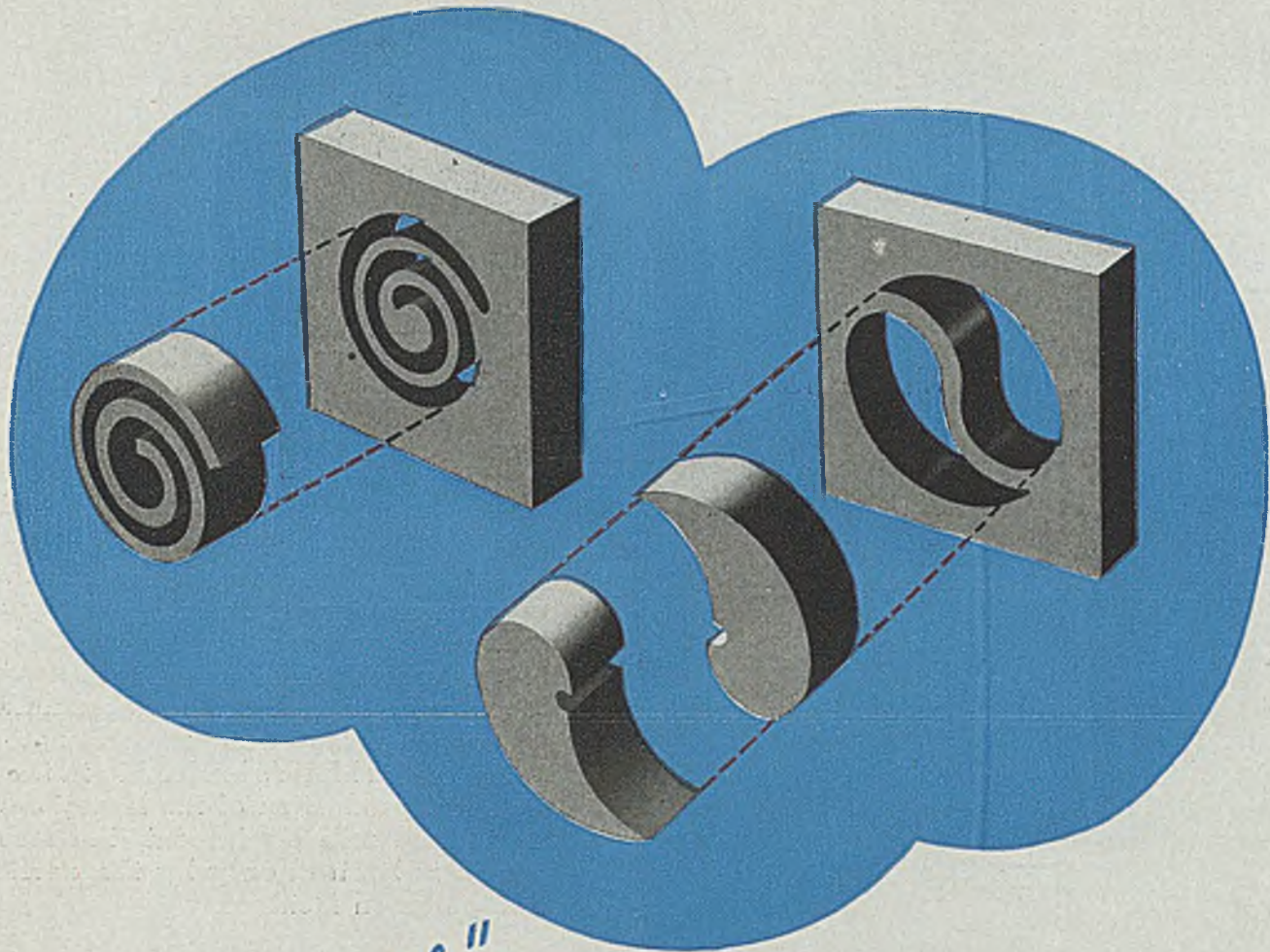
## SPRAY BONDERIZING *Small parts*

FULLY automatic unit shown here was developed recently by Parker Rust Proof Co., Detroit, for spray-bonderizing small parts. While the model was designed primarily for treatment of panels, the company is using it as an experimental unit to develop similar and larger equipment.

According to the manufacturer, sequence of operations in the machine includes emulsion cleaning, hot water rinsing, bonderizing, cold water rinsing, Parcolene rinsing and drying. By horizontal motion of 2 1/4-in. twenty times per minute, work is kept constantly in motion to avoid spray patterns. Panels move at the rate of 450 per hour through five tanks and dry-off oven on a 1 min cycle with a 20-sec transfer interval between stages. Miscellaneous small parts up to 8 x 18 x 18 in. can be handled in the unit. Cycle and interval are set to meet requirements of work being treated.

Dry-off oven in foreground of picture consists of a double bank of 36 infra-red lamps; gas heated oven may be used if desired. Entire compact unit is said to occupy floor area of approximately 70 sq ft.





# THE *"Impossible"*

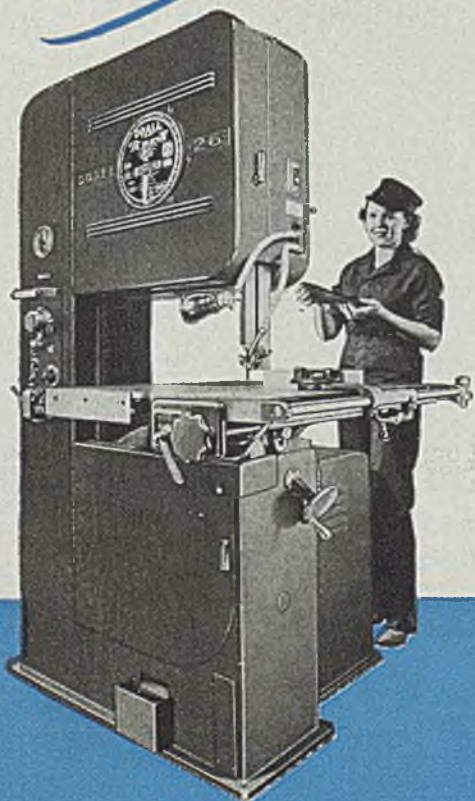
## WITH DoALL CONTOUR SAWING

- *Miracle Method of Low-Cost Production*
- *World's Fastest Metal-Removing Process*

No metal-cutting process except Contour Sawing can do these two jobs, leaving cutouts and leftover stock intact. Other metal-cutting processes waste time reducing stock to worthless chips. Contour Sawing slices stock; leaves only a 1/16-in. kerf. Hundreds of superhard, razor-sharp teeth on a narrow band cut continuously through hard, tough metals as much as 30 in. thick. Apprentices soon do expert work—do not need years of experience.

Contour Sawing is an entirely new approach to low-cost production. Jobs done slowly by other methods are "naturals" for fast Contour Sawing. It magically reproduces parts usually cast or forged; turns out shop jigs and fixtures; makes cams; cuts sheet-metal stampings; patterns and templates.

Advantages of Contour Sawing shown in free booklet "DoALL Equals Ten Plus". Write for one if you want to see production zoom and costs sag!



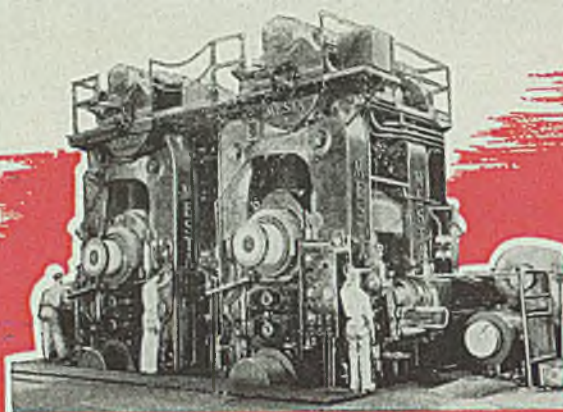
*The* **DoALL** *Company*

DoALL STORES  
IN PRINCIPAL CITIES



MACHINE-TOOL DIVISION  
MINNEAPOLIS 4, MINN.



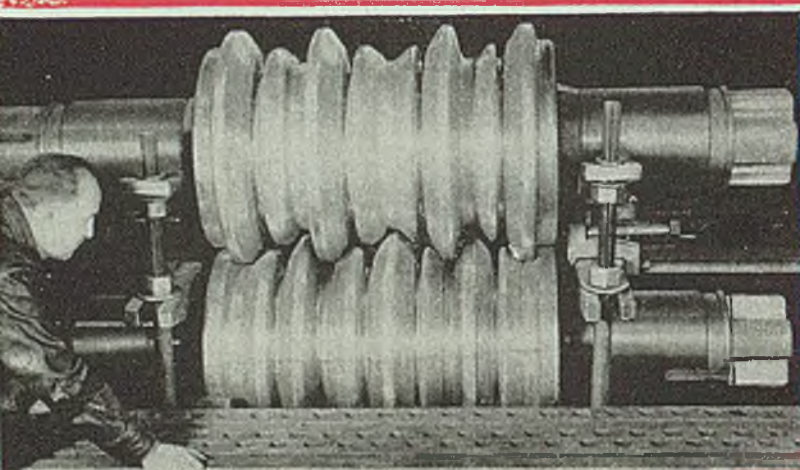


42" TWIN FOUR-HIGH SKIN PASS MILL FOR TIN PLATE

# MESTA

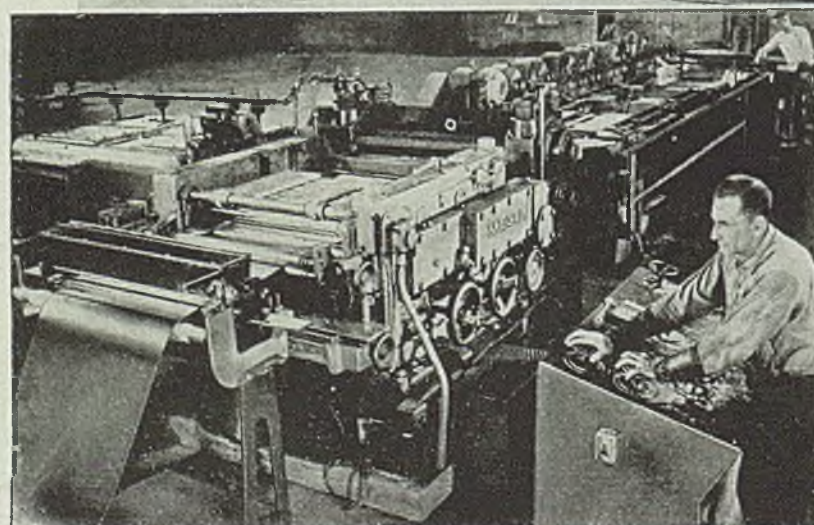
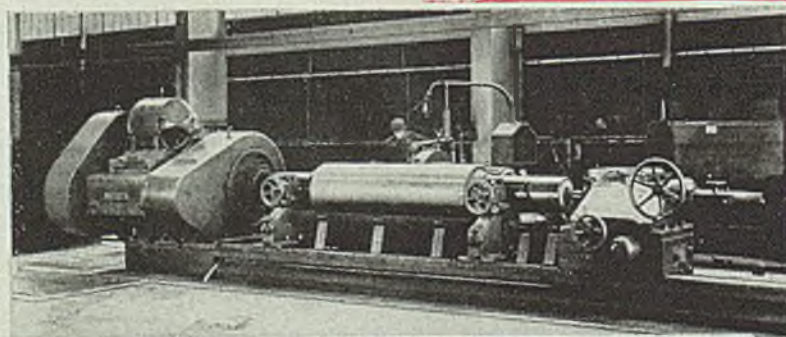
## WORLD'S LEADING DESIGNERS and BUILDERS of COMPLETE STEEL PLANTS

Unequalled plant facilities, equipped with the most modern precision machinery, and manned by skilled workmen with long service records, an engineering staff whose technical ability has been accumulated over many years—these resources are responsible for Mesta's leadership in the design and production of the largest heavy duty steel mill equipment, the size of which is limited only by the carriers' transportation facilities.

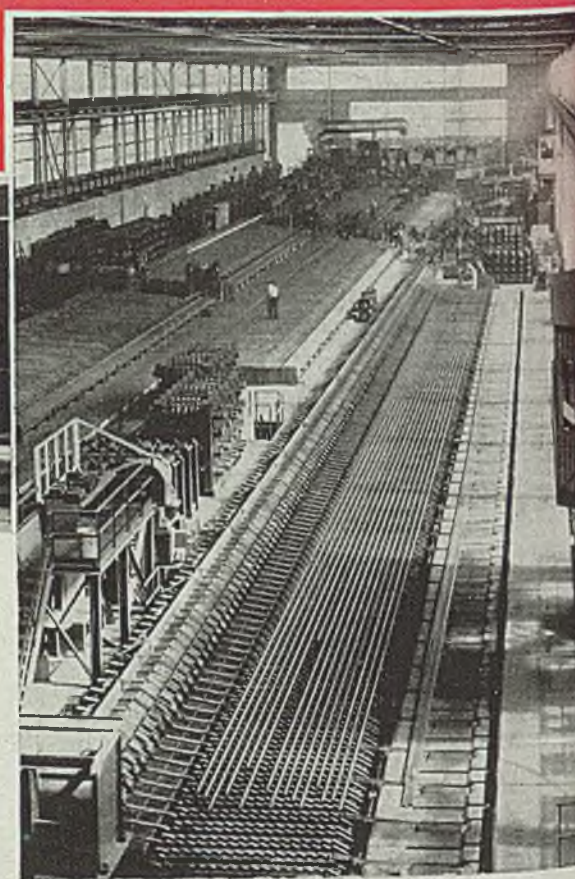


MESTA MERCHANT MILL ROLLS FOR ROLLING I-BEAMS

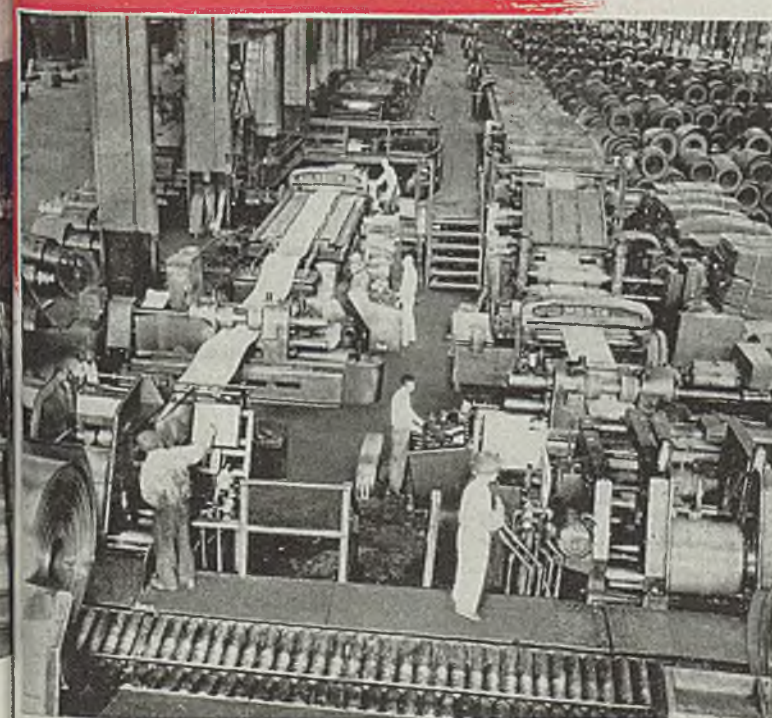
MESTA 60" HEAVY DUTY ROLL GRINDER



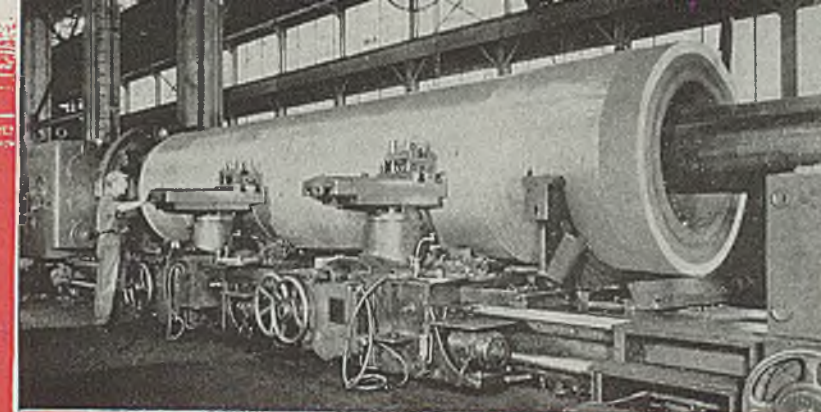
MESTA 42" TIN SHEARING LINE, SHOWING MESTA PATENTED FLYING SHEAR AND LEVELLER WITH CLASSIFYING AND PILING EQUIPMENT IN BACKGROUND



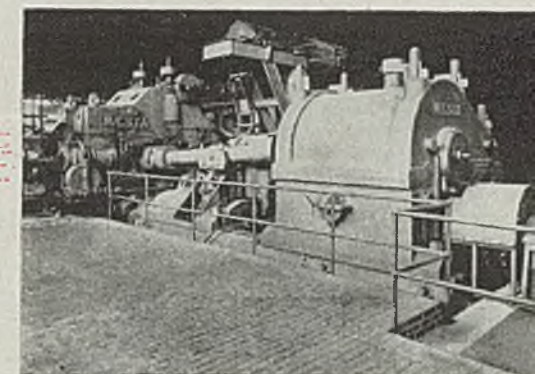
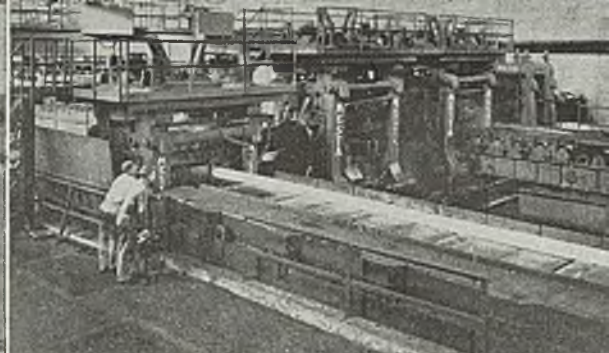
MESTA 18"—14"—10" MERCHANT MILL WITH PACK ANNEALING COOLING BED



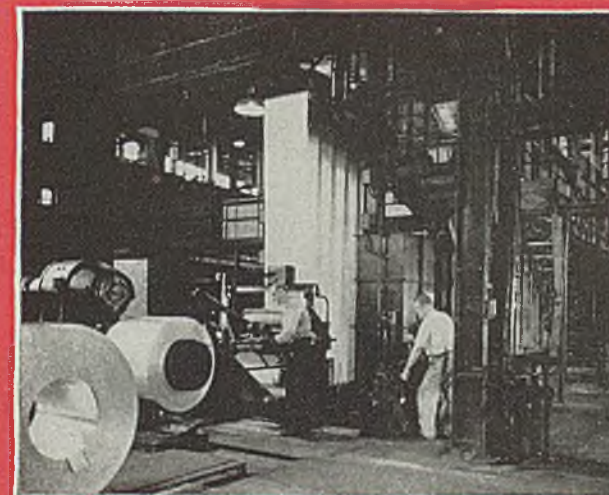
MESTA 66" CONTINUOUS PICKLING LINE WITH TRIMMERS AND UPCOILERS



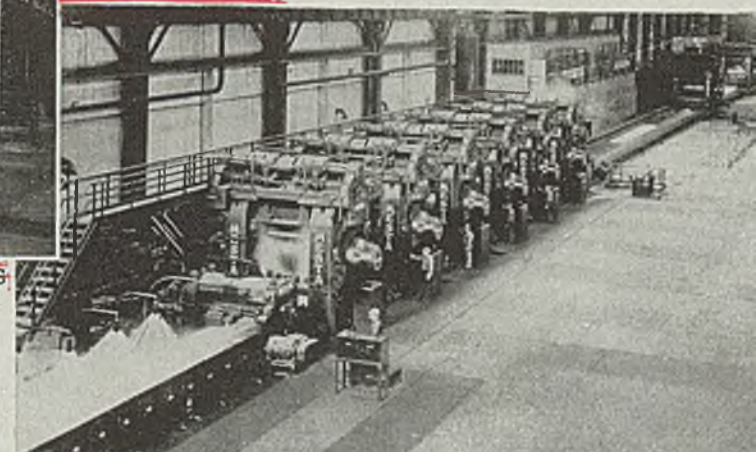
MESTA 29" STRUCTURAL MILL WITH TRAVELING TILTING TABLE



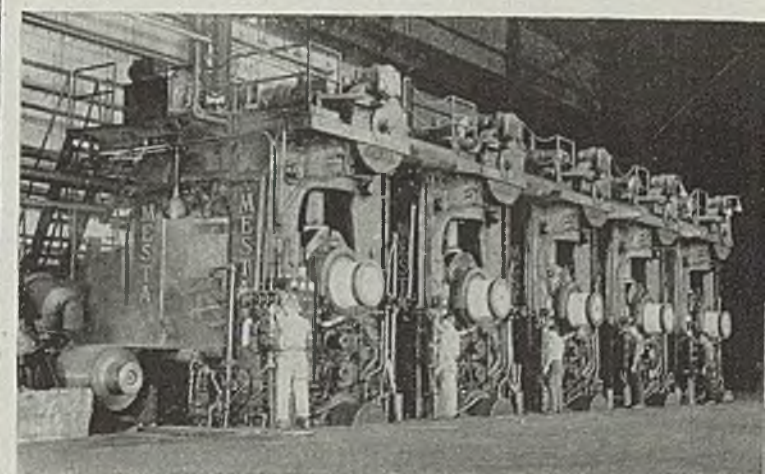
MESTA PIERCING MILL AND DRIVE



DISCHARGE END OF MESTA 42" CONTINUOUS ELECTROLYTIC TIN PLATING LINE



MESTA 80" FOUR HIGH CONTINUOUS STRIP MILL



MESTA 42" HIGH SPEED FOUR-HIGH TANDEM COLD MILL FOR ROLLING TIN PLATE GAUGES

# MESTA MACHINE COMPANY . . . PITTSBURGH, PA.



# Advantages of NEMA Standardized Motors

*Besides reducing costs, standardization enables established machinery manufacturers to secure the same motor from several sources with confidence in performance and interchangeability*

WITH increasing number of users of small motors, the new National Electrical Manufacturers Association standards are of utmost importance to the appliance or machinery manufacturers from purely an application standpoint. One of the foremost considerations is given to the assurance of continuity of service and freedom of trouble from the motor. The NEMA standardized motor is called upon to meet certain exacting standards which gives the machinery manufacturer as well as the ultimate user the assurance of a quality product.

During a period of approximately 30 years, the application engineer played an important role in correlating the device manufacturer's requirement with the type of unit which the motor manufacturer was in a position to furnish. After making a complete and thorough study of the requirements of a particular application, a motor of the required electrical design and mechanical construction was selected by the application engineer for that particular device. This selection was made from a standpoint of minimum costs, but with the assurance of continuity of service and freedom from trouble.

Several motor manufacturers in 1939 promoted the standardization of the gasoline dispensing pump motor. This was definitely welcomed by the pump manufacturers and the oil industry. Due to the war, further standardization from an industry standpoint was not consummated until this year.

It was pointed out that with the increase in production rate, through standardization, costs are reduced. Reduction of cost in a major component of the appliance in turn results in increased sales. This is an important consideration from the motor and appliance manufacturer's standpoint.

By E. G. WICKERSHAM

Application Engineer  
Leland Electric Co.  
Dayton, O.

Through standardization the established machinery manufacturer can secure more than one motor source without considerable expenditure for development or exhaustive engineering tests. Let us, for example, assume he is a jet pump manufacturer, for whom the motor has been standardized both electrically and mechanically. By using the standardized motor, he is in a position to secure the same motor from several sources without additional application work, and be confident of performance and interchangeability.

Then there is the new appliance or machinery manufacturer, who is just entering the field of a particular commodity, and is seeking a motor source. His first move in the layout and design is to call in an application engineer for his motor recommendation. Knowing the application and torque requirements, a standard motor may be selected and fitted into the layout. The appliance manufacturer may see fit to run certain tests on the complete

unit, however, by selecting a standardized motor, he is assured he is using a design engineered for that application and one that has been tested in actual service. This is vital to him as he has the assurance of maximum service, continuity, and dependability. This manufacturer, by taking advantage of a standardized unit being built by a motor manufacturer, is not called upon to bear the development expense necessary if a special motor had been required.

The new standards provide specific definition of motor rating and performance in co-ordinated terms of horsepower rating, speed, breakdown torque and service factor.

In formulating the new standards, as L. C. Spoor, vice president of the fractional horsepower subdivision of the motor and generator section of NEMA, pointed out the motor manufacturers felt that a clearly defined and generally accepted method of evaluating motor performance was essential in order to assure intelligent design, manufacture and use of small power motors.

**Rating Motors:** In the application of fractional horsepower induction motors, the motor should be selected with a breakdown torque which is sufficient to take care of the maximum peak load requirements of the application. Breakdown torque is the maximum torque that the motor will develop without an abrupt change in speed. In order that new standards would be inclusive and serve to provide a definition of rating of any particular motor design, the complete range of breakdown torque was divided into bands for the various standard horsepower ratings.

Such a series of torque values associated with corresponding horsepower rating provides a definite classification of any motor in terms of horsepower ratings.

Values shown in Table I are the newly adopted NEMA standards for breakdown torque of single-phase fractional horsepower motors.

**Load Carrying Ability:** Fractional horsepower motors of the open 40° C rise continuous rating, referred to as general purpose motors, have a lower temperature

TABLE I

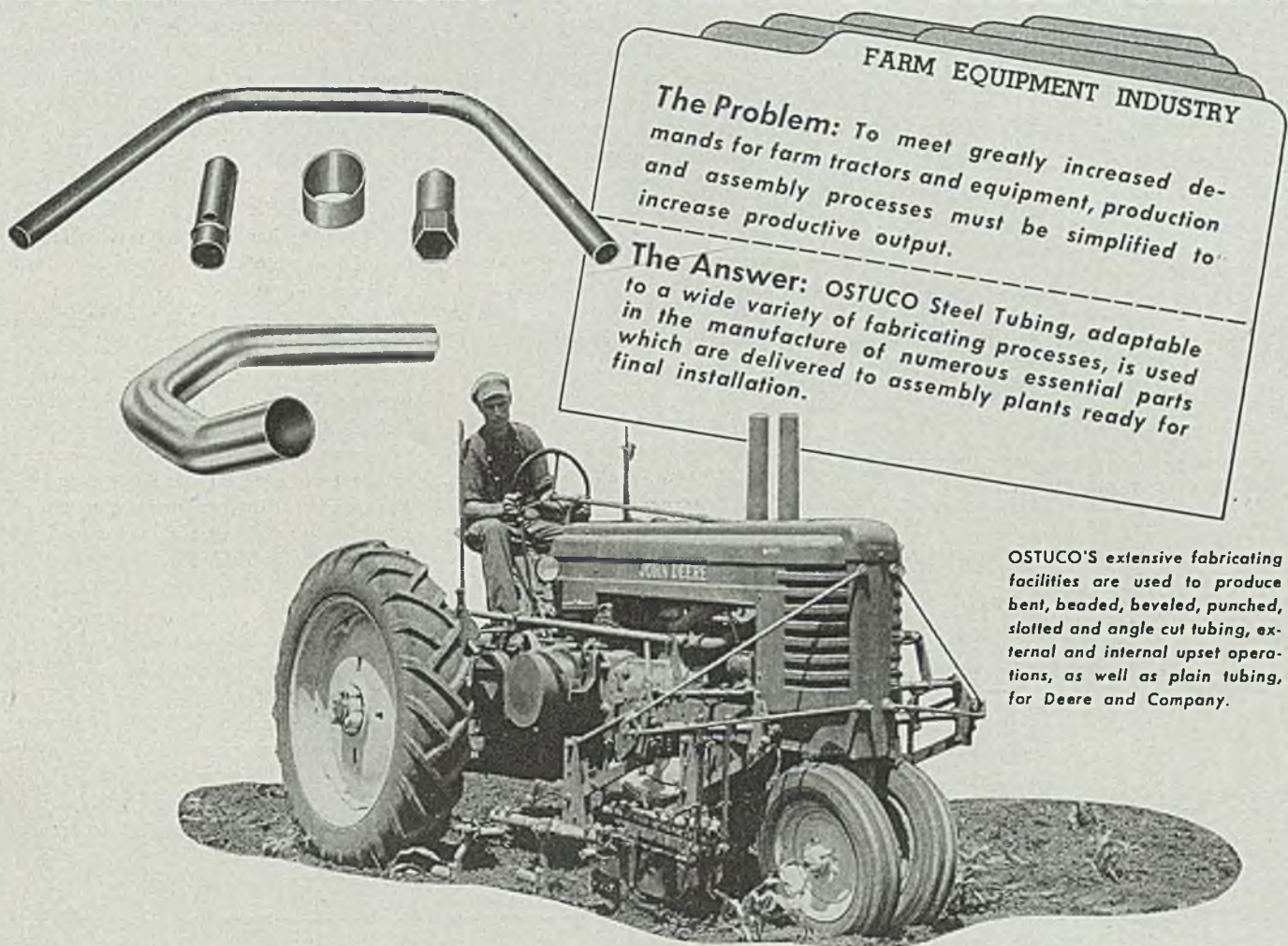
Small power single phase induction motors shall be rated primarily on the basis of breakdown torque. Value of breakdown torque for defining horsepower rating shall fall within following ranges:

		Revolutions Per Minute			900 Synchronous RPM	
3600	3000	1800	1500	1200	850 Approx. F.L. RPM	
3450	2850	1725	1425	1140		
Breakdown Torque Oz-Ft						Brake Hp Rating
2.0-3.7	2.4-4.4	4.0-7.1	4.8-8.5	6.0-10.4	8.0-13.5	1/20
3.7-8.0	4.4-7.2	7.1-11.5	8.5-13.8	10.4-16.5	13.5-21.5	1/13
6.0-8.7	7.2-10.5	11.5-16.5	13.8-19.8	16.5-24.1	21.5-31.5	1/8
8.7-11.5	10.5-13.8	16.5-21.5	19.8-25.8	24.1-31.5	31.5-40.5	1/6
11.5-16.5	13.8-19.8	21.5-31.5	25.8-37.8	31.5-44.0	40.5-58.0	1/4
16.5-21.5	19.8-25.8	31.5-40.5	37.8-48.5	44.0-58.0	58.0-77.0	1/3
21.5-31.5	25.8-37.8	40.5-58.0	48.5-69.5	58.0-82.5	.....	1/2
31.5-44.0	37.8-53.0	58.0-82.5	69.5-99.0	.....	.....	3/4
44.0-58.0	53.0-89.5	.....	.....	.....	.....	1

Note 1. Breakdown torque range includes the higher figure, down to, but not including the lower figure.



# Problem TROUBLE-SHOOTING with SEAMLESS STEEL TUBING



**FARM EQUIPMENT INDUSTRY**

**The Problem:** To meet greatly increased demands for farm tractors and equipment, production and assembly processes must be simplified to increase productive output.

**The Answer:** OSTUCO Steel Tubing, adaptable to a wide variety of fabricating processes, is used in the manufacture of numerous essential parts which are delivered to assembly plants ready for final installation.

OSTUCO'S extensive fabricating facilities are used to produce bent, beaded, beveled, punched, slotted and angle cut tubing, external and internal upset operations, as well as plain tubing, for Deere and Company.

In the assembly of the famous John Deere tractors, numerous parts, ranging from radiator vent drain tubes to exhaust pipes, are furnished by The Ohio Seamless Tube Company. Deere and Company, alert to every opportunity to streamline production, has found OSTUCO Steel Tubing, fabricated to its specific requirements, a means of eliminating extensive, time-consuming operations in its own plants.

OSTUCO tubing, inherently strong and lightweight, is ideally suited for applications where severe usage is expected, yet its uniform quality permits its use in the most complicated fabricating processes. As a manufacturer, you'll be interested in learning how OSTUCO's skilled craftsmanship\* and engineering experience can help improve your production picture. Write to the nearest sales office for your free copy of "M-1," an informative booklet on steel analyses, tolerances and machining methods.



*\*This is Walter Oman, one of the many members of the OSTUCO 50-Year Club, all veterans who have devoted a lifetime developing the skill and ability that contribute so much to the OSTUCO tradition of quality . . . a tradition as old as the history of tube-making itself.*

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• Canadian representative: Railway & Power Engineering Corp., Ltd. Hamilton, Montreal, Noranda, North Bay, Toronto, Vancouver, Windsor and Winnipeg.



**Plant and Main Office  
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MANUFACTURERS OF SEAMLESS AND ELECTRIC-WELD STEEL TUBING



rise rating than certain motors designed for specific duty and load conditions which are rated 50° C rise (open) or 55° C rise (totally enclosed). These temperature rises are recognized by industry

**TABLE II**  
Service Factor for General Purpose  
40° C. Induction Motors

HP	
1/20	1.4
1/12	1.4
1/8	1.4
1/6	1.35
1/4	1.35
1/3	1.35
1/2	1.25
3/4	1.25
1 at 3600 RPM only	1.25

**TABLE III**  
Locked Rotor Current in Amperes

Rated HP	115 Volts	230 Volts
1/6 and smaller	20	10
1/4	23	11.5
1/3	31	15.5
1/2	45	22.5
3/4	61	30.5

**TABLE IV**

NEMA standards list code letters to designate the starting current in terms of "locked kva per horsepower," as follows:

Code Letter	KVA per Horsepower *
A	0-3.15
B	3.15-3.55
C	3.55-4.0
D	4.0-4.5
E	4.5-5.0
F	5.0-5.6
G	5.6-6.3
H	6.3-7.1
J	7.1-8.0
K	8.0-9.0
L	9.0-10.0
M	10.0-11.2
N	11.2-12.5
P	12.5-14.0
R	14.0 and up

\* Locked kva per horsepower includes the lower figure, up to but not including the higher figure.

as the maximum compatible with long insulation life.

Users of fractional horsepower motors, when applying open 40° C rise motors on specific applications and known load conditions recognize that these motors may be safely operated continuously at loads greater than the horsepower rating on the nameplate. It became apparent that motor users desire recommendations from the motor manufacturers regarding the safe continuous overloads which would give the maximum safe operating temperatures of the open 40° C rise motors, considering the inherent 10° C margin of safety of these motors. This inherent overload ability is referred to as service factor.

Fractional horsepower motors, due to their physical size and value of breakdown torque related to full load torque, as compared with motors of larger rating, have a higher overload ability than indicated by 1.15 service factor of the larger ratings.

Service factors, recently adopted as standards by NEMA, and given in the Table II determined to define the loading that will give a total temperature rise of 50° C on a general purpose fractional horsepower motor having 40° C rise at the nameplate rating.

The temperature rise on which the nameplate rating is based shall be no more than 40° C for all coil windings. This low limiting temperature rise is provided to allow a greater factor of safety

where the service conditions are unknown.

When authorized by the manufacturer such a motor may be operated (at rated voltage and frequency and in an ambient temperature and exceeding 40° C) at a continuous load greater than rated load determined by the above service factors.

It is recommended that the service factor be marked on the nameplate in addition to the rating.

It will be noted that these service factors go up as far as 1.4, which means a 40° C motor having a 1.4 service factor may be operated at 140 per cent load continuously.

**Starting Current Limits:** Maximum locked rotor current standard is not new, having been adopted by NEMA several years ago. The standard provides, that the locked-rotor current of 60 cycle, single phase motors, (900-3600 RPM range) of any type, except those split-phase motors at present used on washing machines and ironing machines, shall not exceed the values given in Table III.

The recent standardization extends the stamping of the NEMA code letter (note Table IV) on the motor nameplate of fractional horsepower motors of 1/20 hp rating. This provides a marking from which can be determined the actual starting current and provides a check as to the motors conformance with the standard for locked rotor current. This is of value to suppliers of control equipment and power suppliers.

## Bearing Firms To Exhibit at Steel Show

SKF Industries Inc., Philadelphia, will exhibit at the Iron and Steel Exposition, Oct. 1 to 4 in Cleveland, occupying spaces 71 and 72. A range of ball and roller bearings will be shown, as well as the new spherical roller thrust bearing and SKF rod mill mounting.

The following representatives will be in attendance: R. H. DeMott, R. R. Zisette, R. C. Byler, C. D. Cummings, V. A. Menaglia, P. A. Carlson, J. H. Sutherland, H. G. Wallace, R. S. Baines, P. T. Hopper, F. O. Hamlet, G. E. Mayhew and P. R. Payson.

Another prominent bearing manufacturer, Hyatt Bearings Division, General Motors Corp., will exhibit in booths 286 and 287 at the exposition. Extensive use of Hyatt roller bearings in steel mill equipment will be shown.

Those in attendance will be from the Pittsburgh sales office: J. M. Kelly, manager; R. W. Fraser, division engineer; L. L. Hill, T. E. Husted and M. B. Barbe, sales engineers. From the Chicago sales office will come C. L. Newby,

manager; J. L. Haynes, division engineer; and R. F. Wilson, sales engineer. From the Harrison sales office will come W. L. Iliff, manager; and E. P. O'Neill, sales engineer. Also from Harrison sales headquarters: H. K. Porter, general sales manager, and H. M. Carroll, advertising manager.

Statler Hotel will be Hyatt Headquarters in Cleveland during the exposition and staff members of SKF and friends will meet at Hotel Cleveland.

## Magnetic Control Operates Crane from Floor Level

Controller for operating alternating current crane from pendant push button station or from rope-operated master switches at floor level is described in illustrated bulletin No. 931, available from the manufacturer, Electric Controller & Mfg. Co., Cleveland.

Designed for mounting on trolley or on crane girder, controller is of the magnetic contactor type with accelerating and speed-limiting functions controlled by frequency relays. Relays operate directly from the secondary circuit of the

wound rotor motor. Operation is matched to induced rotor frequency, which is directly proportional to motor speed.

## Study of Security Market Regulation by Government

*Regulation of the Security Markets*, by Willard E. Atkins, George W. Edwards and Harold G. Moulton; cloth, 126 pages, 5 1/4 x 8 inches; published by the Brookings Institution, Washington, for \$2.

This is the ninth of an integrated series of studies pertaining to postwar readjustments and reconstruction. It seeks to clarify the basic issues involved in regulation of the security markets. It analyzes the forces and conditions responsible for federal regulations and summarizes in non-technical form the major purposes and provisions of the eight acts pertaining to the security business passed since 1933 and concentrates on the practical issues arising out of administration of these laws.

The study reveals underlying causes of the security market stagnation of the thirties and explains why an extensive expansion of security flotations will occur in the postwar period.

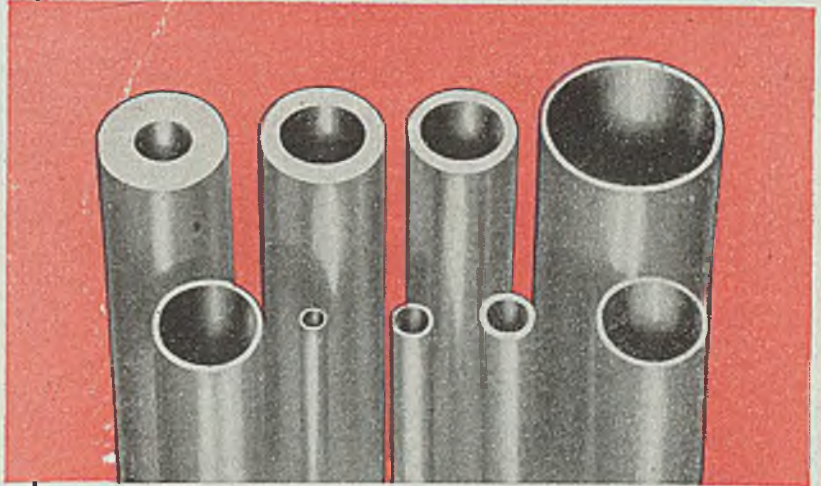


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If you machine cylindrical or ring shaped parts out of bar stock, consider these 16 possible ways to save by using Timken Seamless Steel Tubing:

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3. *Save* by faster machining.
4. *Save* by less evaporation of coolant due to better circulation.
5. *Save* by less tool wear due to lower temperature.
6. *Save* by quicker gaging of cooler surfaces.
7. *Save* by more accurate machining resulting from cooler operations.
8. *Save* by less grinding of smoother machined surfaces.
9. *Save* by combining more operations.
10. *Save* by releasing screw machine stations.
11. *Save* by cheaper handling of lighter stock.
12. *Save* on magazine recharging time due to lighter stock.
13. *Save* by reducing tool changes.
14. *Save* on tool grinding operations.
15. *Save* by use of longer stock in magazines.
16. *Save* by reducing crop-end losses.



★ When Timken Seamless Steel Tubing replaces bar stock in production of tubular parts, amount of the saving usually comes as a surprise to the user. And quite often, performance of the finished part is definitely improved because of the ability of Timken Metallurgists to tailor alloy steel tubing to exacting specifications.

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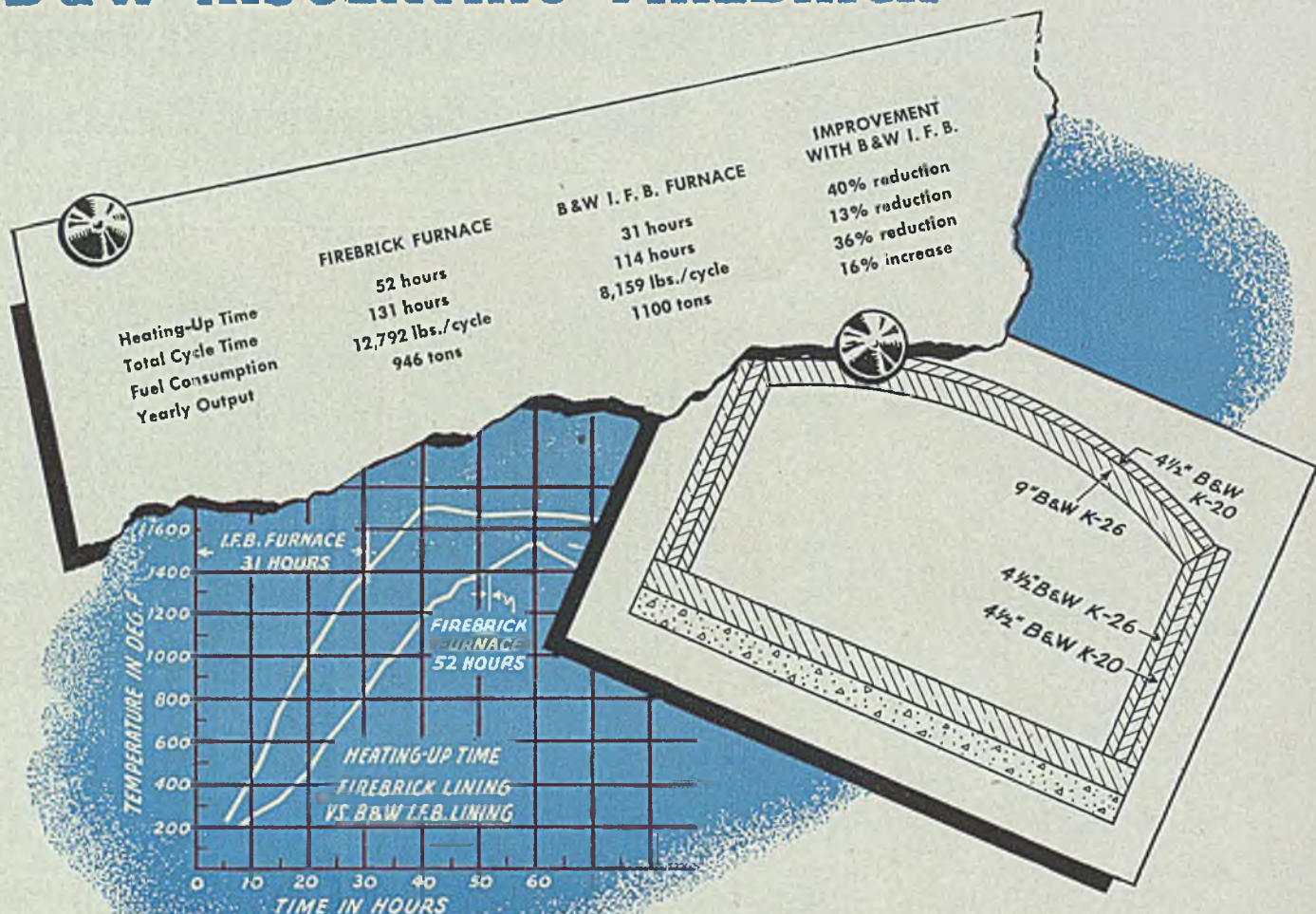
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# Annealing Furnace Tests Show Substantial Savings with B&W INSULATING FIREBRICK



During 1945, The Federal Malleable Company ran comparative tests to determine the most efficient refractory for their annealing furnaces. Two furnaces, having identical inside dimensions and duplicate conditions of loading and firing, were tested. Regular first-quality firebrick was used in one furnace—B&W Insulating Firebrick in the other.

