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STEEL

ESTABLISHED 1882

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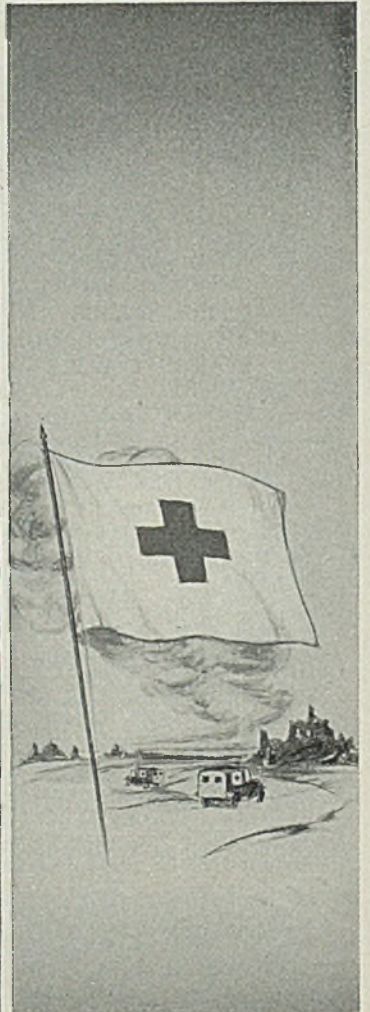
PRODUCTION • PROCESSING • DISTRIBUTION • USE



LARA BARTON, founder of the American Red Cross, was born in Worcester County, Massachusetts, in 1821. Typically American in its Service to Humanity, this great institution is also typically American in its call for your help — without compulsion. Plan to keep giving — generously . . . Send your contributions to your local chapter.



YOUR RED CROSS NEEDS YOU!



MORGAN CONSTRUCTION COMPANY, WORCESTER, MASS.

HIGHLIGHTING

THIS ISSUE OF

STEEL

Manufacturers are urged to read, again and again, the message which Donald M. Nelson broadcast to the public last Monday night. STEEL (pp. 30-32) prints it in full. He asked for a 25 per cent increase in war production with existing facilities—but he did much more than that. His address, in the opinion of E. L. Shaner, STEEL's editor-in-chief (p. 29) "was by all odds the most practical call to action which free people have heard or read in this war." Assignment of production quotas with day-by-day scoreboards in each shop, the establishment of awards to meritorious workmen, with messages and speeches from the soldiers and sailors who use the weapons to the workers who make them are measures calculated to inject vitality in the production drive.

Steel warehouses are prohibited from accepting deliveries in excess of assigned quotas (p. 42); ratings covering mining machinery repairs have been elevated; cutting tool manufacturers must use the Production Requirements Plan after April 1; warning is given of a shortage in chlorinated solvents; the zinc pool is growing rapidly in size; lead pool for March is 15 per cent of January output; use of jewel bearings is further restricted; copper will be available to the railroads. . . . Conservation Order M-81 which restricts tin and terne plate can sizes has been modified so as to permit shipment of cans of any size if already manufactured or in process on Feb. 11.

Zinc Pool Is Growing

WPB officially sponsors the new AISI-SAE standard steels (p. 39); bus manufacturers now have an industry advisory committee. . . . OPA is reorganizing to meet new duties and responsibilities (p. 44). . . . The United States will help to develop Brazil's iron and rubber resources (p. 43). . . . Rationing of trailers, trucks, tractors has been formulated (p. 45); building materials are under new restrictions. . . . The

Standard Steels Made Official

domestic manganese program is expected to result in annual production (p. 56) of 600,000 tons. . . . Steel strapping carries an A-10 rating under P-100 (p. 53). . . . Vastly improved tanks are seen as forthcoming in the near future (p. 47). . . . 1942 Lake ore movement is expected (p. 50) to top 85,000,000 tons. . . . More government inquiries and subcontract opportunities are announced (p. 55). . . . The famous Wrigley sign in Times Square succumbs to the scrap drive (p. 58).

WPB's job instructor training program is aimed to train (p. 62) supervisors in the art of so instructing both new and old hands as to get them into maximum war production quickly. . . . Only minor adjustments are required to swing idle porcelain enameling furnaces (p. 68) and the facilities of a toy factory (p. 70) into war production. . . . Paul J. McKimm (p. 76) details the deoxidation phase in the manufacture of high-quality, low-cost steel. . . . A newly designed lighter weight cast iron stool described by William W. Bergman (p. 86) besides giving more service uses about 32 per cent less cast metal. . . . Aircraft cylinders are now being turned out on a high production basis by automatic metal spraying equipment (p. 92): a two-machine line now is turning out a finished part every 75 seconds.

Instructor Training

Aircraft Forgings

In a fifth article dealing with forgings, A. H. Milnes (p. 64) takes up the subject in relation to aircraft, pointing out factors to be considered in turning out quality drop forgings. . . . Harold Lawrence (p. 72) discusses measuring of weldability by the use of the hardness test, and tells what must be done to interpret results properly. . . . A well planned materials handling set-up (p. 83) enabled a West coast contractor to get into war production 4 months from the time a contract was awarded. . . . Arthur F. Macconochie (p. 88) relates the advantages of abrasive-disk cutting of steel and hard metals.

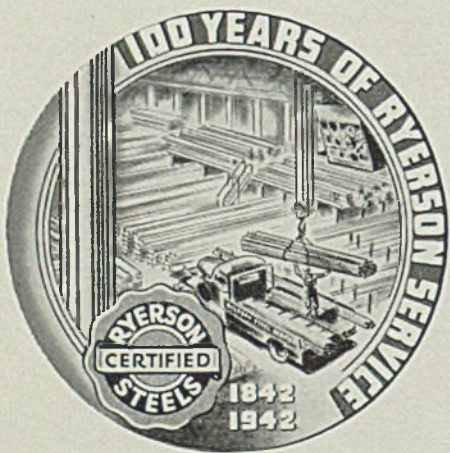
Whenever Steel is Needed..

In peace and war, in good times and bad—year-in year-out for a century—Ryerson stocks of steel have been American industry's prompt, dependable source of supply.

Today, war production requirements come first—but Ryerson is serving, too, the needs of other essential industries from which flow the goods that feed, clothe and house the nation,—that supply its power, its minerals and other raw materials—all part and parcel of the mighty war endeavor.

The two-fold Ryerson function is to supply steel where needed, without delay—and to aid in the most effective, intelligent use of that steel in every way that experience and skill can suggest.

Wartime demands have made inroads in Ryerson stocks, but Ryerson resources are at your command, to assist you in meeting any problem of steel supply or application.



Joseph T. Ryerson & Son, Inc.,
Chicago, Milwaukee, St. Louis,
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Buffalo, Boston, Philadelphia,
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RYERSON

STEEL

March 9, 1942

BLUEPRINT FOR MORE PRODUCTION NOW

No American can afford to ignore or to discount the tremendous importance of the message which Donald M. Nelson addressed to the public last Monday night.

It was by all odds the most practical call to action which free people have heard or read during this war.

Most of the famous utterances of Winston Churchill and Franklin D. Roosevelt have dealt with lofty ideals and matters of broad policy. These eminent statesmen have been forced to temper their remarks to meet the exigencies of delicate diplomacy abroad and embarrassing politics at home. For this reason --perhaps--their speeches, while deserving the highest rating as state papers, have fallen short of inducing the people of free nations to shake completely their attitude of complacency.

Mr. Nelson, unrestrained by considerations of state and party, was able to speak more plainly. He went right to the heart of the foremost problem of the hour, which is more production now by American industry.

With straight-from-the-shoulder word punches, he drove home the basic idea that anyone who is not doing every single thing within his individual power to see that the planes, tanks, guns and ships--which the boys in Bataan and in the Indies need so desperately--are getting into their hands faster and in ever-increasing quantity, is in reality "helping the Axis win this war."

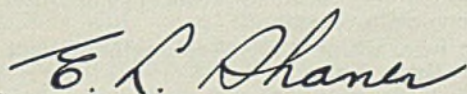
Mr. Nelson announced a new, intensive production drive. Shop quotas will be established and every plant will be asked to keep a "production scoreboard." He hopes to develop inter-plant competition--the popular American sport of outdoing the other fellow in performance.

It will work. It worked marvelously well in World War I. It will work now despite restrictions imposed by law and custom in recent years.

Mr. Nelson will arrange for men on the battle line to tell men on the production line how equipment of their construction performs under fire. This is a capital idea. It will do more for morale than 50 Acts of Congress and a dozen fireside talks.

Mr. Nelson asks for a 25 per cent increase in production with existing facilities. If every one of us does his level best, we will make it 30, 35 or 40 per cent. The WPB chief reminds us that we have but 10 months--304 days (now shrunk to 297 days)--to achieve our goal for this critical year.

Time enough for American industry, imbued with the right spirit, to help all Americans to rediscover America in 1942!



Editor-in-Chief

★ ★ ★ ★ ★ ★ ★

Work as You Never Worked Before!

Nelson's Inspiring Message to Nation

EDITOR'S NOTE: The radio speech March 2 by Donald M. Nelson, chairman, War Production Board, is reproduced here in full because it generally is considered to be the "blueprint" and keynote for industrial operations in the critical "ten silver months" ahead

My fellow Americans:

I have come to this microphone tonight to talk about one thing, particularly to the managers and the workers of American industry. It is deadly serious. I want to ask you a question I have been asking myself:

Are you doing everything within your power today to put more weapons into the hands of our fighting men?

I emphasize today because the arms we produce tomorrow, next month or next year are not going to the men who need them today, and they need them desperately today.

Let us look at the other side of the picture for a minute. In Germany, in Japan, in the conquered countries, millions of men are bound to their tasks under threat of death, under threat of concentration camps, under the whip and the goad of the secret police.

We are not fighting enemies whose production is free. We are fighting enemies where management is force and where labor is forced. Both, upon pain of death, must do exactly what they are told and exactly as much as they are told. They are actually slaves. That is what we are up against—a Germany and a Japan whose production is at its peak.

So, I ask you—all of you free men and free women—can we beat it? The answer is to be found particularly in what you men in the war production plants—management and labor—what you do about it now—today.

"What Have You Done About It Yourself?"

I have talked to men who blame labor for lack of production. I have talked to labor leaders who blame management for lack of production. I have talked to managers who blame their suppliers. I have talked to suppliers who blame scarcity of materials. And I have talked to a lot of people who blame Washington.

My answer to each of these people has been: What have you done about it yourself?

To the business men who blame labor, I say:

What have you done to settle the problem forthrightly instead of merely complaining? Have you really tried to remove the causes of just complaints against working conditions in your plant?

To the representatives of labor, I say: Have you really gone to the limit to adjust your differences without stopping production?

To those who whine that Washington hasn't done enough for them I say:

Where is your initiative? Where is your enterprise? You are always talking about preserving free enter-

prise. What is it? Do you usually get business by waiting for the customer to call you and ask you to take an order? Have you made a thorough study of what the customer wants? Are you prepared to convert your machinery to those needs? Can you show us what you can do? There isn't time for the Army and Navy to determine what every plant can make. There must be initiative and enterprise at the other end of the transaction.

If you can show the Army and Navy what you can do and are prepared to do it, most of the problem is solved.

Almost without exception, every one of these people I have talked to feels the urge to do more. The trouble is not with their intentions. The trouble is rather too strong a tendency to pass the buck—to blame the other fellow. Work is slowed down, production is lost and the men in the foxholes with MacArthur, the men in the Indies, our boys on land and sea and in the air are the first to suffer, and suffer death.

... "Helping the Axis Win This War"

So I ask industry; I ask the men in the plants; I ask all of you who can contribute so much to ever greater production—look into your hearts, look into your minds—be honest with yourselves individually and answer my question:

Are you doing today every single thing within your individual power to see that the planes, the tanks, the guns and ships, the ammunition and equipment those boys need desperately is getting into their hands faster and in ever-increasing quantity.

I'm not talking tonight merely to hear the sound of my own voice. Nor am I appealing to you. I am telling you that unless we can answer that question with a loud, positive yes, we are, in reality, helping the Axis win this war.

It is the production line that supplies the battle line. But it is on the battle line that freedom is being defended—where your right to free enterprise; your right to collective bargaining; your right to criticize; your right to worship as you please—it is on the battle line that those things you hold more precious than all else are being defended. It is on the battle line that men—fathers, sons, brothers, boys you know, have pledged their lives to this thing for their country, for you and for me. And their success in this heroic undertaking depends entirely upon what we—you and I—here at home—you and I on the production line—do to give them the stuff they need to destroy the enemy.

Let's put it another way. Have you clenched your



Donald M. Nelson, Delivering His Radio Address

fists, impatient to get at the Japanese for what they did at Pearl Harbor? How many MacArthurs does it take to make you mad. Doesn't your blood run faster as you read of the undersea raiders operating within a torpedo's length of our own shores?

If these things have left you indifferent; if these things have not brought you to your feet alert and mad, determined that they shall stop and that those who inflict this bloodshed upon us shall be destroyed, then you are not worthy to be called American.

But I know that most of you are mad. So, I ask you to put that heat and indignation—that fight—into that job of yours, whatever the job may be. It doesn't matter whether you tend a lathe, boss a production line or manage the plant. If you, every one of you, start tomorrow putting that extra bit of drive; that extra head of steam; that extra measure of determination into the job at hand, we can win with a minimum loss of blood and treasure.

In doing that we carry the fight into our plants. We then move faster toward our goals, by which I mean the 60,000 military planes, the 45,000 tanks, the 20,000 anti-aircraft guns and the 8,000,000 tons of merchant ships the President has said we must have this year.

"Greatest Production Job in History"

This is the task before us. It is the greatest production job in history. And it must be done this year—the year 1942. We have but ten months to go—304 days—in which to strengthen our striking power to a point where victory can come within our grasp.

Think for a moment of 304 days—304 days out of three score years and ten—the life of a man. In the lives of men now living those 304 days immediately ahead can shape the whole course of history for a thousand years, and shape it to our way of life.

Is it not then worth while to give up all else but war and production for war during those 304 days? Could any right, privilege, profit or material possession of which we voluntarily deprive ourselves during those 304 days to gain our end compare with what we gain by so doing? Failure to achieve that end can mean the end of freedom throughout the world for centuries to come.

Can we not understand what that would mean not only to those now living but to generations yet to

come? I think we can and by dedicating ourselves wholly to this task we'll make those goals—yes, and exceed them.

To help us do all this and to give us the genuine feeling of participation that we need, the President has asked us for a great production drive. I am, therefore, writing the management and workers in plants engaged in primary war production asking them to set up joint management-labor committees within each of those plants to run this drive to push production up to and beyond the President's goals.

And right here I want to say that this is no sly scheme to speed up men and machines for profits' sake. It is instead a job in which we all can take a hand, and share in its success. Out of it must come greater production per machine and much greater use of each machine now operating. We cannot always wait for new ones.

"We Must Have Full, Three-Shift Operations"

We must have full, three-shift operations of those we have. We cannot be satisfied until we've come as close as possible to the limit of 168 hours of work per machine per week.

In doing that I am confident we can increase production at least 25 per cent on existing equipment. That we must do and let no man fear that by putting more steam into his effort he'll soon run out of work. It is because there is so much yet to do that we must move faster than we have thus far.

To bring the goals closer to men and management I am assigning production schedules to the primary producers. They'll get a quota for the drive. These quotas are based on what we know a plant can do to meet the President's goals.

They are not, however, the most the plants can do. No man can set a limit upon our will and determination once we have resolved to do our utmost.

That each man may measure his determination visually I am asking the plants to erect a production score-board within the shops upon which each schedule can be laid out. There every man can see what lies ahead each day. In fact the joint committee can mark each shift's progress toward the goal.

"Every Workman Can Be a Member of the Team"

I want quotas broken down for each division within the plant so that every man working on every contract can be a member of the team.

On the way he does his job depends the fate of all of us—the fate of our soldiers, sailors and airmen, of our families and friends.

Upon the way that job is done rest all our hopes for future years.

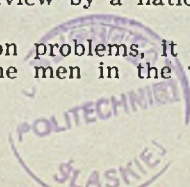
We Americans love competition—the matching of wills and skills in sport and trade. Here in this plan, we have in effect the greatest competition of all time in which the wills and skills of American industry—men and management—can really make freedom ring around the world.

In this production drive I am also asking the joint committees in each plant to provide machinery whereby each man may submit ideas and suggestions for doing the job better. These ideas and suggestions will be studied each week by the committees. Those found sound will be forwarded to Washington. Our engineering staff will examine them. Those proved valuable will be made available to other plants. Thus we tap a vast new reservoir of ideas, welding our productive genius into a united effort for victory.

Our Army and Navy have systems of commending merit of high order in the line of duty. There is also merit of a high order on the production line in this war. I have therefore proposed that the production soldier shall also be recognized for meritorious service to his country.

Individuals making special contributions to greater production will, upon recommendation of the local plant committees and subject to review by a national board, be given awards of merit.

As I have studied our production problems, it has seemed to me unfortunate that the men in the war



plants so seldom have an opportunity to know how the plane, the tank, gun or ship they have constructed, has performed.

Consequently, I am asking the Army and the Navy to arrange for men at sea and at the front who are using these instruments of warfare, to report directly to the men who built them. I want them to tell us how the job's been done. They are the only ones who really know. To do this we will use every possible means to extend a line of communication between the plants and the theaters of war.

Here in Washington, we can but outline the basic framework of this production drive. We can give guidance and make suggestions. Success depends upon the men and women in industry—the men and women out there on the production line. The war can be lost in Washington. It cannot be won here. That can be done only on the battle lines that now extend around the world and on the production lines that extend across this nation. Those production lines will determine whether we hold the battle lines and whether ultimately we crush the enemy.

Hard months are ahead. You know that. The materials for war are for the most part materials of peace. Peace has given way to war and many of the materials which gave us those conveniences we have come to take for granted must now be devoted ex-

clusively to the production of guns, tanks, planes, etc.

In the months ahead there will be privation and there will be hard work. Yet, if I understand the temper of the American people, there will not be complaint or protest if the job is well done. But to do it well, those of us on the production line have got to get into this fight now. It's a fight in which no holds are barred. Our enemy has suspended all the rules. We can't fight by the book. For that reason nothing can be allowed to delay production.

There must be sweat and action on the production-line to match the blood and action on the battle-line.

We must train our sights on 168 hours per week of machine-time to match the 168 hours per week of machine-gun time.

The men of the production-line dare do no less than the men of the battle-line.

So, in closing, let me remind you once more that the slaves of Germany and the slaves of Japan are producing arms at a peak which we must equal and then surpass—quickly.

I therefore say to you free men and free women on the production-line—to the free management of American industry—work as you've never worked before that we may defeat an enemy more ruthless, brutal and bloody than we ever faced before.

Industry Pledges Support to Nelson's Accelerated War Materials Program

FURTHER increase in the tempo of war materials production was undertaken by steel and metalworking companies last week, in line with program outlined by WPB Chairman Donald M. Nelson in his address to the nation March 2.

Mr. Nelson ordered an immediate speedup in arms production to better the President's goal for planes, tanks, guns and ships, and proposed round-the-clock operations to boost output on existing machines by 25 per cent.

A four-point program to achieve the goal was advanced:

1. Establishment of joint labor-management committees in each war plant to direct production "up to and beyond the President's goal."
2. Assignment of production quotas to each primary producer, with day-by-day scoreboards in each shop.
3. Awards of merit to workmen "making special contributions to greater production."
4. Speeches and other reports, by soldiers and sailors, who use the weapons, to the workmen who build them.

Some of these proposals already are in effect in plants producing arms. A favorable reaction by industry and labor to Mr. Nelson's address indicates they will be instituted in others in the immediate future.

Proposal for the joint shop committees came as a surprise to some plant managers, due to seeming similarity to the proposal by CIO

President Philip Murray for joint labor-management planning of production. Analysis of Mr. Nelson's speech, however, reveals a fundamental difference in the two proposals. Where the Murray plan contemplated co-operative planning at

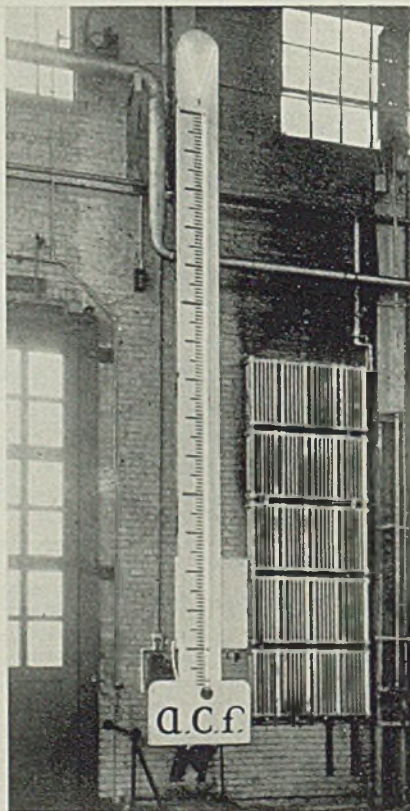
the top and on an industry basis, the Nelson program proposes closer teamwork in the shop, where the work is done, for the sole purpose of speeding up war production.

With the other proposals, this involves no more than the ordinary ingredients for teamwork that many companies have employed for years.

Many industrial leaders immediately pledged full support to the program. Some said they would not only meet Mr. Nelson's goal but would exceed it.

B. F. Fairless, president, United States Steel Corp., wired the war production chieftain as follows:

"Every man and every faculty in United States Steel is squarely behind the production program outlined in your radio address last night. Armed forces fighting to defend the liberties of the United Nations can count on the production soldiers of United States Steel to back them to the limit until final victory is won."



◆
PRODUCTION indicator in one of the American Car & Foundry Co.'s plants on war work. Daily output is shown by means of lights. A contest was held recently to decide on a slogan, and a machinist received a prize for submitting the winner: "Volume for Victory"

Bethlehem's Report to Employees Stresses Need for Peak Production

"WE CANNOT all serve in the front lines but we can all help to see that America's war production can never be called 'too little and too late'" said E. G. Grace, president, Bethlehem Steel Corp., in the company's annual report to employees.

Bethlehem has assumed responsibility for the manufacture of over \$1,000,000,000 worth of vessels and war materials and is currently adding to these responsibilities, Mr. Grace stated.

Company's average rate of operations, ingots and castings, in 1941 was 101.5 per cent, against 93.3 per cent in 1940. Ingot capacity rose to 12,700,000 tons per year, an increase of 850,000 tons, representing five times its capacity in World War I.

"Every forward surge of the tide of aggression has demonstrated that victory almost inevitably goes to the side with the greatest mass of equipment," said Mr. Grace in an appeal to employes for acceleration of war output. "That makes production a vital phase of the fight to preserve our liberties. Furthermore, this country can't set its sights too high on war material production. The excess beyond that necessary to win will bring victory with less expenditure of human lives.

"In this great work every one of the 200,000 employes is playing a vital part. We are assuming almost daily additional responsibilities for more production in various lines needed by our government and allies

for successful prosecution of the war. That places a high responsibility on each of us to see that our respective duties are carried out with the utmost efficiency and speed. It is urgent that equipment be rushed to our fighting forces. The sooner they can start carrying the war to the enemy the sooner victory can be won and the wastage of war stopped . . .

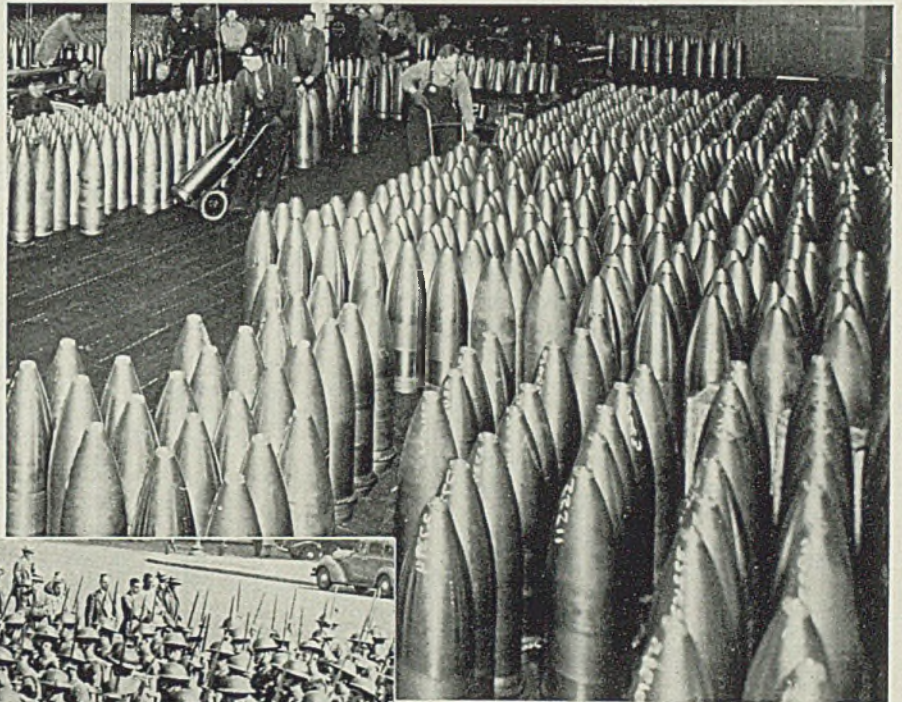
"Never before in the history of America has there been such urgent need to accomplish great feats of production in a hurry. I am confident that Bethlehem will more than measure up to any job it may be called upon to handle."

Mr. Grace pointed out that from

the outbreak of this war up to the time of America's involvement approximately \$200,000,000 had been authorized for facilities to equip Bethlehem plants for their part in the growing emergency, \$95,000,000 of which was for facilities to be owned by the government but operated by Bethlehem. Since then over \$150,000,000 more has been authorized for facilities to handle the corporation's increased production under war conditions, \$126,000,000 of which is being supplied by the government.

A total of 45 ships slid down the ways in Bethlehem shipyards during 1941 and it is expected that launchings will average two per week in 1942, the report states. Bethlehem's shipbuilding program includes not only naval vessels, but also mass production of "Liberty Fleet" ships of which 62 were on order in 1941. Orders from the U. S.

(Please turn to Page 125)



Mr. Grace Writes a Caption

"This country can't set its sights too high on war material production," said Mr. Grace. "The excess beyond that necessary to win will bring victory with less expenditure of human lives"

Daily Average Pig Iron Output in February Second Highest on Record

PIG IRON production in February aggregated 4,503,962 net tons. This was a drop of 454,823 tons from the January figure. However, February was a 28-day month; its daily average rate of 160,856 tons was the second highest record in history and was exceeded only by the December rate of 161,774 tons. In February the daily rate was 6.81 per cent above that of January.

The February production was up 6.58 per cent from February of 1941, and up 36.30 per cent from February of 1940, thus demonstrating the rapidity with which capacity has increased over the past two years.

The two-month total for 1942 was 9,462,747 net tons, compared with 8,873,059 for 1941 and 7,328,924 in 1940. This is an increase of 6.6 per cent over 1941 and 29.07 per cent over 1940.

The 1942 daily average so far has been 160,408, against 150,284 in 1941 and 121,884 in 1940.

The average operating rate in February was 97.22 per cent of ca-

capacity as of Jan. 1, 1942, being figured on the basis of 28 days' production in comparison to the daily capacity of 165,463 net tons.

Total stacks at the end of February numbered 232. Stacks active on the last day of the month numbered 220, compared with 219 at the end of January and 218 at the end of December.

Merchant iron, including ferromanganese and spiegeleisen, was produced in the amount of 621,829 net tons in February, or 13.80 per cent of the total. So far in 1942 it has been 13.89 per cent of the total. In all of 1941 it averaged 14.58 per cent of the total, thus indicating a trend toward a lower percentage for merchant iron.

Only change in the operating picture that developed during the month was the blowing in of the Provo, Utah, stack.

Rustless Iron & Steel Corp. reports net profit for the year of \$2,334,627, equal to \$2.42 a share

on 926,212 common shares, after federal income and excess profits taxes. Company paid \$1,275,993, or \$1.28 a common share, in 1940.

In 1941 period, federal income and excess profits taxes totaled \$5,325,000, compared with \$1,274,000 in preceding year.

Effect of Freight Rate Increase on Steel Studied

WASHINGTON

FULL reaction of the steel industry to the railroad freight rate increase authorized by the Interstate Commerce Commission last week is not yet measured in terms of price changes for iron and steel.

The increase is expected to take effect March 18. It is 6 per cent on finished iron and steel products, pig iron and scrap; 3 per cent on furnace slag other than ground open-hearth basic slag; and 4 to 6 cents per gross ton for coal and coke. The rates on iron ore are not advanced.

Inclusion of scrap caused considerable surprise in the industry, due to the difficulty experienced in finding amounts sufficient for current needs, and the long distances over which much of it must be carried to the furnaces.

As steelmakers studied the decision, opinion was divided as to its ultimate effect. However, they generally were inclined to accept the increases, seeing little possibility for an appeal, since this was a revenue and not a rate case.

Chicago district producers were quoted as saying they saw little justification in the rise for higher steel prices at this time.

Pittsburgh executives saw indications of a 15 to 20-million-dollar increase in costs to the entire industry, mainly on inbound materials, since more steel is now moving on an f.o.b. mill basis than normally.

A Cleveland mill official predicted a 12 to 15 per cent increase in costs, with a total freight bill increase to the mills of \$20,000,000 to \$25,000,000.

This year capacity steel operations have whittled iron ore stock piles to the point where companies have been forced to resort to the more expensive overland haul, where normally this traffic is moved by vessel. One traffic expert inclines to the belief that this factor was taken into consideration when ore rate increases were waived.

PIG IRON STATISTICS

RATE OF FURNACE OPERATION (Relation of Production to Capacity)				
	1942 ¹	1941 ²	1940 ³	1939 ⁴
Jan.....	102.89	95.5	85.4	51.0
Feb.....	97.2	95.3	75.0	53.5
March.....	96.3	96.3	69.5	56.1
April.....	91.8	68.9	49.8	
May.....	94.1	74.2	40.2	
June.....	95.7	83.6	51.4	
July.....	97.0	86.1	55.0	
Aug.....	97.4	89.9	62.4	
Sept.....	99.3	91.5	69.7	
Oct.....	98.9	94.2	85.2	
Nov.....	99.0	96.4	90.3	
Dec.....	104.1	96.4	88.5	

¹First half, 1942 percentage of capacity is based on capacity of 60,393,980 net tons, as of Jan. 1, 1942. ²Second half percentages based on 57,937,170 net tons as of July 1, 1941, and first half on 57,609,590 net tons as of Jan. 1, 1941. ³Based on 55,628,060 net tons as of Dec. 31, 1939. ⁴Based on 56,222,790 net tons as of Dec. 31, 1938. Capacities by American Iron and Steel Institute.

FEBRUARY IRON PRODUCTION Net Tons				
	No. In blast last day of Feb.	Jan.	TOTAL TONNAGE Merchant	Non- merchant
Alabama ...	19	19	108,976*	187,941
Illinois ...	20	20	110,166	349,507
Indiana ...	19	19	20,479	468,607*
New York ...	15	15	115,983	190,222
Ohio ...	46	46	109,053	874,442
Penna ...	72	72	118,128*	1,277,636*
Colorado ...	3	3		
Michigan ...	5	5		
Minnesota ...	2	2	21,534*	198,317
Tennessee ...	3	3		
Utah ...	1	0		
Kentucky ...	2	2		
Maryland ...	7	7		
Mass. ...	1	1	17,510*	335,461
Virginia ...	1	1		
West Va. ...	4	4		
Total ...	220	219	621,829*	3,882,133*

*Includes ferromanganese and spiegeleisen.

MONTHLY IRON PRODUCTION Net Tons			
	1942	1941	1940
Jan.....	4,958,785	4,666,233	4,024,556
Feb.....	4,503,962	4,206,826	3,304,368
Two mos. total...	9,460,747	8,873,059	7,328,924
March.....	4,702,905	3,270,575	
April.....	4,340,555	3,139,043	
May.....	4,596,113	3,497,157	
June.....	4,551,040	3,813,092	
July.....	4,766,216	4,060,513	
Aug.....	4,784,639	4,234,576	
Sept.....	4,721,337	4,172,551	
Oct.....	4,860,033	4,437,725	
Nov.....	4,707,194	4,397,656	
Dec.....	5,014,995	4,542,864	
Total...	55,918,086	46,894,676	

AVERAGE DAILY PRODUCTION Net Tons				
	1942	1941	1940	1939
Jan.....	159,961	150,524	129,825	78,596
Feb.....	160,856	150,244	113,943	82,407
March.....	151,707	105,502	86,465	
April.....	144,685	104,635	76,732	
May.....	148,262	112,811	62,052	
June.....	151,701	127,103	79,125	
July.....	153,749	130,984	85,121	
Aug.....	154,343	136,599	96,122	
Sept.....	157,378	139,085	107,298	
Oct.....	156,775	143,152	131,053	
Nov.....	156,906	146,589	138,883	
Dec.....	161,774	146,544	136,119	
Ave.....	153,200	128,128	96,740	

Steel Expansion Program To Cost Two Billions

WASHINGTON

WPB steel experts estimate the steel expansion program, from 1940 through completion of the program, will cost about \$2,000,000,000. This figure includes both government and private expenditures, and is somewhat higher than the estimate for 1941 and 1942 spending by the American Iron and Steel Institute (see page 51).

Requests for expansion projects still are being received by WPB. These are expected to continue throughout the emergency. Current requests are largely for electric furnaces, and facilities for making wire and aircraft tubing.

January Payrolls, Employment Near All-Time Records

PAYROLLS of the steel industry in January totaled \$118,785,000, an increase of \$22,551,000, or more than 23 per cent over the total of \$96,234,000 for January last year, according to American Iron and Steel Institute.

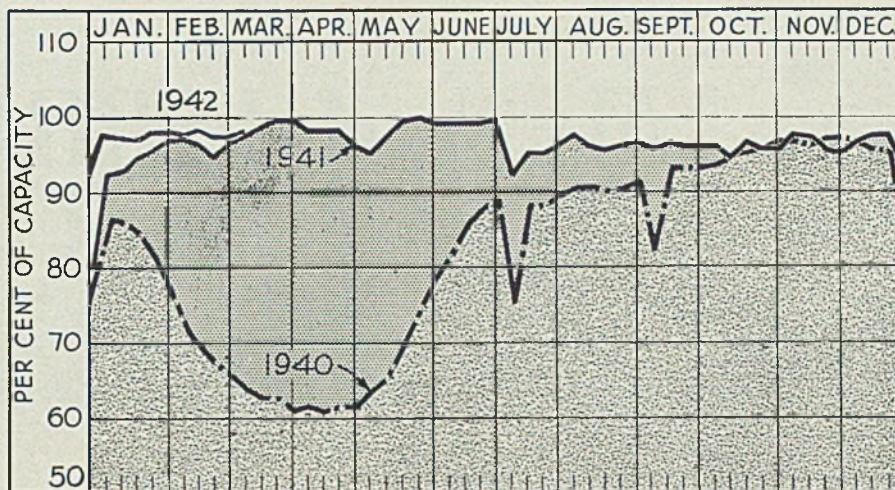
In December, 1941, payrolls totaled \$117,221,000. The amount for January this year was only slightly below the record for any month, \$118,890,000 last October.

Wage-earning employes in the industry received an average of 99.2 cents an hour, or nearly 15 per cent more than the average of 86.6 cents an hour in January of last year. In December, 1941, the average was 99.9 cents an hour, the highest average wage ever recorded.

Wage earners worked an average of 39.2 hours per week in January, the same as in January, 1941. In December, 1941, wage earners averaged 38.2 hours per week.

Total employment in the steel industry during January rose 5000 to a total of 651,000. This was 53,000 more than the 598,000 that were employed in January 1941. In December, 1941, 646,000 were employed in the industry.

The number of steel employes in January was only 3000 less than in last August, when the record of 654,000 employes was established.



PRODUCTION Up

PRODUCTION of open-hearth, bessemer and electric furnace ingots last week advanced ½-point to 96½ per cent. Three districts gained, two lost and seven were unchanged. A year ago the rate was 97½ per cent; two years ago it was 63½ per cent, both computed on the basis of capacity then existing.

Youngstown, O.—Operations remained at 91 per cent last week, with 71 open hearths and three bessemer active. Two more open hearths will be in operation this week, bringing the rate to 93 per cent.

Central eastern seaboard—Production held at 90 per cent for the seventh week, though scrap supply is precarious.

Chicago—Advanced 1½ points to 103½ per cent. Five producers made gains and one receded.

Detroit—Held steady at 84 per cent in spite of narrow margin of scrap supply.

Birmingham, Ala.—Unchanged at 95 per cent, with 23 open hearths active.

Cincinnati—Gained 7½ points to 94½ per cent, two interests having all open hearths on. One producer will shut down completely this week, for repairs.

St. Louis—Interruption at one plant brought a decline of 10½ points, to 78 per cent, several open hearths being idle for lack of scrap.

New England—Continued at 95 per cent of capacity.

Buffalo—Lack of scrap prevented the rate from rising above 79½ per cent, which has prevailed the past nine weeks.

Pittsburgh—Some shifts in active equipment were made last week but the rate remained at 95½ per cent.

Wheeling—Lost 1 point to 85½ per cent.

Cleveland—Two producers increased activity, the rate rising 2½ points to 91½ per cent.

District Steel Rates

Percentage of Ingot Capacity Engaged In Leading Districts

	Week ended Mar. 7	Change	Same week 1941	1940
Pittsburgh	95.5	None	98	61
Chicago	103.5	+ 1.5	100	60
Eastern Pa.	90	None	95	60
Youngstown	91	None	97	41
Wheeling	85.5	— 1	88	90
Cleveland	91.5	+ 2.5	91.5	73
Buffalo	79.5	None	93	55.5
Birmingham	95	None	90	78
New England	95	None	92	75
Cincinnati	94.5	+ 7.5	95	54.5
St. Louis	78	— 10.5	93	65
Detroit	84	None	92	78
Average	96.5	+ 0.5	*97.5	*63.5

*Computed on steelmaking capacity as of those dates.

\$18,000,000 Expansion for Wheeling Steel Approved

Wheeling Steel Corp. revealed last week in its annual report the War Production Board has approved an \$18,000,000 expansion program for the company's Steubenville, O., plant.

The money will be used to construct 78 additional coke ovens with necessary by-product apparatus, a 1200-ton blast furnace, one 150-ton open-hearth furnace, a row of soaking pits and a plate finishing building.

Company officials said \$2,500,000 would be used by the company to install equipment to "bonderize" black plate and electric tinning.

MEN of INDUSTRY

WILLIAM S. FORD, president of the management engineering firm of Wm. S. Ford Inc., Milwaukee, has joined Trundle Engineering Co., Cleveland, as vice president in charge of the latter's Chicago office and operations in that territory. **S. A. Peck**, vice president, heretofore in charge at Chicago, has been transferred to Cleveland and will be active in all phases of the company's operations. The clientele of the Ford organization will be served by Trundle Engineering under supervision of Mr. Ford, who will maintain his Milwaukee office.

Howard G. E. Smith has been elected a director, Fedders Mfg. Co., Buffalo, to fill the vacancy created by death of Louis F. Fedders. Mr. Smith is the company's attorney.

Richard G. Taylor has joined the Scaife Co., Oakmont, Pa., as assistant to **A. V. Murray**, secretary. He formerly was associated with LaSalle Steel Co., Chicago, in a sales capacity.

James L. Mahon, for 30 years foundry superintendent at Detroit for American Car & Foundry Co., and associated with the company since 1898, has been appointed Detroit district manager.

Harold R. Wegner, formerly metallurgist, Brown-Lipe-Chapin Division of General Motors Corp., Syracuse, N. Y., has resigned to become metallurgist and plant superintendent, Syracuse Heat Treating Corp., Syracuse, N. Y.

George A. Fowles has been named a sales engineer, synthetic sales division, B. F. Goodrich Co., Akron, O., with cable and wire insulation problems as his special field.

Howard C. Waldron has become superintendent of foundries, Nordberg Mfg. Co., Milwaukee. He succeeds **John H. Champion**, who has retired after 30 years with the company.

George T. Weisbeck has resigned as vice president and general manager, Van Buren Products Co., to become president, Niagara Ship-

building Corp., Buffalo. He succeeds **K. Bruce MacDonald**, who has resigned to devote his full time to the presidency of Buffalo Pressed Steel Co.

A. Donnally Armitage has been elected president, J. H. Williams & Co., New York and Buffalo, succeeding the late J. Harvey Williams. **Willard C. Kress** has been named vice president in charge of manu-



William S. Ford

facturing, while **E. J. Wilcox** has become vice president in charge of stock products sales. **Hugh Aikman** and **Clark M. Fleming** have been re-elected secretary and treasurer, respectively. Mr. Fleming has also been elected a director.

T. F. Barton, manager, New York district, and **W. B. Clayton**, district manager at Dallas, Tex., General Electric Co., have been elected commercial vice presidents of the company, retaining their respective positions.

F. B. Bell, president of Edgewater Steel Co., Pittsburgh, since organization 25 years ago, has been elected chairman of the board of directors. He has been devoting most of his time to work in the War Production Board and asked that he be relieved of the detailed duties of president.

D. S. Bell was chosen president, and **J. H. Baily**, **D. W. McGeorge**, and **W. F. Carey** were re-elected to the offices of vice president, secretary,

and treasurer, respectively. **M. A. Smith** was elected to the new office of vice president and general manager. **J. F. Manns** was elected assistant secretary; **D. S. Bell** and **W. F. Carey**, as directors.

Fred H. Ragan Jr., formerly purchasing agent, White Motor Co., Cleveland, and the past two years director of sales and purchases, Orrville Body Co., Orrville, O., is now associated with Clark Equipment Co., Battle Creek, Mich., as purchasing agent, railway division.

C. J. Stakel has been appointed assistant manager, Lake Superior iron mines, Cleveland-Cliffs Iron Co., Cleveland. **Stanley W. Sundeen** has been made assistant superintendent at Cliffs shaft mine, succeeding Mr. Stakel.

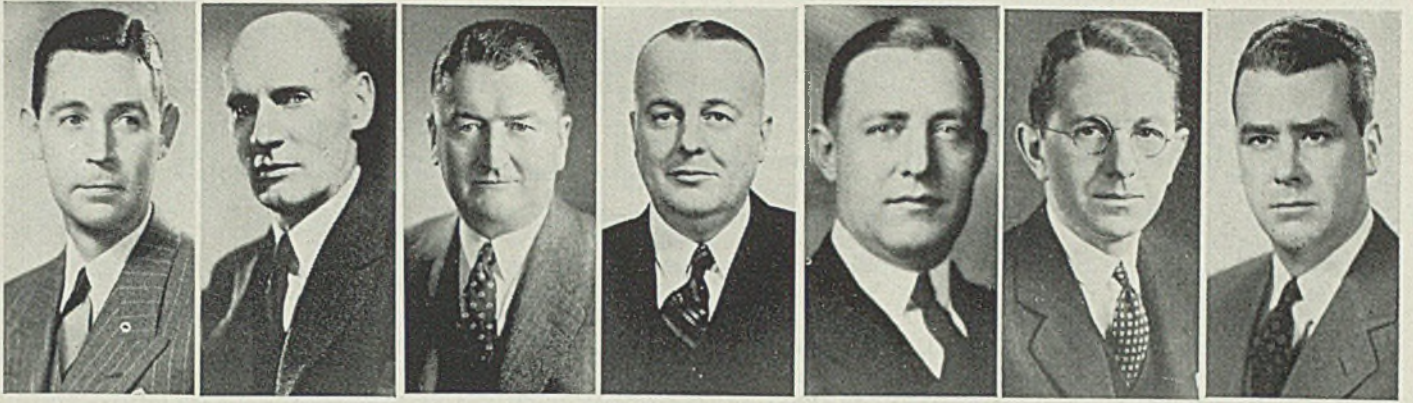
Walter Larkin, senior inventor, Fidelity Machine Co., Philadelphia, has been awarded a certificate of merit by Franklin Institute, Philadelphia, "in consideration of his admirable machine designing involving the ingenious application of known mechanical movements to the invention of circular knitting machines of special types."

Robert D. Williams has been named a research engineer, Battelle Memorial Institute, Columbus, O., where he will assist in the institute's welding research. He formerly was a member of the faculty in the department of mechanical engineering, University of Illinois.

E. S. Coldwell, vice president, Ford, Bacon & Davis Inc., New York, has been elected a director.

Fred L. Thompson, vice president in charge of engineering department, Illinois Central railroad, Chicago, retired March 1 after 46 years' service. **Charles H. Mottier**, heretofore chief engineer, has been named Mr. Thompson's successor.

Frank S. MacGregor, director, priorities division, E. I. du Pont de Nemours & Co., Wilmington, Del., has replaced **Milton Kutz** as assistant general manager, R. & H. chemicals department. Mr. Kutz has been on



H. B. Shepherd

C. M. Mason

E. H. Hughes

G. G. Marshall

L. S. Berkey

P. B. Turner

E. S. Lewis

leave of absence for several months due to ill health, and upon his return will assume new duties as sales advisor and assistant to general manager, R. & H. chemicals department.

C. M. Mason has been appointed district sales manager at Cleveland for Jones & Laughlin Steel Corp., Pittsburgh. He succeeds E. A. France, who has retired after 37 years of service. Since October, 1938, Mr. Mason has been district sales manager in Buffalo. H. B. Shepherd, associated with Jones & Laughlin's Cleveland office since 1929, has been named assistant district sales manager there.

E. H. Hughes, since April, 1938, district sales manager at St. Louis, has been transferred to Buffalo as district sales manager, while G. G. Marshall, identified with the Buffalo office since 1934, has become assistant district sales manager there.

L. S. Berkey has been named district sales manager in St. Louis. Since 1940 he has been resident manager of sales in Toledo, O. He has been succeeded in that post by E. S. Lewis, the past several years in the corporation's general sales office at Pittsburgh.

P. B. Turner has been made manager of export sales in New York. Since 1938 Mr. Turner has been special representative in the New York office. W. R. Spindler has been named assistant to manager of export sales.

Fred H. Lewis, heretofore district sales manager in the Chicago territory for Wall Chemicals Division, Liquid Carbonic Corp., has been appointed sales manager of that division.

Forrest E. Ricketts, vice president, Consolidated Gas Electric Light & Power Co., Baltimore, has been awarded the 1941 Lamm medal of the American Institute of Electrical Engineers "for his contribu-

tion to the high reliability of power supply systems, especially in the design of apparatus for selective relaying and circuit reclosure." The medal and certificate will be presented to him at the annual summer convention of the institute in Chicago, June 22-26.

Byron A. Boynton has been appointed general credit manager, Pittsburgh Coal Co., Pittsburgh, and its subsidiaries.

Walter Williams, formerly in the Chicago sales territory for Manning, Maxwell & Moore Inc., Bridgeport, Conn., has been assigned to the St. Louis district, replacing Harold Moore.

C. S. Craigmile, vice president, Belden Mfg. Co., Chicago, has been elected president, Greater Chicago Safety Council for the fourth consecutive year.

George P. Lozier, superintendent, Electric Furnace Co., Salem, O., has been re-elected president, Salem Manufacturers' Association.

Irving L. Simmons, since 1909 bridge engineer, Chicago, Rock Island & Pacific railroad, Chicago, retired March 1 after 39 years in the engineering department.

E. E. Walsh, general purchasing agent, Pennsylvania railroad, has been named assistant to C. D. Young, vice president in charge of real estate, purchases and insurance. E. J. Lanneck, purchasing agent, has been made general purchasing agent, while J. S. Fair Jr., heretofore assistant stores manager, has become acting purchasing agent.

S. J. Newman, president, Newman Brothers Inc., Cincinnati, was elected president for the fourth successive term of the National Association of Ornamental Metal Manufac-

turers, while Henry J. Neils, Flour City Ornamental Iron Co., Minneapolis, was re-elected president, National Association of Ornamental Non-ferrous Metal Manufacturers, and B. W. Stonebraker, Roanoke Iron Works, Roanoke, Va., re-elected president, National Association of Ornamental Iron Manufacturers, at the joint annual convention in Cincinnati, Feb. 20-21. Jim Condon, 209 Cedar avenue, Takoma Park, Washington, was re-elected national secretary of the above associations.

W. Stapley Wonham, vice president, Wonham Inc., and partner of Carter & Co., member of the New York Stock exchange, has retired from the securities business and will devote his time to Wonham Inc., export and sales engineering firm.

Dr. Hugh S. Taylor, chairman, department of chemistry, Princeton University, Princeton, N. J., has been awarded the Longstaff medal of the Chemical Society of London. The medal is conferred every three years upon a fellow of the society "who, in the opinion of the council, has done most to promote the science of chemistry by research."

John A. Finley has been named a research engineer, Battelle Memorial Institute, Columbus, O., and has been assigned to research in metallurgy. Mr. Finley formerly was associated with Carnegie-Illinois Steel Corp., Chicago.

James L. Caruth, Cleveland manager of National Lead Co. since 1937, has been appointed assistant manager of the Pacific coast branch at San Francisco. Ellis E. Busse will succeed Mr. Caruth as manager at Cleveland.

Eric G. Orling has been named assistant manager at Cleveland. He formerly was associated with Eagle-Picher Sales Co., Cincinnati.

REVISIONS AND ADDITIONS TO PRIORITIES-ALLOCATIONS PRICES

as published in Section Two of STEEL of Feb. 23, 1942

"M" ORDERS

M-9-a (Amendment): **Copper**, effective Feb. 25, 1942. Revokes proposed assignment of A-9 rating for replenishment of stocks by warehouses handling copper and copper products. Assignment would have become effective Feb. 28.

M-9-c (Amendment): **Copper**, effective Feb. 28, 1942. Permits use of copper for essential operating parts and essential maintenance and repair parts for railroad cars, locomotives and equipment.

M-11-i: **Zinc**, effective March 1, 1942. Sets March pool at 50% of December, 1941, production of high grade and/or special high grade, 40% of all other grades of metallic zinc; 20% of December production of lead free zinc oxide and 10% of leaded zinc oxide output.

M-15-b (Amendment): **Rubber**, effective March 1, 1942. Revises list of products for which rubber and latex may be used up to certain percentages of average monthly consumption in year ended March 31, 1941, except for war orders. Use in rubber-lined tanks, pipes and fittings raised from 100% to 140%, electricians' gloves from 100% to 200%, tire and mill hose cut from 180% to 40%, suction and welding hose from 140% to 100%, conveyor belts from 140% to 125%.

M-19 (Amendment): **Chlorine**, effective Feb. 25, 1942. Prohibits chlorine use in bleaching of foodstuffs, wiping rags and waste, and in manufacture of cosmetics. Other uses, except water and sewage treatment, cut 40% to 90% below consumption in year ended June 30, 1941.

M-21-b (Amendment): **Steel Warehouses**, effective Feb. 28, 1942. Prohibits warehouses from accepting steel deliveries in excess of their assigned quotas from any person or company. Permits accumulation up to 30 days of ratings higher than A-9 on deliveries to customers. Steel obtained by a warehouse on a rating higher than A-2 must be delivered on orders with similar rating unless held at least 90 days. Wire rope omitted from products to which quotas may be assigned.

M-38-f: **Lead**, effective Feb. 28, 1942. Sets March pool at 15% of January production.

M-50 (Amendment): **Jewel Bearings**, effective Feb. 28, 1942. Prohibits use of large ring jewel bearings or vee jewel bearings except on orders rated A-9 or higher. Includes smaller ring jewel bearings than covered by original order. Exempts from order restrictions any jewel bearing which by Jan. 15, 1942, had been physically incorporated in a device where it was subject to friction.

M-73-a: **Men's and Boy's Clothing**, issued

March 2, 1942. Specifies style of suits and overcoats made of wool.

M-79 (Amendment): **Asbestos**, effective Feb. 28, 1942. Permits use of 85 per cent magnesia and other types of pipe covering on ship installations where temperatures under 200 degrees Fahr. occur.

M-100: **Rationing of Trucks, Truck-tractors and Trailers**, effective March 9, 1942. Program will be administered jointly by WPB and Office of Defense Transportation. Application forms and instructions to applicants available at truck and trailer sales agencies. Applicants approved by WPB and ODT receive Certificate of Transfer, issued by Director of Industry Operations, permitting purchase of vehicle. Preference given to military forces, police, public health and sanitation services, communication services and transportation directly connected with war effort.

M-181 (Amendment): **Tin, Plate, Terne Plate**, effective March 3, 1942. Permits can manufacturers to deliver until Dec. 31, 1942, cans of any size for primary and secondary products which were completely made, or whose parts were completely cut, on Feb. 11. Canners permitted to use such cans and cans of sizes other than those specified in the order in their possession Feb. 11.

"P" ORDERS

P-18-a (Extension): **Cutting Tools**, effective Feb. 28, 1942. Extended to July 1, 1942, but after latter date manufacturers must obtain priority assistance under Production Requirements Plan.

P-45 (Revised): **Motorized Fire Apparatus**, effective Feb. 28, 1942. Assigns A-2 rating to material entering into such equipment delivered on defense orders. Rating is limited to quantities and kinds of material specifically authorized by Director of Industry Operations as indicated on copy of PD-82 returned to the producer.

P-53 (Amendment): **Textile Machinery Parts**, effective Feb. 28, 1942. Raises from A-10 to A-8 the rating available for deliveries of materials to producers of spare parts for maintenance and repair of textile machinery and equipment.

P-55 (Amended): **Defense Housing Projects**, effective when issued. Suppliers who process material furnished to contractor or subcontractor in substantial amount may not extend ratings on orders they fill. Assistance should be obtained under Production Requirements Plan. Subcontractors making only minor changes in material they install may extend ratings. All extensions of ratings by builders or subcontractors must be countersigned by authorized agent of FHA. Suppliers who do not process the materials do not require countersignature.

P-56 (Amendment): **Mines**, effective March 2, 1942. Raises former A-3 rating to A-1-c for materials for repair and maintenance of essential mining machinery, subject to quarterly quota to be established for each enterprise by Director of Industry Operations. Less essential mining, including sand, gravel, stone, clay, gypsum, talc, soapstone and slate may use A-1-c rating only in cases of imminent breakdown. A-10 rating assigned to supplies not immediately connected with actual production. Suppliers may extend ratings. Does not cover mines more than 30% of whose production value consists of gold and/or silver.

P-56-a (Amendment): **Mining Machinery and Equipment**, issued March 2, 1942. Provides for assignment of rating or ratings to a producer based on the pattern of ratings on the orders he is filling. Ratings will be assigned quarterly on PD-25A.

P-68 (Amended): **Steel Plant Maintenance, Repair, Operating Supplies**, effective Feb. 27, 1942. Extends availability of ratings to Canadian plants and to plants engaged in production of delined iron and steel scrap. Adds A-10 rating, applicable to materials for other repairs, maintenance and operating supplies, even though not for property and equipment used in and essential to production of specified iron, steel and related products. Each producer must file PD-228 with WPB on March 31, 1942 and semi-annually thereafter.

P-89 (Amendment): **Chemical Plants**, March 2, 1942. Redefines operating supplies to include lubricants, fuels, catalysts and small perishable tools. Excludes materials physically or chemically incorporated into the producer's products, and material other than catalysts which enter into chemical reactions pertinent to manufacturing. Permits Canadian firms to use ratings.

P-100 (Amendment): **Repairs, Maintenance, Operating Supplies**. Authorizes firms engaged in examining industrial installations for the purpose of discovering defects to use A-10 rating to obtain operating supplies.

"L" ORDERS

L-1-a (Amendment): **Trucks, Truck Trailers**, effective March 2, 1942. March production quota for medium trucks (weighing less than 16,000 pounds) cancelled. Unused portion of February quota must be completed by March 31. Production of trucks of any size limited to amount of partially and fully fabricated materials on hand Feb. 28. Amendment to L-1-c, effective Feb. 28, extends ban on sales and deliveries of new trucks to March 8. Effective Feb. 25, fire apparatus exempted from limitations on sales, provided buyer has A-10 or better rating. Effective Feb. 27, tank vehicles

For additional revisions and additions please see STEEL of March 2, p. 39.

to be used in transportation of petroleum products released for delivery.

L-5-c (Amendment): Mechanical Refrigerators, effective Feb. 27, 1942. Prohibits manufacturers from disposing of inventory materials and parts except to other refrigerator companies for use in making units permitted under L-5-c or for repair and maintenance parts. Manufacturers must file with WPB by March 15 estimate of raw material and parts inventory after completing quota of refrigerators.

L-43: Motorized Fire Apparatus, effective Feb. 27, 1942. Eliminates use of fire bells, aluminum, copper, copper base alloy, nickel, chromium, cadmium, tin, zinc, steel, neoprene and other synthetic rubbers, except for limited use in specific list of products. Manufacture of motorized apparatus prohibited except to fill defense orders. Sizes of fire engine pumps standardized.

L-46: Electric Power, effective Feb. 27, 1942. Provides for integration of generating systems by utilities and industries and curtailment in consumption in Niagara frontier area in event of power shortage.

L-50: Telephone Industry, effective March 2, 1942. Limits changes in equipment and facilities of telephone companies. Bans conversion of manual offices, replacement of existing instruments of users unless beyond repair, installation of extension phones in residences.

L-57: Gas Masks and Anti-Gas Devices, effective March 3, 1942. Prohibits manufacture or sale of such items for protection against enemy attack, unless ordered by government agency and built to Army Chemical Warfare Service specifications. Also prohibits sale or delivery of materials for use in unapproved masks. Does not apply to masks for non-military purposes.

L-60: Pistols, Rifles, Shotguns, effective Feb. 27, 1942. Prohibits disposition of new guns, except sales to federal, state, local and Allied governments and Lend-Lease. Sellers must report their inventories within 45 days.

PRICE SCHEDULES

No. 2 (Amendment)—Scrap and Secondary Aluminum, effective Feb. 26, 1942. Exempts from provisions of the schedule excessive inventories of aluminum materials purchased by Metals Reserve Co.

No. 80 (Amendment)—Lithopone, effective Feb. 27, 1942. Permits non-manufacturing dealers and exporters to fill, at higher than ceiling prices, contracts made prior to Feb. 2, 1942. Affects only lithopone on hand or in transit Feb. 2. Detailed reports on such deliveries must be furnished OPA within ten days.

Steel Institute Omits Banquet from Program

Fifty-first general meeting of the American Iron and Steel Institute will be held at the Waldorf-Astoria hotel, New York, May 21, as previously announced. The general session will be held in the morning and the special session in the afternoon as usual, but owing to war-time conditions there will be no banquet in the evening. This will be the first general meeting in the institute's history that the banquet has been omitted.

Steel Specifications Changed To Conserve Strategic Alloys Supplies

WASHINGTON

CHANGES in steel specifications to further the war production drive were announced last Friday by WPB. They are designed to conserve supplies of steel alloys, most important material used in war.

(For detailed information on new standard steels, see STEEL of Feb. 16, pp. 64 and 65, also STEEL of Feb. 9, pp. 70, 99 and 100.)

With the rapid increase in production it became evident that unless steel alloys were conserved there would not be enough for both the war program and essential civilian demands.

Anticipating this shortage, representatives of the steel industry, the Society of Automotive Engineers, the American Iron and Steel Institute and other technical bodies were called together by WPB to discuss emergency steel specifications.

The conservation of alloying elements in the specifications is based upon the principle that small quantities of several different alloys are more effective than large quantities of any single element.

It appears that these national emergency steels and certain others containing less strategic elements, or none, will soon be the only steels available. Therefore it is imperative, it was explained, that industry take the necessary steps to change over as quickly as possible, so as to be prepared when the supply of habitually used steels is cut off.

Some Heats Already Made

Steel containing the strategic elements, nickel, chromium, tungsten, cobalt and vanadium, may only be used on extremely important functional parts, it was pointed out. Hence industry is to be urged to use carbon and intermediate manganese steel (1000-1100-1200 series), and carbon molybdenum series 4000, manganese molybdenum, series 8000-8100-8200-8300, 400 and 500 series; or silico manganese, series 9200 wherever possible.

WPB issued analyses of alternate steels available in Table I of its report on these new specifications, with existing steel specifications listed in Table II, with the national emergency equivalents of such specifications. It was stated that those interested in obtaining these steels can apply to their regular steel sources. Heats have already been made by a number of companies including the following:

Bethlehem Steel Corp., Carnegie-Illinois Steel Corp., Copperweld Steel

Co., Pittsburgh Crucible Steel Co., Republic Steel Corp., Rotary Electric Steel Co., Steel & Tube Division, Timken Roller Bearing Co. and Youngstown Sheet & Tube Co.

The board states that in the early stages of this program it may not be possible for a user to obtain the exact bar size or shape to which he is accustomed, and it may be necessary to accept some other size. Test steels should be ordered in the usual manner.

Production of Medium Trucks After February Quotas Banned

WPB has prohibited further construction of medium trucks, after completion of February quotas, in order to save large quantities of critical materials, particularly rubber and steel.

Production quotas established for medium trucks for March have been canceled, and the only kind of trucks for which continued production will be permitted are those having a gross vehicle weight of 16,000 pounds or more.

Manufacturers were ordered by WPB to make no further trucks of any sizes unless they can be produced from semifabricated or fabricated materials which were on hand Feb. 28. Further fabrication of material is prohibited.

The order, Amendment No. 4 to Limitation Order L-1-A, retains the prohibition against equipping trucks to be produced under it with tires. Under previous orders, tires may be placed on these vehicles only to enable their delivery to dealers, after which the tires must be returned to the manufacturer.

The new order, which will concentrate truck production on the heavier types necessary for hauling war supplies, will not affect the recent WPB authorization for manufacturers to carry over into March certain unfinished portions of production quotas established for February. These quotas, announced last January, allow manufacturers to produce medium and heavy trucks at a rate 15 per cent higher than in February, 1941.

To keep present trucks and buses in operation, WPB has raised priority rating for materials for production of replacement parts from A-3 to A-2. The change, contained in amendments to Limitation Order L-35 and Preference Rating Order P-107, applies only to parts for medium and heavy trucks, truck trailers, passenger carriers and school buses.

Windows of WASHINGTON

Converted strip mills now looked to for fast shipments of plates for marine construction, under new plan . . . Modification of can conservation order allows use of large stocks on hand for primary and secondary products . . . No ceiling put on purchase of remelted aluminum classified as scrap . . . Such materials deemed useless to holders.



By L. M. LAMM

Washington Editor, STEEL

WASHINGTON
MUCH of the steel plate for merchant ships henceforth will come from mills that last year were turning out sheet steel for automobile bodies, according to C. E. Adams, chief, WPB Iron and Steel Branch.

A plan for the use of plates from converted strip mills was worked out by representatives of the branch and of the Maritime Commission and will go into effect immediately. It is expected to speed greatly shipments of steel for the "Liberty ship" fleet and to help solve one of the most perplexing materials problems, that of abnormal demand for plates.

Under the plan, items of similar size were grouped together in a new bill of materials. Specific items will be obtained from strip mills with facilities suitable for the production of the sizes involved. Thus any one mill will deliver plates of a specific size to a number of shipyards.

High speed strip mills were built to take care of large orders of one size, automobile body steel being the outstanding example. The new plan, which, in effect, applies assembly line methods to the shipbuilding program, enables the Maritime Commission to take advantage of this facility.

Heretofore, only about 10 per cent of the steel plate required for the Liberty ships has come from strip mills. Under the new program 80 or perhaps 90 per cent will be strip mill plate.

The new combined bill of materials and the ordering program will govern on approximately 770 new ships for which no material has, as yet, been ordered or scheduled.

Tonnage for the Maritime Commission is the largest item for steel plates in the entire war program and the Liberty ship schedule represents more than half the commission's requirements. The working out of this arrangement

is expected to ease a part of the burden on sheared plate mills which have been faced with a war demand far beyond their capacity to produce. The plan will not free steel plate for civilian use, but will make possible the fulfillment of essential war orders.

Can Conservation Order Provisions Modified

Provisions of Conservation Order M-81 which restrict sizes for primary and secondary-products cans made of tin plate or terne plate have been modified by WPB.

A telegraphic amendment of the order sent to the industry by J. S. Knowlson, director of industry operations, permits manufacturers to deliver this year cans of any size for primary and secondary products which were completely manufactured, or whose parts were completely cut, on Feb. 11.

Canners are permitted to buy and use such cans, and also cans of sizes other than those specified in the order which were in their possession on Feb. 11.

The WPB Containers Branch explained that both manufacturers and canners have on hand considerable can stocks of sizes other than those specified by the order, as well as stocks of processed tin plate which can only be devoted to the manufacture of cans of the sizes for which the plate was originally designed.

Use of these cans is expected to release considerable storage facilities. Use of tin plate will not be increased, since there is at present no quantity limitation upon primary-products cans, and the cans used for secondary-products pursuant to the telegraphic amendment will be charged to the canners' quotas.

Conservation Order M-81 defines primary products cans as those used to pack fruits and vegetables of primary importance. In the main, they represent products for which the De-

partment of Agriculture has set production goals, or which would spoil if not canned when fresh. No limit is placed by the order on the number of such cans.

Secondary-products cans are used to pack fruits and vegetables regarded as of secondary importance, some of which can be dried.

Brake Shoe Price Increase Rescinded at OPA's Request

Complying with a request of the OPA, the American Brake Shoe & Foundry Co., New York, has rescinded the recent increase in its price of brake shoes. With the withdrawal of the \$2 per net ton price advance made on Jan. 1, 1942, the company's brake shoe prices are again at Oct. 1, 1941, levels.

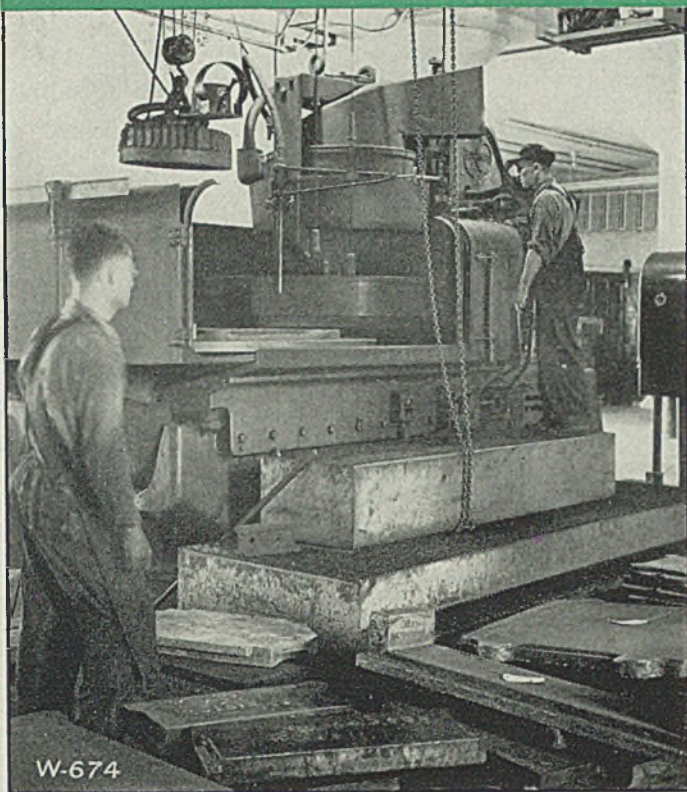
Purchases of Idle Aluminum Stocks Excepted from Ceiling

Purchases by Metals Reserve Co. of idle or excessive inventories of aluminum materials, in accordance with the program announced by the WPB Division of Industry Operations, will be excepted from provisions of the aluminum scrap price schedule. This ruling was made in Amendment No. 1 to Revised Price Schedule No. 2.

