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# STEEL

ESTABLISHED 1882

## Contents

Volume 110—No. 15

April 13, 1942

BEHIND THE SCENES WITH STEEL	4
HIGHLIGHTING THIS ISSUE	35
EDITORIAL—Little Things Will Win the War	37
NEWS	
Conversion Pictorial Feature	38
Drastic Regulation "To Change Face of Industry"	42
Stupendous, Tremendous—Words To Describe Detroit Arsenal	44
Priorities—Allocations—Prices	46
Steelworks Operations	47
Stocks of Nineteen Types War Supplies Ordered Restricted	50
WPB Control Over Rolling Stock May Bring Freight Priorities	51
Nationwide "Spring Housecleaning" To Salvage War Materials Asked	51
Large Quantities of Critical War Materials Requisitioned by WPB Unit	52
Ford's Willow Run Bomber Plant Soon to Make "One an Hour"	53
Men of Industry	64
Activities of Steel Users and Makers	67
Forum Hears "Production Will Soar When Americans Feel Hurt of War"	68
New Projects for More Steelmaking Capacity in Canada	69
Sound Film Shows Proper Grinding, Setting of Tools	70
Demonstrate New Method for Melting Down Automobiles	70
Use 598 Sheets of Government Forms for \$40.90 Order	71
Find New Priority Violations Among Thousands of Firms	71
21,000,000 Tons of Steel Made in First Three Months	72
WINDOWS OF WASHINGTON	48
MIRRORS OF MOTORDOM	55
WING TIPS	60
THE BUSINESS TREND	73
TECHNICAL	
Jacks for Aircraft Maintenance and Other Special Work—By Herbert Chase	76
The "Erie Plan" Can Help Every Industrial Community To Get in the Scrap	78
From Automobile To Airplane Engines	84
Mohawk Valley Plan Speeds Production of War Items	87
Seventeen-Roll Universal Machine Straightens Bars and Shapes	107
Progress in Steelmaking	
The Manufacture of High-Quality, Low-Cost Steel—By Paul J. McKimm	88
Joining and Welding	
Evaporator Assemblies Resistance Welded at High Speed with Special Setup	96
Heat Treating	
Principles and Metallurgy of Induction Heating—By Arthur F. Macconochie	102
Materials Handling	
Pickling Capacity Increased by Mechanization of Handling System	108
INDUSTRIAL EQUIPMENT	112
HELPFUL LITERATURE	121
MARKET REPORTS AND PRICES	125
NEW BUSINESS	137
CONSTRUCTION AND ENTERPRISE	142
INDEX TO ADVERTISERS	152

PRODUCTION • PROCESSING • DISTRIBUTION • USE

April 13, 1942

33

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# HIGHLIGHTING

## THIS ISSUE OF

# STEEL

NEVER before has American industry been confronted with so drastic a readjustment period as that which lies immediately ahead by reason of the War Production Board's suspension orders which, in effect, signify virtually complete discontinuance of all consumers' durable goods production within the next three months (p. 42). Courage, resourcefulness and initiative will be required to solve the many problems involved. . . . In the meantime, conversion to war production continues at many plants. STEEL in this issue tells pictorially (pp. 38-41) how a plant normally producing electric fans and motors has been switched over to booster parts for shells. . . . Inspection of a dozen plants at Detroit last week showed (p. 44) that the automobile industry is converting at a tremendous pace.

• • •

Complete substitution of steel for brass in the manufacture of cartridge cases is expected by the fall (p. 123). . . . First quarter output of steel ingots was at an annual rate of slightly more than 84,000,000 net tons (p. 72). The ingot production rate last week (p. 47) advanced one-half point to 98½ per cent of capacity but there continues fear of the effect of the scrap shortage. Plate shipments in March registered an all-time record of 878,726 net tons. . . . A supplier of electrodes reports that he had to use 598 priority extension sheets, weighing 5¼ pounds, to fill an order coming to \$40.90 (p. 71).