The above tabulation shows the results of using B&W I. F. B.—reduced heating-up time, less cycle time, lower fuel consumption and increased production. Equally important, Federal Malleable points out that with B&W I. F. B. they can produce better

castings, since they can duplicate the firing period by better control.

This case history is typical of the savings made possible by the use of B&W I. F. B. Similar results are being obtained in all types of steel processing furnaces such as annealing, stress relieving, normalizing, and heat treating.

Throughout the country, B&W Refractory Engineers are helping to guide progressive industries to more profitable production. For more detailed information on how you can increase the efficiency and economy of your furnaces—consult your local B&W Representative.

R-262



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DROSS is pure zinc contaminated with about 4 per cent iron. Dross formation originates from four sources, namely, the kettle itself, the work passing through the zinc, from the dross itself when held in suspension and from iron salts resulting from the use of active flux. The magnitude of this dross loss to the galvanizing industry is estimated at approximately \$4,500,000 per year in this country alone.

The dross made by the kettle itself is not entirely avoidable as long as steel is used as the zinc container, but many improvements have been effected lately in methods of heat application which have greatly reduced this loss. By divorcing the heat input from the bottom or too low on the sides and placing the greatest proportion of heat at the top half of the kettle, thereby assisting the dross in its natural desire to settle to the bottom, two advantages have been gained. First, no dross is held in suspension; second, a pure zinc galvanizing area results, both of which mean less dross. Furthermore, in doing this, additional kettle life results.

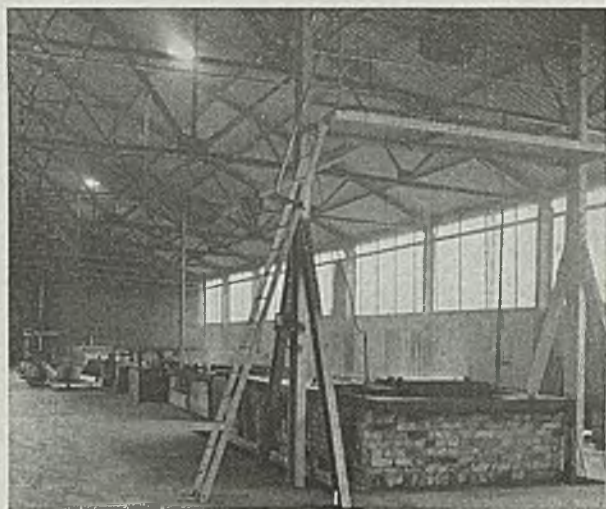
The first step in the old line technique, which made for heavy dross losses, was the operation of presenting to the zinc work that was coated with iron salts. These iron salts are the result of the action of the cleaning acids in their function of ridding the work of oxide. They are highly soluble in zinc and readily and rapidly contaminate great quantities of pure zinc which will then immediately settle to the bottom of the kettle as dross.

The elimination of these salts was therefore, imperative for two reasons: First, because of their effect on the growth of the alloy structures, and second, because of their disastrous ability to form dross.

The desired result was attained in the

Fig. 23 (right)—Modern coke-fired galvanizing installation for zinc coating wire

Fig. 24 (below) — Old-type coke-fired galvanizing kettle in which steel angles were coated with zinc



# Hot-Dip Galvanizing Practice

By WILLIAM H. SPOWERS JR.  
President  
Spowers Research Laboratories Inc.  
New York





following manner: First, a washing operation was installed between the cleaning tanks and the flux wash, and by doing this job of washing thoroughly, clean work resulted entirely free of iron salts. Second, hydrochloric or muriatic acid was eliminated from the technique as a flux wash and a neutral flux wash with no attacking effect on the iron was substituted. Third, the neutral flux wash was well developed, it effectively wetted the work, and it actually carried over to the zinc bath and formed its own volatile cover, thus also eliminating the use of sal ammoniac as a volatile bath cover medium.

By this change in technique, it will be seen then, that a clean work is presented to the bath free of salts, thereby controlling to a large extent the growth of alloy, greatly reducing the dross losses, and eliminating the use of hydrochloric acid and sal ammoniac from the operation as a flux wash and bath cover. The improvement in quality of coat and economy of operation was impressive.

The *second* step to be considered in reducing dross losses, concerns the container itself. It will be noted that in the most modern methods of producing spelter, great care is taken in the distilling operation not to permit iron in any form to come in contact with the spelter. Great care is taken throughout this operation to produce a zinc as low as possible in iron. And in spite of this the first thing the galvanizer does is to melt this spelter in a steel kettle, thus establishing a fertile source of zinc contamination and dross production.

Heat is applied to the outside of the steel plate; on the inside rests molten zinc. That portion of the plate in contact with the zinc, and through which heat

is being forced, naturally dissolves away into the zinc and results in the deterioration of the kettle and the formation of dross. This deterioration is, of course, exaggerated in any case of actual flame impingement or localized heat, and it can easily be seen that all effort should be made to soften the heat input.

### Kettles Too Small

Investigation led to the conclusion that many installations were much under-capacitated. In other words the kettles were so small that the heat outgo (from radiation and absorption in the work) was so rapid that terrific heat had to be forced through small kettle sidewall areas. In discussing this situation it may be noted that in many sheet installations the fire chamber must be held as high as 1800 ° F to maintain a zinc temperature of 850 ° F. The reason for this is that the kettle itself contains so little zinc and offers such a small surface area to which the heat may be applied that the transfer of heat from its source to the outgoing work is extremely rapid. This state of affairs offers fertile field for both rapid deterioration of the kettle and the production of large quantities of dross. This situation results in a zinc flow which holds great quantities of dross in suspension, thereby aiding in the formation of more dross and producing a dross contaminated galvanizing area.

The whole actual coating technique followed in the continuous process of galvanizing sheets was originally considered from the standpoint of a machine designed to handle the sheets through the zinc. A container for the zinc was built *around the machine* and of sufficient size to *hold the galvanizing machine*. At the time of its original design no con-

sideration was given to such things as dross manufacture, dross flow, tight heavy coats, etc. Even at the present time, many sheet galvanizers continue to listen to burners roaring into a fire box held at 1800 to 2000° F in order to maintain 840 to 850° F in a little under-capacitated kettle. Little wonder then that dross worts, flux spots, and brittle coats are the watch word in plants of this type.

Fig. 25 is a case in point. Note the soft coal fired shallow pan heated from the bottom. This pan is 14 in. at its greatest depth. It was heated directly from the bottom with the result that 32 lb out of every 100 lb of new zinc added had to be dug out of the bottom as dross. Every six months a new pan was installed.

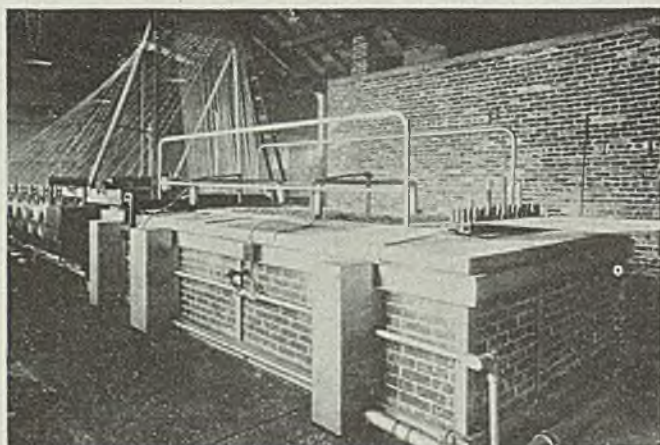
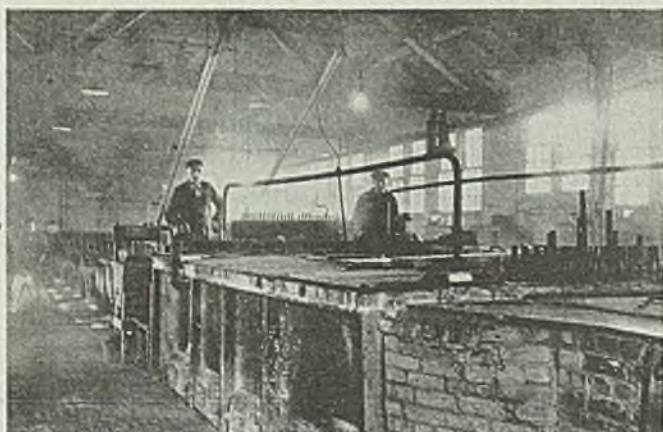
The kettle shown in Fig. 26 is 42 in. deep; its dross loss is approximately 3 per cent of the new zinc used. The same tonnage of steel was galvanized in the pan (Fig. 25) as in the kettle (Fig. 26) but the latter was not removed until after four years of service on continuous production. There was no spill or burn-out and examination led to the conclusion that the next kettle should be given six years of continuous service before removal.

Wire produced in the shallow kettle shown in Fig. 25 was of inferior quality. It peeled on the slightest provocation with even light-weight coats, while the installation shown in Fig. 26 with properly designed heat graduation from end to end and top to bottom offers a heavy coat of metallic zinc having a high ductility and beautiful appearance.

This result was obtained because the kettle shown in Fig. 26 is of sufficient capacity and size that the fire chamber need be maintained at only 1200° F for a constant zinc temperature of 850° F; and because two-thirds of the heat input is effected through the top half of the sidewalls, one-third through the next quarter and little or none through the bottom quarter. The galvanizing area of the zinc in this kettle is constantly

Fig. 25 (left)—Old-type galvanizing unit which was fired with soft coal. The shallow pan, heated from the bottom, was replaced twice each year

Fig. 26 (right)—Modern wire galvanizing setting designed with heat graduation from top to bottom and from end to end which minimizes dross production and affords long kettle life





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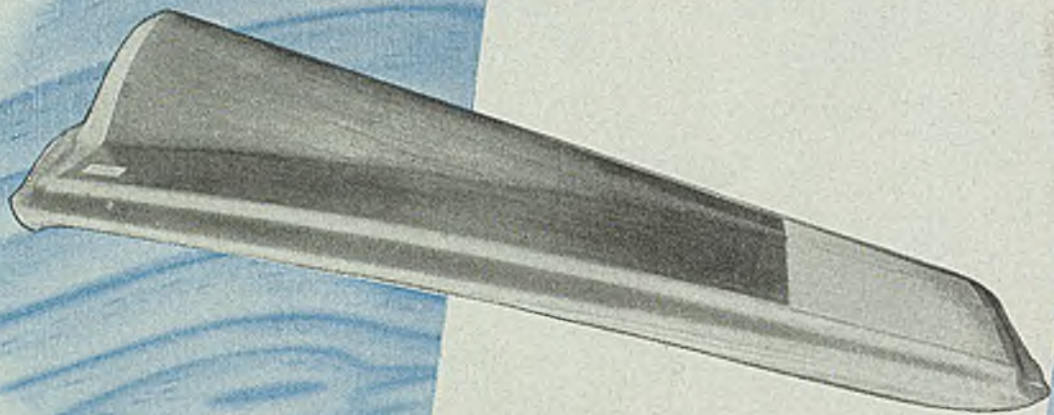


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pure and clean and is at all times kept free of any dross contamination.

The *third* step to be considered in reducing dross losses is to avoid holding the dross in suspension. Dross flow is disastrous because of the inescapable fact that dross circulating in pure zinc makes more dross. Dross is nothing but pure zinc contaminated with iron, and when any installation continuously recirculates this iron within itself, it results in a larger quantity of dross.

Sufficient has been said anent the causes of dross flow such as underfiring, too low firing, firing through too restricted an area and too rapid firing due to under-capacity, to visualize what goes on inside the zinc. An actual test in this respect is shown in Table I. The data cover five pans fired in such a manner as to have disturbed the dross, and show the condition of the kettles before and after drossing. It will be noted that

the iron content of the fluid zinc before drossing (after the weeks' run) averages about twice as high as it does after drossing (at the beginning of the weeks' run) and the dross has been allowed to settle.

This is an evil which must be guarded against if the product is to be of uniform

TABLE I  
IRON CONTENT OF ZINC BATH BEFORE  
AND AFTER DROSSING

Grade of Zinc	Pan No.	Per cent iron	
		After drossing	Before drossing
Prime western	1	0.080	0.182
Prime western	2	0.062	0.172
Prime western	3	0.154	0.192
Prime western	4	0.114	0.190
High-grade	5	0.114	0.286

and high quality. As long as a boiling or flowing action takes place, the galvanizing after drossing is done in fairly clear zinc but from that time onward until the bath is drossed again, the work

is galvanized in an increasingly heavy zinc-iron alloy.

The *fourth* source of dross contamination is from the work itself. Little has been accomplished on this score. It is apparent that some dross must be formed by repeatedly immersing iron in molten zinc. This is evidenced particularly in the case of castings, malleable pipe fittings etc., in which case the dross is always heavy. Tests are being conducted along the line of giving the work a light copper flash which seems to hold some promise in this connection, but as yet is not conclusive.

It will be seen from the foregoing discussion of dross contamination that each of the four causes enumerated is closely related and is to a large extent controlled by the type and design of the installation itself.

(To be continued)

## B O R I N G

### Cast Iron Valve Guides

CURRENTLY, investigations are being conducted into the feasibility of expanding the fields for carbides by utilizing the comparatively high modulus of elasticity possessed by carbide metals. Cemented carbides possess a modulus of elasticity ranging from approximately 73,000,000 psi up, according to grade of material used.

In recent tests by Carboloy Co. Inc., Detroit, a number of boring bars were made of solid Carboloy cemented carbide to determine the extent to which advantage can be taken of the metal's stiffness in this type of application. It was reasoned that it should be possible to precision-bore deeper and smaller holes with boring bars made of solid carbide inasmuch as the greater stiffness of the carbides could be used to keep the longer tool from backing away from the work or from "winding up" in the hole.

Backing away of the boring tool is a frequent cause of eccentricity and taper in a bored hole. It was also believed that the higher torsional stiffness of the carbide boring bar might tend to improve the surface finish by minimizing wind-up and chatter.

The bars were made up according to specifications shown in the accompanying sketch. These were tipped with carbide cutting tips having nose radius which was purposely held small to prevent chatter. The nose radius tends to wipe out feed marks, thereby improving

the surface finish of the bored hole.

Particular job for which the boring bars were used was the semifinish boring of valve guides for automotive engines. The guides were of cast iron with a brinell hardness of from 160 to 200 and with a bore of 0.345-in. in diameter. Ratio of length of bore to bore diameter was 7.3 to 1.

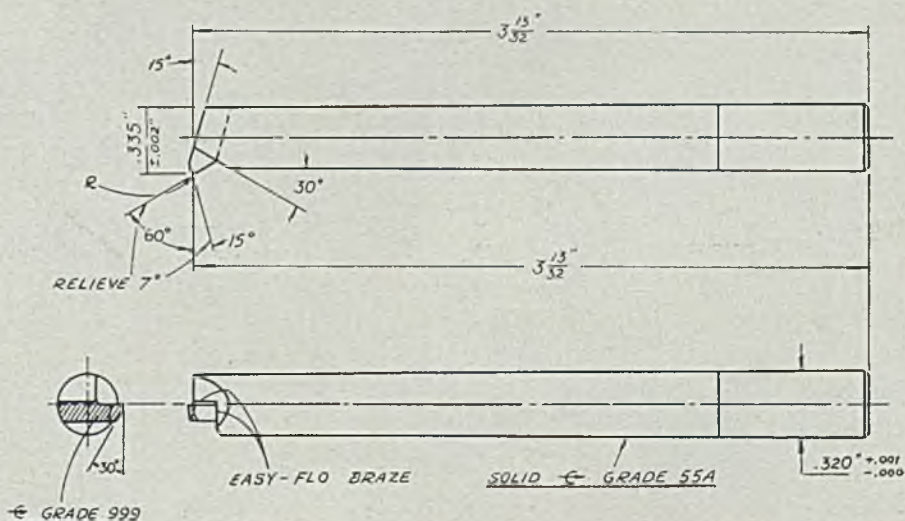
#### Bore Semifinished On "In Pass"

In using the solid carbide bars, it was planned to semifinish bore on the "in pass" of the tool; index tool into work a slight amount at end of bore, then finish bore on the "out pass." A precision boring machine to use the bor-

ing bars in the manner described was not available in the manufacturer's plant at the time the tests were run. A small lathe in good condition was used.

The valve guide was chucked and the boring tool held in the tool post. Feed was set at 0.002-in. per revolution for making both semifinish and finish bore. Holes bored in the valve guides with the solid Carboloy boring bars in this set-up were straight, round, concentric and to a tolerance of 0.0002-in.

As a result of this performance, a precision boring machine designed to use carbide boring bars in the routine production of long, small bore valve guides is now being built.





# Special Metal · Special Finishes

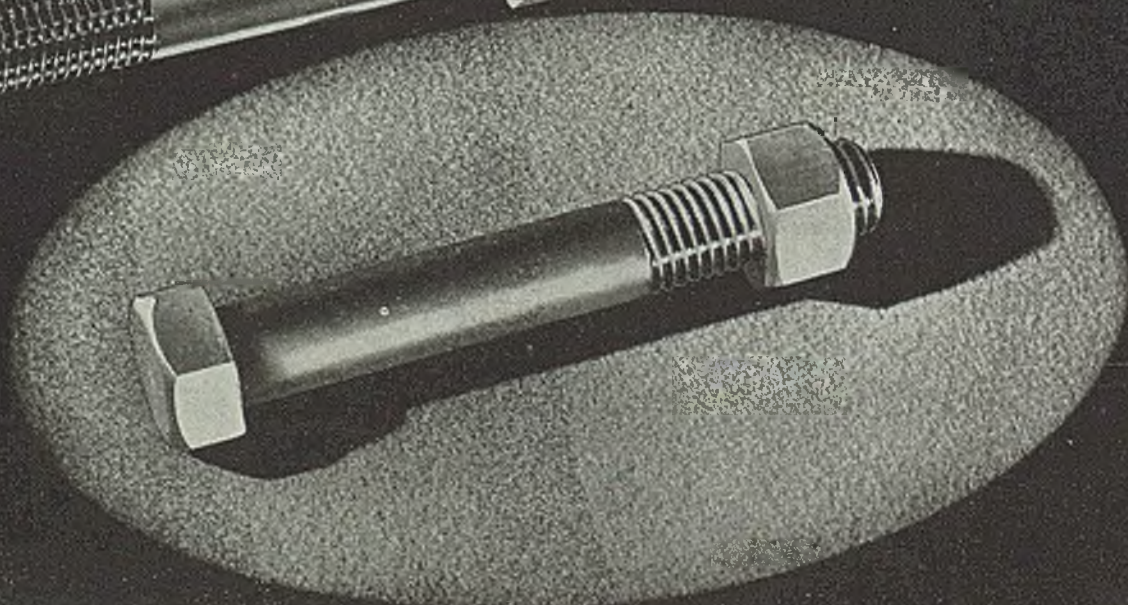
## in the RB&W EMPIRE line



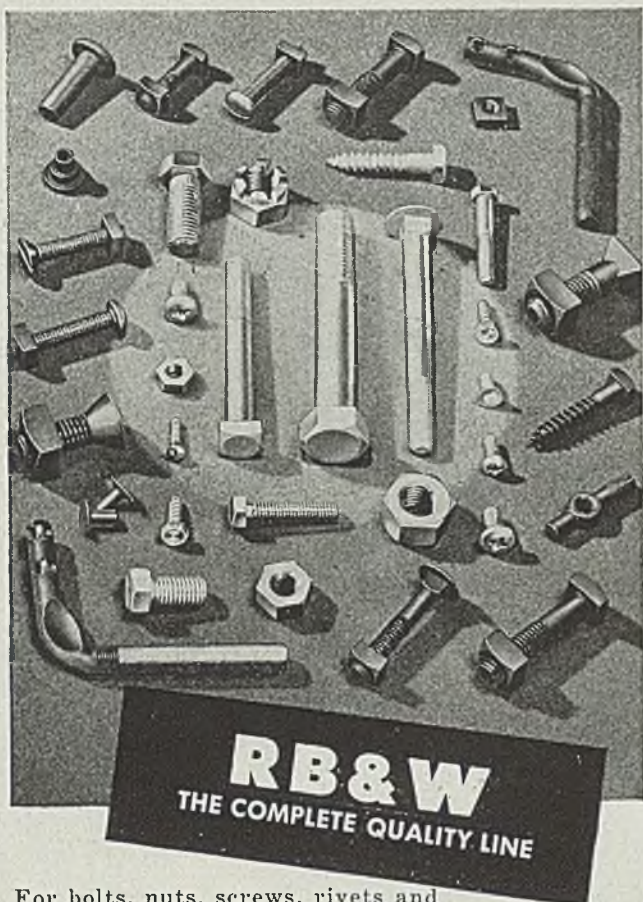
• Should your next fastener requirements call for something other than the standard common steel product — for example, high-carbon heat-treated cap screws, silicon bronze bolts, hot galvanized, plated or case-hardened parts — you can benefit by the wide variety and high precision of RB&W equipment.

RB&W has invested heavily in research and development work and modern machinery with the result that its facilities cover the broadest possible range of customer needs. The photographs on the opposite page give a mild idea of scope of work that RB&W is capable of performing.

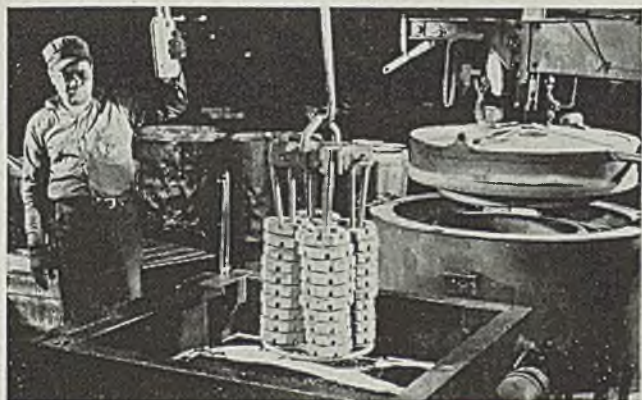
The maintenance of RB&W's high standards for strength, accuracy and finish are assured by such complete facilities for production and by RB&W's policy of subjecting the product in process to a progressive system of quality control.



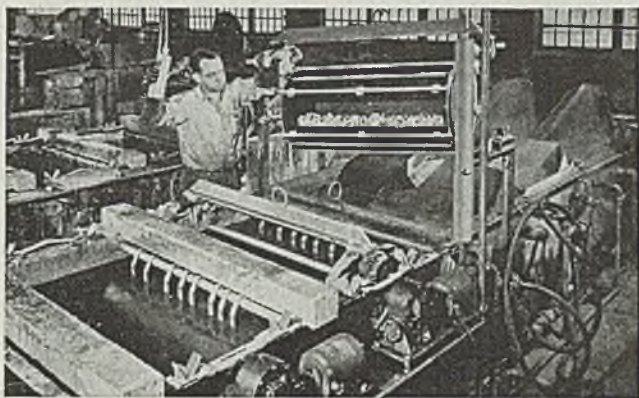




For bolts, nuts, screws, rivets and many allied fastening products, thousands of industrial firms rely upon the RB&W EMPIRE brand. Experience has shown that the extra effort RB&W puts into engineering the accuracy and dependability of its product, results in savings in assembly time, in maximum holding power and excellent appearance.



**CARBURIZING**—Where severe wear conditions require a deep and uniform case, carburizing is recommended. Cases 1/32" deep can be obtained in these furnaces.



**PLATING**—Part of RB&W's plating department — equipped for hot galvanizing, electrolytic plating, lead coating, Parkerizing, Cronak finishing, etc.



**HOT GALVANIZING**—One of the steps in RB&W's carefully controlled hot galvanizing process — best method of rust-proofing steel.



**SURFACE-HARDENING**—Greater skin hardness and better wearing surfaces are obtained from specialized treatment in these cyanide pots.

**101 YEARS** *Making strong the things that make America strong*

Plants at: Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill. Sales Offices at: Philadelphia, Detroit, Chicago, Chattanooga, Los Angeles, Portland, Seattle. Distributors from coast to coast. By ordering through your distributor, you can get prompt service for your normal needs from his stocks. Also, the industry's most complete, easiest-to-use catalog.



**RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY**

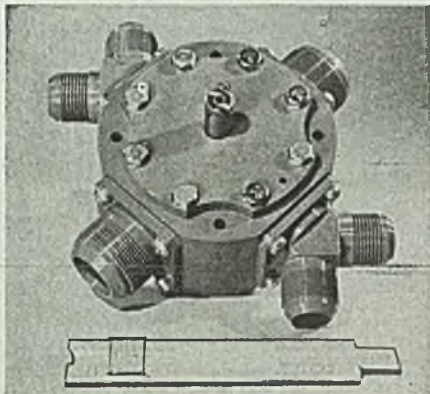


# Industrial Equipment

## Solenoid Valve

Hydro-Aire Inc., 626 North Robertson boulevard, Los Angeles, is now manufacturing a series of industrial 2, 3 and 4-way selector valves capable of handling flows up to 2500 gph with negligible pressure drop. Sizes range from 3/8 to 1½ in.

Valves are extremely light weight, have low operating torque and are not affected



by back pressures. They are suitable for use at temperatures ranging from minus 65°F to plus 200°F, and can be used with any type liquid. Valve can be positioned at 200 psi, and will withstand operating pressures of 1000 psi.

*Steel 9/23/46; Item No. 9602*

## Surface Analyzer

Model BL-103 surface analyzer, a product of Brush Development Co., 3405 Perkins avenue, Cleveland 14, checks surface finishes from less than 1 to 5000 microinches. Exploration is achieved with a fine diamond point. Instantaneous chart



record on the magnetic direct-inking oscillograph provides accurate "peak and valley" profile of surface finish. Rapid warm up time (2 min) makes possible instant use in cases where time delay would affect inspection.

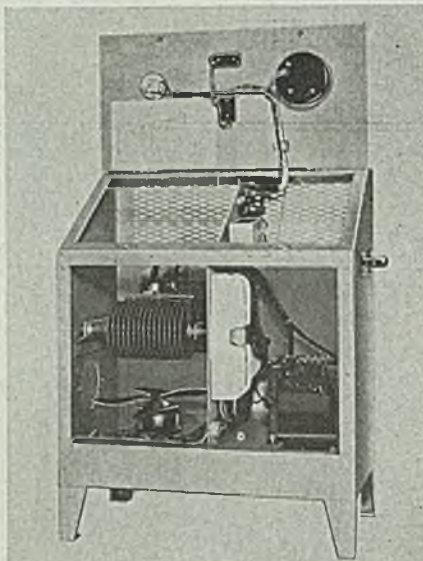
Measuring surface finishes of metals, glass, plastics, plated and painted surfaces, the instrument eliminates human error through a power-driven pickup and accurate chart record. Analyzer con-

sists of a pickup arm, drive head, amplifier, magnetic direct-inking oscillograph, surface plate, carrying cases, glass calibration standard and two V-blocks.

*Steel 9/23/46; Item No. 9620*

## Battery Charger

On-the-spot charging of batteries is possible with the selenium battery charger now being manufactured by Automatic Transportation Co., 149 West 87th street, Chicago 20. Completely automatic, unit enables untrained personnel to charge batteries from electric outlets by simply connecting battery to charger and setting



time clock. Clock regulates length of charge and terminates charge automatically.

Battery temperature well below the maximum permitted by manufacturers is maintained throughout the charging period, prolonging battery life. Chargers are available for operation from three standard alternating current lines: 110-115 v 60 cycle single phase, 220-230 v 60 cycle single phase, and 110-115 v 25 cycle single phase.

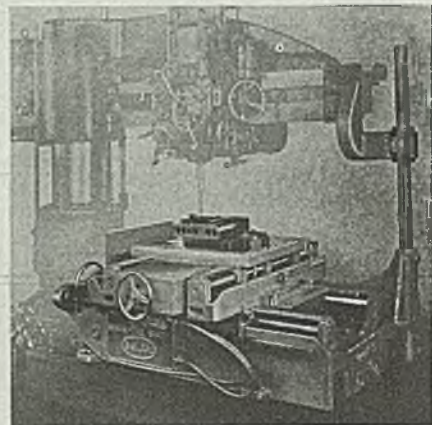
*Steel 9/23/46; Item No. 9599*

## Spacer Device

Pin-point precision in drilling holes in metal parts without jigs, and at a saving in time of 20 per cent or better, is now possible through a device manufactured by Bullard Co., Bridgeport, Conn. Spacer consists of a heavy flat table, which moves either laterally or longitudinally on its base under an accurate drill spindle fixed rigidly in one position. With the work clamped in place, table is hydraulically traversed from one predetermined po-

sition to another by means of two selector controls—one for lateral positions, the other for locating longitudinal positions.

Setting of selector dial by operator determines which one of a number of cylinders is to receive the hydraulic pressure. A piston in the cylinder reacts to thrust of the pressure, thereby moving the table. Motion continues until the piston reaches a stop, position of which may be varied and selected through screw adjustment.



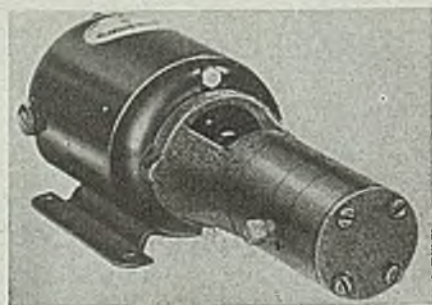
There is one hydraulic cylinder for each longitudinal and transverse motion. Thus, if 10 cylinders were provided for each of the two directions, there would be 100 positions available.

Hydraulic power to operate the spacer is provided by a self-contained pump operated by a constant speed motor. Spacer may be applied to various types of drilling machines, and is to be made in a variety of sizes.

*Steel 9/23/46; Item No. 9721*

## Vane-Type Pump

Pressure vane-type pump, type VW-1, designed for handling nonlubricating liquids is being produced by Eastern Engineering Co., New Haven, Conn. In-



corporated in pump are two composition bearings requiring no lubrication beyond that furnished by liquid being pumped.

By means of a special design and by applying proper radii on vane edges, the vanes are held in contact with pump

(All claims are those of respective manufacturers; for additional information fill in and return the coupon on page 164.)



# OVEN ENGINEERING NEWS

## SYNTHETICS NOW WOUND AT HIGH SPEEDS

### IOE continuous takeup does the trick —

In the production of synthetic tubing of either circular or other cross sections, one of the most difficult problems is the uniform cooling and the constant tension takeup of the material as it leaves the head of the insulating machine.

In the manufacture of tubing or hollow extruded shapes of various cross sections, large scrap loss is the result of improper takeup design, uneven pull on the soft material and the final deformation of the material as it is continuously wound at varying tensions on the takeup reel.

Because of our background in the single reel takeup for wire and cable, Industrial Oven engineers attacked the problem of extrusion takeup with the pictured efficient results.

The machine pictured is used for the continuous takeup of plastic tubing and has an integral speed range of 100' to 800' per minute. It has a tension range of from 0 dampened tension to a maximum total tension of approximately 50 lb. Other higher speed ranges are available.

The unit is for continuous operation and provisions can be made for the automatic continuous cut-off and travel of the tubing after one reel has been completely filled with wound tubing to a reel which is empty.

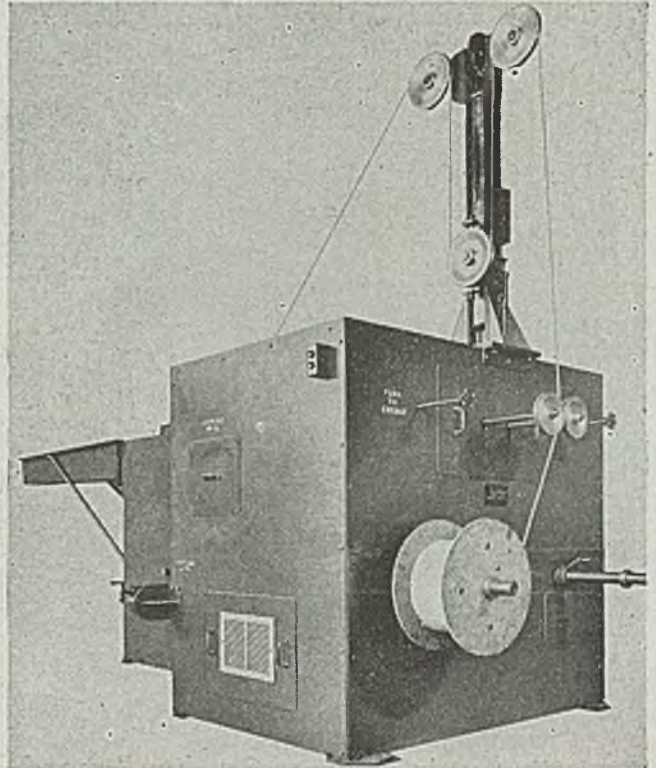
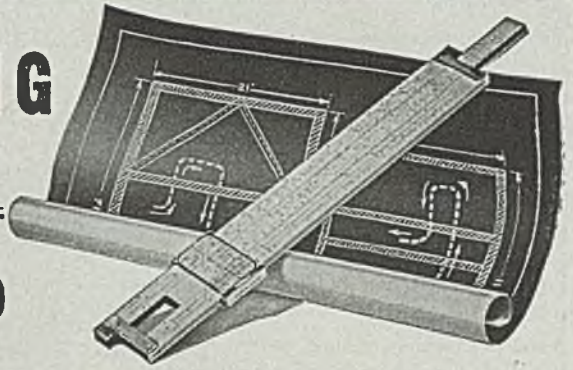
In order to handle the newer high temperature materials, extra cooling capacity is provided in the water cooling section of the unit. This extra cooling capacity in no way affects easy accessibility to the capstans for threading or for access into the interior of the cooling trough for visual inspection of the tubing.

At the option of the customer the unit may be synchronously driven and definitely locked into the insulating screw speed; or the unit can be furnished with manual and visual synchronization.

Not only is this machine available for synthetic tubing but the same machine with minor modifications is used for the continuous takeup of jacketed wire, cable and coated cord.

On special order the same model in different arrangement is available in automatic cross-over which automatically transfers the moving strand from the full reel to the empty one.

*(This is Number 28 of a series. Reprints of previous advertisements sent on request.)*



A built-in traverse with adjustable lay range, the main speed synchronization control, the individual reel controls, and the tension controls are all within easy reach of the operator.

**WE MAKE:** Cord Coating, and Cable Lacquering Systems • Complete Fabric Cementing Systems • Continuous Takeup and Pay-off Stands • Dip Tanks • Drying Ovens • Creel Rooms • Constant Speed, Constant Tension, Extrusion Takeup Machines for Plastic Resin Hose, and Coated Cords • Rubber Tubing, V-Belt Cord and other continuous Materials



**THE INDUSTRIAL** *Oven Engineering* **COMPANY**  
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## Notes on STEEL CASTINGS



FOR STRESSED PARTS  
*rely on*  
**HEAT-TREATED  
"PITALOY"**

Illustrated above are a Coupling Box and Spindle for a 40" Blooming Mill, heat treated to proper Brinell on all wearing surfaces. These parts were cast from "Pitaloy", an alloy steel developed by PSF which has ideal qualities for this type of application—the tough strength required to absorb heavy driving stresses, combined with the ability to assume high surface hardness under heat treatment. • Here's just another instance: first, of the tremendous utility of modern steel castings; second, of PSF's capacity to handle any kind or size of job, and any finishing requirements. Put your steel casting needs up to PSF!



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48 YEARS OF STEEL CASTING KNOWLEDGE

# Pittsburgh

## STEEL FOUNDRY CORPORATION

Glassport, Pa. • Fort Pitt Steel Casting Div., McKeesport, Pa. • Pittsburgh Spring and Steel Co. Div., Pittsburgh, Pa.

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STEEL



chamber. No centrifugal force is required to maintain volumetric efficiency. Pump is designed for use in systems having a relief valve and, therefore, has no bypass valve built into design. Shaft sealing is accomplished by means of a mechanical rotary seal.

Delivery approximates 1/2 gpm. It is suitable for operating pressure of from 0 to 30 psi and is self-priming. Motor is 1/15 hp and is available in either 110 or 220 v ac or dc.

Steel 9/23/46; Item No. 9611

## Tachometer

Tachometers are being made with 8, 10 or 20 in. dial reading in revolutions per minute, feet per minute, sheets per minute or per hour, etc. by Herman H. Sticht Co. Inc., 27 Park place, New York 7. Being of centrifugal design, it is non-



magnetic, not affected by temperature variations and operates independent of direction of rotation.

All parts are mounted on ball bearings, requiring lubrication every 500 hours. Instrument is driven by a flexible shaft which terminates in pinion bracket. Latter is driven by tachometer drive gear usually attached to proper shaft of machine to be indicated.

Steel 9/23/46; Item No. 9606

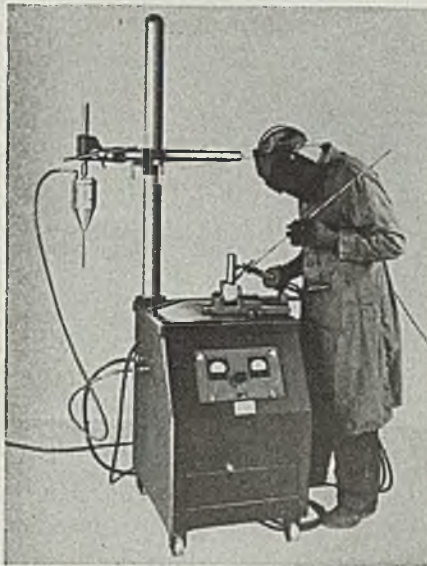
## Metalworking Machine

Manufacture of Thomas 8-in-1 Metal Master, featuring eight different metalworking operations built into one machine, is announced by Clinton Machine Co., Clinton, Mich. It can be used for metal disintegration, arc-welding, brazing, soldering, drill pulling, air extraction, metal etching and demagnetizing operations.

Mounted on steel casters, unit can easily be rolled to any part of plant, and by a simple plug-in to a convenient outlet any of operational units can be put into operation quickly.

Arc-welding unit will do flat, vertical,

overhead or horizontal welds; weld in angles and deep grooves; fabricate tools, dies and fixtures; tack weld on tanks; repair automobile or airplane engines without dismantling; and other applications. Unit provides 100 amp for 30 min runs,



up to 200 amp for intermittent runs, with 8 heat stages, and uses up to 3/16 rods.

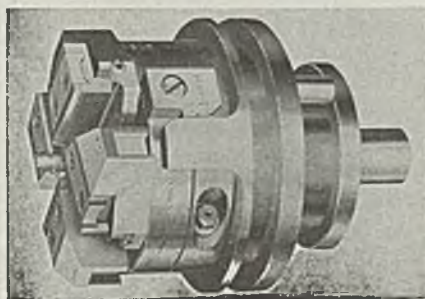
For the fusion of light metals, a brazing unit is incorporated. Aluminum, brass, red brass, bronze, phosphor bronze and nickel parts can be fabricated or repaired quickly.

A metal etching unit etches numbers, designs, names and other information on castings, parts, etc., operating either on or off the work-plate of device.

Steel 9/23/46; Item No. 9619

## Taper Die Head

Landis Machine Co., Waynesboro, Pa., recently developed a 9/16-in. taper attachment die head having a capacity of 1/8 to 1/2-in. standard pipe threads. Head is of the rotary type and adaptable to any



machine having either a leadscrew or lead cam. It also can be furnished with special shank and flange required for adapting it to different machines.

Tapered threads are generated with die head the same as straight threads in that they are formed with the chaser

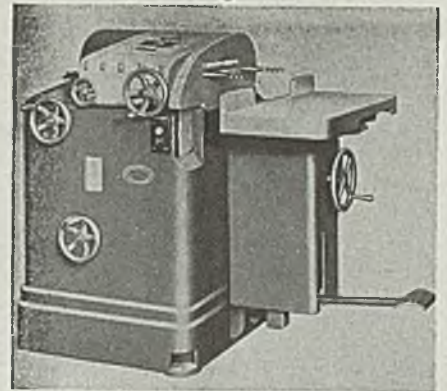
throat. Heads fitted with alternating tooth tangential pipe chasers have proved successful on threading of stainless steel. Combination of die head and alternating tooth chasers prevent tearing on crest of thread since chip is formed only on one side angle of thread.

Steel 9/23/46; Item No. 9707

## Light Metal Borer

Designed to meet demands of plastic, light metal and allied industries, a two spindle radial borer now being produced by Moak Machine & Tool Co., Port Huron, Mich., features enclosed top which permits movement of head to any position in a 90-degree arc, and adjustment of spindles from 1 1/16 to 12 in. apart.

Spindle at right of machine is stationary while left hand spindle is adjustable. Their speeds are variable from 1000 to



4000 rpm, and they operate freely in antifriction bearings, being driven by a silent chain. Aluminum top is light enough for easy movement of head to any angle from horizontal to vertical. An indicator and pointer show the exact degree of setting.

Steel 9/23/46; Item No. 9722

## Linear Dividing Machine

Gaertner Scientific Corp., 1201 Wrightwood avenue, Chicago 14, is announcing several new models in its line of automatic linear dividing machines which automatically rule highly accurate linear scales of practically any pattern or spacing having industrial or scientific application.

Largest model will rule a continuous scale up to 40 in. long at a rate of 60 or more lines per minute with a rated accuracy of 0.0001-in. Models of lower precision and models of smaller capacity are also offered.

After once adjusting machine for a particular type of ruling job, operator clamps workpiece in position and throws starting handle. Ruling process is thereafter com-

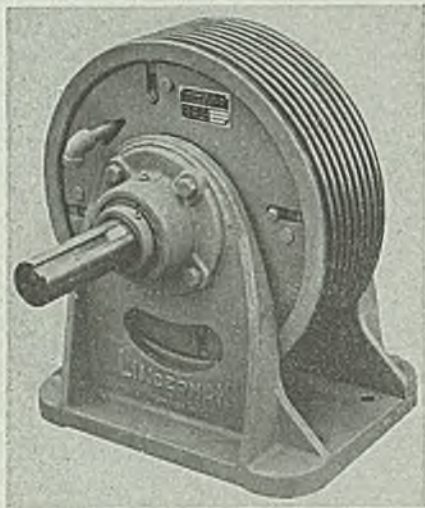


pletely automatic. When the last line of scale has been ruled machine stops automatically.

Steel 9/23/46; Item No. 9532

## Tension Brake

Line of brakes designed to apply accurately controllable continuous tension in industrial machinery is announced by Linderman Devices Inc., Newburgh, N. Y. Available either as self-contained units or for building into equipment



under design, brakes are suitable for applying continuous retarding force in the absence of self-energizing action.

In operation, amount of tension desired is accurately secured and maintained by merely setting air-pressure regulating valve in lead from factory air line. Slight increases or decreases in tension are obtained by merely changing the gage setting. Shoes are self-equalizing, full floating, with no localized high pressure areas on lining or drum.

Drums are heavily finned to provide maximum heat-dissipation under continuous application. If desired, fan cooling also can be provided, brake assembly being enclosed within an annular sheet metal housing.

Steel 9/23/46; Item No. 9597

## Dial Scale

Howe Scale Co., Rutland, Vt., recently developed a tape drive dial scale in which the pinion rack and sector in the mechanism is eliminated. Dial head mechanism of the scale includes standard tape-drive with ball bearing assembly. Head is moisture proof, completely sealed and swivels to any position even when weighing.

A locking device fastens pendulum weights and keeps weight off ball bearings. Tapes are self aligning and mechanism is not affected by tilted condi-

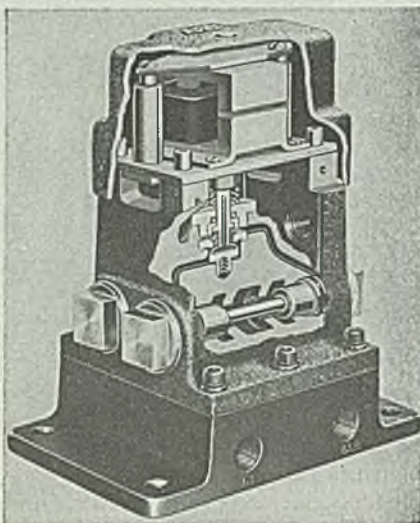
tions or changes in temperature.

Oil dashpot in base keeps shocks from reaching scale mechanism. Platform is free oscillating, levers operating on fixed fulcrums with no lateral motion. Bearings and pivots are of special alloy steel.

Steel 9/23/46; Item No. 9511

## Air Valve

A new valve, introduced by Ross Operating Valve Co., 6474 Epworth boulevard, Detroit 10, is the piston poppet, pilot operated, solenoid controlled air



valve. It is comparatively small and compact and allows operating speeds up to 400 cycles per minute, with current consumption 1.2 amp at 110 v 60 cycles.