A high percentage of the materials involved in this program will be remelted for further use. Therefore, they would be classified as scrap under provisions of Price Schedule No. 2. In view of the fact that such materials have been rendered useless in the hands of their holders by war restrictions, WPB has recommended that Metals Reserve Co. buy such materials at prices higher than the maximums established for scrap in Price Schedule No. 2.

Exceptions of such purchases from the price schedule's provisions

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was granted by OPA at WPB's request in order to carry out this program.

Steel Warehouses Prohibited From Buying Over Quotas

Steel warehouses are prohibited from accepting deliveries of steel in excess of their assigned quotas from any person or company by the terms of Amendment No. 3 to Supplementary Order M-21-b issued by WPB.

The restrictions previously imposed by the order applied only to deliveries from steel producers. The chief purpose of this amendment is to prevent the warehouses from obtaining deliveries of products listed in schedule A of the order in excess of quotas from other sources such as automobile companies which may have steel for sale at the present time.

The order has also been amended to permit warehouses to accumulate preference ratings higher than A-9 on deliveries to their customers up to a period of 90 days so that they may place with their suppliers an order for a minimum commercial quantity. However, any steel obtained by a warehouse through extension of a rating higher than A-2 may not be delivered by the warehouse to any customer except on orders which bear a rating higher than A-2 until such stock has been held for at least 90 days.

Higher Rating Assigned for Mining Machinery Repair

Higher ratings for repair and maintenance of essential mine machinery and lower ratings or complete elimination of ratings for non-essential mining purposes are provided by an amendment of Preference Rating Order P-56. The higher ratings will assure continuous production from the mines of such essential materials as copper, iron, coal, and similar materials.

At the same time, Preference Rating Order P-56-a, which formerly assigned a single rating to material entering into the production of mining machinery and equipment, has been amended to permit the assignment of rating or ratings to a producer based on the pattern of ratings on the orders he is engaged in filling by a procedure similar to the Production Requirements Plan.

Gold and silver mines will no longer be permitted to use the ratings assigned for repair and maintenance by P-56. Gold placer mines were not previously included in the order.

The A-3 rating formerly assigned to materials for repair and maintenance of mining machinery has been withdrawn, and an A-1-c rating has

been assigned to materials for the repair and maintenance of essential machinery with specified restrictions, subject to a quarterly quota to be established for each mining enterprise by the director of industry operations. Certain less essential mining operations, including sand, gravel, stone, clay, gypsum, talc, soapstone and slate may use the A-1-c rating only in cases of imminent breakdown.

The A-8 rating assigned to materials for maintenance and repair not covered by the A-1-c rating is continued in effect, and an A-10 rating is assigned to repair, maintenance and operating supplies such as office supplies which are not closely connected with actual production.

Suppliers will hereafter be permitted to extend ratings on orders received from mine operators, and the system of reports required in connection with both P-56 and P-56-a has been simplified.

Cutting Tool Manufacturers Warned To Use PRP After July 1

Manufacturers of cutting tools have been warned by the Director of Industry Operations that beginning July 1 at the latest they must use the Production Requirements Plan to obtain priority assistance.

Preference Rating Order P-18-a, under which specified manufacturers of cutting tools have been entitled to use a preference rating of A-1-a on their orders for materials entering into their production of defense products, has been extended to July 1, 1942, but will be allowed to expire on that date. It was scheduled to expire on Feb. 28.

All manufacturers who have been operating under P-18-a are advised to submit applications under the Production Requirements Plan, and PD-25A application forms are being sent to them so that they will have an opportunity to familiarize themselves with the new procedure.

WPB Warns of Shortage of Chlorinated Solvents

Fabricators of metals have been warned by the WPB Chemicals Branch to investigate every possible cleaning method other than chlorinated solvents applicable to their operations.

A shortage in chlorinated solvents already exists, caused by the vast increase in metal fabricating, the branch said, and the situation will get worse, instead of better, as time goes on.

At least 30 per cent of the cleaning operations in the metals industry now being done with chlorinated

solvents can be accomplished by the use of other materials, such as mineral spirits, non-chlorinated-solvent-water emulsions and alkalis.

March Zinc Pool Requirements 50 Per Cent of December Output

Zinc producers are required to set aside 50 per cent of their December, 1941, production of high grade and special high grade zinc and 40 per cent of all other grades for the March pool.

Lead free zinc oxide requirements are set at 20 per cent of December production and leaded zinc oxide at 10 per cent. No zinc dust is set aside for the month.

February requirements were 40 per cent for all types of zinc and 10 per cent for zinc oxides.

Lead Pool Set at 15% of January Production

The March lead pool has been set at 15 per cent of January, 1942, production in Order M-38-f. While the percentage is unchanged from last month, the actual amount of metal set aside for specific shipments is larger, since the base period is changed from December, 1941, to January, 1942, production being larger in the latter month.

Further Restrictions Imposed On Use of Jewel Bearings

Further restrictions on the use of jewel bearings have been announced by the director of industry operations.

Order M-50 has been amended to prohibit the use of large ring jewel bearings or vee jewel bearings except on orders with a rating of A-9 or higher. The original order, effective March 1, limited deliveries by suppliers but did not cover usage.

Two other changes are made: large ring jewel bearings are re-defined for size to include smaller ones than originally covered by the order, and an exception is made so that the restrictions of the order do not apply to any jewel bearing which by Jan. 15, 1942, had been physically incorporated in a device where it was subject to friction.

Railroads Permitted To Use Copper for Essential Needs

Use of copper for essential operating parts and essential maintenance and repair parts for railway locomotives, cars and equipment will be permitted under an amendment to Order M-9-c issued.

Amendment adds railroad uses to list "B" of the order, which permits the use of copper where the use of less scarce material is impractical.



BRAZILIAN and United States officials signed a series of agreements in Washington last week providing for American financial aid in developing Brazil's iron and rubber resources. Left to right, seated: Carlos Martins, Brazilian ambassador; Acting Secretary of State Sumner Welles; Brazilian Finance Minister Arthur de Sousa Costa. Standing to the rear of Mr. Welles is Federal Loan Administrator Jesse Jones. NEA photo

United States Agrees To Aid Brazil Develop Iron, Rubber Resources

FOUR important accords providing for large scale production of strategic materials, especially iron and rubber, in Brazil and for United States financial assistance to that country were signed last week in Washington. United States will extend lend-lease aid to the South American republic.

The four agreements provide:

A program for the mobilization of the productive resources of Brazil and for a line of credit of \$100,000,000 to be made available through the Export-Import bank.

Expanded assistance to Brazil under the lend-lease act in order that the Brazilian government may speed up armament for self defense.

Establishment of a \$5,000,000 fund by the Brazilian government for developing the raw rubber production in the Amazon valley and adjacent regions. The Rubber Reserve Co. agrees to purchase Brazilian rubber for the next five years.

Agreements for the development of the Itabira mining properties and the Victoria-Minas railroad, with accompanying arrangements for the acquisition by the United States and Great Britain of high grade iron ores to be produced.

In connection with the last agree-

ment, Federal Loan Administrator Jones said the Export-Import bank had agreed to lend Brazil \$14,000,000 for the rehabilitation of the railroad and mines and for improving ore-

Lend-Lease Aid Above 47 Billion Dollars

Authorized dollar limit on aid which the President may provide to the United Nations under lend-lease rose past the 47 billion dollar mark when the fifth supplemental war appropriation bill received final approval by Congress last week.

loading facilities at the port of Victoria.

The amount of credit to be extended under lend-lease was not made public. Brazil already has been allotted about \$98,000,000 under a previous agreement, and it is believed the additional credits will total at least as much.

A \$20,000,000 loan was made to Brazil by the Export-Import bank

in 1940 to finance purchases of steel mill equipment in this country.

In addition to direct aid by the government a number of private industries are co-operating with Brazil in developing that country's resources and in building up its defenses. Last week a Brazilian government mission and officials of the Wright Aeronautical Corp., Paterson, N. J., signed an agreement under which Brazil will build aircraft engines under a Wright license.

Midwestern Plant Producing New Model Medium Tanks

Mass production of a new medium tank for the Army has begun at a new Midwestern plant, William H. Harrison, director of the WPB Production Division, announced last week.

Known as the M-4 medium tank, it is the forerunner of thousands of similar design that will be built this year as part of the program for 45,000 tanks set by President Roosevelt as the goal for 1942.

Other plants now turning out M-3 medium tanks shortly will begin making the M-4. Some plants will begin building M-4's while finishing the last of their orders for M-3's and will have two models leaving production lines at the same time. In other plants, extensive plans are being made so the first of the new type tank will follow immediately after the last of the old type tank.

As other new tank arsenals come into production, they will begin with the M-4 medium models. Dates originally set for delivery of the first tanks from these new sources have been advanced considerably in order to meet the President's requirements. It is expected that several more tank plants will be in mass production in the near future.

The new medium tank will use cast steel and welded hulls to a much greater extent than the M-3 and a change in design will increase the effectiveness of its armament.

Meanwhile, additional plants are being made ready to build light tanks to augment those that now are producing this type of combat vehicle. Plans currently call for several new types of light tanks and they will come into production when facilities now being prepared are ready.

When the tank program gets in full swing it will be drawing its heaviest support from the locomotive, automotive and farm machinery industries.

National Youth Administration is training youths between the ages of 16 and 24 at more than 4000 welding work stations, under the direction of Col. Frank J. McSherry.

OPA Organization Realigned To Meet New Duties, Responsibilities

WASHINGTON

REALIGNMENT of executive personnel of the OPA to meet the expanded responsibilities arising out of the new Emergency Price Control Act and the rationing authority vested in his office by the WPB has been announced by Price Administrator Henderson.

The changes create three deputy administrator posts in place of one; break down the price division into four separate divisions—food and apparel, industrial materials and equipment, general products, and fuel—and place an assistant administrator in charge of each; set up a new rent division, also under an assistant administrator; and provide for the organization of a rationing division.

John E. Hamm, deputy administrator, has been made senior deputy administrator, second in command to Mr. Henderson. J. K. Galbraith, until now assistant administrator, has been named staff deputy administrator, and John S. Keir has been appointed acting administrative deputy administrator. Mr. Keir, executive vice president of the Denison Mfg. Co., has accepted the new post on a part-time temporary basis and will only serve until Mr. Henderson can fill the post permanently.

Hamm To Handle Rationing

For the time being, Mr. Hamm will handle the organization of the new Rationing Division, with the assistance of Harold Rowe, who will have executive responsibility for food rationing, and Paul M. O'Leary, who will direct planning and analysis. Both Rowe and O'Leary have been assistant directors of the Price Division. During Mr. Hamm's temporary assignment to rationing, Mr. Keir will act for the administrator on all matters previously handled by Mr. Hamm. David Ginsburg continues as general counsel.

Mr. Galbraith, as staff deputy administrator, will assist Mr. Henderson on policy matters relating to labor, shipping, transportation, taxation, and other policy matters not specifically assigned to OPA organizational units. He also will represent the price administrator in contacts with other agencies, such as the War Production Board, the Petroleum Coordinator, the Transportation Coordinator, etc., and before Congressional committees, and the like. He will review, on behalf of the administrator, all policy statements to the public and work of consultants not specifically attached

to OPA operating units.

In addition, Mr. Galbraith will organize and direct the work of the Research Section, the Transportation Section and the Questionnaire and Financial Reporting Unit.

The four new assistant administrators, and the Price Divisions of which each has charge, are as follows: Food and Apparel Division—Howard Tolley, on loan from his post as chief of the Bureau of Agricultural Economics, Department of Agriculture.

Industrial Materials Division—Donald Wallace, hitherto, assistant director of the Price Division, in charge of metals, rubber, machinery, and automobiles and trucks.

Porter Heads Rent Division

General Products Division—Herbert F. Taggart who in addition will continue as head of the Division of Accounting, Analysis and Review.

Fuel Division—Vacancy, appointment of assistant administrator to be announced shortly.

The new Rent Division is in charge of Paul A. Porter, formerly executive assistant to Chester C. Davis, commissioner in charge of agriculture of the National Defense Advisory Commission and now Washington counsel for the Columbia Broadcasting System. Mr. Porter, will be assistant administrator, while Karl Borders, who has been in charge of the Rent Section of the Price Division, will be director of the New Rent Division.

The various price sections under the former Price Division, together with price executives and all personnel, have been assigned among the new price divisions as follows:

Food and Apparel Division—Howard Tolley, Assistant Administrator—Food, Textiles and Apparel, Leather Footwear, Fertilizer, Farm Machinery.

Industrial Materials & Equipment Division—Donald Wallace, Assistant Administrator—Iron and Steel, Copper and Brass, Zinc and Lead, Industrial Machinery, Lumber, Chemicals.

General Products Division—Herbert Taggart, Assistant Administrator and Chief Accountant, Consumer Durables, Rubber, Paper and Pulp, Autos and Parts, Building Materials.

Fuels Division—Assistant Administrator—Petroleum, Hard Fuels.

"Leather Footwear" and "Fertilizer" are new price sections, the executives for which will be announced shortly.

All new assistant administrators are authorized to make decisions re-

specting maximum price regulations, subject only to review, if necessary, by the administrator or his deputies.

C. A. Bishop, who has been special assistant to the administrator, has been appointed official secretary to the OPA. R. K. Thompson has been named executive assistant to the administrator. Robert E. Sessions, executive assistant to the assistant administrator, under the former set-up, now has been designated as assistant to acting administrator Keir, and will function also as a staff assistant to the administrator for liaison in connection with Mr. Henderson's membership on the WPB. There are no changes in the Consumer Division, now headed by Dexter M. Keezer, assistant administrator of the OPA, with Dan A. West as director.

Donald D. Kennedy has been named chief of the Castings Unit of the OPA Iron and Steel Section. He replaces J. E. McDonough, who is a major in the reserve forces and has been called into the service.

George C. S. Benson, professor of public administration, Northwestern university, Evanston, Ill., has been appointed assistant director of OPA in charge of field co-ordination.

Personnel Changes in War Production Board

W. F. Vosmer, Cleveland, has been appointed head of the Hot-Rolled Carbon Bar and Semifinished Unit of the WPB Iron and Steel Branch. Mr. Vosmer has been sales manager of the carbon bar division of the Republic Steel Corp., since 1930.

Ralph J. Stayman, Pittsburgh, has been named head of the Distressed Stock Unit. Mr. Stayman has been a special representative of the bar and semifinished materials division of the Carnegie-Illinois Steel Corp. at Pittsburgh.

Orrin H. Baker, Chicago, will be head of the Rail Unit. Mr. Baker has been assistant manager of sales of the railroad materials division, Carnegie-Illinois Steel Corp. at Chicago.

Three men have been appointed assistants to the head of the Plate and Shape Unit. They are: A. L. Meyer, Wynnewood, Pa., who has been with the Great Lakes Steel Corp.; A. S. Hoff, Chicago, who was with the Inland Steel Co.; and R. A. Marble, Pittsburgh, of Carnegie-Illinois, Pittsburgh. All of these men have been active in plate and shape sales in the companies with which they have been associated.

D. Edwin Gamble, Chicago, vice president and general manager of the Borg & Beck Division of the Borg-Warner Corp., has joined the staff of the Ordnance Branch, WPB Production Division.

Rationing Program for Trailers, Trucks, Truck-Tractors Formulated

WASHINGTON
RATIONING program for all types of new trucks, truck-tractors and trailers has been announced today by J. S. Knowlson, director of industry operations.

The plan, effective March 9, will be administered jointly by the War Production Board and the Office of Defense Transportation. It is set forth in Order M-100.

Since the start of the year, sales and deliveries of new trucks and trailers have been prohibited by the so-called "freeze" orders. Rationing will permit gradual release of "frozen" stocks and make these vehicles available to government and essential civilian users.

Application forms and necessary instructions to applicants will be made available at all truck and trailer sales agencies. These forms will furnish data upon which WPB, in consultation with ODT, will determine if an applicant is entitled to purchase a restricted vehicle.

OPA Rations Autos

OPA has been given authority to ration passenger automobiles, but will not handle the rationing of commercial vehicles.

Preliminary estimates indicate that approximately 196,000 trucks and truck trailers will be available for rationing during the next 22 months.

Vehicles required by the Army and Navy, the Marine Corps, Maritime Commission, lend-lease, and certain other designated war operations will be released under a general "Governmental Exemption Permit," which will enable war agencies to make purchases without adhering to the routine outlined for non-war users.

Persons outside the exempted categories must send their purchase applications to one of the "Local Allocation" offices of ODT, which also serve as field offices of the Bureau of Motor Carriers of the Interstate Commerce Commission.

Upon approval by a "Local Allocation" officer, the application will be sent to ODT headquarters in Washington. If approved there, it will be forwarded to WPB for review and action. WPB approval, in the form of a "Certificate of Transfer" issued by the director of industry operations, will enable the applicant to purchase the type of truck or trailer he desires from any dealer in the country who has such a vehicle in stock.

The ODT is authorized to estab-

lish appeal boards to review rejected applications.

Under the program, five "Usage Classifications" are established. These, subject to revision, show the order in which trucks and trailers will be released for sale, according to their place in the war program. The classes are:

1. Vehicles used by the military forces in the field; police, fire-fighting and other public health services; mail, telegraph, telephone and organized radio communication services, and water supply, sewage and garbage disposal and other sanitation services.

2. Vehicles used on fixed military and naval posts; transportation of all materials and equipment directly connected with the war effort, including farm and forest products; construction, maintenance and supply of essential rail, highway, water, pipeline, and air transportation facilities; transportation of materials for construction of defense housing projects; transportation of materials for construction and maintenance of public utilities in addition to those classed under No. 1, and transportation of persons engaged in business and industry directly connected with the war effort.

3. Vehicles used to transport ice and fuel for heating and power to the ultimate consumer; farm and forest products indirectly connected with the war program; essential roofing, plumbing, heating, electrical, building and vehicle repair services; waste and scrap materials; persons in business and industry indirectly connected with the war program, and in the services of public and private schools.

Preference Rating Won't Help

4. Vehicles used to transport persons or goods not connected with the war program, including all forms of retail delivery except of ice and fuel.

5. Vehicles used for nonessential functions.

With a limited supply of trucks and trailers, WPB offers no encouragement to persons who can qualify only under classes 4 and 5. These two classes were established so that there would be a "preference" guide in the event that the available supply was not exhausted under classes 1, 2 and 3.

An important feature of the program is that a preference rating, whether granted before Jan. 1, before March 1 or after the ration-

ing plan becomes effective, will not enable the holder to obtain a truck or trailer. The only way to secure a commercial vehicle will be to obtain a certificate under the rationing plan.

WPB established production quotas for medium and heavy trucks for February at a rate 15 per cent above February, 1941. Quotas also were fixed for March, but these may be canceled because of the shortage of rubber for tires and the effort to hasten conversion of the vast automotive industry to war work.

New Restrictions on Building Materials Ordered by WPB

A new defense housing critical list has been issued by the Housing Priorities Branch, Division of Industry Operations.

The new list is more specific than the original issued on Sept. 19, 1941, which it supersedes and nullifies. It is based upon the present critical position of many materials essential to the construction and equipment of housing, and is subject to revision as changes in the situation develop.

Preference ratings assigned to deliveries of scarce materials for defense housing projects may be applied only to items appearing on the new critical list, which was drawn up to conform to the limitations placed upon the uses of a number of scarce metals since the issuance of the original list last September.

Some major changes in the new list are:

Steel bearing plates are eliminated and steel stair construction is further restricted.

Tin coating for sheet metal coverings on fire doors is eliminated.

The use of metal lath is further curtailed.

Detailed specifications are included for builders' hardware so as to reduce the use of the more critical metals to a minimum.

Armored cable, metallic cable, metallic raceways, and metal outlet boxes are allowed only where other methods are prohibited by the National Electric Code.

Private telephone systems are prohibited.

Quantity and sizes of roughing in materials for plumbing and gas distribution are limited to meet the minimum requirements of the "Emergency Plumbing Standards" issued by the Defense Housing Co-ordinator, Dec. 26, 1941.

Copper coils for hot water generators and heat exchangers are not allowed.

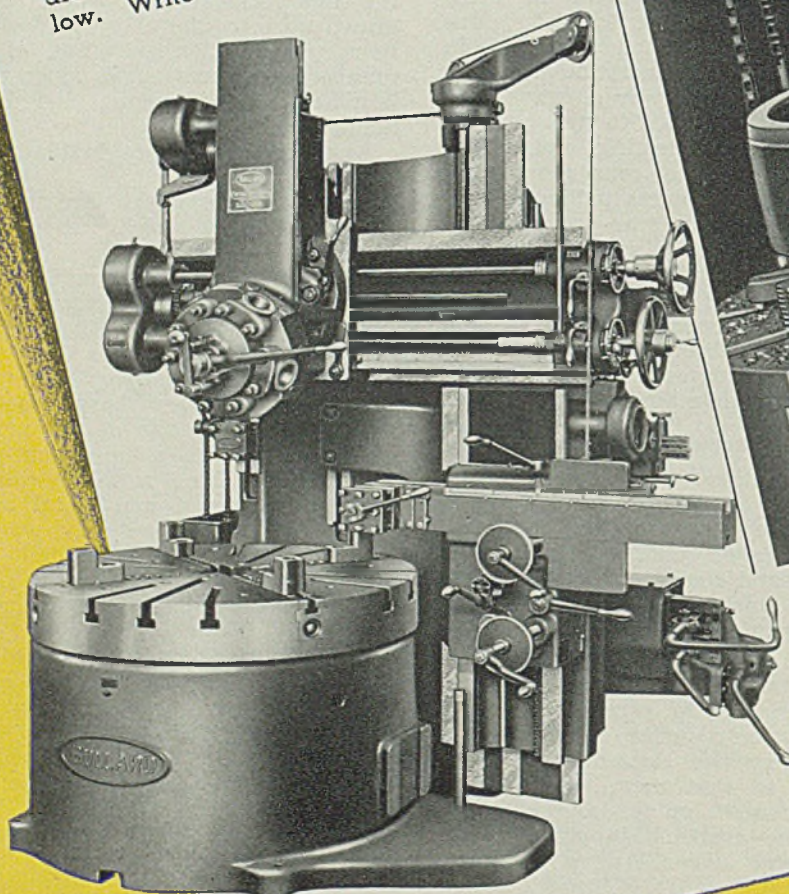
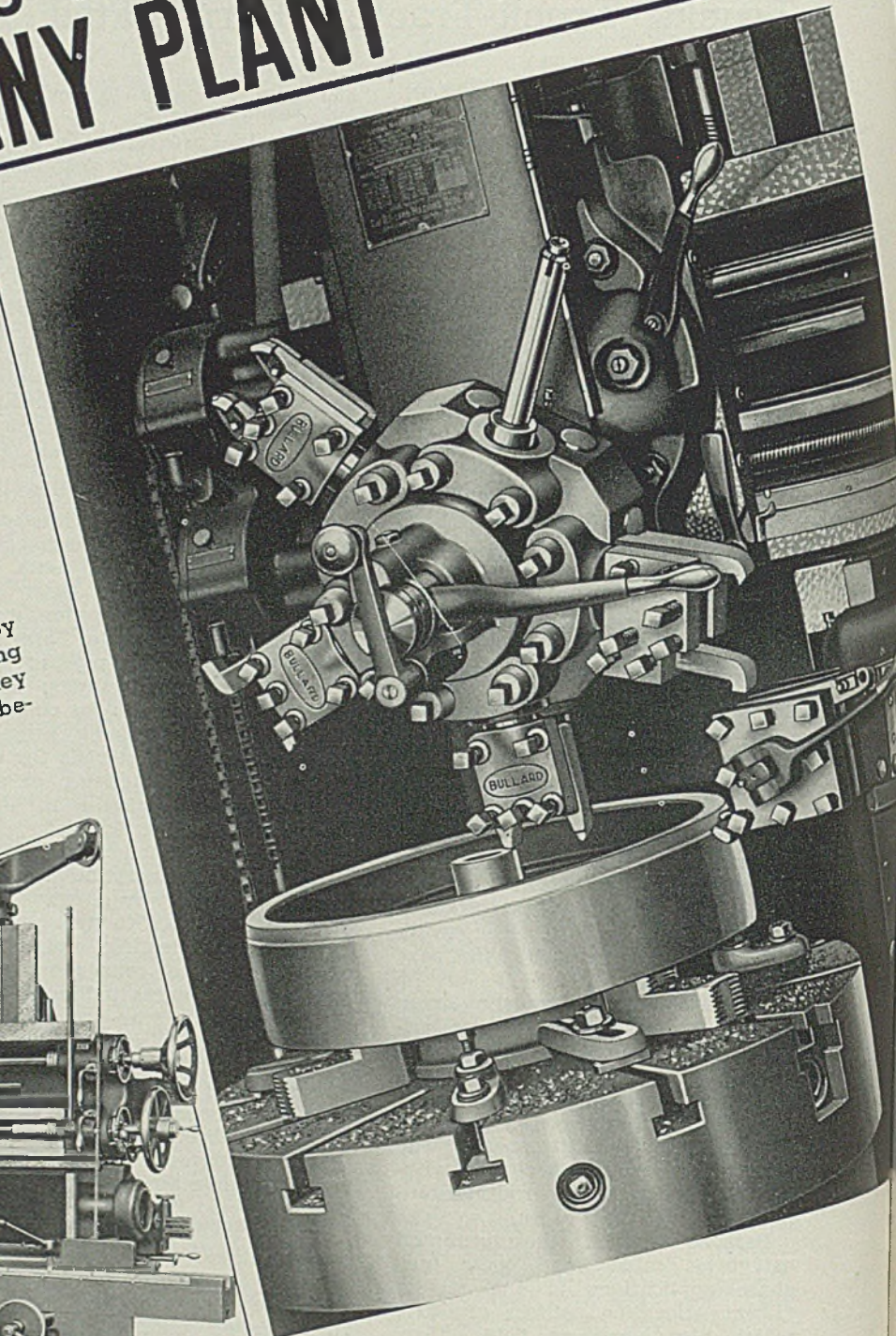
Steam or hot water systems are allowed only for installations serving two or more families; metal jackets for boilers are not allowed.

VERSATILE V.T.L.s A FAVORITE TOOL IN ANY PLANT

The 5-hole Main Turret and 4-tool Side Turret Heads of Bullard Vertical Turret Lathes can be operated simultaneously and independently, thus cutting machining time and time between actual cuts. The horizontal table provides faster locating and chucking of heavy or awkwardly shaped pieces.

Operations performed include boring, facing, turning, drilling, reaming, threading, forming—in fact, practically every type of machining.

Bullard V.T.L.s are widely used by manufacturers of air conditioning equipment. Some of the parts they are helping to produce are listed below. Write for bulletin.



PARTIAL LIST OF PARTS GENERALLY HANDLED

Valve Bodies	Packing Rings
Compressor Pistons	Pulleys
Compressor Rings	Sheaves
Compressor Cylinders	Gear Blanks
Pipe Flanges	Clutch Rings

THE BULLARD COMPANY
BRIDGEPORT, CONNECTICUT

Mirrors of MOTORDOM

Motor companies analyzing shipping and servicing of war equipment, as well as production. Will set up schools to train army mechanics at own cost . . . Look to diesel power for tank installations . . . General Motors will build three types of complete airplanes . . . Help dealers by repurchasing frozen new models . . . Automobile material inventories are heavy



By A. H. ALLEN
Detroit Editor, STEEL

DETROIT

WAR headlines are pretty bleak reading these days and to Detroit, which has been called a city of perpetual optimists, the bad news is particularly trying. If it were possible to lift the curtain of military secrecy which has been dropped over the war activities of the automobile industry, considerable comfort and encouragement could be derived. The industry would like to tell and show the public how it is helping to bring our military forces to a parity with the enemy, but strict regulations muzzle official lips.

Some generalities can be drawn, however. One is that the motor manufacturers are not contenting themselves with merely producing the weapons, they are attacking aggressively the problem of shipping the material in the most economical way and of servicing the equipment after it goes into action. And beyond that they are studying and analyzing new types of equipment, both combat and transport, lending the benefit of their engineering knowledge to the military services. Already some of these new vehicles are going into production, one example being a heavy four-wheeled armored car, with power steering and power brakes, which Chevrolet will build.

Devise New Crating For War Materials

With their detailed knowledge of export shipments, automotive experts are in a good position to advise on shipping of war goods. In one case, study showed that approximately four times the amount of material could be shipped by crating knocked-down units over the former system of shipping assembled units. Hence automotive experience is being utilized to change over former methods, thereby stimulating the movement of war material to the world battlefields.

When it is realized that it takes four months for a medium tank to get from Detroit to Libya, for example, the vital importance of shipping can be appreciated. Transport of these tanks can be likened to a huge pipeline extending from Michigan to Africa. Before any of the tanks can be made ready for combat work at their destination, the entire pipeline must be filled with finished units, so that eventually they will be dropping off in Libya just as fast as they drop off the assembly line here.

Then there is the matter of servicing tanks in the field. One automobile company is spending a good many millions of dollars of its own money to set up schools to train army men in the technical features of tank construction, servicing and operation. Eventually it is believed 20 such schools will be set up around the country, with the army supplying selected recruits who will spend several weeks learning tank details. Cost of this training work is estimated to be \$10 per man per week, and this expenditure is being absorbed by the manufacturers.

Extent of this training activity can be appreciated from the fact that army estimates call for 30 per cent of the personnel of an armored division to be trained mechanics. There are about 15,000 men in an armored division, and it is expected to outfit eventually something like 20 divisions.

Diesel power appears promising for tanks. For one thing, greater cruising range for the fuel load carried is possible, and diesel engines have several times the service life of radial engines, now used in some tanks. Radial engines were selected originally because they had lighter weight and were unencumbered by cooling systems. But tank service is a grueling proposition, with engines operating at full-throttle

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nearly all the time. The diesel is a rugged type of plant, can be serviced readily, and can be produced in large quantities in a short time. Where extra cruising range is desired, jettison tanks are employed—armored tanks outside the hull storing spare fuel, which are thrown overboard when the fuel is loaded into supply tanks.

Big Three Collaborate On Engineering Tanks

The critical rubber situation is prompting investigation of metal tank treads. Rubber treads have a life of around 600 miles in rough going. Steel or iron treads can be substituted and probably will have a longer life, but throw the wear problem on pins and add to the operational noise of the tank. Incidentally, studies are well along on such problems as reducing noise level inside tanks, air conditioning interiors, etc. Engineers of Ford, Chrysler and General Motors are collaborating with army officials on the whole tank picture and speedy progress is expected. Competitive lines between these three companies, if they ever did amount to much, are clear down now and there is complete interchange of information on tank problems. Interchangeability of parts produced by the three companies likely will result.

Fire power of tank guns is another vital consideration, particularly at the moment. Not much can be said about it, except that if shell velocities can be stepped up from their present level, the range of fire power is thereby increased, suggesting that smaller-caliber ammunition of the high-velocity type, greater quantities of which could be carried in a tank, might make for greater attacking power than the larger-caliber ammunition with slower velocity and shorter range.

Temporary disemployment result-

MIRRORS OF MOTORDOM—Continued

ing from changeover of motor plants to war production is not nearly as severe as had been anticipated. Taking the case of General Motors as typical of the industry, early estimates indicated employment as of March 1 would be around 148,000 persons. Instead it totaled nearly 162,000. Average employment for the entire year of 1939 for GM was only 152,000 and average working hours only 35 per week. In February of this year, the average work week was 44 hours. This shows GM has now reached a level of war activity greater than its total normal business activity in 1939.

86 of 90 Plants on War Work

In a recent radio address, C. E. Wilson, GM president, summarized the outlook by saying the corporation "has 90 factories or producing units, with approximately 65 million square feet of floor space, of which 86 are already producing war ma-

terial or are being rearranged and retooled for war production. War work will be found for the remaining four, or they will be sold or leased to the government or other contractors."

Mr. Wilson also revealed the corporation is preparing to produce three different types of complete airplanes, in addition to the parts work for the North American bomber now under way. While he did not say so, it is learned that two of the planes—a dive bomber and a torpedo bomber—will be furnished by the new Eastern Aircraft Division. The third, a bomber, will be produced in the middle west at a new plant.

Help for the nation's ice-bound automobile dealers whose stocks of frozen cars were threatening to paralyze dealer operations came recently with the announcement by divisions of General Motors that after April 1 the corporation will

buy back from dealers any unused or undamaged 1942 models on the basis of net cost to the dealer plus transportation charges, plus storage charges of about \$15 a month since Jan. 31. Other auto companies probably will follow suit, and the repurchase agreements will be extended to stocks of parts and accessories if dealers so desire.

To Redistribute Cars From Dealer Stocks

The distressed dealer need not sell back his entire stock if he prefers to retain some of it. Assumption is that the manufacturers will redistribute the repurchased cars to other dealers who want them. Three reasons were advanced for the repurchase agreement: (1) To relieve unbalanced dealer inventories, (2) to minimize wild bidding for available sales by liquidating dealers, and (3) to prevent cars from falling into illegitimate hands.

Some interesting observations on manufacturers' inventories for parts and materials were in the annual report of K. T. Keller, president of Chrysler Corp., to stockholders meeting April 21. As of Feb. 1, Chrysler had in its inventories and on order materials in various stages of fabrication, for 53,484 civilian passenger cars and light trucks previously authorized by the government, but which, following Feb. 10 could not be used for such vehicles. Much of this inventory will be used in producing vehicles and other products under the war program and for service requirements, and the remainder is expected to be available when production of cars for civilian use is resumed.

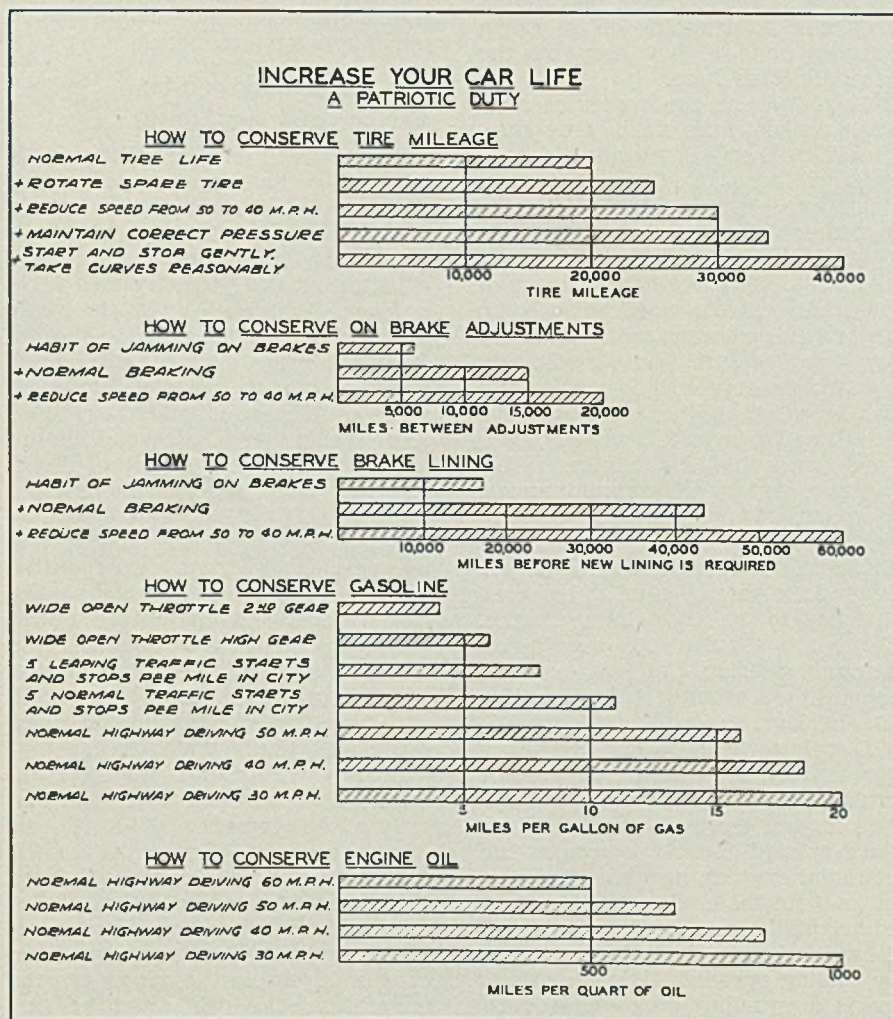
May Build New Melting Plants

In addition to the fabricated parts and partly fabricated parts for these cars, there were raw materials in inventory and on order which are not immediately suited to war use. Estimates place the value of these slow moving raw materials and parts on hand and on order at about \$40,000,000.

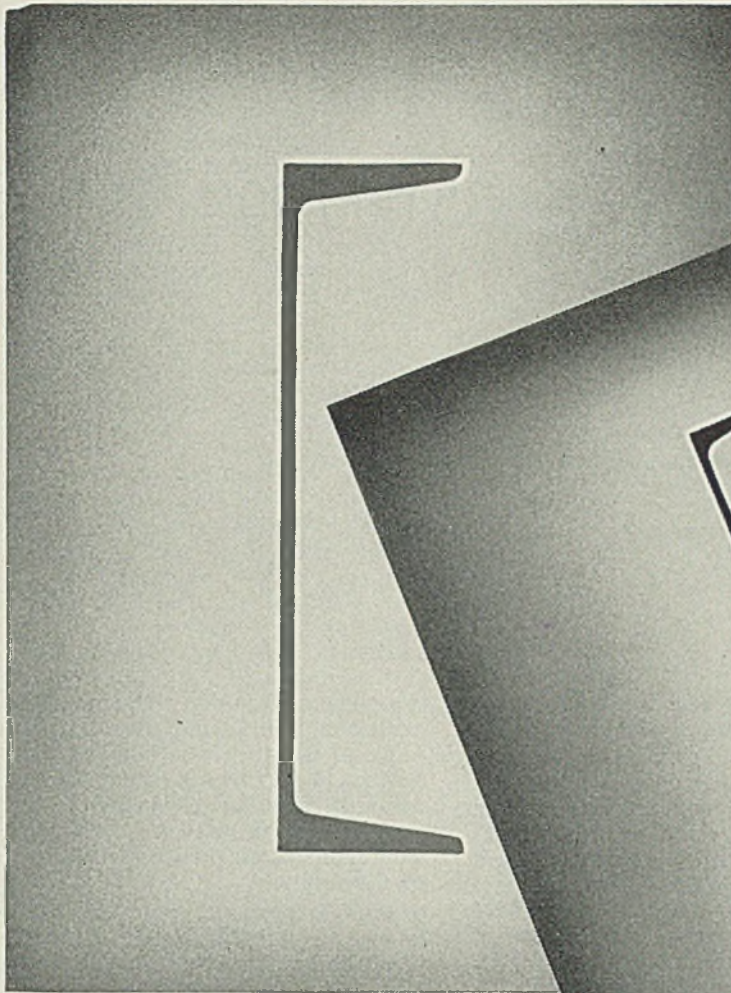
Foundry circles in Detroit have heard reports of plans for erection of two new electric steel melting and casting plants in the metropolitan area for production of large-size armor castings, presumably for tank parts. These would be apart from the armor plant now going up at Ford's Rouge works, where a combination of four cupolas, four bessemer converters and electric holding furnaces before long will be processing armor steel for casting purposes.

Plans also are under way for a new plant to supply aluminum forgings for aircraft engines, to be located outstate.

How To Make Your Car Last Longer

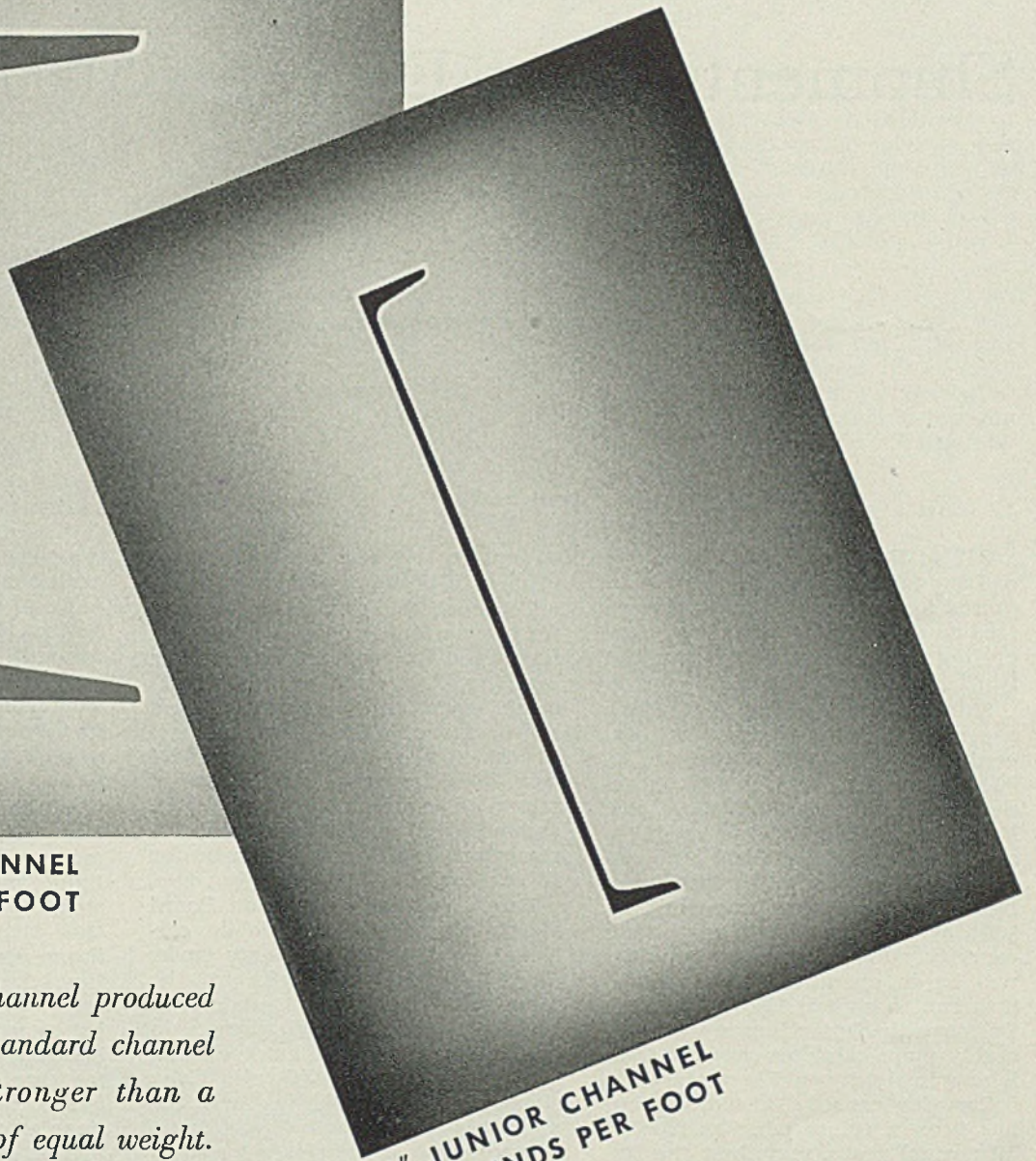


HOW to make present automobiles last longer is a question uppermost in everyone's mind. Here are five angles, developed by the engineering department of the Pontiac Motor Division. Particularly impressive are the gains achieved by lowering driving speeds



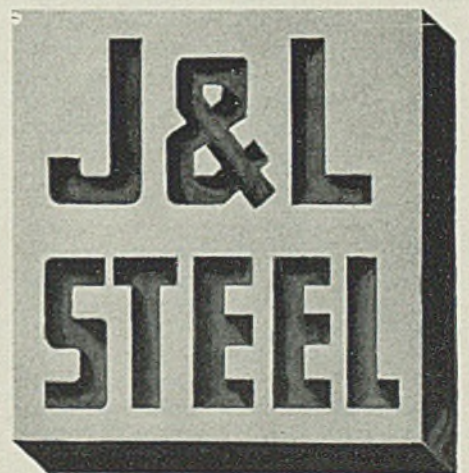
10" STANDARD CHANNEL
15.3 POUNDS PER FOOT

*Lightest rolled steel channel produced
— weighs less than standard channel
of equal depth, is stronger than a
formed plate channel of equal weight.*



10" JUNIOR CHANNEL
6.5 POUNDS PER FOOT

**CONTROLLED QUALITY
JUNIOR
CHANNELS**



JONES & LAUGHLIN STEEL CORPORATION
AMERICAN IRON & STEEL WORKS • PITTSBURGH, PA.

Iron Ore Requirements Expanding; Shipments May Exceed 85,000,000 Tons

◆

*New vessels building . . . Conversion of auto-
mobile carriers proposed . . . Canadian ships may
haul larger tonnage*

◆

STEADILY increasing shipments of Lake Superior iron ore will be required for the next several years to feed an expanding steel industry operating at capacity to produce the No. 1 raw material of war.

Shipping and mining authorities expect the 1942 movement will exceed the record 1941 shipments of 80,116,000 tons; this year's movement may exceed 85,000,000 tons. For 1943 even more will be required, and with about 11,000,000 tons annual carrying capacity added, may reach 95,000,000 tons or more. In 1944, when most of the new steel capacity now projected or building will be in operation, requirements may run as high as 120,000,000 tons. To move the latter tonnage, considerably more carrying capacity than is now in sight would be required.

Carrying capacity, of which there has been a comfortable surplus in all normal years, may limit the tremendous expansion required in the ore movement. The fleet worked at capacity in 1941 and was favored by unusually good weather to achieve its 80-million-ton record. Last year's total tonnage exceeded best expectations of shippers and government officials by 5,000,000 to 8,000,000 tons.

Fleet capacity will be increased by the five large new carriers to be launched this year by the Pittsburgh Steamship Co. All will see service during 1942, according to present plans.

Sixteen vessels have been ordered by the Maritime Commission, ten placed with Great Lakes Engineering Works at River Rouge, Ecorse, Mich., and six with American Shipbuilding Corp., Lorain, O. All are expected to be completed in 1943.

These new ships will add approximately 11,000,000 tons to the fleet's annual capacity. However, the add-

ed capacity will be scarcely sufficient to meet 1943 requirements.

To meet the expanding demand for ore, various proposals have been forwarded for increasing the fleet's carrying capacity. In the original steel expansion program advanced by the former OPM Iron and Steel Branch, it was proposed to build 25 new lake freighters. Shortage in materials and congestion in lake shipbuilding capacity resulted in the compromise letting of contracts for 16 carriers.

Later the War Production Board suggested that 17 automobile carriers be converted to the ore trade. These vessels, made idle by the moratorium on auto production, could add a substantial tonnage to ore carrying capacity but the problem of conversion is difficult. Lake shipyards are crowded and the steel plates and other materials necessary for conversion are scarce. Many shipping experts believe the attempt to switch over these vessels to the ore trade would result in a slowing down of the present new vessel construction program as well as delaying necessary repairs to the present fleet.

Canadian Vessels To Help

Canadian ore vessels, which were permitted to carry cargoes between United States ports last season will again figure in this year's traffic, permission having been granted by Congress. Tonnage carried by the the Dominion freighters will depend to large extent on the exigencies of war. Ordinarily they are engaged in the grain trade and, if diverted to ore carrying a diversion of grain traffic would be required. Normally this would not be practicable, but war conditions may make it necessary.

All-rail shipments will be in-

creased moderately. Probably an additional half million tons will move to Granite City, Ill., to supply a new blast furnace there. Other demands on the railroads' rolling stock, however, will make any considerable expansion in all rail shipments unlikely.

Some increase in carrying capacity can be obtained by diverting upward bound coal traffic and downward bound grain traffic to rail shipments. Upward bound vessels going light and without necessity for stopping for unloading could shorten time required for trips. Likewise, those vessels carrying grain down the lakes, mostly Canadian, could carry ore. Such diversion would be uneconomic in ordinary times but may be resorted to as a war measure.

The full ore fleet will start operations as early as weather conditions permit and, in fact, may push the weatherman more than ordinarily. Present plans call for the fleet to be on the alert by April 1, ready for a start as soon as ice conditions allow.

Government agencies will aid with ice breakers and possibly blasting crews. These aids, however, will be of an emergency nature and will be called upon only if ships are halted by jammed ice. Lake shippers are skeptical of the value of ice breakers for opening a channel to the upper lakes before weather conditions become favorable.

During the season a new lock at Sault Ste. Marie will be constructed by the government. Congress has approved a measure to build the project at a cost of \$8,000,000. It will be completed during 1942.

In the 1941 season some delay was occasioned when a bridge over one of the present locks collapsed. The loss to the ore traffic however,

did not exceed 200,000 to 300,000 tons.

The new lock is necessitated not only by the Soo's increased traffic but also by its strategic importance. Military and shipping experts have emphasized that a few well placed enemy bombs could effectively disrupt iron ore shipments.

Upper lakes mining areas have been active throughout the winter. Underground mines have been working steadily and stockpiling ore in preparation for the season's opening. Open pit mines were favored during the early part of the winter by mild weather and continued operations.

Major attention has been given to mining equipment. Many companies have ordered or received new power shovels, trucks and other implements. Equipment on hand has been given a thorough overhauling.

While delivery of such equipment has been delayed by the tremendous demand, the mining companies have been aided by high priority ratings—A-3 in many cases. Deliveries, reportedly have been fairly satisfactory, although some trouble was experienced recently in obtaining equipment requiring rubber. This problem, however, now is in process of solution.

Oliver Mining Co., United States Steel Corp. subsidiary, has placed orders for seven power shovels and 61 trucks, deliveries of which have been made or are expected to be made soon.

Two Years' Expenditures for New Steel Facilities Exceed Billion

NEARLY \$1,100,000,000 in private and government funds was expended in 1941 or allotted for expenditure in 1942 to increase steel output for war needs, according to a survey just completed by the American Iron and Steel Institute.

The outlay by steel companies themselves for new equipment and construction last year was \$295,000,000, and this year they are planning further expansions at a cost of \$260,000,000.

The government in 1941 spent \$130,000,000 to install certain new steel equipment wanted for special war work, and for 1942 approximately \$414,000,000 in government funds has been allotted for the development of steel facilities. Plans for still larger additional expenditures by the government are under consideration.

The institute survey showed that of 176 steel companies replying to the questionnaire, 134 representing more than 90 per cent of the industry's capacity planned expansion or improvement of their plants this year.

The investment in new steel plants and equipment from 1935 through 1942 totals \$2,207,000,000. From 1929

to 1939, the industry increased its capacity by over 10,000,000 net tons of ingots and since the beginning of 1939, the increase in capacity has been nearly 7,000,000 tons to the present total of approximately 88,500,000 tons. Total capacity at the beginning of 1929 was approximately 71,500,000 tons.

This additional capacity, built while the nation was at peace, was not fully employed until the war emergency arose. A reserve capacity thus was created, which is now proving of incalculable value in preventing shortages of materials essential to the war effort.

25% Above Previous Record

The steel industry, as a result of its expansion and modernization program, was able to produce nearly 83,000,000 net tons of steel last year, or about 97 per cent of its capacity, despite strikes and shortages of scrap and other raw materials. This output, a new record, was about 25 per cent more than was ever before produced in a single year.

Steel production for war equipment is being facilitated as producers and consumers concentrate on a relatively small group of standard steels rather than thousands of special-order steels, according to the institute.

Standard steels on which emphasis is being laid consist of 87 alloy steels and 77 carbon steels, selected after two years' study and research by steelmakers and metallurgists. Previously carbon and alloy steel had been made in 4000 combinations of chemical elements.

In 1941 the groups of standard steels represented approximately 90 per cent of total carbon steel output, 70 per cent of alloy steels made in the open hearth, 85 per cent of electric furnace alloys and 100 per cent of stainless steels. In 1942 it is expected standard steels will constitute an even greater proportion. Steel plant efficiency has been materially improved with greater production of standard steels, both producers and consumers sharing in the advantage of production on a large scale.

Blast furnace operators are trying "every trick of the trade" in an effort to increase pig iron output for war purposes, according to the institute. They also exchange with one another "their most private and formerly closely-held operating secrets."

Shortage of scrap has increased



TO INCREASE carrying capacity of the Great Lakes iron ore fleet, the War Production Board has asked that 17 vessels formerly hauling automobiles be converted to ore freighters. Automobile carriers, such as the one pictured above, have been disemployed by the ban on automobile production, but their conversion to the ore trade would involve extensive and expensive alterations. NEA photo

need for more pig iron and to meet the emergency blast furnace capacity has been increased about 4,600,000 tons in the past two years, and new furnaces with annual capacity of over 7,000,000 tons are planned.

Since it will be a year or more before all the new stacks are in operation, executives of the industry recently asked blast furnace superintendents to use all their experience and ingenuity to get maximum output immediately from existing furnaces, to forget production costs for

the time being and to use any expedient that will produce even a few more tons of pig iron per day.

Among emergency methods now being tried is washing and cleaning of coal to remove sulphur and ash before making it into coke. Experiments are also being made in grading coke to size as some kinds of ore yield more iron when coke of a particular size is used for fuel. Another method being tried is operation of blast furnaces at temperatures higher than usual.

90 Per Cent of Steel in Canada Now in War Work

TORONTO, ONT.

THAT 90 per cent of available Canadian steel is being used directly for war purposes is the statement of F. B. Kilbourn, Canadian Steel Controller. The remaining 10 per cent is limited to purposes high up in the essential class, such as cans for foodstuffs, coal shovels, repair parts for buses.

A long list of products has been banned from further manufacture. Baby carriages are included. Button manufacturers must use wood or plastics. Chain link fences probably will be barred. Orders have been issued for cessation of manufacture of metal ski poles, fishing rods, golf clubs. None of these may be sold in Canada after April 29. J. R. Nicholson, Deputy Controller of Supplies, states that permits may be issued for reasonable use of inventories of materials now in hands of manufacturers.

Steel wool, metal kitchen scrapers and other kitchen utensils, metal lawn rollers, paper weights, metal ornaments and decorations have been put on the prohibited list.

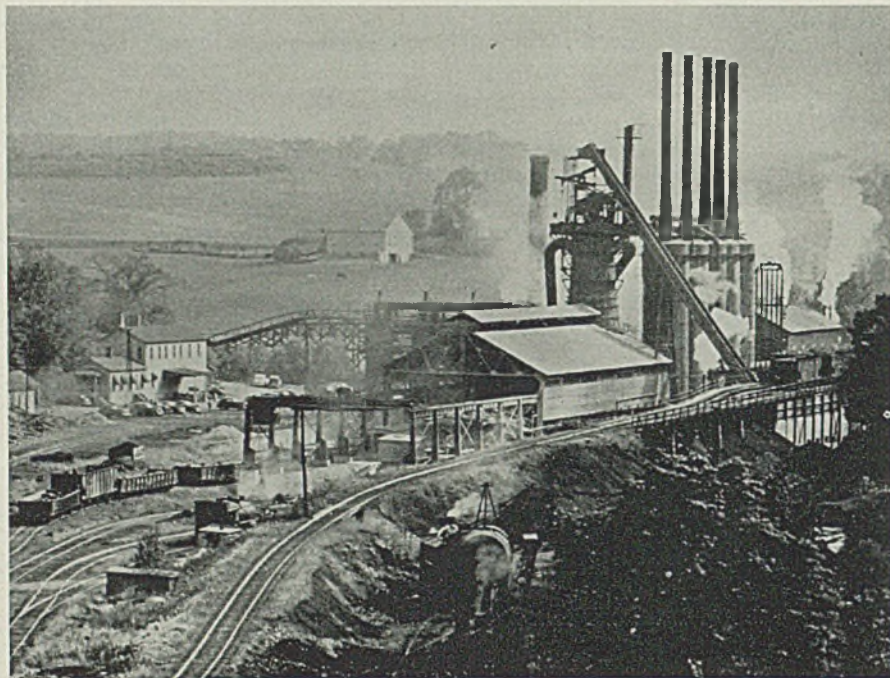
New instructions issued to the metal trades prohibits use of virgin tin for any purpose without written permission of the Metals Controller, of the Department of Munitions and Supply. Permission will be granted only for war materials and most essential civilian products.

Tungsten supply is so short that even in high-speed steel tools tungsten content has been reduced from 18 to 6 per cent. Molybdenum and vanadium will be used instead, though a shortage is developing in the latter.

Restrictions on export of motor vehicle parts are to be extended. On and after March 2 an export permit from the Department of Trade and Commerce will be required for export of replacement parts and accessories for passenger cars, motor trucks, buses, chassis and engines.

Record Steel Output

January production of steel ingots and castings in Canada established a new monthly record with 257,069 net tons, a gain of 5 per cent over 244,846 tons in December. Pig iron output was 163,156 net tons, 3026 tons less than the all-time record of 166,182 tons in December. Dominion Bureau of Statistics rates steel ingot production at 97 per cent of capacity and pig iron at 94 per



“Old Timer” Silvery Iron Producer Gives Way to Modern Blast Furnace

JISCO stack of the Jackson Iron & Steel Co., Jackson, O., is scheduled to be blown out April 1 and will be replaced by a complete new blast furnace of increased capacity.

The stack made its first cast of silvery pig iron Oct. 6, 1908, and has been producing this specialty since. The present campaign of seven years has been one of the longest made by a furnace on silvery iron. During this period several tonnage records have been established by the furnace.

The projected expansion program includes, in addition to the new stack, a new hot blast stove, which already is completed, and installation of a Carrier air conditioning system to dehumidify the hot blast.

Auxiliary furnace equipment has been expanded to help handle the increased tonnage of raw materials. This equipment includes two diesel-electric traveling cranes, a diesel-

driven ore unloader, and an addition to the trestle high-line. Company also is adding to its water system to insure a sufficient supply for the new and enlarged plant.

Urgent need for silvery pig iron in the war production program necessitates completion of the project as soon as possible. To speed the work the company's property will be flood-lighted and construction will be pushed 24 hours a day, seven days a week.

Conservative estimates place at three months the period the furnace will be out of blast.

Small quantities of coal, mined on the company's own property near the cast house, are mixed with coke in the present Jisco stack, shown in the accompanying photograph. Furnace gas is run into a precipitator, conducted through insulated mains, and burned under the boilers and stove.

cent. Ten of 11 blast furnaces are in operation, the one idle stack undergoing repairs at the Algoma Steel Corp. plant at Sault Ste. Marie, Ont. Algoma Steel Corp. has completed arrangements with the government for erection of an additional blast furnace with capacity of 1000 tons per day, to be completed late this year. Dominion Steel & Coal Corp. Ltd., Sydney, N. S., also will start work soon on a new stack.

Steel capacity of Canada at the end of January is estimated at 2,647,000 net tons annually of basic open-hearth steel and 317,000 tons of electric furnace steel, a total of 2,964,000 tons. Steel castings capacity is estimated at 200,000 tons.

Dominion Bureau of Statistics has changed its base from gross to net tons in reporting production and capacity figures. January production, with comparisons, in net tons:

	Steel castings	Pig Iron	Ferro-alloys
Jan., 1942 . . .	257,069	163,156	18,004
Dec., 1941 . . .	244,846	166,182	19,986
Jan., 1941 . . .	208,650	115,455	17,059

Heavy Steel Products Lead in Year's Production

PRODUCTION of semifinished and finished rolled steel products for sale in 1941 established a new record at 65,361,688 net tons, an increase of 34.5 per cent over the prior high, 48,584,860 tons in 1940, according to the American Iron and Steel Institute. Some of the total in 1941 represents conversion of ingots and semifinished products carried over from the previous year.

In production of individual steel products, more standing records were made in 1941 than in any previous year. Except in rails and certain varieties of pipe, new peaks were established for nearly every major class of steel product.

Among materials produced in record quantities were sheets and strip, tin plate, alloy bars, reinforcing bars and sheet piling. Records were also almost certainly made in plates, heavy structural shapes and merchant bars.

Heavy steel products comprised a larger proportion of total output for sale in 1941 than in nine years, reflecting the shift in demand from manufacture of consumers' goods to war equipment.

Plates, shapes, bars, billets and other heavy steel accounted for 60 per cent of the total made for sale last year, while light steel, such as sheets, tin plate and wire rods, amounted to 40 per cent. Heavy

AMERICAN IRON AND STEEL INSTITUTE						January - 1942	
Capacity and Production for Sale of Iron and Steel Products						January - 1942	
	Number of Companies	Items	Annual Capacity Net tons (a)	PRODUCTION FOR SALE—NET TONS			
				Current Month			
				Total	Per cent of capacity	Export %	To members of the industry for conversion into further finished products
Ingot, blooms, billets, slabs, sheet bars, etc.	41	1	xxxxxxx	592,529	xxx		167,829
Heavy structural shapes	9	2	5,047,000	403,215	94.0		xxxxxxx
Steel piling	4	3	374,000	38,099	119.9		xxxxxxx
Plates—Sheared and Universal	20	4	7,100,760	713,182	118.2		13,353
Skelp	7	5	xxxxxxx	83,550	xxx		53,605
Rails—Standard (over 60 lbs.)	4	6	3,563,600	123,263	40.7		xxxxxxx
Light (60 lbs. and under)	6	7	302,800	8,019	31.2		xxxxxxx
All other (Incl. girder, guard, etc.)	2	8	102,000	1,360	15.7		xxxxxxx
Splice bar and tie plates	13	9	1,161,740	54,150	54.9		xxxxxxx
Bars—Merchant	41	10	xxxxxxx	593,129	xxx		82,151
Concrete reinforcing—New billet	18	11	xxxxxxx	164,527	xxx		xxxxxxx
Rerolling	12	12	xxxxxxx	17,023	xxx		xxxxxxx
Cold finished—Carbon	23	13	xxxxxxx	111,545	xxx		xxxxxxx
Alloy—Hot rolled	18	14	xxxxxxx	147,788	xxx		30,154
Cold finished	18	15	xxxxxxx	19,377	xxx		xxxxxxx
Hoops and baling bands	3	16	xxxxxxx	6,136	xxx		xxxxxxx
TOTAL BARS	65	17	13,601,850	1,059,525	91.7		112,305
Tool steel bars (rolled and forged)	16	18	182,340	13,374	86.3		xxxxxxx
Pipe and tube—B. W.	16	19	2,227,040	137,745	72.8		xxxxxxx
L. W.	8	20	904,400	41,714	54.3		xxxxxxx
Electric weld	7	21	1,165,450	56,331	56.9		xxxxxxx
Seamless	13	22	3,031,160	162,565	63.1		xxxxxxx
Conduit	8	23	186,280	14,792	93.5		xxxxxxx
Mechanical Tubing	10	24	402,600	33,153	96.9		xxxxxxx
Wire rods	20	25	xxxxxxx	110,374	xxx		17,590
Wire—Drawn	43	26	2,348,690	200,987	100.7		3,705
Nails and staples	19	27	1,157,650	61,478	62.5		xxxxxxx
Barbed and twisted	15	28	469,810	26,666	66.8		xxxxxxx
Woven wire fence	16	29	774,785	20,100	30.5		xxxxxxx
Dale ties	11	30	120,930	5,480	53.3		xxxxxxx
All other wire products	9	31	71,020	3,103	51.4		xxxxxxx
Fence posts	11	32	107,160	3,020	33.2		xxxxxxx
Black plate	11	33	342,100	51,877	178.5		xxxxxxx
Tin plate—Hot rolled	6	34	508,620	37,355	86.4		xxxxxxx
Cold reduced	11	35	3,871,340	279,905	85.1		xxxxxxx
Sheets—Hot rolled	28	36	xxxxxxx	543,995	xxx		13,945
Galvanized	15	37	xxxxxxx	111,326	xxx		xxxxxxx
Cold rolled	16	38	xxxxxxx	205,391	xxx		xxxxxxx
All other	13	39	xxxxxxx	47,866	xxx		xxxxxxx
TOTAL SHEETS	30	40	13,088,370	908,579	81.7		13,945
Strip—Hot rolled	25	41	2,895,100	152,763	62.1		14,840
Cold rolled	40	42	1,589,320	100,962	74.8		xxxxxxx
Wheels (car, rolled steel)	5	43	424,820	21,401	59.3		xxxxxxx
Axles	6	44	453,470	20,251	52.6		xxxxxxx
Track spikes	11	45	320,940	14,722	54.0		xxxxxxx
All other	6	46	76,600	8,955	137.6		xxxxxxx
TOTAL STEEL PRODUCTS	170	47	xxxxxxx	5,567,539	xxx		397,172

IRON PRODUCTS	Number of Companies	Items	Annual Capacity Net tons (a)	PRODUCTION FOR SALE—NET TONS			
				Total	Per cent of capacity	Export %	To members of the industry for conversion into further finished products
Pig iron, ferro manganese and spiegel	29	48	xxxxxxx	729,960	xxx		286,041
Ingot moulds	5	49	xxxxxxx	65,681	xxx		xxxxxxx
Bars	12	50	177,115	10,125	67.3		807
Pipe and tube	7	51	109,300	7,589	81.7		xxxxxxx
All other	2	52	71,000	2,177	36.1		xxxxxxx
TOTAL IRON PRODUCTS (ITEMS 50 to 52)	15	53	292,915	19,891	79.9		807

(a) To be revised.

* In accordance with Government policy, export figures cannot be published.

steel products comprised 58.5 per cent of the total in 1940, 55 per cent in 1939 and less than 54 per cent in 1938. From 1933 through 1935 heavy steel products at times formed as little as 52.5 per cent of the total.

Details of January production of steel for sale are shown in the accompanying tabulation.

Steel Strapping Carries A-10 Rating Under P-100

Steel strapping is interpreted as "operating supplies" and as such carries a rating of A-10 under Preference Rating Order P-100, according to Acme Steel Co., Chicago. Because this order forbids the application of the rating to "nonferrous material to be used as pack-

aging supplies," there has been some misunderstanding to the effect that steel strapping could no longer be obtained. Steel strapping is "ferrous" material and therefore is eligible to receive an A-10 rating on Order P-100.

There is still sufficient steel available to supply essential needs of industry, and especially where no conservation of needed material results from the replacement of steel by substitutes. This is particularly true of steel strapping which permits the use of lighter weight boxes, makes possible the bundling and skid-handling of hundreds of products which would otherwise be packed in heavier and more expensive containers, thus adding to freight, storage and handling problems.

Activities of Steel Users, Makers

AXELSON Mfg. Co., Los Angeles, is celebrating its fiftieth anniversary this year. Its principal production has been in pumps and other equipment for petroleum production. During World War I a line of machine tools, including heavy-duty lathes and accessories, was developed and this feature also is being pushed. Part of the company's facilities have been converted to production of aviation parts for warplanes.

DeVilbiss Co., Toledo, O., has moved its St. Louis sales and service branch to new quarters at 2737 Washington avenue.

Service badges have been awarded by Hanson-Van Winkle-Munning Co., Matawan, N. J., manufacturer of electroplating equipment and supplies, to all employees who have been with the company for five years or more. Various lengths of service are indicated by different materials used in badges.

An educational calendar showing 11 basic types of machine tools is being distributed by Continental Machines Inc., Minneapolis, and Doall Co., Des Plaines, Ill. Special attention is given to chip production in a study of fundamentals of machine shop practice. The calendar is large and is designed to be hung in the shop where all machine-shop and production men can read it easily.

Despatch Oven Co., Minneapolis, has moved its purchasing, engineering, sales and executive offices to 722 Central avenue, to provide additional manufacturing and assembly facilities at its factory which remains at 622 Ninth street Southeast.