### **Brass Yields To Steel**

Hundreds of companies already have acceded to Donald M. Nelson's request for the establishment of joint labor-management committees to expedite production (p. 48); all stocks of copper screening are frozen; two modifications affect the Production Requirements Plan. . . . A new sound film (pp. 37 and 70) explains correct grinding and setting of cutting tools, essential to good performance on machine tools. A revolutionary new method of melting down old automobiles (p. 70) has been demonstrated. . . . Wartime

### **Automobiles Are Melted**

credit problems are analyzed (p. 66). . . . Canada's increased iron and steel capacity is to be further expanded (p. 69). . . . Sheet steel, also silver, may be used in large quantities by the aviation industry (p. 60). . . . New government orders affect industry (pp. 46, 50 and 52). . . . Freight and passenger transportation priorities loom ahead (p. 51). . . . The automobile industry objects to the present rationing system (p. 55).

• • •

The "Erie Plan" for salvaging scrap (p. 78) is serving as a model for a nationwide salvaging campaign fostered by the Bureau of Industrial Conservation of WPB. . .

### **Effective Scrap Salvage Plan**

. . . From automobile to aircraft engines (p. 84) is a conversion that was greatly facilitated at Cadillac by a unique and highly effective system of presenting each step of the job to the workmen, many of whom were new. . . . Paul J. McKimm discusses the general characteristics of steelmaking (p. 88) in this week's section of his series. . . . Evaporator assemblies are resistance welded at high speed (p. 96) in a special production setup employing seven spot welders and two seam welding machines.

• • •

Subcontracting by the "Mohawk Valley Plan" (p. 87) speeds production of war items 55 per cent, advances delivery five months, is widely applicable to other war work.

### **Speeds War Work 55%**

. . . Jacks for aircraft maintenance and other special work involve some unusual designs that are described (p. 76) by Herbert Chase. . . . In a new testing technique (p. 99) parts are spun in a vacuum to produce a graphic record of stresses. . . . Professor Macconochie discusses (p. 102) the principles and metallurgy of induction heating. . . . Pickling capacity is increased by an unusual conveyor system (p. 108) that employs photocell interlocks on conveyor. . . . A 17-roll machine straightens (p. 107) and untwists bars and shapes.



*The L. E. Block, flagship of the Inland fleet, coming into a northern lake port.*

## **Inland's "Warships of Industry" Open Ore Shipping Season Early**

Inland's ore freighters, the "warships of industry," have opened their season earlier than ever this year, for they are beginning a tremendous job.

In this year of 1942, the Inland fleet must transport the largest tonnages in history of ore and coal and limestone from Inland's own mines and quarries to the Inland docks

and mills—Inland must constantly strive to increase its already record-breaking levels of production.

The Inland fleet, prepared through the winter months, sailed this year a full week earlier than in any previous season—in order to assure an ample supply of raw materials for the steel that will provide guns, ammunition and ships needed for Victory.

SHEETS • STRIP • TIN PLATE • BARS • PLATES • FLOOR PLATE • STRUCTURALS • PILING  
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# **INLAND STEEL CO.**

# AS THE EDITOR VIEWS THE NEWS

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## **STEEL**

April 13, 1942

### LITTLE THINGS WILL WIN THE WAR

Slogan-conscious Americans are being bombarded with formulas for victory. One group tells us that "mass production will win the war." Others contend that steel, transportation, money, men or morale will be the decisive factor.

All of these are important, of course. But none of them by itself will bring victory. The war will be won by the cumulative effect of numerous small successes.

For instance, steel output in the first quarter of 1942 totaled 21,038,889 net tons. This is a phenomenal record, yet it is 800,000 tons short of capacity output. During the current quarter, production can be brought closer to capacity if we can gather a little more scrap from farms, industrial plants, automobile graveyards, etc. A little more from many sources may do the trick.