Valve is offered in 3-way (normally open or normally closed), 4-way, and 4-way (5 port) and in 1/4, 3/8, 1/2 and 3/4-in. sizes.

Steel 9/23/46; Item No. 9523

## Gravity Conveyor

Island Equipment Corp., 101 Park avenue, New York 17, is marketing a light duty gravity conveyor, manufactured in various lengths and capable of being quickly coupled into a continuous unit for conveying straightaway and around curves. It is supplied with a choice of single and double post adjustable leg supports.

Steel 9/23/46; Item No. 9436

## Special-Purpose Mill

Special-purpose machine introduced by Snyder Tool & Engineering Co., 3400 East Lafayette, Detroit 7, meets specified requirements of accuracy, finish and rate of production in milling pads on automotive manifolds. Part is located by means of guides in a work-holding fixture and is clamped in place manually

by means of cam-action clamps.

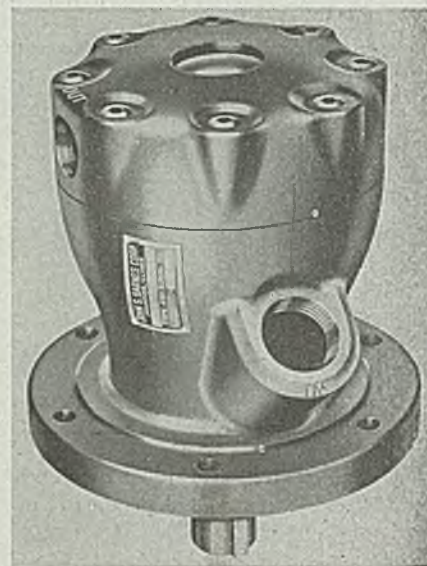
All spindles in five-spindle milling head are mounted in antifricition bearings. Helical gears are used throughout in the construction of this head.

Cutters travel past work for machining operation, which is entirely automatic after the starter button is pressed. An in and out adjustment is provided for sub-slide to facilitate cutter loading and adjustment. Steel base houses hydraulic equipment for controlling travel of the milling head.

Steel 9/23/46; Item No. 9643

## Roto-Blade Pump

John S. Barnes Corp., 301 South Water street, Rockford, Ill., recently developed an equalized Roto-Blade pump which handles continuous working pres-



sures to 1000 psi or 1500 psi, intermittently.

Pump is offered in many combinations such as single or double pump, single with feed pump, double with feed pump, and a single with gear pump. Capacities range from 8.5 gpm to 50 gpm.

Steel 9/23/46; Item No. 9536

## Electric Fork Truck

An electric fork truck, model LCVH Palletier, is being built by Crescent Truck Co., Lebanon, Pa., in 1000 and 2000 lb capacity with either solid or pneumatic tires. Models of both capacities are driven by heavy duty 4-pole series wound motor, ball bearing mounted and totally enclosed. Truck of 1000 lb capacity with pneumatic tires is illustrated.

Driving mechanism employs a single direct worm reduction ratio of 17.5 to 1 which is enclosed in aluminum alloy and cast steel housing. Worm is mounted on





# HOW TO GET A NEW REFRIGERATOR . . .

## *From Your Own Scrap-Pile*

The shortage of scrap metal, desperate during wartime, is still serious. The production of many of the things you need is being slowed up . . . will be interrupted unless steel mills continue to get a larger supply of scrap iron. More than half of the steel used in America requires scrap for its

production. Call your scrap metal dealer . . . gather and sell worn-out iron and steel of all types. This is necessary to help provide uninterrupted production of steel and things made of steel. Help speed delivery of many of the items on your *want list* . . . turn in your scrap today.

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PRODUCERS OF STEEL SHEETS, including  
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vanized, KONIK steel sheets Galvanized,

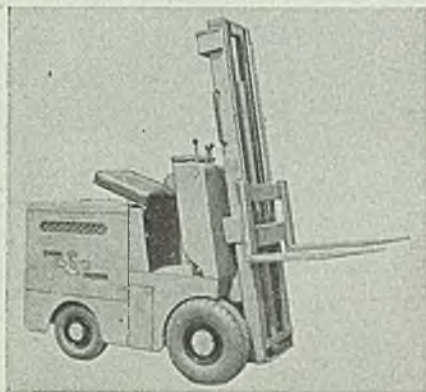
UNIFORM SPANGLE Galvanized, DULL COAT,  
Continental GALVANNEALED, ELECTRICAL, Hot  
Rolled Pickled, and many styles of Formed Roofing.

ALSO, Manufacturer's Wire in many sizes,  
shapes, tempers, and finishes, Continental Chain  
Link Fence, Nails, and other steel products.



ball bearings and alloy bronze worm gear mounted in four pinion differential and carried on taper roller bearings. Brakes are of internal expanding, double-shoe type mounted on driving wheels. They are foot operated and are interlocked with driver's seat for dead man brake.

Travel controls consist of mechanical cam action control with magnetic contactor in line circuit for making breaking



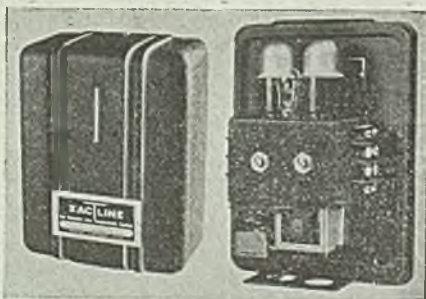
current. Truck has four speeds forward and reverse with two handle operation. If operator leaves seat, controls automatically return to neutral. Electric motor operates hydraulic pump which in turn actuates piston-type cylinders to operate for lift and tilt.

The 1000 lb capacity truck will lift, haul or stack to a height of 114½ in. with solid or pneumatic tires, while the 2000 lb capacity model will handle materials to a height of 122½ in.

*Steel 9/23/46; Item No. 9723*

## Temperature Control Unit

Providing unusually close temperature variation control to a point as low as 1/5° F, the Xactline temperature control, developed by Claud S. Gordon Co., 3000 South Wallace street, Chicago 16, accomplishes this without use of cams, mo-



tors, bearings, shafts, gears or other rotating mechanical parts. It gives straight-line temperature control and eliminates over and undershooting temperature variations prevalent in plastic, molding, tempering, aluminum heat treating and other

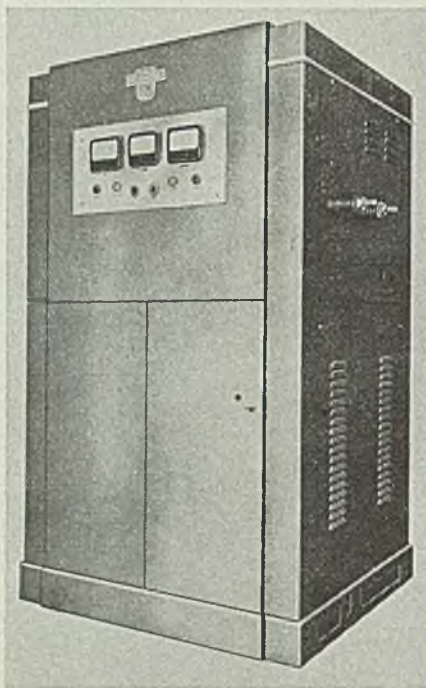
heat processing applications.

Control can be used on all types of electric furnaces, ovens and injection molding machines employing conventional millivoltmeter and potentiometer type controlling pyrometers, or gas-fired equipment employing solenoid-controlled or motor operated valves. Designed for surface mounting installation, it is housed in a cast aluminum case measuring 8¼ x 6¼ x 3 in. Photo shows unit with cover removed.

*Steel 9/23/46; Item No. 9730*

## Induction Heater

Model 1400 is newest in line of Thermo- nomic high-frequency induction heating generators manufactured by Induction Heating Corp., 389 Lafayette street, New York 3. Flexibility of application, heavier construction, filament voltage



stabilizer, variable output control, circuit-breaker overload protection, water-pressure gage, time-delay water system, and supervisory pilot-light control are among the design features incorporated in generator.

Fully loaded, this unit is capable of delivering an output of 1400 Btu per minute or approximately 25 kw at a nominal frequency of 375 kilocycles into a piece of work. It has a full-load input of 50 kva at 90 per cent power factor and operates on a 205-245 v, 60-cycle, 3-phase power supply.

Tube complement of generator consists of two water-cooled oscillators and six rectifiers. A variable output control permits the power output of the generator to be adjusted from approximately 10

per cent to full load by means of a single dial.

*Steel 9/23/46; Item No. 9704*

## Circuit Tester

Precision Apparatus Co., Inc., 92-27 Horace Harding boulevard, Elmhurst, N. Y., announces production of a 41-range, panel mount, alternating or direct current laboratory circuit tester, incorporating a 9 in. rectangular, 5000 ohms per volt meter.

Designated as series 864, unit is designed for use in the modern electronic



laboratory for radio receiver and transmitter service and for industrial maintenance and production testing. It provides the functions of a voltmeter, ohmmeter, milliammeter, ammeter and decibel meter.

Separately enclosed remote control range selector unit slides out of panel compartment for convenient bench operation. A wide selection of ranges is provided up to 6000 v ac and dc; 20 megohms, 12 amp, 70 db.

*Steel 9/23/46; Item No. 9605*

## Insulation Tester

An instrument for checking insulation resistance in alternating and direct-current equipment is announced by Ideal Industries, Inc., 1921 Park Avenue, Sycamore, Ill.

Entirely self-contained, its power is provided by a small internal hand gen-



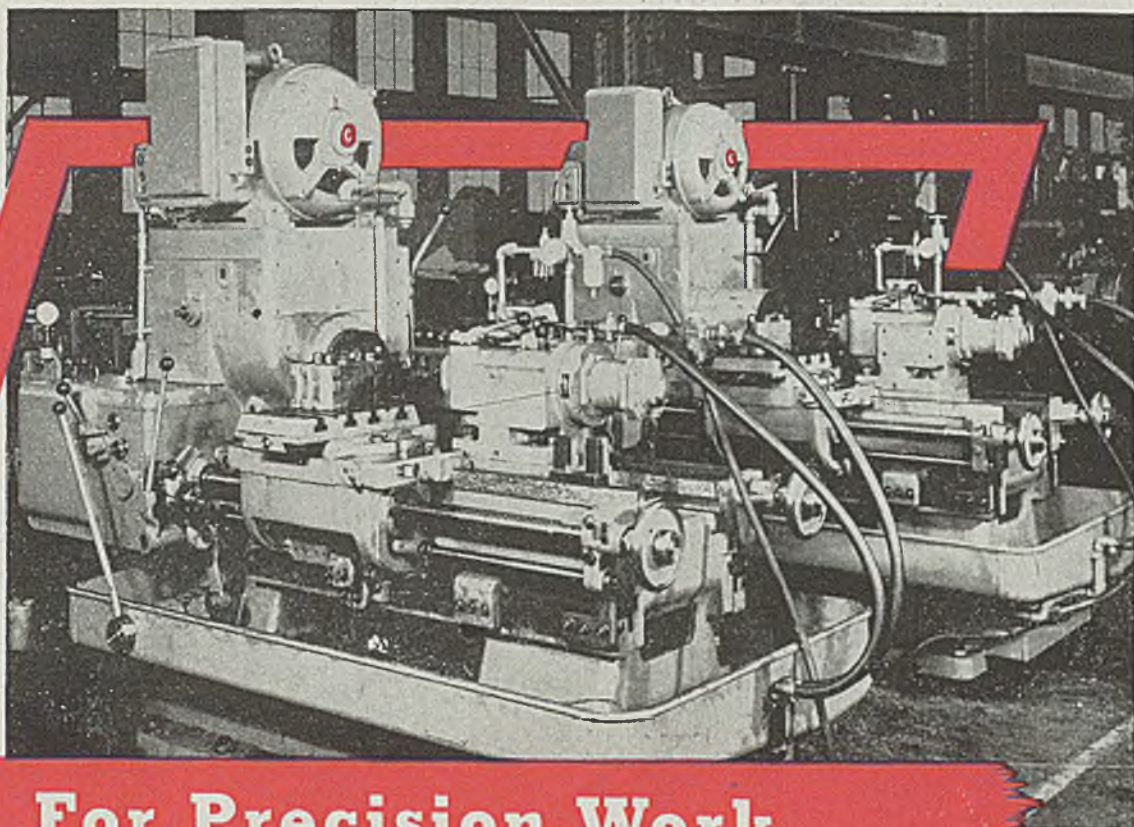
erator which is operated by a slowly turning crank.

Correct testing voltage is indicated by two small button lights that glow

*(All claims are those of respective manufacturers; for additional information fill in and return the coupon on page 164.)*



30  
HP  
3600  
RPM



**For Precision Work  
at High Speed....**

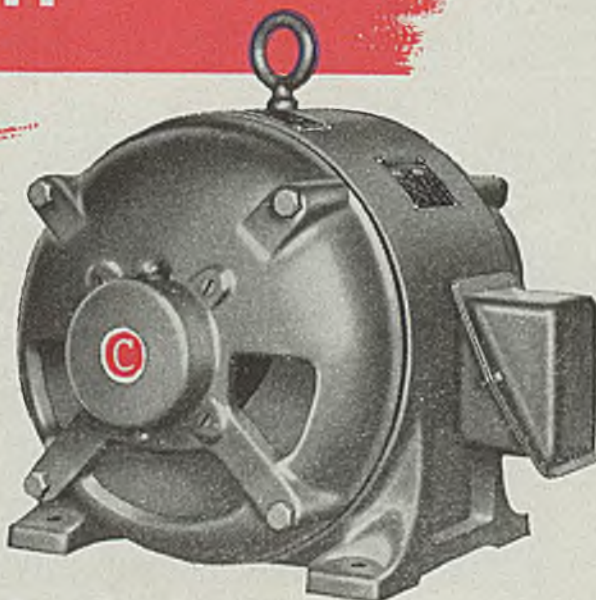
## *Select* **CENTURY MOTORS**

**T**heir remarkable freedom from vibration enables you to get all the precision that your machine was designed to give.

On applications such as the automatic lathes shown above, Century supplied 3600 RPM squirrel cage 30 horsepower motors to provide the speed range required by the manufacturer. To assure maximum precision at this high speed, these motors were specially balanced.

Whether your electric motor applications require high speeds and special balancing — or normal operating speeds, there's a Century motor that will operate your machine at top performance. Rigid construction and accurate machining plus good electrical and mechanical balance help to maintain smooth operation throughout their long life.

Century motors are built in a wide range of types — open and protected — in sizes from 1/6 to 400 horsepower. They are engineered to the functional characteristics of the machines they drive to assure top performance. Specify Century motors for all your electrically powered equipment.



**CENTURY ELECTRIC COMPANY**

1806 Pine Street, St. Louis 3, Mo.

*Offices and Stock Points in Principal Cities*





at 500 v dc. When crank is turned faster than necessary an electronic voltage regulator controls voltage to meter so that a true reading is obtained. Test range is 0-100 megohms and meter is of D'Arsonval type.

Steel 9/23/46; Item No. 9575

## Relay

A sensitive alternating or direct-current large load capacity relay is announced by Sigma Instruments Inc., Boston. Its features include a beryllium-copper armature and contact springs, spring reed-type armature hinge with low reluctance gap, and high permeability, low residual iron parts. Minimum input requirements are 20 milliwatts for direct current types and 0.1 v amps for alternating current types. Contacts will handle up to 15 amp on low direct current voltage or 1 kw voltage or 1 kw incandescent lamp load at 115 v ac.

Steel 9/23/46; Item No. 9495

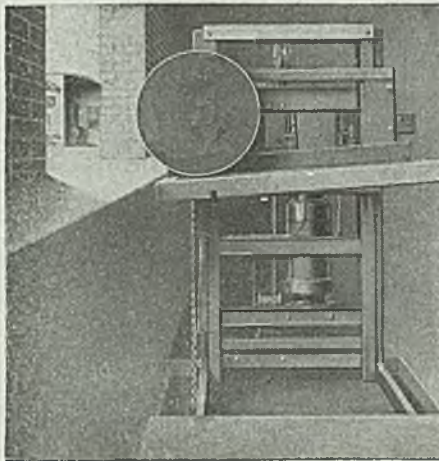
## Barrel Loader

Illustrated is a combination elevating and unloading machine built by Revolver Co., North Bergen, N. J. A time and labor saving automatic high speed barrel loader it is an adaptation of a short lift standard portable nonrevolvable elevator.

Included in design are safety features that make accidents almost impossible. A standard motor hoist unit is used, consisting of herringbone and worm gears, motor and magnetic brake in one sealed unit with all shafts running in oil and ball and tapered roller bearings. Outboard end of shaft is carried on self-aligning precision ball bearings.

Machine is countersunk in position so

that top of platform when lowered is flush with floor. Barrels are rolled on this platform by hand. Operator then throws the switch and the platform goes up. When platform reaches correct height



for unloading it is tilted so that barrel automatically rolls off onto upper level. Platform then returns automatically to lowered position for another loading.

Steel 9/23/46; Item No. 9622

## Flexible Shaft Tool

A portable, flexible shaft, 8-lb utility tool capable of getting into small corners and tight places is offered by Dumore Co., Racine, Wis. Portability of unit is increased by the fact its 1/15 hp motor can be hung on any convenient hook and connected to any outlet.

Tool is equipped with a No. 0 balanced Jacobs chuck to handle all drills, grinding wheels, buffers and countersink bits with shanks of 1/8-in. diameters or less. Shaft is 36 1/2-in. long, and normal speed for the handpiece is 500 to 3000 rpm at gear reduction end. Power may be

taken off other end of motor for direct drive speeds of from 3000 to 10,000 rpm. Speed is controlled by a foot rheostat. Steel 9/23/46; Item No. 9419

## Snap Switch

A snap switch for a wide range of applications is announced by Industrial Controller Division of Square D Co., 4041 North Richards street, Milwaukee 12. It is self-contained mechanism for making or breaking a circuit, in small space, with short movement and light pressure.

Measuring approximately 7/8 x 1 x 2 1/2 in. this new class 9007 type A switch features strong construction, mounting convenience and 550 ratings.

Steel 9/23/46; Item No. 9528

## Pyrometer

Wheelco Instruments Co., 847 West Harrison street, Chicago, is manufacturing a new extension type portable pyrometer designed to permit a choice of plug-in angle extensions where a number of applications necessitate a universal instrument for measuring and checking temperatures requiring the use of different kinds of thermocouples.

A high resistance meter movement consists of baked, processed coils, supported by two lapped pivots resting in two polished sapphire resilient jewels. An Alnico No. 5 magnet, provides ruggedness without a loss of sensitivity.

A calibrated Briguet spiral corrects automatically every reading for variations in cold junction temperature. Plug-in extensions are offered in either straight, 45 or 90 degree angle types as shown. Adapters permit choice of material and calibration of thermocouples. Pyrometer

**FOR MORE INFORMATION** on the new products and equipment mentioned in this section, fill in this form and return to us. It will receive prompt attention.

Circle numbers below corresponding to those of items in which you are interested:

9602	9723	9536
9620	9730	9575
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9611	9532	9419
9608	9597	9528
9619	9511	9598
9707	9523	9509
9722	9436	9592
	9643	
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NAME..... TITLE.....

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PRODUCTS MADE.....

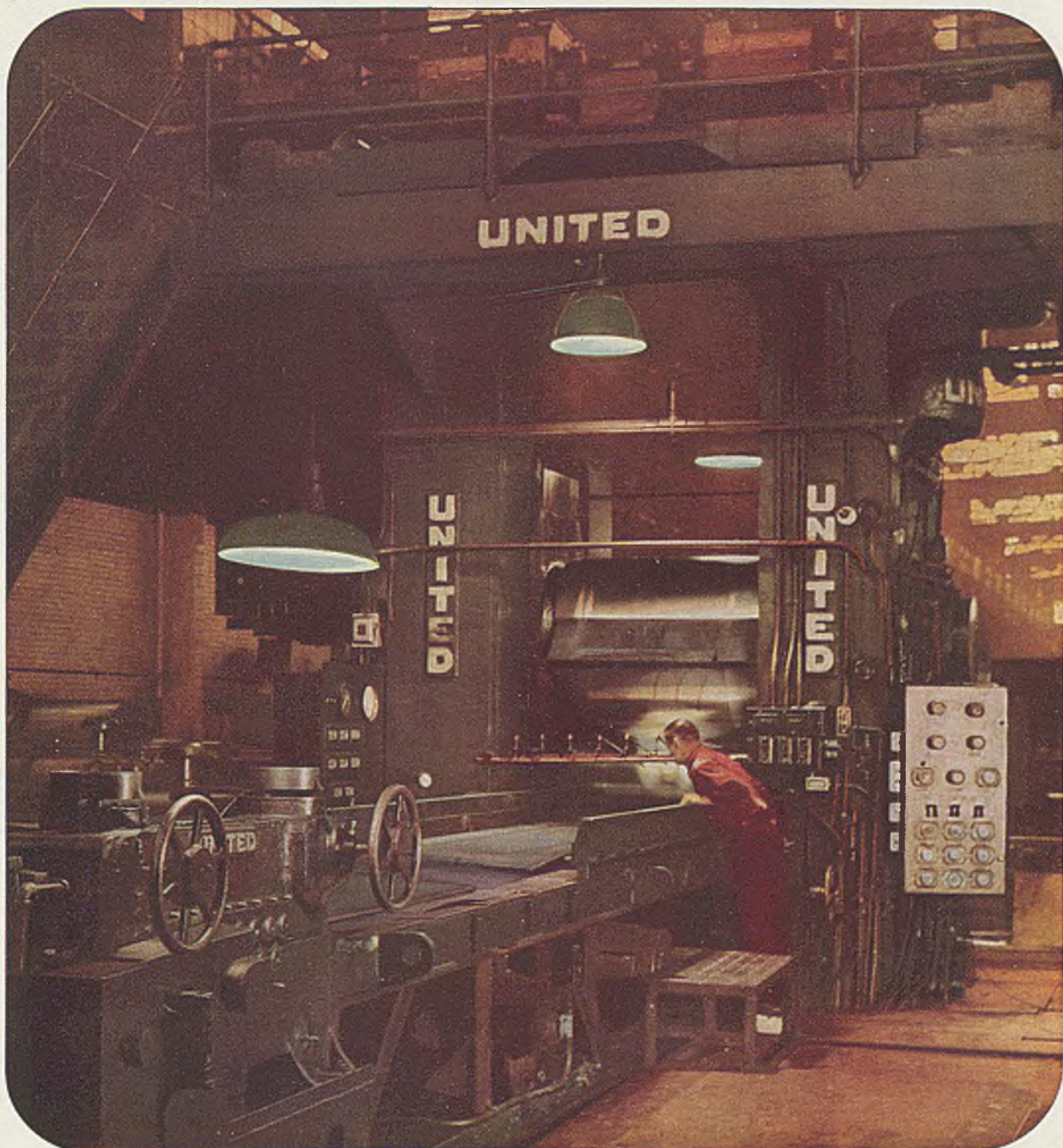
STREET.....

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Mail to: STEEL, Engineering Dept.—1213 West Third St., Cleveland 13, Ohio

(All claims are those of respective manufacturers; for additional information fill in and return the coupon on this page.)





UNITED 16" & 49" x 68"—4-High Sheet Mill

# UNITED SHEET MILLS



UNITED mills of the type illustrated are widely used in the cold reduction of both ferrous and non-ferrous metals.

We are now building two similar mills for rolling stainless steel.

Designs of these new units are available for duplication; or they may be modified to suit your requirements.

Why not ask our engineers for further particulars.

**UNITED ENGINEERING AND FOUNDRY COMPANY**  
PITTSBURGH, PENNSYLVANIA

Plants at Pittsburgh, Vandergrift, New Castle, Youngstown, Canton

Subsidiary: Adamson United Company, Akron, Ohio

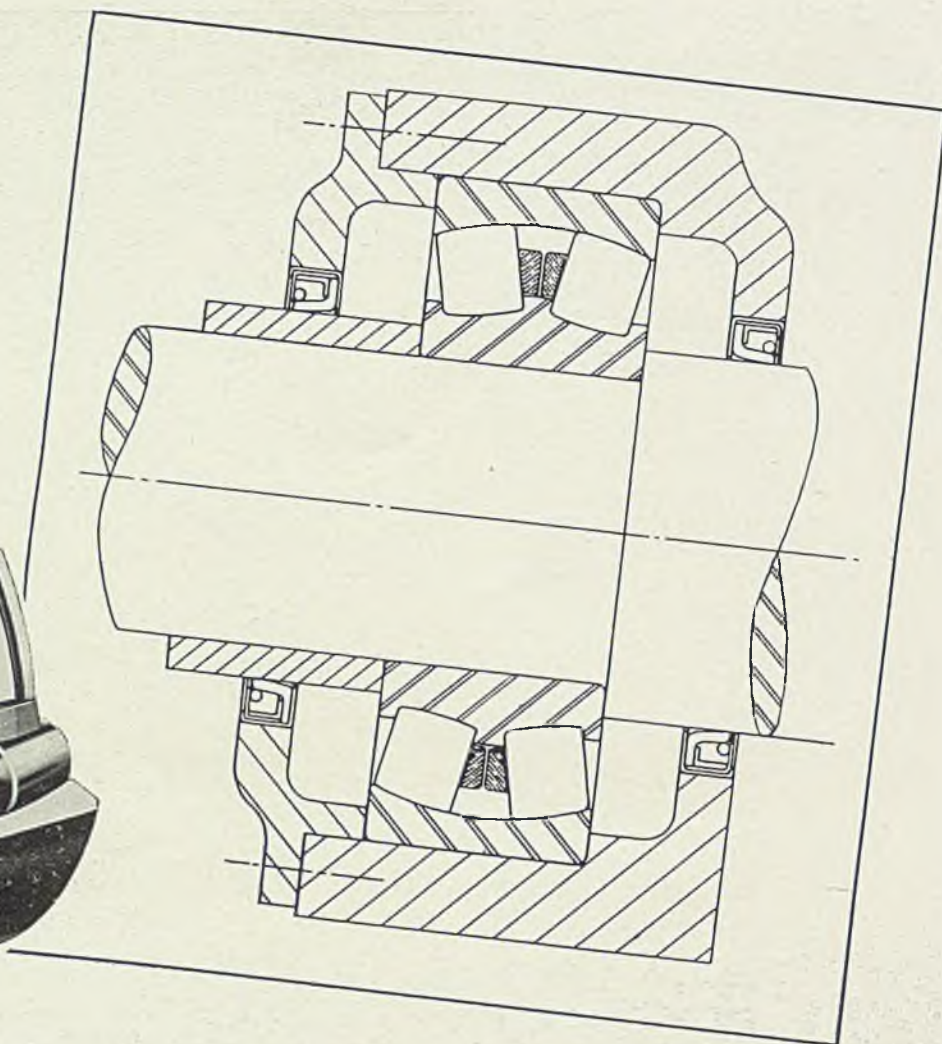
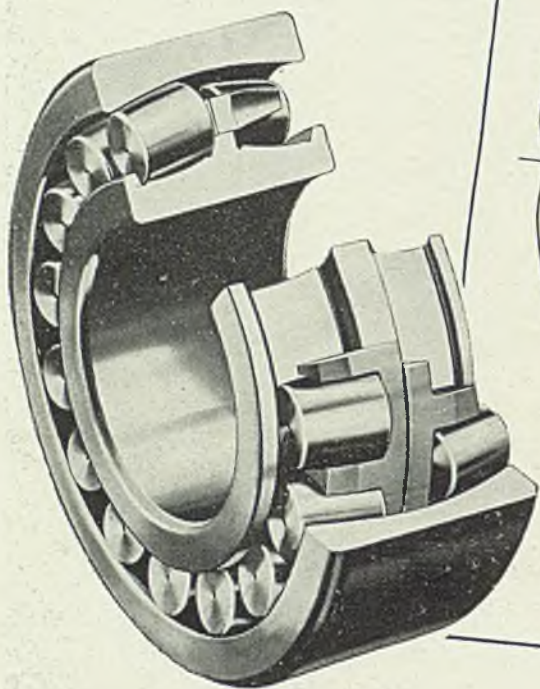
Affiliates: Davy and United Engineering Company, Ltd., Sheffield, England

Dominion Engineering Works, Ltd., Montreal, P. Q. Canada

★ The World's Largest Designers and Makers of Rolls and Rolling Mill Equipment



Cross-section drawing shows a typical arrangement for the use of Torrington Self-Aligning Spherical Roller Bearings in modern, high-speed auxiliary equipment for steel mills. Continuously equalized load distribution is assured by their free-rolling self-alignment under shaft deflection, high load stresses and temperature changes.



## FOR SUSTAINED CAPACITY

Throughout the steel, oil, paper, construction, machine tool and many other industries, Torrington Self-Aligning Spherical Roller Bearings can handle heavy radial and thrust loads at high speeds. With equalized load distribution assured by their free-rolling self-alignment, they provide *sustained capacity*.

Consequently, the Spherical Roller Bearings' tremendous radial capacity... high two-directional thrust capacity...are little affected by shock loads, shaft deflection or frame misalignment. They are easy to install and service because of their unit

construction... require a minimum of maintenance attention. This means *sustained operation* with fewer interruptions.

To help you adapt the Spherical Roller Bearing to machinery you design, manufacture or operate, Torrington's Bantam Bearings Division will be glad to offer practical engineering suggestions. For further information write for our Bulletin No. 200 or see your nearest Torrington Representative.

**THE TORRINGTON COMPANY**  
BANTAM BEARINGS DIVISION • SOUTH BEND 21, IND.

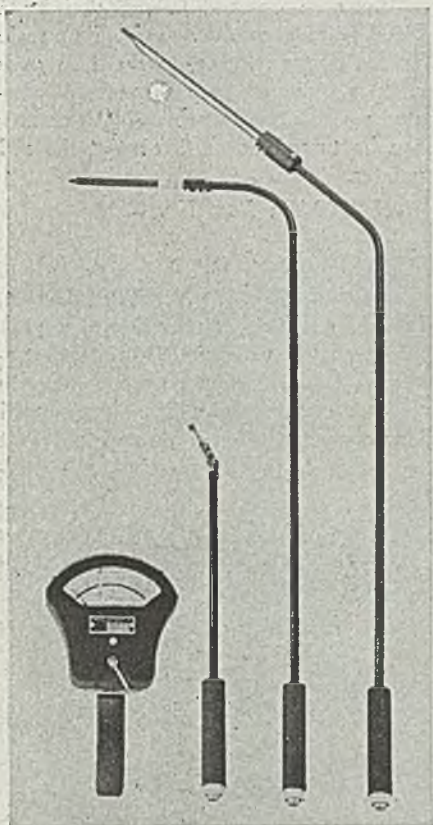
# TORRINGTON BEARINGS

SPHERICAL ROLLER • STRAIGHT ROLLER • TAPERED ROLLER • NEEDLE • BALL



is contained in a sealed, aluminum case.

Dual iron constantan scales are calibrated from 0 to 600°F or 0 to 1000°F (with centigrade equivalents) and dual

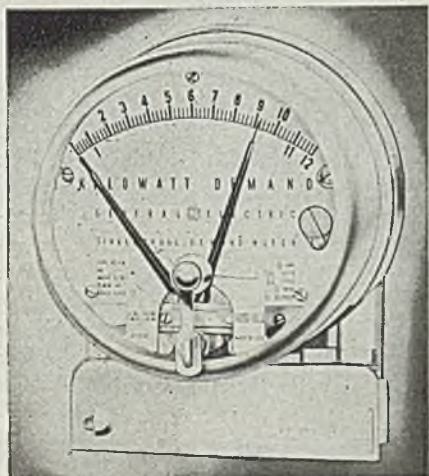


chromel-alumel scales are calibrated from 0 to 1600°F or 0 to 2500°F (with centigrade equivalents).

Steel 9/23/46; Item No. 9598

### Watt-Demand Meter

A thermal watt-demand meter, operating on the direct-heat principle and known as Type HI-1, is latest product of



General Electric's Meter and Instrument Division, West Lynn, Mass. The direct-heat principle is based on use of temperature-sensitive, bi-metallic spirals that act as their own heaters.

With no loss of efficiency in transmittal



## Sure Cure For "Box Jitters"

**L**oading 18-foot long boxes into a freight car is quite a problem in itself . . . especially when each box weighs half a ton. It's enough to give anyone "box jitters." But the Magee Carpet Company, Bloomsburg, Pa., devised a solution to this problem that cut loading time two-thirds and completely eliminated lost time accidents and injuries.

A rigid crane arm and tongs attachment, installed on a Towmotor Lift Truck, is the secret. Boxes are lifted by the tongs, swung deftly and quickly into place and stacked four high. In loading the top box, one end is set on the third box; the other end is then raised and the box is eased into balanced position. Using a pusher attachment of special design, the box is then nudged into place by Towmotor.

This same Towmotor, with attachments quickly removed, performs normal lift truck service about the plant, unloading and stacking raw wool, transporting rugs and carpets of all sizes and shapes.

For every handling problem, however unusual, there is an engineered solution . . . a solution based on Towmotor experience and "know-how" gained in solving handling problems in every industry. Send for your copy of the Lift Truck ANALYSIS GUIDE today. Towmotor Corporation, 1223 East 152nd Street, Cleveland 10, Ohio.

TAKE IT UP WITH

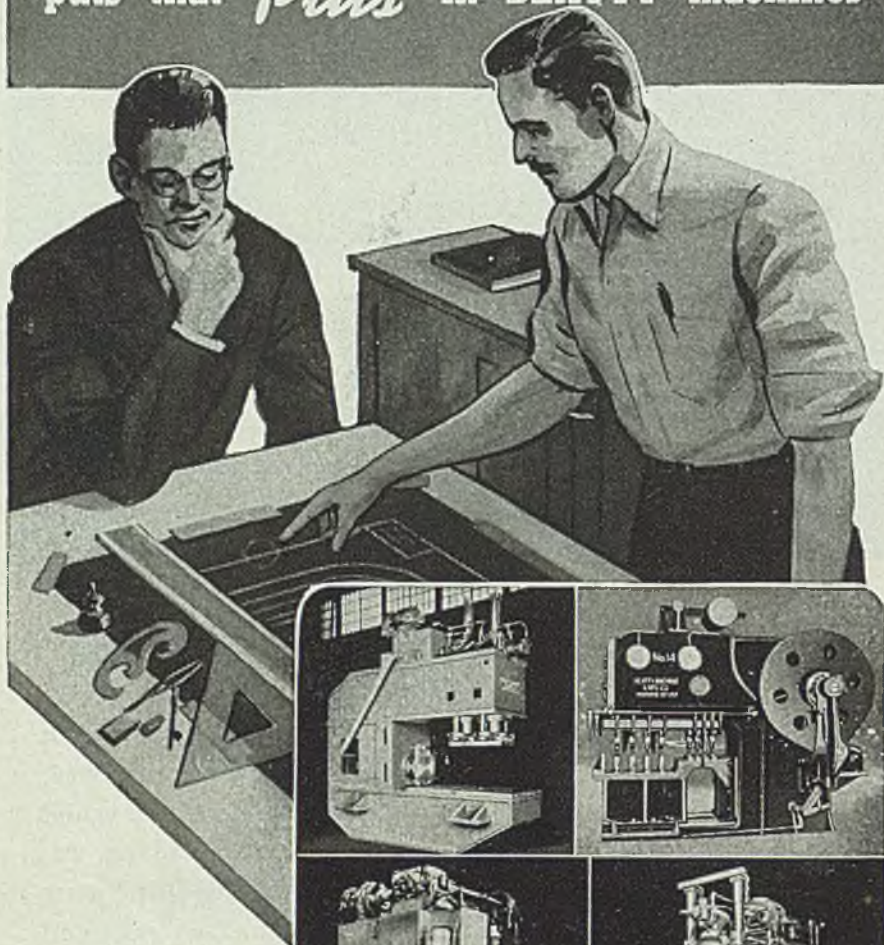
**TOWMOTOR**

THE ONE-MAN-GANG

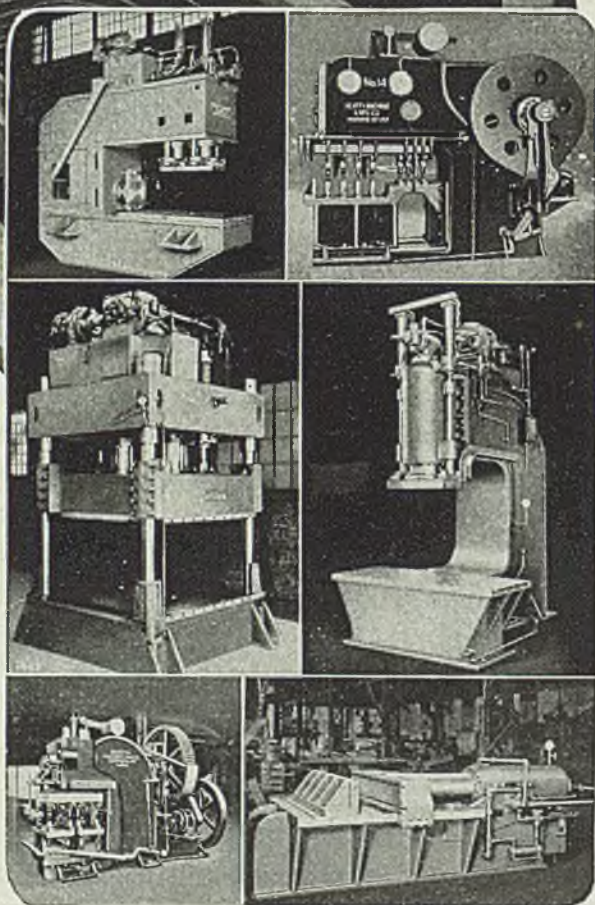


# BEATTY Engineering

puts that *Plus* in BEATTY machines



**B**ack of the solid, money-making performance of every BEATTY Machine stands the sound, seasoned judgement of a BEATTY engineer. This broad engineering experience represents an important bonus in every machine that bears the BEATTY name.



# BEATTY

**MACHINE AND  
MFG. COMPANY  
HAMMOND, INDIANA**

## —INDUSTRIAL EQUIPMENT—

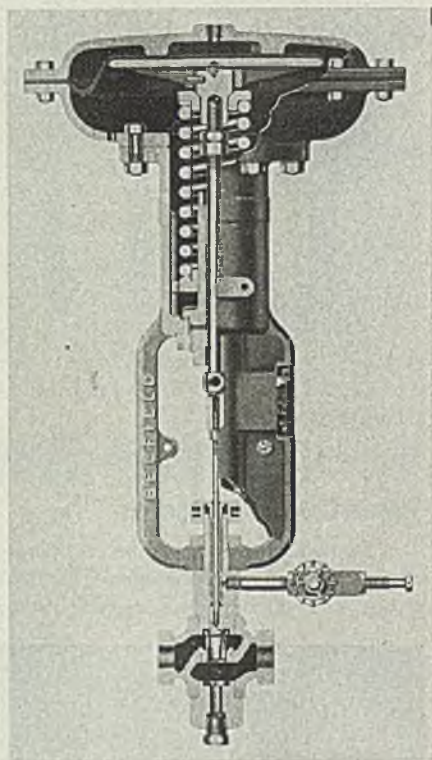
of heat, the construction results in inherently greater operating torques. Temperature-sensitive elements are attached directly to a shaft and gear.

Maximum demand is indicated by a black pointer, which is pushed up-scale by red pointer. Meter, housed in a glass case, is provided with a manually-operated reset device by which black pointer can be turned down to contact the red pointer.

Steel 9/23/46; Item No. 9509

### Pilot Piston Valve

H. Belfield Co., 435 North Broad street, Philadelphia 23, has developed a pilot piston control valve which brings an accurately defined flow characteristic into the field of small flows. The valve's equal flow characteristic is applied to its fullest advantage in processes including a com-



bination of large load changes and long time lags.

Valve stem changes its position in accordance with air pressure signals received from the instrument controller, the diaphragm motor accomplishing this function. Heat-transfer radiation fins are furnished for temperatures exceeding 540° F. Body materials are bronze, cast iron, cast and forged steel. Pressure ratings are from 150 to 3000 psi, according to material.

Valve bodies are made with screwed ends in sizes of ½, ¾ and 1 in. Bodies are made, upon specification, with standard ASA rated flanges in either horizontal or angle type.

Steel 9/23/46; Item No. 9592

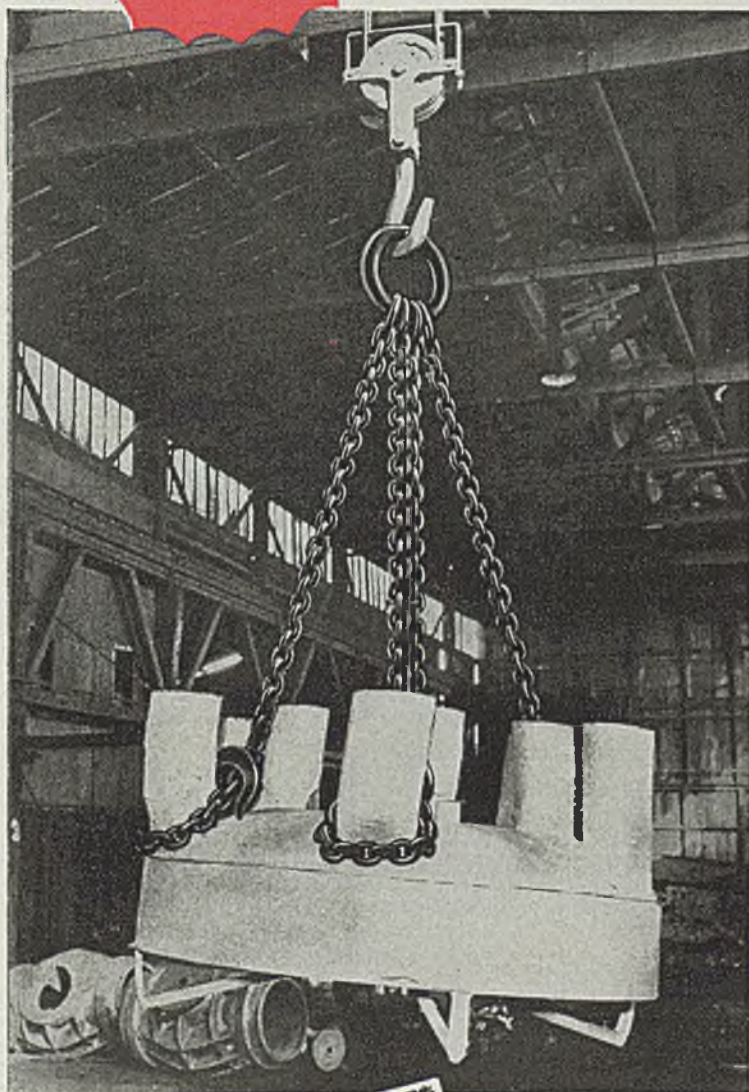
STEEL



Where Safety Is of First Consideration Specify

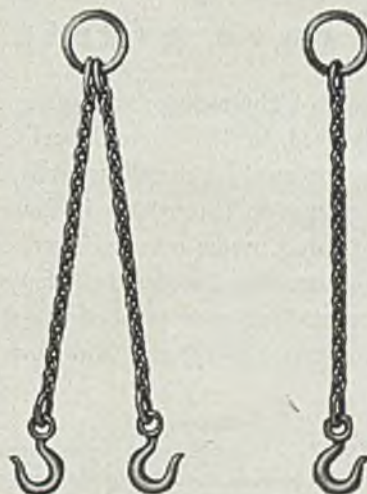
*Certified  
Tested*

# **CLEVELAND** **SLING CHAINS**



**F**OR dangerous overhead lifting, particularly where shock loads must be handled, safety recommendations call for wrought iron sling chains. Cleveland Sterling Grade Wrought Iron Sling Chains provide the highest degree of protection against sudden breakage. Made only by highly skilled chain makers, Cleveland Sterling Grade Sling Chains are unsurpassed for heavy-duty lifting where the safety factor is paramount.

All Cleveland Sterling Sling Chains are furnished with rings and sling hooks unless otherwise specified. Supplied in single, double, 3-way or 4-way slings or in any special pattern sling chain.



All fittings supplied on Cleveland Sling Chains are tested and are more than equal in strength to the chain on which they are used.