Pennsylvania Transformer Co., Pittsburgh, has appointed the following sales representatives: Associated Engineers, 747 Martin building, Birmingham, Ala.; R. D. Cope & Co., Southland Building annex, Dallas, Tex.; W. Porter Jones, 910 Fidelity building, Cleveland; J. E. Murray & Co., Midland building, Kansas City, Mo.; Williamson Sales Co., P.O. Box 1194, Shreveport, La.

Lincoln Electric Co., Cleveland, has changed the addresses of the following branch offices: Oklahoma City office is now located at 19 North Ellison street, with R. L. Looney, manager, in charge; Milwaukee, 733 North Van Buren street, with F. C. Archer continuing as district manager; Chattanooga, Tenn., 1111 James building, R. M. Daniels

in charge; Chicago, 323-325 East Twenty-third street, G. E. Tenney, manager; Dayton, O., 246 Wiltshire boulevard, R. P. Sharer, manager. Fuchs Machinery & Supply Co., Lincoln's office in Omaha, Nebr., is now located at 521 South Fifteenth street.

Manning, Maxwell & Moore Inc., Bridgeport, Conn., has distributed a jobbers' salesmen's hobby club roster to about 6000 jobbers' representatives, containing the home address and hobby of all those to whom the book has been sent. It includes many photographs showing salesmen at work on their hobbies and lists more than 110 spare-time activities. The purpose was to build goodwill among salesmen, and the response has been encouraging.

Alan Wood Steel Co., Conshohocken, Pa., is renovating the iron ore mine at Oxford, N. J., recently purchased from Warren Foundry & Pipe Co., Phillipsburg, N. J. Improvements include an ore crusher, a trolley railroad in the mine and latest type dump cars and trolley locomotives. Materials and equipment have been ordered.

The company also purchased the Scrub Oak mine, near Wharton, N. J., which it had been operating for some time under lease. Produc-

tion from the old McKinley vein will be started soon, after an interruption of several years.

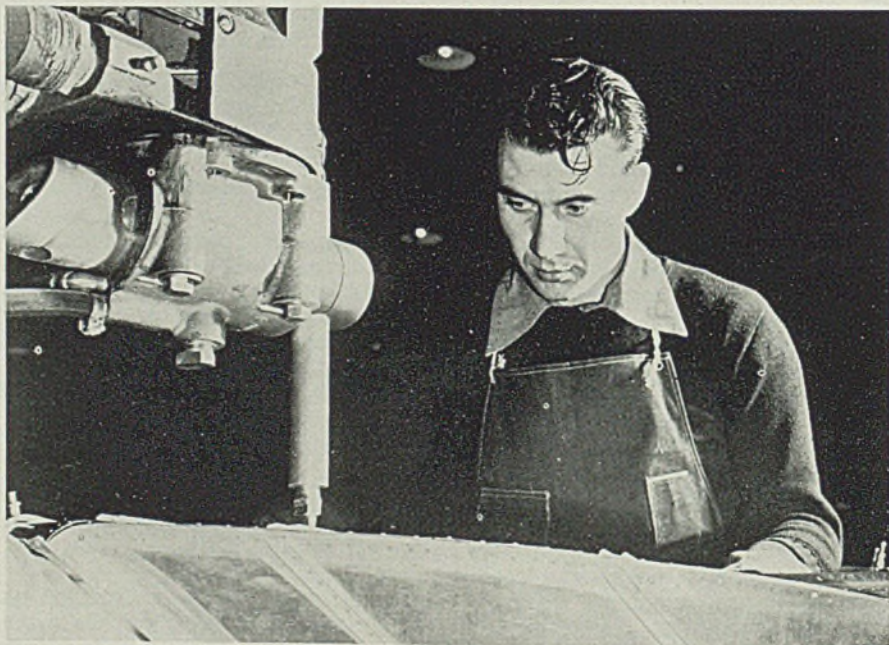
General Electric Co., Schenectady, N. Y., in 1941 paid employes \$95,203 for 12,453 suggestions, a large portion of which were ideas for speeding or improving war production. This was 22 per cent more than \$77,477 in 1940. Total suggestions numbered 40,834, or 24 per cent more than in 1940, and the number accepted was 8 per cent greater. Many employes took their awards in defense bonds.

Plant Conversion Industries, 55 Liberty street, New York, has been organized to aid manufacturers in converting their plants to war production. It announces it has engineering, plant survey, retooling, equipment and plant financing services and has established branch engineering and auditing staffs in key cities.

The group is headed by Maxwell J. Mangold, its organizer. It offers its services to manufacturers seeking to obtain subcontract work and to prime contractors wanting to place part of their requirements.

Allegheny Ludlum Steel Corp. employes have instituted a voluntary payroll allotment for the purchase of defense bonds, effective through all of the company's seven plants.

Spot Welding Aluminum Alloys



SPOT welding aluminum alloy members of airplane duct system at aircraft parts plant of Briggs Mfg. Co., Detroit. Close inspection of reinforcing strips shows closely spaced welds, with only four rivets used, equally spaced along the strips. Successful welding depends on accurate control of electrode pressure, current and position of parts, plus frequent dressing of electrode tips

Government Inquiries

The following prime contracts are pending, with closing dates for bids as indicated. QR refers to quantity required. Bidding forms on these items can be obtained only by wiring, mentioning schedule number, to the Procurement Branch of the service heading the list of requirements. Field offices of Contract Distribution Branch, WPB, generally have available for inspection and examination, schedules, invitations, specifications and drawings (where required) concerning these contracts.

BUREAU OF SUPPLIES, ACCOUNTS

NAVY DEPARTMENT, WASHINGTON

- 443—Machines, milling, vertical, QR-7. Bids Mar. 12.
- 452—Crane, Crawler type, gasoline engine driven, double drum, with 40' boom, complete with tools and accessories, QR-1. Bids Mar. 13.
- 458—Steel bunks, double deck, with 2 fabric springs, QR-13,753; single deck, QR-1524. Bids Mar. 17.
- 466—Street sweepers, gasoline, motor driven, of the latest design, complete ready for use, QR-19. Bids Mar. 17.
- 471—Hand and leg irons, QR-2,998. Bids Mar. 20.
- 479—Buoys, cylindrical and mooring, QR-232. Bids Mar. 17.
- 483—Metallic mercury, U.S.P. redistilled, in 5 lb. earthenware or glass bottles, QR-15,700 lbs. Bids Mar. 17.
- 476—Ammunition boxes, mark 1, for 40 mm. ammunition, QR-200,000. Bids Mar. 13.
- 478—Calcium carbide, in 100 lbs. drums, lump size, QR-400 lbs., nut, QR-1,420,000 lbs., ¼ size, QR-150,000 lbs. Bids Mar. 20.
- 482—Door closers, liquid, QR-4,928. Bids Mar. 20.
- 486—Mechanical clocks, type A, 24 hr. dial, 6" dial, QR-1,700, 8½" dial, QR-700; clocks, mechanical, type B, 12 hr. dial, 6" dial, QR-4,300. Bids Mar. 13.
- 4504—Countersinks, high speed steel, taper shank (Morse) No. 2 37 Deg. angle, dia. of body 2", Morse taper shank No. 3, QR-48, Reamers, high speed steel, bridge, spiral flutes, taper shank, "Morse" type R, 21/32" and 25/32", QR-30 of each, Countersinks and drills, type C (combined) carbon steel, double point, straight shank, dia. of body ¼", dia. of drill ⅜", QR-750. Bids Mar. 14.
- 4505—Pipe, brass, seamless, grade A, Standard weight, 2½", IPS, 12-16' long, QR-7,100 ft. Tubing, brass, seamless, grade I, type C, 300 pounds working pressure, per sq. in. O.D. 1.135", wall thickness, .065", QR-3800 ft., O.D. 3.5" x .122", QR-400 ft. Bids Mar. 13.
- 4510—Rope, wire, regular lay, 600' reels, Phosphor bronze, 6 x 19, fibre core, type C, ⅜" dia. QR-16,800 ft. Steel, extra strong, galv. 6 x 37, fibre core, ⅝" dia. type D. QR-2400 ft. Steel, plow, high grade, uncoated, 6 x 37, type E dia. ⅝", QR-37,200 ft. Clips, wire-rope, steel or iron, galv. QR-560. Bids Mar. 14.
- 4521—Tubing, steel, cor. res. cold drawn ¼ hard, finish "C", polished outside, random commercial lengths, 1.00" x .058" thick, QR-180 lin. ft. Bids Mar. 13.
- 4526—Irons, soldering, electric, heavy work, 115 volts, type D, pyramidal point, QR-315. Drills, electric, portable, universal current, voltage 115, chuck or Morse paper chuck, type B. Size max. of drill ¼" and ⅜", QR-94 of each. Bids Mar. 14.
- 4527—Shackles, anchor, screw, dia. ½" and 1" length, QR-4460. Thimbles, steel, galv. Manila and wire rope, QR-2240. Bids Mar. 14.
- 4515—Wrenches, socket, handles, ratchets, etc., QR-misc. Bids Mar. 13.
- 4518—Cutters, router, high-speed steel, heat-treated, guaranteed suitable for R. L. Carter routing machines, QR-

472. Bids Mar. 13.

- 4520—Nickel-copper-alloy, sheets, QR-approx. 4,100 lbs.; seamless, QR-approx. 894 lbs.; Electrodes, welding (covered) nic. cop. alloy, Class "B" ⅜" diameter, 18" long, QR-100 lbs. Bids Mar. 14.
- 4547—Pneumatic grinders, portable rotor type, wheel size 2", QR-12, 4", QR-24, 8", QR-6. Bids Mar. 14.
- 4549—Frames: hack saw, adjustable, straight handle, QR-7,238. Bids Mar. 16.
- 4550—Chains: type A, welded, crane, close link, wrought iron, black ⅝" dia. of wire, QR-26,400 lbs. Bids Mar. 16.
- 4568—Vises: hand, parallel jaw, type V, class B, opening (minimum) 1", width of jaws 1¼" to 1½", QR-50; vises: machinists', bench, swivel-base, station-

ary jaw, type VII, class B, opening of jaws (minimum) 4", width of jaws (approx.) 3", QR-400. Bids Mar. 17.

- 4564—Tungsten annealed steel, grade W, machine cold-rolled, rivet, class HG, heat treated; tinned plate, bolt material steel, sheet steel, flat, galv., QR-Large. Bids Mar. 17.
- 4565—Adjustable wrenches, combination box and open end; double end; enginners; screw, monkey; type C, heavy duty wrenches, QR-Large. Bids Mar. 14.
- 4571—Reamers, bridge, taper shank, spiral fluted, H.S.S., normal dia. 21/64" Morse taper No. 1, QR-18. Bids Mar. 17.
- 4576—Springs, open box type berth, (built-in), QR-213. Bids Mar. 17.
- 4577—Saws, hole, tungsten high speed steel cutting edge, QR-360; arbors, hole saw, solid hexagon shank, furnished with 1 high speed steel pilot or center drill, QR-96. Bids Mar. 17.
- 4588—Bolts: steel, NCTS, carriage, black and galvanized, sq. neck, with sq. nut; machine black, hex. head and nut; lag-steel bolts and deck; machine, screw, steel, NCTS, hexagon, castelated and regular nuts; iron or steel, lock; spring steel; and phosphor bronze washers; boat, copper rivets; rivet, copper burrs, QR-Large. Bids Mar. 17.

Sub-Contract Opportunities

Data on subcontract work are issued by local offices of the Contract Distribution Branch, WPB. Contact either the office issuing the data or your nearest district office. Data on prime contracts also are issued by Contract Distribution offices, which usually have drawings and specifications, but bids should be submitted directly to contracting officers as indicated.

Production Division, Contract Distribution Branch of WPB, 1617 Pennsylvania boulevard, Philadelphia, reports the following subcontract opportunities:

- 2-B7-1: Dayton, O., firm requires subcontracting facilities on the following items: (a) Nuts, 10,000 per day—requiring automatic screw machines for at least 1-inch hex bar steel. (b) Clips, 20,000 per day—requiring stamp-forming presses, spring tempering furnaces. (c) Pins, 10,000 per day—requiring plain, 20-inch wide table, horizontal millers; small external grinders and heat treating facilities. (d) Wedge, 10,000 per day—requiring turret lathes, small size millers, heat treating facilities, small drop hammer. (e) Body, 5000 per day—requiring copper brazing facilities, external grinders and plain grinders, and heat treating facilities. (f) End connectors, 10,000 per day and (g) links which require same facilities as item "d". Material for above items—seamless steel tubing, sheet phosphor bronze, hex bar steel, small steel forgings. Tolerances: 0.005 to 0.0025-inch, material to be furnished by subcontractor. Plans and specifications on file at Philadelphia office.
- 4-B5-1: Philadelphia firm requires subcontracting facilities on tank turrets weighing approximately 4500 pounds each. Material which is cast armor steel will be furnished by prime contractor. Tolerances, 0.005-inch. Quantity, 1200. Tools required: 12-foot or larger boring mills vertical, horizontal boring mills having 4½ to 5-inch spindle.
- 4-B6-1: Michigan firm requires subcontracting facilities for QE gun parts. Thirty component parts are required with 2100 of each part necessary at rate of 300 to 500 sets per month. Material—bars and forgings will be furnished by prime contractor. Tolerances

are close. Equipment for Parkerizing, heat treating, milling and profiling is necessary.

- 4-B6-2: The government wishes to secure for planning purposes potential subcontractors for 90-millimeter gun mounts. Drawings and specifications are on file at this office.
- 4-B7-1: Government arsenal requires subcontracting facilities for chill molds for 75 and 90-millimeter guns. Tools required are: Engine boring lathes, 48 x 24-inch; taper attachments—master boring bar available for tooling up; crane facilities; heat treating equipment; material—gray iron castings—Spec. 14 x S 15(2); tolerances—+ or - ¼-inch; quantities—twelve 22,900 pounds each, 75-millimeter, and ten 44,500 pounds each, 90-millimeter. A-1-A priority. Rush.
- 5-B6-1: Brooklyn, N. Y., firm requires subcontracting facilities for manufacturing blanks for 1-S-5 driving cut. Material—Hyma steel (Union Drawn Steel Co.) or approved equivalent to be furnished by subcontractor. Ten to twenty thousand pieces are required, tolerances, + or - 0.010. Production to start immediately. Automatic multi-spindle screw machines 3½ to 3¼-inch required.
- 5-B8-1: Allentown, Pa., firm requires subcontracting facilities to manufacture the following: Three thousand T128 socket slugs, five thousand T20 socket slugs, five thousand A22 socket slugs, ten thousand RF22 socket slugs. Material—SAE 6120 and SAE 6150 cold rolled steel—will be furnished by prime contractor. Tolerances: +0.000, -0.005 and + or - 0.003-inch. Tools required: automatic screw machines. Production to start as soon as possible. Prints are on file at this office.
- 5-B8-2: Norfolk, Va., firm requires subcontracting facilities on 50,000 drop forgings, material to be SAE 1020

steel. Each drop forging weighs approximately 8 pounds. Production to start as soon as possible.

12-B7-1: Philadelphia prime contractor desires to locate subcontractor with experience in the construction of surface condensers. Items to be subcontracted are ten 7800-square-foot surface condensers to be fabricated according to paragraph U-69 of the ASME code for unfired pressure vessels. Eight-foot boring mill is required to machine component parts; 14-foot planer is required to machine assembled shell structure. First 3 of a lot of 10 to be complete by December, 1942, and 3 per month thereafter. Specifications and blue prints can be viewed at this office.

12-B7-2: Indiana prime contractor requires subcontractors to machine completely large and medium size steel and manganese bronze castings. Ten different sizes are involved. Quantity, 500 each. Machine tools required, 24, 36, 48-inch swing lathes; 3-inch horizontal boring mill; 36-inch planer. Necessary tools, jigs, gages, etc., to be furnished by subcontractor. Furnishing of patterns and material optional. Order to be completed by Nov. 1, 1943. This job carries A-1-a priority rating. Drawings can be viewed at this office.

12-B7-3: A Philadelphia prime contractor desires the subcontracting of cutting of serrations on end of shaft. Dimension of shaft 1 1/4" O.D. by 5 1/4" long. Dimension of serration .8536 P.D., number of serrations -48. Material S.A.E. 1045. Type of machine required—7A Type Fellows high speed gear shaper. There is a large quantity of these shafts to be cut.

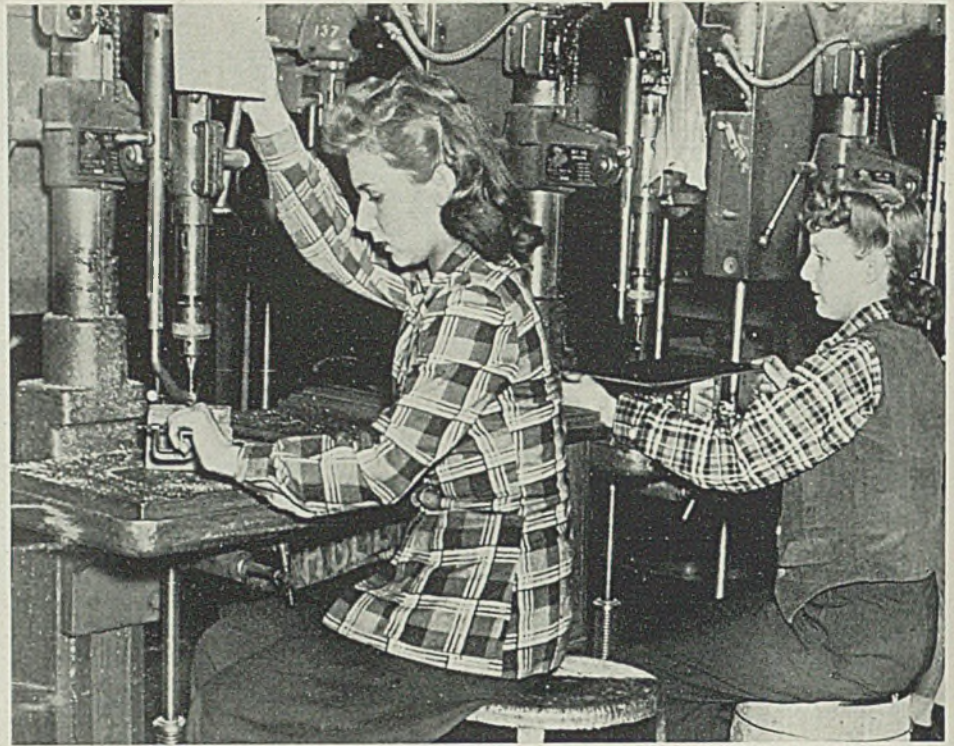
14-B6-1: Philadelphia Ordnance District requires preliminary planning and procurement for various types of fuzes. Steel (bar and sheet), brass (rod and strip) seamless brass tubing and steel music wire are required. Tools necessary for the work include multi-spindle screw machines (1/4" to 2 3/4") and gear cutting equipment. Quantities and dates not settled.

14-B7-1: A government arsenal requires subcontracting assistance on trail stops. Plate metal work up to 1/4" is required with butt welding and seam welding. Material—low alloy Steel, grade 2; to be furnished by prime contractor. Fifty items required at commercial tolerances. Priority A-1-f. Plans and specifications at Philadelphia office.

15-B6-1: Bronx, N. Y., firm requires subcontracting facilities on special bolts, bored millster heads, spuds, etc. Close precision automatic screw machines, precision grinders, drill presses and millers are required. Material—SAE 2330 steel bar stock to be furnished by subcontractor. Various quantities are required, from 6000 to 20,000 pieces. Production to start at once at rate of 100 per day.

Chicago office, Contract Distribution Branch of WPB, 20 North Wacker Drive, is seeking contractors for the following:

5-J-113: A large Midwest manufacturing company finds it necessary to sublet work for machining motor end shields, made from SAE-X-4130 steel forgings. Quantity requirement 750 per month, based on a priority of A-1-a. The prime contractor will for the present furnish the forgings, but eventually the subcontractor will be required to also furnish the forgings. All tools to be the property of the prime contractor. Planning, as set up by the prime contractor, will require the following equipment: Potter & Johnson machines, vertical milling machines.



Domestic Manganese Program "To Produce 600,000 Tons Annually"

WASHINGTON

A VAST manganese production program from low-grade domestic ores was announced last week by William L. Batt, WPB Director of Materials.

Seven small projects and three large ones have been recommended for federal financing.

The new plants, plus those already in operation, should produce well over 600,000 tons a year in high grade manganese concentrates, as compared with 30,000 tons domestically produced in 1939 and 40,000 tons in 1940.

The United States never has been more than a negligible producer of manganese because deposits in this country are low grade and present difficult engineering and technical problems in their recovery.

Intensive studies and experiments carried on during the past year by the United States Bureau of Mines and Geological Survey and by private groups have developed methods that will produce high-grade manganese concentrates from 10 to 12 per cent ores. Results of the various tests have been evaluated by the Advisory Committee of the National Academy of Sciences and several have been recommended to the WPB for development.

These will be applied on the three large projects that will produce more than two-thirds of the expanded domestic output—in the Cuyuna range of Minnesota, the Missouri

River area in South Dakota and in the vicinity of Boulder Dam in Nevada.

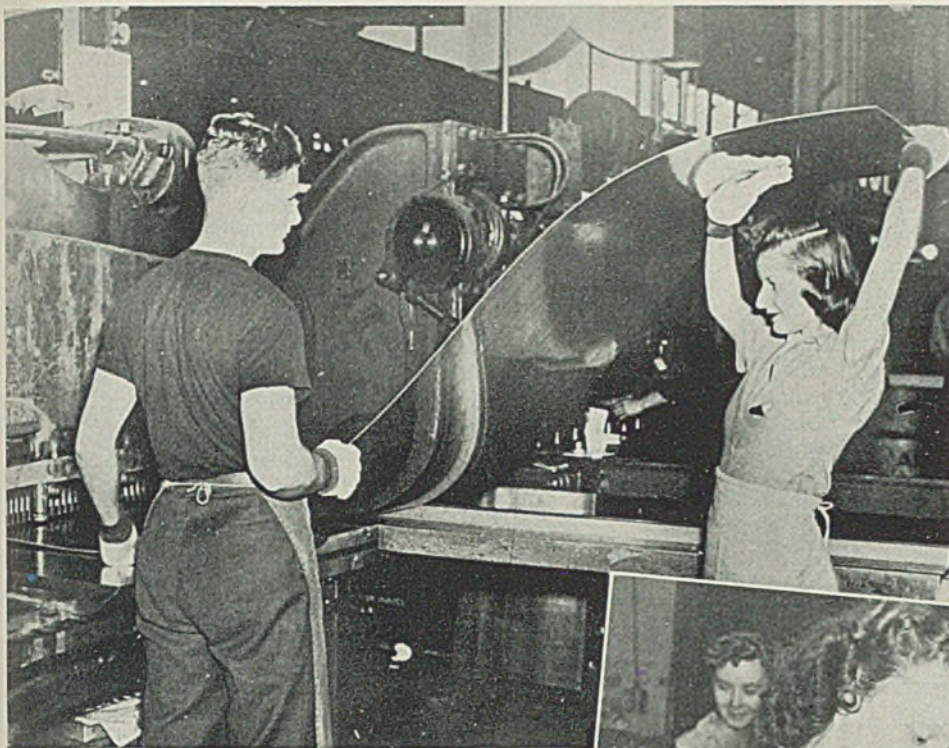
The Cuyuna Range, largest of the three projects, has presented the most difficult extraction problem. The method finally adopted is a sulphuric and sulphurous acid leach, by which manganese sulphate is formed, then kiln-treated to produce 60 per cent manganese oxide concentrate.

More than a million tons of ore a year will be treated at a government-built plant to be erected in the area.

In the South Dakota area, 16 per cent manganese concentrate will be extracted from 1 and 2 per cent manganiferous shales. Ore dressing followed by a blast furnace smelting process will be used to extract the metal from some five million tons of clay annually.

At the Nevada mill, a sulphurous acid method will be used on 20 per cent ores to produce 60 per cent concentrates. The plant will handle 300,000 tons of ore annually.

In addition to these three large projects, seven small ore dressing plants are to be built in Arkansas, Montana, Utah, Nevada, Georgia, and Tennessee to treat production from small mines. These plants will treat from 150 to 500 tons per day of crude ore and will produce high grade manganese concentrates and an appreciable amount of manganiferous iron ore.



LEFT. girl workers in naval aircraft plant, Philadelphia. Below, girls in Goodyear Aircraft's Akron, O., plant learn use of sheet metal shears, and train to be junior draftsmen under Goodyear industrial instructor

"Majority in New Labor Force Must Be Women"

SHORTAGE of skilled and semi-skilled labor caused by the draft and growing production schedules has stimulated demand for women workers in war plants. Applications by women for jobs also are reported to be increasing.

Women now hold only one of every ten jobs in essential war industries, whereas they held one out of four jobs at the peak of industrial effort in the World War I.

At present, only 500,000 women are employed in all defense industries, compared with two and one-quarter million in 1918. At least 7,000,000 additional women between the ages of 14 and 44 could be drafted into these ranks, about one-fifth of them coming from the normal labor force. War Production Board has estimated that among the 2,000,000 new workers who must be drawn into the labor force in 1942, the majority will be women.

A limited indication of the abrupt increases that may arise is noted in an analysis of shifts in World War I employment. In the iron and steel industry the ratio was raised from 29 women per 1000 in 1914 to 95 after the second draft.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has established a special separation reserve



fund in which it is setting aside the equivalent of half of 1 per cent of its payroll each month. The fund will be for the benefit of employees who may be laid off during the change from emergency to normal produc-

tion. The payroll now is about \$15,000,000 per month. This reserve is being provided in addition to more than \$4,000,000 in federal and state unemployment insurance payments made in 1941.

Republic Steel Increases War Service with Plant Expansions

CONTRIBUTIONS being made by Republic Steel Corp. to the war program are set forth by T. M. Girdler, chairman, and R. J. Wysor, president, in the company's annual report. These include:

Units now under order will greatly increase the company's electric furnace steel capacity.

Additional facilities are under way for increased production of forging steels for aircraft engine parts.

Light armor plate is being produced for aircraft and land vehicles, including tanks and trucks.

The Steel and Tubes Division has developed and put into commercial operation a welded alloy steel tubing process for use in airplane construction.

A large gun bloom forging plant is under way.

A rough turn and bored gun forging plant has been authorized.

Truscon Steel Co., Republic's subsidiary, has filled and is filling orders for steel barracks, airplane hangars, etc.

Production of steel plate, vital to shipbuilding, has been substantially increased.

Shell production is absorbing large tonnages of the bar mills' output.

Production of low phosphorus pig iron, necessary in making acid open hearth steel, has been increased.

The report showed sales and operating revenue of \$483,812,368, as compared with \$305,293,356 for 1940. Total payrolls increased in 1941 from \$97,570,848 in 1940 to \$137,079,363. Taxes jumped from \$16,034,921 to \$57,277,622, and net income from \$21,113,507 to \$24,038,339.

Working capital mounted nearly \$5,000,000 from \$105,990,562 to \$110,841,036.

"Donald Nelson Salvage Program" in Missouri

ST. LOUIS

Following a census of 803 automobile wrecking yards in Missouri by WPA and the Department of Agriculture for the War Production Board a statewide campaign to collect scrap from Missouri industries is under way. Clifford W. Gaylord, president, Gaylord Container Corp., and brigadier general commanding the Missouri state guard, is chairman. The drive is under direction of the Chicago regional office of the Bureau of Industrial Conservation of the WPB, and will be known as the "Donald Nelson Salvage Pro-

gram." Meetings will be held in St. Louis and Kansas City.

Result of the census of automobile wrecking yards revealed 12,600 tons of scrap, which can be reclaimed from 20,024 cars at an estimated yield of 1200 pounds each. Favorable results have been noticed already. However, shipments are not as great as sales, bad weather delaying preparation.

MEETINGS

American Tool Engineers' Program for St. Louis

Tenth annual meeting of the American Society of Tool Engineers Inc. is scheduled for March 26-28, in St. Louis. Features of the program:

Thursday, March 26
2:30 p.m.

"Defense Contract Distribution, Finding Facilities for Contract Placements, and

Problems of Small Shops", by Clifford Ives, state director, contract distribution branch, War Production Board, Milwaukee.

"Management Problems Involved in Plant Conversion", by Hugh H. C. Weed, vice president, Carter Carburetor Corp., St. Louis.

8:00 p.m.

"General Problems of Nondefense Industries", by Arthur Stockstrom, president, American Stove Co., St. Louis.

"Metallurgical Problems Involved in Materials Substitution", by Dr. D. R. Kellogg, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Friday, March 27

9:30 a.m.

"Cutting Tool Design", by A. H. d'Arcambal, vice president, Pratt & Whitney Co., Div. Niles-Bement-Pond Co., W. Hartford, Conn.

"Salvaging Worn-Out Cutting Tools", by L. W. Lang, president, National Tool Salvage Co., Detroit.

"Cutting Tool Life and Cutting Fluids", by Prof. O. W. Boston, University of Michigan, Ann Arbor, Mich.

2:30 p.m.

"Government Specifications and Inspectors", by F. E. Allison, chief inspector, Wagner Electric Corp., St. Louis.

8:00 p.m.

Annual banquet: Speaker to be announced.

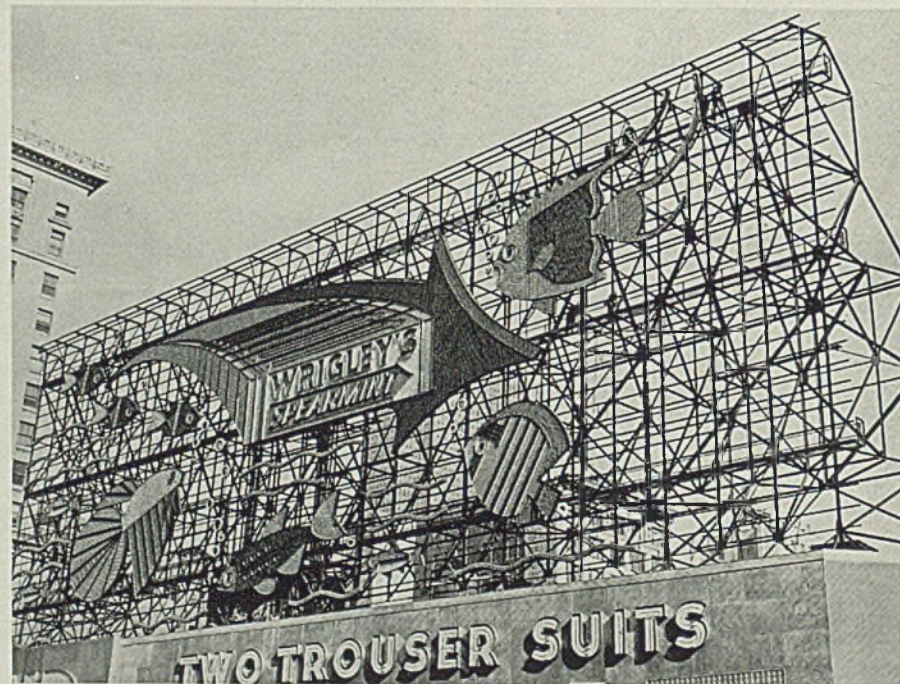
Saturday, March 28

9:30 a.m.

"Problems of the Service Influencing Design, Procurement and Production", by Col. K. B. Wolfe, material division, Army Air Corps, Wright, Dayton, O.

"Manufacture of Aircraft Engines", by H. E. Linsley, Wright Aeronautical Corp., Paterson, N. J.

Spectacular Gum Sign Goes Into War-Metal Hopper



WORKMEN are dismantling the Wrigley sign in Times Square, New York, to salvage critical metals for war production. A block long and ten stories high, the "spectacular", as such signs are known in the trade, used 35,220 electric bulbs, as many sockets, 80 miles of covered copper wire and 1080 feet of neon tubing. All that will remain when the workmen complete their task will be a structural steel frame which is a part of the building on which it rests. The sign is estimated to have consumed enough electric power to illuminate a city of 10,000. ACME photo

The BUSINESS TREND



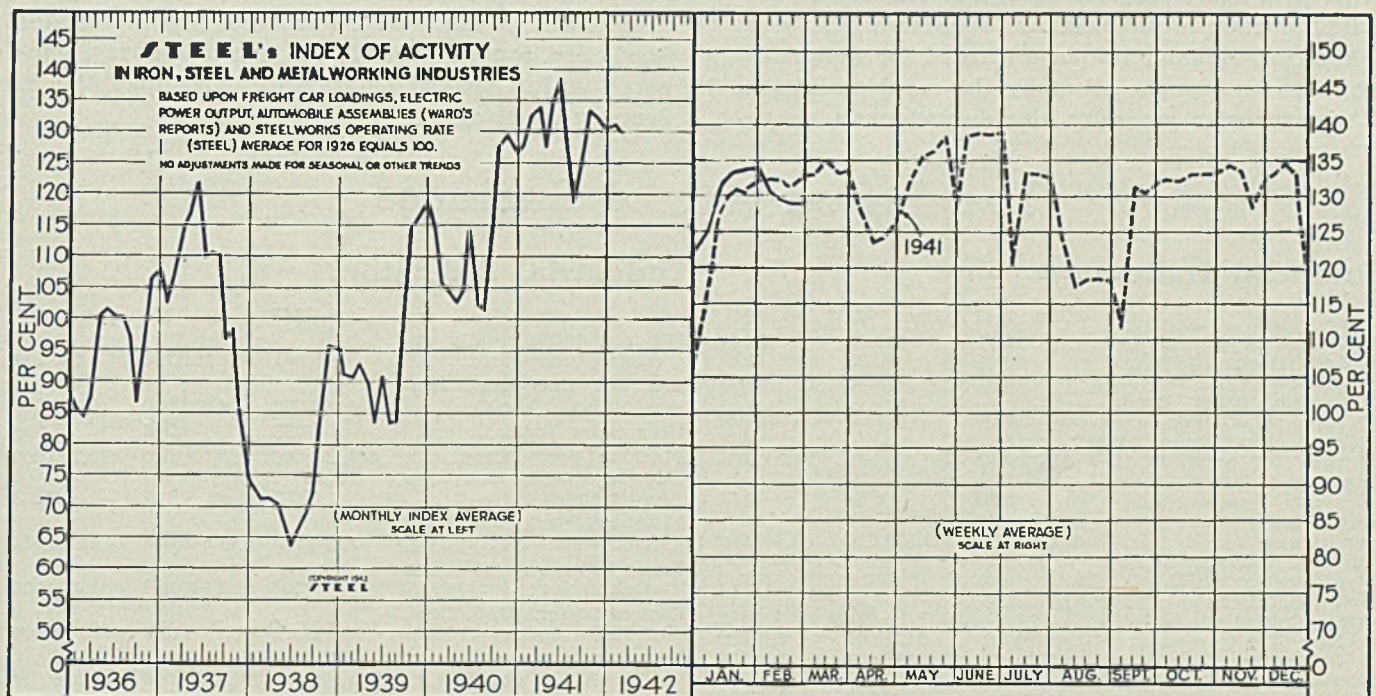
Conversion to War Goods Output Gathers Momentum

CONVERSION to war production continues to gather momentum. Most of the large manufacturing concerns formerly producing consumer goods have made marked progress in converting output to war materials. The same trend, although naturally at a slower pace, is occurring among numerous small plants throughout the country.

Despite government restrictions and manufacturers' own rationing schemes, which tend to hold commitments down in civilian goods lines, incoming orders still exceed deliveries in leading industries.

STEEL'S index of activity in the iron, steel and metalworking industries edged downward throughout February, primarily reflecting the cessation of automobile assemblies. A slight downward tendency in revenue freight carloadings and electric power consumption also occurred.

During February the weekly index averaged 129.5, compared with the January average of 131.3; while in February, 1941 the index stood at 132.3. The all time monthly peak recorded by the index was 138.7 in June of last year.



STEEL'S index of activity advanced 0.1 points to 129.1 in the week ended Feb. 28:

Week Ended	1941	1940	Mo. Data	1942	1941	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931
Dec. 27.....	120.5	107.5	Jan.	131.3	127.3	114.7	91.1	73.3	102.9	85.9	74.2	58.8	48.6	54.6	69.1
			Feb.	129.5	132.3	105.8	90.8	71.1	106.8	84.3	82.0	73.9	48.2	55.3	75.5
Week Ended	1942	1941	March	.....	133.9	104.1	92.6	71.2	114.4	87.7	83.1	78.9	44.5	54.2	80.4
Jan. 3.....	124.7	114.5	April	.....	127.2	102.7	89.8	70.8	116.6	100.8	85.0	83.6	52.4	52.8	81.0
Jan. 10.....	131.2	128.2	May	.....	134.8	104.6	83.4	67.4	121.7	101.8	81.8	83.7	63.5	54.8	78.6
Jan. 17.....	133.1	130.8	June	.....	138.7	114.1	90.9	63.4	109.9	100.3	77.4	80.6	70.3	51.4	72.1
Jan. 24.....	133.7	130.7	July	.....	128.7	102.4	83.5	66.2	110.4	100.1	75.3	63.7	77.1	47.1	67.3
Jan. 31.....	133.9	132.0	Aug.	.....	118.1	101.1	83.9	68.7	110.0	97.1	76.7	63.0	74.1	45.0	67.4
Feb. 7.....	130.6	132.7	Sept.	.....	126.4	113.5	98.0	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3
Feb. 14.....	129.8	132.3	Oct.	.....	133.1	127.8	114.9	83.6	98.1	94.8	77.0	56.4	63.1	48.4	59.2
Feb. 21.....	129.0	131.2	Nov.	.....	132.2	129.5	116.2	95.9	84.1	106.4	88.1	54.9	52.8	47.5	54.4
Feb. 28.....	129.1	133.0	Dec.	.....	130.2	126.3	118.9	95.1	74.7	107.6	88.2	58.9	54.0	46.2	51.3

THE BUSINESS TREND—Continued

The index registered a slight increase of 0.1 point to 128.5 during the latest week. This compares with the 133.0 level for the corresponding week last year.

Total production remains fairly steady as rising output of war goods offsets curtailment in civilian lines.

Steelmaking production eased during January to 1,609,334 net tons on a daily average basis, compared

Where Business Stands

Monthly Averages 1941=100

	Jan., 1942	Dec., 1941	Jan., 1941
Steel Ingot Output	101.2	101.9	98.3
Pig Iron Output	104.4	105.6	98.3
Building Construction	63.3	86.2	61.0
Auto Output	69.4*	71.0	122.4
Freight Movement	94.8	93.6	85.0
Wholesale Prices	109.2	96.3	92.6

*Preliminary.

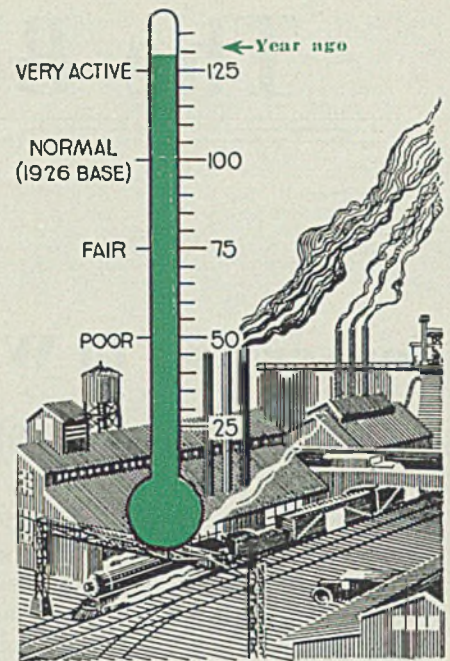
with 1,620,814 in December and 1,563,902 during January, 1941.

Machine tool production rose contraseasonally to \$85,200,000 during January. This is up only slightly from the December output, but represents a gain of 68 per cent over the \$50,700,000 worth of tools produced in January last year. It is estimated that 1942 output will top \$1,500,000,000, or almost twice the record production of \$775,300,000 registered last year. This record-breaking output estimated for 1942 is expected to be brought about by the rapid completion of the expansion programs already underway, simpli-

Industrial Weather

TREND:

Sidewise



fication of product, working longer hours, and more extensive subcontracting.

Foundry equipment orders reached an all-time peak during January. The Foundry Equipment Association's index of new orders rose to 532.7 in January, against 481.1 recorded by the index the preceding month and 285.3 in corresponding period last year.

Shipments of finished steel products of United States Steel Corp. totaled 1,738,983 net tons in January, compared with 1,846,036 in December and 1,682,454 in January a year ago.

The Barometer of Business

Financial Indicators

	Jan., 1942	Dec., 1941	Jan., 1941
30 Industrial Stocks†....	111.11	110.67	130.17
20 Rail stocks†.....	28.01	25.33	29.01
15 Utilities†.....	14.41	14.38	20.17
Par value, listed Bonds, NYSE, (\$1,000,000)....	\$59.08	\$58.24	\$54.14
Bank clear'gs, daily average (000 omitted)....	\$1,210,900	\$1,303,592	\$1,005,944
Commercial paper, interest rate (4-6 months)...	0.56	0.56	0.56
*Com'l. loans (000 omitted).....	\$11,241,000	\$11,370,000	\$9,337,000
Federal Reserve ratio (per cent).....	90.8	90.8	91.0
Capital flotations (000 omitted).....			
New Capital.....	\$181,760	\$121,001	\$95,539
Refunding.....	\$151,478	\$95,427	\$324,573
Federal Gross debt. (mil. of dol.).....	\$60,012	\$57,938	\$45,890
Railroad earnings.....	\$68,966,000	\$80,548,631	\$62,357,404
Stock sales, New York stock exchange.....	12,993,665	36,390,492	13,312,960
Bond sales, par value (\$1,000,000).....	\$220.6	\$225.2	\$230.8

†Dow-Jones Series.

*Leading member banks Federal Reserve System.

Commodity Prices

	Jan., 1942	Dec., 1941	Jan., 1941
STEEL'S composite finished steel price average....	\$56.73	\$56.73	\$56.73
U. S. Bureau of Labor's index.....	95.3	93.6	80.8
Wheat, cash (bushel)....	\$1.308	\$1.285	\$0.915
Corn, cash (bushel).....	\$0.83	\$0.83	\$0.69

Industrial Indicators

	Jan., 1942	Dec., 1941	Jan., 1941
Pig iron output (daily average, tons).....	169,961	161,774	150,524
Iron and steel scrap consumption (tons).....	4,590,000	4,634,000	4,278,000
Gear Sales Index.....	288	243	259
Machine Tool Output ...	\$85,200,000	\$85,100,000	\$50,700,000
Foundry equipment new order index.....	532.7	481.1	285.3
Finished steel shipments (Net tons).....	1,738,983	1,846,036	1,682,454
Ingot output (average weekly; net tons)....	1,609,334	1,620,814	1,563,902
Cost of Living (U. S. Dept. of Labor index).....	111.9	110.5	100.8
Dodge bldg. awards in 37 states (\$ Valuation)...	\$316,846,000	\$431,626,000	\$305,205,000
Fabricated structural steel shipments (tons).....	157,986	176,126	164,590
Automobile output.....	295,000*	302,518	524,073
Coal output, tons.....	48,540,000	46,667,000	44,070,000
U. S. Dept. of Labor (90 Industries, factory):			
Av. wkly. hrs. per worker†.....	41.2	40.3	39.8
Av. weekly earnings† ..	\$33.69	\$32.80	\$27.89
Cement production, bbls.†	13,810,000	14,931,000	11,195,000
Cotton consumption bales	946,909	887,326	844,839
Freight Car Awards.....	4,253	8,406	15,169
Car loadings (weekly av.)	771,284	761,500	690,884

*Preliminary.

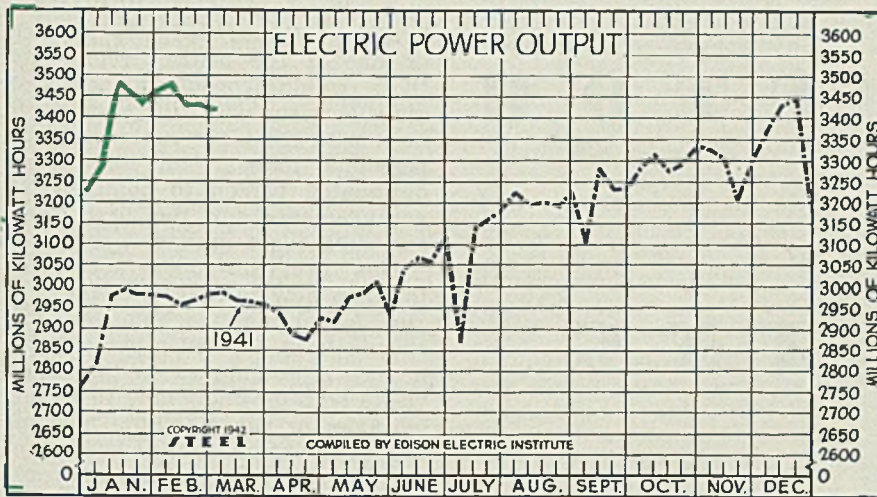
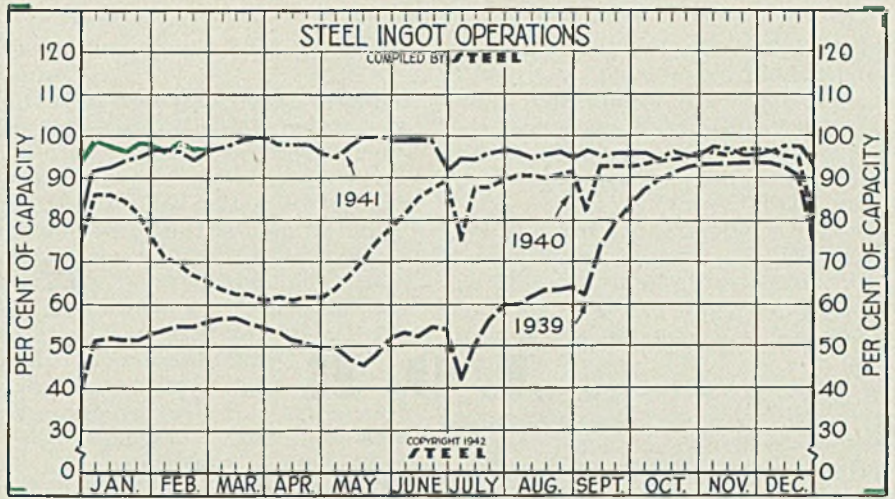
†December, January and December respectively.

Steel Ingot Operations

(Per Cent)

Week ended	1942	1941	1940	1939
Feb. 28....	96.0	96.5	65.5	56.0
Feb. 21....	96.0†	94.5	67.0	55.0
Feb. 14....	97.0	96.5	69.0	55.0
Feb. 7....	96.0	97.0	71.0	54.0
Jan. 31....	97.0	97.0	76.5	53.0
Jan. 24....	97.0	95.5	81.5	51.5
Jan. 17....	96.0	94.5	84.5	51.5
Jan. 10....	96.5	93.0	86.0	52.0
Jan. 3....	97.5	92.5	86.5	51.5
Week ended	1941	1940	1939	1938
Dec. 27....	93.5	80.0	75.5	40.0
Dec. 20....	97.5	95.0	90.5	52.0
Dec. 13....	97.1	95.5	92.5	58.0
Dec. 6....	96.5	96.5	94.0	61.0
Nov. 29....	95.0	97.0	94.0	61.0

†Since Feb. 21 rate is based on new capacity figures as of Dec. 31 last.



Electric Power Output

(Million KWH)

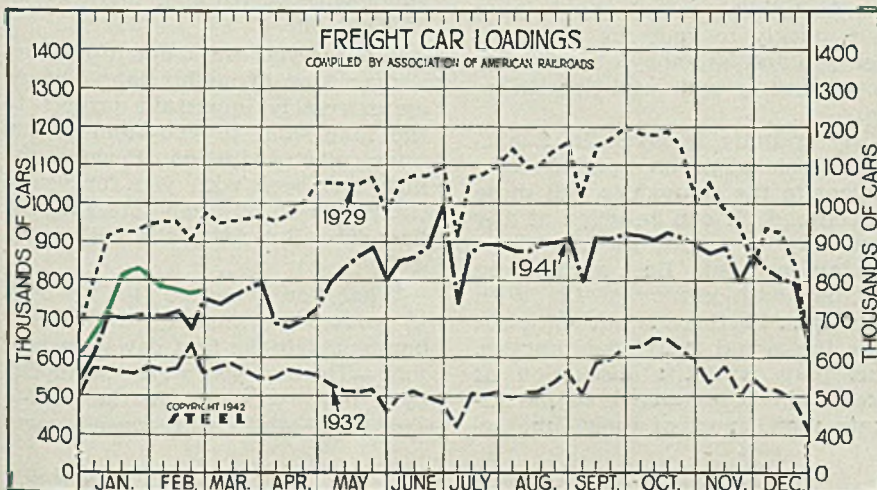
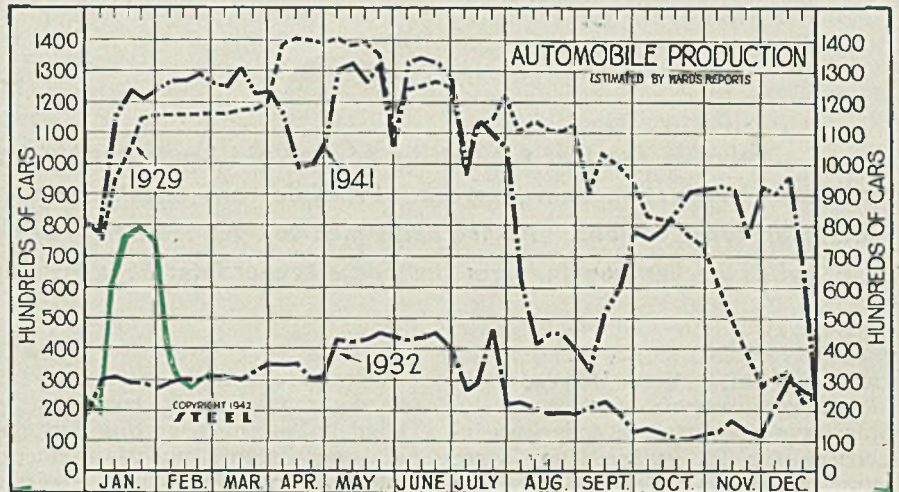
Week ended	1942	1941	1940	1939
Feb. 28....	3,410	2,982	2,568	2,294
Feb. 21....	3,424	2,968	2,547	2,269
Feb. 14....	3,422	2,959	2,565	2,297
Feb. 7....	3,475	2,973	2,616	2,315
Jan. 31....	2,468	2,978	2,633	2,327
Jan. 24....	3,440	2,980	2,661	2,340
Jan. 17....	3,450	2,996	2,674	2,342
Jan. 10....	3,473	2,985	2,688	2,329
Jan. 3....	3,287	2,831	2,558	2,239
Week ended	1941	1940	1939	1938
Dec. 27....	3,234	2,757	2,465	2,175
Dec. 20....	3,449	3,052	2,712	2,425
Dec. 13....	3,431	3,004	2,674	2,390
Dec. 6....	3,369	2,976	2,654	2,377
Nov. 29....	3,295	2,932	2,605	2,335
Nov. 22....	3,205	2,839	2,561	2,248
Nov. 15....	3,304	2,890	2,587	2,325

Auto Production

(1000 Units)

Week ended	1942	1941	1940	1939
Feb. 28....	30.1	126.6	100.9	78.7
Feb. 21....	25.7†	129.2	102.7	75.7
Feb. 14....	29.8	127.5	95.1	79.9
Feb. 7....	37.1	127.7	96.0	84.5
Jan. 31....	73.3	124.4	101.2	79.4
Jan. 24....	79.9	121.9	106.4	89.2
Jan. 17....	75.0	124.0	108.5	90.2
Jan. 10....	59.0	115.9	111.3	86.9
Jan. 3....	18.5	76.7	87.5	76.7
Week ended	1941	1940	1939	1938
Dec. 27....	24.6	81.3	89.4	75.2
Dec. 20....	65.9	125.4	117.7	92.9
Dec. 13....	96.0	125.6	118.4	102.9
Dec. 6....	90.2	124.8	115.5	100.7
Nov. 29....	93.5	128.8	93.6	97.8
Nov. 22....	76.8	102.3	72.5	84.9

†Canadian trucks and automobiles and United States trucks.



Freight Car Loadings

(1000 Cars)

Week ended	1942	1941	1940	1939
Feb. 28....	781	757	634	599
Feb. 21....	775	678	595	561
Feb. 14....	783	721	608	580
Feb. 7....	784	710	627	580
Jan. 31....	816	714	657	577
Jan. 24....	818	711	649	594
Jan. 17....	811	703	646	590
Jan. 10....	737	712	668	587
Jan. 3....	674	614	592	531
Week ended	1941	1940	1939	1938
Dec. 27....	607	545	550	500
Dec. 20....	799	700	655	574
Dec. 13....	807	736	681	606
Dec. 6....	833	738	687	619
Nov. 29....	866	729	689	649

J O B

I N S T R U C T O R

T R A I N I N G

... a valuable shortcut for getting new or old hands quickly into maximum production on war work. Principles are equally applicable to all types of jobs. Its use helps men to "get the hang" of the job, builds worker morale, gives the man a keener interest in his work

THE PRINCIPLES of job instruction set forth in this "streamlined" program of supervisor training have been used in American industry for 25 years. They were first tried during World War I. The condensed plan presented here is from material released by WPB. It was worked out by a group of the nation's leaders in industrial training, who were loaned by their companies to WPB-OPM for this purpose, along with federal and state representatives for vocational education—constituting the Training Within Industry Branch of WPB's Labor Division. This division is located in the Social Security building, Washington, with Sidney Hillman as director; Channing R. Dooley is Chief of the Training Within Industry Branch, which describes the training plan as follows:

The program is designed to help

all men who direct the work of others—from the foreman to the works manager. It has been extremely helpful in getting new men and new plants up to production quickly, in eliminating excessive spoilage and work not up to standard, in building morale by helping men quickly to "get the hang" of their job and be happy at it, in promoting safety and good housekeeping.

The training is given in five 2-hour sessions, at any periods convenient to the companies and those who attend. It can be given at any time, day or night, on any days, Sunday included. Best results are obtained with groups of 12. With more than 12, there is not sufficient time for actual individual practice. This plan is not a discussion of theory but is arranged so participants spend most of their time ac-

tually DOING the instructing job.

The sessions are led by experienced industrial men, serving part time, who have been specially trained to do this job. The quality of the work of these "OPM trainers" is kept at a high standard through supervision from headquarters.

This training is given without cost to all companies holding war production contracts or subcontracts. The WPB trainers receive a modest hourly compensation out of federal funds, administered by the State Vocational Board. All that is necessary for a plant to get started is to notify the district representative of the WPB-OPM's Training Within Industry Branch, or one of the district representative's training consultants. A schedule supervisor will call promptly to meet with the plant superintendent, personnel manager or some other designated person to complete all arrangements for the first group and subsequent groups.

This program does not teach foremen how to assemble axles, or run a milling machine, or mix chemicals in a powder plant. What it does is to impress on the supervisors who do know how to assemble axles or run a milling machine or mix chemicals in a powder plant *how to pass along that knowledge to others in the most simple, effective and rapid manner.* The most technically competent supervisors, the master mechanics, are often the ones who benefit most by this simple drill in imparting knowledge. How to explain a new job to a worker is a skill every supervisor needs every day.

Notice that we say "explain a new job to a worker." We express it that way for a purpose. This program helps explain the job. Where the worker comes from does not matter. The technique is just as applicable to a worker transferred across the aisle or across town, as to one from the farm. The 10-hour program is compact, carefully planned, practical and without a moment of wasted time. It is a single-purpose training tool and an efficient one.

Suppose you are about to instruct a man how to do his job. This is an extremely important project to the man—and to you—and to national war production. Perhaps the man has been with you for years. Or maybe he is green—starting his first job. But first let's get organized!

What You Want To Do: Go back in your own memory. Remember how you felt the first day on a new job?—The time you were "stumped" by a new "wrinkle" on the job?—The time when you caused some

scrap or rework?—The time you got hurt?—The times when the boss corrected you and your work?—Perhaps you like the way he did it— or perhaps you didn't?

Any worker assigned to you feels the same way. He wants to make a good showing. You realize this. You are interested in four things:

—Having the new worker come up to the quality and quantity requirements of production as quickly as possible,

—Avoiding accidents which will injure the worker,

—Avoiding damage to machines or equipment,

—Spoiling as little work as possible.

How You Can Do It: Most of us just "jump right in" and start instructing or correcting a workman without much thought or planning. Perhaps you do the same. But you may know the job so well that you've forgotten the things that "stump" the learner.

You may know it so well that you don't *plan* how to "put it over."

You may know it so well that you don't pick out the "key points"—the "knacks"—the things that make or break the operation.

To instruct a man *rightly* takes just a little extra time at the moment, but it saves hours and days of time later on and prevents a large part of the scrap, spoiled work and accidents. The following plan is simple and easy to follow. Furthermore, it works.

Before instructing, there are four GET READY points for you to watch. You can do them in a few minutes.

When instructing there are FOUR BASIC STEPS to follow. They really are no different from what you may now be doing. But they help you do it *well* and *thoroughly*.

At least they have helped thousands of others.

How To GET READY To Instruct: The four GET READY points you should take care of before instructing are:

1. *Have a time table.*—How much skill do you want the man to have?—How soon? When faced with a "breaking in" problem, don't say, "It takes time . . .," or "He just has to learn." Say to yourself instead: "How *much* time . . . ?"

Here is an easy way to do it. Answer to yourself this statement: ". . . (employee) . . . should be able to (do what job) and do it (how well) by (what date)." Better yet, put down the names of your men on a piece of paper. Set yourself some dates when you are going to try to have them able to do the jobs they need to know. *Time is short.*

2. *Break down the job.* There is *one right way* to do every job. You know too that there are a few "key points" in every operation that make or break it. If these key things are done rightly, the whole operation is right. If *any one* of them is missed, the operation is wrong.—If you put the job over to the worker with these key points made clear he will really "get it."—He will do the operation right the *first time*.—He won't be "fighting" the work—making mistakes—getting hurt.

There is an easy, quick way to get the job clearly outlined in your mind. Fill out a "breakdown sheet" (see illustration) for each of your operations. It only takes 3 to 5 minutes. This is for your own use; it is not to be given to the worker.

3. *Have everything ready*—the right tools, equipment and materials. When you so much as "touch" a job in front of a worker, set the

correct example. Don't miss a trick. When *you* have everything right, *he* is more likely to do the same.

4. *Have the work place properly arranged*—just as the worker is expected to keep it. The same thing applies here as above. You must set the correct example. Put his bench, desk, stock pile or wherever he is to work in *proper order* before you start to put over the job to him. *He* won't do it if *you* don't do it.

HOW TO INSTRUCT: Here is what you should do every time you instruct a man or correct his work:

Step I. PREPARE the worker to receive the instruction—put him at ease. Remember he can't think straight if you make him embarrassed or scared.—Find out what he already knows about this job. Don't tell him things he already knows. Start in where his knowledge ends.—Get him interested. Relate his job or operation to the final product so he knows his work is important.—Put him in the right position. Don't have him see the job backward or from any other angle than that from which he will work.

Step II. PRESENT the operation—tell him, show him, illustrate, ask.—"Put it over" in small "doses." He (the same as all of us) can't catch more than six or eight new ideas at one time and *really understand* them.—Make the "key points" clear. These will make or break the operation—maybe make or break *him*.—Be patient, and go *slowly*. Get accuracy now, speed later.—Repeat the job and the explanation if necessary.

Step III. TRY OUT his performance—have him do the job, but watch him.—Then have him do it again, but have him EXPLAIN to YOU what he is doing and why. All of us find it easy to observe motions and not really understand what we are doing. You want him to UNDERSTAND.—Have him explain the key points.—Correct his errors, but don't bawl him out or indicate that he is "thick" or "dumb."—Continue doing all this until YOU know HE knows. He may have to do the job half a dozen times.

Step IV. FOLLOW-UP—put him on his own. He has to "get the feel" of the job by doing it himself.—Tell him the man to see if he needs help. Make this definite—yourself or someone *you* designate. The wrong person might give him a "bum steer."—Check him frequently, perhaps every few minutes at the start to every few hours or few days later on. Be on the lookout for any incorrect or unnecessary moves. Be careful about

(Please turn to Page 105)

JOB BREAKDOWN SHEET FOR TRAINING MAN ON NEW JOB	
PART	OPERATION
<p>Important Steps in the Operation</p> <hr/> <hr/> <hr/>	<p>"Key Points" — knacks, hazards, "feel," timing, special information</p> <hr/> <hr/> <hr/>

AIRCRAFT

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(Section V in a Series on Forgings, Forging Methods and Forging Equipment)

THE RAPID developments made in aviation in recent years, and the present tendency toward higher powered engines and larger aircraft have increased the stringent demands being made on the forging industry. The production of aircraft forgings is a highly specialized job. A wide experience and an intimate knowledge of the technical requirements are essential if satisfactory results are to be expected.

Generally speaking, the quality of aircraft drop forgings depends on two separate factors: First, the satisfactory production and handling of the raw steel; second, the efficiency of the forging technique and subsequent processing of the forgings. Since it is impossible to produce high-quality forgings unless the raw material is up to standard, brief mention will be made of the precautions that should be taken.

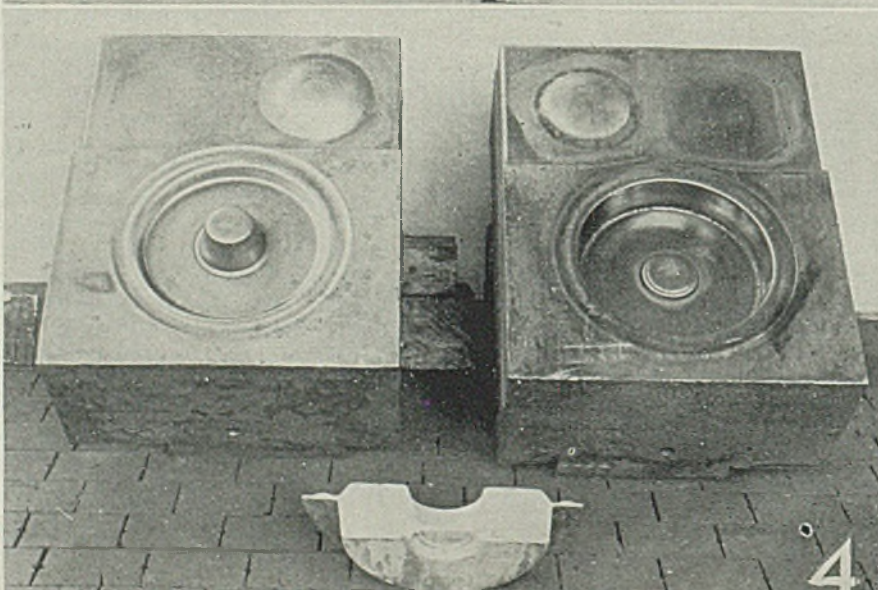
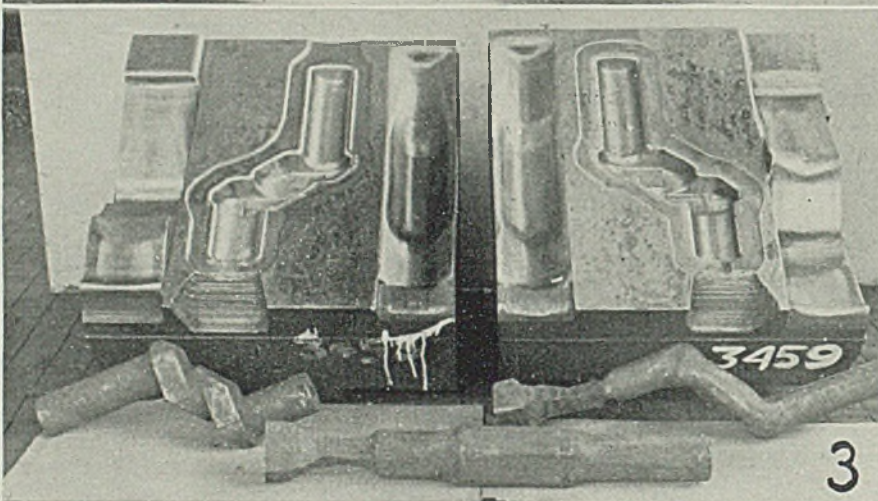
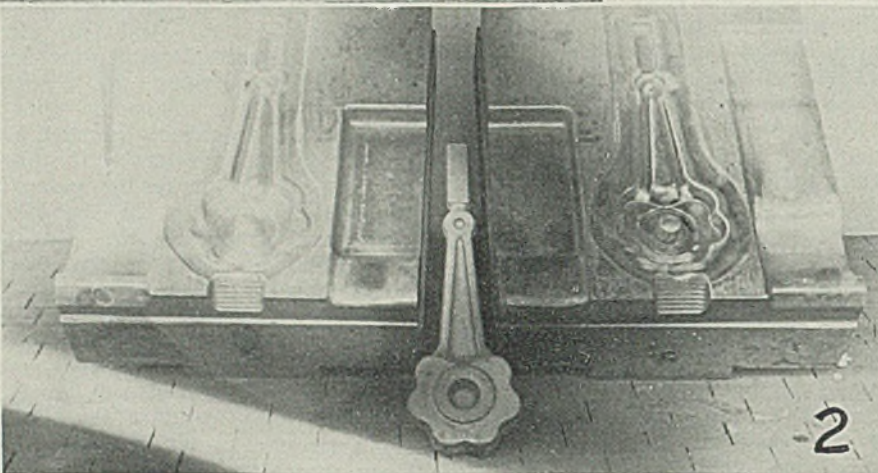
Aircraft Quality Steel: The introduction and development of alloy steels together with the high standards of quality essential for air-

Fig. 1—Hair-cracks like those shown here resemble flakes and thus cause such steel to be known as "flaked" steel. This type of defect is found in many alloy steels that have been cooled too quickly from previous rolling temperatures

Fig. 2—These die blocks for a master connecting rod not only contain the finish impression in the center but also two other impressions for fullering and edging operations prior to the finish operation

Fig. 3—Dies for a built-up crankshaft for a double-bank radial aircraft engine include three impressions, one of which is a "bender." The three stages of the work are illustrated by the three pieces in front of the dies

Fig. 4—Bevel-gear die blocks provide for upsetting and dishing prior to the finishing operation in the main impression. Cross section of finished forging is seen in foreground



DROP FORGINGS

craft purposes and the increased demand for special requirements such as grain size control, magnaflux inspection, etc., have added considerably to the problems of the steel-maker. It is not within the scope of this paper to examine the fundamentals of steelmaking as applied to aircraft steels except insofar as they reflect upon the subsequent processing and ultimate quality of the product. In general, steels melted in the electric furnace are specified because of their greater purity.

It is interesting to note that the platinum-rhodium immersion pyrometer developed by Dr. Schofield of the National Physical Laboratories is now being used extensively in England for the determination of liquid steel temperatures during both melting and pouring. The more accurate control of working and casting temperatures provided by this method is proving of great value in the production of "clean" steel. The use of such an immersion pyrometer has been found particularly beneficial in counteracting the tendency of many steel melters to allow the temperature of the bath to fall appreciably from the "white slag" stage onward and to boost the temperature immediately prior to tapping—which procedure inevitably leads to "dirty" steel, particularly where large alloy finishing additions are made. For some reason the use of immersion pyrometers has received little acceptance in the United States.