The time lost through accidents to American workers last year was equivalent to the man-hours required to build 20 battleships, 200 destroyers and 1000 heavy bombers. Assume that during April, May and June of this year management and employes could cut the accident rate by 20 per cent. The aggregate effect would be to save production time sufficient to build one battleship, 10 destroyers and 50 bombers.

An interesting sound film entitled "Chips" (see p. 70) is about to be exhibited to machine operators throughout the country. Its sole purpose is to show operators how to grind and set cutters properly for turret lathes, engine lathes, boring mills, etc. If showing this film should increase production by as little as 2 or 3 per cent per machine — think what this would mean in production! Consider also how that increase in output would be equivalent to the installation of hundreds of new machine tools.

A few months ago, an alert manufacturer decided to see what could be done to cut the time he held freight cars on his plant sidetrack for loading and unloading. By giving close attention to this detail, he reduced the average holding time from 50 hours 38 minutes to 29 hours 31 minutes. If all shippers could duplicate this achievement, 3,589,833 freight car trips per year would be saved. This would be equivalent to putting 120,000 new freight cars in service.

Attentiveness to small detail presents a golden opportunity for everyone identified with management and labor. Little things will win the war.

*E. L. Shaner*

Editor-in-Chief



## War-Production

# Bottlenecks Broken

by Brainwork

- Yes, brains are your best bottleneck-breakers for
- Smart, aggressive, persistent selling will get war work for your plant
- Ingenuity and resourcefulness will put you into production quickly

**T**HIS BATTLE of production is so big that there is a place for every manufacturer no matter how small or limited his facilities may be for they can all be utilized at some point in our war effort.

But you say, "We make women's handbags, compacts, toys, clocks, cutlery (or other similar or larger items). How could we help?"

The fact that makers of just those articles listed *are already in war production* shows that it is largely a matter of brains and persistence. For it takes brains to do an aggressive selling job and Uncle Sam is the biggest customer you will ever have to sell.

It takes brains and imagination, too, to use your ingenuity and resourcefulness as effectively as did a midwestern maker of small electric motors and fans who has successfully converted his plant to turn out war weapons NOW when they are needed most. There every executive, engineer and worker is making full use of the "know how" for which American industry is famous in an effort to speed our country's war production.

Do they wait weeks or months for special machines to handle tricky war jobs? No sir! They use existing machines of other plants under subcontracts and improvise tools to convert their own equipment from

peacetime to war work. Largely as a result of these intensely realistic production policies, this company is well on the way to becoming the world's largest producer of power-driven machine gun turrets for our fighting aircraft. Other ordnance items being produced include 20-milimeter shell boosters.

Can brains beat bottlenecks? Yes, indeed! Rather than wait two months for delivery of a machine to burr holes inside the shell boosters, the engineering department built its own machine in 30 hours. This home-made machine (shown in Fig. 2) utilizes a dental burr—exactly the same type of tool that dentists employ. It does the job satisfac-



Fig. 1—Instead of making electric fans and motors, these production facilities have been converted to producing booster parts for 20-millimeter shell. This is only a portion of the shell booster line

Fig. 2—The same type of burr that a dentist uses so effectively to clean cavities in teeth is employed here in a home-made machine that burrs holes on the inside of the shell boosters. Instead of waiting months for a special machine to clear up the production bottleneck at this point, the plant engineers conceived and constructed this unit in only 30 hours. That's the way brains break bottlenecks

Fig. 3—Requiring only 60 hours to build, this home-made machine enables an operator to ream simultaneously two specially located holes in a 20-millimeter shell booster part. It would have required two months to obtain a similar reaming machine on a market jammed with war orders, even with a high priority rating

Fig. 4—Another bottleneck broken by brainwork. To save time in getting into production and permit faster operation, a plant superintendent built this machine which makes possible speedy checking of thread accuracy in contrast to older hand methods. The inventor made the machine out of a base from an electric fan and some pieces of machine steel—and in hours instead of the months that would have elapsed before such a machine could have been purchased on the open market

**Donald M. Nelson says:**

"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 our boys need so desperately are getting into their hands faster and in ever-increasing quantities?"