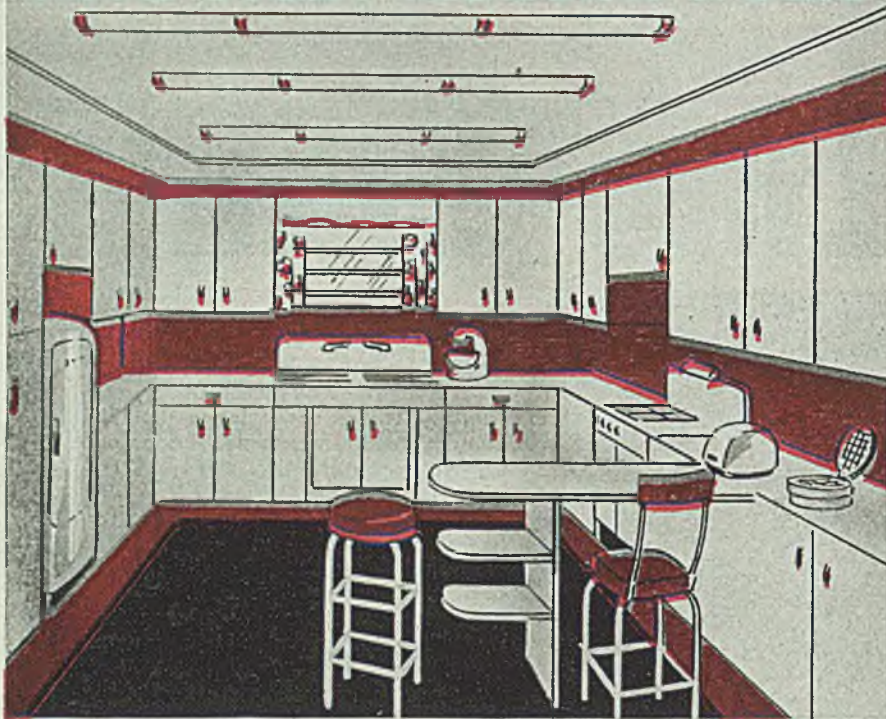
Skilled chain makers with The Cleveland Chain & Mfg. Co. have long been specialists in hand forging the wrought iron chain used in our Sterling Sling Chains. Their faithful adherence to the practices that achieve perfection in welding assures the unvarying high quality of this special type chain. All Cleveland Sterling Grade Sling Chains are certified tested before leaving the factory.

***The Cleveland Chain & Mfg. Co. Cleveland, 5 Ohio***

ASSOCIATES: DAVID ROUND & SON, CLEVELAND 5, OHIO • THE BRIDGEPORT CHAIN & MFG. CO., BRIDGEPORT 1, CONN. • SEATTLE CHAIN & MFG. CO., SEATTLE 8, WASH. • ROUND CALIFORNIA CHAIN CORP. LTD., SO. SAN FRANCISCO & LOS ANGELES 54, CALIF



## THOMASTRIP FINDS ITS WAY INTO EVERY MODERN HOME



### Electrical Products made of ThomaStrip are easily fabricated ... have greater eye-appeal

The use of ThomaStrip broadens as electrical products are designed and improved, for The Thomas Steel Company has long specialized in making strip steel for the electrical field. Used for functional and decorative purposes, ThomaStrip is found in every modern home—in stoves, toasters, waffle irons, refrigerators, dish washers, cabinet sinks, steel cabinets, door handles, light fixtures, radios, clocks, and ironers. As these products were planned and designed for today's modern, attractive homes, ThomaStrip—both coated and uncoated—was specified.

*Why?* ... Because ThomaStrip is so versatile and lends itself to so many different applications. Because it's available in such a wide range of finishes, coatings, special tempers, and analyses... in electro-coated zinc, copper, nickel, and brass... hot dipped tin and solder... lacquer coated in colors... uncoated precision strip... carbon and alloy specialties.

Our engineers will be glad to work with you on new product ideas... in redesigning for product improvement and cost reduction.

**THE THOMAS STEEL CO. • WARREN, OHIO**



## Damper Windings

(Continued from Page 104)

duty, the oxyacetylene torch is used: a carbon arc would melt the nonferrous material if an attempt were made to secure deep heat penetration. The holes in the end ring sections are sometimes counter-sunk to form a wider passageway so that the phos-copper may penetrate to provide greater contact area. Electrical resistance is thus kept at a minimum, and a strong joint is secured.

In first braze-welding the end ring sections to the amortisseur bars the order in which bars are braze-welded to the end ring is of importance. It is not possible to start at one end of the end ring section, and progress from one bar

**PNEUMATIC FATIGUE TEST:** Mr. F. B. Quinlan, General Electric scientist and author of the article "Pneumatic Fatigue Test" which appeared in *STEEL*, Sept. 9, p. 112, suggests the following to supersede previous explanation of formulae determining changes in air path of the instrument as they appear on p. 113:

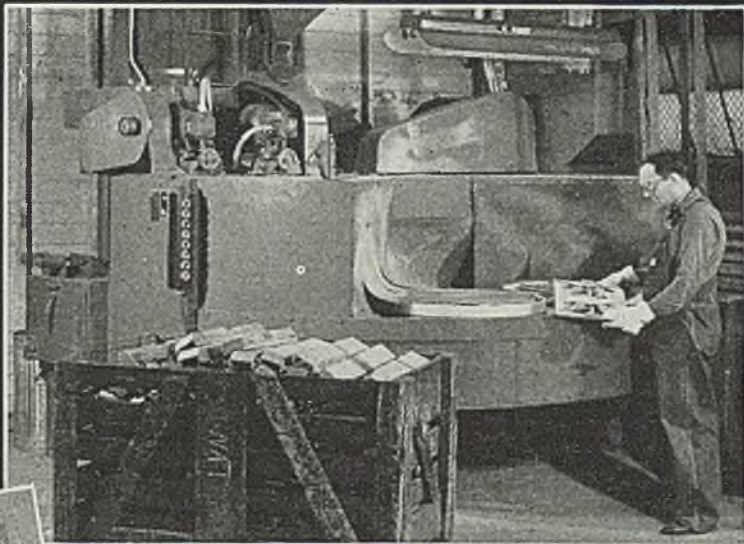
"Measurements of the total air path show that it exceeds the length required for a true half wavelength by a small amount. A thorough investigation of the pressure distribution throughout the tube-length indicates that this added length acts as an impedance matching device. For maximum transfer of energy, the impedance of the resonant air column should match the impedance of the vibrating cantilever".

directly to the adjacent bar and so on, without experiencing difficulties due to metal growth. The proper procedure is first to braze-weld the bars at each end of this section, then the adjacent bars toward the center, and so on. If the braze-welding were done in a straight line sequence, the last bar would be under considerable shear stress, and might flow out of alignment when heated. Care must also be exercised not to bring the bars to too high a heat if the material is brass or bronze, since the bar would be excessively brittle and likely break.

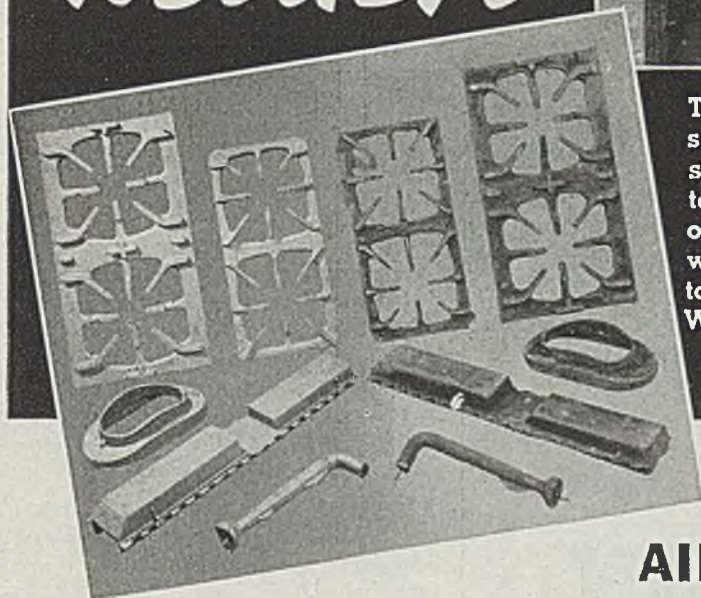
**Special Considerations:** Motors which have extended starting periods with high inertia loads often use double-deck amortisseurs, with either a single end ring or a double-deck end ring. The electrical machine designer may or may not use different materials for the deep and shallow windings in order to secure desired starting, accelerating, and pull-in



# The TEST of a machine is *RESULTS*



The proof of the pudding is in the eating, so the saying goes. Surely the test of a machine is in results. The best proof of the excellent results obtained through use of the Wheelabrator is the list of case histories below. Now is the time to get set with a fast-cleaning, cost reducing Wheelabrator to meet competition on a better than equal footing. Write today for further information and data.



## AIRLESS WHEELABRATORS

*prove themselves on the job!*

### PRODUCTION UPPED 2400%

Forty brass discs, approximately 2" thick and 6" in diameter, are cleaned in five minutes in a small 20" x 27" Wheelabrator Tumblast at the Tri-Boro Brass Co., Bronx, New York. Formerly each casting required three minutes for cleaning with airblast equipment.

### CLEANS BETTER AND ELIMINATES REJECTS

The Florence-Wehrle Stove Co. of Newark, Ohio, found that "The Wheelabrator cleans better, and rejects from faulty cleaning have practically been eliminated." Over a 20-month period, the Wheelabrator reduced cleaning time to 50% of that required by the airblast machines it replaced.

### ONE MAN NOW DOES THE WORK OF SIX

Prior to the installation of a Wheelabrator Tumblast, the Texas Steel Co., Fort Worth, Texas, was operating its sand blast room seven days a week, twenty-four hours a day to handle cleaning room requirements. Six sand blast operators were needed. Since the Wheelabrator Tumblast has taken over, the sand blast room, using a single operator, handles only castings too large to be cleaned in the Tumblast. All other castings are Wheelabrated in eight hours' time.

### CLEANING TIME CUT FROM 30 MIN. TO 6 MIN.

A Wisconsin Malleable foundry obtained these results by installing a 48" x 72" Wheelabrator Tumblast:

**TONNAGE:** The Wheelabrator handles 100% more tonnage per load than the sand blast barrel it replaced.

**TIME:** Wheelabrator's cleaning time averages 6 minutes per load as against 30 to 45 minutes per load with the former sand blast barrel.

**REJECTS:** Whereas rejects in the cleaning department had formerly run as high as 30%, they are now completely eliminated.



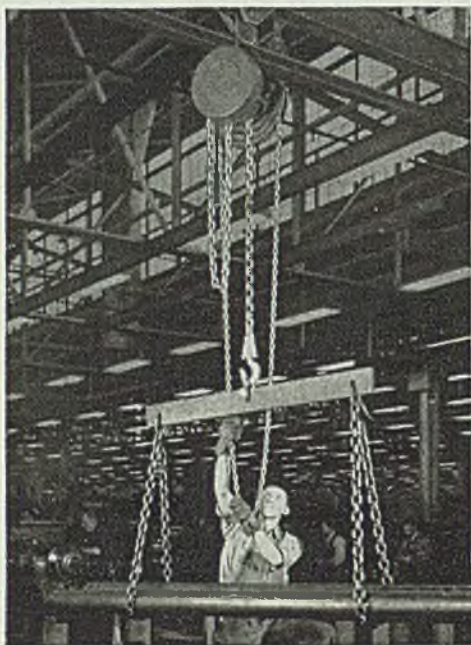
**American**  
FOUNDRY EQUIPMENT CO.

509 S. Byrkit St., Mishawaka, Indiana

WORLD'S LARGEST BUILDERS OF AIRLESS BLAST EQUIPMENT



# For PRODUCTION EQUIPMENT—or the PRODUCT ITSELF



## ★ ★ BUY AMERICAN ★ ★ the COMPLETE Chain Line

American Chain makes practically every type and size of chain used in industry. There is often an advantage in having a single responsible source for all of your chain requirements. And you can always depend upon the high quality of American Chain products—electric welded and fire welded chain—weldless chain made of formed or stamped links—chain fittings, attachments and assemblies—repair links—cotter pins.

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**AMERICAN CHAIN DIVISION  
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*In Business for Your Safety*

torque characteristics. It is desirable in production to be able to use a braze-welding process and material which is applicable to similar or dissimilar metals. The phos-copper technique permits such treatment.

Fig. 6 shows an amortisseur using only one deck of starting conductors. Fig. 1 shows the completed end ring on a motor which has both upper and lower starting decks but a common end ring. The upper deck is that which is closer to the pole face. Figs. 2 and 5 show a double deck amortisseur with separate end rings. The upper winding carries heavy current in the bars during the first part of starting, and the lower winding carries increasing current in the bars as the motor approaches synchronous speed. On high inertia loads these periods are far enough apart so that heat-induced expansion takes place first in the upper deck of bars. To avoid distortion due to the uneven development of heat the end ring sections are separate in the rotor shown in Figs. 2 and 5.

Fig. 3 shows end ring construction before braze-welding, in which the individual sections of the end ring on each pole are butted together and lapped on either side with a bolted connecting piece. The phos-copper shims are pre-placed on either side of the end ring joint. Fig. 4 shows the same joint after braze-welding.

In cases where skewed pole rotors are used, the end ring sections are lapped, then braze-welded and sometimes bolted.

The same methods and materials are used in braze-welding end rings and rotor bars in induction motors as are used with amortisseur bars and end ring segments in synchronous motors. Although damper windings in synchronous generators receive the same treatment, they will not be found in double decks.

## German Electronic Patents Offered to Industry

Photostats and microfilms of 30 German patent applications covering telephonic and electronic devices invented in Germany since 1939 are available from the Office of the Publication Board, Department of Commerce, Washington.

Following are some of the items covered: Process for measurement of distances by means of electromagnetic waves, recording device for stationary position finding, magnetic field tube, circuit arrangement for generation of saw-tooth shaped current curves, free play worm gear, receiver with a positive counter coupling, device for multiplex telephony, power motor for high frequency. Photostats are \$1 each and microfilms 50 cents.



# EXIDE-IRONCLAD POWER MEANS ALL-DAY-LONG POWER

When your materials are handled by the efficient electric industrial truck—powered by Exide-Ironclads—you can always count on full shift availability. You can also count on faster, safer, easier handling and at a lower cost.

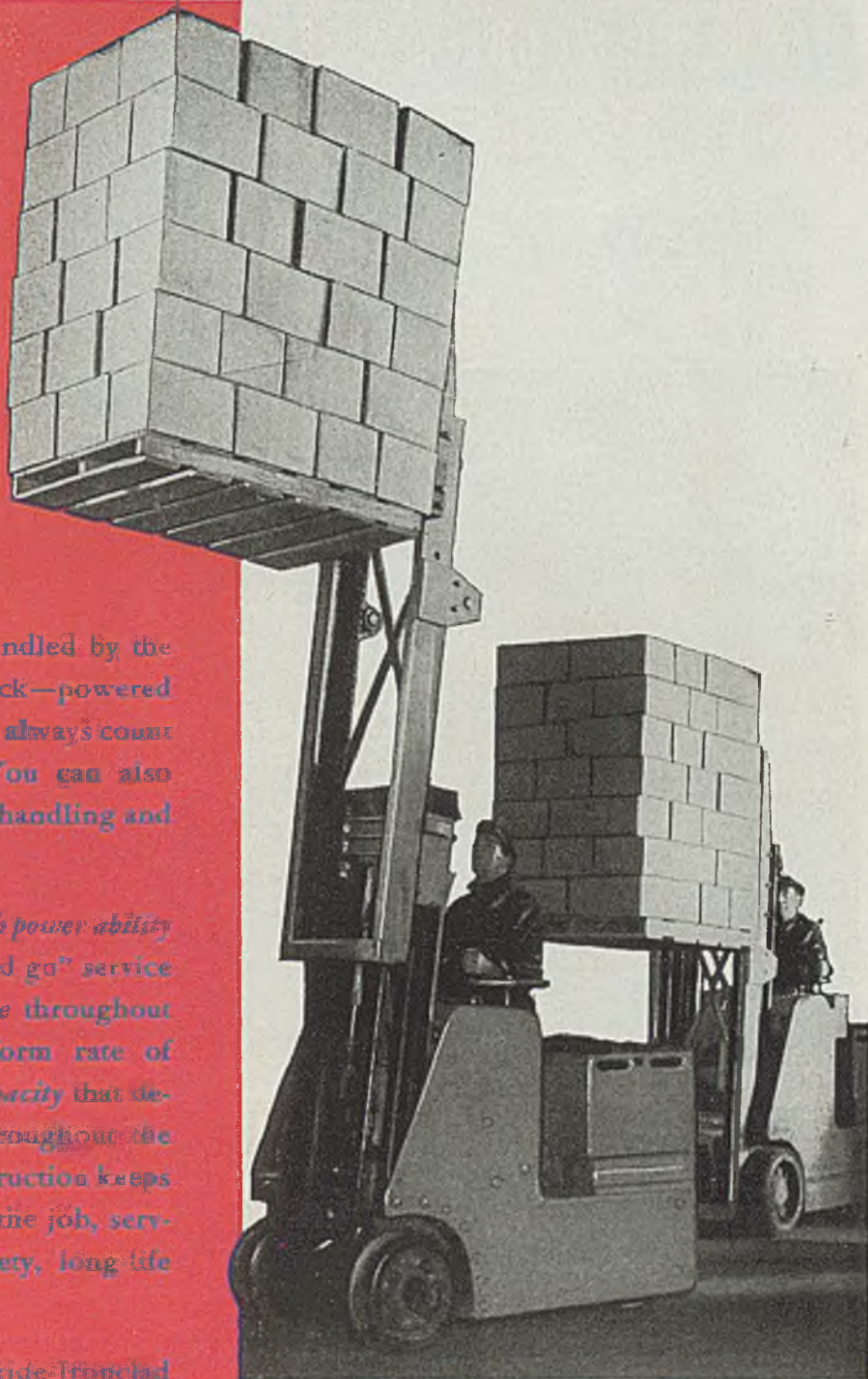
Exide-Ironclads have the *high power ability* needed for frequent "stop and go" service ... a *high maintained voltage* throughout discharge, assuring a uniform rate of operations ... and a *high capacity* that delivers peak performance throughout the shift. And their rugged construction keeps Exide-Ironclads steadily on the job, serving with dependability, safety, long life and ease of maintenance.

Write us for a **FREE** copy of Exide-Ironclad TOPICS which contains "Case Studies" of materials handling problems. Tells how to cut handling costs up to 50% covers latest developments in handling materials from receiving to shipping.

Visit Exide booth #143, Iron and Steel Exposition.

THE ELECTRIC STORAGE BATTERY CO.  
Philadelphia 32

Exide Batteries of Canada, Limited, Toronto



## DEPENDABLE POWER

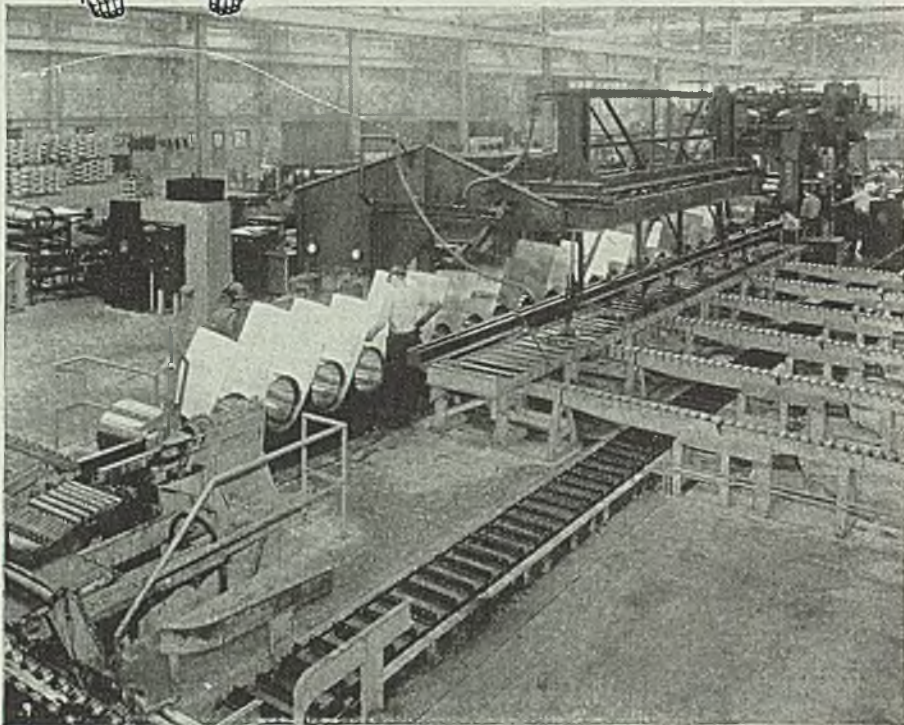




## HANDLING PROBLEMS DESERVE



# Special ATTENTION



**E**VERY manufacturer, in striving to keep costs at a minimum, must deal with more or less difficult material handling problems. These are not always quickly solved, and usually require considerable thought by plant and conveyor engineers. Most experienced plant engineers agree that the use of Mathews methods and Mathews equipment means efficient material handling. That is why Mathews Engineers are usually called in on the problem requiring special attention. There are many types of Mathews Conveyers of both gravity and power designs, and from these types are selected the units which make up Mathews continuous flow conveyor systems. It is with such systems that prominent manufacturers are reducing worker fatigue and keeping materials moving through processing machinery, storage and shipping, with a minimum of product re-handling, costly confusion and delay.

It might be that a Mathews Engineer can show you what others in your industry have done to improve their material handling. We will welcome your inquiry and give it prompt and thorough service.

**MATHEWS CONVEYER COMPANY**  
ELLWOOD CITY, PENNSYLVANIA  
SAN FRANCISCO, CAL. • PORT HOPE, ONT.  
ENGINEERING OFFICES IN PRINCIPAL CITIES

## Machinability of Steels

(Continued from Page 106)

factory. Figs. 1 and 2 show satisfactory microstructure, the fine lamellar structure being preferable.

2. When these steels were received in the coarse spheroidized condition or more than 50 per cent coarse spheroidite with hardness below 187 brinell, the complaints were frequent. They included poor finish on thread cutting operations and poor finish and low tool life on rough cutting operations where form tools with little or no rake were used at comparatively slow speeds, Figs. 3 and 6.

3. When these steels were received in fine spheroidized condition or with mixed lamellar and spheroidized structure, Figs. 3, 4 and 5, with hardness of 187 to 229 brinell, occasional complaints of poor finish were encountered in form cutting operations and threading operations.

The reason for machining difficulties is more closely related to microstructure than to hardness. Those structures with considerable free ferrite, and with coarse spheroids in a matrix of ferrite are extremely ductile and the metal tends to build up on the tip of the tool. The built up edge breaks off intermittently leaving a rough surface. With form tools and thread chasers having little or no rake, this condition develops readily; the additional power necessary to push the built up edge puts an excessive load on the tool causing early breakdown of the cutting edge by cratering.

### Cold Rolling Improves Finish

Work hardening the steel bars by cold rolling or cold drawing to slightly above 210 brinell improves both the finish and the tool life to some extent.

Attempts to use quenched and tempered steel at 23 to 27 rockwell C hardness showed no appreciable improvement in thread cutting finish over fine spheroidized material.

In general, these difficulties have not been serious in most operations. Single point tools having proper rake and run in excess of 80 surface fpm seldom give trouble with any of the structures mentioned. Carbide tools, since they operate at higher speeds, generally give satisfactory results, but high speeds and adequate rake cannot be used on all tools.

Such difficulties are not new and are not characteristic of the 8600 and 8700 series of steels. The better known steels of the 3100, 4100 and 4600 series show the same variable machining characteristics with varying microstructures. The fault does not lie with the composition but rather with the annealing treatment



used in processing bars and forgings.

The 8630 and 8740 grades of steel require more attention during annealing treatment to produce a lamellar structure than do some of the other steels. A low temperature anneal at 1500 to 1550° F following the forging or hot rolling, generally results in a spheroidized structure especially when furnace cooled. Even a slightly higher annealing temperature may give a spheroidized structure if the furnace cooling rate is too slow.

A cycle anneal treatment consisting of soaking at 1600 to 1650° F, cooling fairly rapidly through the critical range, and holding at about 1200° F for a short time gives a lamellar structure. One supplier uses the following cycle with very desirable results: Heat to 1575 to 1625° F, hold 2 hours; cool 100 to 200° per hour to 1275° F, hold 2 hours; furnace cool to 1200° F, hold 1 hour; air or furnace cool.

During the war, demand for heavy tonnage of steel caused mills to select the shortest annealing treatment. This, unfortunately, gave the spheroidized structure to the 8630, 8740 and similar grades of steel. During the last two years as much as 90 per cent of the steel bars of these compositions received at the writer's plant had essentially a spheroidized structure.

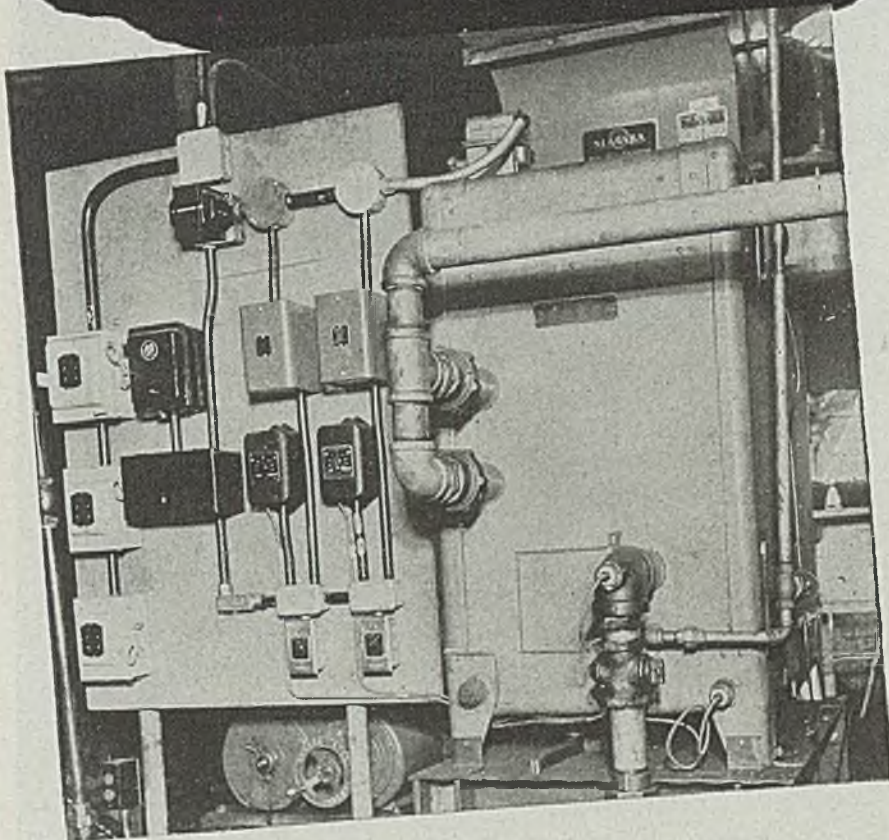
Now that wartime pressure is past, it is hoped that more attention by steel suppliers will be given to proper annealing of the 8600 and 8700 series of steel. If these steels having 0.28 to 0.43 per cent carbon content can be made readily available in a lamellar pearlitic microstructure at 187 to 229 brinell, they should be very popular.

### New Du Pont Resin Has High Heat Resistance

A new resin, known only as BCM, is undergoing tests for automobile, airplane, refrigerator and washing machine structural panels, it is reported. Developed by E. I. Du Pont de Nemours & Co., Wilmington, Del., the product is said to have excellent bonding properties and high resistance to heat.

Although production is still in the semiwork stage, fabricators are testing the material to determine its suitability in manufacture of coatings for tooling jigs, structural panels for automobiles, sections of sinks and decorative panels. It requires a short curing period and low laminating pressure, and can be used by itself or with a polymer. Said to withstand bending without crazing or peeling, resin is thermosetting. Experiments show that colors can be obtained by adding oil-soluble dyes or pigments.

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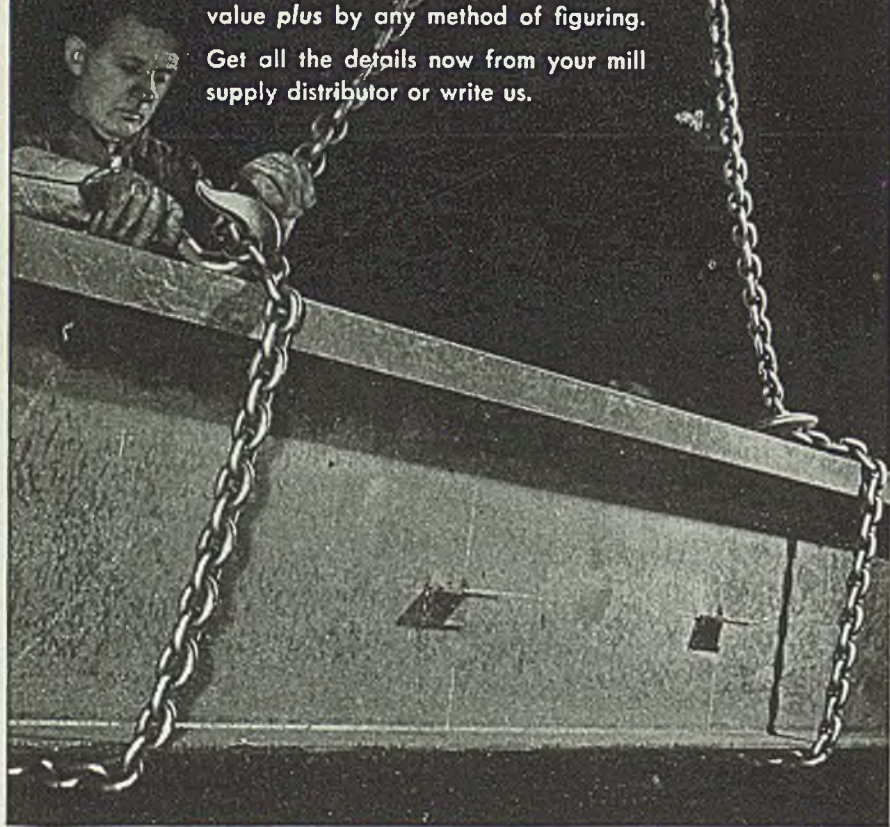
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## Upsetting Aluminum Heads

(Continued from Page 111)

above water quench show a minimum of 40,000 psi tensile, 30,000 psi yield, and 8 per cent elongation with a hardness of 90 brinell. These values are from standard 1 in. square test bars machined to 0.505-in. diameter.

Air-quench cycle involves heating to 950° F and holding for 10 hours, followed by cooling by means of an air blast at room temperature until work reaches 300° F. Then forgings are aged for 8 hours at 340° F and stress relieved for another 8 hours at 470° F. Resulting physicals show a minimum of 38,000 psi tensile, 29,000 psi yield, 9 per cent elongation, 80 brinell (test bar values). While both of these treatments develop physical properties slightly lower than maximum obtainable, they are designed primarily to assure dimensional stability and to prevent subsequent warpage of the forging. In some cases the aging treatment at 340° F is omitted.

Properties actually obtained exceed the above minimum figures somewhat. Thus water-quench test bars show an average of 50,000 psi tensile, 39,000 psi yield, 10 per cent elongation, 108 brinell; while air-quench test bars will average 45,000 psi tensile, 33,000 psi yield, 10 per cent elongation, 95 brinell.

These test bar values are of course checked against values of metal from the heads themselves by cutting additional test bars from the heads. Such bars cut from air-quenched forgings must test at least 80 per cent of the minimum tensile and yield point values listed above, as well as give at least 70 per cent of the minimum elongation value.

Test bars cut from forgings that have been water quenched show substantially the same figures as the 1-in. square test bar.

**Cleaning Finishing:** From the heat treat department, the heads go to the finishing department where they are cleared up completely, bosses cut off, forging cleaned and etched, final inspection given, etc. In general, the movement of the work is as follows:

First, the heads are put through a large continuous conveyor type Ransohoff cleaning machine (Fig. 6) where they are drenched with solution, not sprayed. Treatment is with hot caustic, followed by a water rinse and then a nitric acid bath, ending with another hot water rinse. Cleaning unit employs a stainless steel slat type conveyor for moving the work through.

From this cleaning unit, work goes down a conveyor leading to the touch-up stations distributed between the conveyor lines (Fig. 8). There the operators



use rotary hand tools driven by air motors to clean up the remainder of the flash at the parting lines of the forgings, grind and buff.

Next, the heads move along to the saw station, where they are lifted from the conveyor by means of an air-operated hook. A fixture locates the head in position so that the bosses and bases may be trimmed off readily (Fig. 7).

Work stations are located between the conveyor lines so that operators need only slide the head a short distance from one conveyor to another. Special overhead fluorescent lights at each work station assure maximum visibility.

An unusual feature in this production line is the incorporation of a special hardness testing station where every head that is heated is given a brinell test at three points. Operator at right, Fig. 9, is working the indenter, while worker at left is gaging the impression to check the diameter.

From the brinell station, short portable conveyor sections lead directly into freight cars spotted on the siding alongside of this work area. Or heads may be carried into the cars in steel skid boxes by means of power trucks.

Fig. 10 reveals method of loading heads in a car. Forgings are packed three layers deep as shown, employing tough corrugated paper board between units to prevent damage in transit. Loads are carefully secured to prevent sidewise or lengthwise movement in the car.

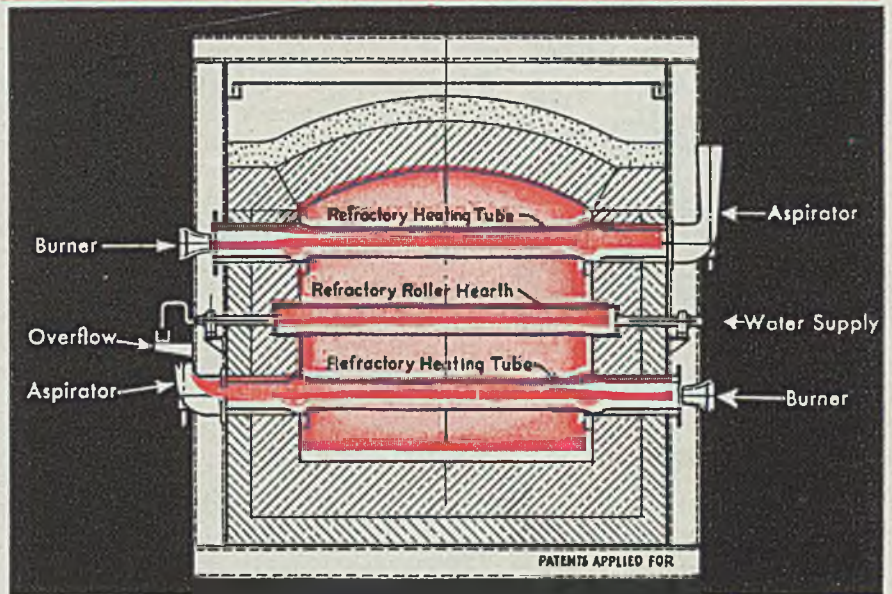
### Hard Composition Resists Cratering

With a rockwell A hardness of 93.2, a new Grade K5H composition, developed by Kennametal Inc., Latrobe, Pa., is said to have great resistance to cratering. Made specifically for small tools used in precision boring of steel parts, solid tools of 3/32 to 5/16-in. diameter and 5/32 to 5/16-in. square are offered as well as blanks 3/32 to 3/8 in. in diameter and 3/16 to 3/8-in. square. These are suitable for grinding to any desired tool point shape.

### New Cutting Oils Marketed

Containing a combination of sulphur and chlorine, a new series of transparent cutting oils introduced by Texas Co., New York, are said to permit high cutting speeds without corrosion of metals. Known as Cleartex cutting oils, A, A-1, B, DD and Britex cutting oil B, they are transparent, pale in color and pleasant of odor. These oils are reported to contain certain war restricted ingredients which improve their performance particularly with nonferrous metals.

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\*NOTE: "Carbofrax" is a registered trademark which indicates manufacture by The Carborundum Company.



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# READING HOISTS

## Forty Miles of Piping

(Continued from Page 113)

chines and equipment. It permits mass production by welding of headers and laterals and makes possible many welds at the point of manufacture rather than on the job. It also permits the use of random lengths of pipe, which is a considerable economy.

Nearly all of the rest of the plant floor has been covered with a combination of grid type and continuous coil construction. Necessity was the reason for much of it. The company was able to procure pipe suitable for continuous coil construction but not for the grid type laterals. Headers were introduced into the continuous coil construction for two principal reasons: (1) To reduce resistance to flow where it was too great for the capacity of the pumps, and (2) to guard against future changes in floor arrangement and foundations. The effect of using headers in a continuous coil panel is to break it up into two or three smaller continuous coil circuits.

In one area a single continuous coil was used for a purely experimental reason. It is near a large furnace in which the heat will exceed 1600° F. Here, by circulating the water without heating it, engineers can determine the rate of heat transfer through the concrete slab, with a depth of about 8 in.

Total area of plant is 381,750 sq ft.

**Mezzanine Floors:** All of the heating installation here is of Bundy tubing, the only tubing available that would fit into the reduced thickness of the concrete slab that forms the floor. The tubing measures 5/8-in. OD and has a wall thickness of 0.049-in. It is of grid type construction throughout, with center-to-center distances varying from 6 to 12 in., depending upon the estimated rate of heat loss. Total area of mezzanine floors is 10,650 sq ft.

**Office Areas:** For the first floor offices wrought iron was used in grid type construction. In the ceiling of the first floor offices, an auxiliary wrought iron surface was used at the outside exposures to add radiating surface for the second floor offices at the windows, and for the ceiling of the first floor. The office area heating job was completed with the installation of copper, in a grid type and continuous coil construction, in the ceiling of the second floor offices so that heat will radiate downward.

**Heaters:** The heaters are connected to the panels in a by-pass hookup so that the full heating capacity of the heater can be utilized. Water enters the unit at the top and flows downward through the tubing which is coiled in such fashion that it becomes, in effect, the wall of the combustion chamber. The

heat exchanger at the top exposes 30 sq ft of transfer area to a total water content of 4 pints. In reality, the plant is heated by 120 small systems, making for greater flexibility. Any area can be turned on or off. No serious heating problem arises if a bay or two must be shut off because of floor rearrangement.

The entire vast system can be serviced by a single man who needs to be acquainted only with a small, simple water heater. Any single area can be heated with peak efficiency even though the remainder of the plant is not in operation. Four of these small heaters will maintain 42° temperature in the water tank which serves the sprinkler system and which contains 100,000 gal of water.

**General:** The heating system is expected to contribute substantially to cleanliness of the plant whose output, when production begins this month or next, will ultimately reach 250,000 gas and electric storage water heaters per year. Health and comfort of employees has been the primary objective from the beginning, with greater individual productivity a natural concomitant. Design of the system is such that not only the separate bays but working areas within the bays and space in which each worker stands can be closely controlled as to temperature, as heat losses from manufacturing operations were calculated and heating grids fashioned accordingly. It is possible to raise temperature of the floor slab to 85° maximum. Workers will be benefitted by radiant heat applied in a straight line.

A unique arrangement of thermostats consisting of 10 master thermostats to be mounted on the outside of the building and teamed with submaster thermostats on the inside affords great flexibility, as the latter can be adjusted at will based on inside dry-wall temperature and conditions in portions of plant not so well served by coils or grids. The submasters control water temperature into the load by increase or decrease of flow into and through one control valve.

The system will contribute to physical efficiency of the plant by offering less interference to conveyor systems and other overhead appurtenances and raise no dust.

In integrally constructing the system as part of the building, provision was made first for insulating sills and floor around the outside walls. There is 2 ft of dead air space above the coils and insulation in mezzanine ceilings.

All of the soft copper tubing used was unrolled from coils and bent in wooden jigs or forms specially designed for the job. From 12 to 13,000 joints in the tubing were brazed with Silphos flux. Of the wrought iron pipe, feeders were fabricated by arc welding, headers by



gas welding, with a total of about 12,000 welds. Gas welding was applied to the 18,000 ft of Bundy tubing going into the job. Blueprints have been prepared which will show the exact location of every weld, joint, bend, header and lateral in the entire plant, adding much to the ease with which studies can be made and facilitating any changes which may be necessary in the future.

Mr. C. W. Colby, president, Colton Corp., heating contractors, designed the installation.

## Safety Color Code Reduces Accidents

Certain accidents resulting in disabling injuries have been entirely eliminated, and others reduced from a frequency of 46.14 per 1,000,000 man-hours worked to a yearly average of 5.58, by employment of a safety color code originated in Office of Quartermaster General, Washington.

Red, green, yellow, white and black, and combinations thereof, are the colors used in the standard code, which was developed for use in quartermaster installations. Basic colors and combinations were kept to a minimum to avoid confusion that would result from too many signals constantly in the vision. Code was designed not to conflict with standardized signals now in use.

Red is basic color for identification of fire protection equipment and apparatus, danger and stop signals. Green denotes, safety, location of first aid equipment, dispensaries, starting signals, the "go" for traffic. Yellow designates caution and is used for making physical hazards more visible. Black is also used with yellow to present a more striking symbol. Black and white are basic colors for designating housekeeping, sanitation and traffic markings.

## Packaging Blue Book Provides Shipping Data

Applications for noncorrosive round steel reinforcement of cartons, boxes, crates and all types of shipping in fiber, corrugated or wood containers are presented in new free "Blue Book of Packaging" published recently by Gerrard Steel Strapping Co., 2915 West 47 street, Chicago.

Illustrated 20-page booklet describes latest strapping methods for both domestic and export shipments, using both hand and automatic round steel strapping machines. Also included are photographs of auxiliary equipment—suspensions, containers, tools and appliances, and special equipment needed for carloading.

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# The Business Trend

## Industrial Activity Sets New Postwar High Mark

A NEW postwar high in electric power production helped push STEEL's industrial activity index in the week ended Sept. 14 to a new postwar high mark of 153 per cent (preliminary) of the 1936-1939 average of 100. This is a 15-point rise over the Labor Day holiday week's index. Previous high level of the index was 152 per cent registered in the weeks ended Aug. 17 and 24.

Electric power's new postwar high mark was 4,521,151,000 kwh. In reaching this level, it bounded from 4,184,404,000 kwh in the Labor Day holiday week.

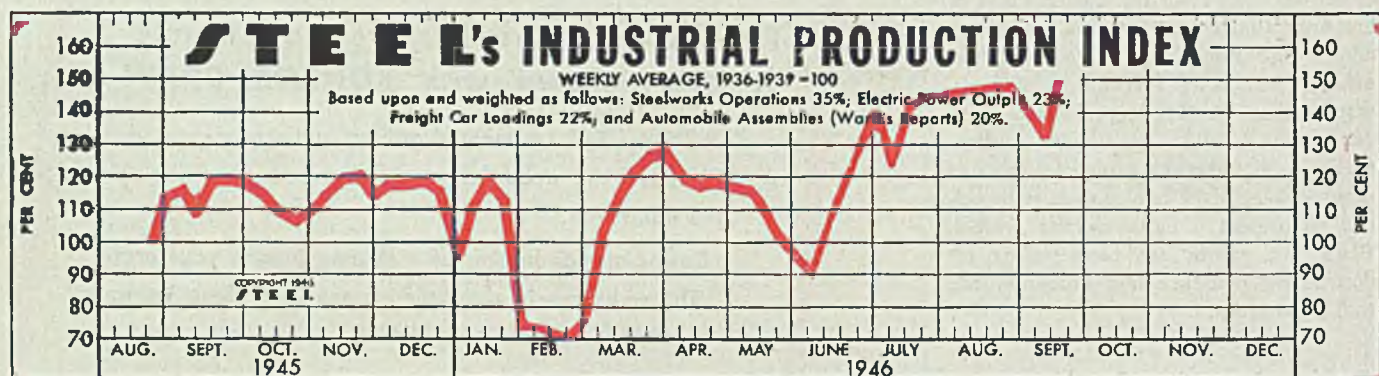
Strikes still are a brake on industry's efforts to attain capacity operations. Another factor that may become increasingly significant in checking the tempo of industrial production is the raising of prices in an effort to overcome rising production costs. This inflation, if carried far enough, could price industries out of the market, with resultant declines in production and employment. **STEEL**—Although the difficulty of obtaining scrap puts steel producers in a precarious position the steel industry has thus far been able to hold production of ingots at a high rate, now approximately 90 per cent of capacity. **COAL**—Cumulative production of bituminous coal this year is now only 12.9 per cent behind that for the corresponding period of last year. A continued high weekly rate of output is steadily erasing the production deficit in-

curred during the miners' strike earlier this year. Production during the Labor Day holiday week this year totaled 11,155,000 tons, compared with 10,013,000 tons in the corresponding period of 1945.

**PRICES**—Reimposition of government price ceilings at the end of August on livestock and meats lowered the U. S. Bureau of Labor Statistics average of primary market prices 4.8 per cent in the week ended Sept. 7. At 122.0 per cent of the 1926 average, the index was 8.3 per cent higher than at the end of June and 16.2 per cent above a year ago. Average of prices for all commodities other than farm products and food dropped only 0.2 per cent during the week ended Sept. 7 but was still more than 10 per cent above a year ago.