British practice is to employ small furnaces. A size around 30 tons is considered the maximum for satisfactory operation. However, much larger furnaces are employed satisfactorily by American producers.

Elaborate inspection is made at the steel mill in order to maintain a close control on quality. American and British inspection requirements for aircraft quality steel are quite similar and include micro examination, macroetches, magnaflux checks, grain size control, physical tests and chemical analysis. British practice favors micro examination, while American practice relies to a large extent on magnaflux tests for cleanliness. But a combination of the two is to be preferred and is frequently specified. Micro, macro, magnaflux and physical tests are

normally required from the top and bottom of the first and last ingots in the heat, but tests from intermediate ingots are also desirable with larger heats.

Soak vs. Anneal: A point of difference between British and American practice in processing at the steel mill is in the treatment of the ingots after casting. American practice is to charge the ingots into the soaking pits for reheating to rolling temperatures immediately after stripping, whereas some British manufacturers prefer to give the ingots a double annealing treatment after stripping before charging to the preheaters for rolling. One object of this treatment is to minimize the danger of hair-cracks during subsequent processing, and the treatment has been found to be helpful in this respect.

For production of major aircraft forgings such as crankshafts, the ingots or billets should be ground or machined all over. With American production methods this must be carried out in the first conversion size or on the finished billet. But where the British practice of annealing the ingots is used, the ingots themselves are machined all over prior to rolling. This has the advantage of reducing troubles on rolling due to ingot skin defects.

Hair-Cracks: With many of the alloy steels, extreme care is necessary in handling after rolling. Many of these steels, particularly those containing molybdenum, are susceptible to hair-cracks (or flakes), and it is necessary to control the rate of cooling from rolling temperatures if trouble is to be avoided in this direction. Insulated cooling pits are desirable for this purpose, although cooling under ashes may be effective. "Flakes" in alloy steels cannot be healed up satisfactorily by subsequent working. They will always be reflected in the fatigue properties of the material. Fig. 1 shows a macroetch of a piece of "flaked" steel. The "flakes" of course are nothing more or less than cracks, but their effect in lowering fatigue strength can be serious as they act as focal points for the spread of fatigue cracks throughout the entire piece or throughout a critical portion.

Aircraft Quality Forgings: The production of aircraft forgings is a

job for the expert who has the experience and technique necessary to maintain the high standards embodied in the term "aircraft quality". With the weight factor so important in aircraft, the designer is compelled to maintain a close control and to use as low a safety factor as possible. Therefore "quality" must be the primary consideration. The manufacturing technique (including details of equipment, die construction, forging reductions, processing and inspection) should be carefully established for each component, and these details should be confirmed as satisfactory by tests, such as grain flow checks, prior to commencing bulk production. Subsequent routine inspection throughout production then is made to insure that the procedure is consistent and that satisfactory quality is maintained.

For the production of forgings which are made by an upsetting process under a drop hammer, it is necessary to cut the stock into individual lengths for each forging. This is done by shearing, cold sawing or on a cut-off machine, according to the size, nature, and application of the stock. In the case of forgings produced by a simple upsetting operation such as gears, bevel pinions, and the like, it is preferable to use sawed stock rather than sheared stock since a truer billet is obtained and there is less likelihood of offsetting the grain flow in upsetting. Forgings which do not require upsetting can normally be made straight from the bar, providing the handling difficulties are not prohibitive.

Equipment: The choice of equipment depends on the size and nature of the forging to be produced, and frequently a number of hammers are teamed up to carry out the various stages of forging. The open frame or blacksmith hammer finds an important place in the production of drop forgings and is often used to carry out preliminary operations to provide a "use" or form suitable for further work in the dies of the drop hammer. Such hammers are steam or air driven, and the stroke can be varied at will by the operator. The Smith hammer uses roughing tools as distinct from the dimensionally accurate dies of the drop hammers. Principal ones

used are flat tools, V tools, and swage tools, although various forms of hand tools may also be used.

The drop hammer proper uses dies to shape the metal and aims at reproducing forgings within close tolerances. The board drop hammer relies solely upon gravity for the energy of the blow, and the weight of the ram plus the dies together with the height of the stroke determines the force of the impact. The air or steam-driven drop hammer uses air or steam to raise the ram and also to increase the intensity of the blow. The full blow of such a hammer is about double that of a board hammer of the same rating, although the blow is variable to any degree.

Dies: The dies used in a drop hammer contain the finished impressions to produce the final shape required. In addition they may contain numerous other impressions for preliminary forging operations aimed to produce the ultimate shape in various predetermined stages. These impressions are known as edger, fuller, bender, and so on. Fig. 2 shows die blocks for a master connecting rod where use is made of "fullering" and "edging" before finishing in the final impression. The two impressions for these operations are placed on left and

right of the final impression seen in the center.

Fig. 3 shows die blocks for forging the center portion of a built-up crankshaft for a double-bank radial aircraft engine. It illustrates the use of the bending operation as a "bender" impression is incorporated in the die blocks. Fig. 4 shows die blocks for a bevel gear forging which provide for upsetting and "dishing" prior to finishing in the main die cavity.

In general, steel forgings are produced at temperatures above the A_c point; that is, in the more plastic "face center cubic" austenitic range. Here plastic flow takes place, the direction of flow being vitally important in its bearing on the ultimate quality of the forging. The basic principles of plastic flow due to mechanical work are the same whether the work is carried out under a drop hammer, a hydraulic press or an upsetter, and depend on the fact that *metal under pressure tends to flow in the direction of least resistance.*

However the method of application of stress affects the mechanics of plastic flow to a considerable degree and this has an important bearing in actual forging practice.

Metal Flow: The drop hammer produces an impact pressure which

is of maximum intensity at the moment of contact and falls off rapidly as the energy of the blow is absorbed by the work done in deformation of the metal. Thus the work done depends on the energy of the *original* blow, and since a number of blows are normally required to produce the deformation desired, plastic flow under such conditions is "erratic." On the other hand with a hydraulic press or an upsetting machine, the pressure is a minimum at the moment of contact and builds up in direct proportion to the resistance to flow and is at a maximum at completion of the stroke. Here the work done depends more upon the *ultimate* pressure.

Metal Flow Smooth

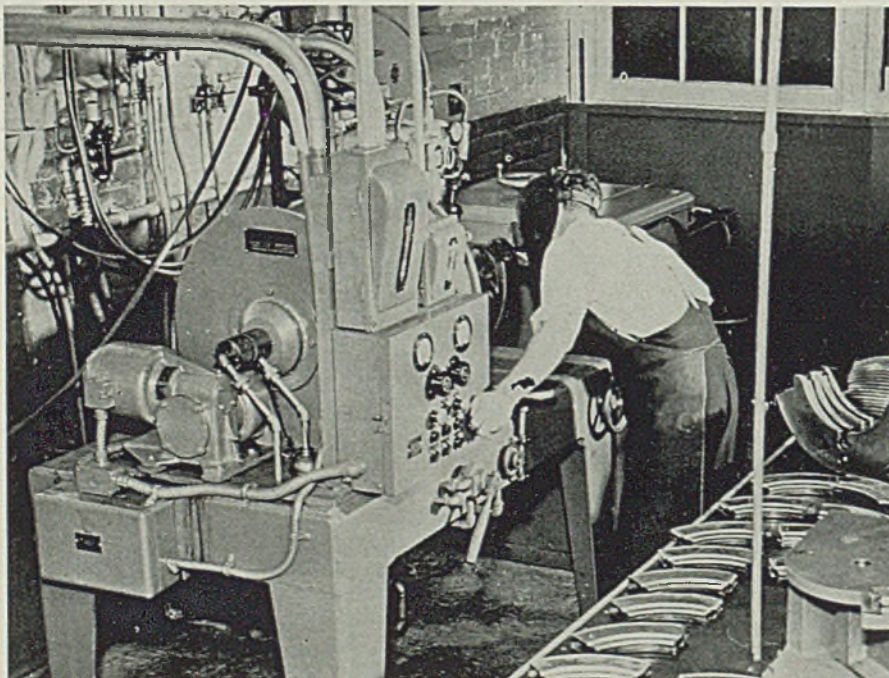
Under such conditions the metal flow is smooth and uniform. The impact pressure of the drop hammer tends to break down the structure to a greater extent than the more uniformly applied pressure of the hydraulic press or upsetter, but the dangers of excessive reduction are increased since this erratic flow is also more likely to break up the fiber structure. Moreover, if the impact pressure of the drop hammer is too light it is possible to get a condition where flow is occurring at the surface but not at the center of the piece. These characteristics of drop hammer work must be understood in order to establish correct forging procedure for the drop hammer.

But regardless of what equipment is used, the nature of the metal or the shape of the piece being forged, it will be found that the resistance to plastic flow depends on the following factors: First, the coefficient of resistance to flow—a value depending on internal friction or viscosity of the metal itself; second, the rate of application of pressure; third, the cooling effect of the forging dies; fourth, the surface resistance between the hot metal and the dies.

The coefficient of resistance to flow of the metal is a constant for any one metal at a definite temperature. This coefficient of resistance normally increases with increased carbon or alloy content, but decreases with increased temperature. Carbon has little effect on the resistance to flow at slow rates of deformation. But with high speeds of deformation such as are present in drop forging, the resistance increases with carbon content. Alloying elements, particularly chromium, also tend to increase resistance to flow.

The rate of application of stress is a function of the strength of
(Please turn to Page 105)

Speeding Flow of Munitions



PRODUCTION of Bren gun magazines, originally done by hand welders at Brno, Czechoslovakia, now is being maintained on an automatic basis at a Canadian munitions plant. Illustration above shows one of two General Electric automatic hydrogen welding machines which are being used to weld the outside and inside seams of five magazines at one time after all five are clamped in a fixture. This same operation was done in two steps by the British formerly—the inside and outside seams being treated separately

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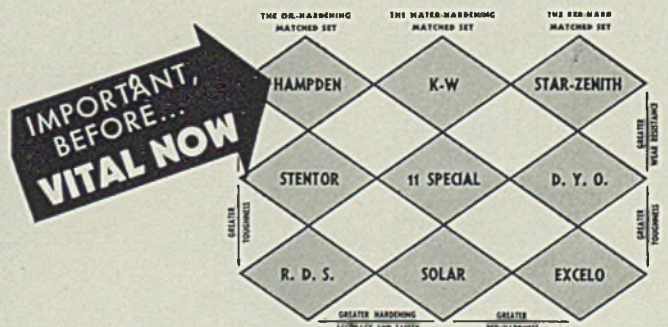
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This country is now engaged in a gigantic effort to convert our industrial production from civilian to war goods. Donald M. Nelson, WPB head, has stated that production NOW is the thing, for one tank now is worth ten a year from now. Only 10 per cent of our industrial production now is in the form of war goods. This must be increased to 40 per cent this year.

The following article is one of a series which STEEL is carrying devoted to explaining what can be done to convert plants to war production quickly.

—The Editors

CONVERSION

... of porcelain-enameling furnaces to war work

MANY fabricating parts previously porcelain enameled are now or soon will be fabricating parts for war work. This means that some enameling furnaces will no longer be used for firing porcelain enamel. Of course there will be some exceptions, as in the production of stoves, sanitary ware, cooking utensils, reflectors and other essential items.

As yet there are extremely few applications for porcelain as a substitute for critical materials on war goods according to the Ferro Enamel Corp., Cleveland, in a recent article in *The Enamelist*. Some few plants may continue to operate on war work which they have devel-

oped through their ingenuity and resourcefulness, but there still will be many plants with idle furnaces.

Applying these idle furnaces to help out in heat-treating operations has been called impractical, but there are already a number of plants which are not only doing heat treating in enameling furnaces but are doing it at a fair profit as well.

Steel castings, forgings, bar stock and other shapes must be annealed to relieve stresses before machining. This means that the parts must be brought up to about 1650 degrees Fahr. and then cooled. Length of time for heating depends on thickness, shape and area of ex-

posed surface. Of course the exact heating and cooling cycle required for any part can be specified by the metallurgist representing the plant which will machine the part.

The change of shell steel specifications to a type requiring heat treatment to develop the desired physical properties means that an enormous load has been placed upon the heat-treating facilities of the country. There is no doubt whatever but that the furnace facilities of porcelain enamel plants can be utilized in some form or other to help out in heat-treating operations. Even with A-1-a priorities, it takes time to build normalizing and heat-treating furnaces. And in the meantime manufacturers of war equipment are looking for needed facilities such as may already be available in the enameling plant or enameling department.

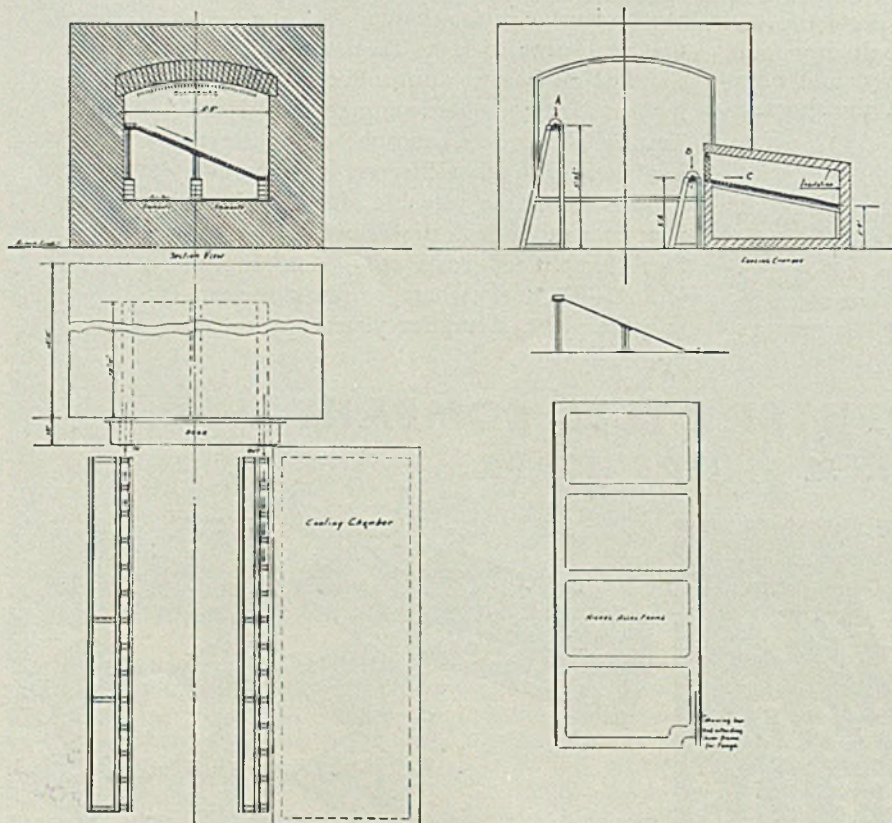
A Typical Example

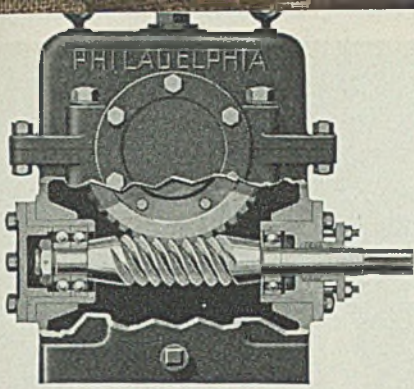
In one typical case, round bar stock had to be annealed. A local enameling plant undertook the job and converted a 5 x 12-foot electric furnace over for this work. As shown in the accompanying diagrams, a sloping frame in the furnace permits the periodic withdrawal of annealed bars and the introduction of cold bars into the furnace. Since the hot bars must cool slowly to retain proper physical structure in the metal, a slow-cooling chamber was built as indicated in the drawing.

This furnace, which would have been idle due to lack of enameling work, is now operating at a fair profit. This is not an outstanding exceptional application of ingenuity to make use of idle furnaces, but is simply typical of what can be done.

It has been suggested that if you have or anticipate having idle furnaces, you should get in touch with your local Office of Contract Distribution or your local chamber of commerce and find out who in your locality needs annealing capacity. Find out the size, shape, weight and quantity of parts to be annealed and the heating cycle specified by the metallurgist. Then if your own engineers cannot evolve a way of revamping your furnace (if such revamping is necessary) to handle the work profitably, call in reliable furnace engineers, preferably the ones who built your furnace, and ask for their recommendations.

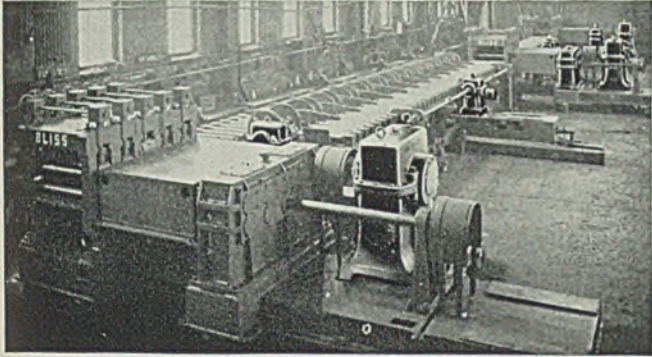
Diagrams showing box annealing equipment used in converting a 60 x 120-inch box electric furnace previously used for porcelain enameling into a unit that now handles annealing of round bar stock for a war plant





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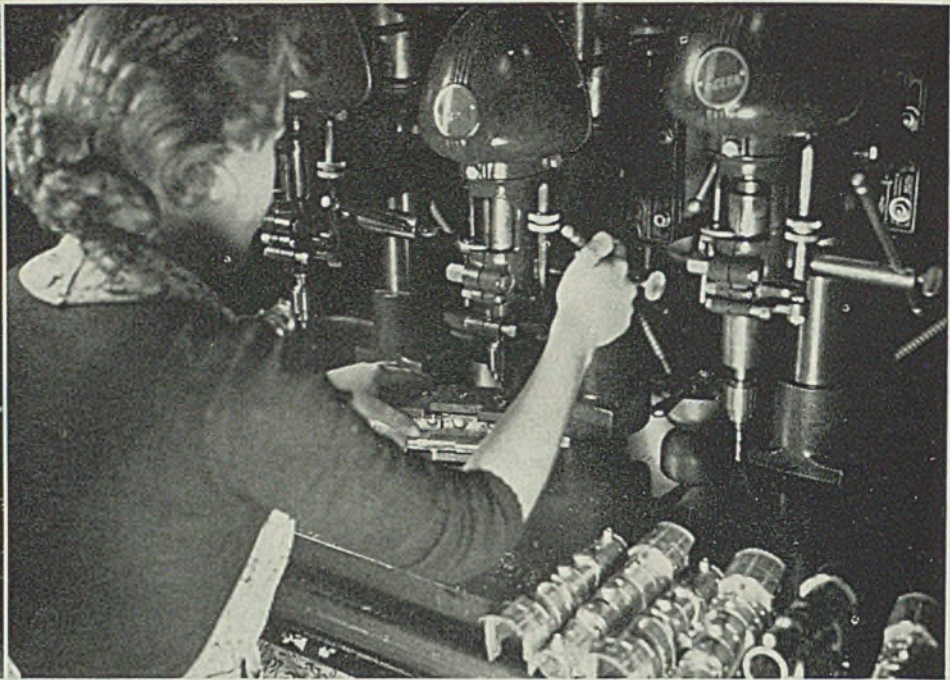
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CONVERTS

Toy Factory to War Production

FROM toy trains to parachute flare casings is the work history of Stephanie Cewe whose skill with this electric screwdriver has been turned to the aid of Uncle Sam's war machine. At upper left, she is shown at her former job—assembling locomotives for toy trains. Today she operates the same power-driven screwdriver in her assembly work on flare casings shown at left, below.

Lucille Ceiko is another one of the thousands of workers who are turning their skill to the production of vital parts for our war machine. At upper right she is shown at her peacetime work—drilling castings for toy locomotives in a large eastern plant. Today she uses the same press (lower right) but with different drills to make holes in parachute flare casings through which wires are to be inserted. Office of Emergency Management photos by Hollem.

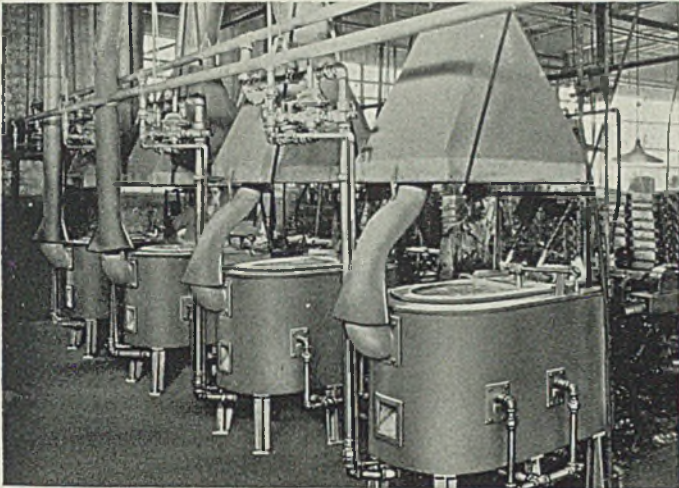
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SMALLER POT FURNACES . . .

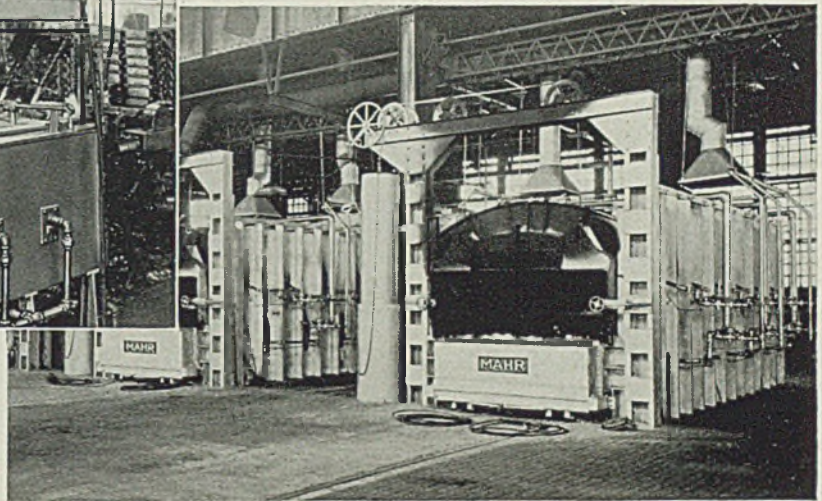
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◀ LEFT: A battery of MAHR lead melting pot furnaces in use in a large battery plant. MAHR pot furnaces for melting or for heat treating with salt, cyanide etc. are fully described in Bulletin No. 110.

RIGHT: Part of a battery of large MAHR car bottom furnaces used in an important defense plant for carburizing armor plate.



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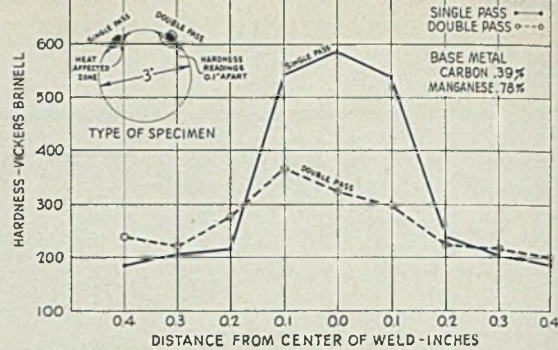
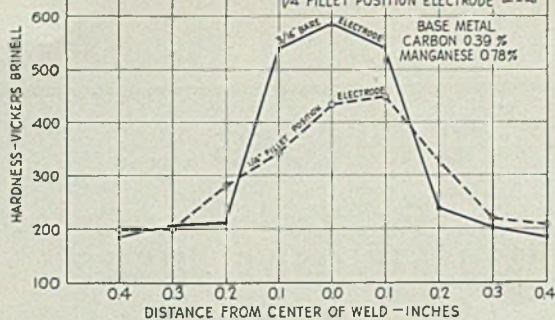
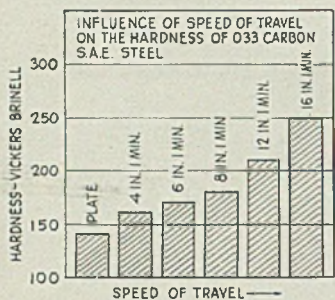


Fig. 1. (Left, above)—Faster speeds of travel bring about greater hardness of the heat-affected zones. Fig. 2. (Center)—Both size and type of the electrode influence the hardness of the heat-affected zone. Fig. 3. (Right)—Multiple passes with 3/16-inch bare electrode lower the hardness of the heat-affected zone

WELDABILITY

... is it practical to measure it by hardness tests? Mr. Lawrence shows that such tests can be utilized but that certain considerations must be understood to interpret the results properly

SINCE hardness tests may be made quickly and accurately, it is not surprising that they were early employed for the measurement of weldability. Although weldability has many ramifications, all of which cannot be reviewed in this discussion, it may be considered as that property of the base metal which permits a welded joint to be produced without any sharp difference in mechanical properties from the center of the weld deposit to a point beyond the heat-affected zone of the base metal.

Furthermore, there is a relationship between hardness and tensile properties in low-carbon steels that is most convenient. Hardness is the clue to tensile strength, yield strength, ductility and similar characteristics. Nor is the utility of hardness measurements restricted to the carbon steels. Similar observations yield valuable information for determining the physical properties of the low-alloy steels as well. But the use of hardness readings is restricted to a particular class of steel if the proper interpretations are to result. Certainly hardness values cannot be used interchangeably for both mild steels and low-alloy steels.

Alloying elements, as a general rule, increase the hardness of the steel in greater proportion than the ductilities are reduced. Thus a low-carbon steel and an alloy steel of identical hardnesses may have vastly different ductilities. Often the carbon steel may demonstrate an elongation of 20 per cent in 2 inches while the low-alloy steel with the same hardness will elongate 30 per cent in 2 inches. It is this difference that has tended in recent years to bring hardness measurements into undeserved disrepute as an index of weldability. The hardness

values themselves are not at fault. Rather a too loose and unwarranted generalization of such values has been responsible for their condemnation by some.

Every welding practice is aimed at making the weld deposit, the heat-affected zone and the parent plate exhibit as close to the same

By HAROLD LAWRENCE
Metallurgist and
Welding Engineer

mechanical properties as can be accomplished with the simplest welding procedure. Hardnesses of the parent metal ought to be unaltered by the welding process. Likewise ductility and strength should be disturbed but little; the ductility should remain unimpaired while the tensile strength should not be unduly increased.

Now the hardness of steels is an important index to their microstructure. And the microstructure in turn is responsible for the mechanical properties of the steel. Thus the hardness tells us the microstructure, and the microstructure yields information as to the mechanical properties. But the microstructure is born of the heat-treating cycle through which the heat-affected zone passes. Therefore the heat-treating cycle is pointed out by the hardness.

As most of the weld metal deposits employed for the welding of both the plain carbon (low-carbon) and the low-alloy steels lead to outstanding combinations of desirable physical properties, the main point of study is the heat-affected zone of the parent metal. It is this narrow band of steel that has been subject-

ed to many hardness studies in an effort to establish the weldability of the steel in question. The actual deposition of the weld metal (and throughout this article it is assumed that this part of the welding process is correctly accomplished) is important only as it determines the amount of heat that is put into the joint.

The physical dimensions of the joint have a definite influence as they, particularly the thickness, establish the rate at which the welding heat is withdrawn—that is, the cooling rate of the heat-affected zone. Preheating is a factor that influences hardness values and associated mechanical properties. And finally, although this is far from the least effective of the matters influencing hardness and weldability, the chemistry of the base material must be understood.

One of the best studies of the effect of heat input on the hardness of the heat-affected zone of a weld was made by Dr. W. G. Theisinger from whose data the information of Fig. 1 has been approximated. Once the correct current conditions have been established for the deposition of metal from a metallic arc electrode, the hardness of the heat-affected zone may be varied by changing the speed of travel. If the rate of progression of the arc is low enough, sufficient heat is put into the parent plate to bring about a slow cooling rate and a reasonable hardness. However when the rate of travel is quite fast, the heat input merely serves to dissolve the carbon in the iron as austenite without adding enough heat to buffer the cooling curve against the formation of martensite with its accompanying high hardness.

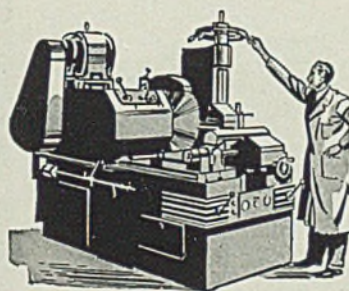
This viewpoint considers that the arc is serving two functions—one,

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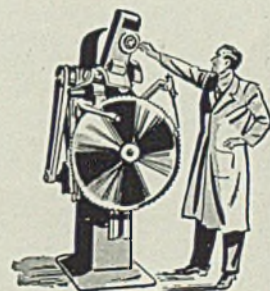
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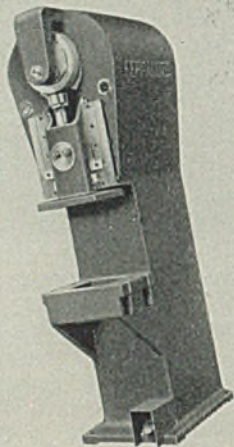
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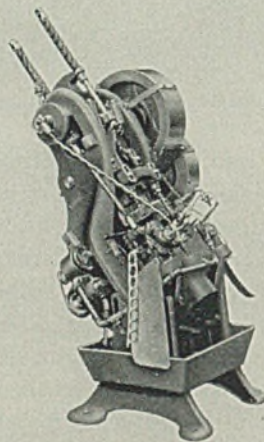
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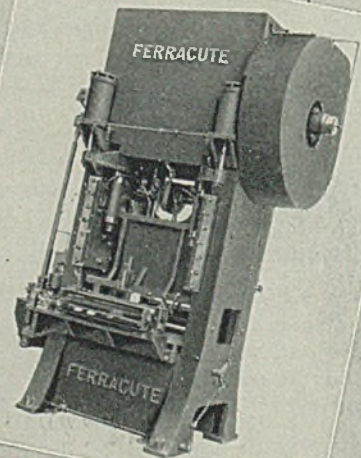


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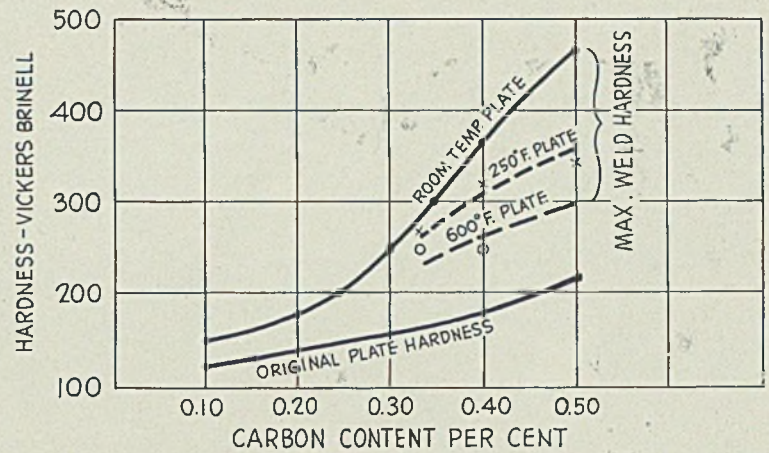
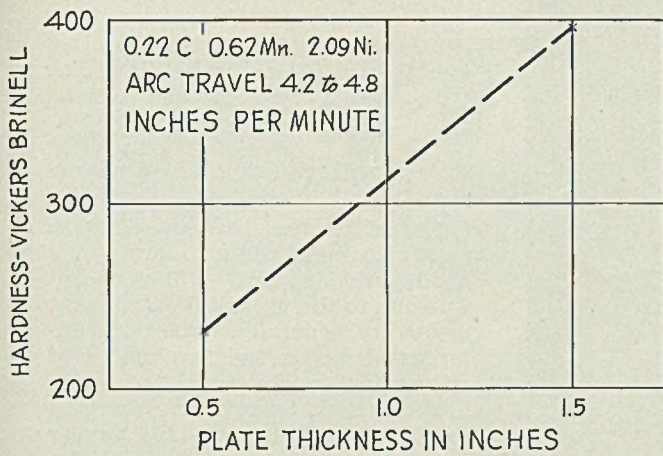


Fig. 4—(Left, above)—Hardness increases with greater thickness of base metal due to quenching effect of surrounding metal

Fig. 5—(Right)—Weld hardness is increased as carbon content becomes greater. Higher preheating temperatures lower weld hardness as shown by dashed lines

the deposition of weld metal; the other, the heat treatment of the base metal. Very often the welding of hardenable steel is accomplished in just this fashion. Small-diameter electrodes are selected solely for the purpose of introducing enough heat at slow rates of travel to prevent the formation of a hard and brittle heat-affected zone alongside the weld.

Oftentimes the investigation of the hardness of heat-affected zones has been conducted by means of single beads deposited automatically on specimens of standard and suitable dimensions. Important as these studies are to the gathering of fundamental information, more multiple-pass welds are made than single-pass welds. In the former the heat left by the preceding pass may act as a preheating treatment or, if the joint is quite long, there may be no preheating influence because of the long time of cooling before the second pass is made. In both cases, though, the second bead serves to draw, or temper, the first bead as a post-heating operation.

The influence of different sizes and types of electrodes as well as that of multiple passes has been demonstrated by R. W. Emerson. In Fig. 2 can be seen the difference in the hardness of the heat-affected zone as brought about by two different sizes and types of electrodes used at about the same rate of travel of from 8 to 12 inches per minute. Again the heat input is the variable as, at the same travel speed, greater heat comes from the use of larger electrodes or from the use of coated electrodes.

The coating on electrodes serves to insulate the cooling weld metal, thereby lowering the cooling rate to promote a lower hardness in the heat-affected zone. This influence becomes increasingly greater as we progress from very light coatings of AWS-ASTM Grade E6012 to the heavy coatings that are found on the flat position electrodes of the AWS-ASTM Grade E6030 type.

At times compromises are indicated. Because of the attention we

are giving to factors affecting the hardness of the parent plate, the problem of warping should not be overlooked. Applying greater heat input to lower the cooling rates to avoid dangerous hardness values may often result in more pronounced warping.

Fig. 3, also taken from Emerson's data, proves the beneficial heat treatment that may be attributed to the use of multiple passes. The very best adaptation of this principle to successful welding without preheating is in the welding technique known as block or cascade welding where the repeated application of many short beads close together prevents the build-up of hardness in susceptible parent metal. The same type of specimen was employed for the data of Figs. 2 and 3 with manual welding at a rate of 8 to 12 inches a minute on a 3-inch round 10 inches long. Hardness surveys were made on a slice cut 6 inches from the start of the weld.

In the work of H. J. French and T. N. Armstrong is the excellent example of the effect of greater plate thickness on hardness shown as Fig. 4. Once the heat is put into a joint, the mass of the plate acts

exactly like a quenching medium. A good way to visualize this phenomenon is to take a light-gage plate and an oxyacetylene torch. Play the torch on the plate and see how long it takes for a red color to appear. Not very long, is it? Now take a plate of considerable thickness and play the torch on it exactly as was done with the light-gage plate. It takes a long time for the color to appear. Yet the same amount of heat was being applied to the surface in each case. Only the greater heat capacity or cooling power of the heavier plate retarded the appearance of color.

Light plates, therefore, have little heat capacity and cool the heat-affected zone at a relatively slow rate. This property of light-gage metal accounts for the successful arc welding of SAE-X4130 steel in aircraft work. In heavier gages the steel is unweldable without careful preheating and postheating.

French and Armstrong show the maximum weld hardness to be expected in a 2-per-cent nickel steel of varying thickness using a constant speed of travel and a fixed current and voltage condition. Although a nickel steel was used in the example, the same type of curve would result with any steel. The principal difference would exist in the slope of the line, which changes for each type of base metal and for each set of welding conditions.

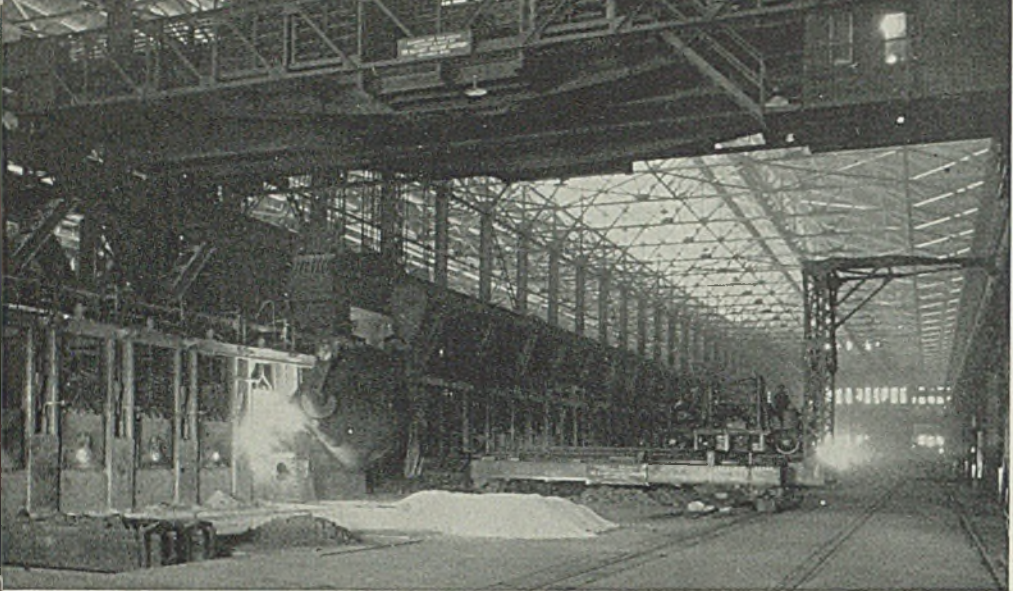
Joint design, other than thickness, has an influence on hardness that ought to be recognized. A narrow V, for instance, is subject to a greater hardening of the heat-affected zone than is a wide V. Mass quenching and speed of travel both exert an influence in joints of differing widths. As a rule, the wider the joint, the slower is the travel speed and the lower is the hardness of the heat-affected zone.

Thus anything that tends to increase the heat in the parent metal also lowers the hardness of the heat-affected zone. Slowing the rate of travel has this effect. Increasing the size of electrode at the same rate

(Please turn to Page 106)

References

- Weldability — Cracks and Brittleness under External Loads, *The Welding Journal*, August, 1941.
- The Effects of Carbon on the Welding of Plain Carbon Steels, *The Welding Journal*, August, 1939.
- Report of Subcommittee on Welding of Low-Alloy Steels, *The Welding Journal*, January, 1938.
- Weldability of Medium Carbon Steel by R. W. Emerson, *The Welding Journal*, October, 1938.
- Weld Hardening of Carbon and of Alloy Steels by H. J. French and T. N. Armstrong, *The Welding Journal*, October, 1939.



Charging a ladle of molten iron after the scrap charge has been melted

maintained requiring no conditioning.

The difference between straight and broadside rolling during the good period of only 1.70 per cent was due to the overall improvement in quality generally. The wide difference between the two modes of rolling during the poor period is due to the fact that more excessive and extensive breaking occurred during the slabbing process. If a break in the steel under broadside rolling affects 80 per cent of the width of the slab, it will affect 80 per cent the length of the hot strip and necessitate this amount of loss; the same defective steel when straight rolled will only cause a loss of 10 or possibly 15 per cent. Often it is necessary to shear the slab through the resulting defect thereby affecting two slabs which means a loss of 80 per cent on two strips in the one case and 10 to 15 per cent on two strips in the other.

Steel Was Over-Oxidized

The greatest source of difficulty was over-oxidation of the steel which was attributed to an unbalanced charge, a deficiency of lime for the quality of the scrap used and indirectly to a gradual change in the technique of shaping and refining of the metal. The deoxidation practice had slipped considerably from standard which permitted the ingots to drop in the molds excessively. The ingots because of their thick walls, even to the extent of 4 inches, could not absorb heat rapidly in the soaking pits and, therefore, after a few passes in the blooming mill were somewhat like a thin walled ingot. The steel was "dry" and "bony" and because of its physical condition would not elongate or flow at rolling temperatures. The result was large and extensive breaking or tearing and excessive crowsfeet, snakes and seams in the slabs.

The improvement shown for the "good period" continued until rejections for steel defects were nil. No conditioning of the slabs was necessary. Where there is no breaking of the ingot during the slabbing passes the ingot is free of scabs and burned areas and, hence, no conditioning is required.

Several heats had all of the manganese added to the ladle and this procedure was immediately established as standard practice and for a 10-year period no manganese was added to the bath except in the case of high-manganese steels, which contained in excess of 1.00 per cent manganese. Under this condition

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Deoxidation

COMMON STEELS are the basic foundation for the higher-carbon grades, commercial alloy, high-tensile low-alloy and all of the S.A.E. grades. If the base steel is of good quality then a satisfactory alloy or other S.A.E. grade can be produced merely by adding the necessary alloying elements accompanied by closer temperature control during pouring, reladling in some cases, slower pouring using smaller nozzle, special designed mold or special treatment of the ingot top with or without hot-top, etc.

Representative heats of a series produced under slightly different charging and/or working practices showed extremely wide variance in ultimate quality, both for intermill rejections, physical variance and performance in fabrication. Table I shows practice under two periods.

Approximately 50 heats were tabulated immediately preceding a change in the steelmaking practice and 50 heats after the change. Further improvements were developed later with rejections being reduced to nil.

Total rejections under "Poor Practice" varied from 68.90 per cent per heat to as low as 0.69 per cent per heat while those under "Good Practice" varied from 30.60 per cent per heat to nil.

When segregation of the carbon even with high normal manganese

By PAUL J. McKIMM
Cleveland

was so great that the ingot wall which corresponds to the hot strip edge dropped to 0.025 per cent carbon, excessive cracked edges occurred which caused rejection of the final cold reduced material from its original order to one of a narrower width. This necessitated side shearing thereby adding to the cost.

Table II shows a total loss of 22.70 per cent under "Poor Practice". The straight rolled shows a loss of 18.00 per cent against 28.60 per cent for broadside rolling. That is, with the same steel the straight rolled was 10.60 per cent lower. The highest was 33.2 per cent and three heats, which were the last of the group, had no rejections and these were established as the general practice. Under "Good Practice" a total rejection for steel defects of 9.70 per cent is shown. The straight rolled shows 8.10 per cent against 9.80 per cent for the broadside or a difference of 1.70 per cent. Broadside material is where the edges of the slab correspond to the end of the strip.

None of the slabs were scarfed or chipped in either period which further demonstrates that within the scope of good practical limits such quality can be consistently

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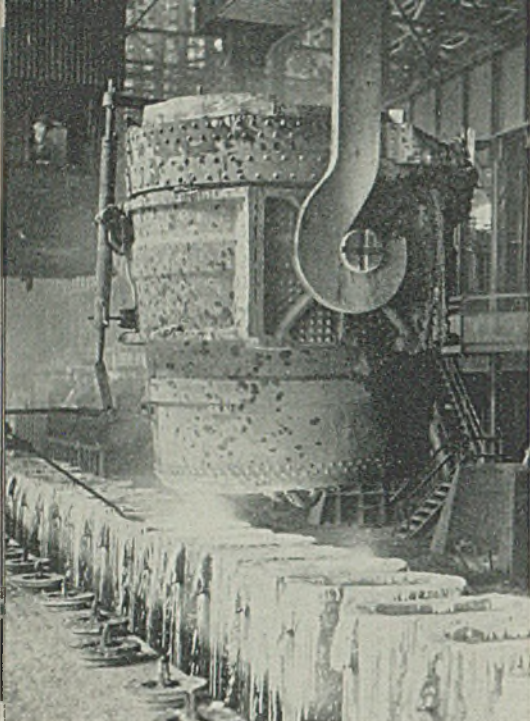
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Pouring a heat of basic open-hearth steel into big-end-down molds

specification. In order to prevent the ill effects of an improperly shaped-up bath where the heat was ored too closely or worked "soft" otherwise, the iron addition was made before the completion of the lime boil; or, sufficient iron was charged to require an ore addition of about 2000 pounds to make sure that the heat was properly shaped-up. The required additional time by this method soon caused the first helpers to shape their heats up correctly in the first place.

Deoxidation with aluminum generally is based on the iron oxide but this has never proved successful in producing a quality rimmed ingot and should be used only as a medicine to cause the ingot to begin action immediately after the shut-off and yield a suitable rimming action.

With scrap heats it is necessary to carburize and the simplest and cheapest medium for this purpose is coke although in some cases amorphous graphite and other ma-

terials are used but no difference can be found in the resultant steel. Sufficient carburization gives the bath the desired carbon content to facilitate the proper working and shaping-up.

Several heats with different type charges were made aiming for 0.10 to 0.15 per cent carbon and carburizing with amorphous graphite in the mold during pouring. The amount was calculated to yield 0.20, 0.30 and 0.40 per cent carbon, respectively. Part of the treated ingots were rolled and part of each group were split for segregation analysis. The results were excellent. This test merely was conducted as a study to prove that in cases of emergency, a lower carbon heat could be made and the ingots converted to any high-carbon range.

Importance of Graphite

Amorphous graphite also used for recarburizing can be calculated readily to yield a definite carbon increase. The reason this material is of paramount importance in the production of acid steels is on account of the high cost of low-phosphorus pig iron over the basic grade. In this practice a charge can be developed using some basic iron, eliminating all the higher cost low-phosphorus iron, finish off the charge with plate scrap and the like, and carburize by charging amorphous graphite. The most logical method is to cover the furnace bottom with a layer of scrap, add graphite in 50 or 100-pound bags, charge more light scrap for coverage and then continue with the balance. A better method is to charge the graphite in metal containers or drums or to bury it in between layers of turnings or borings in charging boxes. The recovery for the carbon constituent is approximately 75 per cent. It is a good practice to add sufficient silicon pig, containing about 15 per cent silicon, with the charge to compensate for the deficiency of iron in the charge. A safe procedure is to calculate a higher carbon than the specification to permit the proper refinement of the heat. This usually is about 0.10 to 0.15 per cent higher for the low-carbon ranges and up to 0.30 to 0.40 per cent for the higher carbon ranges. This practice has been followed for some time with heats of 30 to 40 tons and in carbon ranges over 0.75 per cent for steel having the most severe requirements and including all types of mill rolls without a single failure in quality.

When a graphite carburizer is employed in basic steel practice it usually is added on the bottom or sandwiched in between the lime charge for most efficient results. Crushed electric furnace electrodes

all manganese was added to the bath to avoid reladling.

Some of the heats were "ored" so closely that it could not be worked out of the bath thoroughly. In many cases iron had to be charged after the oreing to meet the carbon

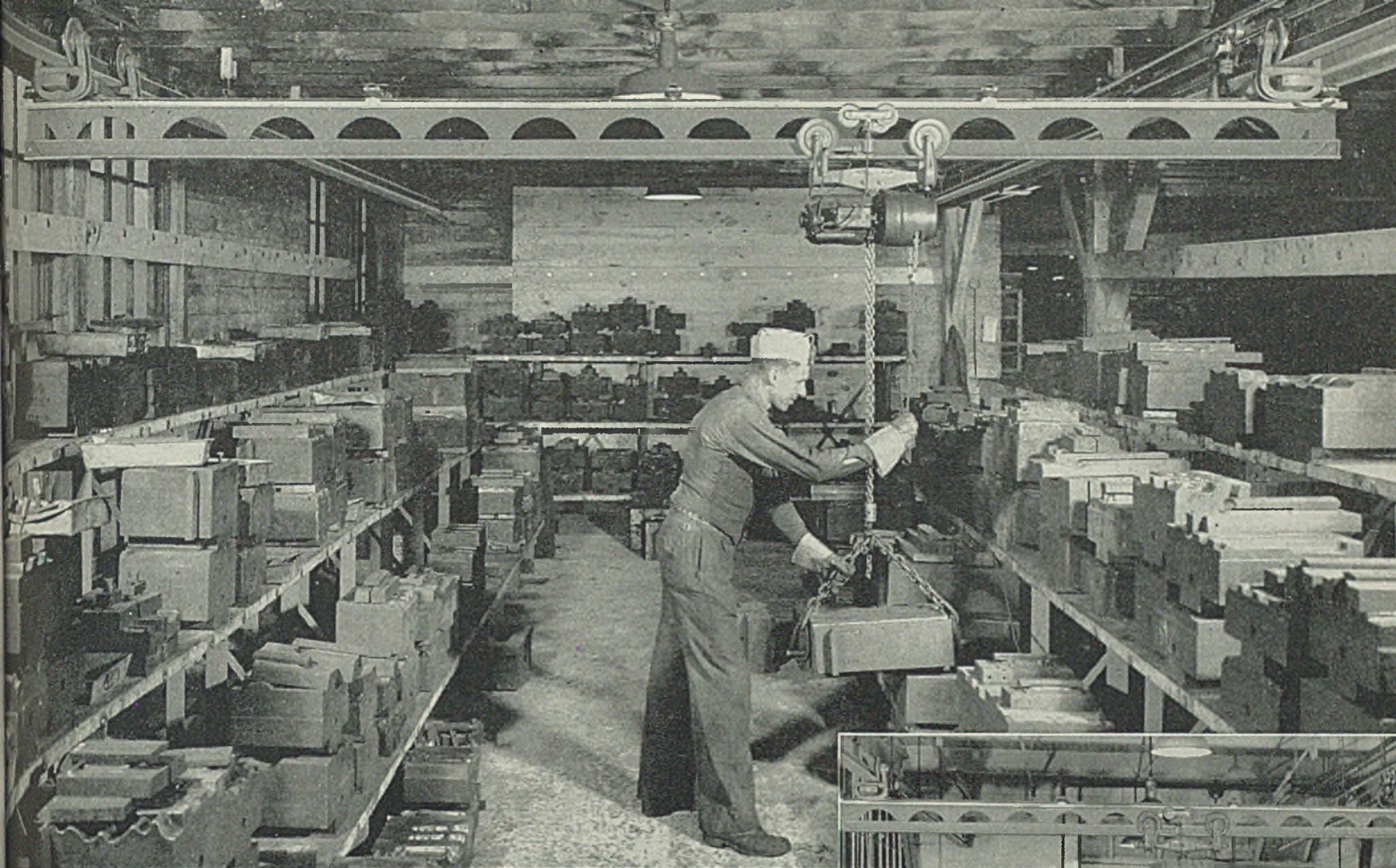
Table I—Data on Representative Heats

	Poor Period*			Good Period†		
	1	2	3	4	5	6
Heat number	1	2	3	4	5	6
Steel rejected, %	24.2	14.6	3.7	23.1	10.2	0.7
Scabs, %	14.7	12.3	3.4	3.9	2.1	0.5
Slivers, %	9.5	2.3	0.3	17.6	7.0	0.0
Snakes	Yes	Yes	Yes	1.6	1.0	0.4
Split edges, %	None	0.7	0.9	0.0	0.3	0.5
Lime added, lbs.	None	2,000	0	1,000	0	0
Lime, %	8.09	7.42	8.21	8.35	8.17	8.16
Iron:						
silicon, %	1.16	1.01	1.32	1.23	1.25	1.05
sulphur, %	0.019	0.023	0.023	0.022	0.022	0.023
Scrap, road, lbs.	52,700	56,600	14,300	20,700	127,800	None
Ore, lbs.	9,000	4,500	5,000	13,500	10,000	13,500
Hot metal, lbs.	None	None	None	None	0	0
Pig iron, lbs.	4,500	6,000	None	None	2,500	0
Spiegel, lbs.	500	1,200	1,200	1,200	1,200	1,200
Manganese:						
furnace, lbs.	600	600	600	600	600	600
ladle, lbs.	600	700	500	200	500	900
residual, %	22.0	20.0	19.0	22.0	18.0	15.0
Fluorspar, lbs.	500	.....	500	100	200	300
Bottom condition	Fair	Good	Bad	Fair	Fair	Fair
Aluminum:						
ladle, lbs.	5	5	5	5	5	9
mold, oz.	2	0	0	2	2	3.5
Mold drop, inches	0	2	2	0	0	2.0
Mold rise, inches	1	1	0	1	1	0
Skull, lbs.	0	0	0	0	0	0
Mold temperature	Cold	Warm	Warm	Cold	Warm	Warm
Nozzle, type	Oval	Oval	Oval	Oval	Oval	Oval
Analysis:						
carbon, %	0.08	0.08	0.08	0.09	0.09	0.08
manganese, %	0.35	0.37	0.30	0.35	0.35	0.40

*Chosen from 43 heats. †Chosen from 53 heats.

TABLE II—Data on Rolling of Heats

Rolling procedure	Poor Period		Good Period	
	No. of heats	Rejections, %	No. of heats	Rejections, %
Broadsided	22	28.60	26	9.80
Straight rolled	17	18.00	20	8.10
Broadsided and straight rolled	4	17.30	7	12.20
Total and average	43	22.70	53	9.70
Rejections, %:	No. of heats		No. of heats	
0 to 10	16		41	
10 to 20	12		9	
20 to 30	8		..	
30 to 40	2		3	
40 to 50	3		..	
50 to 60	3		..	
60 to 70	3		6	



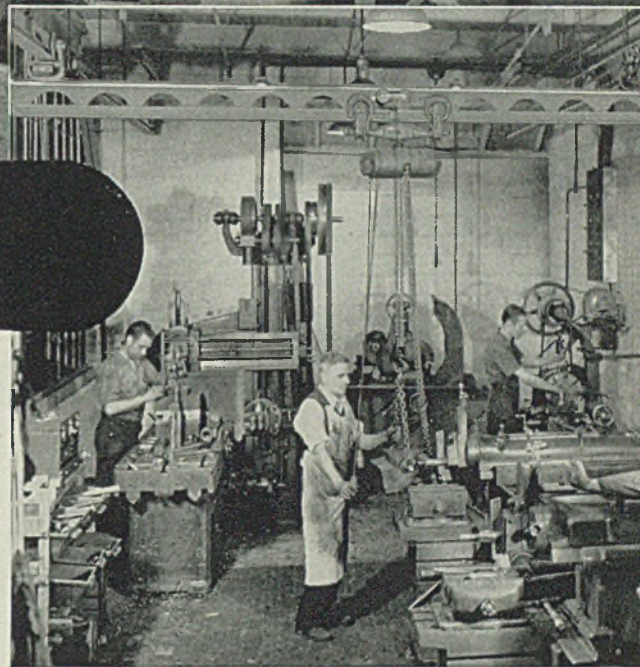
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Another crane in the die storage department makes possible an efficient die-storage scheme that should prove advantageous to many others. The die storage room has been provided with shelves on which the dies are stored in step fashion in numbered positions. Thus any die can be picked up or set in place without disturbing other dies. Locations of dies are quickly found by means of an index.



Above: Heavy dies are easily handled in this efficient die storage room. The electric chain hoist does the hard lifting. A gentle push moves the crane to any point on the runway.

Below: These valuable men spend less time handling materials and more time with actual production because of the help of this inexpensive Cleveland Tramrail crane.

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OVERHEAD MATERIALS HANDLING EQUIPMENT

will serve the purpose equally well.

Heats foam for many reasons. In general, the quantity of carburizer must be sufficient to insure at the meltdown a carbon content at least 0.30 to 0.40 per cent carbon above the specified analysis. When hot metal is added irrespective of whether the heat is worked with or without ore in the charge (high-iron heats) the condition of the scrap and the proper time must be well selected. That is, hot metal should be added as soon as the scrap charge has fused and melted down somewhat; it reacts at once with the liquid scrap and accelerates the melting time and increases the tons per hour. When hot metal is added before the scrap has been melted, a great amount of the reacting energy or metallurgical heat is lost. If hot metal is added too late, the reaction may become so violent as to impair the furnace bottom and banks and cause the bath to foam and flow over the door sills thereby necessitating extra labor in cleaning up and having an ill effect on steel quality.

Charging hot metal too early or too late has a detrimental effect on the steel quality and the time of the heat. Where the metal is added too early the cold scrap lowers the

temperature of the hot metal to such a degree that the action is greatly retarded. There is a time loss of 45 minutes or more depending on the extent of heat present in the cold part of the charge. When added too late foaming frequently occurs and time is also lost because during the foaming stage the action is valueless.

The importance of charging hot metal at the correct moment was developed by tabulating a large number of heats at several steelworks. Heats having the fastest charging time and naturally the shortest time of charge to hot metal were the heats of the greatest duration while heats having the greatest time in charging and longer period to hot metal charge were heats of the shortest duration. The time factor was twice as long and the duration time of the heat was extended as much as three hours. Heats requiring the longest charging time averaged 11 hours 27 minutes while a large number of heats with about half the time of charging averaged about 12 hours and 37 minutes. Fast charging of the cold material chills the bottom, the banks and the furnace generally, a greater time allowance must be made before the hot metal is added to permit a rise

in the temperature of the cold material so that when the iron is added reaction begins immediately. A time differential of 1 hour and 10 minutes means considerable difference in tons per hour.

The cold iron charge melts more rapidly than the scrap and shortly a molten mass is formed which in turn promotes a speedier melting of the scrap; hence, the reducing or reacting constituents (silicon and carbon) present in the pig iron are distributed quickly throughout the liquified mass. With this system of charging cold pig iron decarburization never occurs earlier nor at accelerated speed to promote soft heats or to require an increase in the amount of iron to obtain the proper carbon at the meltdown or to necessitate extra additions of pig to give the desired carbon content at this stage of the process.

SAE Manual Unifies Aircraft Drawings

Society of Automotive Engineers, 29 West Thirty-ninth street, New York, announces completion of a manual of aircraft-engine drafting room practice to help unify practices of different aircraft-engine manufacturers. It consists of seven sections:

Preparation of drawings, dimensioning by the decimal system, standardized parts, gears, thread specifications, materials, miscellaneous—abbreviations and symbols for use on drawings.

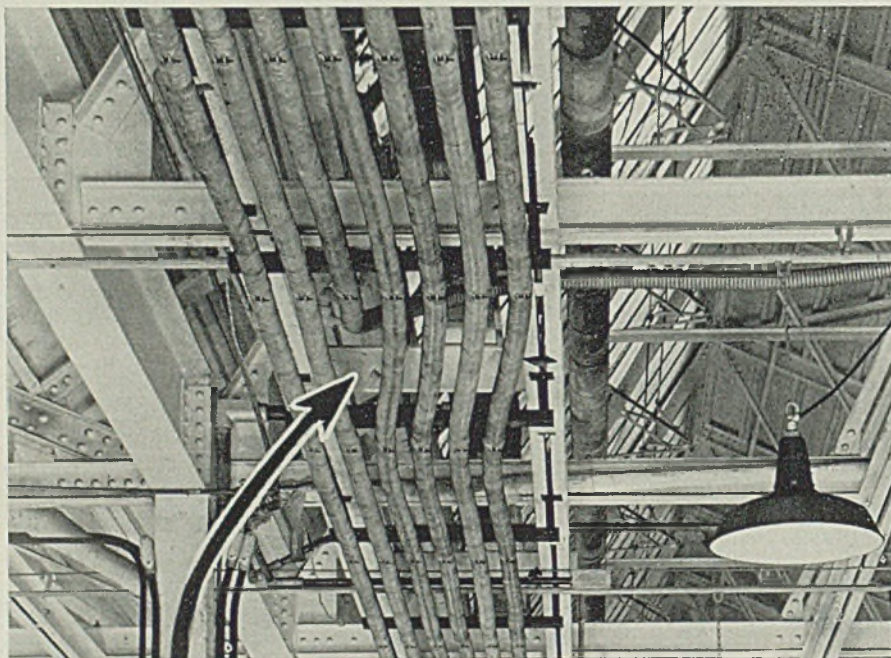
"Up to now each engine and engine-accessory manufacturer has had his own manual," John A. C. Warner, secretary and general manager of the SAE, explained in announcing the publication. "However, because of the technical differences between these company manuals, the government asked the society to develop a standard manual which would make universal the language of design and manufacturing engineers."

The Manual is being distributed in loose-leaf form, copies of which are available at \$1.50 each.

Service Pipe Made By Special Process

To relieve the shortage of galvanized pipe and copper tubing, the Hill-Hubbell process is now being made available in S-P steel service pipe according to Hill, Hubbell & Co., 3091 Mayfield road, Cleveland. These exterior "factory processed" coatings are offered in sizes from $\frac{3}{4}$ to $1\frac{1}{2}$ inches with special interior cement linings. In addition, regular water works enamel linings and coatings are available in sizes 2 inches and up.

Armored Cable Simplifies Plant Expansion



MATERIALS AND TIME. so vital in the present world battle, besides expense were cut to a minimum recently by installation of this General Electric varnished-cambic interlocked-armor cable for power distribution shown in a midwest plant producing 155 millimeter shell. Only a little over one third as much material is required for such an installation compared with the heretofore conventional system. Besides doing away with conduits, elbows etc., this flexible cable, because of its metallic covering, acts as a ground, protecting workers from shocks. It can be bent at right angles, see arrow, and around obstructions without injuring any part of the insulation

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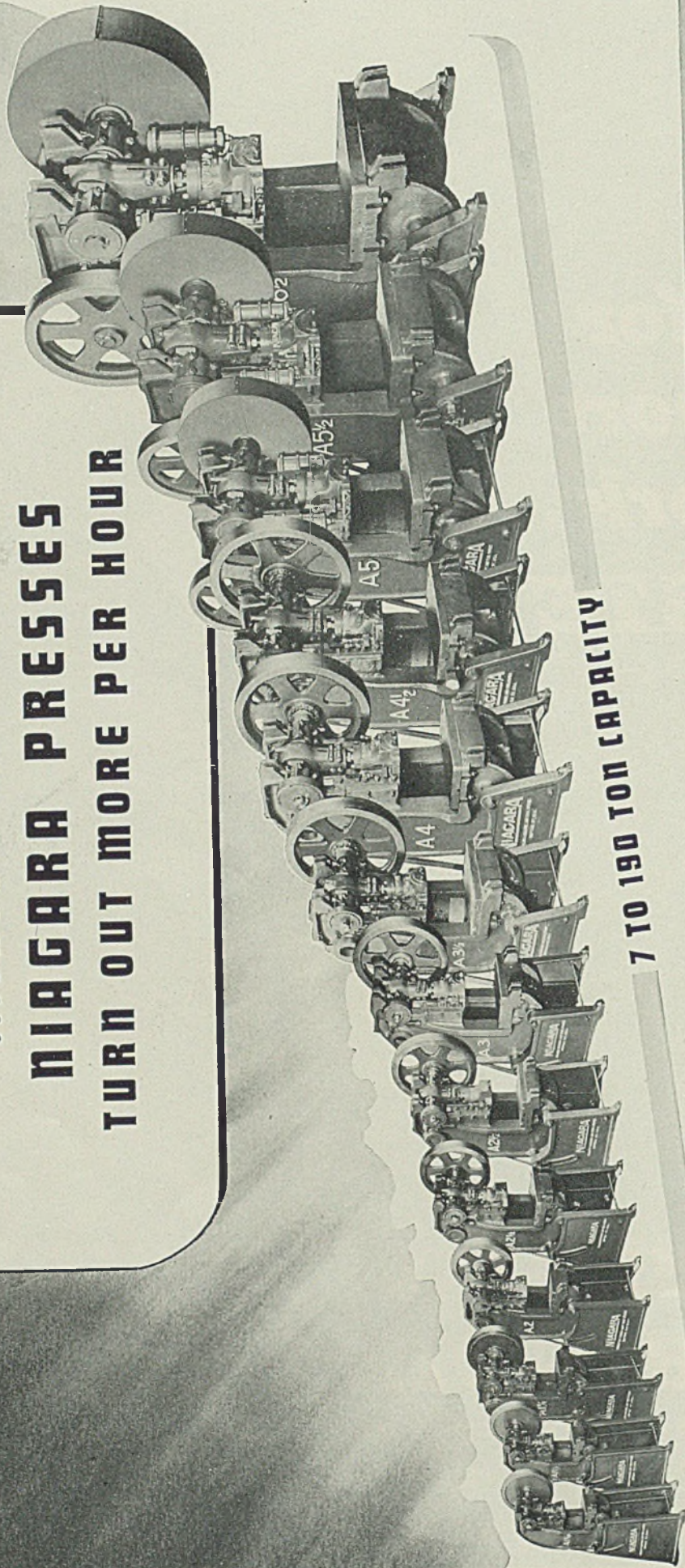
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Fig. 1—Above, view of the steam steering engine assembly line as seen from the starting end

EXPANSION and rearrangement of an already busy plant was the problem which confronted the officers and engineering staff of the Webster-Brinkley Co., 651 Alaska street, Seattle, when it signed a contract with the United States Maritime Commission to fabricate and assemble 252 steam steering engines.

How to avoid bottlenecks, make capacity use of existing equipment and improvise tools that could not be obtained promptly were questions that were successfully answered. This firm has been in business for years as founders and machinists specializing in elevating, conveying and transmission equipment for saw mills, mines, canneries and other heavy operations.

Working under a limited time schedule, a fast assembly line production setup was imperative. This phase of the problem was successfully met while special machinery for this particular job was developed by company engineers. The result is that within *four months* from the time the contract was awarded, the plant was in scheduled production, finishing one complete steering engine daily, as originally planned.

While the construction of an additional plant bay was under way, other units of the organization were busy making patterns for the iron, brass and steel foundries, also developing drill jigs and machinery for quantity production. Because of the lay of the land, the addition had to be built at right angles to the original shop. The new structure measures 40 by 150 feet, 24 feet in height. Because steel was not obtainable for this building, timber construction was adopted. The upper section is a continuous row of

windows giving maximum light.

How to use current equipment to the best advantage and to obtain additional machines were difficulties that were overcome. Many machine tools were not obtainable within reasonable time and consequently engineering ingenuity was brought into play. One machinery fixture developed by the engineering staff is a base plate combination boring fixture and drill jig as shown in Fig. 2. This piece of equipment bores the crankshaft bearings, locates the hole for the worm and pinion shaft as well as serving as a drill jig. This tool was developed in order to relieve congestion on shop tools that could have been used for the same

purposes, and additional tools of the same nature were not obtainable readily and in time to fit into the schedule.

As Fig. 2 indicates, a Van Norman portable boring bar is used to bore the vertical hole at the same time the special bar is simultaneously boring the crankshaft bearing. High speed Carboloy tool bits are used on both bars. Boring of the crankshaft bearing requires seven minutes.