**Here's how to  
GET WAR WORK!!!**

Survey your facilities—list equipment, types of skilled workmen, products that you already make. (See STEEL, Mar. 16, Page 59) Make this survey as complete as you can.

Go to your nearest War Production Board Contract Field Office (see list in STEEL of Feb. 23, Section Two, Page 21). There you will be placed in contact with opportunities to get prime and subcontracts. But remember, it's up to you to do the selling. Get started NOW and be persistent—so that you not only will help swell war production, but make certain that you will be able to stay in business!

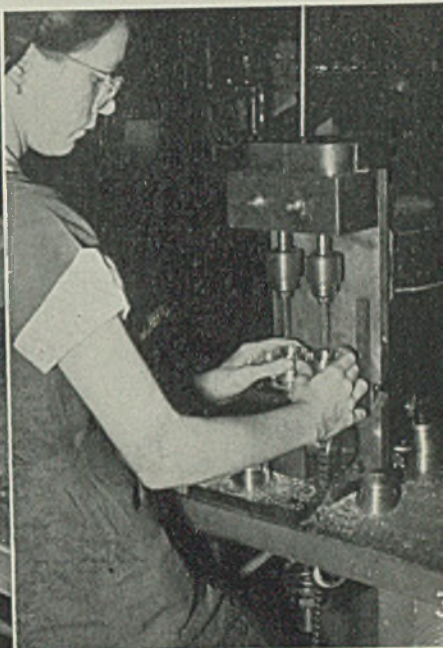


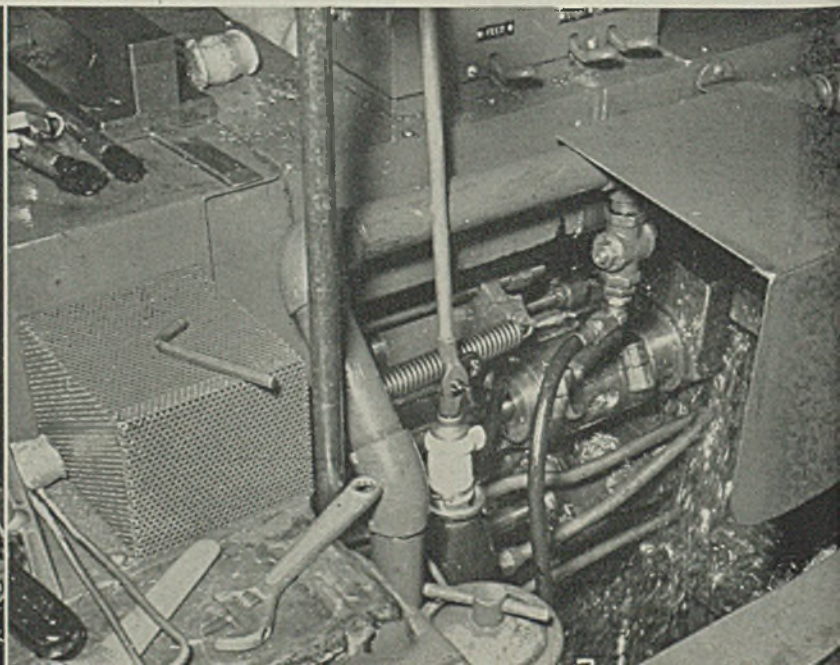


Fig. 5—Conversion of skilled labor is equally as important as conversion of the machines of production. Here a veteran employe of the plant's experimental division teaches a former farmerette the operations involved in making holes in shell booster parts using a Haskins drilling machine. All photos from Office of Emergency Management

Fig. 6—Instead of holding up production while trying to buy a staking machine, this ingenious manufacturer converted an old standard arbor press to an air-operated machine which now stakes screws in 20-millimeter shell boosters. And the air-powered unit can be operated so fast and easily that a girl is fully capable of running it efficiently. The operator shown formerly made loose-leaf notebook binders before she became employed in war work