**CASTINGS**—Gray iron castings shipments during July totaled 810,829 tons, compared with 735,060 tons in June and 856,678 tons for April, the high month thus far this year. A slight rise in unfilled orders put the backlog at the end of July at 2,668,782 tons, highest for this year. Also up over June were shipments of malleable iron castings in July. The July shipments aggregated 64,446 tons, compared with 61,650 tons in June. Unfilled orders for malleable iron castings for sale dropped to 271,981 tons at the end of July, compared with 275,845 tons at the end of June.

**FORGINGS**—Shipments of steel forgings during July rose approximately 5 per cent to 153,839 tons, compared with 146,612 tons in June. Unfilled orders for steel forgings for sale totaled 623,723 tons at the end of July, an increase over the 610,204-ton backlog at the end of June.



The Index (see chart above):

Latest Week (preliminary) 153

Previous Week 138

Month Ago 152

## FIGURES THIS WEEK

### INDUSTRY

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)§	89.5	85.5	90	80.5
Electric Power Distributed (million kilowatt hours)	4,521	4,184	4,422	4,106
Bituminous Coal Production (daily av.—1000 tons)	1,859	2,083	2,050	1,669
Petroleum Production (daily av.—1000 bbls.)	4,773	4,800	4,843	4,538
Construction Volume (ENR—Unit \$1,000,000)	\$86.2	\$86.1	\$129.1	\$60.4
Automobile and Truck Output (Ward's—number units)	87,078	72,535	88,990	12,910

\*Dates on request. §1946 weekly capacity is 1,762,381 net tons. 1945 weekly capacity was 1,831,636 net tons.

### TRADE

Freight Carloadings (unit—1000 cars)	898†	794	888	856
Business Failures (Dun & Bradstreet, number)	31	14	17	7
Money in Circulation (in millions of dollars)†	\$23,499	\$28,506	\$28,353	\$27,793
Department Store Sales (change from like wk. a yr. ago)†	+50%	+45%	+29%	0

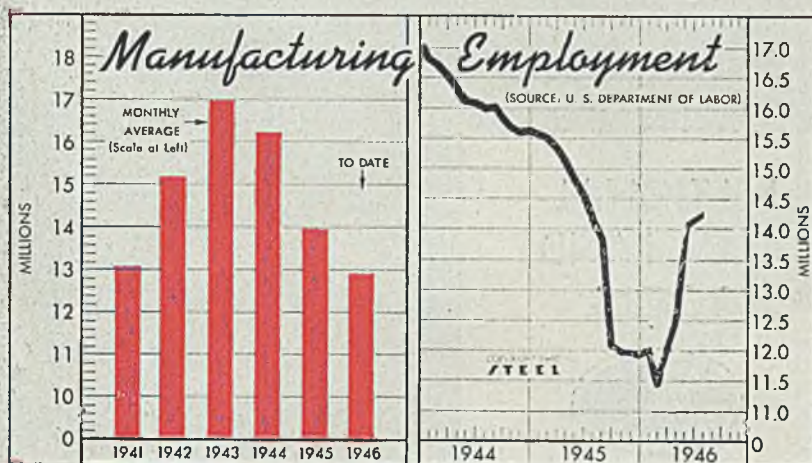
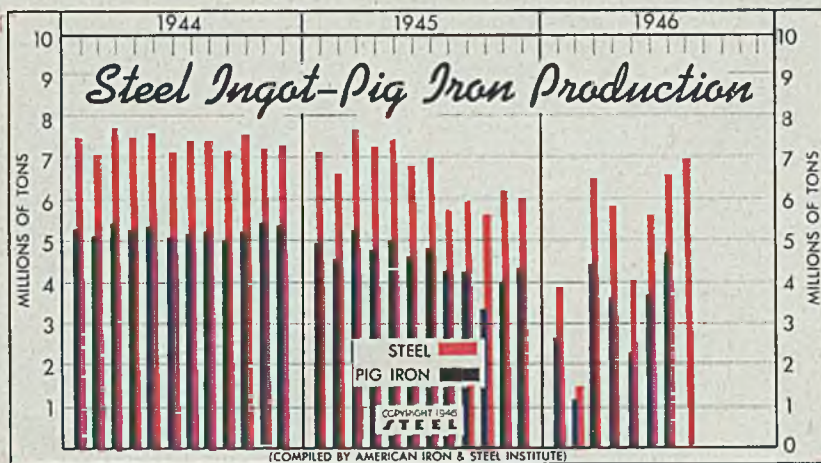
†Preliminary. †Federal Reserve Board.



## Iron, Steel Production

(Net Tons—000 omitted)

	Steel Ingots			Pig Iron	
	1946	1945	1944	1946	1945
Jan.	3,872	7,206	7,593	2,645	4,945
Feb.	1,393	6,655	7,194	1,148	4,563
Mar.	6,507	7,708	7,826	4,424	5,228
Apr.	5,860	7,292	7,594	3,614	4,786
May	4,072	7,452	7,703	2,275	5,016
June	5,624	6,842	7,234	3,682	4,605
July	6,610	6,987	7,498	4,705	4,812
Aug.	6,895	5,736	7,499	.....	4,249
Sept.	.....	5,983	7,235	.....	4,227
Oct.	.....	5,598	7,621	.....	3,888
Nov.	.....	6,201	7,279	.....	4,026
Dec.	.....	6,059	7,366	.....	4,323
Total	79,719	89,642	.....	54,167	.....



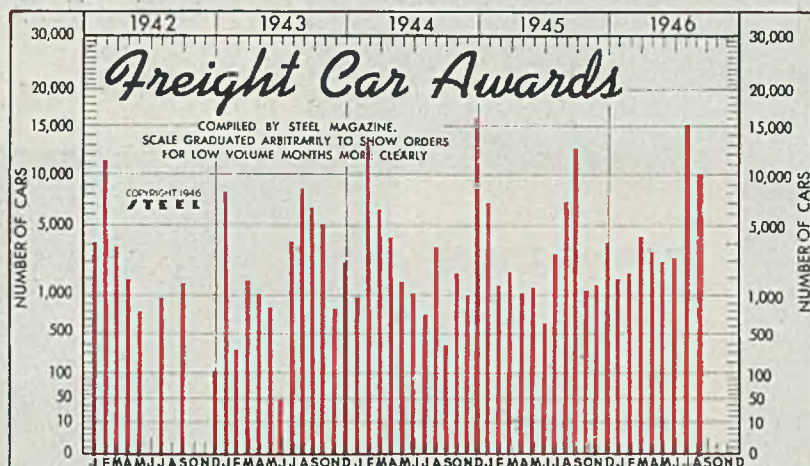
## Factory Employment

(000 omitted)

	1946	1945	1944
January	12,038	15,555	16,825
February	11,393	15,517	16,735
March	12,014	15,368	16,559
April	12,543	15,102	16,309
May	13,901	14,811	16,122
June	14,119	14,538	16,093
July	14,258	14,130	16,013
August	.....	13,831	16,023
September	.....	12,097	15,843
October	.....	11,941	15,692
November	.....	11,947	15,607
December	.....	11,914	15,632
Monthly Ave.	.....	13,896	16,121

## Freight Car Awards

	1946	1945	1944	1943
Jan.	2,050	7,200	1,020	8,365
Feb.	2,403	1,750	13,240	350
Mar.	4,516	2,500	6,510	1,935
Apr.	3,764	1,120	4,519	1,000
May	3,025	1,526	1,952	870
June	3,334	670	1,150	50
July	15,236	3,500	795	4,190
Aug.	9,530	7,240	3,900	8,747
Sept.	.....	12,840	400	6,820
Oct.	.....	1,320	2,425	5,258
Nov.	.....	1,650	1,065	870
Dec.	.....	4,116	16,245	2,919
Total	45,432	53,221	41,374	.....



## FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	\$11,361	\$10,055	\$11,100	\$9,733
Federal Gross Debt (billions)	\$265.7	\$266.0	\$267.7	\$263.2
Bond Volume, NYSE (millions)	\$41.8	\$28.1	\$17.4	\$26.0
Stocks Sales, NYSE (thousands)	12,723	10,559	3,747	6,425
Loans and Investments (billions)†	\$59.1	\$60.0	\$59.8	\$62.4
United States Gov't. Obligations Held (millions)†	\$40,492	\$41,463	\$41,454	\$46,182

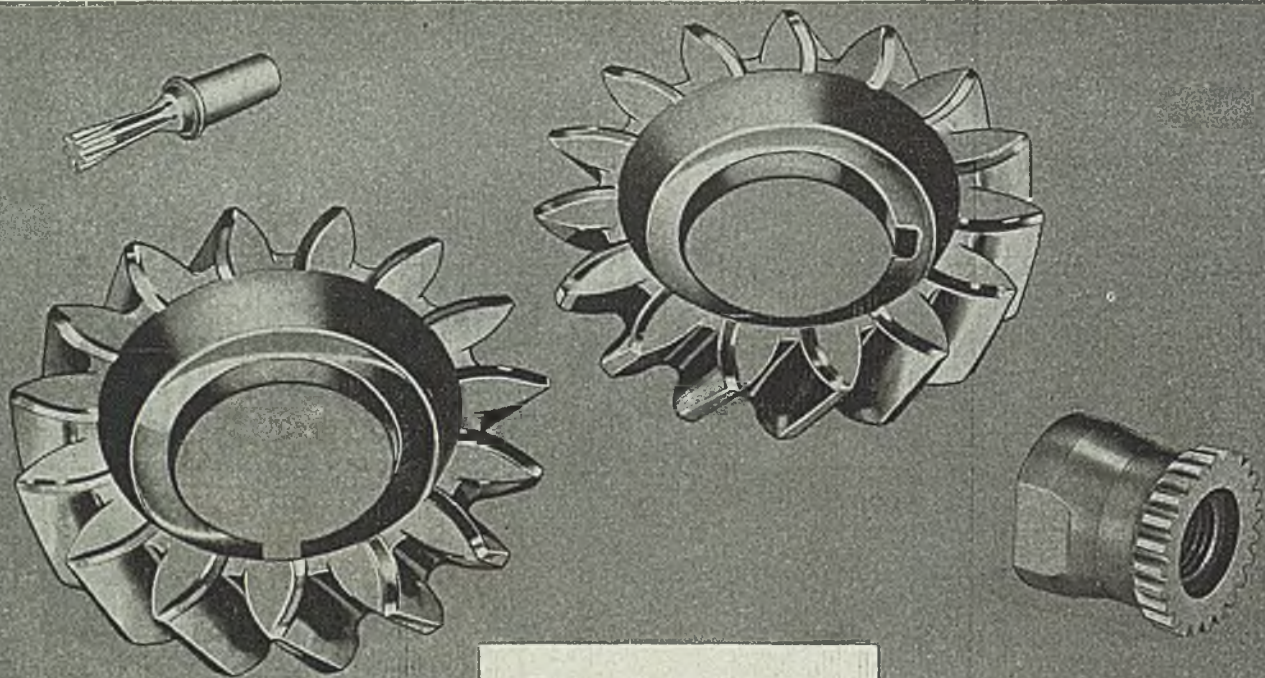
†Member banks, Federal Reserve System.

## PRICES

STEEL's composite finished steel price average	\$64.45	\$64.45	\$64.45	\$58.27
All Commodities†	122.0	128.2	127.1	105.0
Industrial Raw Materials†	137.5	142.6	145.7	115.3
Manufactured Products†	116.9	124.5	121.3	102.0

†Bureau of Labor Statistics Index, 1926 = 100.





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# NATIONAL

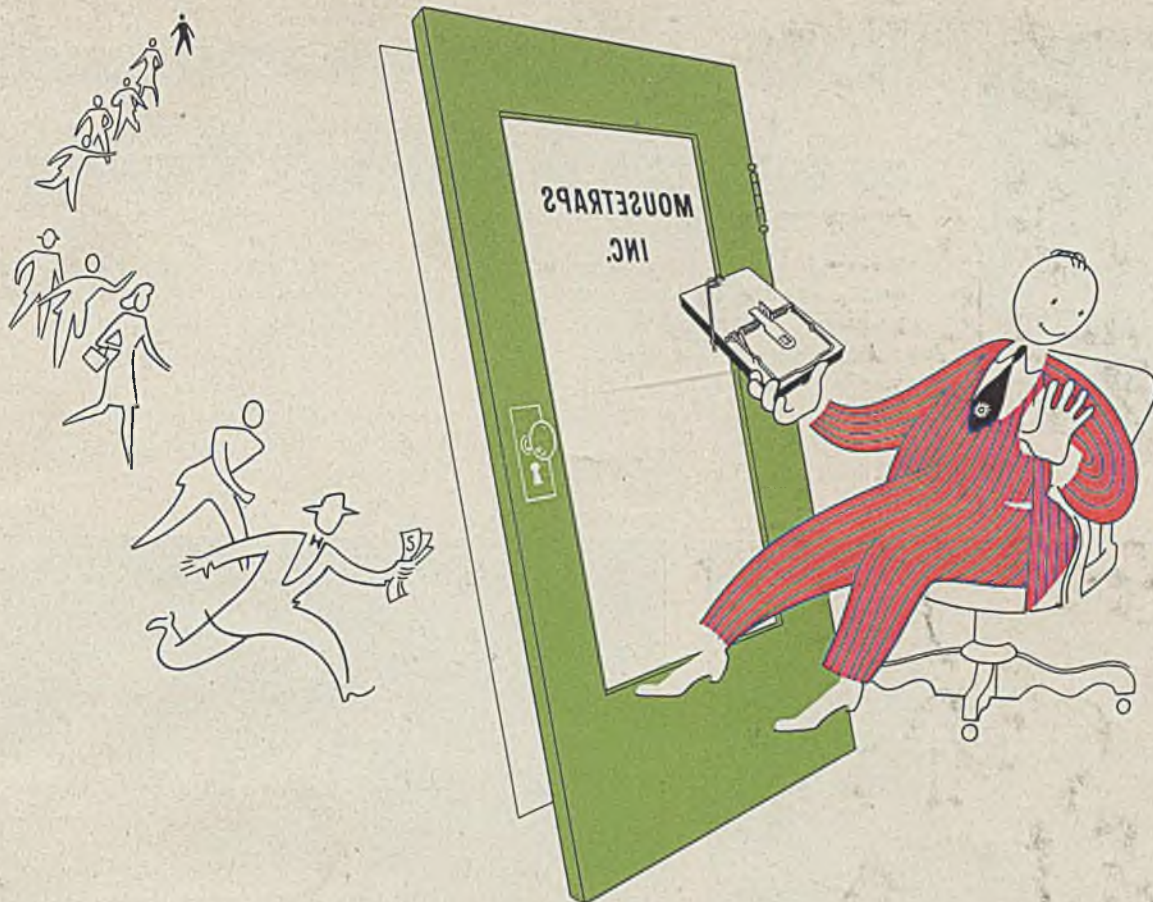
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# TOOL Co.

CLEVELAND, OHIO





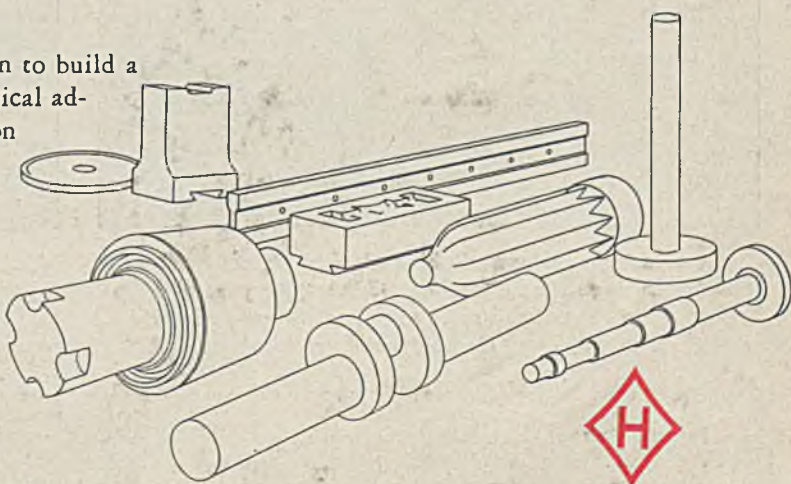
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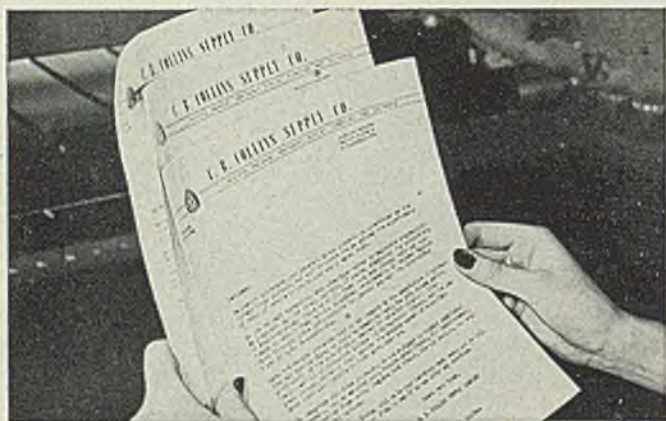
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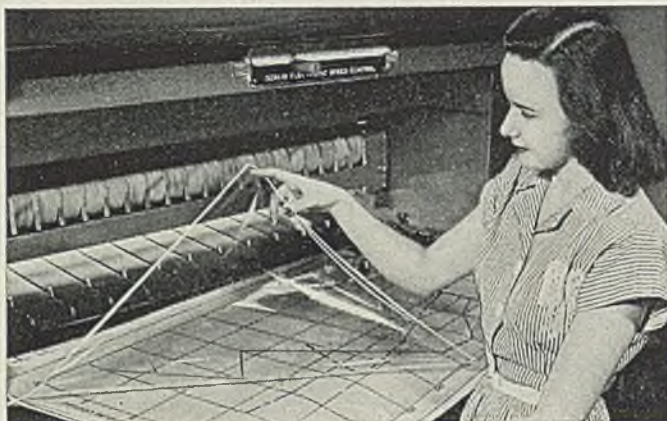
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## OZALID

DIVISION OF GENERAL ANILINE AND FILM CORPORATION  
JOHNSON CITY, NEW YORK

Ozalid in Canada—Hughes Owens Co., Ltd., Montreal



## Mills Slow To Open Books For Next Year's Steel Needs

*Promises being given on some less important products. . . Uncertain volume of preference orders clouds fourth quarter situation*

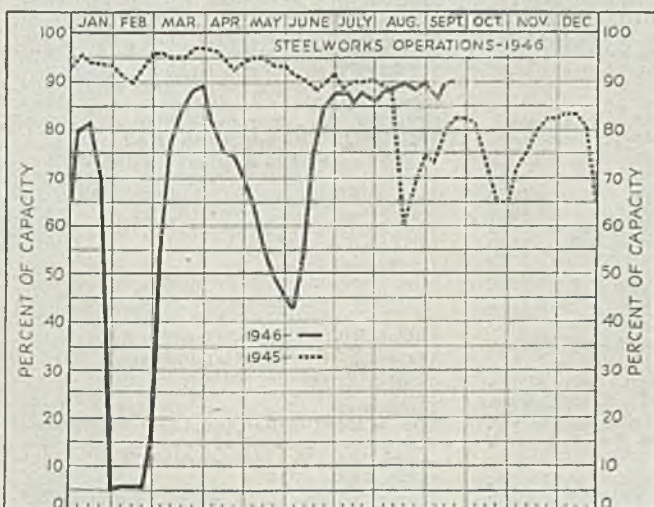
PRESSURE on steel mills for acceptance of 1947 tonnage is increasing and some producers within the past week have opened books on certain products. However, in most instances such action has not been on items in most demand, as producers do not know yet where they stand on such products.

Recently books have been opened for shipment after the turn of the year by some mills on alloy and cold-drawn carbon bars. Some mills have advised warehouses as to what they may expect in stainless sheets in first quarter, though no such word has gone out to manufacturing consumers and there has been loosening in promises for next year in other directions, including plates, cold strip and railroad accessories.

Electrical sheets are also being scheduled by some makers for shipment after December. However, there has been no general opening of books for next year on hot and cold sheets, hot strip, hot carbon bars and shapes, among other items and some large plate producers have not opened books for first quarter.

Cause for the delay is heavy arrearages and inability of producers to appraise closely what they will be called on to supply in fourth quarter on ratings and special directives. Already they are so far behind on current commitments that it appears probable that when books are opened it will be for late positions in first quarter and beyond.

Much pressure for next year's deliveries is coming from buyers, who believe they know about what they can expect in the remainder of this year, in virtually all cases far less than they want, unless engaged in highly preferential work. Many customers whose fourth quarter quotas have been drastically reduced or almost wiped out have reasonable assurance that their regular suppliers will carry their un-



### DISTRICT STEEL RATES

(Percentage of Ingot Capacity Engaged in Leading Districts)

	Week Ended Sept. 21	Change	Same Week 1945	Same Week 1944
Pittsburgh	97.5	None	74	90.5
Chicago	90	None	88	99
Eastern Pa.	81	+ 1	76	95
Youngstown	89	None	89	90
Wheeling	93.5	None	94	96
Cleveland	91	+ 3	85	91
Buffalo	90.5	None	81.5	88.5
Birmingham	99	None	95	95
New England	95	+ 9	80	92
Cincinnati	81	- 2	81	94
St. Louis	65.5	+14	68	84.5
Detroit	86	None	87	89
Estimated national rate	90	+ 0.5	83	96

Based on weekly steelmaking capacity of 1,762,381 net tons for 1946; 1,831,636 tons for 1945; 1,791,287 tons for 1944.

filled commitments into first quarter, but they seek to know what else they can count on.

If producers are able to continue the high operations of recent months it is considered possible that by early next year supply and demand will be brought into fairly good balance on a number of products, though admittedly this is not likely to be the case in light products or small carbon bars or reinforcing bars, unless production is stimulated by higher prices.

Although the question as to how much tonnage will be required under ratings and special directives in fourth quarter is not clear there have been evidences recently of intention by CPA to hold down preferences as far as possible. Washington shows a disposition to provide little special help outside the housing program.

Despite shortage of freight cars, builders have been denied ratings and appeals for preferences from other important consuming groups have been refused recently. However, in the case of carbuilders CPA has appealed to steel producers for voluntary action in meeting car repair needs. Approximately 250,000 tons, mainly plates are required for this purpose in fourth quarter but as producers are well booked ahead and are far behind on current commitments it is difficult for them to see where much extra tonnage can be provided, unless at expense of exports.

Steelmakers are expected to file application for higher steel prices within a short time, to cover increased costs which have reduced or eliminated profit in many cases.

Steel production is holding remarkably well under circumstances of raw material shortages, the estimated national rate for last week showing a gain of ½-point to 90 per cent of capacity. Changes were few and at most important centers prior rates were held steady. St. Louis advanced 14 points to 65½ per cent from a revised rate for the previous week, Cleveland rose 3 points to 91, eastern Pennsylvania 1 point to 81 and New England 9 points to 95. Cincinnati showed the only decline, dropping 2 points to 81. Other districts were unchanged, as follows: Birmingham 99, Pittsburgh 97½, Chicago 90, Youngstown 89, Wheeling 93½, Buffalo 90½, Detroit 86, West Coast 84.



## COMPOSITE MARKET AVERAGES

	Sept. 21	Sept. 14	Sept. 7	One Month Ago Aug., 1946	Three Months Ago June, 1946	One Year Ago Sept., 1945	Five Years Ago Sept., 1941
Finished Steel .....	\$64.45	\$64.45	\$64.45	\$64.45	\$64.09	\$58.27	\$56.73
Semifinished Steel .....	40.60	40.60	40.60	40.60	40.60	37.80	36.00
Steelmaking Pig Iron .....	27.50	27.50	27.50	27.50	27.50	24.00	23.00
Steelmaking Scrap .....	19.17	19.17	19.17	19.17	19.17	19.17	19.17

Finished Steel Composite:—Average of industry-wide prices on sheets, strips, bars, plates, shapes, wire, nails, tin plate, standard and line pipe. Semifinished Steel Composite:—Average of industry-wide prices on billets, slabs, sheet bars, skelp and wire rods. Steelmaking Pig Iron Composite:—Average of basic pig iron prices at Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Neville Island, Granite City and Youngstown. Steelworks Scrap Composite:—Average of No. 1 heavy melting steel prices at Pittsburgh, Chicago and eastern Pennsylvania. Finished steel, net tons; others, gross tons.

## COMPARISON OF PRICES

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

Finished material (except tin plate) and wire rods, cents per lb; coke, dollars per net ton; others, dollars per gross ton.

## Finished Material

	Sept. 21, 1946	Aug., 1946	June, 1946	Sept., 1945
Steel bars, Pittsburgh .....	2.50c	2.50c	2.50c	2.25c
Steel bars, Philadelphia .....	2.86	2.86	2.82	2.57
Steel bars, Chicago .....	2.50	2.50	2.50	2.25
Shapes, Pittsburgh .....	2.35	2.35	2.35	2.10
Shapes, Philadelphia .....	2.48	2.48	2.465	2.215
Shapes, Chicago .....	2.35	2.35	2.35	2.10
Plates, Pittsburgh .....	2.50	2.50	2.50	2.25
Plates, Philadelphia .....	2.558	2.558	2.55	2.30
Plates, Chicago .....	2.50	2.50	2.50	2.25
Sheets, hot rolled, Pittsburgh .....	2.425	2.425	2.425	2.20
Sheets, cold-rolled, Pittsburgh .....	3.275	3.275	3.275	3.05
Sheets, No. 24 galv., Pittsburgh .....	4.05	4.05	4.05	3.70
Sheets, hot-rolled, Gary .....	2.425	2.425	2.425	2.20
Sheets, cold-rolled, Gary .....	3.275	3.275	3.275	3.05
Sheets, No. 24 galv., Gary .....	4.05	4.05	4.05	3.70
Hot-rolled strip, over 6 to 12-in., Pitts.	2.35	2.35	2.35	2.10
Cold-rolled strip, Pittsburgh .....	3.05	3.05	3.05	2.80
Bright basic, bess. wire, Pittsburgh .....	3.05	3.05	3.05	2.75
Wire nails, Pittsburgh .....	3.75	3.55	3.25	2.90
Tin plate, per base box, Pittsburgh .....	\$5.25	\$5.25	\$5.25	\$5.00

## Semifinished Material

	Sept. 21, 1946	Aug., 1946	June, 1946	Sept., 1945
Sheet bars, Pittsburgh, Chicago .....	\$38.00	\$38.00	\$38.00	\$36.00
Slabs, Pittsburgh, Chicago .....	39.00	39.00	39.00	36.00
Revolving billets, Pittsburgh .....	39.00	39.00	39.00	36.00
Wire rods, No. 5 to 3-in., Pitts.	2.30c	2.30c	2.30c	2.15c

\* \$2 higher on bessemer, basic, foundry and malleable on adjustable pricing contracts.

## Pig Iron

	Sept. 21, 1946	Aug., 1946	*June, 1946	Sept., 1945
Bessemer del. Pittsburgh .....	\$29.77	\$29.77	\$27.69	\$26.19
Basic, Valley .....	28.00	28.00	26.00	24.50
Basic, eastern del. Philadelphia .....	29.93	29.93	27.84	26.34
No. 2 fdry., del. Pgh. N. & S. sides .....	29.27	29.27	27.19	25.69
No. 2 foundry, Chicago .....	28.50	28.50	26.50	25.00
Southern No. 2, Birmingham .....	24.88	24.88	22.88	21.38
Southern No. 2, del. Cincinnati .....	28.94	28.94	26.94	25.44
No. 2 fdry., del. Philadelphia .....	30.43	30.43	28.34	26.84
Malleable, Valley .....	28.50	28.50	26.50	25.00
Malleable, Chicago .....	28.50	28.50	26.50	25.00
Charcoal, low phos., fob Lyles, Tenn. .....	33.00	33.00	33.00	33.00
Gray forge, del. McKees Rocks, Pa. .....	28.61	28.61	28.55	25.05
Ferromanganese, fob cars, Pittsburgh .....	140.00	140.00	140.00	140.39

## Scrap

	Sept. 21, 1946	Aug., 1946	*June, 1946	Sept., 1945
Heavy melting steel, No. 1, Pittsburgh .....	\$20.00	\$20.00	\$20.00	\$20.00
Heavy melt, steel, No. 2, E. Pa. ....	18.75	18.75	18.75	18.75
Heavy melting steel, Chicago .....	18.75	18.75	18.75	18.75
Rails for rolling, Chicago .....	22.25	22.25	22.25	22.25
No. 1 cast, Chicago .....	25.00	20.00	20.00	20.00

## Coke

	Sept. 21, 1946	Aug., 1946	*June, 1946	Sept., 1945
Connellsville, furnace ovens .....	\$8.75	\$8.75	\$8.75	\$7.50
Connellsville, foundry ovens .....	9.50	9.50	9.50	8.25
Chicago, by-product fdry., del. ....	15.10	15.10	13.75	13.75

## STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Finished steel quoted in cents per pound and semifinished in dollars per gross ton, except as otherwise noted. Delivered prices do not include the 3 per cent federal tax on freight. Pricing on rails was changed to net ton basis as of Feb. 15, 1946.

## Semifinished Steel

Carbon Steel Ingots: Re-rolling quality, standard analysis, \$33, fob mill; forging, quality, \$38, Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown.

Alloy Steel Ingots: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, Coatesville, uncrop, \$43.69.

Re-rolling, Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Sparrows Point, Birmingham, Youngstown, \$39; Detroit, del., \$41; Duluth (billets), \$41; Pac. ports (billets), \$51. (Andrews Steel Co., carbon slabs, \$41; Northwestern Steel & Wire Co., \$41, Sterling, Ill.; Granite City Steel Co., \$47.50 gross ton slabs from D.P.C. mill. Geneva Steel Co., \$58.64, Pac. ports.)

Forging Quality Blooms, Slabs, Billets: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, \$47; Detroit, del., \$49; Duluth, billets, \$49; forging billets fob Pac. ports, \$59.

(Andrews Steel Co. may quote carbon forging billets \$56 gross ton at established basing points; Fullansbee Steel Corp., \$49.50 fob Toronto, O.; Geneva Steel Co., \$64.64, Pacific ports.)

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, \$58.48; del. Detroit \$60.43; eastern Mich. \$61.43.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Point, Youngstown, \$38, (Empire Sheet & Tin Plate Co., Mansfield, O., carbon sheet bars, \$39, fob mill.)

Skelp: Pittsburgh, Chicago, Sparrows Point, Youngstown, Coatesville, lb, 2.05c.

Wire Rods: Pittsburgh, Chicago, Cleveland, Birmingham, No. 5— $\frac{3}{8}$  in. inclusive, per 100 lb, \$2.30. Do., over  $\frac{3}{8}$ — $\frac{1}{2}$  in. incl., \$2.45; Galveston, base, \$2.40 and \$2.55, respectively. Worcester add \$0.10; Pacific ports \$0.50.

## Bars

Hot-Rolled Carbon Bars and Bar-Size Shapes under 3-in.: Pittsburgh, Youngstown, Chicago, Gary, Cleveland, Buffalo, Birmingham base, 20 tons one size, 2.50c; Duluth, base, 2.60c; Detroit, del., 2.60c; eastern Mich., 2.65c; New York, del., 2.86c; Phila., del., 2.86c; Gulf ports, dock, 2.85c; Pac., ports, dock, 3.15c. (Sheffield Steel Corp. may quote 2.75c, fob St. Louis; Joslyn Mfg. & Supply Co., 2.55c, fob Chicago.)

Rail Steel Bars: Same prices as for hot-rolled carbon bars except base is 5 tons.

Hot-Rolled Alloy Bars: Pittsburgh, Youngstown, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 2.921c; Detroit, del., 3.021c. (Texas Steel Co. may use Chicago base price as maximum fob Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

ATSI Series	(*Basic O-H)	AISI Series	(*Basic O-H)
1300 .....	\$0.108	4300 .....	\$1.839
2300 .....	1.839	4600 .....	1.298
2500 .....	2.759	4800 .....	2.328
3000 .....	0.541	5100 .....	0.379
3100 .....	0.920	5130 or 5152 ..	0.494
3200 .....	1.461	6120 or 6152 ..	1.028
3400 .....	3.462	6145 or 6150 ..	1.298
4000 .....	0.487	8612 .....	0.703
4100 (15-25 Mo) ..	0.757	8720 .....	0.757
(20-30 Mo) .....	0.812	9830 .....	1.407

\* Add 0.25 for acid open-hearth; 0.50 electric.

Cold-Finished Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base, 20,000-39,999 lb, 3.10c; Detroit, 3.15c; Toledo, 3.25c.

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base, 3.625c; Detroit, del., 3.725c, eastern Mich.; 3.755c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base, 2.35c;

Detroit, del., 2.45c; eastern Mich. and Toledo, 2.50c; Gulf ports, dock, 2.70c; Pacific ports, dock, 2.75c.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Buffalo, base, 2.35c; Detroit, del., 2.45c; eastern Mich. and Toledo, del., 2.50c; Gulf ports, dock, 2.70c.

Iron Bars: Single refined, Pitts., 4.76c; double refined, 5.84c; Pittsburgh, staybolt, 6.22c; Terre Haute, single ref., 5.42c; double ref., 6.76c.

## Sheets, Strip

Hot-Rolled Sheets: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Pt., Middletown, base, 2.425c; Granite City, base, 2.525c; Detroit, del., 2.525c; eastern Mich., del., 2.575c; Phila., del., 2.615c; New York, del., 2.685c; Pacific ports, 2.975c. (Andrews Steel Co. may quote hot-rolled sheets for shipment to the Detroit area on the Middletown, O., base; Alan Wood Steel Co., Conshohocken, Pa., may quote 3.00c on hot carbon sheets, Sparrows Point, Md.)

Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.275c; Granite City, base, 3.375c; Detroit, del., 3.375c; eastern Mich., del., 3.425c; New York, del., 3.615c; Phila., del., 3.635c; Pacific ports, 3.925c.

Galvanized Sheets, No. 24: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base, 4.05c; Granite City, base, 4.15c; New York, del., 4.31c; Phila., del., 4.24c; Pacific ports, 4.60c.

Corrugated Galv. Sheets: Pittsburgh, Chicago, Gary, Birmingham, 29-gage, per square, 3.73c.

Culvert Sheets: Pittsburgh, Chicago, Gary, Birmingham, 16-gage not corrugated, copper alloy, 4.15c; Granite City, 4.25c; Pacific ports, 4.60c; copper iron, 4.50c; pure iron, 4.50c; zinc-coated, hot-dipped, heat-treated, No. 24, Pittsburgh, 4.60c.

Aluminized Sheets, 20 gage: Pittsburgh, hot-dipped, coils or cut to length, 9.00c.



**Enameling Sheets:** 10-gage; Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base 3.20c; Granite City, base 3.30c; Detroit, del., 3.30c; eastern Mich., 3.35c; Pacific ports, 3.85c; 20-gage: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base, 3.80c; Detroit, del., 3.90c; eastern Mich., 3.95c; Pacific ports, 4.45c.

#### Electrical Sheets No. 24:

	Pittsburgh	Pacific	Granite
	Base	Ports	City
Field grade	3.90c	4.65c	4.00c
Armature	4.25c	5.00c	4.35c
Electrical	4.75c	5.50c	4.85c
Motor	5.425c	6.175c	5.525c
Dynamo	6.125c	6.875c	6.225c
Transformer			
72	6.625c	7.375c	
65	7.625c	8.375c	
58	8.125c	8.875c	
52	8.925c	9.675c	

**Hot-Rolled Strip:** Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Middletown, 6-in. and narrower: Base, 2.45c; Detroit, del., 2.55c; eastern Mich., del., 2.60c; Pacific ports, 3.10c. (Superior Steel Corp. may quote 3.30c, Pitts.)

Over 6-in.: Base, 2.35c; Detroit, del., 2.45c; eastern Mich., del., 2.50c; Pacific ports, 3.00c. (Superior Steel Corp. may quote 3.20c, Pitts.)

**Cold-Rolled Strip:** Pittsburgh, Cleveland, Youngstown, 0.25 carbon and less, 3.05c; Chicago, base, 3.15c; Detroit, del., 3.15c; eastern Mich., del., 3.20c; Worcester, base, 3.25c. (Superior Steel Corp. may quote 4.70c, Pitts.)

**Cold-Finished Spring Steel:** Pittsburgh, Cleveland base, 0.26-0.50 carbon, 3.03c. Add 0.20c for Worcester.

#### Tin, Terne Plate

(OPA ceiling prices announced March 1, 1946.)  
**Tin Plate:** Pittsburgh, Chicago, Gary, 100-lb base box, \$5.25; Granite City, Birmingham, Sparrows Point, \$5.35.

**Electrolytic Tin Plate:** Pittsburgh, Gary, 100-lb base box 0.25 lb tin, \$4.60; 0.50 lb tin, \$4.75; 0.75 lb tin, \$4.90; Granite City, Birmingham, Sparrows Point, \$4.70, \$4.85, \$5.00, respectively.

**Tin Mill Black Plate:** Pittsburgh, Chicago, Gary, base 29-gage and lighter, 3.30c; Granite City, Birmingham, Sparrows Point, 3.40c; Pacific ports, boxed, 4.30c.

**Long Ternes:** Pittsburgh, Chicago, Gary, No. 24 unassorted, 4.05c; Pacific ports, 4.80c.

**Manufacturing Ternes (Special Coated):** Pittsburgh, Chicago, Gary, 100-base box, \$4.55; Granite City, Birmingham, Sparrows Point, \$4.65.

**Roofing Ternes:** Pittsburgh base per package 112 sheets; 20 x 28 in., coating I. C. 8-lb \$12.50; 15-lb \$14.50; 20-lb \$15.50 (nom.); 40-lb \$20.00 (nom.).

#### Plates

**Carbon Steel Plates:** Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, Coatesville, Claymont, 2.50c; New York, del., 2.71c; Phila., del., 2.558c; St. Louis, 2.74c; Boston, del., 2.86c; Pacific ports, 3.05c; Gulf ports, 2.85c.

(Granite City Steel Co. may quote carbon plates 2.65c fob DPC mill; Geneva Steel Co., Provo, Utah, 3.20c fob Pac. ports; Central Iron & Steel Co., Harrisburg, Pa., 2.80c, basing points; Lukens Steel Co., Coatesville, Pa., 2.75c, base; Worth Steel Co., Claymont, Del., 2.60c, base; Alan Wood Steel Co., Conshohocken, Pa., 2.75c base.)

**Floor Plates:** Pittsburgh, Chicago, 3.75c; Pacific ports, 4.40c; Gulf ports, 4.10c.

**Open-Hearth Alloy Plates:** Pittsburgh, Chicago, Coatesville, 3.787c; Gulf ports, 4.273c; Pacific ports, 4.49c.

**Clad Steel Plates:** Coatesville, 10% cladding: nickel-clad, 18.72c; Inconel-clad, 26.00c; monel-clad, 24.96c.

#### Shapes

**Structural Shapes:** Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.35c; New York, del., 2.54c; Phila., del., 2.48c; Pacific ports, 3.00c; Gulf ports, 2.70c.

(Phoenix Iron Co., Phoenixville, Pa., may quote the equivalent of 2.60c, Bethlehem, Pa., on the general range and 2.70c on beams and channels from 4 to 10 inches.)

**Steel Piling:** Pittsburgh, Chicago, Buffalo, 2.65c; Pacific ports, 3.20c.

#### Wire and Wire Products

(Fob Pittsburgh, Chicago, Cleveland and Birmingham, per 100 pounds)

**Wire to Manufacturers in carloads**  
Bright basic or bessemer ..... \$3.05  
Spring (except Birmingham) ..... \$4.00

#### Wire Products to Trade

Nails and staples	
Standard and cement-coated	\$3.75
Galvanized	\$3.40
Wire, Merchant Quality	
Annealed	\$3.50
Galvanized	\$3.85

(Fob Pittsburgh, Chicago, Cleveland, Birmingham, per base column)

Woven fence, 15½ gage and heavier	72
Barbed wire, 80-rod spool	79
Barbless wire, twisted	79
Fence posts	74
Bale ties, single loop	72½

\*Add \$0.10 for Worcester, \$0.05 for Duluth and \$0.50 for Pacific ports.

†Add \$0.30 for Worcester, \$0.50 for Pacific ports. Nichols Wire & Steel may quote \$4.25; Pittsburgh Steel Co., \$4.10.

‡Add \$0.50 for Pacific ports.

§Add \$0.10 for Worcester; \$0.70 Pacific ports.

\*\*Pittsburgh Steel Co. may quote 89.

#### Tubular Goods

**Welded Pipe:** Base price in carloads, threaded and coupled to consumers about \$200 per net ton. Base discounts on steel pipe Pittsburgh and Lorain, O.; Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Pittsburgh base only on wrought iron pipe.

Butt Welded					
Steel			Iron		
In.	Blk.	Galv.	In.	Blk.	Galv.
1/4	53	30	1/4	21	0½
1/2	56	37½	1/2	27	7
3/4	60½	48	1-1/4	31	13
1	63½	52	1½	35	15½
1-3	65½	54½	2	34½	15
Lap Weld					
Steel			Iron		
In.	Blk.	Galv.	In.	Blk.	Galv.
2	58	46½	1½	20	0½
2½-3	61	49½	1½	25½	7
3½-6	63	51½	2	27½	9
7-8	62	49½	2½-3½	28½	11½
9-10	61½	49	4	30½	15
11-12	60½	48	4½-8	29½	14
			9-12	25½	9

**Boiler Tubes:** Net base prices per 100 feet fob Pittsburgh in carload lots, minimum wall, cut lengths 4 to 24 feet, inclusive.

Seamless—					
Hot			Cold		
O.D.	B.W.G.	Hot	O.D.	B.W.G.	Cold
1"	13	11.73	1"	13	9.63
1½"	13	12.91	1½"	13	10.63
2"	13	12.41	2"	13	12.10
2½"	13	13.90	2½"	13	13.53
3"	13	15.50	3"	13	15.06
3½"	12	17.07	3½"	12	16.57
4"	12	18.70	4"	12	18.11
4½"	12	19.82	4½"	12	19.17
5"	12	20.79	5"	12	20.05
5½"	11	26.24	5½"	11	25.30
6"	10	32.56	6"	10	31.32
6½"	9	43.16	6½"	9	41.29
7"	9	49.96	7"	9	47.96
8"	7	76.71	8"	7	91.14

Pipe, Cast Iron: Class B, 6-in. and over, \$60 per net ton, Birmingham; \$65, Burlington, N. J.; \$62.80, del., Chicago; 4-in. pipe, \$5 higher. Class A pipe, \$3 a ton over class B.

#### Rails, Supplies

Standard rails, over 60-lb, fob mill, net ton, \$43.40. Light rails (billet), Pittsburgh, Chicago, Birmingham, net ton, \$49.18.

Relaying rails, 35 lb and over, fob railroad and basing points, \$31-\$33.

Supplies: Track bolts, 6.50c; heat treated, 6.75c. Tie plates \$51 net ton, base, Standard spikes, 3.65c.

#### Bolts, Nuts

Fob Pittsburgh, Cleveland, Birmingham, Chicago. Additional discounts: 5 for carloads; 10 for full containers, except tire, step and plow bolts.

(Celling prices advanced 12 per cent, effective July 27, 1946; discounts remain unchanged.)

#### Carriage and Machine

1/4 x 6 and smaller	65½ off
Do., 1/2 and 3/4 x 6-in. and shorter	63½ off
Do., 1/2 x 6-in. and shorter	61 off
1½ and larger, all lengths	59 off
All diameters, over 6-in. long	59 off
Tire bolts	50 off
Step bolts	56 off
Plow bolts	65 off

#### Stove Bolts

In packages, nuts separate, 71-10 off, nuts attached, 71 off; bulk, 80 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts			
	U.S.S.	S.A.E.	
1/4-in. and smaller	62	64	
1/2-in. and smaller	62	60	
1/2-in.-1-in.	59	58	
1/4-in.-1-in.	57	58	
1½-in.-1½-in.	56	58	
1½-in. and larger	56	58	
Additional discount of 10 for full kegs.			

**Hexagon Cap Screws**  
Upset 1-in., smaller ..... 64 off  
Milled 1-in., smaller ..... 60 off

**Square Head Set Screws**  
Upset 1-in. and smaller ..... 71 off  
Headless, 1/4-in. and larger ..... 60 off  
No. 10 and smaller ..... 70 off

#### Rivets

Fob Pittsburgh, Cleveland, Chicago, Birmingham  
Structural ..... 4.75c  
1/2-inch and under ..... \*65-5 off  
\*Plus 12 per cent increase on base prices, effective July 26.

#### Washers, Wrought

Fob Pittsburgh, Chicago, Philadelphia, to jobbers and large nut and bolt manufacturers, 1cl ..... \$2.75-\$3.00 off

#### Tool Steels

**Tool Steels:** Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per lb; reg. carbon 15.15c; extra carbon 19.48c; special carbon 23.80c; oil-hardening 25.97c; high carbon-chromium 46.53c.