At the outset, Webster-Brinkley Co. adopted the policy of subcontracting, antedating the government's request that this be done and

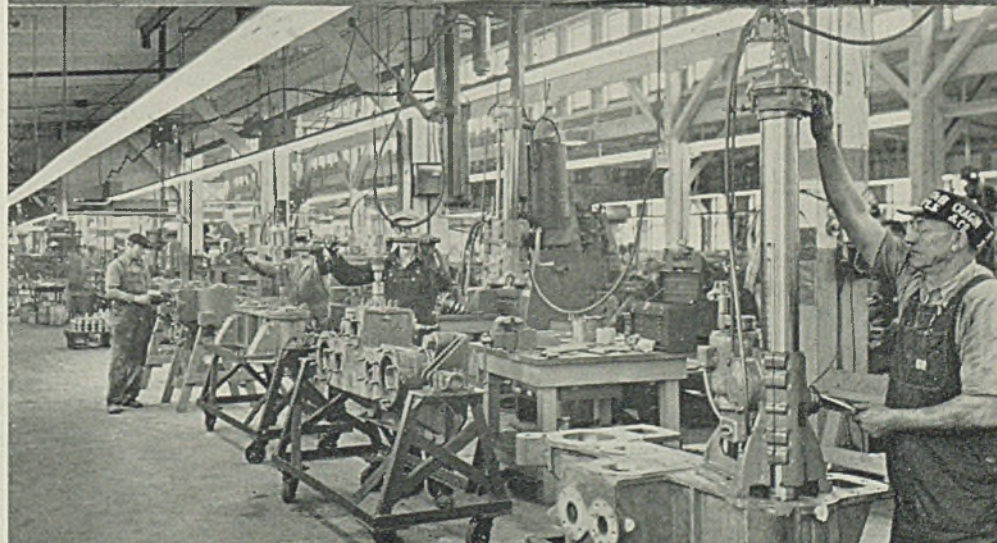
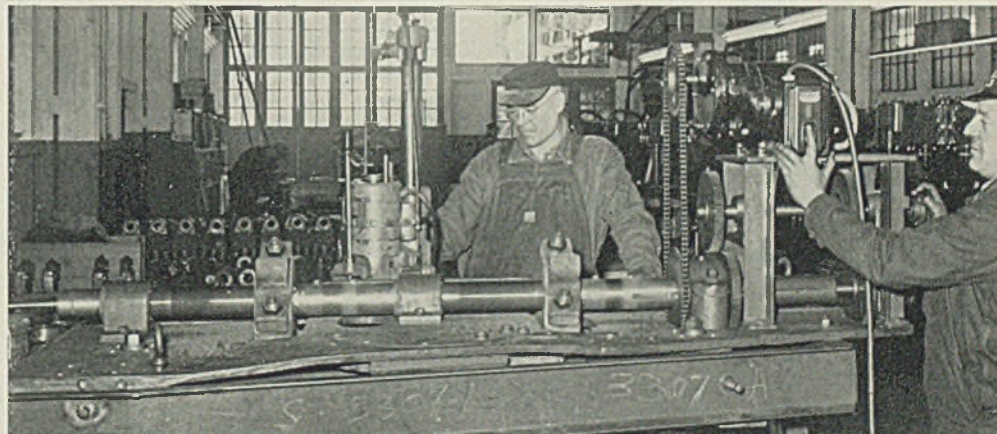


Fig. 2—Upper, right, special boring, drilling fixture for steering engine line

Fig. 3—Lower, a subassembly line feeding the main assembly line

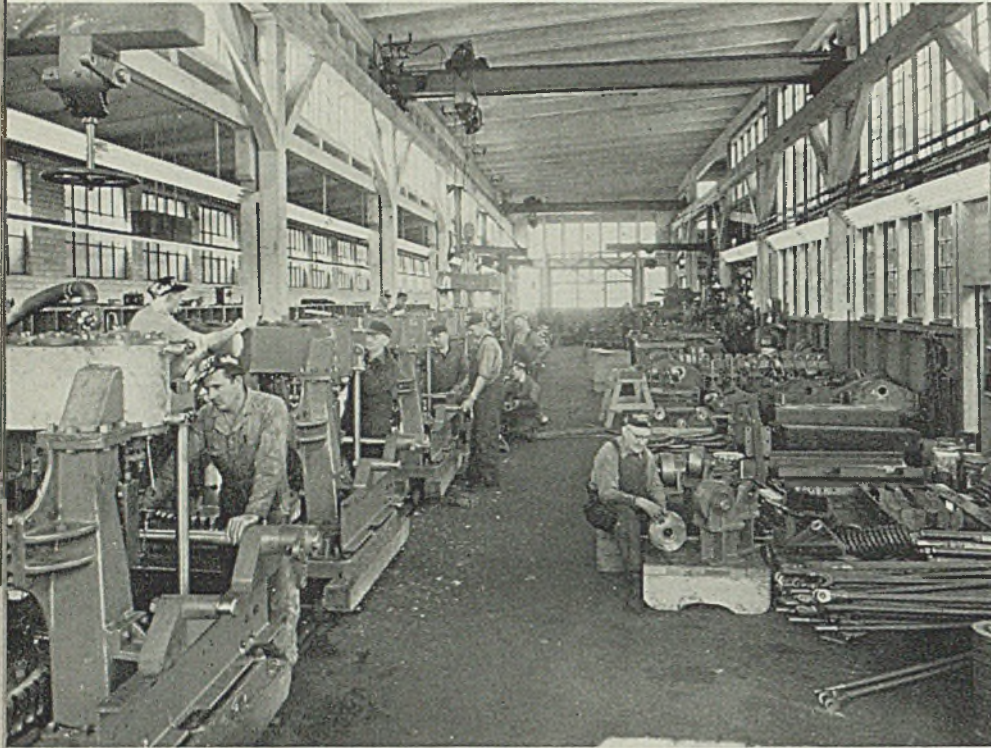


Fig. 4—Left, the steam steering engine assembly line as seen from the finishing end

co-ordinating with the plan since announced by OPM. A dozen or more smaller shops are furnishing parts such as castings and doing machine work for which they are well equipped. The job of co-ordinating these subcontracts with the work at the main plant as it progressed involved no little planning to avoid delays or congestion.

The steam engines for which the local firm holds the contract are of British design. As is well known, the modern freighters built for the Maritime Commission are being equipped with electric or electric-hydraulic steering engines. This type of steam engine was specified due to the existing bottleneck in the electric hydraulic industries.

The engines weigh five tons complete, and in assembling, a number of heavy pieces have to be handled. The sole plate of cast iron, the first piece laid, weighs 1200 pounds; the engine base, 3000 pounds; the tiller, 1000 pounds; while the rear columns, cylinder blocks and other heavy parts also require handling by crane equipment. Over the assembly line four jib cranes are in service along with two 5-ton bridge cranes. In the original shop there is a complete layout of cranes and other modern equipment.

To insure rapid and constant production, line assembly was necessary, and the plans to this end adopted by company engineers are working out most successfully. First a track of 25-pound railroad rails was laid the entire length of the assembly bay and extending 30 feet outside, a total length of 180 feet. See Figs. 1 and 4. The engines

are built up on this track, moving forward once each day. As each complete unit reaches the end of the track, it is immediately loaded into a freight car on a siding serving the plant. The assembly work is done in one shift, with each man performing one operation, each worker being selected and trained for his specific job.

On the assembly track, 6-inch wheels of cast iron with turned and polished sheet shafting axles, 1 7/16-inches in diameter, are used as rolling stock. On each set of four wheels for each engine are placed shipping skids of Douglas fir, 6 x 6 inches x 6 feet in length, to which is bolted the engine bed plate. There are 16 engines on the production line as each unit requires 16 days to complete.

In addition to the main assembly line, many parts are put together in subassemblies. One example is shown in Fig. 3, where the cylinders are reamed, valve cages pressed in and reamed, the pistons, valves and heads assembled in place and the insulation and lagging put on. Here again the value of line production is apparent as the work is planned to progress from station to station while mounted on 4-wheel welded steel-frame dollies, shown clearly in Fig. 3. Black & Decker electric stud drivers, electric nut wrenches and electric screw guns are in use on these assembly operations. The various tools are carried on a monorail, being counterbalanced for easy handling. Steel frames equipped with rubber-tired casters carry the cylinders from each operation.

Officers of Webster-Brinkley Co.

are highly pleased with the results of their careful planning, evolved in the face of many difficulties, and expect to complete the entire lot well in advance of contract requirements. At this writing the plant is about one month ahead of schedule. The handling layout is to be credited for much of this.

New Type Pipe for Corrosive Solutions

A new line of cement-asbestos pipe, called Roxite, for handling a wide range of mildly corrosive solutions and for transporting processing water which must be free of metallic contamination, etc., is being offered by United States Stone-ware Co., Akron, O. Pipe in the line are coupled by Flexlock sleeves and fittings which eliminate the use of tools or threading on the pipe for assembling.

Besides the standard units, pipe also is available with a synthetic coating which offers adequate protection for many types of highly corrosive conditions according to the company. Several types of these coatings are being offered. Each is said to be suitable for a particular range of service, both in respect to the fluid handled and the mechanical severity of the operating conditions. The pipe are made in standard lengths of 14 feet with inside diameters of 3/4 to 8 inches.

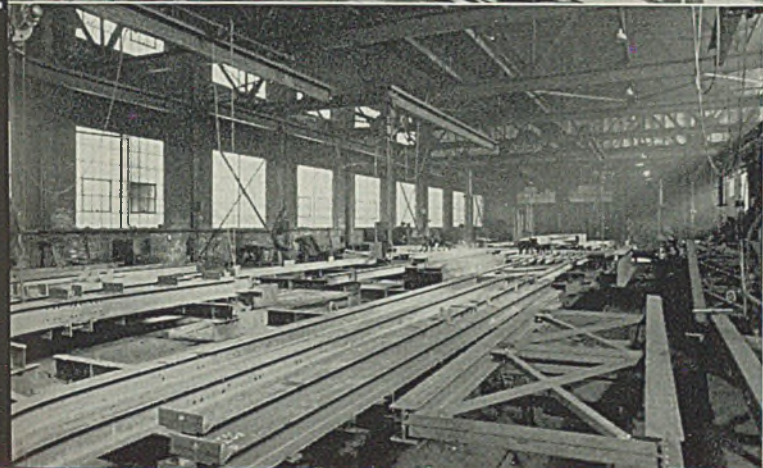
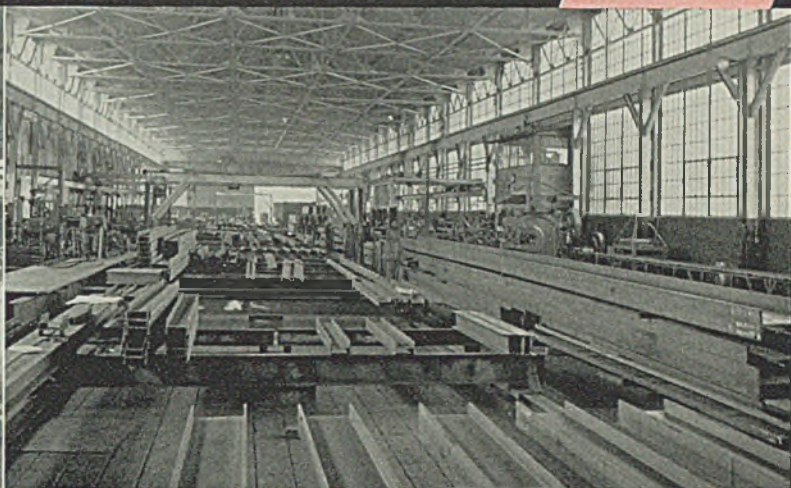
Solves Dust Problem Causing Foundry Rejects

American Magnesium Corp., Cleveland, reports it has found in its foundry a new solution to the old problem of free dust and sand settling into molds and causing rejects. The solution is in the form of a new heating and ventilating system which by means of amount, direction and rate of air delivered prevents dusts from being blown about and dilutes the smoke-laden atmosphere.

Equipment used consists of 10 Carrier Thermajust heat diffusers, supplying 135,000 cubic feet of outside air per minute to the foundry. Mounted in an inverted position along the side walls, the units are 9 feet above floor level. From long slotted outlets, a low velocity flow of outside air is fanned downward and toward the center of the floor at the correct temperature to offset heat losses through ventilators. Overblows which swirl dust and other impurities around the foundry are eliminated by discharging the air at this low velocity.

4

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4

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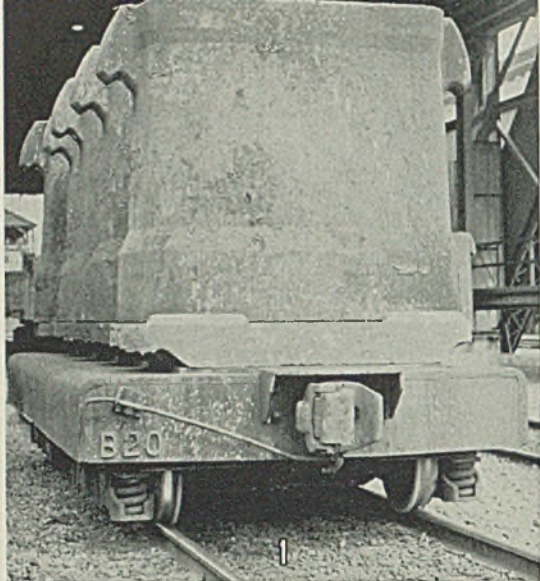


Fig. 1—All-weld ingot buggy carrying five 20 x 57-inch molds and their light-weight stools



Fig. 2—Surface condition of two light-weight stools after 501 and 518 heats respectively. The center was gouged out 5 inches at end of campaign

Fig. 3—Bottom of light-weight stool designed for 20 x 57-inch ingots. This weighs 2644 pounds less than a solid stool designed for same size ingot

A Lighter Weight

CAST-IRON MOLD STOOL

By WILLIAM W. BERGMANN
Open-Hearth Engineer
American Rolling Mill Co.
Middletown, O.

for light stools of this type designed for 20 x 57-inch ingots. The saving of material for this size stool is 2644 pounds. Occasionally the life of this weight stool reaches as high as 250 heats before scrapping is necessary.

steel hits during the pouring operation. This change increased the life of the stool and decreased the number of stickers.

Life of the first 15 experimental stools averaged 279.3 heats, ranging from 105 to 460 heats per stool. Following the test all stools for the open-hearth shop were made of this light-weight design. During 1937 the average life was 152 heats per stool.

The top surface of two light-weight stools is shown in Fig. 2. One stool shows the surface condition after a life of 501 heats and the other after 518 heats which was the largest number of heats obtained from the light-weight units. When the stools were taken out of service and scrapped the center of each was cut out about 5 inches.

A view of the bottom of a light-weight stool weighing 5656 pounds, is shown in Fig. 3. A solid stool for the same size ingot would weigh 8300 pounds. During the last two years the average life was 104 heats

A stool for a 20 x 57-inch ingot is 44 inches wide, 77½ inches long and 10 inches thick at the center. The end section is 4½ inches thick and the three ribs beneath the end section are 4½ inches thick. Four different size ingots are poured on this stool which decreases the life considerably. This is attributed to the pouring of a small size ingot, 20 x 36 inches, on a stool designed for a 20 x 57-inch ingot.

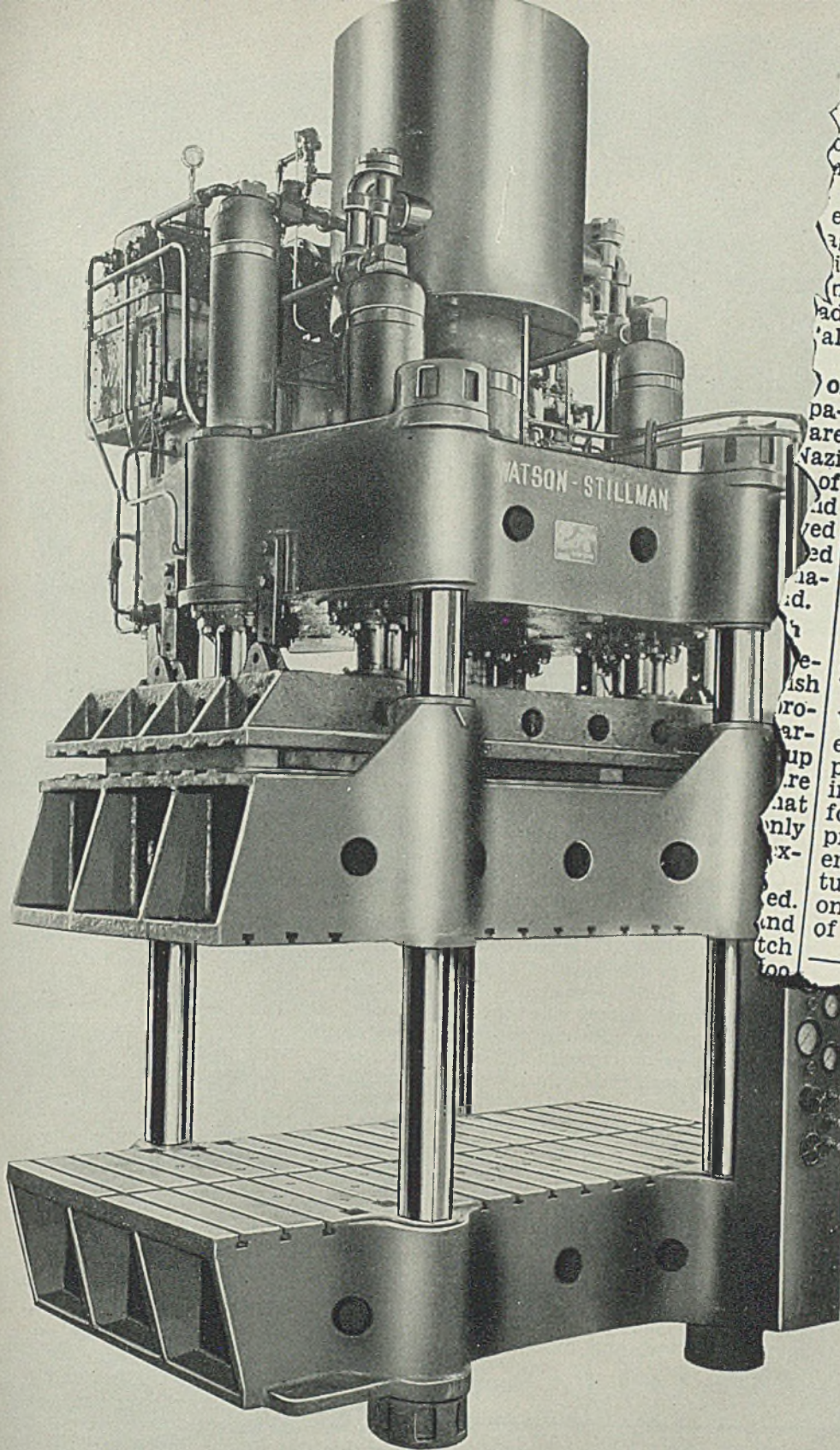
An all-weld ingot buggy carrying five 20 x 57-inch molds and five light-weight stools is shown in Fig. 1. The total weight on the buggy including the ingots is 233,000 pounds. The stool life on this buggy is at least 15 per cent better than obtained from our cast buggies. The full length of the stool is supported by this welded buggy. Stool life is shortened when a long stool is used on an old-style cast narrow buggy which does not support the outside ends of the stools.

WHENEVER a lighter weight stool is discussed by open-hearth operators the trend of thought usually is toward one with either a cast-iron or refractory insert. The American Rolling Mill Co. decided to attack this problem from a new angle, namely, by making the stool heavier at the center and lighter at the ends. In 1935 a light stool for 19 x 42-inch ingots was developed. This stool weighed 3200 pounds compared to 4700 pounds for a solid stool designed for the same size ingot. Making the stool lighter at the ends effected a reduction of 1500 pounds in the weight of the solid stool which is equivalent to a saving of 32 per cent of cast metal for each stool.

The newly designed stool was cored out under each end and its thickness at the center increased 1 inch, thereby making it heavier and stronger where the stream of molten

Comparison of Light Weight and Solid Stools

	1935	1936	1937	1938	1939	1940	1941
Wt. of stool scrapped per ton of steel poured, lbs.	7.00	6.60	4.22	5.58	6.26	8.5	8.20
Stool life: No. of heats	92	97	152	123	123	102	106
Avg. wt. of ingots poured, tons	5	5	5	5.30	5.75	6.50	6.50
Design of stool used:							
Solid, small, %	100	85	100	80	50	100	100
Light, small, % . . . . .	...	15	...	20	50	...	...
Light, large, % . . . . .	...	...	...	...	...	...	...



800-Ton W-S Press . . . For Better Bombers

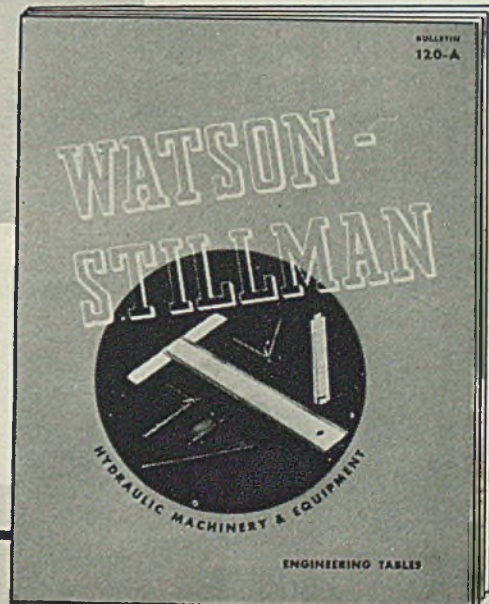
With an 800-ton squeeze, this Watson-Stillman Hydraulic Forming Press (which itself weighs 70 tons) meets Lockheed Aircraft's exacting demands for deep and shallow drawing operations on thin metal parts for bombers. A double-stroke and a pressing speed of 14 inches per minute at 500-ton capacity, this press speeds production of bombers for the war effort.

Bed and moving platen measure 72" x 146". Opening between platens is 52". Overall height of the press is 22' 3 3/4".

This is but one example of how Watson-Stillman's 94 years' experience is solving today's production problems. Other examples appear in General Bulletin 110-A, yours for the asking. If you use hydraulic presses or other hydraulic machinery now—or if you may in the future—let W-S engineers go to work on your requirements. No obligation of course.

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(Bulletin 120-A). This new 12-page hydraulic data book is crammed with valuable facts—no advertising matter. Capacities of Hydraulic Rams, Discharge of Water For Circular Orifices, Seamless Steel Pipe Properties, etc. Write for your free copy now. THE WATSON-STILLMAN CO., ROSELLE, N. J.



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ABRASIVE-DISK CUTTING

... of steel and other metals wastes little material,
can be employed on extremely hard alloys

By **ARTHUR F. MACCONOCHE**
Head, Department of Mechanical Engineering
University of Virginia
University Station, Va.
And
Contributing Editor, STEEL

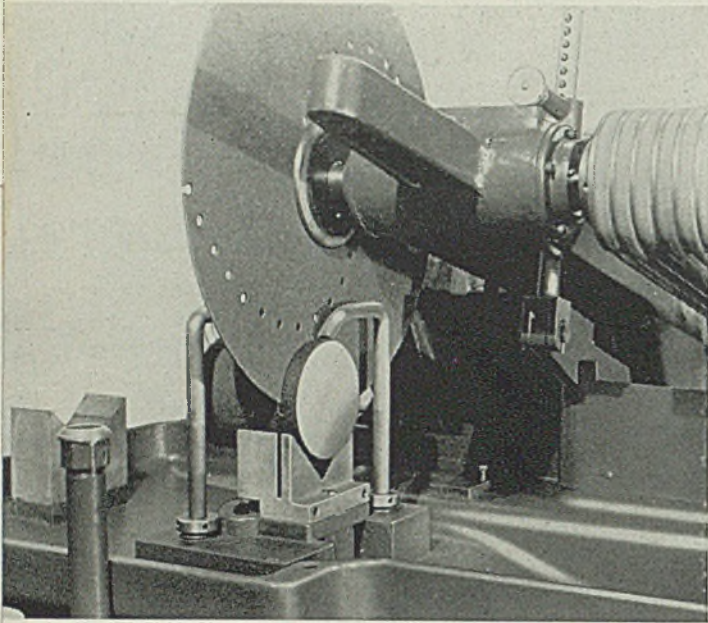


Fig. 1—Cutting head of abrasive-disk cut-off machine made by Andrew C. Campbell Division, American Chain & Cable Co. Inc., Bridgeport, Conn.

AMONG THE various methods now in use for cutting metals, including nick and break, burning, and the circular saw (see STEEL, Feb. 10, 1941, p. 54, and Dec. 15, 1941, p. 72) the use of an abrasive disk offers some advantages and has certain limitations. On the credit side we may write a saving in steel over the saw of the inserted tooth type, together with an ability to tackle hard materials which the saw would find difficult or impossible to cut. On the debit side is the slower speed of operation.

On plain carbon unheat-treated stock the performance indicated in Table I may be expected. If stainless or high-speed steel is being cut, both the time required and the cost are some 25 per cent higher than indicated in Table I. In the case of the larger sizes of material such as 4 to 6-inch, a small scoring wheel is used to insure parallelism within small tolerances, let us say, of the order of 0.010-inch on a 6-inch billet.

From all reports the performance of the abrasive disk on aluminum alloys is especially satisfactory. Wheel costs are low—much lower than on steel—and the cutting time much shorter. For instance, on certain alloys of aluminum, the cutting time on 4-inch diameter stock is only 30 seconds as compared with 3½ minutes in the case of a steel billet of the same diameter.

As indicated above, the special virtue of cutting with an abrasive disk resides in its capacity for handling hard materials, thus avoiding (on occasion) the necessity for annealing the metal before cutting—a task which might otherwise have to be undertaken if the saw were used.

Fig. 1 gives a good general idea of the design of the cutting head of a machine of this type. In action the head carrying the cutting disk is given a rocking motion in the direction of the cut in order to prevent binding and to speed the operation.

For trimming action such as ends of billets for shell forgings, a special attachment (not shown) is provided which rotates the shell as the job progresses. Thus no time is lost in cutting "air," and the disk may be used until it is worn to a small diameter.

Fig. 2 exhibits a cross section of the machine. The cutting head rocks about a center immediately underneath the work table and on the center line of the stock, the eccentric drive being in evidence on the left in Fig. 2—that is, in the rear of the machine. An interesting feature of this assembly is the powerful spring which removes any backlash and renders the action smooth and silent. The amount of back-and-forth movement of the cutting wheel is regulated by an adjusting screw after releasing a nut, both labeled.

Mixture Keeps Wheel Sharp

A proprietary product known as Codol is added to fresh water to form the coolant used. This mixture prevents rust and appears to have an important effect in preserving the sharpness of the rubber-bonded abrasive wheel, a characteristic of considerable importance to effective performance, since a wheel which has become glazed or dull tends to wander from the straight and narrow path through the work. The coolant is fed to both sides of the wheel in equal amounts, thus insuring equal temperature on both sides.

All operating factors are controlled automatically by the machine itself, thus reducing the influence of the human element to a

TABLE I—Data on Cutting with an Abrasive Disk

Stock Size Inch	Area Inch	Wheel Dia. Inches	Wheel Thickness Inch	Wheel Cost	Life in Cuts	Time To Cut
1	0.785	18	$\frac{3}{8}$ or $\frac{1}{2}$	\$2.10	610	10 seconds
1½	1.227	18	$\frac{3}{8}$ or $\frac{1}{2}$	2.10	400	14 seconds
1¾	1.767	18	$\frac{3}{8}$ or $\frac{1}{2}$	2.10	300	25 seconds
2	2.405	18	$\frac{3}{8}$ or $\frac{1}{2}$	2.10	219	35 seconds
2½	3.14	18	$\frac{3}{8}$ or $\frac{1}{2}$	2.10	169	50 seconds
2¾	3.97	18	$\frac{3}{8}$ or $\frac{1}{2}$	2.10	132	75 seconds
3	4.90	18	$\frac{3}{8}$ or $\frac{1}{2}$	2.10	86	90 seconds
3½	5.94	18	$\frac{3}{8}$ or $\frac{1}{2}$	2.10	69	110 seconds
4	7.06	18	$\frac{3}{8}$ or $\frac{1}{2}$	2.10	52	2½ minutes
4½	9.60	20	$\frac{1}{2}$	3.15	40	3 minutes
5	12.50	20	$\frac{1}{2}$	3.15	35	3½ minutes
5½	19.60	20	$\frac{1}{2}$	3.15	20	5 minutes
6	28.70	20	$\frac{1}{2}$	3.15	10	6 minutes

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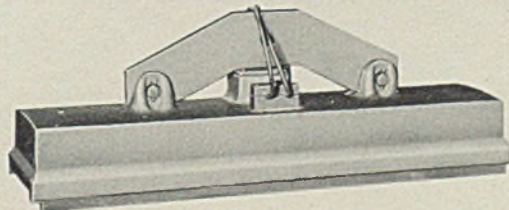
★ In addition to the universal Type SA Magnet for handling almost any type of magnetic material, we offer special lifting magnets of different designs to meet conditions where special types can be used most profitably.

Some of these different types are shown. If the particular operation you have in mind is not featured here, we no doubt have a magnet for that very purpose. Write us and ask for Bulletin 900, "EC&M Lifting Magnets."

THE ELECTRIC CONTROLLER & MFG. CO.
Cleveland, Ohio

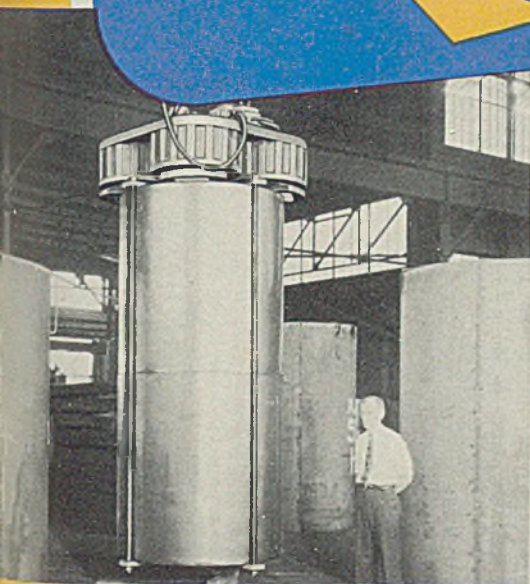
EC&M Magnet Features

- ★ High lifting capacity per pound of magnet weight.
- ★ High lifting capacity per ampere of current consumed.
- ★ High lifting capacity per dollar invested.
- ★ High maintained lifting capacity in all-day service.
- ★ Low heating in long continued service.
- ★ Low maintenance cost.



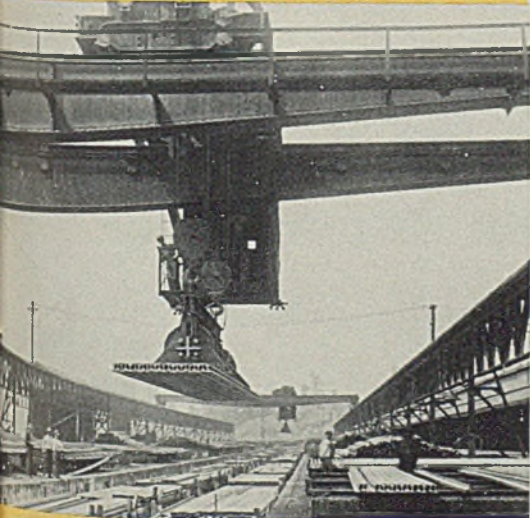
EC&M No. 3 Type P Magnet with renewable pole shoes for pipe or bar-stock handling applications. Also supplied for plate handling. Magnet is 53½ inches long by 14½ inches wide. Available with chain or hanger

HEAVY DUTY MOTOR CONTROL FOR CRANES, MILL DRIVES AND MACHINERY • BRAKES • LIMIT STOPS • LIFTING MAGNETS AND AUTOMATIC WELD TIME



WORLD'S BIGGEST LIFT OF COILED STEEL

EC&M No. 6 Type CSM Magnet, on test, lifting a total load of 56,600 lbs. through two wooden spacers, making an air gap of $\frac{1}{16}$ inch between the magnet and its load. The load consists of 2 coils, each 55½ inches O.D. and 61 inches high, bolted together for the test.

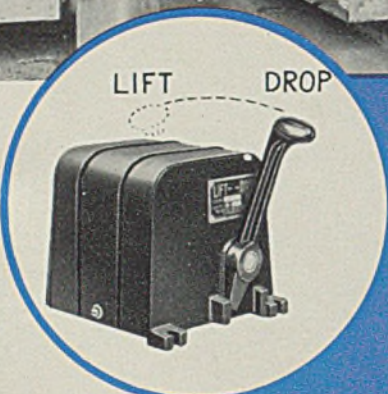
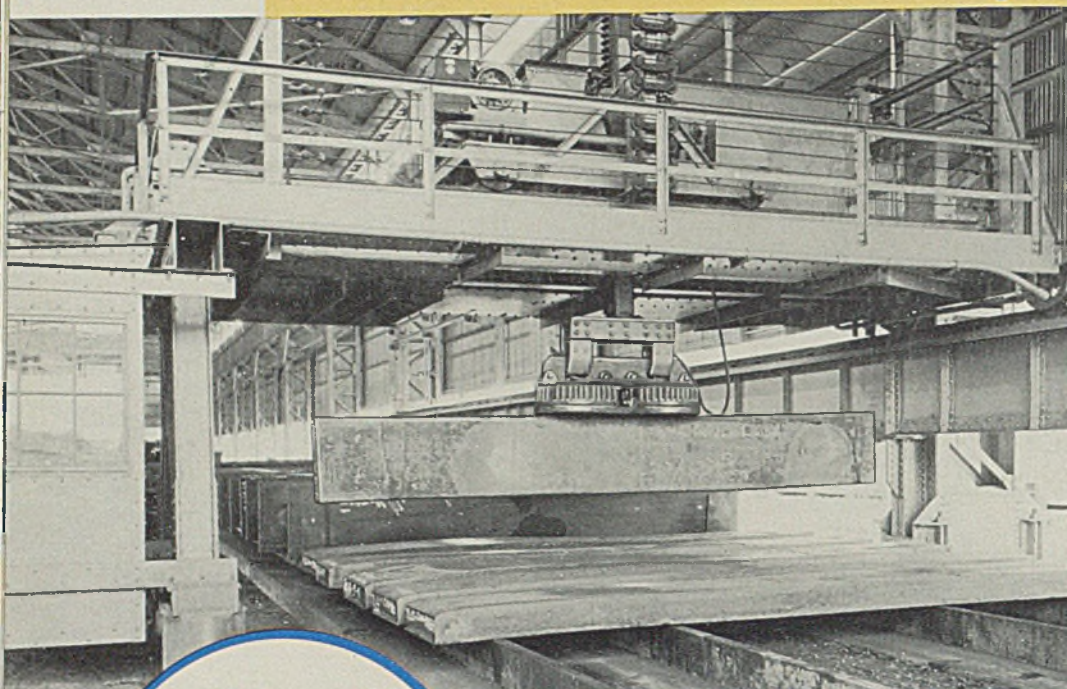


Two pairs of No. 6 Type BM Lifting Magnets handling Rails in a double layer. Each pair of magnets capable of handling 200 or more tons of rails per hour.

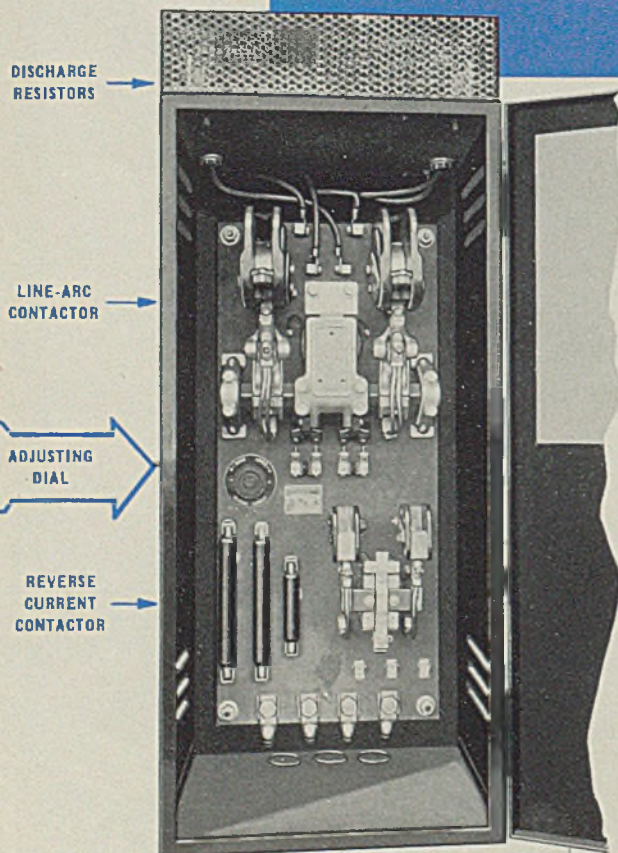
EC&M Duplex 29-R Magnet with special hanger for stirrup-hook attachment on slab-turning crane. Center-line of magnets is placed on edge of slab and when lifted, the slab rotates on magnets and hangs vertically as shown. Magnets and slab are then lowered until edge of slab touches ground-skids. Operator then starts bridge motion of crane while continuing to lower which completes the turning operation.



No. 6 Type SA Magnet handling kegs of Nails, Wire, etc., in warehouse. This lift consists of 29 kegs of 8-penny nails, 100 lbs. per keg.

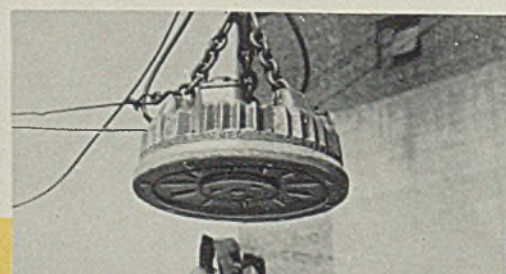


AND THE **EC&M Automatic-Discharge CONTROLLER**
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★ This controller operates with less wear . . . less expense for upkeep than any previous type. No destructive burning of arc shields. Contacts, of unusually high Brinnell hardness throughout their entire thickness, last longer because they operate cooler due to the LINE-ARC principle.

Many magnet users have replaced old controllers with the EC&M Automatic. They have found that lower upkeep and faster operation (quick release of the load) pay for this improved controller quickly. Write today for Bulletin AD giving data on this controller for any make or size of magnet.



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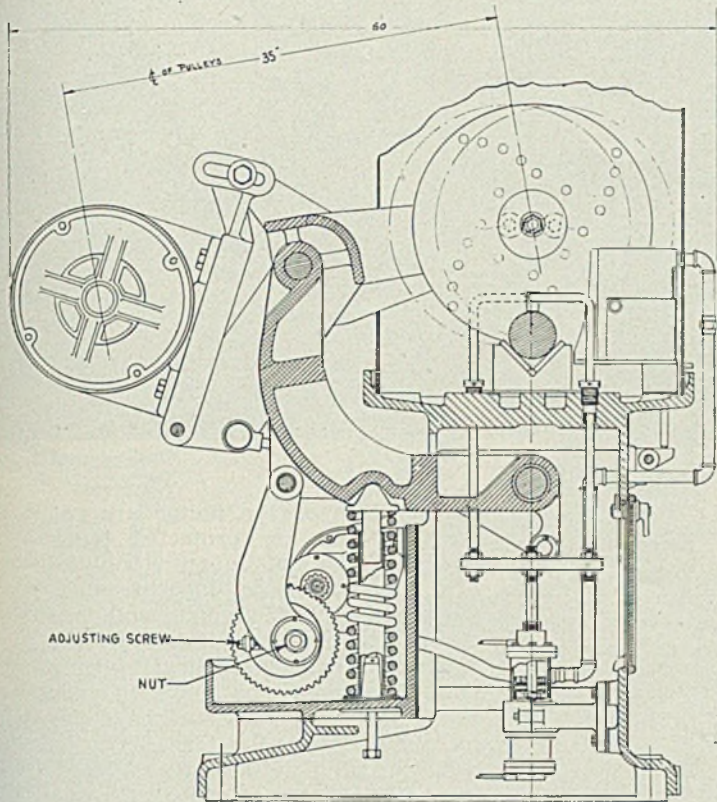


Fig. 2—(Left above)—Cross sectional view from side showing main working parts of the Campbell Cutamatic abrasive-disk cutting machine. Stock is shown in position. Outer and inner, also the mean position of the cutting disk is shown. At left can be seen the driving arrangements and the means employed to give the cutting head its oscillating movement

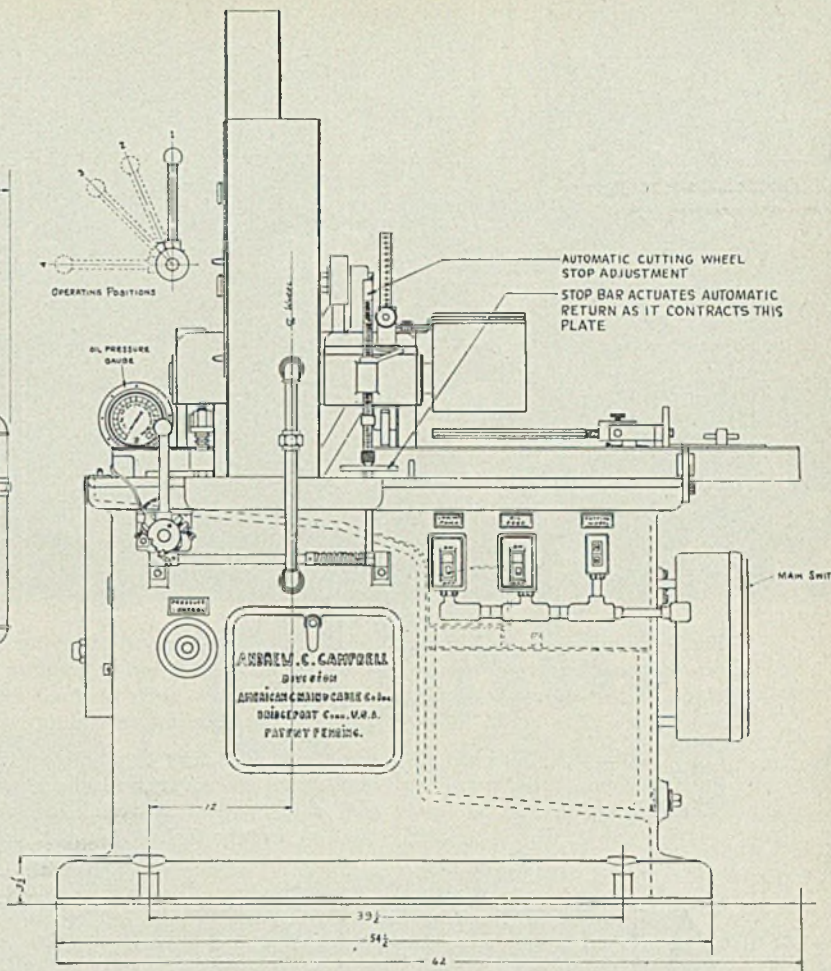


Fig. 3—(Right)—Cross sectional view from front of machine. Here control lever, wheel stop and work stop also are visible. To protect the operator the wheel is covered by guard

minimum. Once these conditions are established for any particular job, all that the operator has to do is to insert and remove the work, start and stop the machine, as conditions require.

The completeness of the protection afforded the operator from the effects of abrasive dust is evidenced by the use of standard squirrel-cage open-type motors, all grit being retained in the wheel guard and eventually carried off by the coolant stream.

The oil gage indicating the pressure required to counterbalance the motor and to control the cut is shown in the upper left of the front view diagram, Fig. 3. To establish this pressure at the proper level, the oil feed motor must be started and the handwheel marked "pressure control" adjusted until the gage reads 120 or other value according to requirements of the work at hand. The various positions of the control lever are also shown, position 4 being the operating position. Position 2 returns the wheel to the starting position after an automatic contact has moved

the lever to position 3. A work stop, capable of primary adjustment to the nearest full dimension and of fine adjustment to intermediate sizes, is also provided. Tension of the driving motor belts is controlled by the position of the swing-type motor bracket.

In operation, the chart provided is first consulted to determine the proper pressure to which the pressure dial must be set for the size and type of metal to be cut. Similarly the feed figure is found from the chart. The stock is now fed into the machine and the wheel lowered hydraulically until it clears the work by about an inch. The wheel height gage seen in the upper right of Fig. 1 is now set and the machine is ready to begin work.

The two rows of spirally disposed holes in the disk keep the wheel from loading, relieve the wheel from buckling strains and assist in carrying the coolant to the cut.

A single operator can handle two to four of these machines, it is reported.

Ampco Issues Revised Bronze Table

A "Table of Bronze Specifications to Government Requirements" which lists in parallel, bronze specifications that are largely used by government contractors is announced by Ampco Metal Inc., 1745 South Thirty-eighth street, Milwaukee. It lists all alloy grade numbers cast by the company to these various governmental specifications. In addition it gives the chemical composition of each alloy. The table is offered by the company free of charge, upon request.

Makes New Camouflage Paint Available

A new camouflage coating, development of which is based on United States Army specifications for camouflage or visual deception for industrial areas is announced by Truscon Laboratories, Detroit. It also is suitable for civilian projects where the intent is for users to avail themselves of the results of the studies by the Army corps of engineers in the selection of colors on buildings, and similar structures to make them less visible to the eye or camera.

The coating is being offered in nine colors—plus black and white. Colors are dead flat and do not show any reflections. Other colors available are loam, dark green, field drab, light green, olive drab, earth red, earth brown, earth yellow and sand.



Fig. 1—(Left, above)—General view of automatic metal spraying layout. Left rear, air compressor; right rear, air drier; center, 6-station automatic metallizing machine. Note gages and controls mounted above each of the 5 operating stations. The sixth, in front here, is the loading-unloading station

Fig. 2—(Right)—Closeup of automatic metallizing machine in operation. Spray guns automatically travel up and down to cover entire surface of part which spins during operation. Spray gun angles, rates of travel, etc. are precisely controlled to apply coating evenly to full depth of fins

AUTOMATIC METAL SPRAYING

... equipment applies a superior protective finish for aircraft cylinders on a high-production basis. Two-machine line turns out a finished part every 75 seconds

PROTECTION of exterior surfaces of aluminum alloy aircraft parts has been the subject of much investigation. The most common method used is painting, but even the best paints have a limited resistance to salt water spray. Moreover, since both a priming coat and a finishing coat must be applied and each of these must be baked for a considerable time, the process is slow, even when handled on automatic conveyors.

A speedier process is metallizing in which pure molten aluminum, itself highly resistant to corrosion, is sprayed on the parts. Many technical details had to be overcome in order to make the process fit into a modern production line, but now at one of the Wright Aeronautical Corp. plants production metallizing of radial engine cylinders is a reality. The "production line" here is composed of only two machines—an automatic sand-blasting machine

and an automatic metallizing machine.

To obtain proper adhesion of the sprayed metal, the surfaces of the cylinders must be thoroughly sand blasted. This is done on a specially designed Wheelabrator supplied by American Foundry Equipment Co., Mishawaka, Ind. This machine is self-contained and has eight long arms projecting radially from a central hub. Main housing is open at the loading station where heavy rubber curtains protect the operator from flying abrasive. The arms rotate within the housing. As each arrives at the loading station, a finished cylinder is removed and a new one slid into place. The finished cylinder is handled with cotton gloves to avoid contaminating the surface and producing spots to which aluminum spray would not adhere.

Since the lower portion of the cylinder barrel, or skirt, and the

bottom face of the flange are not blasted, they are protected by a heavy rubber cuff mounted on the arm. The machine indexes automatically every 65 seconds, and once the arms have passed through the curtain into the main housing they start to revolve on their own axes so as to present every surface of the parts equally to the blast.

Seven individual centrifugal blasting wheels are employed, each one rotating at 2250 revolutions per minute and being set at an angle to assure complete coverage of all surfaces of the part. Approximately 10 pounds of No. 20 Alundum abrasive are used to blast each cylinder. As the grains break down, they maintain their sharpness until they become too small to be effective. As the abrasive is used, it falls to the bottom of the housing, where it is picked up by a bucket elevator and passed through a cleaner. Then the "fines" or extremely small particles are removed before the abrasive is returned to the main supply hopper.

The amount of abrasive handled by each wheel is indicated by an ammeter connected to its driving motor, the power used being proportional to the load. The seven instruments are mounted on a panel easily visible to the operator to enable him to tell instantly if the supply to any wheel is interrupted.

An adjustable timer permits varying the cycle time, but it has been found a 65-second cycle assures adequate cleaning and allows the machine to keep slightly ahead of the metallizing equipment.

From the blasting machine, cylinders go directly to the completely automatic metallizing machine seen in Figs. 1 and 2. Manufactured by the U. S. Galvanizing & Plating Equipment Corp., Brooklyn, N. Y., in collaboration with Metallizing Engineering Co. Inc., Long Island City, N. Y., this equipment applies the coating evenly to the full depth of the fins by holding the guns at exact angles which are impossible

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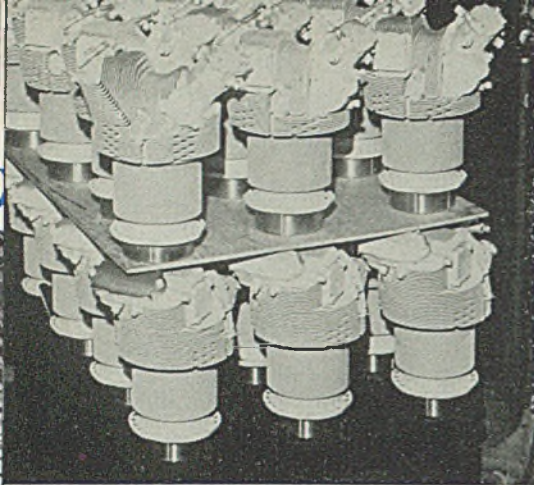


Fig. 3—Group of cylinders for Wright Cyclone 14-cylinder radial engines. These cylinders have been sprayed with aluminum to prevent corrosion. The problem here was to arrange spray guns to coat properly the deep openings between the fins

from a reel mounted a short distance away from the machine.

Compressed air is supplied by a 60-horsepower 6-cylinder water-cooled Schramm air compressor with a 260-cubic-foot delivery. It can be seen in the background at left in Fig. 1. Air is dried by passing through a 300-cubic-foot capacity water-cooled air drier seen in background at the right in Fig. 1. Manufactured city gas is employed as the heating medium for the metal spraying guns. It is compressed by a 3-horsepower 2-cylinder compressor. Oxygen is piped over from a bank of cylinders located in the boiler house annex. An exhaust fan connected by a duct to the top of the machine removes the fumes of the burned gases. As an added precaution, the operators are provided with respirators to prevent their breathing in the minute particles of metal.

Of course automatic metal spraying can be used to advantage for finishing many other metal products. The fact that it has been applied successfully to such a difficult part to finish as this radial aircraft engine cylinder shows that even extremely complicated shapes can be handled efficiently.

to maintain with hand operation. The machine comprises six stations, each controlled by reduction gears and fully adjustable to various motions and speeds. A finished part can be produced every 75 seconds.

Parts are loaded at the first station upon a fixture which supports and properly centers them. Then the machine indexes to the next station, where the part rotates at a predetermined speed while a single Metco spray gun, mounted on a mechanically operated post, passes up the cylinder at one angle and then passes down at another angle, the change in angles being made automatically as the post reaches the

top and bottom of its stroke. See Fig. 2.

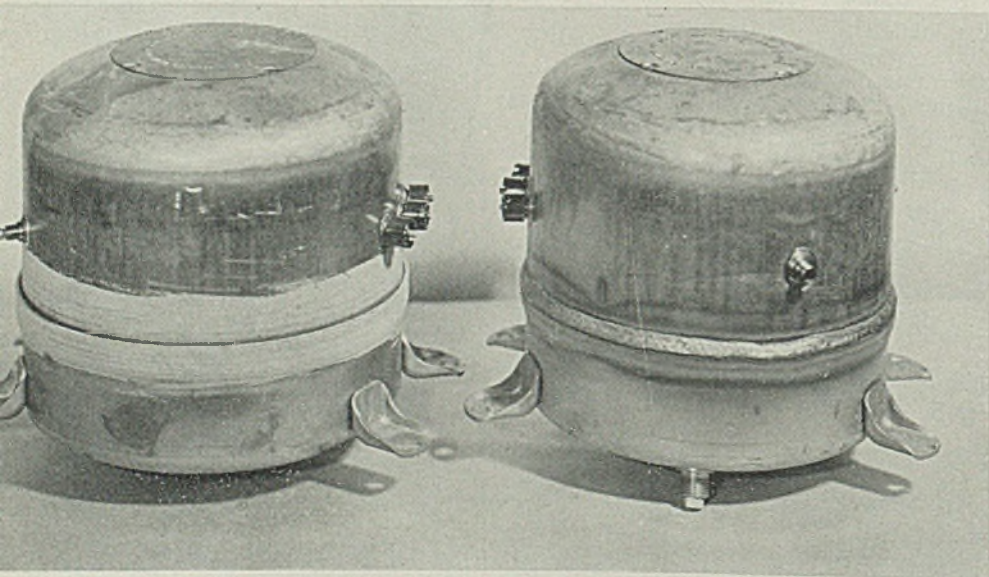
At the third station, the parts are brought in front of two Metco spray guns similarly mounted, but at fixed opposing angles. These also pass up and down, spraying the upper and lower fin surfaces. The following station (No. 4) has two more guns set at different angles. These pass up and down and spray the side surfaces of the head only, while at the fifth station a manual unit is used to spray the upper head surfaces. The sixth station is used for inspection and unloading, but a manual unit is used for touch-up work. Completed cylinders are seen in Fig. 3.

Each spray gun has an individual set of gages and controls mounted on a panel above each station within easy reach of the operator. These panels can be seen in Figs. 1 and 2. Wire is fed to each gun separately

AUTOMATICALLY WELDED SEAL

... withstands 1125 pounds per square inch pressure in regular production test

Fig. 1—Below, compressor housing at left has been prepared for automatic welding by application of flux, appearing as a white smear around the joint. Housing at right has been welded. Note smooth bead surface



WHERE GREAT strength and an air-tight seam is required, automatic carbon arc welding offers a logical solution, particularly in quantity production. Such an application was made recently by engineers of a nationally-known electric refrigerator manufacturer. This refrigerator utilizes a compressor housing which is tested to 1125 pounds per square inch and which must be absolutely air-tight and leak-proof.

This unit, before and after welding under the automatic electric arc, is shown in Fig. 1. At the left is a compressor housing which has been prepared for welding by application of a special flux, which may be seen as a white smear around the seam. The two pieces of the head fit one within the other so that the final weld, as shown at the right, is really a lap weld.

Decreases Costs

Other than application of the flux, no special preparation of the shells is required, according to company engineers. The new method decreases costs, results in less leakage and gives a better appearance. The shells, which enclose the motor and compressor of the refrigerating unit, are deep drawn from 1/8-inch material.

A view of the "Electronic Tornado" automatic carbon arc welding machine, supplied by Lincoln Electric Co., Cleveland, is shown in Fig.



A WAR MESSAGE

to

ALL EMPLOYERS

★ From the United States Treasury Department ★

WINNING THIS WAR is going to take the mightiest effort America has ever made—in men, in materials, and in money! Every dollar, every dime that is not urgently needed for the civilian necessities of food, clothing, and shelter, must, if we are to secure final Victory, be put into the war effort.

An important part of the billions required to produce the planes, tanks, ships, and guns our Army and Navy need must come from the sale of Defense Bonds. Only by regular, week by week, pay-day by pay-day investment of the American people can this be done.

This is the American way to win. This is the way to preserve our democratic way of life.

Facing these facts, your Government needs, urgently, your cooperation with your employees in *immediately* enrolling them in a

PAY-ROLL SAVINGS PLAN

The Pay-Roll Savings Plan is simple and efficient. It provides, simply, for regular purchases by your employees of United States Defense Bonds through systematic—yet voluntary—pay-roll allotments. All you do is hold the total funds collected from these pay-roll allotments in a separate account and deliver a Defense Bond to the employee each time his allotments accumulate to an amount sufficient to purchase a Bond.

The Pay-Roll Savings Plan has the approval of the American Federation of Labor, the Congress for Industrial Organization, and the Railroad Brotherhoods. It is now in effect in several thousand companies varying in number of employees from 3 to over 10,000.

In sending the coupon below, you are under no obligation, other than your own interest in the future of your country, to install the Plan after you have given it your

consideration. You will receive—1, a booklet describing how the Plan works; 2, samples of free literature furnished to companies installing the Plan; 3, a sample employee Pay-Roll Savings authorization card; and 4, the name of your State Defense Bond administrator who can supply experienced aid in setting up the Plan.

To get full facts, send the coupon below—today! Or write, Treasury Department, Section B, 709 Twelfth St., NW., Washington, D. C.

HOW THE PAY-ROLL SAVINGS PLAN HELPS YOUR COUNTRY

- 1 It provides immediate cash now to produce the finest, deadliest fighting equipment an Army and Navy ever needed to win.
- 2 It gives every American wage earner the opportunity for financial participation in National Defense.
- 3 By storing up wages, it will reduce the current demand for consumer goods while they are scarce, thus retarding inflation.
- 4 It reduces the percentage of Defense financing that must be placed with banks, thus putting our emergency financing on a sounder basis.
- 5 It builds a reserve buying power for the post-war purchase of civilian goods to keep our factories running after the war.
- 6 It helps your employees provide for their future.

MAIL THIS COUPON NOW

Treasury Department, Section B
709-12th St., NW.
Washington, D. C.

We want to do our part. Please
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the Pay-Roll Savings Plan.

NAME

POSITION

COMPANY NAME

ADDRESS

NUMBER OF EMPLOYEES



MAKE EVERY PAY-DAY... BOND DAY!
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This space is a contribution to NATIONAL DEFENSE by STEEL

GPO 16-25943-1 Form No. DSS-BP-2



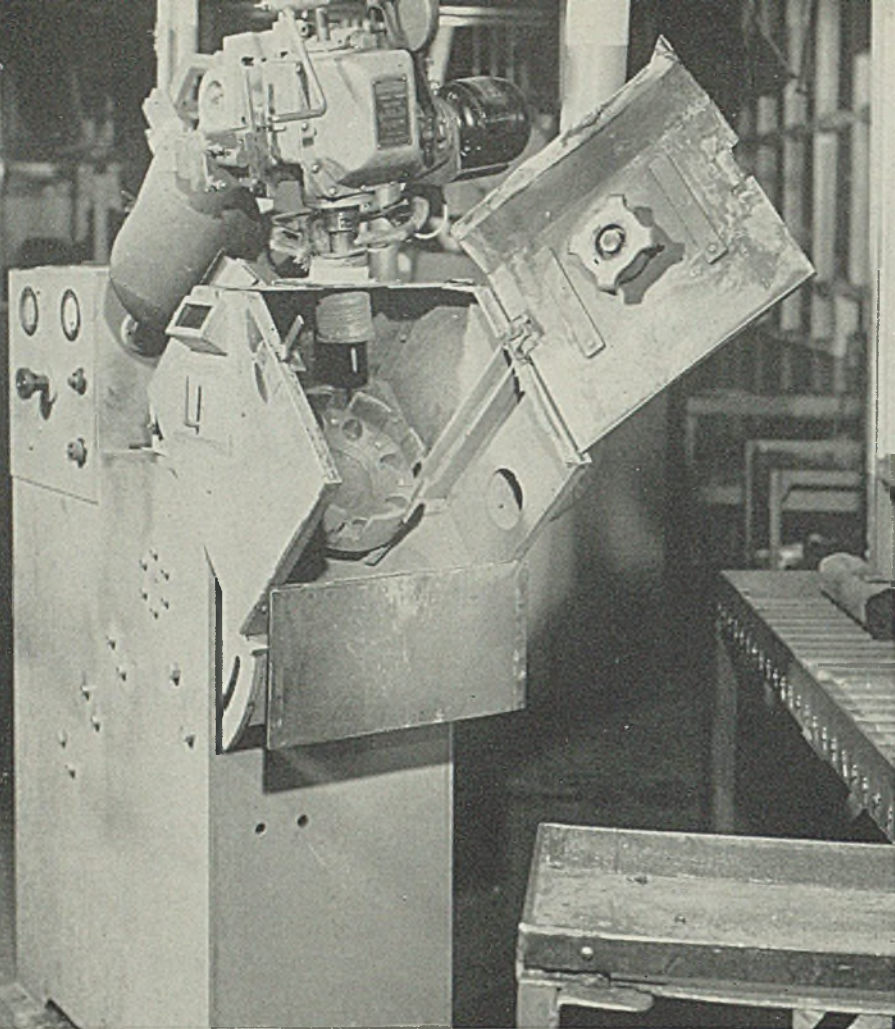


Fig. 2—Shown above is the automatic welder that makes the joint at a speed of 18 inches per minute. Work is entirely enclosed during welding. Note special fixture to hold work in position. Operator watches arc through peep hole seen at left of chamber

2. The special flanged cup seen below the welding head holds a compressor housing unit and revolves it at a timed speed while the carbon draws an arc at the seam. No filler wire is used in this application, and the only flux required is the Type 130 Lincoln automatic flux which is mixed with water and painted on the seam previous to insertion in the machine.

A peep-window for viewing the weld as it progresses may be seen to the left of the carbon, on the side of the box in which the work is done. Further to the left is the control panel.

Engineers at the plant say that this set-up produces a dense, smooth weld with no pronounced crater at the finish. The machine welds at a speed of 18 inches per minute in this operation. The cost is less than five cents per unit for welding, and that includes labor, material, current and overhead.

The welding is done at an angle of 30 degrees. The only finishing operation required after welding is wire brushing.

Two Days Machining—Generator on Job Again

Two days of machining on the job recently, and an old water-wheel generator was again found among the "ranks of the employed". Ordinarily, machining a rotor of this type generator would require removal of the shaft to a shop where it could be swung on a lathe. And this could not be done without practically dismantling the whole station.

How it was done? Under the supervision of R. J. Ruedy of General Electric's Boston office, a rig was made up to grind the shaft fit by rotating the grinder around the vertical stationary shaft. It consisted of an upper and lower guide, each with three adjustable brass blocks for centering and maintaining close running clearance.

The two guides were joined together rigidly by two pieces of stiff channel iron, so spaced that they rode on smooth portions of the shaft which were true in accordance with the original machining. A compound tool rest was secured on one of the channels to support a small motor-driven grinder with a 2-inch wheel operating at about 13,000 revolutions per minute.

Next a 20-inch wooden pulley was secured to the lower guide

and belted to a 1/3-horsepower, 148-revolution per minute gear-motor with small pulley. This drove the rig and grinder around the shaft at about 14 revolutions per minute. The parallel feed of the tool rest was connected to a 6-spoke starwheel below the wooden pulley and a stationary pin was located to turn the feed screw one spoke for each revolution of the rig thereby accomplishing an automatic feed of the grinder up and down the shaft. A collector ring from an old single-phase motor was mounted on top of the assembly to supply power to the grinder.

In two days the shaft was trued up to fit satisfactorily. A pin gage was made for the new diameter with allowance for the fit.

The thrust block with its bore built up by metal spraying was ground out to this pin gage. It was then warmed to about 75 degrees Cent. which allowed it to slide in place on the shaft easily.

Develops New Metal For Collapsible Tubes

A new collapsible tube metal, called Sheffalloy, is announced by New England Collapsible Tube Co., New London, Conn. Based upon tests, it is said to be a good alternative for metals normally used in the manufacture of collapsible tubes, containing all the characteristics of appearance, pliability and strength of the former metal.

Comprising a blend of available metals—melted, mixed, tempered and toughened according to a new formula, the new tubes are said to preserve and protect tooth paste, shaving creams, cosmetics, ointments and other products as efficiently as ever. The metal also may be utilized as containers for many other products, even those containing ingredients of strongly acid or alkaline characteristics, when inner tube coatings are used.

Gas Cylinders Must Be Kept in Circulation

Chlorine and ammonia cylinders must be kept in circulation or many users of these chemicals may have difficulty in obtaining supplies, according to R. J. Quinn, of Mathieson Alkali Works Inc., New York, producers of both materials.

In spite of heavier shipments producers can get no new cylinders and existing supply must serve all users. If all are kept circulating demands of essential industries probably will be met. Idle cylinders should be shipped back at once, Mr. Quinn points out.



Everyday you see
the way
WORTH QUALITY
WORKS FOR AMERICA

Perhaps you rode today on a train whose locomotive and cars were fabricated from WORTH plates. That loaded freight you passed . . . remember the tank cars? That's a use for WORTH heads and plates.

The bridge you crossed . . . the plodding tug and barge below . . . the pipe line that spanned the stream . . . that group of storage tanks and towers, all might be fashioned from Worth plates.

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All these and hundreds more are guises WORTH products take. Manufacturing, transportation, communications, shipping . . . call the roll of American enterprise: *WORTH serves all!*

SHEARED STEEL PLATES
FLANGED AND DISHED HEADS ◆



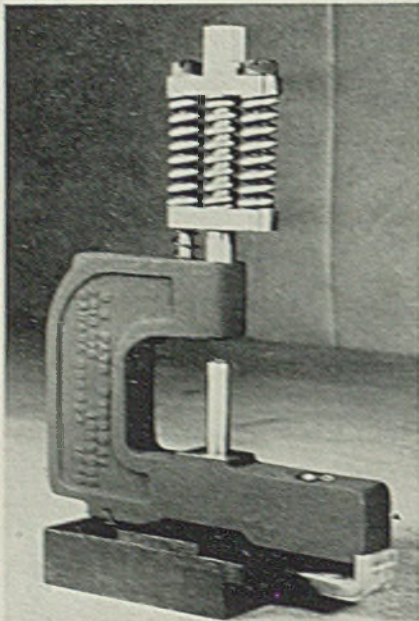
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San Francisco, Calif., W. S. Hanford • Houston, Texas, The Carbett-Wallace Corp. • Cleveland, Ohio, E. F. Bond • Detroit, Mich., H. L. Sevin
Los Angeles, Calif., Ducommun Metals & Supply Co. • Seattle, Wash., Barde Steel Co. • Portland, Oregon, Barde Steel Co. • Montreal and Toronto, Canada, Drummond, McCall & Co., Ltd.

Industrial Equipment

Punch and Die Holders

Strippit Corp., 1200 Niagara street, Buffalo, announces new compact Naropunch punch and die holders which punch 3/16-inch maximum holes on a minimum center to center distance of 3/8-inch with shut height of 6 1/4 inches. They also em-

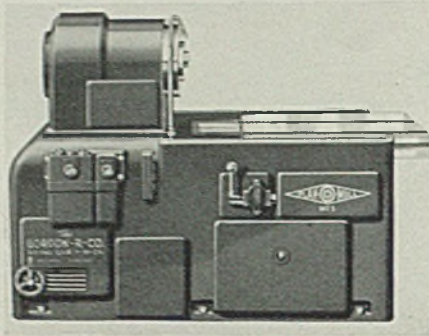


body a selective stripping feature which provides three instantly removable and interchangeable springs for a stripper selection of 1, 2, or 3-spring tension to custom fit the exact stripping action required by various gages and types of metals. See *STEEL*, p. 57, Feb. 2, 1942. The dies and punches are being offered in a wide range of standard and special sizes, capacities and models.

Milling Machine

Gordon R Co., Washington Square building, Royal Oak, Mich., has placed on the market a larger No. 5 hydraulic Plan-O-Mill which combines advantages of planetary milling with the flexibility of hydraulic operation. Through its hydraulic motors on the spindle and quills it permits the operator a choice of feeds and speeds by merely adjusting dials—meeting tolerances to

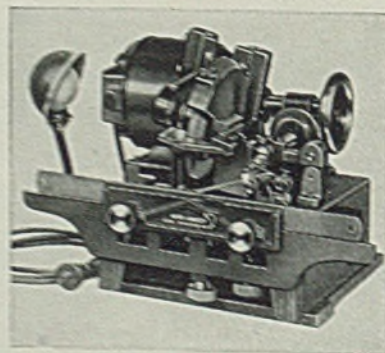
0.001-inch with a minimum of attention. The unit is especially adapted to thread-milling and form-milling operations. All motion of the machine is in the cutting head. The part itself is rigidly held by



its fixture. Large, irregularly shaped parts are accommodated as easily as small ones. Parts ranging from 3/4-inch diameter to 20 inches diameter, inside and outside, are handled. Spindle of machine is driven by a 3-horsepower motor at speeds of 40 to 370 revolutions per minute. Clockwise or counter-clockwise rotation of the cutting head is controlled by a switch of the valve control. A selector switch permits the machine to be operated manually when automatic cycle of operation is not desired. Feed cycle ranges from 1 1/4 to 8 minutes per cycle.

Sharpening Machine

Howe & Son Inc., Hinsdale, N. H., announces a new automatic, high-speed sharpening machine for sharpening and reconditioning various types of saw blades. It will handle hack saw blades to any length, width or pitch, band saw and meat saw blades to any size, circular saw blades up to 20 inches diameter, metal or wood rip, and metal slitting saw blades and milling cutters up to 5/22-inch thick. The machine features a constant speed

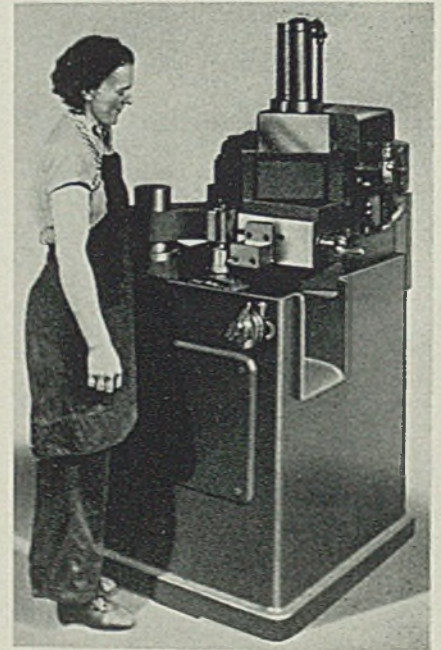


of 88 teeth per minute and operates on a single-phase 1/2-horsepower 110-volt motor. The grinding wheel is 6 inches in diameter, 5/16-inch wide and has a 1/2-inch hole and bevel edge. Standard equipment includes

the band saw holding attachment, one wheel truing device and electric light mounted on arm.

Chucking Machine

Machine Tool Division, Nylen Products Co., St. Joseph, Mich., has introduced a new 6-inch vertical automatic chucking machine designed to turn and face, or bore and face, or contour and dome in one simultaneous operation. It is electrically operated, and its controlled hydraulic feed has single level control. A heavy, rigid construction makes it possible for the machine to handle heavy cuts. The operator loads and moves the lever up after which the complete cycle of work, including starting and stopping, is automatic. Because all obstructions are out of the way, loading is quick and easy. Work

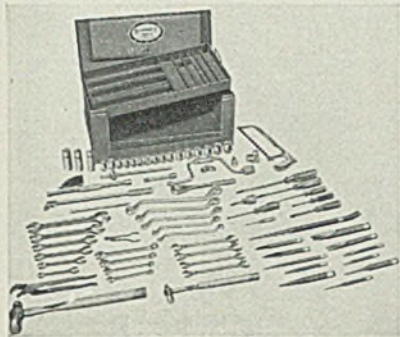


is performed with minimum down time. One operator can handle two or more machines; unskilled labor can produce precision work on the machine after little practice.

Socket and Tool Set

Bonney Forge & Tool Works, Allentown, Pa., announces a new 74-piece socket and tool set for mechanics known as set No. BB1. It includes an assortment of 14 sockets with double hexagon openings from 7/16 to 1 inch; 3 extra-deep sockets with double hexagon openings from 13/16 to 1 inch; 2 sockets with 1/2 and 9/16-inch double square openings; 15/16-inch drag link socket; 14-inch brace; 11-inch sliding T; 5 and 10-inch extensions; cross handle; universal joint; hinge handle and reversible ratchet. In addition it includes 4 Tu-Type wrenches (combination box and open end) with openings from 7/16 to 5/8-inch; 6 Zenel engineers'

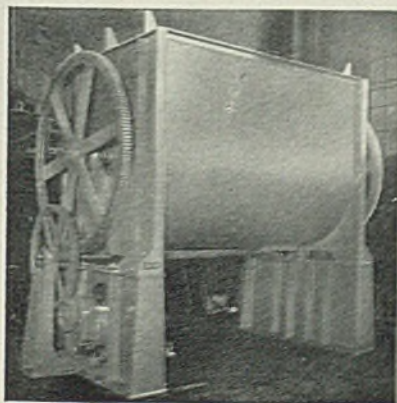
wrenches with openings from 3/8 to 1 inch; 4 Zenel tappet wrenches with openings from 1/2 to 11/16-inch; 5 Bonaloy box wrenches with openings from 3/8 to 1 inch; 4 assorted chisels; 7 assorted punches; 1 pry bar; 8 assorted screw drivers;



3½-ounce and 1 pound ball peen hammers; 1 adjustable plier; 1 ignition plier; 1 adjustable hack saw frame and blade and one standard feeler gage. The entire assortment is furnished in a strong metal box measuring 22¼ x 10¼ x 9 inches.

Double-Ribbon Mixer

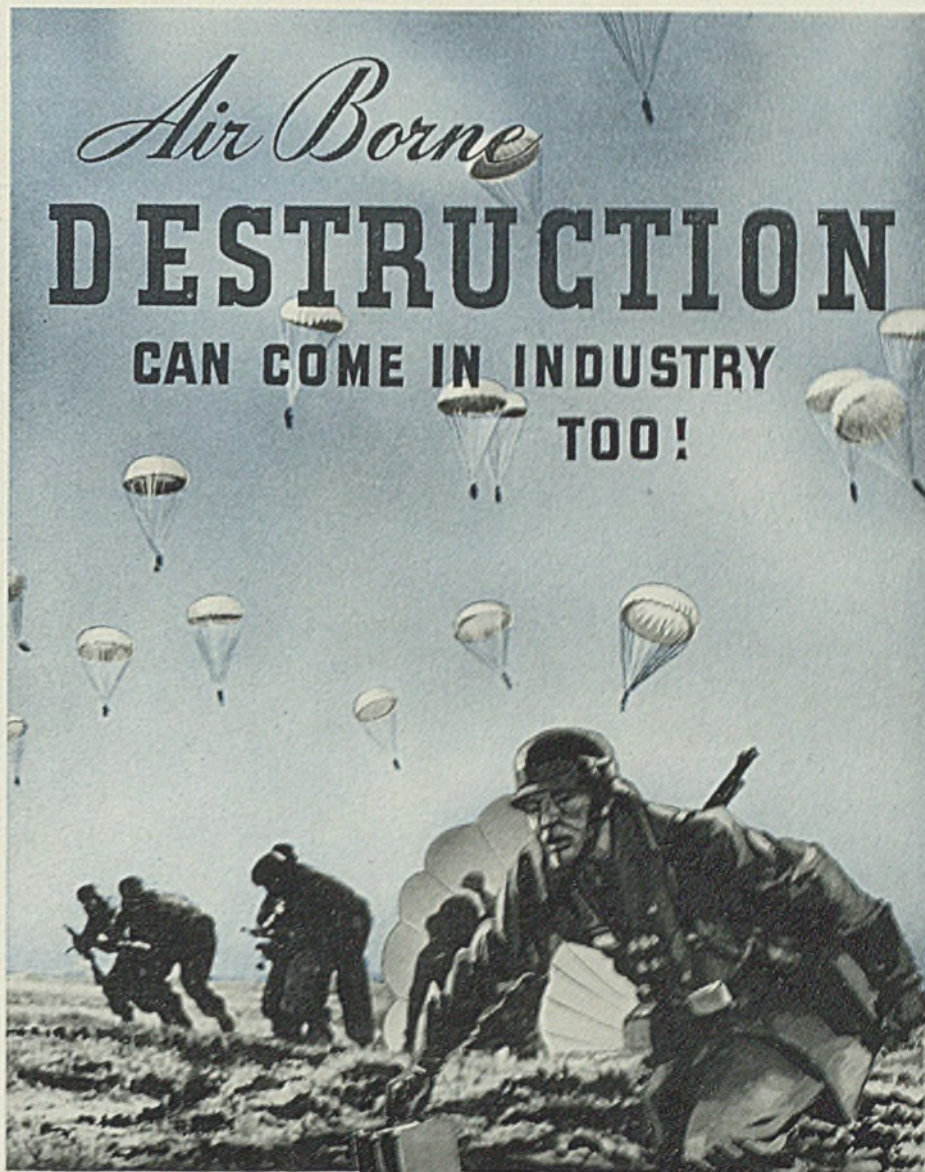
H. K. Porter Co., 4975 Harrison street, Pittsburgh, announces a new large double-ribbon type mixer designed for use in mixing automobile body insulating material. It features a total operating capacity of 2000 gallons. Its mixing bowl is 6 feet wide by 9 feet 2 inches long by 6½ feet high. The tank, fabricated of plain steel, is driven from both ends by machine cut gears riding on



antifriction bearings. Motor drive is mounted on the same base as the machine itself. Mixing is accomplished by means of spiral ribbons arranged to create a positive folding action on the material inside the cylinder. End seals prevent contamination.

Fluorescent Lamp

Hygrade Sylvania Corp., Salem, Mass., announces a new fluorescent lamp for low temperature operation. Known as type LT, it starts and operates at temperatures as low as 0 degrees Fahr. when used in conjunc-



DUST—like enemy Paratroops—is an air-borne menace which, unless controlled, destroys materials, finished products, and man hours of work.

Industry and the war emergency can no longer afford the delay and loss which dust imposes on the nation's productive capacity. So today—more than ever—clean air is recognized as an *industrial necessity*. Practically every new defense plant has been supplied with AAF air filtration and dust control equipment, and hundreds of additional installations have also been made in existing plants whose facilities are required for war material production.

The American Air Filter Company is operating 16 to 24 hours a day in order to meet industry's air filtration and dust control needs, supplying better than 92% of its output to war materials manufacturers. Adequate dust protection will help you maintain your stiff production schedules.

The American Air Filter Company is the world's largest manufacturer of air filtration and dust control equipment, maintaining 53 offices strategically located to serve American industry. Write for booklet "AAF in Industry", which tells the story of industrial dust problems and their solution.

AMERICAN AIR FILTER COMPANY, INC.



443 Central Avenue, Louisville, Kentucky

IN CANADA, DARLING BROTHERS, LIMITED, MONTREAL, P. Q.

tion with Mirastat No. 4. The lamp is being offered in only one wattage and color—40 watt T-12 medium bipin base 3500 degrees white fluorescent unit—having an estimated life of 1400 hours.

Belt Vulcanizer

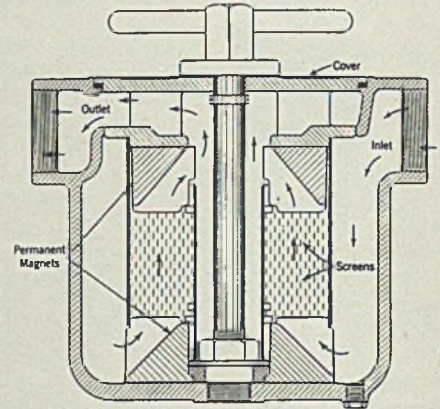
B. F. Goodrich Co., Akron, O., announces an improved square end No. 28 belt vulcanizer which is said to allow greater service. It is now made with a square instead of a diagonal end, making it possible to cure wider belts. Widths of 34 inches can be cured with the vulcanizer

placed at right angles across the belt. By placing the vulcanizer at an angle of approximately 22 degrees, a 28-inch belt can be cured, at an angle of 30 degrees, a 24-inch belt, and at a 45-degree angle a 16-inch belt. The platen now measures 11 x 36½ inches, with an overall length of 41 inches. The unit weighs 380 pounds complete with sheet iron platen covers, curing pad and two 25-foot lengths of extension cord.

Magnetic Separator

S. G. Frantz Co. Inc., 221-5 Centre street, New York, has developed

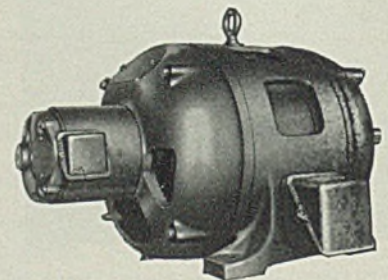
a permanent magnet FerroFilter featuring greater capacity than previous models. Designated as the PQ-6, it has a capacity of 200 gallons per minute. Its pipe size connection is 3 inches. The unit has



no moving parts and stands 15½ inches from the floor. It is especially useful in removing harmful fine iron and steel particles from circulating coolant systems of machines used in tapping, grinding, deep hole drilling, reaming and rifling, also from circulating lubricating oil systems of pumps, diesel and blooming engines, rod mills and roll grinders.

Generators

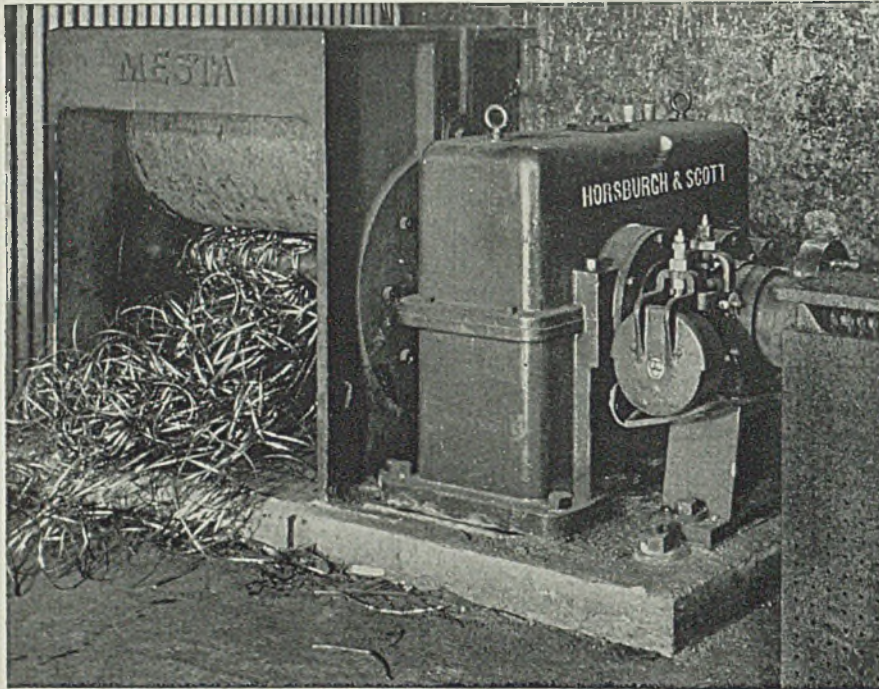
Century Electric Co., 1806 Pine street, St. Louis, offers new, modernized revolving field, alternating-current generators for continuous duty in isolated plants or to supplement other available power supply. The generators are available in sizes from 7½ to 75 kilovolt-ampere; 4, 6, or 8 pole; 1800, 1200 or 900 revolutions per minute; 60 cycle; for belt or coupling drive or flange mounting.



They are wound for various standard voltages, single phase 2 and 3-wire, 3-phase 3 and 4-wire or 2-phase 4-wire. The neutral may be brought out for 3-phase 4-wire systems for light and power. The generators meet AIEE and NEMA voltage regulation standards.

Cleaning Stone

Ideal Commutator Dresser Co., 5076 Park avenue, Sycamore, Ill., announces a new cleaning stone for removing excess film and dirt from commutators. It cleans while the



IT'S BEING BALLED UP

» » » but this time it's for a good purpose. Here a Horsburgh & Scott Double Reduction Herringbone Speed Reducer is driving a metal scrap baller and doing a fine job. Smooth, powerful, quiet transmission of power with design for large starting and momentary overloads are all inherent qualities of Horsburgh & Scott Reducers. There's a Horsburgh & Scott Reducer for every purpose in industry . . . learn about the complete line of Herringbone, Helical and Worm Gear Speed Reducers.

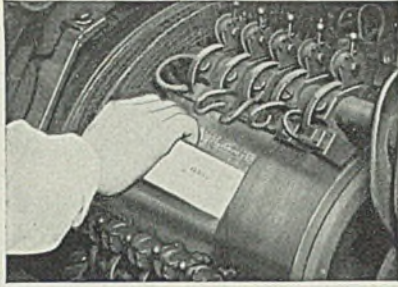
Send note on Company Letterhead for Speed Reducer Catalog 39

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 HAMILTON AVENUE • CLEVELAND, OHIO, U. S. A.

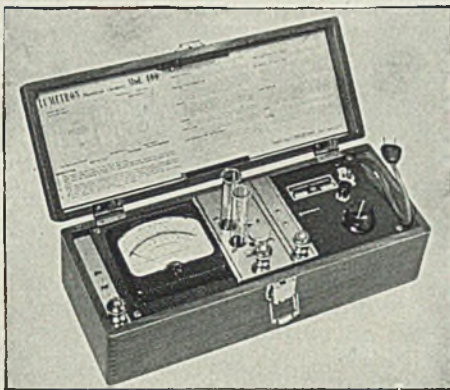
motor or generator is running by holding it against the commutator and moving it slowly across the face. It also cleans film from the brush seats and helps to re-seat



brushes. So-called "excess color", "skin" or "film" resulting from oxidation around paper mills, chemical plants, printing departments and diesel locomotive generators can be removed by the stone.

Portable Colorimeter

Photovolt Corp., 95 Madison avenue, New York, has introduced a new model 400 photoelectric colorimeter for portable service in either the laboratory or plant. It is



built into a wooden housing with cover and carrying strap. It works from any alternating or direct current 110-volt outlet and is claimed to be exceedingly simple in operation. The readings are definite and independent of the judgment of the operator.

Mass Spectrometer

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., is offering a new mass spectrometer for gas analysis. It is essentially a high-vacuum tube containing electrodes, filament, slit system and an electron collector. The gas or vapor to be studied is subjected to bombardment by a narrowly defined beam of electrons in the order of 10^{-9} amperes. The pressure of gas in the ionization chamber where the bombardment takes place, is about 10^{-4} mm of mercury or lower. The ions thus formed are accelerated through two narrow parallel slits in two parallel plates at a potential difference of

from 100 to 1000 volts. The ions emerge from the second slit as a narrowly defined beam of very nearly the same energy. This beam is then deflected by a uniform magnetic field designed to sort the ions according to their mass-to-charge ratio. Thus the spectrometer gives directly information about the relative abundance of different kinds of molecular ion fragments formed when molecules of a particular kind are struck by electrons of known energy. For quantitative indication of the gas to be measured, the ions strike a metal cup connected to ground through a very high resis-

tance. The voltage developed across this resistor is fed to the grid of an electrometer tube. This amplifies the current so it can be read with a sensitive galvanometer. Entire assembly is enclosed by steel panels. The unit is mounted on a rubber-tired truck for complete portability.

Tensioning Tool

Signode Steel Strapping Co., 2600 North Western avenue, Chicago, announces a new fork type stretcher for steel strapping which makes it possible to bind noncompressible packages tightly and to strap

24 YEARS EXPERIENCE IN VOLUME PRODUCTION OF AUTOMOTIVE PARTS

available on
Subcontract or Co-Contract basis

Can you use these facilities?

- A modern 5 acre plant, only 4 years old, completely equipped for immediate volume production of any or all of the items listed below.
- A force of engineers, production men and craftsmen which, at peak volume, totals 800
- all men trained for years in meeting the exacting demands and volume requirements of the automobile industry.

For 24 years the American Metal Products Com-

pany has been a volume producer of parts and equipment for the automobile, truck and allied industries. Due to curtailed automobile production, the complete facilities of American Metal Products Company—plant, equipment and manpower—are available for immediate volume production, on a subcontract or co-contract basis, on any or all of the items listed here.

For full details as to how we can fit into your production requirements, write, wire or phone

★ WELDED STEEL TUBES AND TUBING in diameters from $\frac{3}{4}$ " to 5" and in gauges up to $\frac{1}{4}$ ".

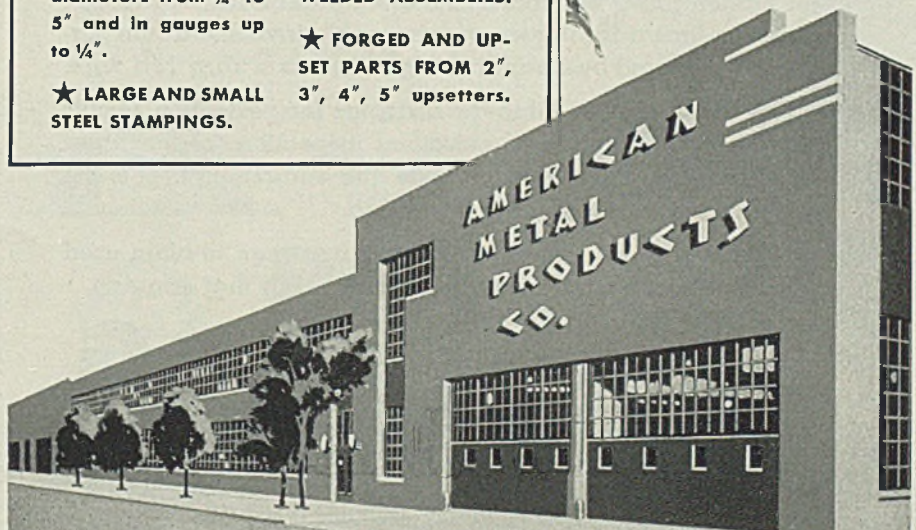
★ LARGE AND SMALL STEEL STAMPINGS.

★ FABRICATED STEEL TUBULAR PARTS AND WELDED ASSEMBLIES.

★ FORGED AND UPSET PARTS FROM 2", 3", 4", 5" upsetters.

AMERICAN METAL PRODUCTS COMPANY

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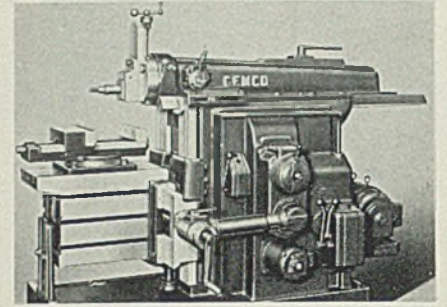
properly those with extremely small surface dimensions. The new tensioning tool has no "foot" or base thus assuring tight strapping without any slack after removal of the stretcher. Two models are available varying in size and weight of strap they accommodate.

Crank Shapers

General Engineering & Mfg. Co., 1523 South Tenth street, St. Louis, announces a new line of Gemco multipurpose, heavy duty crank shapers which are offered in three models, plain, production and universal, in sizes ranging from 16

to 24-inch stroke. Gears, shafts, crank block and crankpin are of hardened alloy steel. Long, deep V-type ram, internally ribbed and braced for rigidity, has generously-proportioned highly-finished sliding surfaces and Timken roller bearings to insure smooth action and accuracy. Rocker arm, actuated through duplex gears, is of high tensile semisteel, strongly ribbed and braced. Main shaft carries an oversize twin disk clutch and friction brake for instant starting and stopping of ram. Through a back gear arrangement controlled through two levers, eight ram speeds are available. A chart

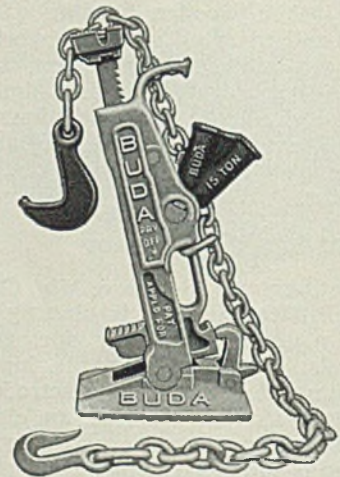
plate indicates lever settings. Built-in force-feed lubrication system, embodying self-cleaning automatic oil filter, serves all bearings and internal sliding parts. A feature of this system is the automatic Lubri-



guard which prevents starting of the ram under the following conditions: 1. When supply of oil in reservoir is insufficient; 2. when pressure in oil system has fallen below a predetermined minimum; 3. when there is a leak or other failure in the oil pressure system. Table is universal type having T-slots on both sides and top. It is carried on a deep cross rail, with adjustable gibs both at top and bottom, mounted on square vertical guides integral with the wide box column of the machine. The table has independent power rapid traverse and powerful vise with graduated base. All control levers, handles, buttons, dials and charts are positioned for ease of observation and operation.

All-Purpose Jack

Buda Co., Harvey, Ill., is offering an improved heavy-duty model 2215-S all purpose automatic lowering ratchet type jack which has a capacity of 15 tons, with a 13 1/4-inch



rise and a height closed of 22 1/2 inches. It is specially designed for outside work such as is found in oil fields, construction jobs, utilities, etc. As shown by the illustration, it has a hinged base which permits it to be tilted for various kinds of work, such as pole pulling and lift-



THE THIN RED LINE OF FAILURE BY THE MAGNAFLUX METHOD

PERFECTION,—no less,—is demanded of the parts made for a fighting airplane engine. Hidden flaws there dare not be. Material and workmanship *must* be perfect.

The Ahlberg inspector you see in this picture is searching for hidden flaws by means of the Magnaflux test,—a test so sensitive that a faint microscopic crack, invisible at the surface, is revealed by means of magnetism as a *thin red line*.

The reputation of Ahlberg bearings for perfection results from the combination of merciless inspection, of the finest materials and the use of methods and equipment that is the last word in precision manufacturing.

That is why you will find Ahlberg bearings so often used where perfect performance is the only thing that counts.



CJB
AHLBERG

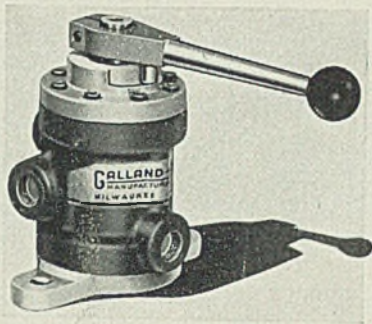


AHLBERG
BEARING COMPANY
Manufacturers of CJB Master Ball Bearings
3015 WEST 47th STREET • CHICAGO, ILL. ★

ing or moving machinery, heavy equipment, etc. The jack is furnished as standard with double lever socket chain type cap and with 5-foot chain with one lift and one grab hook.

Hydraulic Valve

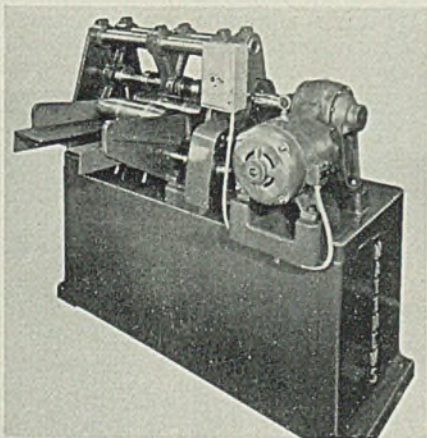
Galland-Henning Mfg. Co., 2753 South Thirty-first street, Milwaukee, is introducing a new type Nopak high-pressure hydraulic valve which is said to overcome tiring valve-lever manipulation and the "pressure-locking" trouble experienced by users of hydraulic power at pressures of 1000 pounds or more. Its lever is as easy to operate from either "on" position as from "neutral." Also the balanced hydraulic



pressure inside the valve eliminates pressure lock. The valve has only one moving part, and is being offered in four sizes to fit the most common sizes of hydraulic pressure lines, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$ and 1-inch. Spindle of the unit, the only moving part, is a one piece forging, heat treated and hardened.

Shell Marking Machine

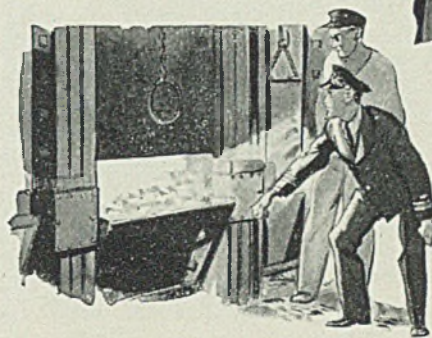
Jas. H. Matthews & Co., 3942 Forbes street, Pittsburgh, is offering a No. 79 heavy duty marking machine for marking 105 and 155 millimeter and 5 and 6-inch shell. Featuring high speed operation, it records the required data by means



of interchangeable steel type, set up in a roller die in the machine. The machine can be changed quickly for various lot numbers, date of manufacture, size and other neces-

To the Pacemaker in Wire A NAVY "E"!

7000 VOICES SPOKE in the person of William A. Anderson, president of Roebling, who received the flag of the Bureau of Ordnance and Navy "E" Pennant on behalf of more than 7000 Roebling employees January 22, 1942. The reward was made for excellence in production for the war effort.

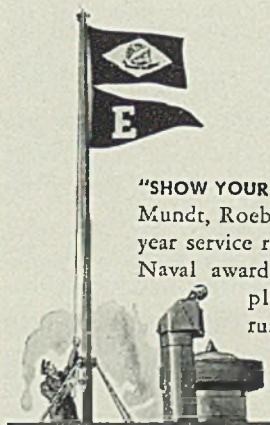


AN ENEMY BOMB fragment is swallowed by the Roebling open hearth furnaces, from the hand of a Naval officer . . . to be made into steel for the Navy, and returned with interest to those who menace American liberty.

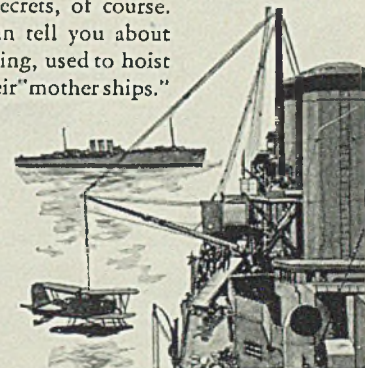
FOR PULLING TOGETHER, doing the job the American way, every Roebling employee received an "E" button. In the group at right six employees with a combined service record of 256 years receive the "E" from a Naval officer.



WIRE GOES TO SEA in hundreds of forms, many of them Naval secrets, of course. But among those we can tell you about is this stout wire rope sling, used to hoist seaplanes back aboard their "mother ships."



"SHOW YOUR COLORS!" Proudly, John C. Mundt, Roebling employee with a 50-year service record, breaks out the two Naval award flags over the Roebling plants. Beneath him, the rumble of machinery continues unbroken, producing for American defense at breakneck speed.



ROEBLING

The Pacemaker in Wire Products

JOHN A. ROEBLING'S SONS COMPANY
TRENTON, NEW JERSEY • Branches and Warehouses in Principal Cities

sary lettering. Depth of marking is controlled by simple adjustments. Shell roll down the gravity feed way, and are selected automatically and ejected at high speed. The machine weighs approximately 2000 pounds and handles shell quickly.

Skid Platform

Yale & Towne Mfg. Co., 4530 Tacony street, Philadelphia, announces a new Timber-Lock skid platform which uses no steel in the frame yet is said to give all the strength inherent in steel welding. It is made of tough oak and so constructed as to

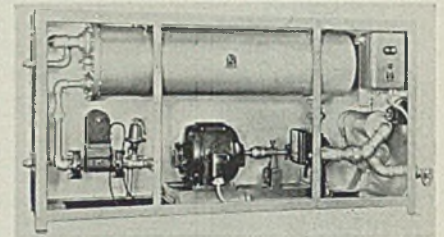
practically defy breakage, it is said. This strength is claimed to be due to a new interlocking "wood-weld" process to tie supporting leg runners and deck boards into one inseparable unit. Instead of just placing the platform deck on the supporting leg runners and nailing, deep cut grooves run along the entire length of the platform deck boards. Into each of these grooves, the supporting hard oak leg beam is tightly fitted thus interlocking platform and beams in a vise-like grip. To further insure this rigidity, beam and deck are bound together with specially cement-coated, spiralled heli-



cal nails, binding platform and beams at double rowed 1-inch alternate intervals along the entire platform length. Legs are of formed steel bars, joined to the leg beam by heavy forged steel bolts.

Oil Cooler

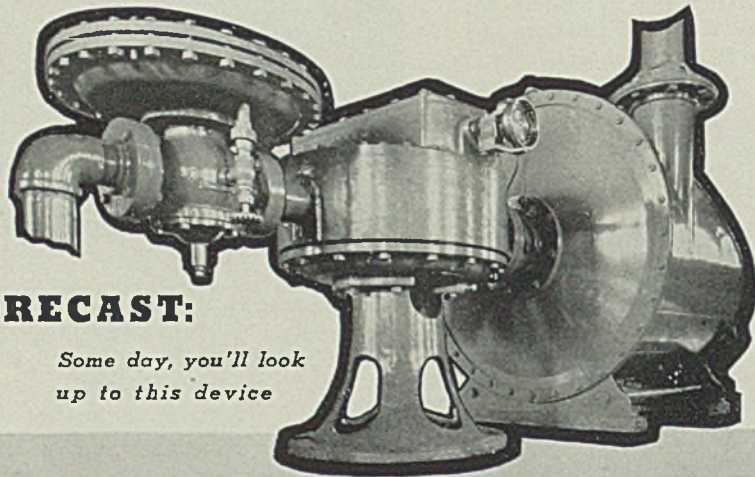
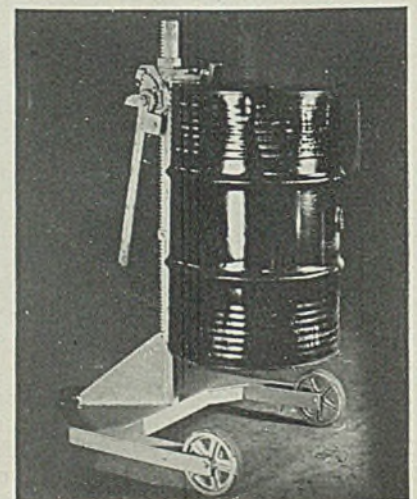
Bell & Gossett Co., Morton Grove, Ill., has introduced a line of rapid oil coolers for heat treating processes. These are used to maintain a constant temperature in the



oil quench bath. Illustration shows the self-contained oil cooler, a unit which combines all necessary equipment, except the quench tank, in a compact package. The company also is offering a complete engineering service in connection with the design and installation of these systems.

Lift Type Drum Carrier

Ernst Magic Carrier Sales Co., 1456 Jefferson avenue, Buffalo, is now offering a new 14-inch lift model carrier for placing and removing 55-gallon drums on and off skids, scales and platforms. It features a lifting device which lifts containers vertically into locked position on the carrier without any aid on the part of the operator. Raising of the container is controlled by lowering a handle which normally is at a horizontal position.



FORECAST:

Some day, you'll look up to this device

BASIC in modern mill practice

This is the patented, exclusive Kemp Industrial Carburetor, the machine that provides *complete* premixing of gas and air to provide new savings, new heat liberation, new flexibility and new control in almost every type of ferrous and non ferrous heat processing.

As the basic unit in Kemp heat treating the Industrial Carburetor supports gas immersion melting in modern tin stacks, provides fuel for inert gas and for recirculating radiators in annealing covers, for Kemp Radiatube Roll Heaters, may be set for exactly the desired flame characteristics whether reducing, oxidizing or for complete combustion . . . and save 15 to 40 percent in fuel. For engineering details and assistance, address **The C. M. Kemp Manufacturing Company, 405 East Oliver Street, Baltimore, Maryland**

KEMP of BALTIMORE

Instructor Training

(Concluded from Page 63)

your taking over the job too soon, or too often. Don't take it over *at all* if you can point out the helps he needs.

Get him to look for key points as he progresses—Taper off this extra coaching until he is able to work under normal supervision.

Use **This Plan**. You will find it amazing that such greatly improved results can come from such a simple plan. Use it, or whatever part of it applies, every time to put over a new operation, check a man's work, or change a work procedure. Truly, if the worker hasn't learned, the instructor hasn't taught!

Publishes Company History for Employees

From cook stoves to massive reclamation project castings, from cast iron to an epoch-making high tensile bronze, from domestic water heating boilers to gigantic modern gas holders—that is part of the story portrayed in the 225-page book, *Iron Men and Their Dogs*, recently published by Bartlett Hayward Division, Koppers Co., Baltimore, for its employees.

Prepared under the direction of Walter F. Perkins, vice president of Koppers Co., and general manager of the Bartlett Hayward Division, the book was written by Ferdinand Latrobe. Stated to be factually correct, it retraces the progress of the organization since it began back in 1837 as a stove maker to its present status, describing its role in the development of the nation and the three times it participated in the defense of our country.

The book really is a "slice" of American tradition narrowed down to the accomplishments of men in one company—bringing home to employees through the interwoven history of a growing country and company that "faith in our country, our state and ourselves is alone the bulwark of our nation today."

Drop Forgings

(Concluded from Page 66)

steel at high temperatures. It is only stress above the elastic limit which results in deformation. However, elastic limit and tensile strength are uncertain values at high temperatures since the rate of application of strain brings about changes which are more or less absent at room temperatures.

For example, a steel analyzing 0.18 per cent carbon and 0.70 per cent manganese when tested at 680

degrees Cent. (1250 degrees Fahr.) for a time of loading of 5 seconds showed a maximum stress of 14.3 tons and elongation of 18.6 per cent. For a time of loading of 35 seconds, it showed maximum stress of 6.2 tons and elongation of 31.0 per cent.

Therefore the rate of application of stress is important, and in general it is found that materials behave as though they were harder under the hammer than under the press due to the time element involved in the flow of metal. Speaking broadly, it is possible to work

to lower temperatures with slow loading. This last has not so much importance in forging steel but it is vitally important in nonferrous forging where embrittlement due to strain hardening is likely to occur. Magnesium alloys must be worked slowly under a hydraulic press. On the other hand many of the aluminum alloys have a finer grain structure if worked at high speeds. Obviously the nature of the material worked greatly influences method to be employed and the results that will be obtained.

(Concluded Next Week)



A Chemist's Notebook told the Story

RUNNING down the cause of weld failures is sometimes as difficult as looking for a black cat in a cellar. At one plant, pronounced weld porosity was encountered on starting automatic welding of a stainless clad container 70' long x 12' in diameter.

After experimenting with various techniques and different types of electrodes, no two successive X-rays were found acceptable. At this point the Murex engineer suggested analyzing the mild steel portion of the stainless clad plate. When this proved to be Silicon-killed steel containing appreciable quantities of Manganese and Silicon, switching to a highly fluid, "hot" electrode provided the answer. Following the change, only 5 or 6 pinpoint defects occurred in each 100 linear feet of welding.

The accumulated experience of our engineering staff with welding procedure, weld design and shop practice is available to help speed war production in your plant.



METAL & THERMIT CORPORATION
120 BROADWAY, NEW YORK, N.Y.

Specialists in welding for nearly 40 years. Manufacturers of Murex Electrodes for arc welding and of Thermit for repair and fabrication of heavy parts.

ALBANY • CHICAGO • PITTSBURGH

SO. SAN FRANCISCO • TORONTO

MUREX
ARC WELDING ELECTRODES

Weldability

(Concluded from Page 75)

of travel has this effect. Increasing the amount of coating on the electrode has this effect. Increasing the number of beads or passes above one has this effect. And now, as might be expected, preheating has the same effect.

In Fig. 5, also taken from the data of French and Armstrong, is seen a lower maximum weld hardness as the amount of preheat is increased. There is a pronounced lowering of the maximum weld hardness with a carbon content of 0.50 per cent by

a preheat of 250 degrees Fahr., while the preheat level of 600 degrees Fahr. is still more effective.

Of course the chemistry of the base metal is a prime consideration in any investigation of weldability. Most important is the carbon content. Next in importance are the alloying elements. Weld hardening, as may be seen also in Fig. 5, increases as the amount of carbon becomes greater.

Carbon is added to steel to increase its strength. This is accomplished frequently at the expense of ductility. Surely this is the situation in the case of welded steel.

For the carbon in the steel lowers the critical cooling rate until there are few or no conditions of welding that will leave a soft, ductile heat-affected zone in the parent metal when it has a high carbon content.

Fortunately there are other ways to increase the strength of steel. One way is through the addition of alloying elements. These may be added in such a manner as to increase both the strength, and the ductility while, in addition, enhancing the creep strength at elevated temperatures through the addition of molybdenum as an example or improving the resistance to impact, or impact strength, at low temperatures by the addition of nickel, as an example.

The alloys, too, lower the critical cooling rate of the steel. But carbon is still the hardening element that must be watched.

The whole purpose of this article is to suggest that absolute values be not used. To say that the hardness of the heat-affected zone should never exceed 200 brinell for instance, is to close our eyes to a host of weldable steels. Or at best this practice may impose a more expensive and unnecessary welding technique on the fabricator. Rather it is suggested that hardness values be used only as indices to the other physical properties of the joint such as strength and ductility.

Once the correlation between the hardness and other physical properties is established, hardness surveys may be used to establish the welding conditions that will yield that value. If the weldment is of such a nature that an elongation of 15 per cent in 2 inches will suffice, it is false economy to demand a joint with a minimum elongation of 30 per cent in 2 inches. *In these times of war with a stringent restriction upon the use of certain alloying materials, the specification of unneeded ductilities may be even more shortsighted than usual. Or if alloys are needed and the elongation or reduction of area values must be kept high, the use of molybdenum which is currently plentiful may be indicated.*

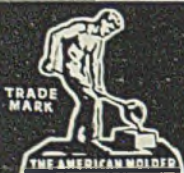
In summation, weld hardness surveys may be employed as a measure of weldability if this use is intelligent. Studies should be confined to the type of material about which the information is desired and should not be considered as valid for both carbon and alloy steels interchangeably. The broad general rules that underlie weld hardening (by weld hardening is always meant the hardening of the heat-affected zone in the parent plate as most weld metal contains too little carbon to harden appreciably) can be followed to prescribe techniques that will lead to proper values.



TO recondition printing rollers the old rubber must be stripped off and the metal core roughened thoroughly by blasting so that new rubber will adhere properly after vulcanizing. Heretofore the blasting job was costly, it consumed a great amount of time, and it tied-up production.

To eliminate this condition the Samuel Bingham's Sons Mfg. Co., Chicago, large producers of ink rollers, installed an American WHEELABRATOR Special Cabinet in 1939. Small rollers that formerly required 20 minutes to process with air blast equipment are now being cleaned in 20 seconds. Large rollers that required as long as 6 hours to finish are now being handled in 5 minutes. Operation of the machine is continuous—loading being handled at one end of the cabinet and unloading at the other.

While you may not be confronted with a problem exactly like this, it is quite possible that you do have one of an equally difficult nature. If so, be sure to get a WHEELABRATOR demonstration and see for yourself how this modern, speed-cleaning process will give you faster production at lower cost.



AMERICAN

FOUNDRY EQUIPMENT CO.

509 S. BYRKIT ST.

MISHAWAKA, IND.

Helpful Literature

1. Surface Plates

Machine Products Corp.—4-page illustrated bulletin contains prices, sizes, weights, type of finish for surface plates, angle plates, slotted angles, universal angles, box parallels, measuring angles, tool makers knees and cast iron hand knobs, hand wheels, offset hand wheels, and alloy cast handles.

2. Hydraulic Hose

Chicago Metal Hose Corp.—2-page and 4-page illustrated bulletins give complete data and specifications on "Cellulined" hydraulic hose for high pressure applications and "Avioflex" flexible metal hose for oil connections. Cellulose lining is claimed to provide ample protection against deterioration.

3. Die Casting Machines

Phoenix Machine Co.—8-page illustrated bulletin, "For Dense, Homogeneous Die Castings", gives details of "Lester-Phoenix" die casting machines for aluminum, brass, magnesium, tin and zinc alloy die castings. Machines are described and operating features explained.

4. Springs

Lee Spring Co.—4-page publication "Lee-Spring Builder" gives engineering data on design of springs. Various spring formulas are listed, with explanations of how they are derived and used.

5. Potentiometer

Bristol Co.—16-page illustrated bulletin No. 507 presents complete description and application information on "Pyromaster" round chart, direct marking, recording pyrometer. This instrument is offered as pyrometer, tachometer, resistance thermometer or millivoltmeter.

6. Aluminum Bronze

Ampco Metal, Inc.—1-page data sheet No. 98 deals with subject of "Ampco Grade 18 and Its Modifications." Table compares physical properties of this grade with other compositions of aluminum bronze.

7. Air Raid Shelters

Armco Drainage Products Association—8-page illustrated bulletin, "Air Raid Shelters," pictures and describes corrugated pipe shelter made to accommodate up to 50 persons. It is made of 90-inch "Multi Plate" pipe in lengths of 2½ feet. Gas-tight end walls and gas lock or chamber can be provided.

8. Oil Coolers

Bell & Gossett Co.—8-page illustrated bulletin No. OC-741 is descriptive of "Rapid" oil coolers for cooling quenching oil at controlled rates. This equipment is said to assure uniform quenching bath temperature. Details of oil quenching methods are given.

9. Hoists

Euclid Crane & Hoist Co.—12-page illustrated bulletin No. 838 lists features of line of standard electric hoists for use with overhead rail systems. Complete specifications are given for hoists, covering construction, controllers, brakes and wiring.

10. Furnace Inspection Door

Gillette Kiln Sales Co.—4-page leaflet describes inspection door which is applicable to various types of industrial furnaces such as heat treating ovens, boilers and kilns. Method of installation is explained with sketches.

11. Welding and Punching

Progressive Welder Co.—Cardboard folder contains collection of 24 pictorial bulletins which depict diversified applications of resistance welding and punching equipment. Adaptions of standard machines and special machines are shown, and their uses explained briefly.

12. Air & Hydraulic Cylinders

Galland-Henning Manufacturing Co.—12-page illustrated bulletin No. 82 describes "Nopak" self-regulating cushioned cylinders which are designed for air or hydraulic service. Dimensions, covering diameter, length of stroke, and other details, are tabulated.

13. Metal Working Equipment

Yoder Co.—8-page illustrated bulletin briefly explains features of line of metal working equipment for steel mills, automotive factories, aircraft industry, structural shops, and sheet metal workers. Numerous machines are pictured and described.

14. Straightening Machine

Taylor-Wilson Manufacturing Co.—4-page illustrated bulletin deals with six sizes of straightening, sizing and burnishing machine for high production work. Explained are details of construction, operation, and specifications. Close-up illustrations show construction features.

15. Rustless Fastenings

H. M. Harper Co.—80-page 1942 catalog and price list sets forth sizes, types, compositions and recommendations for non-ferrous and stainless steel bolts, nuts, screws, washers, and other miscellaneous fastenings. Several pages are devoted to tables of weights, comparative chemical and mechanical properties of various metals, and other helpful data.

16. Rolling Doors

Kinnear Manufacturing Co.—40-page bulletin No. 31 gives general description of line of rolling doors, listing design and construction features, and showing numerous installations in diversified industries. Types covered include steel rolling service doors; labeled automatic fire doors; fire shutters for windows; rolling grilles; and sliding barrier and wood rolling doors.

17. Motor & Generator Care

Ideal Commutator Dresser Co.—6-page illustrated folder describes commutator and ring resurfacers, commutator and ring grinders, commutator mica undercutters, commutator saws and cutters, commutator cleaning stone, carbon brush seater, carbon brush concaver and miscellaneous tools.

18. Tractors

Atlas Car & Manufacturing Co.—4-page illustrated bulletin No. 1262 lists features and specifications for three-wheel tractors which have maximum drawbar pull of 2100 pounds and turning radius of 63½ inches. Photographs show tractors in use.

19. Electric Welding

General Electric Co.—4-page illustrated bulletin No. GES-2704 is entitled, "Reducing Welding Costs with A-C Welding." Examples of savings effected through use of alternating current welding in various types of products are given.

20. Wood Working Machines

DeWalt Products Corp.—17-page illustrated bulletin No. 941 describes features and advantages of "DeWalt" woodworking machine with which it is possible to do cross-cutting, angle cross-cutting, bevel cross-cutting, ripping, bevel ripping, dadoing, angle dadoing, plowing, rabbeting, shaping, routing, boring, grooving, tenoning and bevel rabbeting.

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21. Heat Treating Ovens

Paul Maehler Co.—4-page illustrated bulletin describes varied types of heat treating ovens. Series of installation photographs, accompanied with explanatory paragraphs, show ovens used for treating springs, brass and aluminum shapes, shell casings, and miscellaneous automobile parts.

22. Overnight Concrete

Atlas Lumnite Cement Co.—16-page illustrated booklet SM-1-42 describes use of "Lumnite" cement in making concrete which has full working in less than 24 hours of placing. It also tells how to get fast results on concrete work in cold weather, using minimum of protection.

23. Centrifugal Water Pumps

Chain Belt Co.—22-page illustrated catalog No. 400 describes line of centrifugal water pumps in capacities ranging from 3,000 to 125,000 gallons per hour. Included are detailed information and specifications concerning design and manufacturing of pumps, as well as selection data on how to pick pump for specific job.

24. Gages

Ashcroft Gage division, Manning, Maxwell & Moore, Inc.—60-page illustrated catalog No. 1000 deals with complete line of recording gages and gage testing equipment. There are sizes from 2 1/4 up to 24-inch dial size for pressures from few ounces of water pressure up to 25,000 pounds per square inch. Construction features are explained in detail, with unassembled views of various parts.

25. Burring Compound

Lea Manufacturing Co.—4-page booklet is entitled "Burring with the Lea Method." It gives general description of compounds which are used separately or in combinations on various types of wheels. Using correct combination of compound, wheel composition and speed, undesirable sharp edges and jagged surfaces can be removed without destroying surrounding areas.

26. Fastenings

Shakeproof, Inc.—140-page catalog No. 42 lists engineering data, general description, recommended uses, types of threads, finishes, and other information on line of fastening devices. Covered are lock washers, thread-cutting screws, "Sems" fastening units, spring washers, locking and plain terminals, locking gears, and small precision stampings.

27. Beryllium Copper

American Brass Co.—12-page engineering data section No. B-21 gives complete data on beryllium copper heat treatable alloy. Physical constants, applications, available forms, physical properties, fabricating procedures and mechanical properties are given.

28. Lubricant

Fiske Brothers Refining Co.—4-page illustrated publication "The Lubriplate Film," explains advantages of grade No. 130-A for use in war production equipment. Results of tests are cited to prove that lubricant retards wear, rust and corrosion.

29. Nitriding

Nitralloy Corp.—40-page illustrated data book covers "Nitralloy" and nitriding process. Included are tables, charts and data on composition of nitriding steels, preliminary treatment, physical properties and machining of these steels. Bibliography and list of applications are included.

30. Acid Resistant Alloy

International Nickel Co.—16-page illustrated bulletin T-3 is entitled "Monel in Sulfuric Acid." It treats such subjects as corrosion process, factors affecting corrosion, plant processes and corrosion tests, pickling of iron and steel, and acid treatment of petroleum products and coal distillates.

31. Colloidal Graphite

Acheson Colloids Corp.—4-page illustrated bulletin No. 182.6 is one of series pertaining to application of colloidal graphite to industry. Entitled "Use of Colloidal Graphite Lubricants in Ball Bearings," bulletin gives results of test conducted at National Physical Laboratory of England.

32. Overhead Rail Systems

Cleveland Tramrail division, Cleveland Crane & Engineering Co.—12-page illustrated bulletin No. 20004-A treats subject of how to determine where overhead material handling equipment can be used profitably. Features of overhead rail systems are explained in text and with illustrations of representative installations.

33. Processing Equipment

Amsler-Morton Co.—20-page illustrated bulletin is entitled "25th Anniversary—Scenes From 25 Year Story of Engineering Progress." It shows numerous installations of company's equipment in metal working industries, coal handling plants, and glass plants. Each photograph is briefly explained.

34. Multiple Grinding

Fitchburg Grinding Machine Corp.—Illustrated bulletin deals with "Fitchburgh Multiple Precision Grinding." It tells how complete independent grinding wheelhead units can be applied in special multiple automatic grinding machines for high production grinding operations.

35. Acid Proof Masonry

Keagler Brick Co.—8-page illustrated catalog describes use of "Toronto" acid proof brick for such work as pickling and galvanizing tanks, gutters, floors, sewers and similar work. Two pages deal with new "Monolithic" brick wall construction. Sketches show standard brick shapes.

36. Roller Bearings

Bower Roller Bearing Co.—4-page illustrated bulletin, "Secrets of Bower Roller Bearing Design and Quality," gives pictorial explanation of principal design features of tapered roller bearings. Action of bearing under various types of loads are shown.

37. Bearings

Timken Roller Bearing Co.—12-page supplement lists data on basic dimensions, ratings and prices on 687 bearings widely used in military work. Requests for bulletin must be made on company letter-head.

38. Flow Meters

Merlam Co.—8-page illustrated catalog C-10 describes U-type manometers, draft gages, well type manometers, non-spill mercury pressure gages, and flow meter accessories and parts. Instruments are pictured and described with details of construction, operation and prices.

39. Air Cylinders

Hannifin Manufacturing Co.—4-page bulletin No. 58 describes line of Model NB double-action rotating air cylinders for chuck operation. They feature adjustable "Leakproof" piston packing and special piston shape for reduced air consumption and rapid operation.

40. Insulation Materials

Johns-Manville—52-page illustrated booklet GI-6A contains information and recommendations on high and low temperature insulations for industrial needs from minus 400 to 2500 degrees Fahr. Data are given on refractory products and castables, roofs, friction materials, electrical insulation and conduit, water line pipe, vent pipe and stacks, and packings and gaskets.

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Closer Steel Control As War Effort Grows

*Strip mills to furnish more ship plates.
Most orders now in top priorities. Scrap
shortage continues to retard steel output*

CLOSER control of steel production and consumption is being imposed by Washington as war production is intensified. Warehouses are not allowed to accept supplies from any source in excess of their quota, pig iron users are warned not to take shipment of more than they can consume in any month and tighter lines are being drawn on use of tin plate.

Shipment of steel for civilian use has practically disappeared and fabricators whose normal lines of production have been suspended are canceling contracts with mills. At the same time they are being allocated tonnage for use in their converted production for war purposes, in some instances larger supply than they had used for their regular lines.

Trend of orders to the higher priority range continues and mill shipments are more closely confined to top ratings in practically all products. In most cases shipment under B ratings is practically stopped. The latter applies to pig iron as well.

Tin plate production is at about 92 per cent of capacity but curtailment is imminent under new regulations. A number of details remain to be ironed out in this product. Completion of electrolytic tinning lines by several steelmakers is relied on to take up the slack caused by discontinuance of production by regular tin mills.

Demand for structural shapes is increasing, for war needs. This includes expansion of shipbuilding facilities and a number of additional explosive manufacturing plants in various parts of the country.

Plate consumption is at a record rate. Some ship delay has been caused by slow plate shipments to manufacturers of propulsion equipment and other fittings. This condition is being corrected by allocations. Emphasis is being placed on plate production by strip mills and plans are under way to increase capacity, looking to an addition of 100,000 tons annually to the 400,000 tons now in operation. WPB has worked out a plan for production of 80 to 90 per cent of steel plates for cargo vessels from this source, relieving universal and sheared plate mills for production of heavier gages.

Little change is noted in the scrap situation and some steelmaking equipment remains idle. Tonnage from automobile wrecking yards has begun to move but the total is disappointing compared with expecta-

tions. Search for scrap by various public agencies has been intensified and is producing results. Organized collection of farm scrap is broadening. Since automobile production has been stopped a large source of scrap has disappeared and products now being made by automotive manufacturers do not yield sufficient to make up the loss.

Sheet deliveries are confined almost entirely to top priorities and most March schedules allow for deliveries only at A-1-j or higher, considerably more restricted than in February. Conversion of strip mills to plate production has cut sheet output sharply.

In practically all products mill schedules are continually upset by specific allocations for special purposes, necessitating rearrangement and causing delay for other consumers. Most producers carried over unfilled allocated tonnage from February.

Coke pig iron production in February attained the second highest daily average rate on record, 160,856 net tons, compared with the highest rate, 161,774 tons in December, 1941, and was 6.81 per cent greater than in January. Total February output was 4,503,962 net tons, 454,823 tons less than the January total, because of the shorter month. This was 6.58 per cent above the total production in February, 1941, and 36.30 per cent above February, 1940.

Steel ingot production last week rose $\frac{1}{2}$ -point to 96 $\frac{1}{2}$ per cent. Chicago advanced 1 $\frac{1}{2}$ points to 103 $\frac{1}{2}$ per cent, Cincinnati 7 $\frac{1}{2}$ points to 94 $\frac{1}{2}$ and Cleveland 2 $\frac{1}{2}$ points to 91 $\frac{1}{2}$. St. Louis receded 10 $\frac{1}{2}$ points to 78 per cent and Wheeling 1 point to 85 $\frac{1}{2}$. Unchanged rates were as follows: Pittsburgh 95 $\frac{1}{2}$, Youngstown, 91, eastern Pennsylvania 90, New England 95, Buffalo 79 $\frac{1}{2}$, Birmingham 95 and Detroit 84.

Preparations are being made for an early start in movement of Lake Superior iron ore and the aim is to bring down at least 5,000,000 tons more than was delivered in 1941. War Production Board has asked for 85,000,000 to 90,000,000 tons and weather conditions indicate a large early-season tonnage may make this possible.

Composite prices remain at the level of several months, OPA ceilings making no change. Finished steel composite is \$56.73, semifinished steel \$36.00, steel-making pig iron \$23.05 and steelmaking scrap \$19.17.

MARKET IN TABLOID ★

Demand

War needs heavier.

Prices

At ceiling levels.

Production

Up $\frac{1}{2}$ -point to 96 $\frac{1}{2}$ per cent.

COMPOSITE MARKET AVERAGES

	March 7	Feb. 28	Feb. 21	One Month Ago Feb., 1942	Three Months Ago Dec., 1941	One Year Ago Mar., 1941	Five Years Ago Mar., 1937
Finished Steel	\$56.73	\$56.73	\$56.73	\$56.73	\$56.73	\$56.73	\$60.14
Semifinished Steel ...	36.00	36.00	36.00	36.00	36.00	36.00	39.24
Steelmaking Pig Iron.	23.05	23.05	23.05	23.05	23.05	23.05	22.10
Steelmaking Scrap ..	19.17	19.17	19.17	19.17	19.17	20.15	21.25

Finished Steel Composite:—Average of industry-wide prices on sheets, strip, 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.

COMPARISON OF PRICES

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

Finished Material	Mar. 7, 1942	Feb. 1942	Dec. 1941	Mar. 1941	Pig Iron	Mar. 7, 1942	Feb. 1942	Dec. 1941	Mar. 1941
Steel bars, Pittsburgh	2.15c	2.15c	2.15c	2.15c	Bessemer, del. Pittsburgh.....	\$25.34	\$25.34	\$25.24	\$25.34
Steel bars, Chicago	2.15	2.15	2.15	2.15	Basic, Valley	23.50	23.50	23.50	23.50
Steel bars, Philadelphia	2.47	2.47	2.47	2.47	Basic, eastern, del. Philadelphia.	25.34	25.34	25.34	25.34
Shapes, Pittsburgh	2.10	2.10	2.10	2.10	No. 2 fdry., del. Pgh., N.&S. Sides	24.69	24.69	24.69	24.69
Shapes, Philadelphia	2.215	2.215	2.215	2.215	No. 2 foundry, Chicago.....	24.00	24.00	24.00	24.00
Shapes, Chicago	2.10	2.10	2.10	2.10	Southern No. 2, Birmingham....	20.38	20.38	20.38	20.38
Plates, Pittsburgh	2.10	2.10	2.10	2.10	Southern No. 2, del. Cincinnati..	24.06	24.06	24.06	24.06
Plates, Philadelphia	2.15	2.15	2.15	2.225	No. 2X, del. Phila. (differ. av.)..	26.215	26.215	26.215	26.215
Plates, Chicago	2.10	2.10	2.10	2.10	Malleable, Valley	24.00	24.00	24.00	24.00
Sheets, hot-rolled, Pittsburgh...	2.10	2.10	2.10	2.10	Malleable, Chicago	24.00	24.00	24.00	24.00
Sheets, cold-rolled, Pittsburgh...	3.05	3.05	3.05	3.05	Lake Sup., charcoal, del. Chicago	31.34	31.34	31.34	30.34
Sheets, No. 24 galv., Pittsburgh...	3.50	3.50	3.50	3.50	Gray forge, del. Pittsburgh.....	24.19	24.19	24.19	24.18
Sheets, hot-rolled, Gary	2.10	2.10	2.10	2.10	Ferromanganese, del. Pittsburgh.	125.33	125.33	125.33	125.33
Sheets, cold-rolled, Gary	3.05	3.05	3.05	3.05					
Sheets, No. 24 galv., Gary	3.50	3.50	3.50	3.50	Scrap				
Bright bess., basic wire, Pitts...	2.60	2.60	2.60	2.60	Heavy melting steel, Pitts.....	\$20.00	\$20.00	\$20.00	\$20.75
Tin plate, per base box, Pitts...	\$5.00	\$5.00	\$5.00	\$5.00	Heavy melt. steel, No. 2, E. Pa...	18.75	18.75	18.00	18.65
Wire nails, Pittsburgh	2.55	2.55	2.55	2.55	Heavy melting steel, Chicago...	18.75	18.75	18.75	19.45
					Rails for rolling, Chicago.....	22.25	22.25	22.25	24.00
					No. 1 cast, Chicago.....	20.00	20.00	21.20	20.25
					Coke				
					Connellsville, furnace, ovens...	\$6.25	\$6.25	\$6.25	\$5.50
					Connellsville, foundry, ovens...	7.25	7.25	7.25	6.00
					Chicago, by-product fdry., del...	12.25	12.25	12.25	11.75

Semifinished Material

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

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

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

Sheets, Strip

Hot-Rolled Sheets	
Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base	2.10c
Granite City base	2.20c
Detroit, del.	2.20c
Pacific ports	2.65c

Cold-Rolled Sheets	
Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, B'ham., base ..	3.05c
Granite City, base.....	3.15c
Detroit, del.	3.15c
Other Mich. pts., del....	2.25c
Pacific ports	3.70c

Galvanized Sheets, No. 24	
Pittsburgh, Gary, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base	3.50c
Granite City, base.....	3.60c
Pacific ports	4.05c

Corrugated Galv. Sheets	
Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, 29 gage, per square	3.31c
Granite City	3.35c
Pacific Ports	3.73c

Culvert Sheets	
Pittsburgh, Gary, Birmingham, 16-gage, not corrugated, copper steel 3.60c, copper iron 3.90c, pure iron 3.95c.	
Pittsburgh, 24-gage, zinc-coated, hot-dipped, heat-treated 4.25c.	
Granite City, copper steel 3.70c, copper iron 4.00c, pure iron 4.05c.	
Pacific ports, copper steel 4.25c.	

copper iron 4.55c, pure iron 4.60c.	
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Enameling Sheets	
Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, 10 gage, base	2.75c
Granite City, base	2.85c
Pacific ports	3.40c
Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, 20 gage, base	3.35c
Granite City, base	3.45c
Pacific ports	4.00c

Electrical Sheets, No. 24		
Pittsburgh	Pacific	Granite
Base	Ports	City
Field gr. ... 3.20c	3.95c	3.30c
Armat. 3.55c	4.30c	3.65c
Elect. 4.05c	4.80c	4.15c

TYPE	Base Cents per lb.—f.o.b.		
	BARS	PLATES	SHEETS
302	24.00c	27.00c	34.00c
303	26.00	29.00	36.00
304	25.00	29.00	36.00
304-20% clad		18.00	19.00
308	29.00	34.00	41.00
309	36.00	40.00	47.00
310	49.00	52.00	53.00
311	49.00	52.00	53.00
312	36.00	40.00	49.00
316	40.00	44.00	48.00
317	50.00	54.00	58.00
347	33.00	38.00	45.00
403	21.50	24.50	29.50
410	18.50	21.50	26.50
416	19.00	22.00	27.00
420	24.00	28.50	33.50
430	19.00	22.50	29.00
430F	19.50	22.50	29.50
431	19.00	22.00	29.00
442	22.50	25.50	32.50
446	27.50	30.50	36.50
501	8.00	12.00	15.75
502	9.00	13.00	16.75

*Includes annealing and pickling.

Motor ... 4.95c	5.70c	5.05c
Dynamo . 5.65c	6.40c	5.75c
Transformer		
72.....	6.15c	6.90c
65.....	7.15c	7.90c
58.....	7.65c	8.40c
52.....	8.45c	9.20c

Hot-Rolled Strip		
Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Middletown, base, 1 ton and over, 12 inches wide and less	2.10c	
Detroit, del.	2.20c	
Other Mich. pts. del....	2.25c	
Pacific ports	2.75c	

Cold-Rolled Strip		
Pittsburgh, Cleveland, Youngstown, 0.25 carbon and less	2.80c	
Chicago, base	2.90c	
Worcester, base	3.00c	

TYPE	Base Cents per lb.—f.o.b.		
	BARS	PLATES	SHEETS
302	24.00c	27.00c	34.00c
303	26.00	29.00	36.00
304	25.00	29.00	36.00
304-20% clad		18.00	19.00
308	29.00	34.00	41.00
309	36.00	40.00	47.00
310	49.00	52.00	53.00
311	49.00	52.00	53.00
312	36.00	40.00	49.00
316	40.00	44.00	48.00
317	50.00	54.00	58.00
347	33.00	38.00	45.00
403	21.50	24.50	29.50
410	18.50	21.50	26.50
416	19.00	22.00	27.00
420	24.00	28.50	33.50
430	19.00	22.50	29.00
430F	19.50	22.50	29.50
431	19.00	22.00	29.00
442	22.50	25.50	32.50
446	27.50	30.50	36.50
501	8.00	12.00	15.75
502	9.00	13.00	16.75

Detroit, del.	2.90c
Other Mich. pts. del....	2.95c

Commodity C.R. Strip	
Pittsburgh, Cleveland, Youngstown, base 3 tons and over	2.95c
Worcester, base	3.35c
Detroit, del.	3.05c
Other Mich. pts. del....	3.10c

Cold-Finished Spring Steel	
Pittsburgh, Cleveland, base; add 20 cents for Worcester.	
26-.50 Carbon	2.80c
51-.75 Carbon	4.30c
76-1.00 Carbon	6.15c
Over 1.00 Carbon	8.35c

Tin, Terne Plate

Tin Plate	
Pittsburgh, Chicago, Gary, 100-lb. base box	\$5.00
Granite City	\$5.10

Tin Mill Black Plate	
Pittsburgh, Chicago, Gary, base 29 gage and lighter	3.05c
Granite City	3.15c
Pacific ports, boxed	4.05c

Long Ternes	
Pittsburgh, Gary No. 24 unassorted	3.80c
Pacific Ports	4.55c
Special Coated Mfg. Ternes	
Pittsburgh, Chicago, Gary, 100-base box	\$4.30
Granite City	\$4.40

Roofing Ternes	
Pittsburgh base per package 112 sheets 20 x 28 in., coating I.C.	
8-lb. . . \$12.00	25-lb. . . \$16.00
15-lb. . . 14.00	30-lb. . . 17.25
20-lb. . . 15.00	40-lb. . . 19.50

Steel Plate

Pittsburgh, Chicago, Gary, Cleveland, Birmingham,

Youngstown	2.10c
Coatesville, Sparrows Point, Claymont	2.10c
Gulf ports	2.45c
Pacific Coast ports	2.65c

Steel Floor Plates

Pittsburgh	3.35c
Chicago	3.35c
Gulf ports	3.70c
Pacific Coast ports	4.00c

Structural Shapes

Pittsburgh, Bethlehem, Chicago, Buffalo, Birmingham	2.10c
St. Louis, del.	2.34c
Pacific Coast ports	2.75c

Bars

Hot-Rolled Carbon Bars

Pittsburgh, Chicago, Gary, Cleve., Birm., base 20 tons one size	2.15c
Detroit, del.	2.25c
New York, del.	2.49c
Duluth, base	2.25c
Philadelphia, del.	2.47c
Gulf ports, dock	2.50c
All-rail, Houston from Birmingham	2.59c
Pac. ports, dock	2.80c
All-rail from Chicago	3.25c

Rail Steel Bars

Pitts., Chicago, Gary, Cleveland, Birm., base 5 tons	2.15c
Detroit, del.	2.25c
New York, del.	2.49c
Philadelphia, del.	2.47c
Gulf ports, dock	2.50c
All-rail, Houston from Birmingham	2.59c
Pac. ports, dock	2.80c
All-rail from Chicago	3.25c

Hot-Rolled Alloy Bars

Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size	2.70c
Detroit	2.80c
Alloy	Alloy
S.A.E. Diff.	S.A.E. Diff.
2000..... 0.35	3100..... 0.70
2100..... 0.75	3200..... 1.35
2300..... 1.70	3300..... 3.80
2500..... 2.55	3400..... 3.20
4100 .15-25 Mo.	0.55
4600 0.20-0.30 Mo.; 1.50-2.00 Ni.	1.20
5100 80-1.10 Cr.	0.45
5100 Spr. flats	0.15
6100 Bars	1.20
6100 Spr. flats	0.85
Carb., Van.	0.85
9200 Spr. flats	0.15
9200 Spr. rounds, squares	0.40
T 1300, Mn, mean 1.51-2.00	0.10
Do., carbon under 0.20 max.	0.35

Cold-Finished Carbon Bars

Pitts., Chicago, Gary, Cleveland, Buffalo, base 20,000-39,999 lbs.	2.65c
Detroit	2.70c

Cold-Finished Alloy Bars

Pitts., Chicago, Gary, Cleveland, Buffalo, base	3.35c
Detroit	3.45c
Galveston, add \$0.25; Pacific Coast, \$0.50.	