W	Cr	V	Mo	Base, per lb
18.00	4	1		72.49c
1.5	4	1	8.5	58.43c
	4	2	3	58.43c
6.40	4.15	1.90	5	62.22c
5.50	4.50	4	4.50	75.74c

#### Stainless Steels

Base, Cents per lb					
CHROMIUM NICKEL STEELS					
	Bars	Plates	Sheets	H.R. Strip	C.R. Strip
302	25.96c	29.21c	36.79c	23.93c	30.30c
303	28.13	31.38	38.95	29.21	35.71
304	27.05	31.38	38.95	25.45	32.46
308	31.38	36.79	44.36	30.84	37.87
309	38.95	43.28	50.85	40.03	50.85
310	53.02	56.26	57.35	52.74	60.59
312	38.95	43.28	53.02		
316	43.28	47.61	51.94	43.28	51.94
321	31.38	36.79	44.36	31.65	41.12
347	35.71	41.12	48.69	35.71	45.44
431	20.56	23.80	31.38	18.94	24.35

#### STRAIGHT CHROMIUM STEEL

	Bars	Plates	Sheets	H.R. Strip	C.R. Strip
403	23.93	26.51	31.92	22.99	29.21
410	20.02	23.93	28.67	18.39	23.80
416	20.56	23.80	29.21	19.75	25.45
420	25.96	30.84	36.25	25.70	39.49
430	20.56	23.80	31.38	18.94	24.35
440F	21.10	24.35	31.92	20.29	26.51
440A	25.96	30.84	36.25	25.70	39.49
442	24.35	27.59	35.17	25.96	34.62
443	24.35	27.59	35.17	25.96	34.62
446	29.76	33.00	39.49	37.87	56.26
501	8.66	12.98	17.04	12.98	18.39
502	9.74	14.07	18.12	14.07	19.48

#### STAINLESS CLAD STEEL (20%)

(Fob Pittsburgh and Washington, Pa.) plate prices include annealing and pickling.)

\* With 2-3% molybdenum. † With columbium. \*\* Plus machining agent.

†† High carbon. ‡‡ Free machining.



## WAREHOUSE STEEL PRICES

Base delivered price, cents per pound, for delivery within switching limits, subject to established extras. Quotations based on mill prices announced March 1, 1946

	Hot-rolled bars	Structural shapes	Plates	Floor plates	Hot-rolled sheets (10-gage base)	Hot-rolled strip (14-gage and lighter, 6-in and narrower)	Hot-rolled strip (12-gage and heavier wider than 6-inch)	Galvanized flat sheets (24-gage base)	Cold-rolled sheets (17-gage base)	Cold-finished bars	Cold-rolled strip
Boston	4.358 <sup>1</sup>	4.203 <sup>1</sup>	4.203 <sup>1</sup>	6.039 <sup>1</sup>	4.050 <sup>1</sup>	5.548 <sup>1</sup>	4.418 <sup>1</sup>	5.725 <sup>14</sup>	5.031 <sup>14</sup>	4.656 <sup>14</sup>	4.965
New York	4.134 <sup>1</sup>	4.038 <sup>1</sup>	4.049 <sup>1</sup>	5.875 <sup>1</sup>	3.858 <sup>1</sup>	4.375 <sup>1</sup>	4.275 <sup>1</sup>	5.501 <sup>14</sup>	4.838 <sup>14</sup>	4.584 <sup>14</sup>	5.075
Jersey City	4.155 <sup>1</sup>	4.018 <sup>1</sup>	4.049 <sup>1</sup>	5.875 <sup>1</sup>	3.858 <sup>1</sup>	4.375 <sup>1</sup>	4.275 <sup>1</sup>	5.501 <sup>14</sup>	4.838 <sup>14</sup>	4.584 <sup>14</sup>	5.075
Philadelphia	4.114 <sup>1</sup>	3.937 <sup>1</sup>	3.875 <sup>1</sup>	5.564 <sup>1</sup>	3.774 <sup>1</sup>	4.664 <sup>1</sup>	4.554 <sup>1</sup>	5.499 <sup>14</sup>	5.139 <sup>14</sup>	4.805 <sup>14</sup>	5.064
Baltimore	4.093 <sup>1</sup>	4.05 <sup>1</sup>	3.865 <sup>1</sup>	5.543 <sup>1</sup>	3.84 <sup>1</sup>	4.293 <sup>1</sup>	4.193 <sup>1</sup>	5.365 <sup>14</sup>	5.118 <sup>14</sup>	4.543 <sup>14</sup>	.....
Washington	4.232 <sup>1</sup>	4.22 <sup>1</sup>	4.067 <sup>1</sup>	5.632 <sup>1</sup>	3.842 <sup>1</sup>	4.432 <sup>1</sup>	4.332 <sup>1</sup>	5.667 <sup>14</sup>	5.007 <sup>14</sup>	4.532 <sup>14</sup>	.....
Norfolk, Va.	4.377 <sup>1</sup>	4.803 <sup>1</sup>	4.262 <sup>1</sup>	5.777 <sup>1</sup>	4.037 <sup>1</sup>	4.927 <sup>1</sup>	4.477 <sup>1</sup>	5.862 <sup>14</sup>	4.552 <sup>14</sup>	4.677 <sup>14</sup>	.....
Bethlehem, Pa. <sup>o</sup>	.....	3.70 <sup>1</sup>	.....	.....	.....	.....	.....	.....	.....	.....	.....
Claymont, Del. <sup>o</sup>	.....	.....	3.70 <sup>1</sup>	.....	.....	.....	.....	.....	.....	.....	.....
Coatesville, Pa. <sup>o</sup>	.....	.....	3.70 <sup>1</sup>	.....	.....	.....	.....	.....	.....	.....	.....
Buffalo (city)	3.60 <sup>1</sup>	3.65 <sup>1</sup>	3.92 <sup>1</sup>	5.55 <sup>1</sup>	3.575 <sup>1</sup>	4.21 <sup>1</sup>	4.11 <sup>1</sup>	5.20 <sup>14</sup>	4.625 <sup>14</sup>	4.20 <sup>14</sup>	4.96
Buffalo (country)	3.50 <sup>1</sup>	3.55 <sup>1</sup>	3.55 <sup>1</sup>	5.15 <sup>1</sup>	3.475 <sup>1</sup>	3.85 <sup>1</sup>	3.750 <sup>1</sup>	5.10 <sup>14</sup>	4.525 <sup>14</sup>	4.10 <sup>14</sup>	4.60
Pittsburgh (city)	3.60 <sup>1</sup>	3.65 <sup>1</sup>	3.65 <sup>1</sup>	5.25 <sup>1</sup>	3.575 <sup>1</sup>	3.35 <sup>1</sup>	3.850 <sup>1</sup>	5.327 <sup>14</sup>	4.625 <sup>14</sup>	4.20 <sup>14</sup>	4.70
Pittsburgh (country)	3.50 <sup>1</sup>	3.55 <sup>1</sup>	3.55 <sup>1</sup>	5.15 <sup>1</sup>	3.475 <sup>1</sup>	3.85 <sup>1</sup>	3.750 <sup>1</sup>	5.10 <sup>14</sup>	4.525 <sup>14</sup>	4.10 <sup>14</sup>	4.60
Cleveland (city)	3.60 <sup>1</sup>	3.88 <sup>1</sup>	3.65 <sup>1</sup>	5.48 <sup>1</sup>	3.575 <sup>1</sup>	3.85 <sup>1</sup>	3.850 <sup>1</sup>	5.347 <sup>14</sup>	4.625 <sup>14</sup>	4.20 <sup>14</sup>	4.70
Cleveland (country)	3.50 <sup>1</sup>	3.55 <sup>1</sup>	3.55 <sup>1</sup>	.....	3.475 <sup>1</sup>	3.85 <sup>1</sup>	3.750 <sup>1</sup>	.....	4.525 <sup>14</sup>	4.10 <sup>14</sup>	4.60
Detroit	3.70 <sup>1</sup>	3.952 <sup>1</sup>	3.90 <sup>1</sup>	5.572 <sup>1</sup>	3.675 <sup>1</sup>	4.050 <sup>1</sup>	3.950 <sup>1</sup>	5.491 <sup>14</sup>	4.725 <sup>14</sup>	4.25 <sup>14</sup>	4.95
Omaha (city, del.)	4.32 <sup>1</sup>	4.37 <sup>1</sup>	4.37 <sup>1</sup>	5.97 <sup>1</sup>	4.045 <sup>1</sup>	4.52 <sup>1</sup>	4.42 <sup>1</sup>	6.00 <sup>14</sup>	5.72 <sup>14</sup>	4.945 <sup>14</sup>	.....
Omaha (country)	4.22 <sup>1</sup>	4.27 <sup>1</sup>	4.27 <sup>1</sup>	5.87 <sup>1</sup>	3.945 <sup>1</sup>	4.42 <sup>1</sup>	4.32 <sup>1</sup>	5.90 <sup>14</sup>	.....	.....	.....
Cincinnati	3.902 <sup>1</sup>	3.983 <sup>1</sup>	3.952 <sup>1</sup>	5.583 <sup>1</sup>	3.671 <sup>1</sup>	4.046 <sup>1</sup>	3.946 <sup>1</sup>	5.296 <sup>14</sup>	4.271 <sup>14</sup>	4.602 <sup>14</sup>	.....
Youngstown <sup>o</sup>	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Middletown, O. <sup>o</sup>	.....	.....	.....	.....	3.475 <sup>1</sup>	3.35 <sup>1</sup>	3.750 <sup>1</sup>	4.85 <sup>14</sup>	.....	.....	.....
Chicago (city)	3.75 <sup>1</sup>	3.80 <sup>1</sup>	3.80 <sup>1</sup>	5.40 <sup>1</sup>	3.475 <sup>1</sup>	3.95 <sup>1</sup>	3.850 <sup>1</sup>	5.10 <sup>14</sup>	4.425 <sup>14</sup>	4.20 <sup>14</sup>	4.90
Milwaukee	3.908 <sup>1</sup>	3.958 <sup>1</sup>	3.958 <sup>1</sup>	5.558 <sup>1</sup>	3.633 <sup>1</sup>	4.108 <sup>1</sup>	4.008 <sup>1</sup>	5.558 <sup>14</sup>	4.583 <sup>14</sup>	4.358 <sup>14</sup>	5.058
Indianapolis	3.83 <sup>1</sup>	3.88 <sup>1</sup>	3.88 <sup>1</sup>	5.48 <sup>1</sup>	3.743 <sup>1</sup>	4.118 <sup>1</sup>	4.018 <sup>1</sup>	5.368 <sup>14</sup>	4.793 <sup>14</sup>	4.43 <sup>14</sup>	5.030
St. Paul	4.092 <sup>1</sup>	4.142 <sup>1</sup>	4.142 <sup>1</sup>	5.742 <sup>1</sup>	3.817 <sup>1</sup>	4.292 <sup>1</sup>	4.192 <sup>1</sup>	5.666 <sup>14</sup>	4.767 <sup>14</sup>	4.852 <sup>14</sup>	5.393
St. Louis	3.918 <sup>1</sup>	3.968 <sup>1</sup>	3.968 <sup>1</sup>	5.568 <sup>1</sup>	3.643 <sup>1</sup>	4.118 <sup>1</sup>	4.018 <sup>1</sup>	5.622 <sup>14</sup>	4.593 <sup>14</sup>	4.522 <sup>14</sup>	5.223
Memphis, Tenn.	4.296 <sup>1</sup>	4.346 <sup>1</sup>	4.346 <sup>1</sup>	6.071 <sup>1</sup>	4.221 <sup>1</sup>	4.596 <sup>1</sup>	4.496 <sup>1</sup>	5.746 <sup>14</sup>	.....	4.821 <sup>14</sup>	.....
Birmingham	3.75 <sup>1</sup>	3.80 <sup>1</sup>	3.80 <sup>1</sup>	6.153 <sup>1</sup>	3.675 <sup>1</sup>	4.05 <sup>1</sup>	4.05 <sup>1</sup>	5.20 <sup>14</sup>	5.077 <sup>14</sup>	4.99 <sup>14</sup>	5.465
New Orleans (city)	4.358 <sup>1</sup>	4.408 <sup>1</sup>	4.408 <sup>1</sup>	6.329 <sup>1</sup>	4.283 <sup>1</sup>	4.658 <sup>1</sup>	.....	5.808 <sup>14</sup>	5.304 <sup>14</sup>	5.079 <sup>14</sup>	.....
Houston, Tex.	4.00 <sup>1</sup>	4.50 <sup>1</sup>	4.50 <sup>1</sup>	5.75 <sup>1</sup>	3.988 <sup>1</sup>	4.688 <sup>1</sup>	4.563 <sup>1</sup>	5.763 <sup>14</sup>	5.819 <sup>14</sup>	4.10 <sup>14</sup>	.....
Los Angeles	4.65 <sup>1</sup>	4.90 <sup>1</sup>	5.20 <sup>1</sup>	7.45 <sup>1</sup>	5.225 <sup>1</sup>	5.30 <sup>1</sup>	5.200 <sup>1</sup>	6.55 <sup>14</sup>	7.425 <sup>14</sup>	6.033 <sup>14</sup>	5.863
San Francisco	4.20 <sup>1</sup>	4.15 <sup>1</sup>	4.15 <sup>1</sup>	5.85 <sup>1</sup>	4.125 <sup>1</sup>	5.85 <sup>1</sup>	4.50 <sup>1</sup>	6.35 <sup>14</sup>	6.875 <sup>14</sup>	5.783 <sup>14</sup>	7.588
Portland, Oreg.	4.70 <sup>1</sup>	4.70 <sup>1</sup>	5.00 <sup>1</sup>	6.75 <sup>1</sup>	4.875 <sup>1</sup>	6.85 <sup>1</sup>	5.000 <sup>1</sup>	6.20 <sup>14</sup>	6.825 <sup>14</sup>	5.983 <sup>14</sup>	.....
Tacoma, Wash.	4.60 <sup>1</sup>	4.70 <sup>1</sup>	5.00 <sup>1</sup>	6.75 <sup>1</sup>	4.87 <sup>1</sup>	5.80 <sup>1</sup>	4.60 <sup>1</sup>	6.40 <sup>14</sup>	6.55 <sup>14</sup>	6.23 <sup>14</sup>	.....
Seattle	4.60 <sup>1</sup>	4.70 <sup>1</sup>	5.00 <sup>1</sup>	6.75 <sup>1</sup>	4.87 <sup>1</sup>	5.80 <sup>1</sup>	4.60 <sup>1</sup>	6.40 <sup>14</sup>	6.55 <sup>14</sup>	6.23 <sup>14</sup>	.....

<sup>o</sup>Basing point cities with quotations representing mill prices, plus warehouse spread; <sup>1</sup>open market price.

## BASE QUANTITIES

<sup>1</sup>400 to 1999 pounds; <sup>2</sup>400 to 14,999 pounds; <sup>3</sup>any quantity;  
<sup>4</sup>300 to 1999 pounds; <sup>5</sup>400 to 8999 pounds; <sup>6</sup>300 to 9999 pounds;  
<sup>7</sup>400 to 39,999 pounds; <sup>8</sup>under 2000 pounds; <sup>9</sup>under 4000 pounds;  
<sup>10</sup>500 to 1499 pounds; <sup>11</sup>one bundle to 39,999 pounds; <sup>12</sup>150 to 2249 pounds; <sup>13</sup>150 to 1499 pounds; <sup>14</sup>three to 24 bundles; <sup>15</sup>450

to 1499 pounds; <sup>16</sup>one bundle to 1499 pounds; <sup>17</sup>one to nine bundles;  
<sup>18</sup>one to six bundles; <sup>19</sup>100 to 749 pounds; <sup>20</sup>300 to 1999 pounds;  
<sup>21</sup>1500 to 39,999 pounds; <sup>22</sup>1500 to 1999 pounds; <sup>23</sup>1000 to 39,999 pounds; <sup>24</sup>400 to 1499 pounds; <sup>25</sup>1000 to 1999 pounds;  
<sup>26</sup>under 25 bundles. Cold-rolled strip, 2000 to 39,999 pounds, base;  
<sup>27</sup>300 to 4999 pounds.

## ORES

<b>Lake Superior Iron Ore</b>	
Gross ton, 51½% (Natural)	
<b>Lower Lake Ports</b>	
Old range bessemer	\$5.45
Mesabi nonbessemer	5.05
High phosphorus	5.05
Mesabi bessemer	5.20
Old range nonbessemer	5.30
<b>Eastern Local Ore</b>	
Cents, units, del. E. Pa.	
Foundry and basic 56-63% contract	13.00

<b>Foreign Ore</b>	
Cents per unit, cif Atlantic ports	
Manganiferous ore, 45-55% Fe., 6-10% Mn.	Nom.
N. African low phos.	Nom.
Swedish basic, 60 to 68% Spanish, N. African basic, 50 to 60%.	Nom.
Brazil iron ore, 68-69% fob Rio de Janeiro	7.50-8.00

<b>Tungsten Ore</b>	
Chinese Wolframite, per short ton unit, duty paid	\$24.00

<b>Chrome Ore</b>	
Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S. C., Portland, Oreg., or Tacoma, Wash.	

(S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

<b>Indian and African</b>	
48% 2.8:1	\$39.75
48% 3:1	41.00
48% no ratio	31.00

<b>South African (Transvaal)</b>	
44% no ratio	\$27.40
45% no ratio	28.30
48% no ratio	31.00
50% no ratio	32.80

<b>Brazilian—nominal</b>	
44% 2.5:1 lump	\$33.65
48% 3:1 lump	43.50

<b>Rhodesian</b>	
45% no ratio	\$28.30
48% no ratio	31.00
48% 3:1 lump	41.00

<b>Domestic (seller's nearest rail)</b>	
48% 3:1	\$43.50
less \$7 freight allowance.	

## Manganese Ore

Sales prices of Office of Metals Reserve, cents per gross ton unit, dry, 48%, at New York, Philadelphia, Baltimore, Norfolk, Mobile and New Orleans, 85c; Fontana, Calif., Provo,

Utah, and Pueblo, Colo., 91c; prices include duty on imported ore and are subject to established premiums, penalties and other provisions. Price at basing points which are also points of discharge of imported manganese ore is fob cars, shipside, at dock most favorable to the buyer. Outside shipments direct to consumers at 15c to 17c per unit less than Metal Reserve prices.

## Molybdenum

Sulphide conc., lb., Mo. cont., mines ..... \$0.75

## NATIONAL EMERGENCY STEELS (Hot Rolled)

(Extras for alloy content)

## Chemical Composition Limits, Per Cent

Designation	Carbon	Mn	Si	Cr	Ni	Mo	Bars per 100 lb.	Billets per GT	Bars per 100 lb.	Billets per GT
NE 9415	.13-.18	.80-1.10	.20-.35	.30-.50	.30-.60	.08-.15	\$0.812	\$16.230	\$1.353	\$27.050
NE 9425	.23-.28	.80-1.20	.20-.35	.30-.50	.30-.60	.08-.15	.812	16.230	1.353	27.050
NE 9442	.40-.45	1.00-1.30	.20-.35	.30-.50	.30-.60	.08-.15	.866	17.312	1.407	28.133
NE 9722	.20-.25	.50-.80	.20-.35	.10-.25	.40-.70	.15-.25	.703	14.066	1.244	24.886
NE 9912	.10-.15	.50-.70	.20-.35	.40-.60	1.00-1.30	.20-.30	1.298	25.968	1.677	33.543
NE 9920	.18-.23	.50-.70	.20-.35	.40-.60	1.00-1.30	.20-.30	1.298	25.968	1.677	33.543

Extras are in addition to a base price of 2.921c, per pound on finished products and \$58.43 per gross ton on semifinished steel major basing points and are in cents per pound and dollars per gross ton. No prices quoted on vanadium alloy.



# PIG IRON

Maximum prices per gross ton fixed by OPA schedule No. 10, last amended July 27, 1946: \$2 increase may be charged on adjustable pricing contracts made between May 29 and July 27. Delivered prices do not include 3 per cent federal tax, effective Dec. 1, 1942.

	No. 2 Foundry	Basic	Bessemer	Malleable
Bethlehem, Pa., base	\$29.50	\$29.00	\$30.50	\$30.00
Newark, N. J., del.	31.20	30.70	32.20	31.70
Brooklyn, N. Y., del.	32.28			32.78
Birdsboro, Pa., base	29.50	29.00	30.50	30.00
Birmingham, base	24.88	23.50	29.50	
Baltimore, del.	30.22			
Boston, del.	29.68			
Chicago, del.	28.72			
Cincinnati, del.	28.94	28.06		
Cleveland, del.	28.62	27.74		
Newark, N. J.	30.82			
Philadelphia, del.	30.05	29.55		
St. Louis, del.	28.62	29.54		
Buffalo, base	28.50	27.50	29.50	29.00
Boston, del.	30.06	29.56	31.06	30.56
Rochester, del.	30.03		31.03	30.53
Syracuse, del.	30.58		31.58	31.08
Chicago, base	28.50	28.00	29.00	28.50
Milwaukee, del.	29.73	29.23	30.23	29.73
Muskegon, Mich., del.	32.05		32.05	
Cleveland, base	28.50	28.00	29.00	28.50
Akron, Canton, del.	30.04	29.54	30.54	30.04
Detroit, base	28.50	28.00	29.00	28.50
Saginaw, Mich., del.	30.81	30.31	31.31	30.81
Duluth, base	29.00	28.50	29.50	29.00
St. Paul, del.	31.13	30.63	31.63	31.13
Erie, Pa., base	28.50	28.00	29.50	29.00
Ferret, Mass., base	29.50	29.00	30.50	30.00
Boston, del.	30.06	29.56	31.06	30.56
Granite City, Ill., base	28.50	28.00	29.00	28.50
St. Louis, del.	29.00	28.50		28.50
Hamilton O., base	28.50	28.00		28.50
Cincinnati, del.	29.68	29.18		29.68
Neville Island, Pa., base	28.50	28.00	29.00	28.50
*Pittsburgh, del., N.&S. sides	29.27	28.77	29.77	29.27
Provo, Utah, base	26.50	26.00		
Sharpsville, Pa., base	28.50	28.00	29.00	28.50
Sparrows Point, base	29.50	29.00		
Baltimore, del.	30.60			
Steelton, Pa., base		29.00		
Swedeland, Pa., base	29.50	29.00	30.50	30.00
Philadelphia, del.	30.43	29.93		30.93
Toledo, O., base	28.50	28.00	29.00	28.50
Youngstown, O., base	28.50	28.00	29.00	28.50
Mansfield, O., del.	30.66	30.16	31.16	30.66

\* To Neville Island base adds 61c for McKees Rocks, Pa.; 93c Lawrenceville, Homestead, McKeesport, Ambridge, Monaca, Allquippa; 97c (water), Monongahela; \$1.24, Oakmont, Verona; \$1.38, Brackenridge.

Exceptions to above prices: Struthers Iron & Steel Co., Struthers, O., may charge 50 cents a ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable pig iron. Republic Steel Corp. may quote \$2 a ton higher for foundry and basic pig iron on the Birmingham base.

## High Silicon, Silvery

6.00-6.50 per cent (base)	\$34.00
6.51-7.00	\$35.00
7.01-7.50	36.00
7.51-8.00	37.00
8.01-8.50	38.00
8.51-9.00	39.00
9.01-9.50	40.00
9.51-10.00	41.00
10.01-10.50	42.00
10.51-11.00	43.00
11.01-11.50	44.00

Fob Jackson county, O., per gross ton. Buffalo base \$1.25 higher.

Buyer may use whichever base is more favorable.

Electric Furnace Ferrosilicon: Si 14.01 to 14.50%, \$50 Jackson co.; each additional 0.50% silicon up to and including 18% add \$1; low impurities not exceeding 0.003 P, 0.40 Si, 1.0% C, add \$1.

## Bessemer Ferrosilicon

Prices same as for high silicon silvery iron, plus \$1 per gross ton.

## Charcoal Pig Iron

Semi-cold blast, low phosphorus. Fob furnace, Lyles, Tenn. \$33.00 (For higher silicon irons a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

## Gray Forge

Neville Island, Pa.	\$28.00
Valley base	28.00

## Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Buffalo, N. Y., \$34.00 base; \$35.38, del., Philadelphia. Intermediate phosphorus, Central Furnace, Cleveland, \$31.00.

## Differentials

Basing point prices are subject to following differentials:

Silicon: An additional charge not to exceed 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge not to exceed 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, \$2 a ton; for each additional 0.25% nickel, \$1 a ton.

# Refractories

Per 1000, fob shipping point.  
Net prices

## Fire Clay Brick

### Super Duty

Pa., Mo., Ky. .... \$81.00

### High Heat Duty

Pa., Ill., Md., Mo., Ky. .... 65.00  
Ala., Ga. .... 65.00  
N. J. .... 70.00

### Intermediate Heat Duty

Ohio .... 57.00  
Pa., Ill., Md., Mo., Ky. .... 59.00  
Ala., Ga. .... 51.00  
N. J. .... 62.00

### Low Heat Duty

Pa., Md., Ohio .... 51.00

## Malleable Bung Brick

All bases .... 75.00

## Ladle Brick

(Pa., O., W. Va., Mo.)

Dry Press .... 42.00  
Wire Cut .... 40.00

## Silica Brick

Pennsylvania .... 65.00  
Joliet, E. Chicago .... 74.00  
Birmingham, Ala. .... 65.00

## Magnesite

Dressed dead-burned grains, net ton, fob Chewelah, Wash.  
Bulk .... 22.00  
Bags .... 26.00

## Basic Brick

Net ton, fob Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick .... 54.00  
Chem. bonded chrome .... 54.00  
Magnesite brick .... 76.00  
Chem. bonded magnesite .... 65.00

# Fluorspar

Metallurgical grade, fob shipping point in Ill., Ky., net ton, carloads, effective CaF<sub>2</sub> content, 70% or more, \$33; 65% to 70%, \$32; 60% to 65%, \$31; less than 60%, \$30.

# Ferroalloy Prices

Spiegeleisen: 19-21% carbon per gross ton, Palmerston, Pa., \$36; Pittsburgh, \$40.50; Chicago, \$40.60.

Ferromanganese, standard: 78-82% c.i. gross ton, duty paid, \$135 fob cars, Baltimore, Philadelphia or New York, whichever is most favorable to buyer, Rockdale or Rockwood, Tenn. (where Tennessee Products Co. is producer), Birmingham, Ala. (where Sloss-Sheffield Steel & Iron Co. is producer); \$140 fob cars, Pittsburgh (where Carnegie-Illinois Steel Corp. is producer); add \$6 for packed c.i., \$10 for ton, \$13.50 for less ton; \$1.70 for each 1%, or fraction contained manganese over 82% or under 78%.

Ferromanganese, low carbon: Eastern zone: Special, 21c; regular, 20.50c; medium, 14.50c; central zone: Special, 21.30c; regular, 20.80c; medium, 14.80c; western zone: Special, 21.55c; regular, 21.05c; medium, 15.75c. Prices are per pound contained Mn, bulk carlot shipments, fob shipping point, freight allowed. Special low-carbon has content of 90% Mn, 0.10% C, and 0.06% P.

Ferromanganese Briquets: (Weight approx. 3 lb and containing exactly 2 lb Mn) per lb of briquets. Contract, carlots, bulk 0.0605c, packed 0.063c, tons 0.0655c, less 0.063c, eastern, freight allowed; 0.063c, 0.0655c, 0.0755c and 0.078c, central; 0.066c, 0.0685c, 0.0855c and 0.088c, western; spot up 0.25c.

Ferrotungsten: Spot, 10,000 lb or more, per lb contained W, \$1.90; contract, \$1.88; freight allowed as far west as St. Louis.

Ferrotitanium: 40-45%, R.R. freight allowed, per lb contained Ti; ton lots \$1.23; less-ton lots \$1.25; eastern. Spot up 5c per lb.

Ferrotitanium: 20-25%, 0.10 maximum carbon; per lb contained Ti; ton lots \$1.35; less-ton lots \$1.40 eastern. Spot up 5c per lb.

Ferrotitanium, High-Carbon: 15-20% contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C \$142.50; 3-5% C \$157.50.

Ferrovandium: V 35-55%, contract basis, per lb contained V, fob producers plant with usual freight allowances; open-hearth grade \$2.70; special grade \$2.80; highly-special grade \$2.90.

Ferromolybdenum: 55-75% per lb contained Mo, fob. Langeloth and Washington, Pa., furnace, any quantity 95.00c.

Ferrophosphorus: 17-19%, based on 18% P content with unitage of \$3 for each 1% of P above or below the base; gross tons per carload fob sellers' works, with freight equalized with Rockdale, Tenn.; contract price \$58.50, spot \$62.25.

Ferrosilicon: Contract, lump, packed; eastern zone quotations: 90-95% c.i. 12.65c, ton lots 13.10c, smaller lots 13.50c; 80-90% c.i. 10.35c, ton lots 10.85c, smaller lots 11.35c; 75% c.i. 9.40c, ton lots 9.95c, smaller lots 10.45c; 50% c.i. 7.90c, ton lots 8.50c, smaller lots 9.10c. Prices are fob shipping point, freight allowed, per lb of contained Si. Spot prices 0.25c higher on 80-90%, 0.30c on

75%, 0.45c on 50%. Deduct 0.85c for bulk carlots.

Ferro-Boron: (B 17.50% min., Si 1.50% max., Al 0.50% max. and C 0.50% max.) per lb of alloy contract ton lots \$1.20, less ton lots \$1.30, eastern, freight allowed; \$1.2075 and \$1.3075 central; \$1.229 and \$1.329, western; spot add 5c.

Ferrocolumbium: 50-60% per lb contained columbium in gross ton lots, contract basis, R. R. freight allowed, eastern zone, \$2.25; less-ton lots \$2.30. Spot prices up 10 cents.

Ferrochrome: Contract, lump, packed; high carbon, eastern zone, c.i. 15.05c, ton lots 15.55c; central zone, add 0.40c and 0.65c; western zone, add 0.5c and 1.85c; high carbon, high nitrogen, add 5c to all high carbon ferrochrome prices. Deduct 0.55c for bulk carlots. Spot prices up 0.25c.

Low carbon, eastern zone, bulk, c.i., max. 0.06% C 23c; 0.1% 22.50c, 0.15% 22c, 0.2% 21.50c, 0.5% 21c, 1% 20.50c, 2% 19.50c, add 1c for 2000 lb to c.i.; central zone, add 0.4c for bulk, c.i., and 0.65c for 2000 lb to c.i.; western zone, add 0.5c for bulk, c.i., and 1.85c for 2000 lb to c.i.; carload packed differential 0.45c. Prices are per pound of contained Cr, fob shipping points. Low carbon, high nitrogen: Add 2c to low carbon ferrochrome prices. For higher nitrogen low carbon, add 2c for each 0.25% of nitrogen over 0.75%.

Ferrochrome, Special Foundry: (Cr 62-66%, C about 5-7%): Contract, lump, packed, eastern zone, freight

allowed, c.i. 15.60c, ton lots 16.10c, less than ton 16.75c; central zone, add 0.40c for c.i. and 0.65c for smaller lots; western zone, add 0.5c for c.i. and 1.85c for smaller lots. Deduct 0.55c for bulk carlots.

S. M. Ferrochrome, high carbon (Cr 60-65%, Si, Mn and C 4-6% each): Contract, lump, packed, eastern zone, freight allowed, c.i. 16.15c, ton lots 16.65c, less ton 17.30c; central zone, add 0.40c for c.i. and 0.65c for smaller lots; western zone, add 0.5c for c.i. and 1.85c for smaller lots. Prices are per lb of contained chromium; spot prices 0.25c higher. Deduct 0.55c for bulk carlots.

S. M. Ferrochrome, low carbon: (Cr 62-66%, Si 4-6%, Mn 4-6% and C 1.25% max.) Contract, carlot, bulk, 20.00c, packed 20.45c, ton lots 21.00c, less ton lots 22.00c, eastern, freight allowed, per pound contained chromium, 20.40c, 20.50c, 20.95c and 22.65c, central; 21.00c, 21.45c, 22.85c and 23.85c, western; spot up 0.25c.

Ferrochrome Briquets: Containing exactly 2 lb. Cr, packed, eastern zone, c.i. 9.50c, ton lots 9.80c, less than ton 10.10c, central zone, add 0.3c for c.i. and 0.5c for smaller lots; western zone, add 0.70c for c.i. and 2c for smaller lots. Deduct 0.30c for bulk carlots. Prices per lb. of briquets; spot prices 0.25c higher.

Chromium Metal: 97% min. chromium, max. 0.50% carbon, eastern zone, per lb contained chromium bulk, c.i. 79.50c, 2000 lb to c.i. 80c; central 81c and 82.50c; western 82.5c and 84.75c; fob shipping point, freight allowed.



**Chromium-Copper:** (Cr 8-11%, Cu 88-90%, Fe 1% max., Si 0.50% max.) contract, any quantity, 45c, eastern, Niagara Falls, N. Y., basis, freight allowed to destination, except to points taking rate in excess of St. Louis rate to which equivalent of St. Louis rate will be allowed; spot up 2c.

**Calcium metal, east:** Contract ton lots or more \$1.35, less, \$1.60, pound of metal; \$1.36 and \$1.61 central, \$1.40 and \$1.65, western; spot up 5c.

**Calcium-Manganese-Silicon:** (Ca 16-20%, Mn 14-18% and Si 53-59%), per lb. of alloy. Contract, carlots, 15.50c, ton lots 16.50c and less 17.00c, eastern, freight allowed; 16.00c, 17.35c, and 17.85c, central; 18.05c, 19.10c and 19.60c western; spot up 0.25c.

**Calcium-Silicon:** (Ca 30-35%, Si 60-65% and Fe 3.00% max.), per lb. of alloy. Contract, carlot, lump 13.00c, ton lots 14.50c, less 15.50c eastern, freight allowed; 13.50c, 15.25c and 16.25c central; 15.55c, 17.40c and 18.40c, western; spot up 0.25c.

**Silicon Metal:** Min. 97% Si and max. 1% Fe, eastern zone, bulk, c.l., 12.90c; 2000 lb to c.l., 13.45c; central, 13.20c and 13.90c; western, 13.85c and 16.80c; min. 96% Si and max. 2% Fe, eastern, bulk; c.l., 12.50c, 2000 lb to c.l., 13.10c; central, 12.80c and 13.55c; western, 13.45c and 16.50c, fob shipping point, freight allowed. Price per lb contained Si.

**Silicomanganese,** containing exactly 2 lb. Mn and about 1/2 lb. Si, eastern zone, bulk, c.l. 5.80c, ton lots 6.35c;

central zone, add 0.25c for c.l. and 1c for ton lots; western, add 0.55c for c.l. and 0.20c for ton lots. Ferrosilicon, weighing about 5 lb. and containing exactly 2 lb. Si, or about 2 1/2 lb. and containing exactly 1 lb. Si, packed, eastern zone, c.l. 3.90c, ton lots 4.15c, less ton lots 4.45c; central zone, add 0.15c for c.l. and 0.40c for smaller lots; western zone, add 0.30c for c.l. and 0.45c for smaller lots. Prices are f.o.b. shipping point, freight allowed; spot prices 0.25c higher. Deduct 0.30c for bulk carlots.

**Manganese Metal:** (Min. 96% Mn, max. 2% Fe), per lb of metal, eastern zone, bulk, c.l., 30c, 2000 lb to c.l., 32c, central, 30.25c, and 33c; western, 30.55c and 35.05c.

**Electrolytic Manganese:** 99.9% plus, fob Knoxville, Tenn., freight allowed east of Mississippi on 250 lb or more; Carlots 32c, ton lots 34c, drum lots 36c, less than drum lot 38c. Add 1 1/2c for hydrogen-removed metal.

**Manganese-Boron:** (Mn 75% approx., B 15-20%, Fe 5% max., Si 1.50% max. and C 3% max.) per lb of alloy. Contract ton lots, \$1.89, less \$2.01, eastern; freight allowed; \$1.903 and \$2.023, central, \$1.935 and \$2.055 western; spot up 5c.

**Nickel-Boron:** (B 15-18%, Al 1% max., Si 1.50% max., C 0.50% max., Fe 3% max., Ni, balance), per lb of alloy. Contract, 5 tons or more, \$1.90, 1 ton to 8 ton, \$2.00, less than 8 ton \$2.10, eastern, freight allowed; \$1.9125, \$2.0125 and \$2.1125, central; \$1.9445, \$2.0445 and \$2.1445, western; spot same as contract.

**Borost:** 3 to 4% B, 40 to 45% Si, \$6.25 lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

**Boriam:** B 1.5-1.9%, ton lots, 45c lb; less-ton lots, 50c lb.

**Carburiat:** B 0.90 to 1.15% net ton to carload, 8c per lb fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

**Silicaz Alloy:** (Si 35-40%, Ca 9-11%, Al 5-7%, Zr 5-7%, Ti 9-11% and B 0.55-0.75%), per lb of alloy contract, carlots 25.00c, ton lots 26.00c, less ton lots 27.00c, eastern, freight allowed, 25.50c, 26.75c and 27.75c, central; 27.50c, 28.90c and 29.90c, western; spot up 0.25c.

**Silvaz Alloy:** (Si 35-40%, Va 9-11%, Al 5-7%, Zr 5-7%, Ti 9-11% and B 0.55-0.75%), per lb of alloy. Contract, carlots 58.00c, ton lots 59.00c, less 60.00c, eastern freight allowed; 58.50c, 59.75c and 60.75c, central; 60.50c, 61.90c and 62.90c, western; spot up 0.25c.

**SMZ Alloy:** (Si 60-55%, Mn 5-7%, Zr 5-7% and Fe approx. 20%) per lb of alloy contract carlots 11.50c, ton lots 12.00c, less 12.50c, eastern zone, freight allowed; 12.00c, 12.85c and 13.35c central zone; 14.05c, 14.60c and 15.10c, western; spot up 0.25c.

**CMSS Alloy 4:** (Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75% and C 3.00-4.50%). Contract carlots, bulk, 11.00c and packed 11.50c; ton lots 12.00c; less 12.50c, eastern, freight allowed; 11.50c and 12.00c, 12.75c, 13.25c, central; 13.50c and 14.00c, 14.75c, 15.25c, western; spot up 0.25c.

**CMSS Alloy 5:** (Cr 50-56%, Mn

4-6%, Si 13.50-16.00%, Zr 0.75-1.25%, C 3.50-5.00%) per lb of alloy. Contract, carlots, bulk, 10.75c, packed 11.25c, ton lots 11.75c, less 12.25c, eastern, freight allowed; 11.25c, 11.75c, 12.50c and 13.00c, central; 13.25c and 13.75c, 14.50c and 15.00c, western; spot up 0.25c.

**Zirconium Alloy:** 12-15%, per lb of alloy, eastern contract, carlots, bulk, 4.60c, packed 4.80c, ton lots 4.80c, less tons 5c, carloads, bulk, per gross ton \$102.50; packed \$107.50; ton lots \$108; less-ton lots \$112.50. Spot up \$5 per ton.

**Zirconium Alloy:** Zr 35-40%, eastern, contract basis, carloads in bulk or package, per lb of alloy 14.00c; gross ton lots 15.00c; less-ton lots 16.00c. Spot up 1/4c.

**Alstifer:** (Approx. 20% Al, 40% Si, 40% Fe) contract basis fob Niagara Falls, N. Y., lump per lb 5.88c; ton lots 6.38c; less 6.88c. Spot up 1/4c.

**Siminal:** (Approx. 20% each Si, Mn, Al) Contract, freight not exceeding St. Louis rate allowed, per lb alloy; carlot's 8c; ton lots 8.75c; less-ton lots 9.25c.

**Tungsten Metal Powder:** Spot, not less than 97%, \$2.50-\$2.60; freight allowed as far west as St. Louis.

**Grainal:** Vanadium Grainal No. 1 87.5c; No. 6, 60c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

**Vanadium Pentoxide,** (technical grade): Fused, approx. 89-92% V<sub>2</sub>O<sub>5</sub> and 5.84% Na<sub>2</sub>O; or air dried, 83-85% V<sub>2</sub>O<sub>5</sub> and 5.15% Na<sub>2</sub>O, \$1.10 per lb contained V<sub>2</sub>O<sub>5</sub>, fob plant, freight allowed on quantities of 25 lb and over to St. Louis.

## OPEN MARKET PRICES, IRON AND STEEL SCRAP

Following prices are quotations developed by editors of STEEL in the various centers. Quotations are on gross tons.

### PHILADELPHIA:

(Delivered consumer's plant)	
No. 1 Heavy Melt. Steel	\$18.75
No. 2 Heavy Melt. Steel	18.75
No. 2 Bundles	18.75
No. 3 Bundles	18.75
Mixed Borings, Turnings	13.75
Machine Shop Turnings	13.75
Billet, Forge Crops	23.75
Bar Crops, Plate Scrap	21.25
Cast Steel	21.25
Punchings	21.25
Elec. Furnace Bundles	19.75
Heavy Turnings	18.25
Chemical Borings	16.51

### Cast Iron Grades

(Fob Shipping Point)

Heavy Breakable Cast	20.00
Charging Box Cast	21.00
Cupola Cast	25.00
Unstripped Motor Blocks	20.00
Malleable	24.00

### NEW YORK:

(Dealers' buying prices)

No. 1 Heavy Melt. Steel	\$15.33
No. 2 Heavy Melt. Steel	15.33
No. 2 Hyd. Bundles	15.33
No. 3 Hyd. Bundles	13.33
Chemical Borings	14.33
Machine Turnings	10.33
Mixed Borings, Turnings	10.33
No. 1 Cupola	25.00
Charging Box, Cast	21.00
Heavy Breakable, Cast	20.00
Unstripped Motor Blocks	20.00
Stove Plate	23.00

### BOSTON:

(Fob shipping points, Boston differential 99c higher, steelmaking grades; Providence, \$1.09 higher)

No. 1 Heavy Melt. Steel	\$14.06
No. 2 Heavy Melt. Steel	14.06
No. 1 Bundles	14.06
No. 2 Bundles	14.06
No. 1 Bushelling	14.06
Machine Shop Turnings	9.06
Mixed Borings, Turnings	9.06
Short Shovel Turnings	11.06
Chemical Borings	13.31
Low Phos Clippings	16.56
No. 1 Cast	25.00
Clean Auto Cast	27.00
Stove Plate	23.00
Heavy Breakable Cast	20.00

### BUFFALO:

(Delivered consumers' plant)

No. 1 Heavy Melt. Steel	\$19.25
No. 2 Heavy Melt. Steel	19.25
No. 1 Bundles	19.25
No. 2 Bundles	19.25

No. 1 Bushelling	19.25
Machine Turnings	14.25
Short Shovel Turnings	16.25
Mixed Borings, Turn..	14.25
Cast Iron Borings	15.25
No. 1 Cast	25.00
Clean Auto Cast	27.00
Low Phos. Plate	21.75

### PITTSBURGH:

(Delivered consumers' plant)

Railroad Heavy Melting	\$21.00
No. 1 Heavy Melt. Steel	20.00
No. 2 Heavy Melt. Steel	20.00
No. 1 Comp. Bundles	20.00
No. 2 Comp. Bundles	20.00
Short Shovel Turnings	17.00
Mach. Shop Turnings	15.00
Mixed Borings, Turnings	15.00
No. 1 Cupola Cast	25.00
Heavy Breakable Cast	19.50
Stove Plate	23.00
Cast Iron Borings	16.00
Sheet Bar Crops	22.50
Plate Scrap, Punchings	22.50
Railroad Specialties	24.50
Scrap Rail	21.50
Axles	26.00
Rail 3 ft. and under	23.50
Railroad Malleable	22.00
* Shipping point.	