Turned, Ground Shafting

Pitts., Chicago, Gary, Cleveland, Buffalo, base (not including turning, grinding, polishing extras)	2.65c
Detroit	2.70c

Reinforcing Bars (New Billet)

Pitts., Chicago, Gary, Cleveland, Birm., Sparrows Point, Buffalo, Youngstown, base	2.15c
Gulf ports, dock	2.50c
All-rail, Houston from Birmingham	2.59c
Pacific ports, dock	2.80c
Detroit, del.	2.25c
Reinforcing Bars (Rail Steel)	
Pitts., Chicago, Gary, Cleveland, Birm., base	2.15c
Gulf ports, dock	2.50c

All-rail, Houston from Birmingham	2.59c
Pacific ports, dock	2.80c
Detroit, del.	2.25c

Iron Bars

Philadelphia, com. del.	3.06-3.50c
Pittsburgh, muck bar	5.00c
Pittsburgh, staybolt	8.00c
Terre Haute com., f.o.b. mill	2.15c

Wire Products

Pitts.-Cleve.-Chicago-Birm. base per 100 lb. keg in carloads Standard and cement coated wire nails	\$2.55 (Per Pound)
Polished fence staples	2.55c
Annealed fence wire	3.05c
Galv. fence wire	3.40c
Woven wire fencing (base C. L. column)	67
Single loop bale ties, (base C. L. column)	59
Galv. barbed wire, 80-rod spools, base column	70
Twisted barbless wire, column	70
To Manufacturing Trade	
Base, Pitts.-Cleve.-Chicago Birmingham (except spring wire at Birmingham)	
Bright bess., basic wire	2.60c
Galvanized wire	2.60c
Spring wire	3.20c
Worcester, Mass., 10c higher on bright basic and spring wire.	

Cut Nails

Carload, Pittsburgh, keg.	\$3.85
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Alloy Plates (Hot)

Pitts., Chicago, Coatesville, Pa.	3.50c
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Rails, Fastenings

(Gross Tons)	
Standard rails, mill	\$40.00
Relay rails, base, 35 lbs. and over	28.00-30.00
Light rails, billet qual., Pitts., Chicago, Bham.	\$40.00
Do., rerolling quality	39.00
Cents per pound	
Angle bars, billet, mills.	2.70c
Do., axle steel	2.35c
Spikes, R. R. base	3.00c
Track bolts, base	4.75c
Do., heat treated	5.00c
Car axles forged, Pitts., Chicago, Birmingham	3.15c
Tie plates, base	2.15c
Base, light rails 25 to 60 lbs., 20 lbs. up \$2; 16 lbs. up \$4; 12 lbs. up \$8; 8 lbs. up \$10. Base railroad spikes 200 kegs or more; base plates 20 tons.	

Bolts and Nuts

F.o.b. Pittsburgh, Cleveland, Birmingham, Chicago. Discounts for carloads additional 5%, full containers, add 10%.	
Carriage and Machine	
1/2 x 6 and smaller	65 1/2 off
Do., 5/8 and 3/4 x 6-in. and shorter	63 1/2 off
Do., 3/4 to 1 x 6-in. and shorter	61 off
1 1/2 and larger, all lengths	59 off
All diameters, over 6-in. long	59 off
Tire bolts	50 off
Stove Bolts	
In packages with nuts separate	
71-10 off; with nuts attached	
71 off; bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.	
Step bolts	56 off
Plow bolts	65 off
Nuts	
Semifinished hex. U.S.S. S.A.E.	
1/2-inch and less	62 64
3/8-1-inch	59 60
1 1/4-1 1/2-inch	57 58
1 1/2 and larger	56

Hexagon Cap Screws

Upset 1-in., smaller	60 off
Square Head Set Screws	
Upset, 1-in., smaller	68 off

Headless, 1/4-in., larger	.55 off
No. 10, smaller	.60 off

Piling

Pitts., Chgo., Buffalo	2.40c
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Rivets, Washers

F.o.b. Pitts., Cleve., Chgo., Bham.	
Structural	3.75c
1/8-inch and under	65-5 off
Wrought washers, Pitts., Chi., Phila., to jobbers and large nut, bolt mfrs. l.c.l.	\$3.50 off

Tool Steels

Pittsburgh, Bethlehem, Syracuse, base, cents per lb.	
Carb. Reg. 14.00 Oil-hard-	
Carb. Ext. 18.00 ening	24.00
Carb. Spec. 22.00 Hlgh	car-chr. 43.00

High Speed Tool Steels

Tung. Chr. Van. Moly.				
18.00	4	1	...	67.00
18.00	4	2	1	77.00
18.00	4	3	1	87.00
1.50	4	1	8.50	54.00
...	4	2	8	54.00
5.50	4	1.50	4	57.50
5.50	4.50	4	4.50	70.00

Boiler Tubes

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

Lap Welded

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

Seamless

Sizes	Gage	Hot Rolled	Cold Drawn
1" O.D.	13	\$ 7.82	\$ 9.01
1 1/4" O.D.	13	9.26	10.67
1 1/2" O.D.	13	10.23	11.79
1 3/4" O.D.	13	11.64	13.42
2" O.D.	13	13.04	15.03
2 1/4" O.D.	13	14.54	16.76
2 1/2" O.D.	12	16.01	18.45
2 3/4" O.D.	12	17.54	20.21
3" O.D.	12	18.59	21.42
3 1/2" O.D.	11	24.62	28.37
4" O.D.	10	30.54	35.20
4 1/2" O.D.	10	37.35	43.04
5" O.D.	9	46.87	54.01
6" O.D.	7	71.96	82.93

Welded Iron, Steel,

Pipe

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

Butt Weld

In.	Blk.	Galv.
1/2	63 1/2	51
3/4	66 1/2	55
1-3/4	68 1/2	57 1/2
	Iron	
3/4	30	10
1-1/4	34	16
2	38	18 1/2
2	37 1/2	18
	Lap Weld	
	Steel	
2	61	49 1/2
2 1/2-3	64	52 1/2
3 1/2-6	66	54 1/2
7 and 8	65	52 1/2

Iron		
2	30 1/2	12
2 1/2-3 1/2	31 1/2	14 1/2
4	33 1/2	18
4 1/2-8	32 1/2	17
9-12	28 1/2	12

Line Pipe, Plain Ends

Steel		
1 to 3, butt weld	68 1/2	
2, lap weld	63	
2 1/2 to 3, lap weld	66	
3 1/2 to 6, lap weld	65	
7 and 8, lap weld	64	
Seamless, 3 pts. lower discount.		

Cast Iron Pipe

Class B Pipe—Per Net Ton	
6-in., & over, Birm.	\$45.00-46.00
4-in., Birmingham	48.00-49.00
4-in., Chicago	56.80-57.80
6-in. & over, Chicago	53.80-54.80
6-in. & over, east fdy.	49.00
Do., 4-in.	52.00
Class A Pipe \$3 over Class B	
Std. flgs., Birm., base	\$100.00

Semifinished Steel

Re-rolling Billets, Slabs (Gross Tons)	
Pittsburgh, Chicago, Gary, Cleve., Buffalo, Youngs., Birm., Sparrows Point.	\$34.00
Duluth (billets)	36.00
Detroit, delivered	36.00

Forging Quality Billets

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

Sheet Bars

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

Wire Rods

Pitts., Cleveland, Chicago, Birmingham No. 5 to 1/4-inch incl. (per 100 lbs.)	\$2.00
Do., over 1/4 to 1/2-inch incl.	2.15
Worcester up \$0.10, Galveston up \$0.25 and Pacific Coast up \$0.50 on water shipments.	

Skelp

Pitts., Chi., Youngstown, Coatesville, Sparrows Pt.	1.90c
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Shell Steel

Pittsburgh, Chicago, base, 1000 tons of one size, open hearth	
3-12-inch	\$52.00
12-18-inch	54.00
18-inch and over	56.00

Coke

Price Per Net Ton	
Beehive Ovens	
Connellsville, fur.	\$6.00
Connellsville, fdry.	7.00-7.50
Connell prem. fdry.	7.25-7.60
New River fdry.	8.00-8.25
Wise county fdry.	7.50
Wise county fur.	6.50

By-Product Foundry

Kearny, N. J., ovens	12.15
Chicago, outside del.	11.50
Chicago, delivered	12.25
Terre Haute, del.	12.00
Milwaukee, ovens	12.25
New England, del.	13.75
St. Louis, del.	12.25
Birmingham, ovens	8.50
Indianapolis, del.	12.00
Cincinnati, del.	11.75
Cleveland, del.	12.30
Buffalo, del.	12.50
Detroit, del.	12.25
Philadelphia, del.	12.38

Coke By-Products

Spot, gal., freight allowed east of Omaha	
Pure and 90% benzol	15.00c
Toluol, two degree	28.00c
Solvent naphtha	27.00c
Industrial xylol	27.00c
Per lb. f.o.b. works	
Phenol (car lots, returnable drums)	12.50c
Do less than car lots.	13.25c
Do tank cars	11.50c
Eastern Plants, per lb.	
Naphthalene flakes, balls, bbls. to jobbers	8.00c
Per ton, bulk, f.o.b. port	
Sulphate of ammonia	\$29.00

Pig Iron

Prices (in gross tons) are maximums fixed by OPA Price Schedule No. 10, effective June 10, 1941. Exceptions indicated in footnotes. Allocation regulations from WPB Order M-17, expiring Dec. 31, 1942. Base prices bold face, delivered light face.

	No. 2 Foundry	Basic	Bessemer	Malleable
Bethlehem, Pa., base	\$25.00	\$24.50	\$26.00	\$25.50
Newark, N. J., del.	26.53	26.03	27.53	27.03
Brooklyn, N. Y., del.	27.50			28.00
Birdsboro, Pa., del.	25.00	24.50	26.00	25.50
Philadelphia, del.				
Birmingham, base	†20.38	†19.00		
Baltimore, del.	25.61	24.73		
Boston, del.	25.12			
Chicago, del.	124.22			
Cincinnati, del.	24.06	22.60		
Cleveland, del.	24.12	23.24		
Newark, N. J., del.	26.15			
Philadelphia, del.	25.46	24.58		
St. Louis, del.	124.12	23.24		
Buffalo, base	24.00	23.00	25.00	24.50
Boston, del.	25.50	25.00	26.50	26.00
Rochester, del.	25.53		26.03	26.03
Syracuse, del.	26.08		27.08	26.58
Chicago, base	24.00	23.50	24.50	24.00
Milwaukee, del.	25.10	24.60	25.60	25.10
Muskegon, Mich., del.	27.19	26.69	27.69	27.19
Cleveland, base	24.00	23.50	24.50	24.00
Akron, Canton, O., del.	25.39	24.89	25.89	25.39
Detroit, base	24.00	23.50	24.50	24.00
Saginaw, Mich., del.	26.31	25.81	26.81	26.31
Duluth, base	24.50		25.00	24.50
St. Paul, del.	26.63		27.13	26.63
Erie, Pa., base	24.00	23.50	25.00	24.50
Everett, Mass., base	25.00	24.50	26.00	25.50
Boston	25.50	25.00	26.50	26.00
Granite City, Ill., base	24.00	23.50	24.50	24.00
St. Louis, del.	24.50	24.00		24.50
Hamilton, O., base	24.00	23.50		24.00
Cincinnati, del.	24.44	24.61		25.11
Neville Island, Pa., base	24.00	23.50	24.50	24.00
†Pittsburgh, del.				
No. & So. sides	24.69	24.19	25.19	24.69
Provo, Utah, base	22.00			
Sharpsville, Pa., base	24.00	23.50	24.50	24.00
Sparrows Point, Md., base	25.00	24.50		
Baltimore, del.	25.99			
Steelton, Pa., base		24.50		25.50
Swedeland, Pa., base	25.00	24.50	26.00	25.50
Philadelphia, del.	25.84	25.34		26.34
Toledo, O., base	24.00	23.50	24.50	24.00
Mansfield, O., del.	25.94	25.44	25.44	25.94
Youngstown, O., base	24.00	23.50	24.50	24.00

*Basic silicon grade (1.75-2.25%), add 50c for each 0.25%. †For phosphorus 0.70 and over deduct 38c. ‡Over 0.70 phos. §For McKees Rocks, Pa., add 55 to Neville Island base; Lawrenceville, Homestead, McKeesport, Ambridge, Monaca, Aliquippa, §4; Monessen, Monongahela City .97 (water); Oakmont, Verona 1.11; Brackenridge 1.24.

High Silicon, Silvery

6.00-6.50 per cent (base)	\$29.50
6.51-7.00	\$30.50
7.01-7.50	\$31.50
7.51-8.00	\$32.50
8.01-8.50	\$33.50
8.51-9.00	\$34.50
9.01-9.50	\$35.50
9.51-10.00	\$36.50
10.01-10.50	\$37.50
10.51-11.00	\$38.50
11.01-11.50	\$39.50

F.o.b. Jackson county, O., per gross ton, Buffalo base prices are \$1.25 higher. Prices subject to additional charge of 50 cents a ton for each 0.50% manganese in excess of 1.00%.

Bessemer Ferro-silicon

Prices same as for high silicon silvery iron, plus \$1 per gross ton. (For higher silicon irons a differential over and above the price of base grades is charged as well as for the hard chilling irons, Nos. 5 and 6.)

Charcoal Pig Iron

Northern	
Lake Superior Furn.	\$28.00
Chicago, del.	31.34
Southern	
Semi-cold blast, high phos., f.o.b. furnace, Lyles, Tenn.	\$28.50
Semi-cold blast, low phos., f.o.b. furnace, Lyles, Tenn.	33.00
Gray Forge	
Neville Island, Pa.	\$23.50
Valley, base	23.50

Low Phosphorus

Basing points: Birdsboro and Steelton, Pa., and Buffalo, N. Y., \$29.50 base; \$30.74, delivered, Philadelphia.
Switching Charges: Basing point prices are subject to an additional charge for delivery within the switching limits of the respective districts.
Silicon Differentials: Basing point prices are subject to an additional charge not to exceed 50 cents a ton for each 0.25 silicon in excess of base grade (1.75 to 2.25%).
Phosphorous Differential: Basing point prices are subject to a reduction of 38 cents a ton for phosphorous content of 0.70% and over.
Manganese Differentials: Basing point prices subject to an additional charge not to exceed 50 cents a ton for each 0.50% manganese content in excess of 1.0%.

Celling prices are the aggregate of (1) governing basing point (2) differentials (3) transportation charges from governing basing point to point of delivery as customarily computed. Governing basing point is the one resulting in the lowest delivered price for the consumer.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick	
Super Quality	
Pa., Mo., Ky.	\$64.60
First Quality	
Pa., Ill., Md., Mo., Ky.	51.30
Alabama, Georgia	51.30
New Jersey	56.00
Second Quality	
Pa., Ill., Ky., Md., Mo.	46.55
Georgia, Alabama	38.00
New Jersey	49.00
Ohio	
First quality	43.00
Intermediate	36.10
Second quality	36.00
Malleable Bung Brick	
All bases	\$59.85
Silica Brick	
Pennsylvania	\$51.30
Joliet, E. Chicago	58.90
Birmingham, Ala.	51.30
Ladle Brick	
(Pa., O., W. Va., Mo.)	
Dry press	\$31.00
Wire cut	29.00
Magnesite	
Domestic dead-burned grains, net ton f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00
Basic Brick	
Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.	
Chrome brick	\$54.00
Chem. bonded chrome	54.00
Magnesite brick	76.00
Chem. bonded magnesite	65.00

Fluorspar

Washed gravel, duty pd., lde. net ton	nominal
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	\$25.00
Do., barge	25.00
No. 2 lump	25.00

Domestic dead-burned grains, net ton f.o.b. Chewelah, Wash., net ton, bulk 22.00 net ton, bags 26.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick \$54.00
Chem. bonded chrome 54.00
Magnesite brick 76.00
Chem. bonded magnesite 65.00

Fluorspar

Washed gravel, duty pd., lde. net ton	nominal
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	\$25.00
Do., barge	25.00
No. 2 lump	25.00

Ferroalloy Prices

Ferromanganese, 78-82%.	Less than 200-lb. lots	14.25c			
Carlots, duty pd., seab'd	67-72%, low carbon, cts. per pound:				
Carlots, del. Pittsburgh					
Carlots, f.o.b. So. f'ces.					
Add \$10 for ton, \$13.50 for less ton, \$18 for less than 200-lb. lots.					
Spiegelisen, 19-21%, gross ton, Palmerton					\$36.00
Manganese Briquets, Contract carloads, bulk freight allowed, per lb.		5.50c			
Packed		5.75c			
Ton lots		6.00c			
Less-ton lots		6.25c			
Less 200-lb. lots		6.50c			
Spot ¼c higher.					
Manganese Electro, 99.9+%, less car lots					42.00c
Chromium Metal, per lb. contained chromium					
Contract	Spot				
98% Cr. ton lots	85.00c				
88% Cr. ton lots	79.00c				
Ferrocolumbium, 50-60% f.o.b. Niagara Falls, per lb. contained Cr on contract		\$2.25			
Less-ton lots		2.30			
(Spot 10c higher)					
Chromium Briquets, per lb., freight allowed					
Contract	Spot				
Carlots	8.25c	8.50c			
Packed	8.50c	8.75c			
Ton lots	8.75c	9.00c			
Less-ton lots	9.00c	9.25c			
Less 200 lbs.	9.25c	9.50c			
Ferrocrome, 66-70%, freight allowed, 4-6% carbon, per pound contained (chrome)					
Carlots		13.00c			
Ton lots		13.75c			
Less-ton lots		14.00c			
Ferromolybdenum, 55-75%, per lb. contained molybdenum, f.o.b. furnace					95.00c
Calcium Molybdate (Molyte), 40-45% Mo., per lb. contracts, f.o.b. producers' plant					80.00c
Molybdenic Oxide Briquets, 48-52% Mo. per lb. contained, f.o.b. producers' plant					30.00c
Molybdenum Oxide, (In 5 and 20 lb. mo. contained cans) 53-63 mo. per lb. contained f.o.b. producers' plants					80.00c
Molybdenum Powder, 99%, f.o.b. York, Pa., per lb. in 200-lb. kegs					\$2.60
Do., 100-200 lb. lots					2.75
Do., under 100-lb. lots					3.00
Ferrophosphorus, 17-19%, gross ton carloads, f.o.b. sellers' works, \$3 unitage, freight equalized with Rockdale, Tenn. for 18% phos.					
Contract		\$58.50			
Spot		62.25			
23-26%, \$3 unitage, freight equalized with Mt. Pleasant, Tenn., for 24% phos.					
Contract		75.00			
Spot		80.00			
Ferrosilicon, Gross tons, freight allowed, bulk					
50%	Carloads	\$74.50	Ton lots	\$87.00	
Unitage	1.50		1.75		
75%	135.00		151.00		
Unitage	1.80		2.00		
85%	170.00		188.00		
Unitage	2.00		2.20		
90-95%	10.25c		11.25c		
(Above for contracts; spot ¼c higher)					
Silicon Metal, Spot ¼-cent higher (Per Lb., Contracts):					
1% Iron	2% Iron				
Carlots	14.50c	13.00c			
Ton lots	15.00c	13.50c			
Less-ton lots	15.25c	13.75c			
Less 200 lbs.	15.50c	14.00c			
Silicon Briquets, Contract carloads, bulk freight allowed, per ton		\$74.50			
Packed		80.50			
Ton lots		84.50			
Less-ton lots, per lb.		4.00c			
Less 200-lb. lots		4.25c			
Spot ¼c higher on less ton lots; \$5 higher on ton lots and over.					
Silicomanganese, Carbon	1½%	2¼%			
Carloads					
(contract)	\$128.00	\$118.00			
Ton Lots					
(contract)	140.50	130.50			
Freight allowed spot \$5 above contract					
Ferrotungsten, (All prices nominal) Carlots, per lb. contained tungsten					\$1.90
Tungsten Metal Powder, (Prices Nominal) 98-99 per cent, per pound, depending upon quantity		\$2.60-\$2.65			
Ferrotitanium, 40-45%, f.o.b. Niagara Falls, per lb. contained in ton lots					\$1.23
Less ton lots					1.25
20-25%, C. 0.10 max., in ton lots per lb. contained					1.35
TI					1.40
Less-ton lots (Spot 5c higher)					
Ferro-Carbon-Titanium, 15-20% Titanium, 6-8% C 3-5% C					
Carlots, contract, f.o.b. Niagara Falls, freight allowed to destinations east of Mississippi and north of Baltimore and St. Louis					\$157.50
Ferrovandium, 35-40%, contract per pound contained vanadium		\$2.70-\$2.80-\$2.90			
(Spot 10c higher)					
Vanadium Pentoxide, Per lb. contained, contracts					\$1.10
Do., spot					1.15
Zirconium Alloy, 12-15%, carloads, contract, bulk					\$102.50
Packed					107.50
Ton lots					108.00
Less ton lots					112.50
Spot \$5 a ton higher					
35-40%, contract, carloads, bulk or package, per lb. alloy					14.00c
Do., ton lots					15.00c
Do., less-ton lots					16.00c
Spot is ¼-cent higher					
Aisfer, Per lb., f.o.b. Niagara Falls.					
Contract	Spot				
Carlots	7.50c	8.00c			
Ton lots	8.00c	8.50c			
Simanal, Per lb. of alloy, contracts, freight allowed (approx. 20% Si, 20% Mn, 20% Al)					
Carlots	Ton Lots	Less			
10.50c	11.00c	11.50c			

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials. As of April 16, 1941

As Kansas City, Mo., Chattanooga, Tenn., Tulsa, Okla., and Portland, Oreg., were not named in the order fixing ceiling prices they have been omitted below.

	Soft Bars			Hot-rolled Strip		Plates	Structural	Floor	Sheets			Cold	Cold Drawn Bars	
	Bars	Bands	Hoops	¾-in. & Over	Shapes	Plates	Plates	Hot Rolled	Cold Rolled	Galv. No. 24	Strip	Carbon	S.A.E. 2300	S.A.E. 3100
Boston	3.98	4.06	5.06	3.85	3.85	5.66	3.71	4.68	5.11	3.46	4.13	8.88	7.23	
New York (Met.)	3.84	3.96	3.96	3.76	3.75	5.56	3.58	4.60	5.00	3.51	4.09	8.84	7.19	
Philadelphia	3.85	3.95	4.45	3.55	3.55	5.25	3.55	4.05	4.65	3.31	4.06	8.56	7.16	
Baltimore	3.85	4.00	4.35	3.70	3.70	5.25	3.50	4.05	5.05	....	4.04	....	....
Norfolk, Va.	4.00	4.10	....	4.05	4.05	5.45	3.85	....	5.40	....	4.15	....	....
Buffalo	3.35	3.82	3.82	3.62	3.40	5.25	3.25	4.30	4.75	3.52	3.75	8.40	6.75	
Pittsburgh	3.35	3.60	3.60	3.40	3.40	5.00	3.35	....	4.65	....	3.65	8.40	6.75
Cleveland	3.25	3.50	3.50	3.40	3.58	5.18	3.35	4.05	4.62	3.20	3.75	8.40	6.75	
Detroit	3.43	3.43	3.68	3.60	3.65	5.27	3.43	4.30	4.84	3.40	3.80	8.70	7.05	
Omaha	4.10	4.20	4.20	4.15	4.15	5.75	3.85	5.32	5.50	....	4.42	....	....
Cincinnati	3.60	3.67	3.67	3.65	3.68	5.28	3.42	4.37	4.92	3.45	4.00	8.75	7.10	
Chicago	3.50	3.60	3.60	3.55	3.55	5.15	3.25	4.10	4.85	3.50	3.75	8.40	6.75	
Twin Cities	3.75	3.85	3.85	3.80	3.80	5.40	3.50	4.35	5.00	3.83	4.34	9.09	7.44	
Milwaukee	3.63	3.53	3.53	3.68	3.68	5.28	3.38	4.23	4.98	3.54	3.88	8.38	6.98	
St. Louis	3.64	3.74	3.74	3.69	3.69	5.29	3.39	4.24	4.99	3.61	4.02	8.77	7.12	
Indianapolis	3.60	3.75	3.75	3.70	3.70	5.30	3.45	....	5.01	....	3.97	....	....
Memphis	3.90	4.10	4.10	3.95	3.95	5.71	3.85	....	5.25	....	4.31	....	....
Birmingham	3.50	3.70	3.70	3.55	3.55	5.93	3.45	....	4.75	....	4.43	....	....
New Orleans	4.00	4.10	4.10	3.80	3.80	5.75	3.85	....	5.25	5.00	4.60	....	....
Houston, Tex.	3.75	4.30	4.30	4.05	4.05	5.50	4.00	....	5.25	....	6.90	....	....
Seattle	4.35	4.35	....	4.35	4.35	6.10	4.35	6.35	5.60	....	5.75	....	....
Los Angeles	4.50	5.00	6.80	4.50	4.50	6.75	4.65	6.50	5.85	....	6.60	10.55	9.55
San Francisco	4.10	4.60	6.35	4.25	4.25	5.95	4.25	6.40	6.00	....	6.80	10.80	9.80

BASE QUANTITIES

Soft Bars, Bands, Hoops, Plates, Shapes, Floor Plates, Hot Rolled Sheets and SAE 1035-1050 Bars: Base, 400-1999 pounds; 300-1999 pounds in Los Angeles; 400-39,999 (hoops, 0-299) in San Francisco; 300-4999 pounds in Portland; 300-9999 Seattle; 400-14,999 pounds in Twin Cities; 400-3999 pounds in B'ham., Memphis.

Cold Rolled Sheets: Base, 400-1499 pounds in Chicago, Cincinnati, Cleveland, Detroit, New York, Omaha, Kansas City, St. Louis; 450-3749 in Boston; 500-1499 in Buffalo; 1000-1999 in Philadelphia, Baltimore; 750-4999 in San Francisco; 300-4999 in Portland, Seattle; any quantity in Twin Cities, New Orleans; 300-1999 Los Angeles.

Galvanized Sheets: Base, 150-1499 pounds, New York; 150-1499 in Cleveland, Pittsburgh, Baltimore, Norfolk; 150-1049 in Los Angeles; 300-4999 in Portland, Seattle; 450-3749 in Boston; 500-1499 in Birmingham, Buffalo, Chicago, Cincinnati, Detroit, Indianapolis, Milwaukee, Omaha, St. Louis, Tulsa; 3500 and over in Chattanooga; any quantity in Twin Cities; 750-1500 in Kansas City; 150 and over in Memphis; 25 to 49 bundles in Philadelphia; 750-4999 in San Francisco.

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

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

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

S.A.E. Hot-rolled Bars (Unannealed)

	1035-1050		2300		3100		4100		6100	
	Series	Series	Series	Series	Series	Series	Series	Series	Series	Series
Boston	4.28	7.75	6.05	5.80	7.90	....	....	....	....	....
New York (Met.)	4.04	7.60	5.90	5.65	....	....	....	....	....	....
Philadelphia	4.10	7.56	5.86	5.61	8.56	....	....	....	....	....
Baltimore	4.45	....	....	....	....	....	....	....	....	....
Norfolk, Va.	....	....	....	....	....	....	....	....	....	....
Buffalo	3.55	7.35	5.65	5.40	7.50	....	....	....	....	....
Pittsburgh	3.40	7.45	5.75	5.50	7.60	....	....	....	....	....
Cleveland	3.30	7.55	5.85	5.55	7.70	....	....	....	....	....
Detroit	3.48	7.67	5.97	5.72	7.19	....	....	....	....	....
Cincinnati	3.65	7.69	5.99	5.74	7.84	....	....	....	....	....
Chicago	3.70	7.35	5.65	5.40	7.50	....	....	....	....	....
Twin Cities	3.95	7.70	6.00	6.09	8.19	....	....	....	....	....
Milwaukee	3.83	7.33	5.88	5.63	7.73	....	....	....	....	....
St. Louis	3.84	7.72	6.02	5.77	7.87	....	....	....	....	....
Seattle	6.25	....	8.75	9.85	8.65	....	....	....	....	....
Los Angeles	4.80	9.55	8.55	8.40	9.05	....	....	....	....	....
San Francisco	5.60	9.80	8.80	8.65	9.05	....	....	....	....	....

EUROPEAN IRON, STEEL PRICES

Dollars at \$4.02 1/2 per Pound Sterling

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

By Cable or Radio

	BRITISH		U.K. Ports	
	Gross Tons	f.o.b.	£	s d
Merchant bars, 3-inch and over	\$66.50	16 10 0	....	....
Merchant bars, small, under 3-inch, re-rolled	3.60c	20 0 0	....	....
Structural shapes	2.95c	15 10 0	....	....
Ship plates	2.90c	16 2 6	....	....
Boiler plates	3.17c	17 12 6	....	....
Sheets, black, 24 gage	4.00c	22 5 0	....	....
Sheets, galvanized, corrugated, 24 gage	4.61c	25 12 6	....	....
Tin plate, base box, 20 x 14, 108 pounds	£ 6.20	1 10 9	....	....
British ferromanganese	\$120.00 delivered Atlantic seaboard	duty-paid.	....	....

Domestic Prices Delivered at Works or Furnace—

	£		s d	
	£	s d	£	s d
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	\$25.79	6 8 0(a)	....	....
Basic pig iron	24.28	6 0 6(a)	....	....
Furnace coke, f.o.t. ovens	7.5c	1 17 6	....	....
Billets, basic soft, 100-ton lots and over	49.37	12 5 0	....	....
Standard rails, 60 lbs. per yard, 500-ton lots & over	2.61c	14 10 6	....	....
Merchant bars, rounds and squares, under 3-inch	3.17c	17 12 0 1/2	....	....
Shapes	2.77c	15 8 0 1/2	....	....
Ship plates	2.91c	16 3 0 1/2	....	....
Boiler plates	3.06c	17 0 6 1/2	....	....
Sheets, black, 24 gage, 4-ton lots and over	4.10c	22 15 0	....	....
Sheets, galvanized 24 gage, corrugated, 4-ton lots & over	4.70c	26 2 6	....	....
Plain wire, mild drawn, catch weight coils, 2-ton lots and over	4.28c	23 15 0	....	....
Bands and strips, hot-rolled	3.50c	18 7 0	....	....
(a) del. Middlesbrough 5% rebate to approved customers.	....	↑↑Rebate	....	....
15¢ on certain conditions.	....	....	....	....

Ores

Lake Superior Iron Ore		South African (excluding war risk)		
Gross ton, 51 1/2%	Lower Lake Ports	No ratio lump, 44%	Do.	
Old range bessemer	\$4.75	Do. 45%	29.00	
Mesabi nonbessemer	4.45	Do. 48%	34.00	
High phosphorus	4.35	Do. concentrates, 48%	33.00	
Mesabi bessemer	4.60	Do. 50%	34.00	
Old range nonbessemer	4.60			
Eastern Local Ore		Brazilian		
Cents. unit, del. E. Pa.		2.5:1 lump, 44%	31.00	
Foundry and basic 56-63%, contract	12.00	2.8:1 lump, 44%	32.50	
Foreign Ore		3:1 lump, 48%	41.00	
Cents per unit, c.i.f. Atlantic ports		No ratio lump, 48%	35.00-35.50	
Manganiferous ore, 45-55% Fe., 6-10% Mang.	Nom.	Do. concentrate, 48%	33.00-33.50	
N. African low phos.	Nom.	Philippine		
Spanish, No. African basic, 50 to 60%	Nom.	No ratio lump, 45%	32.00	
Chinese wolframite, net ton, duty pd.	\$24.00	2.8:1 lump, 48%	40.00	
Brazil iron ore, 68-69% ord.	7.50c	Do., concentrate, 48%	39.00	
Low phos. (.02 max.)	8.00c	2.5:1 concentrate, 48%	36.50	
F.O.B. Rio Janeiro	23.50-24.00	No ratio concentrate, 48%	34.00	
Scheelite, imp.	....	No ratio lump, 48%	35.00
Chrome Ore		Rhodesian		
Gross ton c.i.f. Baltimore; dry basis; subject to penalties for guarantees		nominal		
Indian and African, 2.8:1 lump, 48%	\$39.00	Manganese Ore		
		Including war risk but not duty, cents per unit cargo lots		
		Caucasian, 50-52%	
		S. African, 48%		65.00
		Indian, 50%		66.00
		Brazilian, 48%		65.00
		Chilean, 48%		68.00
		Cuban, 51%, duty free		81.00-83.00
		Molybdenum	
		Sulphide conc., lb., Mo. cont., mines		\$0.75

MAXIMUM PRICES FIXED BY OPA ON IRON AND STEEL SCRAP

Other than railroad grades quoted on the basis of basing point prices from which shipping point prices and consumers' delivered prices are to be computed. Scrap originating from railroads quoted delivered to consumers' plants located on the line of the railroad from which the material originated. All prices in gross tons. A basing point includes its switching district.

PRICES FOR OTHER THAN RAILROAD SCRAP

	ELECTRIC FURNACE AND FOUNDRY GRADES									
	Low Phos. Grades		Heavy Structural, Plate		Cut Auto Scrap		Alloy-Free		First Cut	
	Billet, Blooms, Forges, Crops	Bar	3 ft. and less	2 ft. and less	3 ft. and less	2 ft. and less	1 ft. and less	Low Phos. & Sulphur Turnings	Heavy Axle & Forge Turnings	Electric Furnace Bundles
Pittsburgh, Brackenridge, Butler, Johnstown, Midland, Monessen, Sharon, Steubenville, Weirton, Canton, Youngstown, Warren	\$20.00	\$22.50	\$21.00	\$21.50	\$20.00	\$20.50	\$21.00	\$18.00	\$19.50	\$21.00
Claymont, Coatesville, Harrisburg, Conshohocken, Phoenixville	18.75	21.25	19.75	20.25	18.75	19.25	19.75	16.75	18.25	19.75
Bethlehem	18.25	20.75	19.25	20.75	18.25	18.75	19.25	16.25	17.75	19.25
Buffalo	19.25	21.75	20.25	21.25	19.25	19.75	20.25	17.25	18.75	20.25
Cleveland, Middletown, Cincinnati, Portsmouth, Ashland	19.50	22.00	20.50	21.00	19.50	20.00	20.50	17.50	19.00	20.50
Detroit	17.85	20.35	18.85	19.35	17.85	18.35	18.85	15.85	17.35	18.85
Toledo	13.85	21.25	19.75	20.25	18.75	19.25	19.75	16.75	18.25	19.75
Chicago	14.75	23.75	19.25	20.75	18.25	19.75	19.25	16.25	17.75	19.25
Kokomo	14.25	20.50	19.00	20.00	18.00	18.50	19.00	16.00	17.50	19.00
Duluth	14.00	23.00	19.00	20.00	18.00	18.50	19.00	15.50	17.00	18.50
St. Louis	17.50	22.50	18.50	19.50	17.50	18.00	18.50	15.00	16.50	18.00
Birmingham, Atlanta, Alabama City, Los Angeles, San Francisco, Pittsburg, Calif.	17.00	19.50	18.00	18.50	17.00	17.50	18.00	15.00	16.00	17.50
Minneapolis, Colo.	16.50	21.50	17.50	18.00	16.50	17.00	17.50	12.50	14.00	15.50
Seattle	14.50	19.50	15.50	16.00	14.50	15.00	15.50	11.00	12.50	14.00
Portland, Ore.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

clmatt basing point includes the switching district of Newport, Ky. St. Louis basing point includes the switching districts of Granite City, East St. Louis and Madison, Ill. San Francisco basing point includes the switching districts of South San Francisco, Niles and Oakland, Calif.

Inferior Grades: Maximum prices of inferior grades shall continue to bear the same differential below the corresponding listed grades as existed from Sept. 1, 1940, to Jan. 31, 1941. No premium allowed on grades considered superior, unless approved by OPA. Addition of special preparation charges prohibited. Purchase of electric furnace or foundry grades for open hearth or blast furnace use permitted only at no more than price for corresponding open hearth grade. Exceptions: Low phos. billet, bloom and forge rods and electric furnace bundles may exceed open grade price, and electric furnace bundles may exceed blast furnace price, if material is delivered to the consumer direct from the original industrial producer.

Maximum Shipping Point Price: Where shipment to consumer is by rail, vessel or combination of both, scrap is at its shipping point when it has been placed f.o.b. railroad car or f.a.s. vessel. In such cases, maximum shipping point price are: (1) For shipping points located within a basing point, the price listed in the above table for scrap at the basing point in which the shipping point is located, minus the lowest established switching charge for scrap in the above table for scrap at the most favorable basing point, minus the lowest transportation charge by rail, water or combination thereof. When vessel movement is involved, dock charges shall be 50 cents at Memphis, \$1 at Great Lakes ports, \$1.25 at New England ports, 75 cents elsewhere. New England shipping point prices computed on most favorable basing point prices; maximum transportation charge on scrap from New England, \$6.27 per ton.

Scrap shipped by motor vehicle is at its shipping point when loaded. For shipping points within basing points, maximum is price listed in table minus lowest switching charge. When outside basing point, maximum is price at most favorable basing point minus lowest established charge when hauled by common carrier. When hauled by seller charges are based on carload rate for rail shipment, minimum \$1.00 per ton.

Maximum Delivered Prices: Determined by adding established transportation charges to shipping point price, not to exceed by more than \$1 the prices listed in the table for the nearest basing point. Certain exceptions specified in OPA Price Schedule No. 4 (Amendment 11) apply to St. Louis district consumers, to WPB allocations, to water shipments from Duluth or Superior, Wis., to shipments of billets, blooms and forge crops from Pittsburgh and to shipments of electric and foundry grades from Michigan.

Unprepared Scrap: Above prices are for prepared scrap. Maximum prices for unprepared scrap are \$2.50 less than for the corresponding grades of prepared scrap, except for heavy breakable scrap. In no case shall electric furnace and foundry grades be used as the "corresponding grade or grades of prepared scrap." Graveyard autos not considered unprepared scrap.

Remote Scrap: Consists of all grades, except railroad scrap, located in Florida, Montana, Idaho, Wyoming, Nevada, Arizona, New Mexico, Texas, Oklahoma, Oregon and Utah. Delivered price may exceed by not more than \$5 the price at the basing point nearest consumer's plant, provided sworn details furnished OPA. Permission required to exceed by more than \$5 the nearest basing point price.

RAILROAD SCRAP

	Heavy Melting Steel	Scrap Rails		18 in. and under
		3 ft. and under	2 ft. and under	
Pittsburgh, Wheeling, Steubenville, Sharon, Youngstown, Canton	21.00	22.00	24.00	24.50
Philadelphia, Wilmington, Sparrows Point	19.75	20.75	22.75	23.25
Cleveland, Cincinnati, Middletown, Ashland, Portsmouth	20.50	21.50	23.50	24.00
Chicago	19.75	20.75	22.75	23.25
Buffalo	20.25	21.25	23.25	23.75
Detroit	18.85	19.85	21.85	22.35
Kokomo	19.25	20.25	22.25	22.75
Duluth	19.00	20.00	22.00	22.50
Kansas City, Mo.	17.00	18.00	20.00	20.50
St. Louis	18.50	19.50	21.50	22.00
Birmingham	18.00	19.00	21.00	21.50
Los Angeles, San Francisco	18.00	19.00	21.00	21.50
Seattle	15.50	16.50	18.50	19.00

CAST IRON SCRAP OTHER THAN RAILROAD

(Shipping point prices in gross tons)

	Group A		Group B		Group C	
	150 lbs. & Under	Over 150 lbs.	150 lbs. & Under	Over 150 lbs.	150 lbs. & Under	Over 150 lbs.
No. 1 Cupola Cast	\$18.00	\$18.00	\$19.00	\$19.00	\$20.00	\$20.00
No. 1 Machinery Cast, Drop Broken	18.00	18.00	19.00	19.00	20.00	20.00
Clean Auto Cast	18.00	18.00	19.00	19.00	20.00	20.00
Stove Plate	17.00	17.00	18.00	18.00	19.00	19.00
Unstripped Motor Blocks	17.50	17.50	18.50	18.50	19.50	19.50
Heavy Breakable Cast	15.00	15.00	16.00	16.00	17.00	17.00
Charging Box Size Cast	17.00	17.00	18.00	18.00	19.00	19.00
Miscellaneous Malleable	20.00	20.00	21.00	21.00	22.00	22.00

Group A includes the states of Montana, Idaho, Wyoming, Nevada, Utah, Arizona and New Mexico. Group B includes the states of North Dakota, South Dakota, Nebraska, Colorado, Kansas, Oklahoma, Texas and Florida.

Group C includes states not named in groups A and B, plus Kansas City, Kans.-Mo. *Open Hearth Grades refer to No. 1 heavy melting steel, No. 1 hydraulic compressed black sheet scrap. No. 2 heavy melting steel, "leaky" No. 1 melting steel, No. 2 bundles and No. 1 bushing. Blast Furnace Grades refer to mixed borings and turnings, shoveling turnings, No. 2 bushing and cast iron borings. Add \$3 for chemical borings, \$5 when chemical borings used in manufacture of explosives. A basing point includes the switching district of the city named. The Pittsburg basing point includes the switching districts of Bessemer, Homestead, Duquesne, Munhall and McKeesport, Pa.

Sheets, Strip

Sheet & Strip Prices, Page 110

While sheet schedules have shown little change recently a tighter situation is expected, due to diversion of an increasing proportion of strip capacity to plates and heavier demand for semifinished steel for other purposes.

Sheet delivery is fairly steady, A-1-a tonnage being promised at an average of seven to eight weeks. On lower A-1 classifications two months can be done in some instances, though promises are indefinite. On lower priorities promises are almost impossible to obtain.

Electric refrigerator manufacturers in most cases have cancelled orders on mill books and most seem to have sufficient inventory to run at the reduced rate allowed by Washington, production scheduled to stop at the end of April.

Mill schedules in some cases show March production absorbed on orders with A-1-j priority or higher and the trend is toward even higher ratings. In February some sheets were shipped at lower ratings.

Shops fabricating steel sheets are rapidly moving from production of regular products and changing to war production where conversion is possible. Range builders, household tank fabricators and makers of appliances are shifting production lines and in some instances already are buying sheets of all finishes in high ratings in greater volume than for normal consumption. Some producers are able to make better deliveries on cold-rolled sheets than on other grades.

Narrow cold strip mills are booking practically no non-rated tonnage, with the trend in new volume toward higher classifications, some producers reporting fully half their new business in the A-1 group. Current shipments include some low or non-rated tonnage but this is dwindling. An increasing number of consumers have converted to war goods production. Demand for high-carbon narrow strip is relatively higher than for low-carbon, cartridge clip steel contributing to this ratio.

Sheet consumers in the East will have to pay more for their steel when the 6 per cent increase in freight rates goes into effect later in the month, but sellers of hot and galvanized sheets with plants in the Pittsburgh, Wheeling and Ohio areas will receive less because they will have to absorb much more than they will gain by the increase in the rate from Sparrows Point, the eastern basing point, owing to the longer hauls from their plants. On the other hand, some eastern producers, it is pointed out, will not only be able to pass the increase along, but will actually gain by virtue of their closer proximity than Sparrows Point.

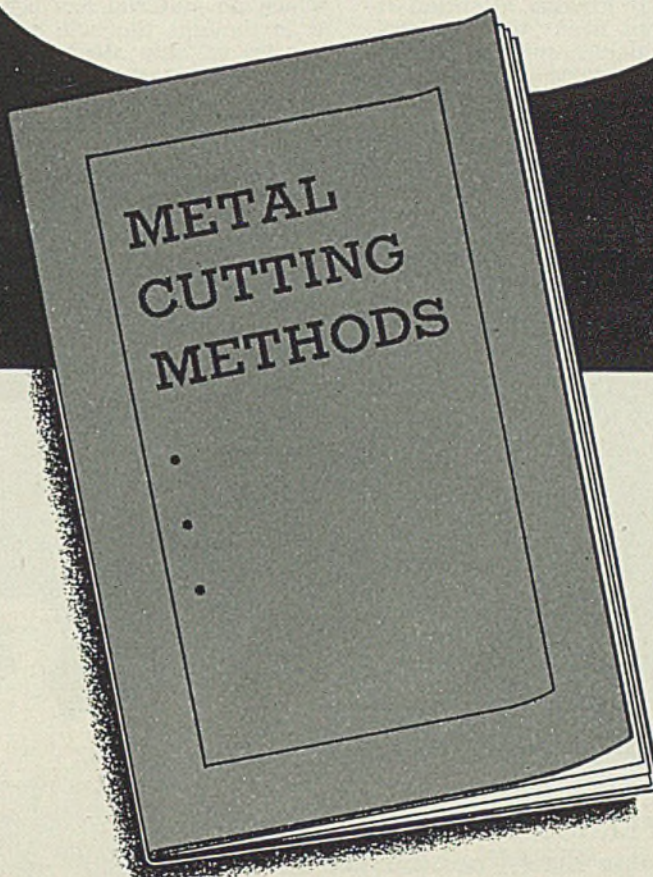
Plates

Plate Prices, Page 110

Plate producers believe about 60 days will be required to bring

March 9, 1942

NEW BOOK



Tells How to Get More Production from your METAL-CUTTING SAWS



Under today's wartime conditions, Simonds' leadership in the manufacture of Metal-Cutting Saws involves a special duty to help all saw-users get the utmost in production on metal-cutting jobs.

Year after year, knowledge accumulates . . . resulting in better methods that increase production. This knowledge is now available in the compact Simonds handbook, "Metal-Cutting Methods", to help you choose the most efficient operating procedure. *This new book is free to users of metal-cutting saws. Write for your copy now, to:*

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smooth working of allocations. Considerable delay is being experienced in clearing forms due in producers' hands at the beginning of the month, because of errors on the part of consumers. One large mill reports a heavy percentage of error, resulting in the forms being returned. One cause was the short time allowed for filing.

Shipyard requirements dominate allocations but greater attention is being given to needs of ship propulsion machinery manufacturers. This and other types of equipment are said to be causing delay in getting ships into operation.

Considerable over-allocation of plates continues but this probably

will be corrected by a larger share of ship plates being provided by strip mills. Iron and Steel Branch, WPB, has worked out a plan by which 80 to 90 per cent of steel required for EC-2 vessels will be produced on strip mills converted to production of plates. Formerly only about 10 per cent was from these mills. The plan will be applied to about 770 new ships for which no material has been placed. It is thought this will expedite deliveries of ship steel.

Various measures are being taken to increase strip plate capacity and hope is held that the present rate of 400,000 tons annually may be increased by 100,000 tons.

March plate schedules already are being adjusted to accommodate special allocations imposed for special purposes. Many plate consumers asked larger tonnage for April than for previous months and numerous requests were received from buyers in lower priority brackets. The latter are likely to be refused as sheared plate producers are not allowed to consider anything under A-1-k. Most platemakers carried over into March tonnage allocated for February delivery.

PLATE CONTRACTS PENDING

500 tons, 1,000,000-gallon reservoir and 250,000-gallon elevated steel tank, Florida Keys Aqueduct commission, contract 2, Key West, Fla.; bids in.

100 tons or more, 10,000-barrel fuel oil tank for Tacoma power plant; Birchfield Inc., Tacoma, low at \$9630.

Unstated, penstocks and other equipment, second Nisqually power plant; bids to Board of Contracts and Awards, Tacoma, March 23.

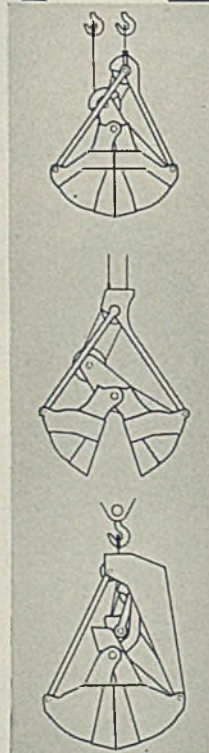


Handling FERROMANGANESE from cars to stock pile this Blaw-Knox Bucket unloads an average of 7 cars per eight hour shift. The former cost of \$.65 per ton was reduced to \$.25 per ton.

This bucket handles LIMESTONE in pieces ranging from 6" to 12" from dock to 50-60 ton gondola, filling car in an average time of 20 minutes.

It unloads SPIEGEL from 50-60 ton car in 1½ hours without teeth, and handles PIG IRON from stock pile at the rate of about ¾ Cu. Yds. per grab.

Blaw-Knox Buckets are designed to meet Steel Mill requirements—put your bucket problems up to Blaw-Knox.



BLAW-KNOX DIVISION
OF BLAW-KNOX CO.
Farmers Bank Bldg. Pittsburgh, Pa.

Digging and Rehandling **BUCKETS**

Pipe

Pipe Prices, Page 111

War work contracted by cast iron pipe foundries includes shells and practice bombs, production of these being large in the South. Cast pipe work scheduled for the next few weeks is mainly on A-1-a rating and little tonnage is on books much under this level. Demand is heavy but contains little municipal work, deliveries on the latter being uncertain. On an inquiry for 13,000 tons for New York City an A-10 rating was assigned, which does not promise early delivery.

Orders for alloy tubing for aircraft are being more widely distributed, easing pressure on some mills. Total volume being allocated leaves little for consumers without high ratings and deliveries are somewhat more extended. Steel pipe for industrial needs is in good demand, lap-weld moving better than black. Plumbing and heating requirements are slower but several large housing projects require large tonnages.

STEEL PIPE PENDING

Unstated, large army projects in Pacific area; bids to United States engineer, Portland, Ore.

CAST PIPE PENDING

600 tons, 6 to 16-inch, bell and spigot, Bolling Field, D. C.; bids in.

Bars

Bar Prices, Page 111

Demand for alloy and carbon steel bars for war requirements is heavy, regular customers placing orders for many times normal volume and other consumers appearing as bar buyers for the first time. Cold-finished needs are heavy for screw machine and lathe work. Forward buying is heavy on all finishes, including material for alloy forgings, at price effective at time of delivery, after March 31, but not in excess of prevailing OPA ceiling at time of shipment.

Practically all bar buying and orders now on books are covered by ratings in the A group. Only two mills bid on the entire lot of

3758 tons of nickel steel hot-rolled round bars for dielock chain cable for an eastern navy yard. Republic Steel Corp., Cleveland, was low on 2500 tons at \$260,763.08, delivered, and Carnegie-Illinois Steel Corp., Pittsburgh, was low on 1258 tons at \$102,854.06, delivered. Youngstown Sheet & Tube Co. and Crucible Steel Co. of America also bid.

Hot carbon bars are still available in seven to eight weeks on A-1-a priorities, although some producers have little to offer under 10 weeks. Hot alloy bars have been reported as being offered in 11 weeks by one mill on such priorities, with an additional three months, however, where the bars are subject to special heat treatment. Compared with several months ago there is general improvement in deliveries of alloy bars for war work, due, some believe, to the more exacting regulations for protecting supply for such requirements.

Allocation of hot-rolled bars to cold drawers, scheduled for April 1, again has been postponed, no definite date being set. It is believed it may not be put into effect for at least three months. Reasons for delay are not known.

Wire

Wire Prices, Page 111

Bookings and shipments of wire and wire products continue to rise in priority. New tonnage, notably specialties, is in excess of deliveries. Most business being booked is at A-3 rating or higher.

Some finishing mills are operating seven-day schedules, especially in heat-treating departments. An eastern mill has ordered additional gas-fired heat treating equipment, to be in operation by June.

Wire rod supplies are limited, alloys being tightest, with the trend toward greater volume.

Rails, Cars

Truck Material Prices, Page 111

Freight car awards in February totaled 11,725 units, the largest number since June, 1941, when 32,749 were bought. Total for two months this year is 15,978, compared with 20,667 in the same period a year ago.

	1942	1941	1940	1939
Jan.....	4,253	15,169	360	3
Feb.....	11,725	5,508	1,147	2,259
2 mos. ...	15,978	20,667	1,507	2,262
March.....		8,074	3,104	800
April.....		14,645	2,077	3,095
May.....		18,630	2,010	2,051
June.....		32,749	7,475	1,324
July.....		6,459	5,846	110
Aug.....		2,668	7,525	2,814
Sept.....		4,470	9,735	23,000
Oct.....		2,499	12,195	19,634
Nov.....		2,222	8,234	2,650
Dec.....		8,406	7,181	35

Total.. 121,499 66,889 57,775

Heavy locomotive and freight car buying continues as carriers seek to provide facilities for heavy traffic demand. Car builders are operating to the limit of steel supply but current buying has been greater than deliveries, backlogs

TO KEY MEN: Can You Use Sheet Metal Working Data for War Products — and Post-War Plans?

These and other important ordnance buildings are roofed and sided with galvanized corrugated ARMCO Ingot Iron — for long-time weather protection.



Weather protection on a
LONG-TERM LEASE

• "Build 'em fast" counts most these grim days, yet construction engineers are not losing sight of the post-war value of buildings erected now for army ordnance and arms production.

That's why corrugated galvanized ARMCO Ingot Iron is being used for roofing and siding on so many new structures needed for America's victory-drive. Engineers are sure of fast, easy erection and long, low-cost service life.

There are other important advantages too—in war or in peace. Metal buildings can be dismantled and erected again on another site. They assure protection against fire and, when grounded, from lightning.

ARMCO Ingot Iron has proved its worth in industrial service. This metal has the longest record of service of any low-cost iron or steel sheets. Installations dating back as far as 1909 are in good condition. Yet galvanized ARMCO Ingot Iron, with all its durability, costs *only about 1c a pound more than ordinary galvanized steel.*

If you are designing or constructing buildings for war production write for complete information about galvanized ARMCO Ingot Iron*. We'll give you proof of its long life and low maintenance cost. The American Rolling Mill Company, 811 Curtis Street, Middletown, Ohio.

*For immediate painting and long paint life ask about galvanized ARMCO Ingot Iron PAINTGRIP.

A LABEL KNOWN TO MILLIONS



being extended. Some use of wood instead of steel is of slight assistance and larger utilization is planned.

Union Pacific has placed 30 large high-speed freight locomotives, in addition to 20 of the same type on which deliveries are now being made.

CAR ORDERS PLACED

Chicago, Rock Island & Pacific, 650 freight cars; 350 fifty-ton auto box cars to Pressed Steel Car Co., Pittsburgh, and 300 fifty-ton flat cars to its own shops.

CAR ORDERS PENDING

Denver & Rio Grande Western, 1500 freight cars; 1000 seventy-ton drop-door, 450 fifty-ton flat-bottom and 50

seventy-ton drop-end mill type gondolas, bids asked.

Treasury Department, 1000 thirty-ton flat cars, reported contemplated for export to Australia.

LOCOMOTIVES PLACED

Union Pacific, 30 high-speed 4-6-4-type freight locomotives, to American Locomotive Co., New York; in addition to 20 of the same type now being delivered.

BUSES BOOKED

Twin Coach Co., Kent, O.: Twenty-one 44-passenger for Surface Transportation Co., New York; fifteen 35-passenger and five 29-passenger for Milwaukee Electric Railway & Transport Co., Milwaukee; ten 35-passenger for Akron Transportation Co., Akron, O.; seven 27-passenger for Georgia Power Co., Atlanta, Ga.; five 27-passenger

for Ohio Rapid Transit Co., Newark, O.; four 31-passenger for Bremerton-Charleston Transportation Co., Bremerton, Wash.; four 31-passenger for Birmingham Electric Co., Birmingham, Ala.; three 23-passenger for Springfield Gas & Electric Co., Springfield, Mo.; two 35-passenger for Schenectady, N. Y.

Structural Shapes

Structural Shape Prices, Page 111

Structural steel demand is increasing as additional war plants come out. These include extensions to shipbuilding plants and expansion in the TNT program. Two Boston engineering firms have contracts for at least three units in various parts of the country. These will also require large quantities of plates for tanks and pipe. Plain material for ship construction is also in great demand. Other war projects now being planned include gasoline refineries and synthetic rubber plants. Several additional airplane hangars have been awarded recently.

SHAPE CONTRACTS PLACED

2800 tons, extrusion plant, Extruded Metals Defense Corp., to Whitehead & Kales Co., Detroit.

2400 tons machine shop addition for Navy, to Bethlehem Steel Co., Seattle; General Construction Co., Seattle, contractor.

2300 tons, aluminum extrusion plant, Bohn Aluminum & Brass Corp., to Midland Structural Steel Co., Cicero, Ill. (to be fabricated by Four V Structural Steel Companies, Chicago.)

2000 tons, aluminum extrusion plant, Bohn Aluminum & Brass Corp., to Midland Structural Steel Co., Cicero, Ill. (to be fabricated by Four V Structural Steel Companies, Chicago); Krieghoff Co., Detroit, contractor.

1650 tons, state bridge, Black river, Essex, Md., to Bethlehem Steel Co., through Melwood Construction Co., New York, contractor.

1380 tons, fitting out pier, navy yard, to Bethlehem Steel Co., Bethlehem, Pa.; Sanders Engineering Co., Portland, Me., contractor.

1225 tons, Spokane street overcrossing, Seattle, for state, to Pacific Car & Foundry Co., Seattle.

700 tons, warehouse, Pontiac, Mich., Yellow Coach & Mfg. Division, General Motors Corp., to Duffin Iron Co., Chicago (to be fabricated by Four V Structural Steel Companies, Chicago.)

600 tons, two aeronautical equipment plants, Electric Auto-Lite Co., Toledo, O., to Bethlehem Steel Co., Bethlehem, Pa.

530 tons, tantalum carbide plant, for Tantalum Defense Corp., subsidiary of Fansteel Metallurgical Corp., to Duffin Iron Co., Chicago; (to be fabricated by Four V Structural Steel Companies, Chicago); John Griffiths

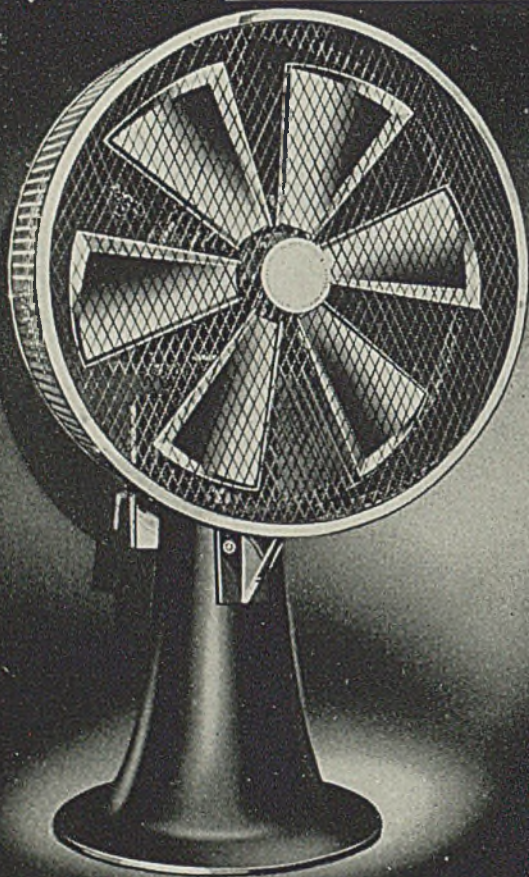
SAVE VALUABLE WORK HOURS

Perkins Man Coolers keep men cool. Comfortable workers produce more. Give them a steady re-circulation of air.

Perkins Man Coolers are made in stationary and oscillating types, both portable.

B. F. PERKINS & SON, INC.

Engineers and Manufacturers
HOLYOKE, MASS.



**PERKINS
MAN COOLERS**

TRADE MARK REGISTERED UNITED STATES PATENT OFFICE

SHAPE AWARDS COMPARED

	Tons
Week ended March 7	16,490
Week ended Feb. 28	28,640
Week ended Feb. 21	14,661
This week, 1941	16,196
Weekly average, 1942	23,077
Weekly average, 1941	27,373
Weekly average, Feb., 1942	26,015
Total, 1941	327,859
Total, 1942	207,695

Includes awards of 100 tons or more.

The Story of the Missing Fastener

■ Slowly the massive hangar doors rolled back and into the early morning mists trundled a gleaming airship of terrific proportions . . . the world's largest bombing plane readied for its final trial flight. Seven times before, this tense moment had occurred in utmost secrecy, but today the field was crowded with military officials, designers, research engineers and brass hats.

In a roped-off area a mechanic stood with other workmen, he heard the four giant motors "rev-up"; saw the "all clear" signal flash from the



. . . not this kind

tower. All four motors thundered and the ship rolled down the runway and into the air . . . then he started to remember. The left landing gear . . . he had re-assembled it yesterday . . . that bolt that fit so snugly . . . had he put it in after he was called away? Oh! sure, Joe inspected the job . . . but did he notice?

Right then, nearly three years of intensive aircraft design and construction, an experiment costing over \$3,000,000 and the pride and hopes of countless men depended . . . not on correct design, accurate construction or safety factors . . . but on the absence or presence of a *single bolt*.

This story is fictional to illustrate the supreme importance and necessity of nuts, bolts and fastenings to aviation and every industry. No other means of fastening will do all of the jobs done by nuts, bolts and rivets.

There is *nothing fictional* about the ability of Oliver Iron and Steel Corporation to produce the metal fasteners you use, dependably, uniformly excellent and promptly for all essential purposes.



& Son Construction Co., Chicago, contractor.

375 tons, initial section armor plate development, to Belmont Iron Works, Philadelphia.

200 tons, shop building, Fitchburg Engineering Co., Fitchburg, Mass., to Haarmann Steel Co., Holyoke, Mass.; J. B. Lowell Co., Worcester, contractor; 25 tons of reinforcing bars to Joseph T. Ryerson & Son Inc., Cambridge, Mass.

125 tons, access road bridges, Stelton, N. J., to American Bridge Co., Pittsburgh; Charles F. Vachris Co., New York, contractor.

105 tons, shop for War Department, to Frank M. Weaver Co., Philadelphia.

100 tons, steel platforms, walkways, supports, stairways and miscellaneous material, armory, to Builders Iron Works, East Boston, Mass.; Eastern Bridge Co., Worcester, awarded contract for erecting crane ways, building 41.

Unstated tonnage, additional shipways and shop facilities, Sun Shipbuilding & Dry Dock Co., to Belmont Iron Works, Philadelphia.

SHAPE CONTRACTS PENDING

27,826 tons, Panama; United States Steel Export Co. only bidder, March 3.

13,000 tons, also 50,000 tons reinforcing bars and miscellaneous steel approaching 100,000 tons, Panama; Sam Rosoff Ltd., New York, awarded contract.

2600 tons, widening Whitestone bridge, New York.

1200 tons, gun shop, eastern location.

1000 tons, General Motors hangar; bids March 5.

1000 tons, navy yard hangar, Golder Construction Co., Philadelphia, general contractor, on fee basis.

830 tons, shed, for army, bids rejected; redesigned for wood construction.

650 tons, craneway and alterations, shop building, General Motors, Linden, N. J.

535 tons, general construction purposes; bids in to Navy.

200 tons, five buildings, Floyd Bennett Field, New York.

150 tons, county hospital, Havre De Grace, Md.; bids March 17.

Unstated tonnage, navy yard forge shop, Thomas S. Gibson, Philadelphia, contractor, on fee basis.

Unstated, two steel girder bridges for Walla Walla, Wash., flood control project; bids to United States engineer, Portland, Oreg., March 11.

Unstated, two tunnels Deschutes Irrigation project, Oregon state; Kern & Kibbe, Portland, contractor, at \$374,000.

Unstated, Nisqually river power project No. 2, for Tacoma, Wash.; bids to Board of Contracts and Awards, March 23.

Unstated, transmission towers Willamette river crossing No. 2; C. J. Montag & Sons, Portland, contractor, at \$98,910, by Bonneville Power Administration.

Reinforcing Bars

Reinforcing Bar Prices, Page 111

Reinforcing demand is increasingly active and deliveries on orders rated below A-3 are being delayed. Limitations on semifinished steel retard capacity operations and lower priority tonnage is being held up. Extensions against contracts placed months ago are frequent, numerous projects taking much more than first estimated. Housing requirements are heavier, with delayed deliveries likely.

REINFORCING STEEL AWARDS

4000 tons, Defense Plant Corp. aluminum

Dunking Improves Strength

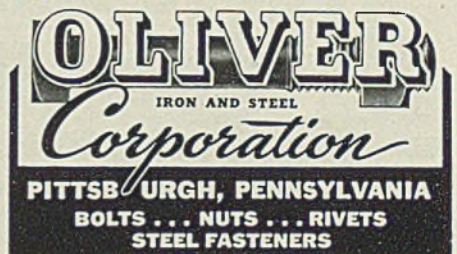
■ We have no accurate statistics as to the relative merits of dunked and undunked doughnuts . . . but we do know that dunking makes a world of difference in the strength of bolts.

As long ago as the days of the renowned Damascus swords, dunking . . . or quenching . . . played an all important role in the heat treating of steel. These keen blades were quenched by thrusting them fiery hot through the thigh of a slave. Through this "baptism in blood" these swords were supposedly endowed with courage and strength beyond all others.



There is no superstition in the modern heat treating of bolts and nuts. Carefully controlled heating cycles and scientific quenching in specially developed quenching fluids give bolts unusual levels of strength, hardness and ductility with better fatigue values. They can be as tough as armor plate, or given a carburized case harder than glass, with a strong, durable core. Other heat treating operations at various stages of manufacture give these fasteners the exact physical properties required for each specific job.

Oliver's heat treating facilities are complete and modernly flexible to produce every physical property required in your fastener specifications. Submit your fastening problems to Oliver for an expert opinion and a prompt solution for any and all War Production metal fastener requirements.



plant in Eastern Washington state, to Bethlehem Steel Co., Seattle.

1350 tons, power plant, Venice, Ill., Unfon Electric Light & Power Co., to Laclede Steel Co., St. Louis.