### CLEVELAND:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	\$19.50
No. 2 Heavy Melt. Steel	19.50
No. 1 Comp. Bundles	19.50
No. 2 Comp. Bundles	19.50
No. 1 Bushelling	19.50
Mach. Shop Turnings	14.50
Short Shovel Turnings	16.50
Mixed Borings, Turnings	14.50
No. 1 Cupola Cast	25.00
Heavy Breakable Cast	20.00
Cast Iron Borings	13.50-14.00
Billet, Bloom Crops	24.50
Sheet Bar Crops	22.00
Plate Scrap, Punchings	22.00
Elec. Furnace Bundles	20.50

### VALLEY:

(Delivered consumer's plant)

No. 1 R.R. Heavy Melt.	\$21.00
No. 1 Heavy Melt. Steel	20.00
No. 1 Comp. Bundles	20.00
Short Shovel Turnings	17.00
Cast Iron Borings	16.00
Machine Shop Turnings	15.00
Low Phos. Plate	22.50

### MANSFIELD:

(Delivered consumer's plant)

Machine Shop Turnings	\$15.00
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### CINCINNATI:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	\$19.50
No. 2 Heavy Melt. Steel	19.50
No. 1 Comp. Bundles	19.50
No. 2 Comp. Bundles	19.50
Machine Turnings	10.50-11.00
Shoveling Turnings	12.50-13.00
Cast Iron Borings	11.50-12.00
Mixed Borings, Turnings	10.50-11.00
No. 1 Cupola Cast	25.00
Breakable Cast	17.75
Low Phos. Plate	21.00-22.00
Scrap Rails	20.50-21.00
Stove Plate	23.00

### DETROIT:

(Delivered consumer's plant)

Heavy Melting Steel	\$17.32
No. 1 Bushelling	17.32
Hydraulic Bundles	17.32
Flashings	17.32
Machine Turnings	12.32
Short Shovel, Turnings	14.32
Cast Iron Borings	13.32
Low Phos Plate	19.82
No. 1 Cast	25.00
Heavy Breakable Cast	20.00

### CHICAGO:

(Delivered consumer's plant; cast grades fob shipping point; railroad grades fob tracks)

No. 1 R.R. Heavy Melt.	\$19.75
No. 1 Heavy Melt. Steel	18.75
No. 2 Heavy Melt. Steel	18.75
No. 1 Ind. Bundles	18.75
No. 2 Dir. Bundles	18.75
Baled Mach. Shop Turn.	18.75
No. 3 Galv. Bundles	16.75
Machine Turnings	13.75
Mix. Borings, Sht. Turn.	13.75
Short Shovel Turnings	15.75
Cast Iron Borings	14.75
Scrap Rails	20.25
Cut Rails, 3 feet	22.25
Cut Rails, 18-inch	23.50
Revolving Rails	22.25
Angles, Splice Bars	22.25
Plate Scrap, Punchings	21.25
Railroad Specialties	22.75
No. 1 Cast	25.00
R.R. Malleable	22.00

### ST. LOUIS:

(Delivered consumer's plant; cast grades fob shipping point)

Heavy Melting	\$17.50
No. 1 Locomotive Tires	21.00
Misc. Rails	19.00
Railroad Springs	22.00
Puddled Sheets	17.50
Axle Turnings	17.00
Machine Turnings	10.50
Shoveling Turnings	12.50

Rerolling Rails	21.00
Street Car Axles	24.50
Steel Rails, 3 ft.	21.50
Steel Angle Bars	21.00
No. 1 Cast Iron Wheels	22.00
No. 1 Cupola Cast	25.00
Charging Box Cast	21.00
Railroad Malleable	22.00
Breakable Cast	17.75
Stove Plate	23.00
Grate Bars	15.25
Brake Shoes	15.25

### BIRMINGHAM:

(Delivered consumer's plant)

Billet Forge Crops	\$22.50
Structural, Plate Scrap	19.00
Scrap Rails, Random	18.50
Rerolling Rails	20.50
Angle Splice Bars	20.50
Solid Steel Axles	24.00
Cupola Cast	25.00
Stove Plate	23.00
Long Turnings	11.00
Cast Iron Borings	13.00
No. 1 Cast Iron Wheels	22.00

### LOS ANGELES:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	\$14.00
No. 2 Heavy Melt. Steel	13.00
No. 1, 2 Dir. Bundles	12.00
Machine Turnings	5.50
Mixed Borings, Turnings	5.50
No. 1 Cast	25.00

### SAN FRANCISCO:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	\$17.00
No. 2 Heavy Melt. Steel	17.00
No. 1 Bushelling	17.00
No. 1, No. 2 Bundles	17.00
No. 3 Bundles	9.00
Machine Turnings	7.00
Billet, Forge Crops	15.50
Bar Crops, Plate	15.50
Breakable Cast	17.75
Cu', Structural, Plate	
1 ft and under	18.00
Alloy-free Turnings	7.00
Tin Can Bundles	14.50
Iron, Steel Axles	24.00
No. 2 Cast Steel	20.50
Uncut Frogs, Switches	18.00
Scrap Rails	18.50
Locomotive Tires	20.50

### SEATTLE:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	\$14.50
No. 2 Heavy Melt. Steel	14.50
Heavy Railroad Scrap	15.50
(Fob shipping point)	
No. 1 Cupola Cast	25.00



## NONFERROUS METAL PRICES

**Copper:** Electrolytic or Lake from producers in carlots 14.37½c, del. Conn.; less carlots 14.50c, refinery. Dealers may add ¼c for 5000 lb to carload; 1c, 1000-4999 lb; 1½c, 500-999 lb; 2c, 9-499 lb. Casting, 14.12½c, refinery, 20,000 lb or more; 14.37½c, less than 20,000 lb.

**Brass Ingot:** 85-5-5-5 (No. 115) 15.50c; 88-10-2 (No. 215) 18.75c; 80-10-10 (No. 305) 18.25c; No. 1 yellow (No. 405) 12.50c; carlot prices, including 25c per 100 lb freight allowance; add ¼c for less than 20 tons.

**Zinc:** Prime western 8.25c, select 8.35c, brass special 8.50c, intermediate 8.75c, E. St. Louis; high grade 9.25c, del., carlots. For 20,000 lb to carlots add 0.15c; 10,000-20,000 lb 0.25c; 2000-10,000 lb 0.4c; under 2000 lb 0.50c.

**Lead:** Common 8.10c, chemical 8.20c, corroding, 8.20c, E. St. Louis for carlots; add 5 points for Chicago, Minneapolis-St. Paul, Milwaukee-Kenosha districts; add 15 points for Cleveland-Akron-Detroit area, New Jersey, New York state, Texas, Pacific Coast, Richmond, Indianapolis-Kokomo; add 20 points for Birmingham, Connecticut, Boston-Worcester, Springfield, New Hampshire, Rhode Island.

**Primary Aluminum:** 99% plus, ingots 15.00c del., pigs 14.00c del.; metallurgical 94% min. 13.50c del. Base 10,000 lb and over; add ¼c 2000-9999 lb; 1c less through 2000 lb.

**Secondary Aluminum:** Piston alloy (No. 122 type) 13.25c; No. 12 foundry alloy (No. 2 grade) 13.25c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1 (95-97½%) 14.50c; grade 2 (92-95%) 13.25c; grade 3 (90-92%) 12.25c; grade 4 (85-90%) 11.75c. Above prices for 30,000 lb or more; add ¼c 10,000-30,000 lb; ½c 5000-10,000 lb; ¾c 1000-5000 lb; 1½c less than 1000 lb. Prices include freight at carload rate up to 75c per 100 lb.

**Magnesium:** Commercially pure (99.8%) standard ingots (4-notch, 17 lb) 20.50c per lb, carlots; 22.50c 100 lb to c.l. Extruded 12-in. sticks 27.50c, carlots; 29.50c 100 lb to c.l.

**Tin:** Prices ex-dock, New York in 5-ton lots. Add 1 cent for 2240-11,199 lb, 1½c 1000-2239, 2½c 500-999, 3c under 500. Grade A, 99.8% or higher (includes Straits), 52.00c; Grade B, 99.8% or higher, not meeting specifications for Grade A, with 0.05% max. arsenic, 51.87½c; Grade C, 99.65-99.79% incl. 51.62½c; Grade D, 99.50-99.64% incl., 51.50c; Grade E, 99.49-99.49% incl. 51.12½c; Grade F, below 99% (for tin content), 51.00c.

**Antimony:** American bulk carlots fob Laredo, Tex., 99.0% to 99.8% and 99.8% and over but not meeting specifications below, 14.50c; 99.8% and over (arsenic, 0.05% max.; other impurities, 0.1% max.) 15.00c. On producers' sales add ¼c for less than carload to 10,000 lb; ½c for 9999-224 lb; and 2c for 223 lb and less; on sales by dealers, distributors and jobbers add ¼c, 1c, and 3c, respectively.

**Nickel:** Electrolytic cathodes, 99.5%, fob refinery 35.00c lb; pig and shot produced from electrolytic cathodes 36.00c; "P" nickel shot or ingot for additions to cast iron, 34.00c.

**Mercury:** Open market, spot, New York, \$96-\$99 per 76-lb flask.

**Arsenic:** Prime, white, 99%, carlots, 4.00c lb.

**Beryllium-Copper:** 3.75-4.25% Be, \$14.75 per lb contained Be.

**Cadmium:** Bars, ingots, pencils, pigs, plates, rods, slabs, sticks, and all other "regular" straight or flat forms \$1.25 lb, del.; anodes, balls, discs and all other special or patented shapes, \$1.30.

**Cobalt:** 97-99%, \$1.50 lb, for 550 lb (bbl.); \$1.52 lb for 100 lb (case); \$1.57 lb under 100 lb.

**Gold:** U. S. Treasury, \$35 per ounce.

**Iridium:** 99.9%, \$2.25 per troy ounce.

**Silver:** Open market, N. Y. 90.12½c per ounce.

**Platinum:** \$91.50 per ounce.

**Palladium:** \$24 per troy ounce.

**Iridium:** \$125 per troy ounce.

## Rolled, Drawn, Extruded Products

(Copper and brass product prices based on 14.37½c, Conn., for copper. Freight prepaid on 100 lb or more.)

**Sheet:** Copper 25.81c; yellow brass 23.67c; commercial bronze, 95% 26.14c, 90% 25.81c; red brass, 85% 24.98c, 80% 24.66c; best quality 24.38c; phosphor bronze, grade A 4% or 5%, 43.45c; Everdur, Duronze or equiv., hot rolled, 30.88c; naval brass 28.53c; manganese bronze 31.99c; muntz metal 26.78c; nickel silver 5% 32.38c.

**Rods:** Copper, hot rolled 22.16c, cold drawn 23.16c; yellow brass 18.53c; commercial bronze, 95% 25.83c, 90% 25.50c; red brass, 85% 24.67c; 80% 24.35c; best quality 24.07c; phosphor bronze, grade A 4% or 5% 43.70c; Everdur, Duronze or equiv. cold drawn, 29.82c; naval brass 22.59c; manganese bronze 25.93c; muntz metal 22.34c; nickel silver 5% 34.44c.

**Seamless Tubing:** Copper 25.85c; yellow brass 26.43c; commercial bronze 90% 28.22c; red brass 85% 27.64c, 80% 27.32c; best quality brass 26.79c; phosphor bronze, grade A 5% 44.70c.

**Copper Wire:** Bare, soft, fob eastern mills, carlots 19.89c, less carlots 20.39c; weatherproof, fob eastern mills carlot 22.07c, less carlots 22.57c; magnet, delivered, carlots, 23.30c, 15,000 lb or more 23.55c, less carlots 24.05c.

**Aluminum Sheets and Circles:** 2s and 3s flat mill finish, base 30,000 lb or more del.; sheet widths as indicated; circle diameter 9" and larger:

Gage	Width	Sheets	Circles
.249"-7	12"-48"	22.70c	25.20c
8-10	12"-48"	23.20c	25.70c
11-12	26"-48"	24.20c	27.00c
13-14	26"-48"	25.20c	28.50c
15-16	26"-48"	26.40c	30.40c
17-18	26"-48"	27.90c	32.90c
19-20	24"-42"	29.80c	35.30c
21-22	24"-42"	31.70c	37.20c
23-24	3"-24"	25.60c	29.20c

**Lead Products:** Prices to jobbers; full sheets 11.25c; cut sheets 11.50c; pipe 9.90c, New York, 10.00c Philadelphia, Baltimore, Rochester and Buffalo, 10.50c Chicago, Cleveland, Worcester and Boston.

**Zinc Products:** Sheet fob mill, 13.15c, 36,000 lb and over deduct 7%. Ribbon and strip 12.25c, 3000-lb lots deduct 1%, 6000 lb 2%, 9000 lb 3%, 18,000 lb 4%, carloads and over 7%. Boiler plate (not over 12") 3 tons and over 11.00c; 1-3 tons 12.00c; 500-2000 lb 12.50c; 100-500 lb 13.00c; under 100 lb 14.00c. Hull plate (over 12") add 1c to boiler plate prices.

## PLATING MATERIALS

**Chromic Acid:** 99.75%, flake, del., carloads 16.25c; 5 tons and over 16.75c; 1-5 tons 17.25c; 400 lb to 1 ton 17.75c; under 400 lb 18.25c.

**Copper Anodes:** In 500-lb lots, fob shipping point, freight allowed, cast oval over 15 in., 25.125c; curved, 20.375c; round oval straight, 19.375c; electro-deposited, 18.875c.

**Copper Carbonate:** 52-54% metallic Cu, 250 lb barrels 20.50c.

**Copper Cyanide:** 70-71% Cu, 100-lb kegs or bbls 34.00c, fob, Niagara Falls.

**Sodium Cyanide:** 96%, 200-lb drums 15.00c; 10,000-lb lots 13.00c fob Niagara Falls.

**Nickel Anodes:** 500-2999 lb lots; cast and rolled carbonized 47.00c; rolled depolarized 48.00c.

**Nickel Chloride:** 100-lb kegs or 275-lb bbls 18.00c lb, del.

**Tin Anodes:** 1000 lb and over 58.50c del.; 500-999 59.00c; 200-499 59.50c; 100-199 61.00c.

**Tin Crystals:** 400 lb bbls 39.00c fob Grassell, N. J.; 100-lb kegs 39.50c.

**Sodium Stannate:** 100 or 300-lb drums 36.50c, del.; ton lots 35.50c.

**Zinc Cyanide:** 100-lb kegs or bbls 33.00c fob Niagara Falls.

## Scrap Metals

**Brass Mill Allowances:** Prices for less than 15,000 lb fob shipping point. Add ¼c for 15,000-40,000 lb; 1c for 40,000 or more.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	12.000	12.000	11.250
Yellow brass	9.875	9.625	9.125
Commercial bronze			
95%	11.250	11.000	10.500
90%	11.125	10.875	10.375
Red brass			
85%	10.875	10.625	10.125
80%	10.875	10.625	10.125
Best quality (71-79%)	10.500	10.250	9.750
Muntz metal	9.250	9.000	8.500
Nickel silver, 5%	10.500	10.250	.....
Phos. br., A, B, 5%	12.750	12.500	11.500
Naval brass	9.500	9.250	8.750
Manganese bronze	9.500	9.250	8.750

**Other than Brass Mill Scrap:** Prices apply on material not meeting brass mill specifications and are fob shipping point; add ¼c for shipment of 60,000 lb of one group and ¼c for 20,000 lb of second group shipped in same car. Typical prices follow:

(Group 1) No. 1 heavy copper and wire, No. 1 tinned copper and copper borings 11.50c; No. 2 copper wire and mixed heavy copper, copper tuyeres 10.50c.

(Group 2) Soft red brass and borings, aluminum bronze 10.75c; copper-nickel solids and borings 11.00c; lined car boxes, cocks and faucets 9.50c; bell metal 17.25c; babbit-line brass bushings 14.75c.

(Group 3) Admiralty condenser tubes, brass pipe 8.75c; muntz metal condenser tubes 8.25c; old rolled brass 8.25c; manganese bronze solids; (lead 0%-0.40%) 8.00c; (lead 0.41%-1%) 7.00c; manganese bronze borings, 7.25c.

**Aluminum Scrap:** Price fob point of shipment, truckloads of 5000 pounds or over; Segregated solids, 2S, 3S, 5c lb, 11, 14, etc., 3 to 3.50c lb. All other high grade alloys 5c lb. Segregated borings and turnings, wrought alloys, 2, 2.50c lb. Other high-grade alloys 3.50c, 4.00c lb. Mixed plant scrap, all solids, 2, 2.50c lb borings and turnings one cent less than segregated.

**Lead Scrap:** Prices fob point of shipment. For soft and hard lead, including cable lead, deduct 0.75c from basing point prices for refined metal.

**Zinc Scrap:** New clippings 7.25c, old zinc 5.75c, fob point of shipment, add ¼c for 10,000 lb or more. New die cast scrap 4.95c, radiator grilles 4.95c, add ¼c for 20,000 lb or more. Unsweated zinc dross, die cast slab 5.80c, any quantity.

**Nickel, Monel Scrap:** Prices fob point of shipment; add ¼c for 2000 lb or more of nickel or cupro-nickel shipped at one time and 20,000 lb or more of monel. Converters (dealers) allowed 2c premium.

**Nickel:** 98% or more nickel and not over ¼% copper 23.00c; 90-98% nickel, 23.00c per lb nickel contained.

**Cupro-nickel:** 90% or more combined nickel and copper 26.00c per lb contained nickel, plus 8.00c per lb contained copper; less than 90% combined nickel and copper 26.00c for contained nickel only.

**Monel:** No. 1 castings, turnings 15.00c; new clipping 20.00c; solder sheet 18.00c.



# Handling Bales with BAKER TRUCK proves more profitable than "manhandling"

*Excerpt of Letter from The  
American Thread Company*



At our Willimantic plant car-loads of raw cotton are received in bales weighing from 450-750 pounds. Prior to the Baker Fork Truck installation, this cotton was all man handled by the use of hand trucks, and cotton was stored "one bale" high on end, in two sheds at opposite ends of the plant. With the Baker Fork Truck we are able to stack bales six high which has increased the storage capacity of our "active" cotton shed by 1500 bales. Normally these 1500 bales would have gone initially into our concrete warehouse, then rehandled and moved to the "active" cotton shed before going into process. Thus we have saved double handling on 1500 bales.

THE AMERICAN THREAD COMPANY  
WILLIMANTIC, CONN.



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## Baker INDUSTRIAL TRUCKS

## Sheets, Strip . . .

*Preference tonnage heavy burden, with buyers seeking supply from other than regular mill sources*

Sheet & Strip Prices, Page 186

Pittsburgh — Although steel producers have not officially opened their books for next year, it is evident tentative commitments are being made well into 1947. Fourth quarter schedules are expected to be juggled considerably, due to CC-rated orders and directives for hardship cases. Mills report receipt of a considerable number of rated orders from entirely new customers, while some regular customers under this preference program are requesting almost double tonnage formerly allotted them each month. However, the present excessive pressure for early sheet and strip shipments is expected to ease slightly early next year. This does not imply peak of postwar steel requirements have been or will soon be reached. Rather this is anticipated because of increased finished steel capacity scheduled to be brought into production at that time, also it is noted that inventories of some manufactured items are rising steadily, due to restricted output of finished products resulting from shortage of components.

New York — Sheet schedules are still so involved, as a result of a continuance of rated orders, that producers have not yet officially opened books for next year. It appears that when they do open books, most will be covered for first quarter because of arrearages. Certain producers already have advised their quota customers that they will have nothing for them, especially in cold-finished sheets and galvanized sheets, for fourth quarter, because of a combination of arrearages and rated tonnage. An exception, of course, is where quota customers have ratings of their own.

Boston — Galvanized sheet tonnage for unrated consumers next quarter will be negligible and this will include warehouses unless some form of priority for distributors is extended. There are scattered ratings on other grades of sheets and some strip, notably builders' hardware requirements, but the load is far heaviest in galvanized, some being new business. Among MM ratings is one for 300 tons of cold-rolled for Watertown arsenal. Limited and unbalanced hot strip shipments to rollers contribute to uncertainty in narrow cold strip deliveries and third quarter increase in hot metal for converting is below expectations. Consumers in most industries are as pinched for flat-rolled as at any time this year and this includes some heavier gages; No. 16-gage pickled and cold-rolled sheets have tightened while shortages in No. 12-gage for household oil heating tanks continue to hold down operations, with tank fabricators confronted by heavy demand.

Philadelphia — While under considerable pressure from buyers for promises for next year, sheet producers are not yet in position to open books for deliveries beyond fourth quarter on hot and cold-rolled and galvanized sheets. In some specialties, however, some tonnage is being promised. In stainless sheets some sellers have told jobbers what they may expect in first quarter,



although so far as can be learned they have not so advised their manufacturing customers. One mill, at least, is now scheduling electrical sheets for January, ascribed in particular to acceptance of this tonnage on a monthly quota basis, with 30 days lead time. Meanwhile sheet consumers continue to curtail production because of lack of material. Some interests would suspend entirely were they not afraid of losing their workmen.

**Chicago** — With return to use of priorities in fourth quarter, sheet and strip consumers express fear concerning how much of their quotas they will get and complain that because of uncertainty they are unable to set up definite schedules. Sheetmakers point out that priorities are not heavy percentage-wise, but unfortunately fall heaviest when it hurts worst, on lighter gages. On galvanized, however, ratings and directives will be large, and little tonnage, if any, will be available to customers lacking preferential position. An important mill a few days ago opened its books for first half of 1947.

**Cincinnati** — Third quarter schedules of district sheet mills are still not definitely set, because of inroads made by priority tonnage. Mill interests are beset from all quarters for deliveries, and for larger allotments. Production uncertainties developed as one mill temporarily reduced steel output because of shortage of scrap. Reserves of raw materials continue low.

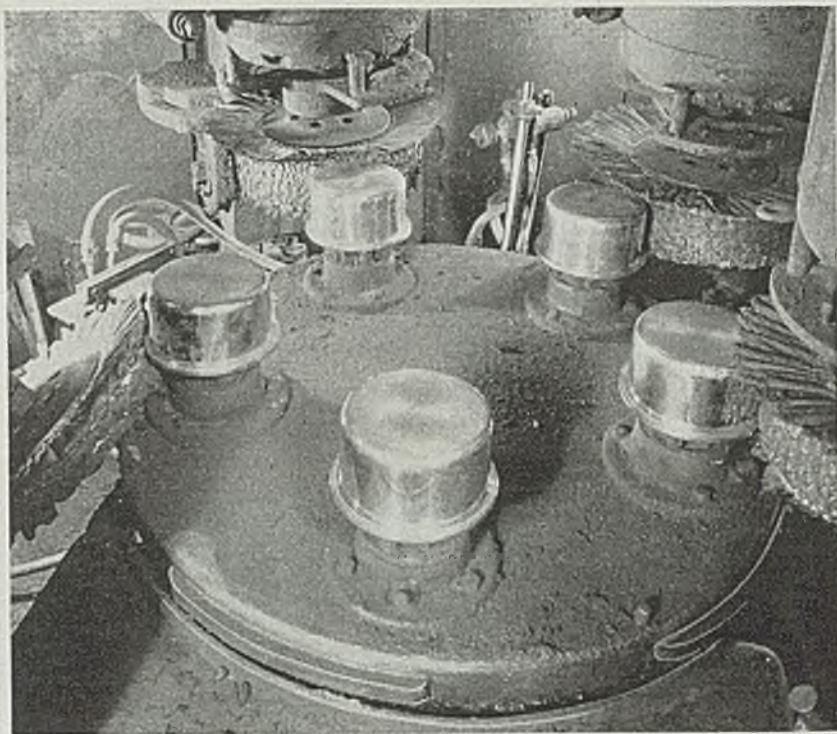
**St. Louis**—Demand for sheets is unabated, with deliveries averaging nine months late. Production is increasing with an additional open hearth in operation last week, another due this week and a third by the end of October. Mills, however, are gaining no ground on backlogs and they see no way to escape a three to five months' carryover into next year. Books for 1947 are not yet open, and unless the current backlog is reduced by the yearend, a reduction in customers' quotas is possible by second quarter. There is little hope of catching up with present orders before June, even though a new cold mill is due to start operation in first quarter. Finished steel shipments have not yet been seriously affected by the railroad car shortage, although some tin plate, requiring box cars, has been held up.

**Birmingham**—Sheet production holds close to capacity, although diversion of ingots momentarily alters the picture. Sheet production is consistently heavy but not in sufficient quantity to meet demands, either for roofing or sheets for processing. The district is producing a moderate volume of strip, mainly cotton ties.

## Tin Plate . . .

Tin Plate Prices, Page 187

**Chicago** — Tin plate production suffered a sharp set-back here last week through a strike at the Gary sheet and tin mill of Carnegie-Illinois Steel Corp. Output of 2000 tons per day was lost, virtually all of which was earmarked for food containers. Another tin plate maker was experiencing difficulty in getting sufficient box cars, the deficiency averaging three cars a day. Canmakers are pressing for all the tin plate they can get, being under extreme pressure from canners now at the height of their season.



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The deep drawn aluminum cups above are buffed to a mirror finish from top to flange by BUFFING NU-SPRA-GLU, a liquid composition that is sprayed to the buffs while they are revolving. Standard spray equipment is used. There is little waste, as practically all the material is sprayed directly on the wheels, and stays put. BUFFING NU-SPRA-GLU is made in various grades to suit various metals. There is a TRIPOLI and a STAINLESS STEEL, LIME FINISH for NICKEL BUFFING, ROUGE for GOLD BUFFING, a BURRING COMPOUND and LIQUID GREASE. The spray method of applying compound to the polishing wheel was a development of the J. J. Siefen Co. in 1945, and patent has been applied for on method.

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## Steel Bars . . .

*Opening books for next year gives little hope for better deliveries; carryovers will absorb much tonnage*

Bar Prices, Page 186

Pittsburgh — Most producers are discouraging all forward ordering but are accepting new business without making commitments as to probable delivery. One interest is refusing to accept orders even on a tentative basis for delivery next year. Mills expect a relatively small tonnage of rated orders for carbon bars next quarter since agricultural im-

plement requirements will not have preferred position. Sellers are booked solid through remainder of this year on all except alloy bars, on which early November shipment is available. Automotive parts manufacturers and most forge shops have been able to increase production slightly in recent weeks, although most do not expect any significant increase in steel supply through this year.

Philadelphia — While books are being opened for next year on cold-drawn carbon bars and alloy bars, the situation with respect to hot carbon bars is still muddled. Consequently no action is being taken on the latter until producers are able to appraise future operations more closely. It is believed that when they do open books for next year on hot carbon grades they will have little ca-

capacity left for first quarter, and then only in larger sizes.

New York — One large bar producer has just opened books for first quarter on hot and cold-drawn alloy bars and cold-drawn carbon bars. At least two other sellers of cold-drawn bars have also taken such action recently. With sellers behind on current commitments, and with little possibility of getting caught up between now and the end of the year, they are quoting next year's shipments beginning early in February and beyond. In hot alloy bars, on which shipments can easily be made in fourth quarter, and as early as next month in some cases, opening of books for 1947 means that they can accept tonnage for January, as little or no carryover is anticipated. The same applies in a somewhat less degree to cold alloy bars.

Boston — Rated orders for carbon bars next quarter in this area are no factor in contributing to extended deliveries and the heavy carryover in small sizes. As in flat-rolled, the finishing end at some mills is not keeping up with rollings in small sizes. Consumers in some cases are attempting to get on books for part or all of next year's requirements, but any volume accepted is tentative. Actually some customers are likely to get less tonnage next year if quotas are held; there will be slight chance of duplicating orders as was the case late last year and on which delivery has filtered through earlier. This accounts in part for some users maintaining operations at the levels reached, although relatively few have balance in inventories. Hot-rolled alloys are now in November with some exceptions in small sizes and some mills are into first quarter on smaller cold-drawn and further processed stock.

St. Louis — Production of merchant bars remains high, but deliveries have been slowed by car shortages. Scarcities of zinc, magnesium and tin now threaten inroads on production. Scrap and pig iron reserves at mills are fair but declining steadily. Lack of storage space for finished steel makes the car situation the most immediate threat. Demand for bars, especially small sizes, continues great and mills are consistently returning proffered orders for 1947. The only exception is bars for essential blue-printed construction projects. Even with these rejections, carryover is expected to be at least six months. A careful scanning of order books for duplications has failed to shrink committed tonnage perceptibly.

Cleveland — Increase in bar production has not been as large as in sheet, strip, pipe and some wire products. Operations at bar mills have been hampered by lack of steel and by scattered work stoppages. Carryover now amounts on an average to over three months' output, so opening of first quarter books will be delayed and will make available only a small additional tonnage.

## Refractories . . .

Refractories Prices, Page 189

Pittsburgh — Freight car shortage continues to retard refractory brick shipments and no immediate improvement is indicated. In a growing number of instances producers are seeking additional storage areas. However, production has not been adversely affected, with output holding steady at practical capacity. Heavy demand makes it impossible to make much headway against order back-



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logs, which range from six to eight weeks on standard items and four to six months on special shapes. Coke oven expansion is an important factor in present demand, with a number of additional projects expected to be announced soon. Extensive relining programs for much overworked blast furnaces, open hearths and coke ovens are expected to substantially augment overall demand for months.

## Steel Plates . . .

*Car repairs require large tonnage and are preferred class; tank builders lack sufficient steel*

Plate Prices, Page 187

New York — Platemakers are being urged by CPA to give special preference where needed to car repair tonnage in fourth quarter. There is a pressing need for car repairs, to say nothing of new car construction, and Washington is endeavoring to have this requirement met without resort to priorities. Approximately 250,000 tons, mainly plates, has been specified as badly needed in the closing quarter for car repairs, or at least principally for car repairs. There is also considerable tonnage on the books for new car construction which is urgently required.

With plate mills generally far behind on schedules, due to strikes over past months and to shortages in pig iron and scrap, eastern plate mills will be hard pressed in getting out car steel required for the remainder of this year. In fact, they will get out only a portion of what is needed for both repairs and new construction, it is believed. Nevertheless producers undoubtedly will alter some of their schedules, where possible, in an effort to increase shipments for this work. As it stands, most eastern platemakers have enough tonnage on books to keep them busy through first quarter and even beyond in some instances.

Boston — Demand for plates is heavy and includes more heavier gages, although strongest in lighter welding quality sizes. With mills extended into second quarter on new orders, small tank fabricators are pushed to obtain enough steel to maintain operations and balance plates with heads; there are some curtailments in schedules while others are unable to increase to the level hoped. Weldment requirements are substantial and the overall tonnage going into shipyards is fair for reconversions and repairs; Bath, Me., yard has been getting heavy shipments for French steel trawlers. In view of low and unbalanced inventories, plate fabricators keep warehouse stocks low by filling gaps; numerous distributors are getting less tonnage than expected from usual mill sources because of curtailments due to pig iron and scrap shortages.

Philadelphia — Tieup of ocean shipping has caused plate producers to divert capacity scheduled for exports to domestic needs. In anticipation of the seamen's strike producers scheduled no export tonnage for this month and have little steel piled for foreign account. It appears that September export allotments will not be rolled until October, assuming that the strike is completely settled by that time. Cramp Shipbuild-

ing Co., Camden, N. J., with no construction on hand, has announced it will take no more ship repair work when repairs on three ships in its yards are finished. This should end its operations some time in November, it is believed.

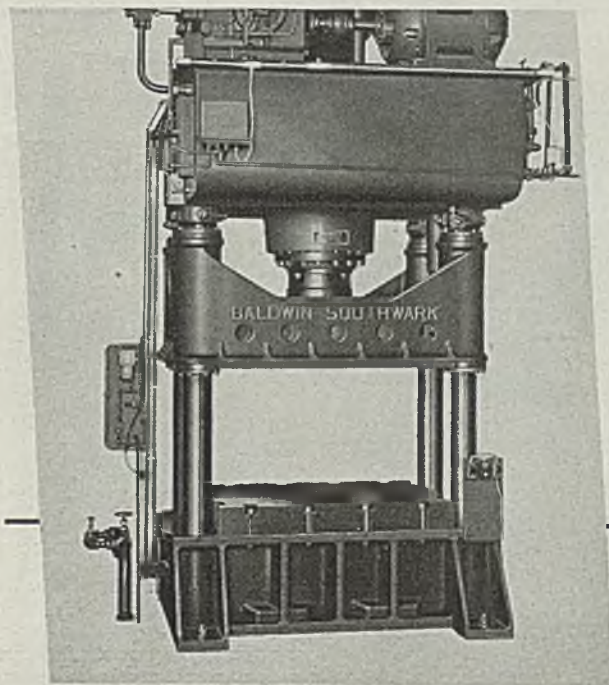
Birmingham—No appreciable change in demand for plates is evident. Production continues on a comparatively full scale and orders are in generally moderate volume, but the overall situation is shortage which has held order backlogs at the highest mark the district has ever known.

## Wire . . .

Wire Prices, Page 187

Pittsburgh — Nail production has shown steady improvement in recent

weeks and likely will attain the 70,000-ton monthly goal toward the close of this year. Estimated 1947 nail requirements of 835,000 tons indicate that this rate will have to be maintained through next year. Production of bale ties also has been rising steadily and is expected to reach peak output early in first quarter. Output of valve spring wire has been aided somewhat through imports of wire rods from Sweden. Critical shortage of wire rods continues to restrict output of nonintegrated producers. However, the situation has recently been temporarily eased by distribution to domestic consumers of some tonnage that cannot be shipped on export account because of the maritime strike. Heavy demand for spring wire is developing from the automotive and furniture industry



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in particular. Many consumers are attempting to get on mills' first-quarter schedules, with little success. Producers are not expected to open books for first quarter delivery until October at the earliest, when they hope to have a clearer picture of backlogs in respect to probable carryover.

**Boston**—Few wire consumers are getting the volume requested and inventories are low and out of balance. Attempting to spread available tonnage as widely as possible, mills frequently are forced to reduce already restricted quotas and are satisfying no one. This shows in uneven operations by wire fabricators. Consumers using three or more sizes or grades are frequently short of one or two and with supply of the others. Under

these circumstances pressure on mills is constant. Shortages in rods are a hampering factor, notably with nonintegrated units operating on a day to day rod schedule.

Production total of 65,000 tons of nails in September will be approximated, after reaching 60,000 tons in August. Where this production is going is a mystery to distributors, most nail production normally going to consumers through distributors, who claim they are getting only a small part of normal share of this tonnage. Total nail capacity is estimated at about 70,000 tons per month, with present output approaching capacity, with the drain on semifinished being felt in other finished products. High-carbon specialties are heavily sold ahead

and on some items backlogs extend through first quarter and into second.

**Cleveland** — Merchant wire products output has been increasing steadily during recent weeks, indicating that slightly larger quotas will be established for first quarter when books are opened in late October or early November. Demand for all products shows no abatement with business awaiting acceptance sufficient to fill mill schedules for 18 months or more. Therefore, there will be no tapering this fall and early winter in orders for barbed wire, fence and similar products. Operations at wire mills are still hampered by absenteeism and scattered work stoppages, but producers continue to place additional mills on a full capacity basis.

**New York** — Effective Sept. 23 manufacturers of metal upholstery springs, constructions and accessories are granted a ceiling price increase of 3.5 per cent. This is in addition to an increase of 8 to 10 per cent granted in April, which reflected increases in cost of steel and other minor items only. The latest advance covers wage increases. Most producers of these springs are short of wire and have sought tonnage far in excess of pre-war levels. Numerous drawn wire products, notably in the low-carbon group, are still unprofitable and consequently production is low and users are especially short.

## Structural Shapes . . .

*CPA restrictions limit new construction but mills and shops have heavy load and are booked far ahead*

*Structural Shape Prices, Page 187*

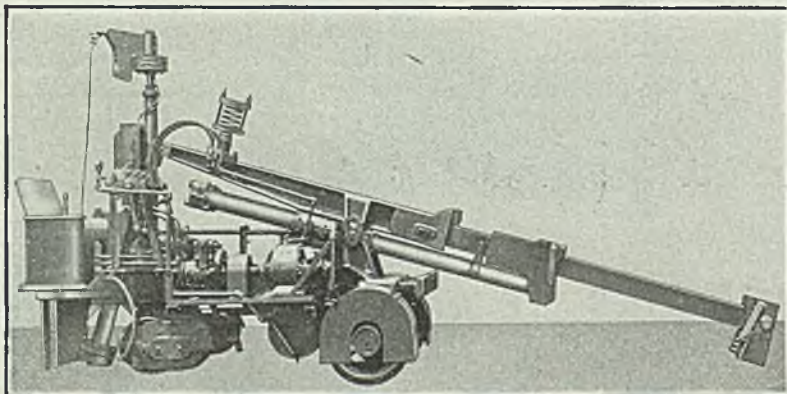
**Boston** — Additional clamps on non-housing construction is reflected in slackening inquiry for fabricated structural steel, but mill backlogs are so heavy any easing in plain material is weeks away. Larger fabricating shops are also filled into second quarter next year; smaller shops, those taking 50-200-ton orders, will first feel effect of construction curtailments. This group has been depending heavily on warehouses for at least part of requirements and some breather with the latter may develop, providing they get the steel. Active bridge inquiry has slumped, but includes rebidding, Sept. 30, steel girder viaduct over the New Haven railroad and Connelly avenue, Hamden, Conn., originally 835 tons, on which bids for furnishing fabricated material only were rejected.

**New York** — Although structural demand in general is fairly slack, 5200 tons for a subway extension for the New York City Board of Transportation in Jamaica, Long Island, is up for bidding Sept. 30. Also figures are being taken on foundation work for a New York state bridge at Roslyn, Long Island, which will require eventually 4500 tons for superstructure. Little or no steel is required in the foundation work. Meanwhile, orders have been placed for a 4000-ton gas holder, Elizabethport, N. J., and a 1000-ton underpass at the Idlewild municipal airport, New York City.

**Pittsburgh** — Largest non-housing construction project approved by local CPA office in week ended Sept. 12, involved

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\$155,000 for production of high alloy strip at Allegheny Ludlum Steel Corp.'s West Leechburg, Pa., plant. During the latest period CPA approved only half the proposed projects screened. Despite dearth of construction awards in recent weeks, fabricators report order backlogs are sufficient to sustain active operations well into 1947. Shortage of steel and strikes earlier this year have delayed completion of many projects. Carryover tonnage on mill books represents over two months' output, with most interests booked through the year and not yet scheduling first quarter tonnage.

**Philadelphia** — New structural demand continues relatively light. This reflects principally CPA restrictions on nonhousing construction, although costs in excess of appropriations remain a factor. Recently bids on a Pennsylvania state bridge in Montgomery county, requiring 180 tons, have been rejected as have been those on the Frankfort elevated station extension, Philadelphia, requiring 200 tons.

Effect of tightening restrictions on nonhousing construction is reflected by the latest report from CPA regional office on projects approved during the period Sept. 6-Sept. 12, inclusive. The figure was the lowest since curbs were first placed on nonhousing construction a number of weeks ago, involving five projects, having a total valuation of \$125,760. As a matter of fact, the total number of cases up for consideration apparently reached a new low, involving 24 in all. With five approved, this left 19 as disapproved, valued at \$316,993.

**Seattle** — Fabricators are booking only small jobs in the face of light steel supply. Potential demand is large but will not come out for bids until the situation is stabilized. Pending business includes 100 tons of shapes and 100 tons of reinforcing bars for a public roads bridge in Willamette national forest in Oregon, bids to the bureau, Portland, Sept. 27. Whiting Corp., Harvey, Ill., is low at \$140,000 for two 100-ton traveling cranes and \$71,000 for one 60-ton crane for the Coulee pumping plant.

## Reinforcing Bars . . .

Reinforcing Bar Prices, Page 187

**Pittsburgh** — Critical shortage of reinforcing bars is retarding many building programs now under way, while a number of expansion plans in blue print stage have been shelved temporarily due to uncertain delivery. Some producers have withdrawn from the market on new business until they can determine the extent first quarter schedules will be absorbed by carryover tonnage. As long as reinforcing bars remain a loss item there is little prospect overall output will be substantially increased. Shortage of rails prevents rollers from increasing operations above 50 to 60 per cent, further limiting supply of reinforcing bars. A considerable tonnage of old rails is being shipped to Europe and China.

**Seattle** — Bar mills have full schedules and are taking no new business except small lots for regular customers. Reinforcing bars constitute the largest tonnage, although merchant bars represent a large tonnage. Labor turnover continues to trouble and low efficiency hampers production.

## Pig Iron . . .

*Supply continues far below needs despite additional furnaces being blown in; some foundries close*

Pig Iron Prices, Page 189

**Pittsburgh** — A number of jobbing foundries already have been forced to curtail production due to pig iron shortage, while some larger interests claim to have only one to two weeks supply. No immediate relief is indicated for local consumers, although the premium price plan is expected to increase output about

100,000 tons monthly. Inadequate supply of coke, iron ore and scrap, however, will be chief hurdles to overcome in bringing idle blast furnaces into operation. It is also pointed out integrated steel producers are not in position to take on additional basic iron commitments because they are forced to use greater proportion of pig iron. Some interests state premium price plan is an indirect admission that current pig iron prices are inadequate.

The merchant iron producer here has been operating at practical capacity and there is little prospect that overall output can be substantially increased. This interest has been operating almost entirely on foundry and malleable grades, with 50 per cent of its output going

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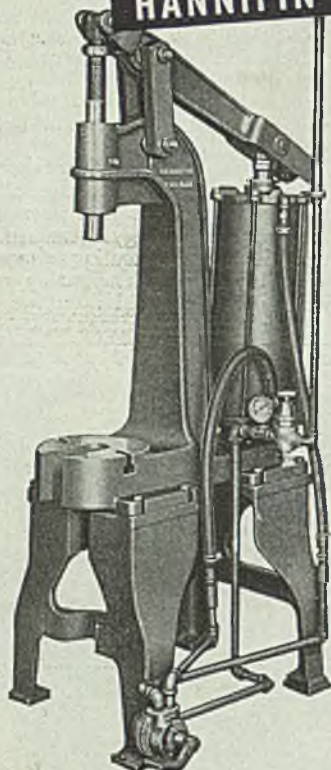
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New York — Pig iron consumers have until Sept. 26 to file specifications on preference tonnage for October delivery. For the remaining two months of the year the respective deadlines will fall earlier in the preceding months, but the dates have not been specified, so far as can be learned.

The melt this month in the metropolitan area may even be lighter than in August, particularly in view of the trucking strike. One Brooklyn foundry closed at the beginning of last week because of inability to obtain pig iron; however, most foundries have been more concerned by their inability to obtain coke because of the trucking situation and a few within the past several days have curtailed their melt in an effort to extend their supply of coke as much as possible.

Apart from the strikes, which have also included the tug boat strike in sympathy with the walkout of ocean seamen, the melt in this district is being restricted because of the relatively few foundries engaged in work for which pig iron preferences can be obtained.

Boston—Probably less than 25 per cent of melt in this area will be covered by ratings next quarter and outlook for the remainder, already high in scrap charging, is not bright. One New York state furnace contributing to the supply will switch from basic to foundry next month, but slight relief from integrated steelworks stacks is in sight and only resumption by Mystic furnace holds much hope. Melt of pig iron by non-rated consumers has declined to 10-15 per cent of charges, the remainder being scrap. Some have fair scrap supplies picked up during the OPA recess, but are all but out of iron. There are unconfirmed reports of purchases of Mexican iron, allrail delivery, which would figure about \$65 per ton. One dealer bid \$20 per ton on 250 tons of 516 tons of ballast iron offered by the Boston navy yard.

After being down two years Mystic furnace at Everett, Mass., will resume pig iron production about Nov. 15 under the subsidy program, which gives this producer \$12 per ton premium as an idle stack returning to blast. Enough ore and raw materials, including coke, are available to start but are not sufficient for sustained operation and these must be supplemented by Lake Superior or imported ore. This may be difficult, due to the transportation factor. Grade of ore on hand will make necessary production of malleable mainly in the initial output. The furnace will produce about 15,000 tons per month.

Chicago—Premium payments for increased production of merchant pig iron is not expected to lift production in this district, at least immediately. Of the 41 blast furnaces here, 37 are operating and of the four idle only two are in condition to resume. Their idleness results from lack of coke, which traces back to the recent coal strike. Foundries stand to gain some by dropping of farm implements from iron priorities. However, iron is extremely short, both as to inventories and allocations, so that melting has suffered limitation as a result of the priorities.

Buffalo — Even though there is one idle blast furnace in the area that might be relighted as a result of the government's premium payment for additional output, the overall production increase



is expected to be small because of the coke situation. Producers generally are operating on a hand-to-mouth basis on coke. One operator reports furnace is kept going on coke shipped in from another area where the same company has a unit down for relining. This coke source is expected to be shut off as soon as the unit is repaired. Meanwhile, foundries continue to press for iron.

**Philadelphia** — The incentive price program recently announced to stimulate production of merchant pig iron for the housing program and production of brakeshoes is causing some speculation as to possibility of resumption of operations at the furnace of the Delaware River Steel Co., Chester, Pa. This furnace has been down for a number of months following temporary operation during the war by the Pittsburgh Ferromanganese Corp. So far as can be learned, however, no plans are under way at this time for resumption at this plant. Deadline for receipt of preference tonnage for October shipment has been postponed from Sept. 27 to Sept. 30.

**St. Louis** — Pig iron stocks, while adequate for the present, continue to decline, with the prospect of replenishment increasingly gloomy. Production in this district has remained unchanged for months, but declining output elsewhere, plus the car shortage, is beginning to tighten the situation. Melters are pressing suppliers for increased shipments to offset a possible serious scarcity of scrap.

**Birmingham** — Pig iron production continues less than current demand. Announcement of relighting of the government-owned blast furnace at Gadsden by Republic Steel Corp. is hailed with considerable elation in this district, but even that contribution will not fill the current gap between supply and demand since conservative estimates are that at least 50 per cent more iron will be needed in this district indefinitely. A measurable relief is expected when the new furnace reaches capacity.