1000 tons or more, army cantonment in Pacific area, reported placed with Soule Steel Co., Portland.

800 tons, navy torpedo plant, to Joseph T. Ryerson & Son Inc., Chicago; R. C. Wieboldt Co., contractor.

600 tons, machine shop addition for Navy, to Bethlehem Steel Co., Seattle; General Construction Co., Seattle, contractor.

500 tons, defense projects in Northwest, to Northwest Steel Rolling Mills, Seattle.

500 tons, tantalum carbide plant, North Chicago, Ill., for Tantalum Defense Corp., subsidiary of Fansteel Metal-

urgical Corp., to Joseph T. Ryerson & Son Inc., Chicago; John Griffiths & Son Construction Co., Chicago, contractor.

200 tons, general defense projects in Pacific area, to Northwest Steel Rolling Mills, Seattle.

104 tons, addition, Pressed Steel Car Co., Hegewisch, Ill., to Inland Steel Co., Chicago.

REINFORCING STEEL PENDING

4500 tons, powder plant, Hercules Powder Co.; Mason & Hanger Co., New York, contractor; bids March 3.

2000 tons or more, army cantonments in Pacific area; W. C. Smith Inc., L. H. Hoffman, Portland, and Howard S. Wright & Co., Seattle, low for one project.

1500 tons, flood control project, Elmira, N. Y.; bids in.

CONCRETE BARS COMPARED

	Tons
Week ended March 7	9,054
Week ended Feb. 28	2,175
Week ended Feb. 21	3,469
This week, 1941	17,722
Weekly average, 1942	7,621
Weekly average, 1941	13,609
Weekly average, Feb., 1942	3,489
Total, 1941	101,283
Total, 1942	68,586

Includes awards of 100 tons or more.

300 tons, Bybery state hospital; bids March 6.

105 tons, concrete slab bridge on treated timber pile foundations, Spring street-Hog Island, Hull, Mass.; bids March 13, R. W. Coburn, chief engineer, state department of public works, Boston.

Unstated tonnage, federal flood control project, Mt. Holly, N. J.; general contract to Foundations Inc., Morristown, N. J.

Unstated, second Nisqually river power project, Tacoma, Wash.; bids to Board of Contracts and Awards, March 23.

Unstated, two tunnels Deschutes irrigation project, Oregon; to Kern & Kibbe, Portland, low at \$374,000, by Reclamation Bureau.

Pig Iron

Pig Iron Prices, Page 112

March pig iron allocations show a higher average of priorities as the number of A ratings increases and average inventory position recedes. Some tonnage is still being allocated on B ratings but this is growing smaller and request for iron under the low ratings is less. Consumers are making every effort to obtain high priority business and in some cases refuse to quote on B ratings if they can avoid it. Allocation in the B range seems likely to disappear soon.

Deliveries against A-10 ratings probably will be confined in April to maintenance and repair work covered by blanket priority. Shipments on April allocations will reflect 6 per cent higher freight rates.

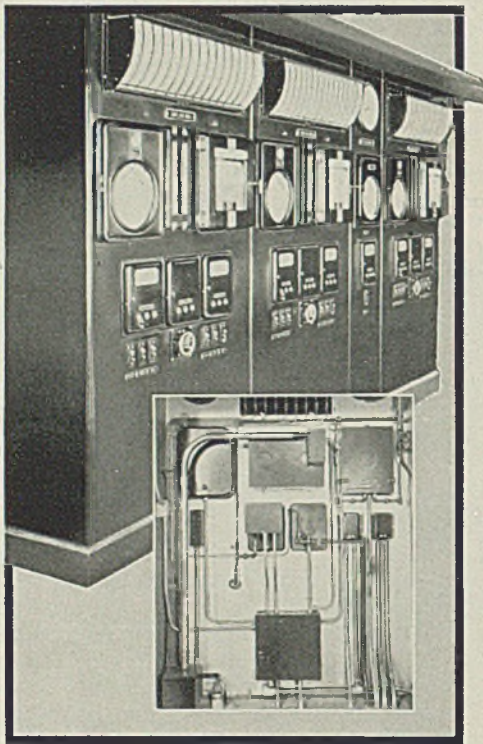
Orders for machine tool castings in New England shops are steadily broadening, shops formerly depending on one or two foundries now spreading requirements among five or six.

Numerous pig iron consumers, particularly foundries have received letters recently from the Compliance Division, WPB, warning against ordering more than they are able to consume. Various companies thus warned have written for further information, pointing out that such overbalancing may occur temporarily in the course of normal allocations and that any accumulation is reflected in the inventory statement.

Aliquippa stack No. 3 of Jones & Laughlin Steel Corp. was out 24 days in February for relining, resuming before the end of the month.

Plans are said to be under way for reopening of the Addyston, O., plant of United States Pipe & Foundry Co. for production of castings for the Navy Department.

Buffalo pig iron producers and others, who have an established



Electric
ALL THE WAY!



Stokers, pulverizers, fans and oil burners are more and more becoming electrically driven. It is entirely logical therefore that an automatic combustion control system be operated electrically. Hays *centralized* control is operated entirely by electricity, employing enclosed mercury switches for the sensitive contacts, thus assuring freedom from trouble due to moisture, dust, dirt and chattering. Electric operation also simplifies installation and maintenance. Adjustments are made direct and are not dependent upon air pressures, oil pressures, and the numerous valve mechanisms made necessary by non-electric designs. When considering automatic combustion control buy for tomorrow—buy electric—buy HAYS.

HAYS Automatic
COMBUSTION CONTROL
THE MODERN SYSTEM—It's Electric!

THE HAYS CORPORATION • • • MICHIGAN CITY, INDIANA

trade in eastern New York and New England and who have to equalize with eastern basing points, will be forced to absorb a substantial proportion of the 6 per cent increase in freight rates, now apparently scheduled for March 18. It is pointed out that while they will be able to benefit from the increase in the rate from the eastern basing point involved to the point of consumption, they will lose more than they gain by having to allow the increase in the freight rate from their own furnaces to the consuming plant, due to the much longer haul usually involved.

Scrap

Scrap Prices, Page 114

Little change is apparent in the steel and iron scrap market, supply being tight and numerous consumers restricting operations because supplies are insufficient to keep all equipment in operation. In some areas slightly better movement is noted, material from automobile wrecking operations beginning to reach melters. Total receipts from this source seem likely to be disappointing and once cleared these yards will not yield a continuing flow.

Scrap supply at Detroit continues to hamper steel production, four of Ford Motor Co.'s ten open hearths being idle, while Great Lakes Steel Corp. maintains 15 of its 16 furnaces. Concentration of shipments to Ford threatens supply to Great Lakes. One automotive plant normally supplying 20,000 tons a month now has only 2000 tons at best. Another automobile plant recently offered 150 cars, nearly all of which was allocated to specific melters.

In many instances railroads are not offering their accumulations, the tonnage to be allocated by government agencies direct to consumers, through designated brokers. Municipal rail removal programs are beginning to increase supply of

rails for foundry use, but cast scrap shows no increase.

Cincinnati scrap consumers who recently made recommendations to Washington for relaxing some rules are awaiting announcement of decision. One end sought was designed to make larger supply of remote scrap available.

Large scale scrapping of old tools, dies, jigs, fixtures, idle machinery, conveyor systems and the like seems certain in view of the long-term scrap outlook.

Heavy snow last week in the Buffalo area practically stopped collection and preparation and melters were dependent on supplies from outside, railroads being able to continue car service.

Greater part of 9000 tons of structural steel scrap from the Atlantic avenue elevated highway, Boston, to be wrecked, is expected to go to a central New England steelworks, to be sold unprepared on the basis of \$12.55, f.o.b., Boston.

Until instructions are received from Washington as to increased freight rates on scrap it seems that shippers will have to absorb the increase on grades quoted on a delivered basis, such as open-hearth and electric furnace steel, while consumers pay the increase on grades quoted on a shipping point basis.

Illinois Central railroad has started an intensive search of its lines and shops to gather all scrap ma-

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for parts needing extreme wear resistance

When long life is an important factor in the selection of parts—when you must have a metal that can "take it"—your designing engineers can specify Ampco Metal with assurance that it will give maximum service life under the toughest conditions.

Ampco Metal is a special alloy series of the aluminum bronze class, available in six alloy variations. Of course, it has high physical properties and unusual tensile strength, but it also has controlled hardness and superior resistance to wear, corrosion and fatigue. It gives many times the service life of ordinary bronzes and is just the metal for that troublesome part that is weak or failing.

Headquarters for Bronzes

When you need a *reliable* source of supply for that government contract—when you need better industrial bronzes for machine parts, submit your problems to Ampco engineers. We make bronzes to government specifications. Literature sent free on request.

AMPCO METAL, INC.

Department 5-3 Milwaukee, Wisconsin

AMPCO LITERATURE Available

- AMPCO METAL, catalogue 22
- Ampcoloy—Industrial Bronzes Catalogue
- Ampco-Trode Coated Aluminum Bronze Welding Rod
- Ampco Metal in Machine Tools
- Ampco Metal in Bushings and Bearings
- Ampco Metal in Dies
- Ampco Metal in Acid-Resistant Service
- Ampco Metal in Aircraft
- Ampco Metal Centrifugal Castings
- Ampco Metal in Heavy Machinery
- Ampco Metal in Gears

AMPCO METAL

The Metal Without An Equal

Tool Steel Scrap

Cents per pound, to consumers
f.o.b. shipping point

Tungsten Types

(For each 1% tungsten contained)

Solid scrap containing over 12% . . .	1.80c
Solid scrap containing 5 to 12% . . .	1.60
Turnings, millings containing over 12%	1.60
Do., 5 to 12%	1.40
Turnings, millings, solids under 5%	1.25

Molybdenum Types

Solid scrap, not less than 7% molybdenum, 0.50 vanadium	12.50
Turnings, millings, same basis	10.50
Solid scrap, not less than 3% molybdenum, 4% tungsten, 1% vanadium	13.50
Turnings, millings, same basis	11.50

Mixed Scrap

(Molybdenum and Tungsten Types)	
Solid scrap, each 1% contained tungsten	1.60
Solid scrap, each 1% molybdenum . . .	.80
Millings, turnings, each 1% tungsten	1.40
Millings, turnings, each 1% molybdenum . . . . .	.70

terial that can not be reused for repair work. From the beginning of the defense program this road has contributed 281,119 tons of scrap iron and steel and 1672 tons of nonferrous scrap.

Warehouse

Warehouse Prices, Page 113

Closer restrictions on supply of steel to warehouses are imposed by amendment No. 3 to order M-21-b, issued by the Director Industry Operations. This provides that houses may not accept delivery of steel in excess of assigned quotas, even though the source is other than a producer. Previous restric-

tion applied only to shipments from producers.

Another change allows warehouses to accumulate ratings above A-9 on deliveries to customers up to a period of 90 days, so that orders may be placed for a minimum commercial quantity. Steel obtained by a warehouse through extension of a rating higher than A-2 may not be delivered to a customer except on an order higher than A-2. Small warehouses are allowed to buy certain products in minimum carload lots, despite restrictions on quarterly deliveries, provided tonnages are not in excess of annual quota.

While turnover of stocks covered by top ratings is high, volume

could be tripled were products available. Replacements are confined largely to material sold on high priorities, which are frequently re-extended, but deliveries are tightening, due to accumulation of high ratings with mills. Plates are most difficult to obtain, with light shapes next. Some distributors are unable to obtain delivery on galvanized sheets, though cold-finished are slightly easier. Small-lot inquiry takes increasingly higher ratings. Chromium or nickel alloy bars are replaceable only on ratings of A-1-j or better.

Pacific Coast

Seattle—Major projects pending in the Pacific Northwest include the Kaiser shipyards, the second Nisqually power plant at Tacoma, the aluminum plant in eastern Washington, proposed expansion of Seattle's Skagit power project and several large army and navy construction jobs.

Four Portland firms have contracts totaling \$800,000 for construction of the shipyard, including offices, administration building, machine, paint, carpenter, sheet metal, electrical shops, rigging loft, etc. This plant is scheduled for completion in 30 days, and will have all modern equipment. Kaiser Company has leased more than 187 acres for the yard, plant to cost \$20,000,000. Application has been filed for four additional ways, making a total of 12. Original contract for 65 10,500-ton Liberty ships is expected to be increased to 89, all to be built by the end of 1943.

Tacoma board of contracts and awards has called bids March 23 for the \$11,000,000 second Nisqually power plant, bids in whole or in four sections for dam and works, tunnels, intake structures, surge tanks, penstocks and powerhouses at Alder and LaGrande. Unstated tonnages of shanes, plates and bars will be required. Bids are called March 16 for steel transmission towers for the double-circuit, 35-mile transmission line. Seattle has applied for federal funds to increase capacity of the Skagit municipal plant.

United States engineer, Portland, has received a low joint bid, said to be about \$2,000,000, from W. C. Smith Inc., L. H. Hoffman, Portland, and Howard S. Wright, Seattle, for an army center involving large quantities of materials. Other similar projects are out for figures and 1000 tons or more of steel pipe is reported placed for one of these jobs.

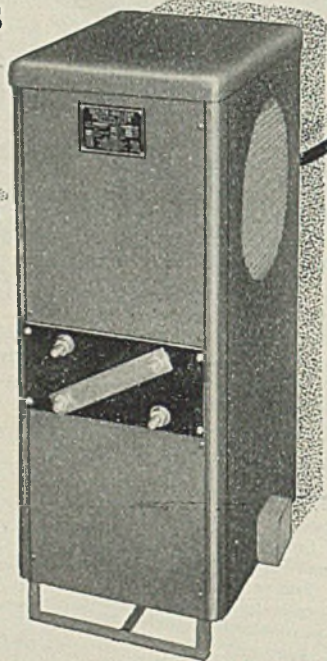
Bethlehem Steel Co., Seattle, has taken 4000 tons of concrete bars for an aluminum plant, 600 tons for a navy yard project, and 2400 tons of shapes for the latter. Soule Steel Co. is reported to have been awarded 1000 tons or more of concrete bars for an army cantonment and Northwest Steel Rolling Mills. Seattle, is furnishing 500 tons of merchant bars and 200 tons of concrete bars for defense work. Bids are in to the navy for 535

The UDYLITE-MALLORY

Rectoplater

FOR ECONOMICAL PLATING AND ANODIZING AMPERES

(IMMEDIATE SHIPMENT!)



Adaptable to Any Plating or Anodizing Process! Produces 1440 amperes at 6 volts or 720 amperes at 12 volts. By grouping in series or parallel, any combinations of current and voltage can be secured.

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Convertible! Should your finishing specifications be changed, Rectoplater groups can be rearranged to meet the revised voltage and current specifications.

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Economical! You will receive a pleasant surprise when you learn the price of the Udylite-Mallory Rectoplater.

Dependable! Built for long, trouble-free service, the Rectoplater is a compact, sturdy source of DC amperes. Has only one moving part. Designed to deliver its rected output continuously. The performance of hundreds of Rectoplaters in many leading industrial plants demonstrates their dependability.

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The Machine You Want! If you are considering plant expansion, you should investigate the Udylite-Mallory Rectoplater. Delivery, price, convertibility—these add up to the best bargain in DC power on the market!

Available Now! Delivery from stock the same day the order is received.

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tons of shapes and United States engineer, Portland, has called tenders March 11 for two steel girder bridges for the Walla Walla, Wash., flood control project.

Both rolling mills and fabricating plants are working under heavy pressure and accepting no additional orders except those essential to the war program. Backlogs are large. The scrap situation continues to give concern, particularly in cast iron, which is especially scarce. All potential sources of supply are being explored.

Canada

Toronto, Ont.—The advance of \$5 per ton on a number of steel materials recently announced by Algoma Steel Corp. Ltd. has not yet been followed by similar action by Steel Co. of Canada Ltd., Hamilton, and Dominion Steel & Coal Corp., Sydney, N. S. The advance in Algoma Steel's prices, however, has resulted in much discussion among steel interests, especially consumers, and at the moment they are unable to give any clear statement as to what the increase will mean with regard to their contracts with the government.

As far as Canadian steel prices are concerned a rather unique situation has developed and buyers are waiting for some pronouncement from the Steel Controller that might give them some idea as to their position with regard to old contracts and the recently advanced prices.

War contracts continue to pour from the Department of Munitions and Supply and manufacturers are maintaining a flow of fresh orders to steel mills well in excess of the latter's production capacity. Imports from the United States also are being increased steadily to meet Canadian war demands. As far as plates and sheets are concerned there has been no change. The government controls all output and mills are accepting only such orders as are approved by the Steel Controller and are delivered under his direction. According to word from Ottawa there will be sharp gain in plate demand within the next couple of months when plants engaged in war tank production start speeding output, and boiler plants, now under construction, are completed and go into production on boilers for Canada's shipbuilding program.

The situation in merchant bars is becoming more serious daily. Inquiries for bars are increasing and mills are making no definite promise regarding delivery.

Minor tapering in sales has developed in the merchant pig iron markets with total orders running to about 8000 tons. The decline, however, was due to shortage of iron rather than falling off in actual requirements. Orders, all going through the Steel Controller, are held to lots of 300 tons or less, while producers are delivering in one to two cars, only to melters engaged on war work and in most

urgent need. Melters primarily engaged in peace-time operations, but with a minority of war business, are able to get deliveries of iron only for their work that is associated with war.

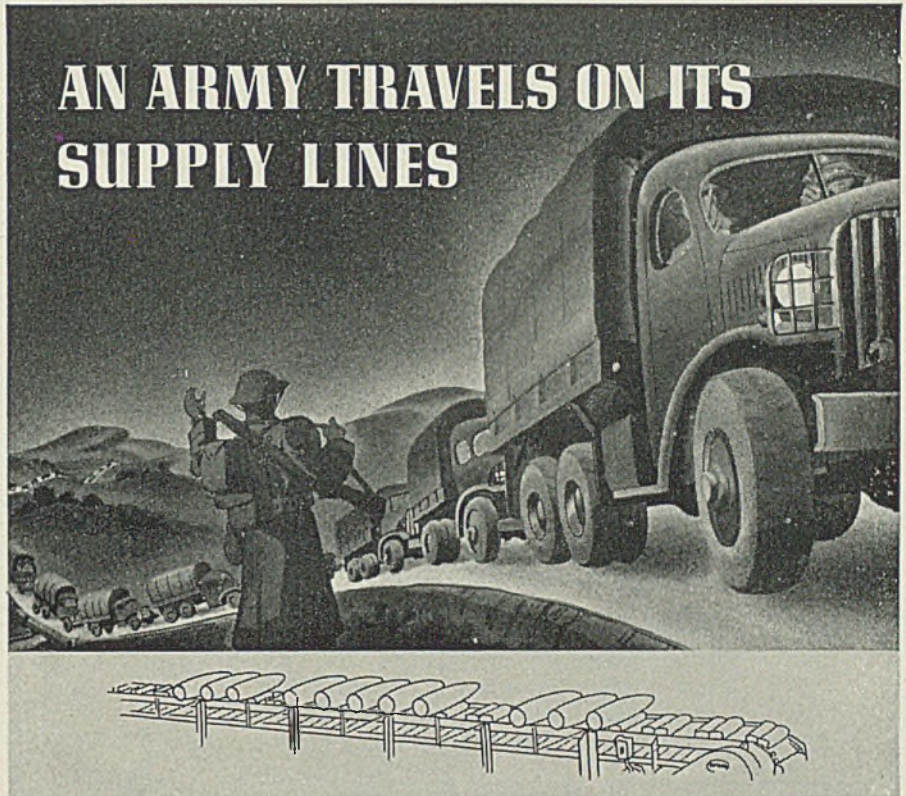
Deliveries of steel scrap to local dealers again show improvement. Some shipments were received from outside sources, although most supplies are from local producers. Automobile wreckers are operating at about 40 per cent of normal production, having to contend with weather conditions but with lack of cars for wrecking the chief factor. Iron scrap materials are appearing in small volume only, with no indication of immediate improvement.

Metallurgical Coke

Coke Prices, Page 111

Shortage of coking coal for beehive ovens continues, although mining facilities on the better quality seams are being pushed. In some instances new operations are being started by independent beehive operators and there is a possibility of increasing coke supply. There is considerable talk of opening new mines in the coking coal area, but little has developed.

Not much action has resulted from the request of WPB that coal users increase inventory, to lessen transportation demands later in the year and to avoid shortages if transportation should be curtailed.



.. SO DOES PRODUCTION

● If a modern army is to attain any measure of success, it must have complete and fast-moving lines of supply backing it to the limit. Likewise, high speed machines turning out shells and guns, planes and tanks, must have supply lines to keep them producing. In America's great plants today where war materials are made, Mathews Conveyers are keeping parts and assemblies flowing to and from machines with speed and control. It's a Mathews job to keep vital material moving.

If you are manufacturing war material, or anything vital to the success of the war effort, you can get Mathews Conveyers to handle that material. Rely as usual on your Mathews Engineer.



MATHEWS CONVEYER CO., ELLWOOD CITY, PENNA.

MATHEWS CONVEYERS FOR MECHANIZED PRODUCTION

Tin Plate

Tin Plate Prices, Page 110

Tin plate production continues at 92 per cent of capacity but a decline is imminent when curtailments have been worked out. New electrolytic lines will take up the slack as they are put in operation.

First signs of output reduction probably will be in small hot mills, which were started recently to help carry the load. No plans have been made to convert these mills to other products but this possibility undoubtedly will be thoroughly examined.

Preference rating has been given

on equipment for electrolytic lines. Delay was met in obtaining priority for rubber but it has been decided the savings in tin more than balance the quantity of rubber.

A problem is lack of proper ratings on black plate for use in untinned cans. Before the can order was issued sheet mills diverted a certain tonnage of black plate for tin mills on the assumption ratings would be issued. Now that ratings have been announced untinned cans have not been covered. Some of these cans will be classed as vital but meanwhile this black plate has no rating and cannot be supplied. Since tin plate has been frozen

plate users who intended to shift to untinned material will have nothing available.

Clarification is needed on the position of packers of nonessential products and their can suppliers in regard to frozen stocks of tin plate now on hand. This probably will be resold to packers who can use it.

Refractories

Refractories Prices, Page 112

Consumers of silica and fire clay brick, like consumers of coal, are being urged by Washington to store up all the supplies they feel able to purchase, so as to relieve a likely congestion of shipping facilities later on. So far action by consumers in this respect is said to be somewhat disappointing, although the movement is undergoing some expansion.

On the other hand, magnesite and magnesite brick are scarce and Washington, therefore, is urging consumers to lay in no more than is absolutely necessary. There apparently is enough to meet all requirements, but certainly not enough to permit any extra accumulation in buyers' stockpiles.

Meanwhile, prices are unchanged, there having been no revision in many weeks. Sellers generally look for no early change, at least not for the next three or four months, unless there is an appreciable increase in cost of labor and fuel. However, they are quoting on the basis of prices ruling at time of delivery.

Iron Ore

Iron Ore Prices, Page 113

Early opening of navigation on the Great Lakes is expected under present weather and ice conditions, probably before April 8, the date of opening last year. Movement of iron ore is expected to be 5,000,000 to 6,000,000 tons more than the 80,116,360 tons moved last year. WPB ore committee has asked 85,000,000 to 90,000,000 tons for the season. Larger ore supply is needed to make up for scrap shortage by providing more pig iron.

Start is being made earlier than usual on putting ships in condition for early trips and the entire fleet will be in action as soon as conditions permit.

Steel in Europe

Foreign Steel Prices, Page 113

London—(By Cable)—Steel ingot output is expanding in Great Britain under pressure for all forms of steel. Demand for shipbuilding material, tank and boiler plates, colliery and railroad material continues intense. Special alloy steels are in increasing demand. The position in scrap is tightening materially.

Ferroalloys

Ferroalloy Prices, Page 112

Ferroalloy prices for second quarter are expected to be announced this week. The trade ex-

BARRELS,
TABLES,

SPECIAL
CABINETS

ROTOBLASTING

speeds work!

No matter how tough the test—how difficult the problem—turn to Pangborn for blast cleaning that is **QUICKER, CHEAPER and BETTER.**

If pushed for production—install airless **ROTOBLASTING**—use it twenty-four hours a day—seven days a week. Pangborn Barrels, Tables and Special Cabinets have stamina and strength—have proven they can take it—**BY CONTINUOUS INCREASED PRODUCTION.**

For speed—for control—for lower cost cleaning—shift gears quickly into **ROTOBLASTING.** Costs have dropped as much as 50%. Production has increased as high as 80%. And quality goes up to the very top.

For quickest possible delivery—place tentative orders **NOW.**



WORLD'S LARGEST MANUFACTURER OF BLAST CLEANING & DUST CONTROL EQUIPMENT

PANGBORN

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pects there will be little or no change in most items in this classification.

Equipment

Boston—Trend toward allocations in machine tool distribution mounts steadily with some shops almost completely on this basis. Bookings are accumulating with a strong wave of orders during the last two weeks. For the bomber and aircraft building program hundreds of tools are being placed through Wright Field, Dayton, O., and heavy purchases are being made by an Eastern Pennsylvania steel company. Additional orders are being placed by manufacturers of bearings, the latter in some instances urging engineers to specify bearings of standard size and tolerance where possible. Machine builders are also streamlining production by temporarily dropping some units and specializing on more active lines. Demand for automatic screw machine equipment is notably heavy and shop backlogs are at an all-time high. Operating three crews 24 hours daily, seven days per week, some shops in the grinding field are producing five times as many tools as under normal pre-emergency schedules. Broader sub-contracting is also a factor in stepping up output, more builders letting out large orders for work who normally sub-let only castings, motors and limited numbers of fixtures.

Seattle—Electric equipment leads the market, public agencies being the leading buyers as private purchasers are unable to get their requirements. Dealers report stock replacements slow and unsatisfactory many items being unobtainable within reasonable time. Allis-Chalmers Mfg. Co., Milwaukee, will furnish circuit breaker for the Tillamook power station of Bonneville Power Administration, low at \$6926. Bids are in to the same agency for 65,000 feet of copper wire, Contractors Equipment Co., Portland, is low \$16,332, for furnishing a power shovel.

Castings for Anchors

Cast steel anchors for merchant and navy ships are taking large tonnages of castings, current inquiries approximating 8000 tons, of which 1750 tons are for delivery at New England points. Stockless anchors for lend-lease are included in the inquiries.

Bethlehem Report

(Concluded from Page 33)

Navy and Maritime Commission since the first of the year call for the building of 182 more ships.

As a result of steps taken more than a year ago, facilities that more than double Bethlehem's already large capacity for heavy forged products for the Navy are now coming into play. Gun forgings, armor,

shells, ship shafting and torpedo forgings are being turned out at an ever increasing rate.

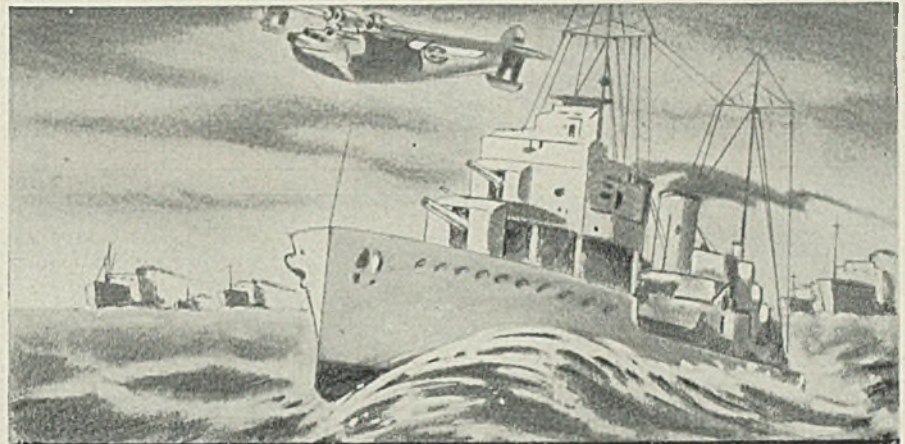
Equipment for making cylinders and other forged parts for airplane motors has kept up with the successively stepped-up airplane production program.

Substantial increases in total pay and rates of pay of employes are reported. Total wages amounted to \$364,354,322 in 1941 as compared with \$212,232,884 in 1940, and average earnings rose from 94.1 cents an hour in 1940 to \$1.07 in 1941. A peak of \$1.13 was reached in the last quar-

ter of 1941.

Social security taxes paid by Bethlehem in 1941 amounted to \$13,733,000. These were in addition to pension disbursements of \$797,000, the cost of vacations with pay, amounting to \$4,200,000 and other measures for the advancement of the general welfare and security of employes. The relief plan for Bethlehem employes distributed \$1,003,790 in disability benefits and \$921,351 was paid in death benefits.

For statement of Bethlehem's earnings, taxes and dividends, see STEEL, Feb. 2, page 21.



JESSOP WASHINGTON
STRAIGHT CARBON TOOL STEEL

"First Consideration"
IN TIME OF WAR

• Jessop WASHINGTON contains no tungsten, nickel, chromium, or other strategic alloys—therefore, deserves first consideration for tool and die applications while the nation is at war. Since carbon is the only alloying element present, the production of WASHINGTON is entirely independent of foreign sources of supply.

Unless an alloy steel is necessary, you can help conserve our imported alloys—and at the same time reduce your tool steel costs—by specifying Jessop WASHINGTON water hardening tool steels for your tool and die applications. WASHINGTON is our highest quality carbon tool steel and is very carefully processed to insure maximum productivity. Send for our descriptive Bulletin 142.

JESSOP STEEL COMPANY
General Offices
WASHINGTON, PENNA., U. S. A.



JESSOP STEELS FOR AMERICA AND HER ALLIES

CARBON · HIGH SPEED · SPECIAL ALLOY · STAINLESS · COMPOSITE STEELS

Dravo Receives "First All-Navy Navy E"

PITTSBURGH

The first all-navy navy "E" award has been made to an American industry. This award, which differs from the conventional navy "E" pennants, is made when several branches of the navy concur in their citation for meritorious service incidental to the national defense and war effort. The Dravo Corp., Pittsburgh, was so honored last Thursday by the Bureau of Yards and Docks and the Bureau of Ships. The company had previously received the individual navy "E" awards for participation in the naval construction program.

The new award is not a permanent citation, but is subject to review every six months. If at the end of that time operations of the

company indicate a continued performance meriting the excellence award of the navy, the all-navy "E" is re-awarded for another six-month period. A chevron strip is affixed to the flag for every six months of continuous meritorious work done for the navy.

The ceremonies with respect to presentation were participated in by a large number of naval and governmental officials. The award was made by Rear Admiral William Carleton Watts, USN, retired. Lowell Thomas, nationally known radio commentator, acted as master of ceremonies for the program. A welcome on behalf of the County of Allegheny was given by John J. Kane, chairman of the board of commissioners. Congressman James A. Wright, of the thirty-fourth district of Pennsylvania, and Senator James J. Davis of Pennsylvania also spoke. The award was accepted by J. D.

Berg, chairman of the board of Dravo Corp.

Highlight of the affair was the launching of a new submarine chaser, the third of these ships to be launched from the Dravo marine ways under the navy program.

OPA Makes Exception In Magnesite Schedule

War demands for dead-burned grain magnesite, essential in maintenance of basic open-hearth steel and other metallurgical furnaces, necessitating some production at high costs resulted in issuance of Amendment No. 1 to Revised Price Schedule No. 75, permitting some sales at prices higher than the established maximums.

Amendment also permits sellers to add to maximum prices an additional charge when deliveries are made from stock accumulations other than at the point of production; and allows an additional charge to cover incurred costs for packing for export shipments.

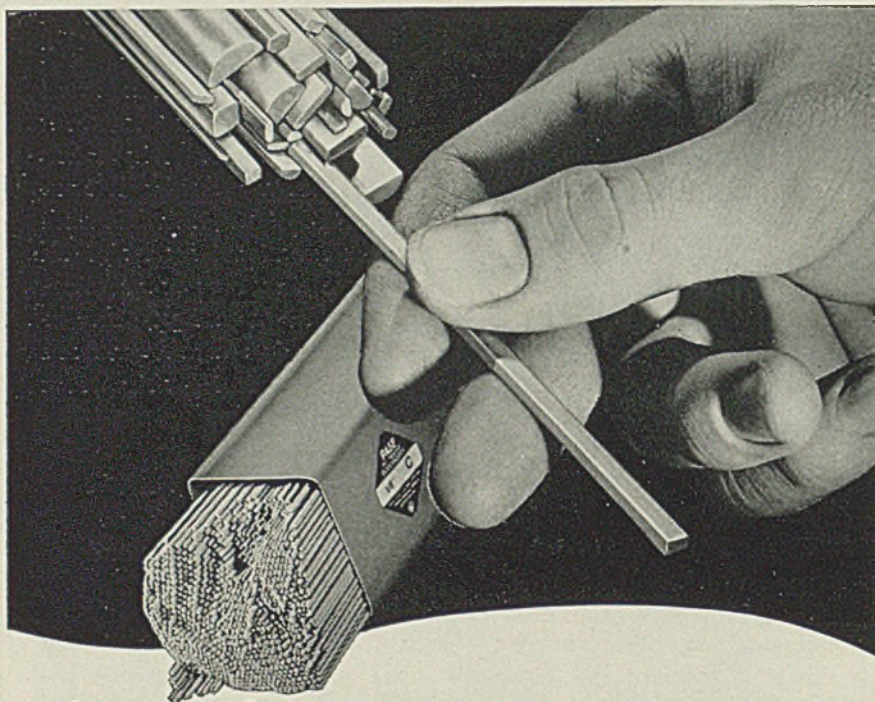
The exception to the maximum price (due to high-cost war production) is for sales by the Westvaco Chlorine Products Corp. from stocks at Permanente, Calif., to its regular customers in that state, the maximum price being set at \$32.00 per ton f.o.b. Chewelah, Wash. Additions for delivered prices and sales in bags or sacks are the same as those set for other domestic sales. A similar exception has already been made for sales by this company from its plant in Patterson, Calif.

The maximum price for other domestic shipments of maintenance grades in bulk remains at \$22.00 per ton f.o.b. Chewelah. A delivered price in excess of the maximum f.o.b. Chewelah price may be charged, consisting of such maximum price plus a transportation charge computed at carload rate from Chewelah to the delivery point designated by the buyer.

When the buyer asks delivery from stocks at some point other than the place of production, a delivered price in excess of the maximum f.o.b. Chewelah price may be charged, consisting of such maximum price plus a transportation charge to the point of accumulation and from such place to the place of delivery designated by the purchaser, and \$1.00 per ton.

A charge of \$4.00 per net ton is permitted for domestic grades in bags or sacks.

The maximum f.a.s. price for export shipments of maintenance grades shall be the maximum price for delivery to the export dock, plus \$7.50 per net ton when the product is packed in double jute sacks, or \$12.50 per ton when packed in wooden barrels.



Here's the WIRE SITUATION

★ Deliveries are controlled by government. PAGE mills are at capacity. As a user of wire, there are things you might do.

SHAPED WIRE. Use a standard shape. Avoid special runs. A wide variety of shapes is available: oval, hex, octagonal, square, channel, keystone, etc.; diameters to 3/4", end section areas to .250 sq. inches.

WELDING ELECTRODES. Conserve. Check with PAGE Distributor. Be sure your rods

are correct in analysis and diameter. Insist that your men do not bend electrodes and that they use each one down to the holder.

GENERAL WIRE. Change in analysis, shape or diameter might improve your position. Check waste. The situation in such products as Spring Wire, Bond Wire, Telephone Wire, etc. is not subject to early improvement.

If PAGE experience can help work out changes, our cooperation is yours.

PAGE STEEL AND WIRE DIVISION • MONESSEN • PENNSYLVANIA

In Business for Your Safety



PAGE for Wire

AMERICAN CHAIN & CABLE COMPANY, Inc.
BRIDGEPORT • CONNECTICUT

Nonferrous Metal Prices

Mar.	Copper			Straits Tin, New York		Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Anti-mony Amer. Spot, N. Y.	Nickel Cathodes
	Electro, del. Conn.	Lake, del. Midwest	Casting, refinery	Spot	Futures						
2-6	12.00	12.12½	11.75	52.00	52.00	6.50	6.35	8.25	15.00	14.00	35.00

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 12.00c Conn. copper

Sheets

Yellow brass (high)	19.48
Copper, hot rolled	20.87
Lead, cut to jobbers	9.75
Zinc, 100 lb. base	13.15

Tubes

High yellow brass	22.23
Seamless copper	21.37

Rods

High yellow brass	15.01
Copper, hot rolled	17.37

Anodes

Copper, untrimmed	18.12
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Wire

Yellow brass (high)	19.73
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OLD METALS

Dealers' Buying Prices

No. 1 Composition Red Brass

New York	9.50
Cleveland	9.25-9.50
Chicago	9.50
St. Louis	9.50

Heavy Copper and Wire

New York, No. 1	10.00
Cleveland, No. 1	10.00
Chicago, No. 1	10.00
St. Louis	10.00

Nonferrous Metals

New York—New maximum price schedule for copper and copper alloy scrap, other than brass mill scrap, became effective March 27. Other important OPA developments included the authorization for Harshaw Chemical Co. to pay 11.25c a pound for special purpose copper scrap, issuance of the order providing that prices paid by MRC for idle or excessive inventories of aluminum materials will be exempted from provisions of the aluminum scrap price schedule, and that certain contracts for sale of lithopone may be completed at higher than established prices.

Copper—Due to increasing demand for copper for war work, certain essential and other uses must be cut further or eliminated. Some consumers with ratings as high as A-1 have been unable to secure all needed tonnages.

Lead—Total stocks continue to increase, amounting to 106,859 tons as of Feb. 1. WPB still needs to allocate only a small part of domestic production.

Zinc—WPB has lifted requirements for the March pool to the following rates: 50 per cent of December, 1941, production of high grade and special high grade zinc and 40 per cent of all other grades; 20 per cent of December production of lead-free zinc oxide and 10 per cent of leaded zinc oxides. February requirements were 40 per

Lead

New York	5.25-5.60
Cleveland	5.40-5.50
Chicago	5.25-5.60
St. Louis	5.25-5.35

Old Zinc

New York	5.00-5.25
Cleveland	5.25-5.50
St. Louis	4.50-5.00

Aluminum

Old castings	10.50
Segregated borings	8.50
Old sheet	10.50
Clips, pure	9.50

SECONDARY METALS

Brass ingot, 85-5-5-5, l.c.l.	13.25
Standard No. 12 aluminum	14.50



HERE is how you barricade a blaze so it can't spread into other parts of a factory. In open-end booths or drying ovens, in spaces not equipped with fire-proof doors, you spray fire-killing gas across the openings. The gas is carbon dioxide . . . and fire can't pierce this screen.

This is extra fire protection that may be combined with LUX Built-in extinguishing Systems. The LUX screening nozzles aren't meant for extinguishing. They

simply provide a fire-stop. Actual fire extinguishing is handled by LUX Shielded Nozzles within the enclosure. These totally flood the space with LUX carbon dioxide gas, creating an atmosphere in which fire can't live.

If you have an "open-end" fire hazard in your plant, you can use LUX screening nozzles to knock flames back. Then, in a front-and-rear pincers, quickly overwhelm the blaze in a blast of carbon dioxide snow-and-gas.

ENGINEERING FACTS—LUX Screening Nozzles are used in pairs, opposed in position, laterally. One set of nozzles aims carbon dioxide gas directly across opening, cuts off inrush of air. Second set aims at an inward angle, to dilute oxygen which may penetrate the first screen.



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Heavy "Fluid-Fusion" Welded Vessels made at the Sharon plant of General American Transportation Corporation get their *baptism of fire* in a huge car-type annealing furnace. Oil-fired under automatic temperature control which varies less than 10° at 1100° to 1200° F., this heat treatment effectively relieves stresses of all types. G. A. Pressure Vessels pass the most critical tests without a quiver. They make good because they are *made right*.



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cent for all types of zinc and 10 per cent for zinc oxides.

Tin—Conservation measures have allowed interests in this country to maintain their supplies at a high level, being only slightly below the Dec. 7 total. MRC continues to sell small lots at the 52-cent base price.

Canada will require 500,000 more tons of iron and steel scrap than will be available from regular sources in 1942, according to estimates by Harry Lewis, Toronto scrap dealer.

Mr. Lewis is advocating the organization of a systematic collection campaign in the Dominion and the development of import sources, particularly in South America.

In 1940, Canada imported 415,981 tons of scrap from the United States.

CONSTRUCTION and ENTERPRISE

Ohio

BRILLIANT, O.—American Gas & Electric Co., Philip Spon, vice president, Thirty-third street, New York, has acquired tract on Ohio river here for erection of power plant.

CLEVELAND—Carey Machine Co., 9600 Cassius avenue, has applied for permission to extend machine shop with an addition 90 x 117 feet. J. Fred Connelly is president.

CLEVELAND—Barth Stamping & Machine Works, John J. Barth, manager, has again applied to city zoning authorities for permission to erect hardening and storage rooms at plant at 3811 West Thirty-fourth street.

CLEVELAND—Austin Co., 16112 Euclid avenue, is in charge of plans for magnesium plant to be erected in north-eastern Ohio. First part of program is well under way.

CLEVELAND—Bishop & Babcock Mfg. Co., 4901 Hamilton avenue, is planning building to house heat treating department at plant on East Fifty-fifth street.

CLEVELAND—National Acme Co., 170 East 131st street, will start work immediately on 80,000-square foot addition to plant. This is in addition to expansion reported in January.

CLEVELAND—Cowles Tool Co., Edward A. Cowles, president, 2086 West 110th street, is considering expansion of office and plant.

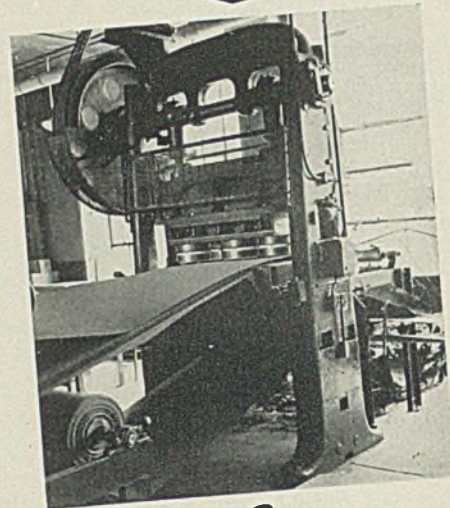
CLEVELAND—Ajax Mfg. Co., 1441 Chardon road, Euclid, O., will add 20,000 square feet to present facilities, estimated to cost \$100,000. John R. Blakeslee is president, and W. W. Criley, general manager.

CLEVELAND—Cleveland Automatic Machine Co., 2269 Ashland road, is continuing enlargement program reported last year, and latest is an addition 46 x 120 feet to building T.

COLUMBUS, O.—Universal Concrete Pipe Corp., Columbus, will establish \$40,000 plant on five-acre tract in Kentucky.

LIMA, O.—Ohio Steel Foundry Co.,

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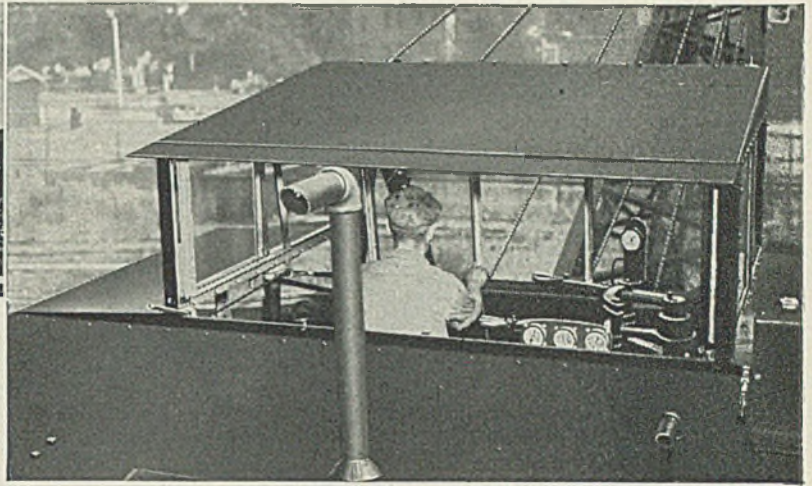
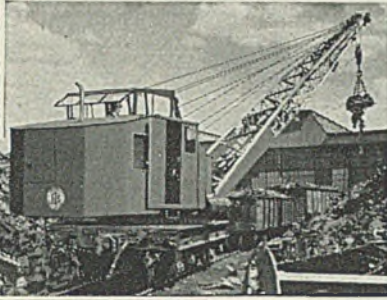


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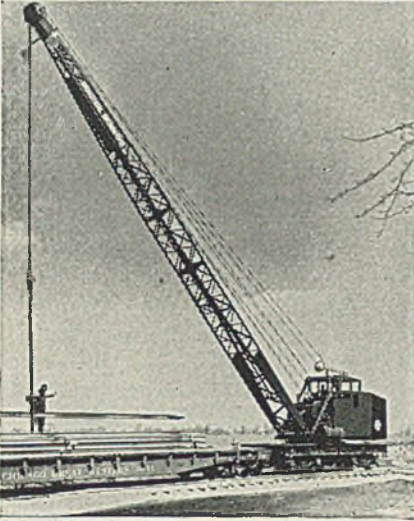
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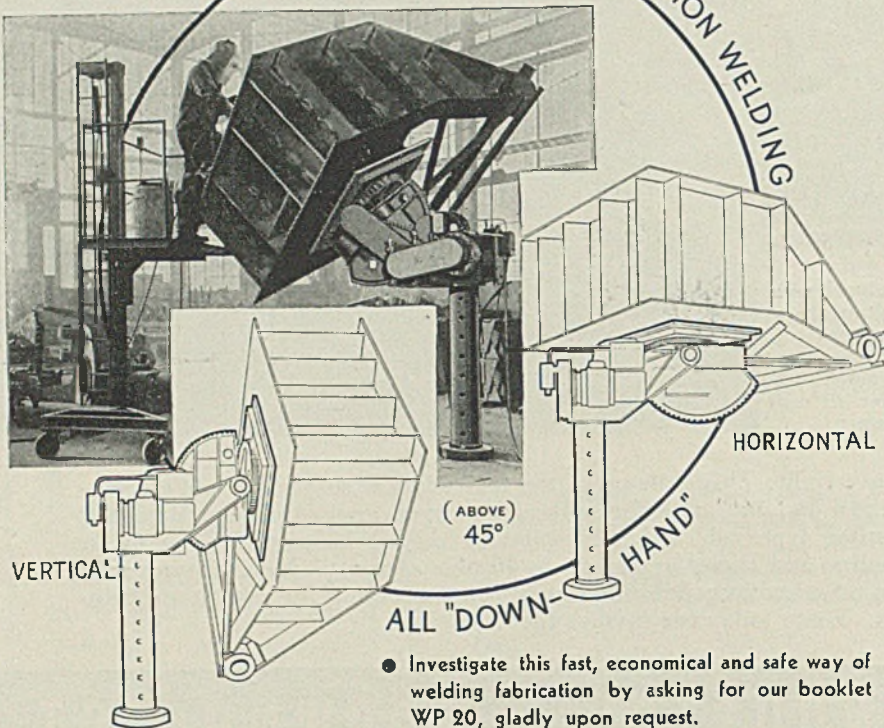
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WORCESTER * MASSACHUSETTS.

NEW YORK — AKRON — DETROIT — CHICAGO — LOS ANGELES — TORONTO

John E. Galvin, president, plans to spend approximately \$13,000,000 for erection of plant, comprising about 12 buildings, including steel casting foundry, heat treating, machine shop, power plant, etc.

MONROEVILLE, O.—Monroeville Co-operative Grain Co., Leo J. Cook, manager, will expand milling facilities with 670-square foot mill building.

TIFFIN, O.—Hanson Clutch & Machine Co. will erect an assembly building adjacent to its plant at cost of about \$8500.

TOLEDO, O.—Defense Plant Corp. has allocated \$7,200,000 for plant here to be operated by Lyeoming Motors Corp.

Connecticut

BRIDGEPORT, CONN.—Singer Mfg. Co. has contracted for erection of two-story warehouse and showroom, estimated to cost \$90,000.

BRIDGEPORT, CONN. — Dictaphone Corp. has plans for one-story addition, 60 x 200 feet. Estimated cost \$60,000, with equipment.

NAUGATUCK, CONN. — An aniline manufacturing unit is to be erected here at the United States Rubber Co. plant.

NEW HAVEN, CONN.—Wire Rope Corp. of America Inc. has approved plans for two-story addition, 105 x 150 feet. Estimated cost \$75,000.

NORWALK, CONN.—Extruded Plastics Co. will begin construction soon of one-story addition, 25 x 125 feet. Cost \$50,000, with equipment.

PORTLAND, CONN.—Portland Foundry is building 40 x 90-foot addition to its main plant here.

Massachusetts

CHICOPEE FALLS, MASS.—Chicopee Mfg. Corp. has begun construction of one-story addition, 43 x 48 feet. Estimated cost, including alterations and improvements in existing building, \$25,000.

SPRINGFIELD, MASS.—American Saw & Mfg. Co. has awarded contract for erection of addition, estimated to cost over \$14,000.

SPRINGFIELD, MASS. — Gilbert & Barker Mfg. Co. will build three-story addition, 70 x 115 feet.

Rhode Island

PAWTUCKET, R. I.—Davis-Jones Wire Co. will build three one-story additions, estimated to cost \$60,000.

New Jersey

NEWARK, N. J.—To expand its facilities, Muller Sheet Metal Works, Newark, has purchased a one-story factory building at 836 Lafayette street.

NEWARK, N. J.—Sheet Metal Products Co., Newark, has leased a one-story building on Congers street, Bloomfield, N. J.

Pennsylvania

EASTON, PA.—Lehigh Foundry Co., Frank E. Shumann, president, sustained damage by fire to its plant here.

SHALER TOWNSHIP, PA.—Plans are being completed and bids will be taken early this month for two additions to waterworks here. Estimated cost \$50,000. Chester Engineers, 210 East Parkway, N.S., Pittsburgh, engineers.

Michigan

DETROIT—Active Industrial Engineering Co., 12917 Jefferson avenue East, has been incorporated with \$10,000 capital, to design and process tools. Cor-



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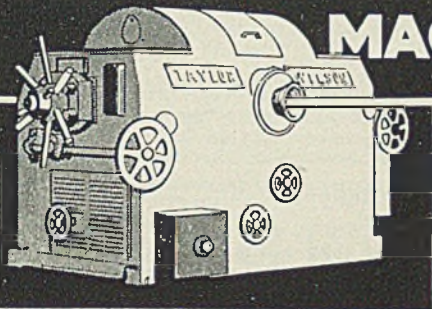
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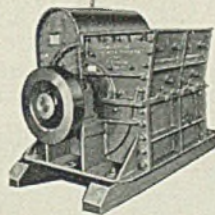
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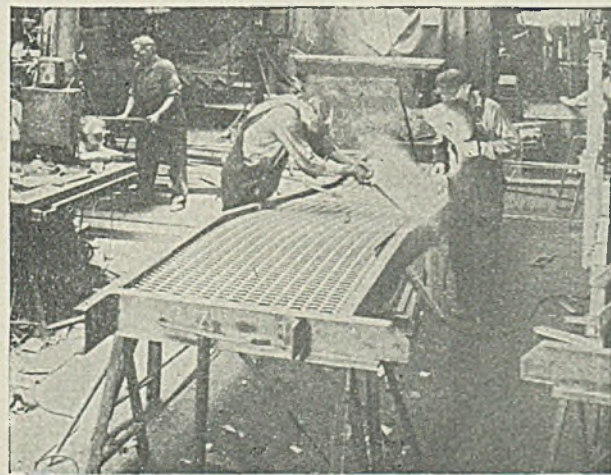
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respondent: J. Fred Edgar, 12917 East Jefferson avenue.

DETROIT—Walcott Machinery Co., 430 Buhl building, has been organized with \$250,000 capital to manufacture machinery products. Gust Dahlen, 12134 Minden street, correspondent.

GRAND RAPIDS, MICH.—Bids are being asked for construction of an addition to the plant of the Grand Rapids Stamping Division of the General Motors Corp., the new unit to be 65 x 100 feet.

GRAND RAPIDS, MICH.—Haviland Products Co. has plans for a \$25,000 office and manufacturing building. H. B. Rohloff, Grand Rapids, has been awarded contract.

HILLSDALE, MICH.—Hillsdale Tool &

Mfg. Co. has been granted permission to build a 40 x 64-foot addition to its plant.

HILLSDALE, MICH.—Hillsdale Foundry Co. will build a 40 x 40-foot addition to its plant.

JACKSON, MICH.—H. R. Graf, Jackson architect, is taking figures for shop addition to factory of Industrial Automatic Co., Jackson.

LANSING, MICH.—Granger Bros., Lansing, have been awarded contract for an addition and alterations to factory building here for Nash-Kelvinator Corp. (Noted March 2).

LUDINGTON, MICH.—Austin Co., Detroit, has contract for construction of chemical plant here for Dow Magnesium

Corp., an affiliate of Dow Chemical Co., Midland, Mich. (Noted March 2).

PORT HURON, MICH.—Mueller Brass Co. has awarded contract to Austin Co., Detroit, for office building and factory addition, estimated to cost \$139,000.

SAGINAW, MICH.—Spence Bros., Saginaw, have contract for addition to plant of Wickes Bros., Saginaw. (Noted Feb. 16).

TECUMSEH, MICH.—James Kramer, Hudson, Mich., has acquired the H. Brewer & Co. plant and equipment here, and will convert the plant for defense work.

WYANDOTTE, MICH.—Pennsylvania Salt Mfg. Co. has awarded contract to F. H. Martin Construction Co., Detroit for an ammonia plant here.

YPSILANTI, MICH.—R. S. Gerganoff, Ypsilanti architect, is taking figures for construction of addition to plant of Motor State Products Co., Ypsilanti.

Illinois

CHICAGO—Stewart-Warner Corp., Diverser at Wolcott, will be the operating lessee for a \$20,000,000 ordnance works for the War Department, to be financed by Defense Plant Corp.

KEWANEE, ILL.—Walworth Co., Kewanee, is building a plant near St. Louis, covering 16 acres, for the manufacture of steel valves and fittings.

PEORIA, ILL.—R. G. LeTourneau Inc., R. G. LeTourneau, president, is considering establishment of iron plant, to include blast furnaces and open hearths for processing deposits of iron ore.

PLANO, ILL.—West Specialty Co. recently sustained severe damage by fire to its foundry, core, cleaning and cupola housing rooms. Work of rebuilding will begin soon.

ROCK ISLAND, ILL.—Construction will start soon on an ordnance plant for the War Department to be located in the Middle West. General engineering supervision will be the United States engineer for the Rock Island district. Hazelet & Erdel, Chicago, architects and engineers. J. L. Simmons Co. Inc., Decatur, Ill., general contractor.

SPRINGFIELD, ILL.—I. F. Loucks & Co., Seattle, is reported to be planning construction of a soybean processing plant somewhere in Illinois, estimated cost of which is \$3,000,000.

Mississippi

JACKSON, MISS.—W. G. Avery Body Works has acquired building on Ricks street which it will convert into box manufacturing plant.

Tennessee

MANCHESTER, TENN.—City, Thomas A. Johnson, plans \$51,000 extension to waterworks; will build filtration plant. Walter L. Picton, engineer, 711 American Bank building, Nashville, Tenn.

Louisiana

HOUMA, LA.—City will take bids March 26 for furnishing and installing internal combustion engine-driven generating unit and equipment and also extension of present power plant building.

West Virginia

HINTON, W. VA.—United States engineer office, Huntington, W. Va., will take bids March 12 for furnishing labor and materials and designing, furnishing and delivering two turbines with accessories and two sets of governing equipment for Bluestone dam power plant. (Noted Jan. 10.)

HUNTINGTON, W. VA.—Huntington Industrial Corp., B. C. McGinnis, chair-

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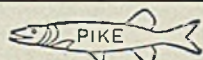
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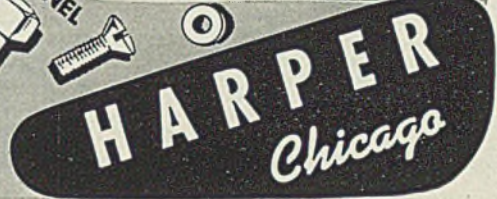
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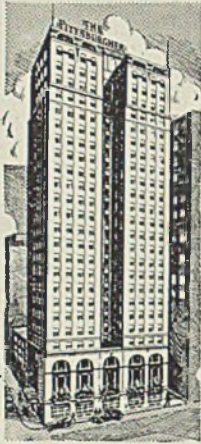
man of building committee, will soon call bids for plant on Washington street, to be operated by Huntington Precision Corp., eastern branch of Adel Precision Corp., Burbank, Calif. Robert S. Kilgore, 301 Eighth street, Huntington, will supervise construction.

Missouri

VALLEY PARK, MO.—City, Theodore R. Reifling, mayor, plans sanitary sewer extension; has DPW grant of \$25,370. Caldwell Engineering Co., Jacksonville, Ill., engineer.

Wisconsin

WAUNAKEE, WIS. — Waunakee Canning Co. has awarded contracts for construction of one-story plant addition here, 100 x 200 feet, to cost more than \$50,000, with equipment.



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Joseph F. Duddy, Manager

Texas

EL CAMPO, TEX.—City, J. S. Carroll, mayor, has DPW grant of \$40,000 for improvements to sewage disposal system, estimated to cost \$95,000. J. H. Wilkins, Bay City, Tex., consulting engineer.

EL PASO, TEX.—Headman-Ferguson & Carello, engineers, P.O. Box 375, El Paso, will have plans completed in about six weeks for extension of sewage disposal system.

GOOSE CREEK, TEX.—City, J. H. Meek, mayor, will soon call bids for waterworks improvements, including elevated tank, to cost \$124,582. Charles P. Smith, Orange, Tex., consulting engineer.

HOUSTON, TEX.—City, J. C. McVea, water department director, will soon call bids for drilling an additional water well and installing two pumps and motor. Estimated cost \$45,000.

MART, TEX.—City, C. Roy Chambers, mayor, has plans in progress for sewer and waterworks improvements; \$90,000 bonds available. Koch & Fowler, engineers, Great National Life building, Dallas, Tex.

ROCKPORT, TEX.—City, J. E. Moore, mayor, has DPW grant of \$65,000 for sewer system and disposal plant. M. C. St. John, engineer, 4101 Polk avenue, Houston, Tex.

VICTORIA, TEX.—City, Ben T. Jordan, mayor, plans waterworks improvements, costing approximately \$59,000. E. F. Miles, engineer.

Iowa

SPENCER, IOWA—Wagg Battery Mfg. Co., Wapello, Iowa, has started erection of factory here.

California

LOS ANGELES—Clary Multiplier Corp. will erect an addition 108 x 150 feet to its factory at 1524 North Main street.

LOS ANGELES—An addition to the machine shop of General Machine Works, 48 x 66 feet, is being erected at 3022 San Fernando road.

LOS ANGELES—Bechtel-McGone-Parsons Corp., 601 West Fifth street, has been awarded contract to design and erect three synthetic rubber plants in the Los Angeles area for the Kaiser Co., 1552 Latham Square building, Oakland, Calif. Loan of \$25,000,000 has been approved by RFC.

Washington

SEATTLE—Parker & Hill, engineers, are preparing plans for proposed \$60,000 water and sewer system at Keyport, Wash.

SPOKANE, WASH.—Columbia Metals Corp. has been organized with \$100,000 capital by J. O. Gallagher and associates, care of Graves, Kizer & Graves, Old National Bank building.

TACOMA, WASH.—National Blower & Sheet Metal Co. has been incorporated with \$45,000 by Robert H. Colman and associates, Washington building, to manufacture and deal in sheet metal and allied materials.

Canada

VANCOUVER, B. C.—Vancouver Iron Works Ltd., 1155 West Sixth street, W. T. Fraser, manager, has completed plans and will place contracts soon for plant addition, to cost \$75,000, including equipment.

BRANTFORD, ONT.—Cockshutt Plow Co. Ltd., Mohawk street, is having plans prepared for another addition to plant to cost, with equipment, about \$45,000. W. J. Phillips is manager.

HAMILTON, ONT.—Dominion Foundries & Steel Ltd., Depew street, has let general contract to Frid Construction Co. Ltd., Terminal building, for construction of one-story universal mill building, 60 x 72 feet.

HAMILTON, ONT.—National Steel Car Corp. Ltd., Kenilworth avenue North, Robert S. Hart, vice president, has given general contract to Frid Construction Co. Ltd., Terminal building, for construction of shell plant. Estimated cost \$300,000, including equipment.

HAMILTON, ONT.—Union Drawn Steel Co. Ltd., 2 Webber street, has let general contract to Pigott Construction Co., 36 James street South, for plant addition to cost about \$50,000. H. M. Sweeney is general manager.

LONDON, ONT.—London Concrete Machinery Co. Ltd., Cabell avenue, plans to start work early in April on plant addition, estimated to cost about \$30,000, with equipment. Henry Pocock is general manager.

ORILLIA, ONT.—Fahralloy Canada Ltd., 25 King street West, Toronto, Ont., Norman F. Parkinson, president, has awarded general contract to C. V. Bennett Construction Ltd., West street, Orillia, for construction of foundry building, to cost \$60,000, with equipment.

RENFREW, ONT.—Renfrew Electric & Refrigerator Co. will make repairs to factory recently damaged by fire and erect new plant to cost about \$55,000.

ST. THOMAS, ONT.—Canada Vitrified Products Ltd., J. A. Sutherland, secretary, plans to start work early in May on plant addition to provide additional 10,000 feet of floor space.

TORONTO, ONT.—Aluminum Goods Ltd., 158 Sterling road, has had plans prepared and will call bids soon for construction of plant addition at 4006 Dundas street West, one-story, 50 x 185 feet, costing \$50,000, with equipment.

TORONTO, ONT.—Massey-Harris Co. Ltd., 915 King street West, has let general contract to Walter Davidson & Co., 188 Duke street, for addition and alterations to truck assembly building, to cost, with equipment, about \$50,000.

WELLAND, ONT.—Dominion Oxygen Co. Ltd., 159 Bay street, Toronto, Ont., plans construction of plant on Dain avenue here to cost about \$25,000, with equipment.

WELLAND, ONT.—Page-Hersey Tubes Ltd., 100 Church street, Toronto, has acquired a 35-acre site adjoining its plant here and is considering plant addition.

WINDSOR, ONT.—Chrysler Corp. of Canada Ltd., 300 Tecumseh boulevard East, is having plans prepared by Hutton & Souter, architects, Pigott building, Hamilton, Ont., for another addition to plant here. Estimated cost about \$250,000.

DARTMOUTH, N. S.—Department of Munitions and Supply, Ottawa, H. H. Turnbull, secretary, has awarded general contract to Foundation Maritime Ltd., 1538 Sherbrooke street West, Montreal, for addition to plant here to cost \$160,000. Ross & Macdonald, 1010 St. Catharine street West, Montreal, architects.

MONTREAL, QUE.—R.C.A. Victor Co. Ltd., 976 Lacasse street, is having plans prepared by W. K. Gordon and L. Lyman, architects, 2058 Victoria street, for plant addition to cost about \$40,000.

SHAWINIGAN FALLS, QUE.—Aluminum Co. of Canada Ltd., Sun Life building, Montreal, is having plans prepared by its own staff for large addition to plant here.

THURSO, QUE.—Singer Mfg. Co. is having plans prepared for plant addition to cost about \$85,000, with equipment.

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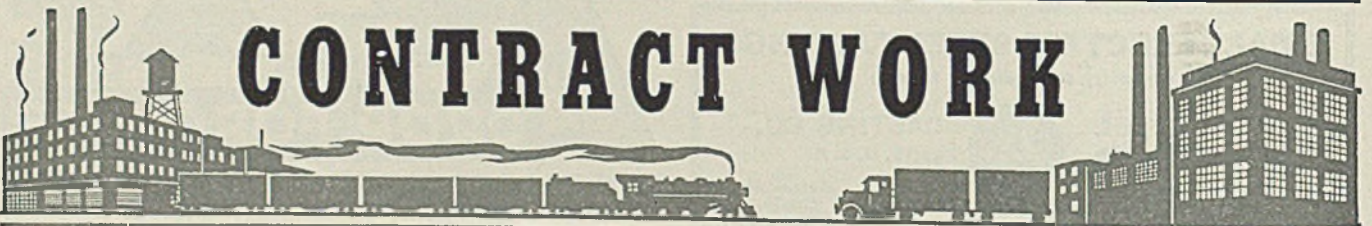
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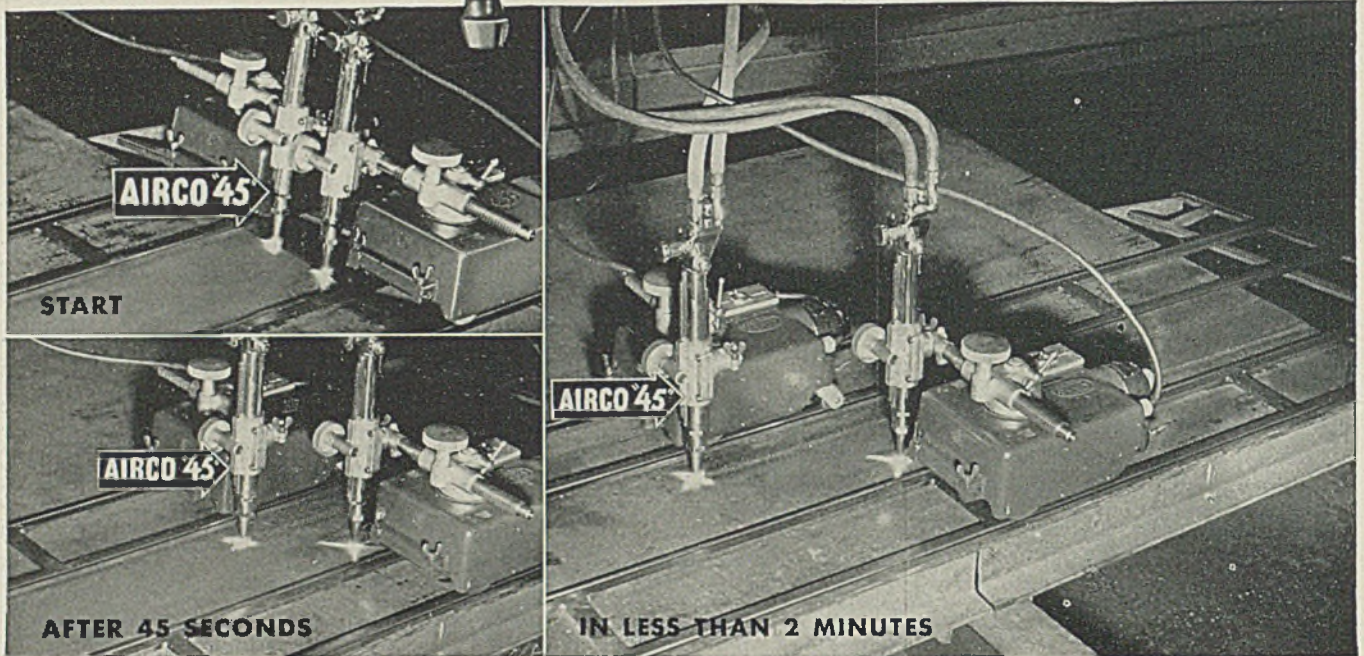
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