**Cincinnati** — Pig iron is coming through steadily, even though in reduced volume, and foundries have avoided shutdowns. A moderate increase in supplies of cast scrap provided a bit of relief, but the situation in both pig iron and scrap continues precarious. Demand for unrated castings is undented, with only slim chance for rise in output.

## Scrap . . .

*Industry protests action freezing prices, collections taper and preparation lags in face of shortage*

Scrap Prices, Page 190

**Boston**—Steel scrap shipments are light as tonnage continues to be withheld, although movement of cast is slightly higher following increases. Inventory control ruling to apply on dealer stocks might pry loose some steel scrap, but yard dealers appear to be holding until this is operative. While shipments of cast are somewhat better since the advance, visible supply still is limited although foundries are on a high ratio of scrap and a few are 100 per cent on scrap. Scattered lots of low phos are being diverted to electric furnaces from open hearths. Two New England government-

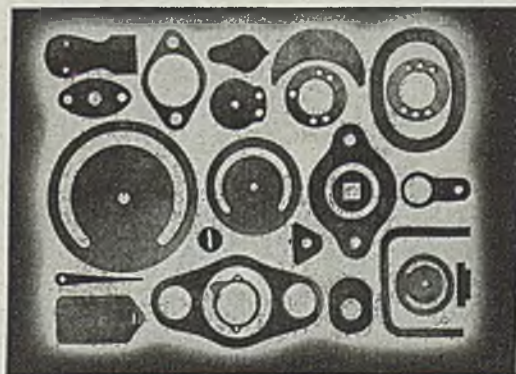
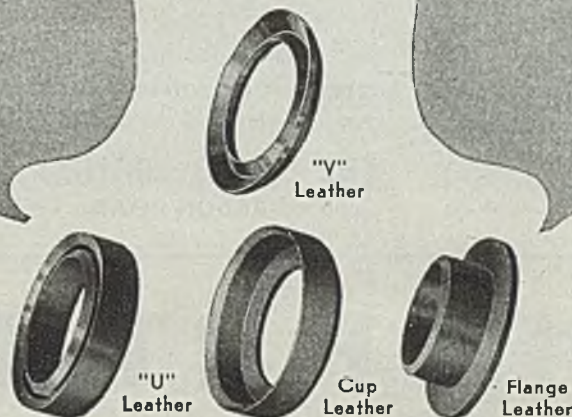
owned yards have been designated to be available soon for lease for ship-breaking. They are General Ship & Engine Works, East Boston, Mass., and New England Shipbuilding Corp., South Portland, Me.

**Cleveland** — Intense bitterness is evident in the scrap industry here over OPA's refusal to grant a general price increase. Many dealers have announced they will not devote as much time as formerly to collection and preparation of scrap until a more satisfactory price is established. Collections continued to decline last week and have practically ceased at some yards. The increase in cast grades has failed to bring out larger supplies. All steel producers in this district have obtained authority to purchase electric furnace grades at premium

prices for use in basic open-hearth furnaces, transactions which are now prohibited unless the scrap has been allocated by CPA.

**Pittsburgh** — Movement of scrap through dealer yards has shown no improvement following OPA's decision refusing higher prices. There is increasing concern over the scrap outlook, particularly for winter. Scrap stocks here average about two to three weeks. However, mills in the Youngstown and Chicago areas are operating on a hand-to-mouth basis. Indicative of the critical tight supply in open-hearth grades, Carnegie-Illinois Steel Corp. obtained permission from OPA last week to purchase 25,000 tons of low phos grades for its Chicago mills. Inland Steel also obtained similar permission. Most scrap

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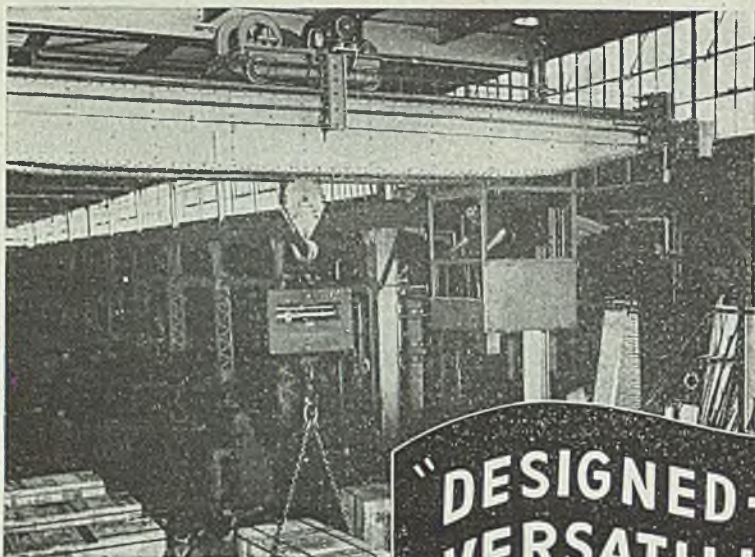
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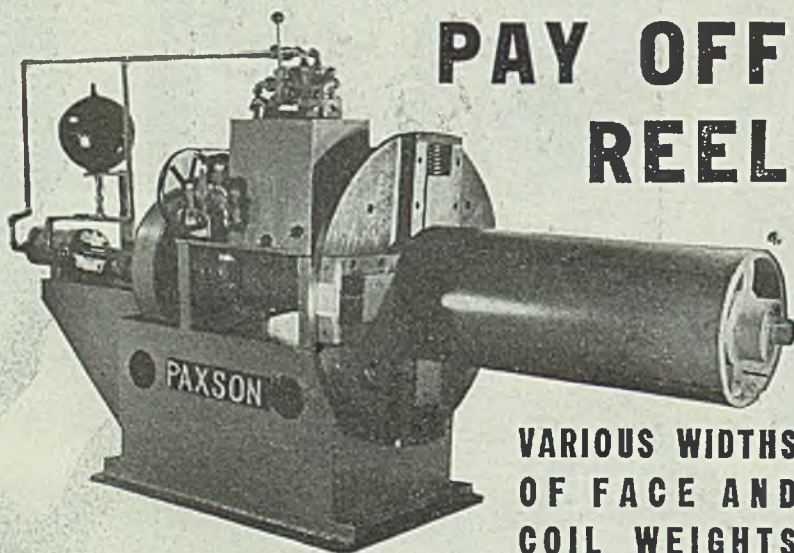
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interests claim little of this tonnage is available for CPA to allocate for use in open-hearth operations. Five OPA investigators paid this district a visit last week ostensibly to check on possible violations of new regulations. Elimination of scrap grades 13, 22, 23 and 24 came as a complete surprise to the trade, and means billet, bloom and forge crops must take low phos plate price of \$22.50 instead of \$5 spread over heavy melting steel. It is believed that this move will result in mills remelting almost all their scrap in this category instead of selling it. Foundries report little improvement in cast supply, although it is too early to draw conclusions as to whether the recent advances will bring out too much additional material.

**Chicago** — Flow of steelmaking scrap in this district improved noticeably for a brief period following the OPA announcement that ceilings would remain at present levels for the next six months, but it has now fallen to about the same level as before the announcement. This would seem to support those who have maintained that hoarding has been small. Cast scrap has been moving in heavier volume as result of the price boost it received, but the aggregate is far short of foundry needs.

**Buffalo** — Resentment over OPA's refusal to boost scrap ceilings is mounting. Dealers seem to be showing less initiative in going out to get scrap since OPA's action. The recent flurry in shipments of accumulated material during the waiting period seems to be waning. Predictions of drastic scrap shortages during the winter are increasing. An early estimate places the winter's ingot rate cut because of the scrap situation as 20 to 30 per cent.

**Philadelphia** — Movement of steel scrap has declined to about as low a level as at any time this summer, barring a few days while OPA was considering the suggestion for higher prices. Following OPA announcement that prices would not be increased dealers moved tonnage that had been loaded on cars, thus adding to various other scattered shipments and providing a flurry, which has since disappeared. Consumers of low phos scrap still are having particular difficulty obtaining material, as special permission is being granted by Washington in various instances for use of this grade for basic open hearths.

**New York** — Low phos steel is still moving to Pittsburgh for basic open hearths. A recent OPA ruling bars use of this material for such purposes except where special permission is given by Washington but this permission is being given in various instances. In general movement is sluggish, even in cast grades, on which some price increases were given recently. Light movement in cast is ascribed primarily to extreme scarcity, combined with the fact that price advances on some grades were still not high enough.

**Birmingham** — Scrap is virtually dormant. Some government scrap in various specifications found its way to market at Oak Ridge, Tenn., last week, but the regular movement of needed items has dried up. Some accumulation of scrap, mostly in unwanted items, is noted on local yards, but most of the preferred items are being held for price adjustment. Little scrap is being processed currently with the advent of fall rains.

**Cincinnati** — Deliveries of cast scrap were a bit heavier in the wake of the price increase granted by OPA but most



major interests conceded the tonnage recently withheld was moderate. Shipments of other grades held close to recent levels, with brokers and dealers trying to spread the available supply to meet most urgent needs.

St. Louis — Three business days after OPA's denial of a price increase, scrap movement in this district had increased only a trifle, mainly specialties to open hearths. Brokers are now convinced no great tonnage is being hoarded at collection points and that little of that will move until widespread anger at the price decision subsides. Mills are dipping deeper into reserves, which average 30 to 45 days. Foundry stocks have dwindled to a week and many are operating only by purchasing it by the truckload.

## Warehouse . . .

Warehouse Prices, Page 188

Boston—Admitting that mill deliveries in third quarter have improved distributors claim receipts are short in products in heaviest demand and point to lack of sheets, strip, nails, small carbon bars and other products. Concern as to fourth quarter tonnage holds attention, notably in flat-rolled, on which mill schedules will be affected by the extent of ratings. Jobber quotas for sheets have been reduced 40 per cent by one producer for fourth quarter and in plates two of the three months allotments have been canceled. Distributors are being informed that unless the warehouse directive operative in third quarter is extended in some form they can expect less steel for the final quarter.

New York—Distributors able to unload mill deliveries but not to ship to consumers during the truck strike built up inventory slightly, though part of the tonnage was spoken for. This applies mainly to warehouses with railroad sidings. Others, unable to take in tonnage but able to ship, have lowest inventory in year. Some could ship to only part of their territories and the situation is snarled. Demand is unabated but supply of sheets, small carbon bars and other light products is insufficient.

Cincinnati — Warehouses depend on wasters and rejects to meet part of the demand, as mill shipments fall far short.

## Scrap Flow Cut Further By Price Increase Denial

Recent denial by the government of a general price increase on scrap has further tightened the already meager flow of steelmaking grades. Even the price increase on cast grades is reported to have been of little or no help in stimulating movement of this material to foundries.

Reporting on consumption of iron and steel scrap and pig iron in May, the U. S. Bureau of Mines said that consumption was at a lower rate than in any month except the January-February strike period, since the Bureau's reports were inaugurated in July, 1941.

Total consumption of ferrous materials in May amounted to 5,408,000 tons,

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compared with 7,359,000 tons during April. The May consumption consisted of 1,711,000 tons of purchased scrap, 1,559,000 tons of home scrap, and 2,138,000 tons of pig iron. In April, consumption of home scrap exceeded consumption of purchased scrap. The April consumption was 1,940,000 tons of purchased scrap, 2,081,000 tons of purchase scrap, and 3,338,000 tons of pig iron.

Consumers' scrap stocks at the end of May totaled 3,911,000 tons, compared with 3,933,000 tons at the end of April. The May stocks were comprised of 2,767,000 tons of purchased scrap and 1,144,000 tons of home scrap. April stocks consisted of 2,776,000 tons of purchased scrap and 1,157,000 tons of home scrap.

## STRUCTURAL SHAPES . . .

### STRUCTURAL STEEL PLACED

8000 tons, exchange building for New England Telephone & Telegraph Co., Boston, to Bethlehem Steel Co., Bethlehem, Pa., through Turner Construction Co., Boston; also 1200 tons reinforcing bars to same supplier.

4000 tons, gas holder, Elizabethtown Consolidated Gas Co., Elizabethtown, N. J., to Stacey Bros. Gas Construction Co., Cincinnati.

1125 tons, plant additions for Norton Co., Worcester, Mass., to American Bridge Co., Pittsburgh.

1000 tons, underpass, Idlewild Municipal airport, New York city, to American Bridge Co., Pittsburgh.

1000 tons, bridge A195-B62, for Albuquerque division, Atchison, Topeka & Santa Fe railroad, to American Bridge Co., Pittsburgh; bids Aug. 30.

680 tons, manufacturing building, Indianapolis, for Foster Engineering Co., to Joseph T. Ryerson & Son Inc., Chicago.

600 tons, addition for LaSalle Steel Co., Hammond, Ind., to Joseph T. Ryerson & Son Inc., Chicago, through Hughes-Foulkrod Co., Philadelphia.

490 tons, catalytic cracking tower, Robinson, Ill., for Ohio Oil Co., to American Bridge Co., Pittsburgh.

450 tons, mill building for Hayward Woolen Mills, East Douglas, Mass., to Bethlehem Steel Co., Bethlehem, Pa.

380 tons, foundry sand storage units for General Electric Co., Everett, Mass., to Bethlehem Fabricators, Bethlehem, Pa.

300 tons, hangar, office and service building for North East Air Lines Inc., East Boston, Mass., to American Bridge Co., Pittsburgh, through Charles T. Main Co., engineer.

280 tons, hangar, Chicago, for Chicago & Southern Air Lines Inc., to American Bridge Co., Pittsburgh; John Griffith & Son Construction Co., Chicago, contractor.

275 tons, plant building for Monsanto Chemical Co., Everett, Mass., to Bethlehem Fabricators, Bethlehem, Pa.

222 tons, plant addition, Bird Machine Co., South Walpole, Mass., 162 tons to Providence Steel & Iron Co., Providence, R. I., and 60 tons to Hub Steel & Iron Co., Boston; Munroe-Langstroth Inc., Attleboro, Mass., general contractor; Truscon Steel Co., Boston, awarded concrete reinforcing bars.

180 tons, steel warehouse, Spec. 1341, Grand Coulee dam, Odair, Wash., for U. S. Bureau of Reclamation, to American Bridge Co., Pittsburgh; bids June 7.

170 tons, further extension du Pont plant at Toledo, O., to Clinton Bridge Works, Clinton, Iowa, which formerly booked 500 tons for same plant.

170 tons, state highway bridge, North Haven, Conn., through Marani Construction Co.,

that city, to American Bridge Co., Pittsburgh. 150 tons, fertilizer plant, Charleston, S. C., through Luria Engineering Co., New York, to Bethlehem Steel Co., Bethlehem, Pa.

135 tons, state bridge and highway section, Meriden, Conn., to Bethlehem Steel Co., Bethlehem, Pa.; Arute Bros., New Britain, Conn., general contractors; Truscon Steel Co., New York, awarded 50 tons concrete reinforcing bars.

130 tons, boiler house in West Virginia, through Turner Construction Co., New York, to Bethlehem Steel Co., Bethlehem, Pa.

104 tons, mill addition for Dorr Wollen Co., Newport, N. H., to Lyons Iron Works, Manchester, N. H.

100 tons, bleaching plant, Everett, Mass., to A. O. Wilson Structural Co., Cambridge, Mass.

100 tons, bleaching plant for Maine Seaboard Paper Co., Bucksport, Me., to Groisser & Schlager Iron Works, Cambridge, Mass.

100 tons, shapes and bars, cyclotron building and laboratory, Harvard University, Cambridge, Mass., to Babcock-Davis Corp., Boston, and Truscon Steel Co., Boston; McCreery & Theriault, Boston, general contractors.

100 tons, shapes and bars, plant building, Taylor Reed Corp., Glenbrook, Conn., to Port Chester Iron Works, Port Chester, N. Y., and Fireproof Products Co., New York; Leo F. Caproni, New Haven, engineer.

### STRUCTURAL STEEL PENDING

5200 tons, subway extension, Route 110, section 12, Hillside Avenue from 178th St., to 184th Place, Jamaica, Long Island; bids to be opened by New York City Board of Transportation Sept. 30.

4500 tons, New York state bridge, Roslyn, Long Island, plans to be issued later; meanwhile figures are being taken on foundation work which involves little steel.

2500 tons, du Pont research center at New Bridge, Del.; bids closed.

650 tons, warehouse, Wichita, Kans., for Immes Dry Goods Co.

400 tons, parts warehouse, Chicago, for United Motor Services Division, General Motors Corp.

300 tons, spring steel storage building, Chicago Heights, Ill., for American Locomotive Co.

Unstated tonnage, involving several hundred tons, subway platform extensions, Brooklyn and Manhattan, group 2; bids postponed from Sept. 16 to Sept. 19.

Unstated, two 100-ton and one 60-ton traveling cranes for Coulee pumping plant; Whiting Corp., Harvey, Ill., low.

Unstated, warehouse for Coulee project; National Iron Works, San Diego, Cal., low, \$60,971

## REINFORCING BARS . . .

### REINFORCING BARS PLACED

250 tons, state highway bridge, Northport, Wash., to Bethlehem Pacific Steel Co., Seattle.

### REINFORCING BARS PENDING

2750 tons, South Side intercepting sewer, Contract No. 2, Chicago, for Sanitary District of Chicago; S. A. Healy Co., Chicago, low on general contract; bids Sept. 12.

143 tons, power house, Kankakee, Ill., for state hospital; John Moroff Co., Kankakee, Ill., low on general contract; bids Sept. 12.

100 tons, Bureau of Roads, bridge, also 100 tons shapes, Willamette national forest, Oregon; bids to Portland, Sept. 27.

Unstated, building, Chicago, for Derby Foods Inc.; bids Sept. 16

## PIPE . . .

### CAST IRON PIPE PLACED

5730 tons, 10,000 feet of 16-inch centrifugally cast water pipe, Proposal 98-46, for Department of Public Works, Chicago, to U. S.



Pipe & Foundry Co., East Burlington, N. J.; bids Aug. 5.

1480 tons, centrifugally cast water pipe, Proposal 89-46, including 5000 feet of 6-inch, 50,000 feet of 8-inch and 10,000 feet of 12-inch, for Department of Public Works, Chicago; to U. S. Pipe & Foundry Co., East Burlington, N. J.; bids Aug. 5.

1480 tons, centrifugally cast water pipe, Proposal 90-46, including 5000 feet of 6-inch, 50,000 feet of 8-inch and 10,000 feet of 12-inch, for Department of Public Works, Chicago; to U. S. Pipe & Foundry Co., East Burlington, N. J.; bids Aug. 5.

1480 tons, centrifugally cast water pipe, Proposal 91-46, including 5000 feet of 6-inch, 50,000 feet of 8-inch and 10,000 feet of 12-inch, for Department of Public Works, Chicago; to U. S. Pipe & Foundry Co., East Burlington, N. J.; bids Aug. 5.

#### CAST IRON PIPE PENDING

2100 tons, 9300 feet of 36-inch water pipe, for Department of Public Works, Chicago; bids Sept. 25.

#### PLATES . . .

##### PLATES PLACED

4000 tons, gas holder, Elizabethtown Consolidated Gas Corp., Elizabethport, N. J., to Stacey Bros. Gas Construction Co., Cincinnati.

##### PLATES PENDING

3000 tons or more, 5000-ton passenger vessel for Canadian National Steamships, contract to Burrard Dry Dock Co., Vancouver, B. C.

Unstated, water supply line, Olympia, Wash.; low bid \$1,574,151, rejected; new bids soon.

Unstated, Bow Lake airport supply line, estimated at \$1,520,573 for steel; bids to Port of Seattle, alternate concrete pipe, Oct. 3.

Unstated, \$250,000 42-inch steel water pipe for Ballard district, Seattle; bids soon.

#### RAILS, CARS . . .

##### RAILROAD CARS PLACED

Baltimore & Ohio, 2000 hopper cars, 1000 of 50-ton capacity, to Bethlehem Steel Co., Bethlehem, Pa., and 1000 of 70-ton capacity, divided equally between Pressed Steel Car Co., Pittsburgh, Pullman-Standard Car Mfg. Co., Chicago; this makes a total of 6400 freight cars now on order for this railroad, of which 4000 are hoppers and 2400 box cars.

Georgia Railroad, Atlanta & West Point, 50 box cars, to Bessemer, Ala., plant of Pullman-Standard Car Mfg. Co., Chicago.

Illinois Terminal, three baggage-coach cars, two coaches and three parlor-dining cars, to St. Louis Car Co., St. Louis.

Kansas City Southern, 100 ninety-ton pulp wood cars, to American Car & Foundry Co., New York, for account of the Louisiana & Arkansas.

Western Railroad of Alabama, 50 box cars, to Bessemer, Ala., plant of Pullman-Standard Car Mfg. Co., Chicago.

##### RAILROAD CARS PENDING

Delaware, Lackawanna & Western, three sleepers; bids asked under Clayton Act.

Missouri Pacific, 18 seventy-ton container cars.

New York, Chicago & St. Louis, 500 fifty-ton box cars, and 100 fifty-ton automobile cars; bids asked.

New York, New Haven & Hartford, 27 or 30 sleepers; bids Oct. 7 under Clayton Act.

Union Pacific, 1000 seventy-ton ballast cars and 250 fifty-ton box; in addition to 750 placed recently with General American Transportation Co. and 1000 with own shops.

##### LOCOMOTIVES PLACED

Kansas City Southern, ten 1000-hp diesel switchers; five each to Baldwin Locomotive Works, Eddystone, Pa., and Electro-Motive Division of General Motors Corp., La Grange, Ill.

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## CONSTRUCTION AND ENTERPRISE

## ARKANSAS

CONWAY, ARK.—Swift & Co., 4115 S. Packers, Chicago, contemplates spending \$100,000 for an addition to its plant.

FORT SMITH, ARK.—Oklahoma Gas & Electric Co., 321 North Harvey St., Oklahoma City, Okla., is planning construction of an electric substation to cost approximately \$100,000.

FORT SMITH, ARK.—Dixie Paper Cup Co., 421 N. Western Ave., Chicago, plans construction of a factory group to cost at least \$2,000,000 with equipment.

RECTOR, ARK.—City has let contract to Universal Supply & Machinery Co., Tulsa, Okla., for diesel electric generating unit and distribution system, to cost about \$150,000.

## CALIFORNIA

ALAMEDA, CALIF.—United Engineering Co., 500 Deale St., San Francisco, has awarded contract for a one-story, 120 x 334-foot steel warehouse to H. J. Christensen Co. & W. E. Lyons Construction Co., 3454 Harlan St., Oakland, Calif., for an estimated \$55,000. J. Hudspeth, 427 Thirteenth St., Oakland, is the architect.

BELL GARDENS, CALIF.—Metal Enameling Co., 6650 E. Slauson Ave., has awarded contract for building a 45-foot brick stack and installing furnaces in its metal enameling plant addition to Ferro Enamel Corp., 4814 Loma Vista Ave., Vernon, Calif., for \$68,000. D. R. Edwards, 5911 Pine Ave., Maywood, Calif., is the engineer.

BERKELEY, CALIF.—Trailmobile Co. has let contract to John J. Moore Co., Oakland, Calif., for a plant building at Seventh and Gilman Sts., 60 x 380 feet, to cost about \$140,000.

BERKELEY, CALIF.—A. M. Castle & Co., 4242 Hollis St., Emeryville, Calif., has received a low bid of \$97,400 for a one-story, 140 x 359-foot steel warehouse from Willis F. Lynn, 1040 Folger Ave.

BURBANK, CALIF.—Pacific Air motive Corp., 2940 Hollywood Way, has permit for plant building 322 x 352 feet, to cost about \$250,000. Contract has been let to Buttress & McClellan, 1013 East Eighth St., Los Angeles.

DAVIS, CALIF.—Fruehauf Trailer Co., 2030 Third St., San Francisco, has let contract to Collins Construction Co., 15 West Tenth St., Kansas City, Mo., for design and construction of a manufacturing plant on Davis Highway, to cost about \$175,000.

LOS ANGELES—Stone Tool Co. has let contract to William J. Moran Co., 1011 South Fremont St., Alhambra, Calif., for a machine shop building 35 x 102 feet, to cost about \$15,000, at 1127 Mississippi Ave., West Los Angeles.

LOS ANGELES—Steamaster Automatic Boiler Co., 5819 Compton Ave., has CPA approval for plant building at that address, 68 x 260 feet, to cost about \$30,000.

LOS ANGELES—Warner Truck Body Works is having plans prepared by W. M. Bostock, engineer, 8414 Otis St., South Gate, Calif., for a one-story plant building at 2911 Whittier Blvd.

PASADENA, CALIF.—Consolidated Engineering Corp. has let contract to J. A. McNeil Co., 714 West Olympic Blvd., Los Angeles, for a plant building at 620 Lake Ave., Pasadena, two stories, 72 x 120 feet, to cost about \$60,000.

RICHMOND, CALIF.—Standard Oil Co., 225 Bush St., San Francisco, has awarded contract for a machine shop and office to Swinerton & Walberg Co., same address, and Ben C. Gerwick Inc., 112 Market St., San Francisco, at an estimated cost of over \$55,000.

RICHMOND, CALIF.—Parr-Richmond Terminal Corp., R. D. Parr, president, 1 Drumm St., San Francisco, has awarded contract for 150 x 180-foot steel foundry, warehouse and office to cost an estimated \$300,000 to W.

C. Tait Co., 461 Market St., San Francisco.

VERNON, CALIF.—Percival Steel & Supply Co., 4600 Santa Fe Ave., has building permit for a warehouse addition at 4060 Santa Fe Ave., 70 x 266 feet, to cost about \$40,000.

VERNON, CALIF.—H. R. Truck & Equipment Co. has permit for erection of a shop and office building 40 x 110 feet, to cost about \$17,000.

## CONNECTICUT

SPRINGDALE, CONN.—Stamford Rolling Mills has let contract to F. D. Rich Co. Inc., 322 Main St., Stamford, Conn., for a plant addition costing about \$150,000.

## ILLINOIS

CHICAGO—Bodine Electric Co., 2254 West Ohio St., has let contract to C. W. Haynes, 135 South LaSalle St., for a one-story 100 x 278-foot plant, to cost about \$140,000. Graham, Anderson, Probst & White, 80 East Jackson Blvd., are architects.

ROCK ISLAND, ILL.—Servus Rubber Co., Second St., has let contract to Greenleaf Construction Co., Rock Island, for a three-story plant addition, to cost about \$200,000. B. A. Horn, Rock Island, is architect.

## MASSACHUSETTS

CAMBRIDGE, MASS.—Bethlehem Steel Co., Bethlehem, Pa., has let contract to McCutcheon Co., 250 Stuart St., Boston, for a two-story 32 x 35-foot and one-story 70 x 300-foot warehouse and office, to cost about \$175,000.

TAUNTON, MASS.—Geilich Tanning Co., West Water St., is taking bids for an industrial waste treatment plant costing about \$40,000. T. R. Camp, 6 Beacon St., Boston, is engineer.

WALPOLE, MASS.—Ranger Co. plans a one-story boiler plant and storage building to cost about \$55,000. F. B. Mitchell, 5 Mechanic St., Foxboro, Mass., is architect.

## MICHIGAN

DEARBORN, MICH.—Mohawk-Cabot Tool & Metal Forming Corp., 1330 Industrial Ave., has been incorporated with \$36,000 capital to manufacture tools, dies and dies, by Aladar H. Hamoborsky, 14138 St. Marys Ave.

DETROIT—Even-Heat Co., 800 National Bank Bldg., has been incorporated with \$50,000 capital to manufacture electric irons, toasters and other electrical devices, by James P. Robinson, 9604 North Martindale St.

DETROIT—American Liquid Gas Inc., 2740 Book Tower, has been incorporated with \$151,500 capital to manufacture gas plant equipment, by Richard T. Hill, same address.

DETROIT—Price Machine Products Co., 904 Michigan Bldg., has been incorporated to manufacture screw machine products, by W. P. Leyland, 5788 Van Dyke Ave.

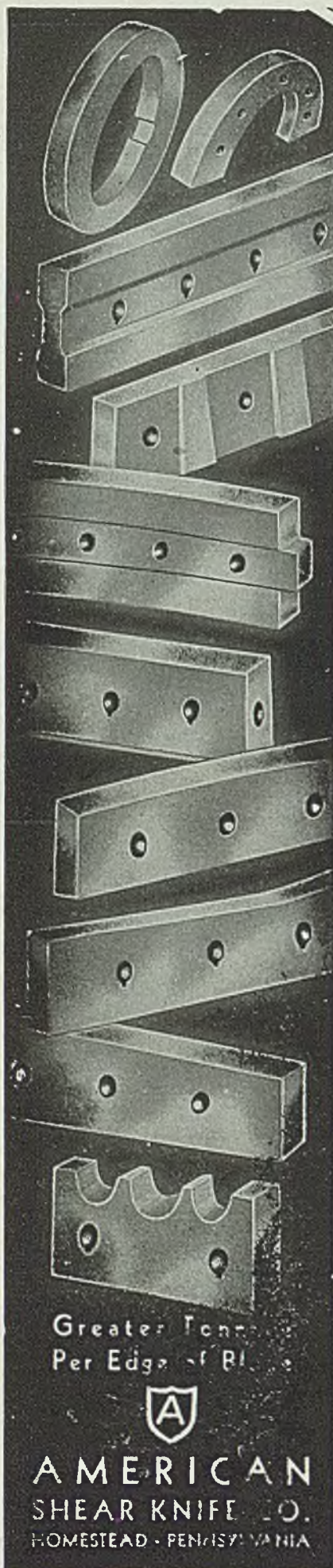
FARMINGTON, MICH.—Royal Tool & Die Inc., 29740 Grand River Ave., has been incorporated with \$100,000 capital to manufacture tools and dies, by Jacob M. Heck, 26423 Puritan Ave., Detroit.

FERNDALE, MICH.—Walker Wire Co., 660 East Ten-Mile Rd., has been incorporated with \$50,000 capital to manufacture wire products, by A. O. Johnson, 314 Waverley St., Royal Oak, Mich.

FLINT, MICH.—Flint Iron & Wire Works Inc., 3423 South Saginaw St., has been incorporated with \$50,000 capital to conduct a wire fabricating works, by Joseph Maldaner, 1481 Friel St.

HAZEL PARK, MICH.—Dequindre Tool & Mfg. Co., 21009 Dequindre Ave., has been incorporated with \$50,000 capital to manufacture tools, dies, jigs and fixtures, by Richard H. Werner, 6607 Kingsley Ave.

ISHPEMING, MICH.—Interlake Iron Co.,



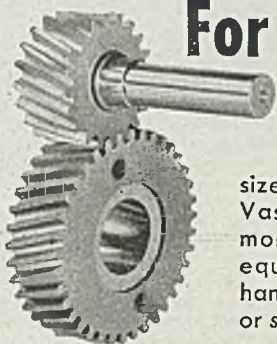
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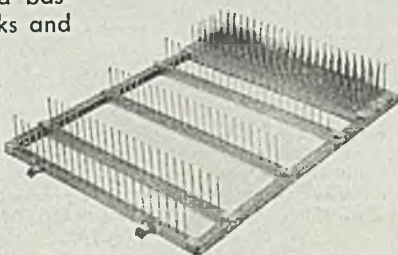
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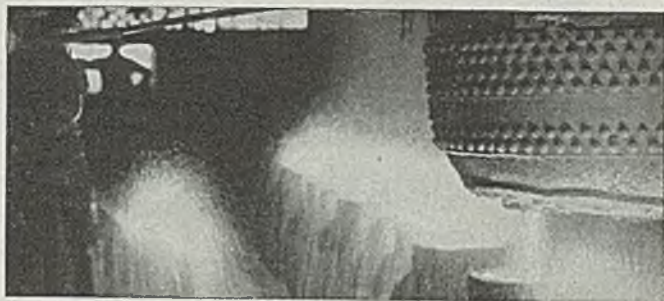
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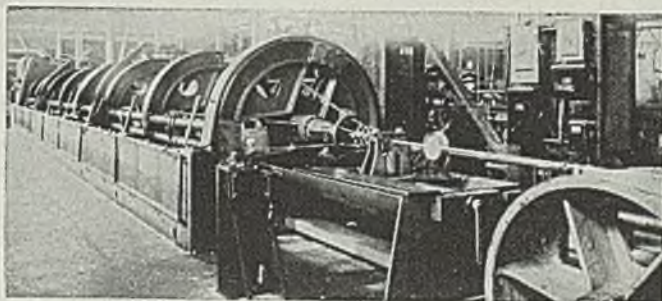
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CLEVELAND, OHIO

Ishpeming, has let contract to MacDonald & Kaake, Marquette, Mich., for an ore dressing plant and laboratory, to cost about \$120,000.

**MARSHALL, MICH.**—Engineering Castings Inc., 600 South Kalamazoo Ave., has been incorporated with \$50,000 capital to manufacture castings and fabricated metal products, by David W. Boyd, 403 North Kalamazoo Ave.

**MUSKEGON HEIGHTS, MICH.**—Michigan Spring Co., 218 Danigelis Bldg., has been incorporated with \$250,000 capital to manufacture coil and other springs, by Herbert W. Johnson, RFD No. 1, Muskegon, Mich.

### MISSISSIPPI

**JACKSON, MISS.**—Mississippi Power & Light Co., R. I. Brown, president, 246 East Capitol Ave., has let contract to Ebasco Services Inc., 2 Rector St., New York, for design and construction of a 30,000-kva steam-electric generating plant, to cost about \$4,500,000.

### MONTANA

**BILLINGS, MONT.**—Carter Oil Co. is planning to construct a refinery to cost \$8,000,000.

### NEW YORK

**BUFFALO**—Larkin Co., 745 Carroll St., has let contract to Siegfried Co. Inc., 6 North Pearl St., for a one-story 45 x 150-foot boiler plant with coal silos, to cost about \$250,000. J. G. Schwartz, 810 Main St., East Aurora, N. Y., is architect.

**TONAWANDA, N. Y.**—Lake Erie Engineering Corp., Woodward and Riverview Aves., Buffalo, has let contract to Siegfried Construction Co. Inc., 6 North Pearl St., for a one-story crane way building 80 x 115 feet, to cost about \$100,000. J. G. Schwartz, 810 Main St., East Aurora, N. Y., is architect.

### OHIO

**CLEVELAND**—Modular Metalware Mfg. Co. has been incorporated to deal in iron, steel and aluminum and to manufacture ferrous and nonferrous metal products by William Marcus, 2528 Mayfield Rd., and Wilbur W. Merkel, vice president of C. S. Bush Iron & Steel Co., 865 East 67th St.

**LORAIN, O.**—Iroquois Tool & Die Co., Detroit, has established a branch plant at 1653 East 28th St., in charge of Clarence Beske.

**NILES, O.**—American Brakeshoe Co., 230 Park Ave., New York, has let contract to James Stewart Co., 230 Park Ave., New York, for a one-story 60 x 300 and 120 x 120-foot plant and office building, estimated to cost about \$350,000.

**UHRICHVILLE, O.**—Mechanisms Co., recently incorporated to manufacture tools, dies and toys, by E. W. Roth, president, and J. M. Roth, secretary-treasurer, has leased a 40 x 65-foot building at 118 East Second St. and is installing new equipment.

### OREGON

**WEST LINN, OREG.**—City will open bids Oct. 2 for a 75,000-gallon elevated steel tank, to plans by Cunningham Associates, Portland, Oreg. G. E. Woodward is city clerk.

### PENNSYLVANIA

**PHILADELPHIA**—Victory Metal Mfg. Co., Wharton and Front Sts., has let contract to D. Iovachinni, 115 South Fairview Ave., Highland Park, Pa., for a one-story 54 x 100-foot plant addition, to cost about \$60,000.

**PHILADELPHIA**—Drexel Institute of Technology, 32nd and Chestnut Sts., will let contract soon through Edward P. Simon, architect, 123 South Broad St., for power plant alterations costing about \$75,000.

### TENNESSEE

**DAYTON, TENN.**—Dayton Foundry & Stove Co. has been incorporated with Dr. A. C. Broyles as president with \$100,000 capital and will construct a plant to manufacture gray

iron castings for autos, farm implements and electric appliances, as well as stoves.

### TEXAS

**HOUSTON, TEX.**—Houston Transit Co. has made approval for 45,000-square foot garage to cost about \$500,000. Howe & Wise are consulting engineers and Wilson, Morris & Crain are architects.

**PORT ARTHUR, TEX.**—Gulf Oil Corp., Port Arthur, is taking bids for two oil distilling plant units to cost about \$2 million each.

**TEXAS CITY, TEX.**—Monsanto Chemical Co., Texas City, is asking bids on a new styrene plastic plant to cost about \$750,000 and improving present plant at cost of about \$500,000.

### WASHINGTON

**OLYMPIA, WASH.**—State pollution control commission has approved a \$4 million sewer and treatment plant project for Spokane, the state contributing a portion of the cost.

**PUYALLUP, WASH.**—H. F. Green, city clerk, will receive bids Sept. 25 for a steel stand-pipe of two million gallons capacity.

**SEATTLE**—Bureau of Reclamation, Denver, Michael W. Straus, commissioner, has let contract to American Bridge Co., Pittsburgh, for a steel warehouse 105 x 300 feet, 25 feet high, at Grand Coulee dam, to cost \$82,558.

**SEATTLE**—Leckenby Structural Steel Co., 1928 Utah St., is building a new plant on a four-acre site on Eleventh Ave. SW., with shop 62 x 100 feet. Standard fabricating equipment will be installed, including welding equipment, punches, etc.

**SEATTLE**—Western Starch Producers Inc. has been incorporated with \$25,000 capital, by Harold Reedmaker, Second Ave. Bldg.

**SEATTLE**—Northwestern Welding Co. has been incorporated with \$25,000 capital by Robert D. Reynolds and Associates, 177 River St.

**SPOKANE**—Pacific Rockwool Co., subsidiary of Carney Co. Inc., Mankato, Minn., H. E. Carney, president, plans construction of a \$100,000 insulation manufacturing plant at Dischwood, Wash.

### WISCONSIN

**BELOIT, WIS.**—Beloit Iron Works, 815 Second St., has let contract to Cunningham Bros., 359 East Grand Ave., for a one-story 130 x 190-foot plant addition, to cost about \$200,000.

**GREEN BAY, WIS.**—City, City Hall, has let contract to H. Bishop, 1120 McCormick St., for an incinerator building, to cost \$115,674.

### CANADA

**CHIPPAWA, ONT.**—Norton Co. has let contract to Smith Bros. Construction Co. Ltd., Ellen Ave., Niagara Falls, Ont., for a one-story plant addition to cost about \$20,000.

**THOROLD, ONT.**—Canadian Ohio Brass Co., Thorold Rd., has let contract to Smith Bros. Construction Co., Ellen Ave., Niagara Falls, Ont., for plant buildings to cost about \$50,000.

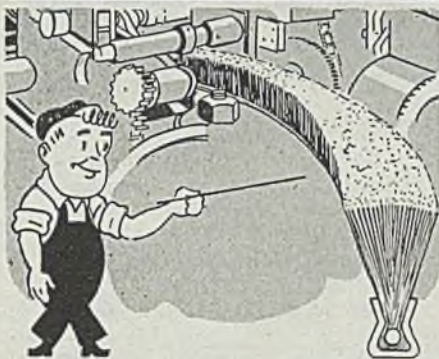
**TORONTO, ONT.**—Iron Fireman Mfg. Co. of Canada Ltd., 602 King St. West, has let contract to R. J. Hibbe Construction Co. Ltd., 15 Trent Ave., for plant and office building to cost about \$100,000 from plans by J. H. W. Bradfield, architect.

**MONTREAL, QUE.**—City Wire & Iron Products Co., 1590 Laurier Ave. East, is having plans prepared for a plant addition to cost about \$50,000.

**MONTREAL, QUE.**—Diamond T. Motor Trucks Montreal Ltd., 87 Prince St., is taking bids for construction of a plant on Smith St., to cost about \$75,000. Thomas W. Burge, 4059 Beaconsfield Ave., is architect.

**ST. JOHNS, QUE.**—Singer Mfg. Ltd., 165 St. Paul St., has let contract to Anglin-Norcross Corp. Ltd., 892 Sherbrooke St. West, Montreal, Que., for construction of plant buildings to cost about \$500,000. T. Pringle & Son Ltd., 485 McGill St., Montreal, are engineers.





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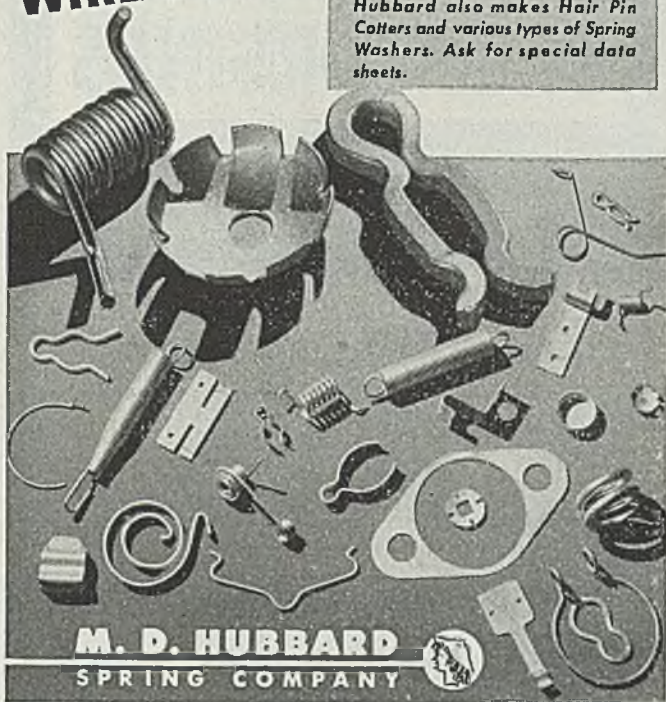
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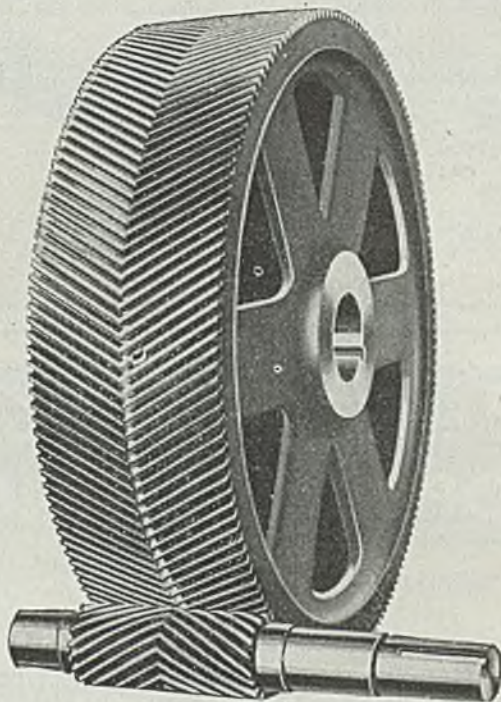
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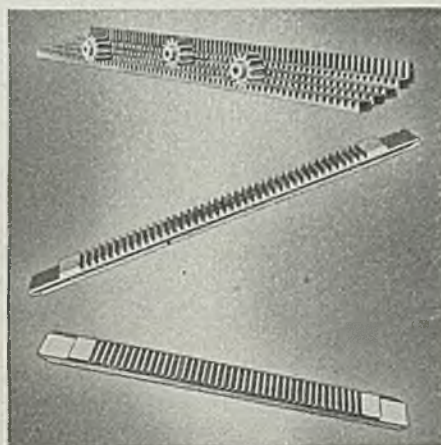


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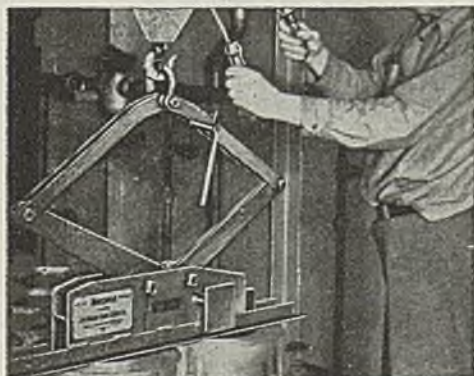
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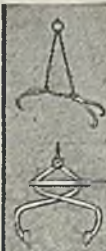


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1456	2" x 1" x 22'0"	150#	218,400#	1	5 1/2" x 5/8" x 20'0"	234#	234#
30	3" x 3/4" x 20'0"	154#	4,620#	3	6" x 1" x 3'0"	61#	183#
401	4" x 3/4" x 22'0"	224#	89,824#	114	6" x 1" x 17'0"	347#	39,558#
14	4" x 2 3/4" x 20'0"	748#	10,472#	29	6" x 1" x 25'0"	510#	14,790#
30	4" x 2 3/4" x 22'0"	823#	24,690#	113	6" x 1" x 30'0"	612#	69,156#
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