Fig. 7—This is a view of the New Britain-Gridley machine (Fig. 8) from the other side. In this closeup, the work feeds into the tool area from the right. A number of special attachments are used, including an eccentric spindle and a thread-rolling device

Fig. 8—Formerly used to make spur gears, worm wheels and commutator rings, this New Britain-Gridley automatic lathe now produces parts for shell boosters. Bar stock is fed into the machine automatically through the tubular guides shown extending to the left here





torily—and with much less complaint than is involved in its regular use.

In Fig. 3 is another example of breaking a production bottleneck with brains. In just 60 hours, the plant engineers designed and built this special machine which reams two holes simultaneously in the shell boosters. Officials state it would take at least two months to obtain a similar reaming machine on today's market, glutted as it is with a vast volume of war orders. Note that it is built largely of scrap parts and is mounted on a simple wooden bench.

To check threads on the shell boosters swiftly, the plant superintendent devised another machine, shown in Fig. 4. It consists largely of two pieces of machine steel and a base that was originally made for an electric fan. It was worked out and built complete in a matter of a few hours.

Because of the time and difficulties that would be encountered in buying a new staking machine, company engineers converted an old standard arbor press into the air-operated machine shown in Fig. 6. It is employed to stake screws in the shell boosters. Not only did this conversion job save the time required to obtain a new machine but it requires so much less brawn than a manual press that a girl can operate it without undue fatigue. Also, the converted unit has a much faster action. The operator has been "converted", too, for in peacetime she made loose-leaf notebook binders.

The New Britain-Gridley lathe shown in Fig. 8 formerly made spur gears, worm wheels and commutator rings for electric motors. Now it is tooled up with an eccentric spindle and a thread-rolling attach-

ment for the production of 20-millimeter shell boosters. Fig. 7 is a close-up of the machine in action.

In Fig. 5 another conversion is taking place for here a veteran employe of the plant's experimental division is teaching a former farmerette how to operate a Haskins drilling machine employed to drill holes in parts for the shell boosters. Many other employes previously making electric fans and motors now have the satisfaction of knowing they are contributing to our war effort by seeing the results of their work in the form of badly needed items for our armed forces.

The realistic approach to production problems at this plant is not confined to their own operations and equipment for this company fully realizes the importance of using the facilities of neighboring plants to help out its own efforts. Last summer, when it started into war production in a big way, the firm sent inquiries to a number of smaller manufacturers throughout the middle west. It asked these prospective subcontractors to outline their facilities and their forces of skilled workers. It asked also whether the smaller plants thought they could turn out certain parts or subassemblies for the gun turrets.

Responses poured in. The company checked the replies and sent technicians to plants that seemed the best bets. To those accepted as subcontractors, the technicians paid repeated visits to co-ordinate the subcontracting work.

What this system meant to the subcontractors is shown by the experience of one machine shop. The proprietors of this shop had a meeting only a few days before they received the "facilities wanted" letter. At the end of it everybody sat around silent and disconsolate. They

had decided that their long-established business faced bankruptcy. They felt that they could no longer obtain material in view of the shortage of metals for nonessential products and that their skilled employes would have to scatter to find new jobs.

Today this same shop is building subassemblies for machine gun turrets, and its employes are working at the old stand, maintaining their homes and families, instead of roaming the country looking for work in other industries.

The principal contractor is now assisted by half-a-hundred subcontractors in Missouri, Illinois, Indiana, Iowa, Wisconsin, Ohio, Michigan and New York. Additional subcontractors will be taken on soon when the company opens a new assembly plant in which parts will be machined and assembled. According to its purchasing agent, the amount of work done by subcontractors for the new assembly plant will range on different contracts from 40 to 75 per cent.

"Subcontracting is basically sound," says an executive of the company.

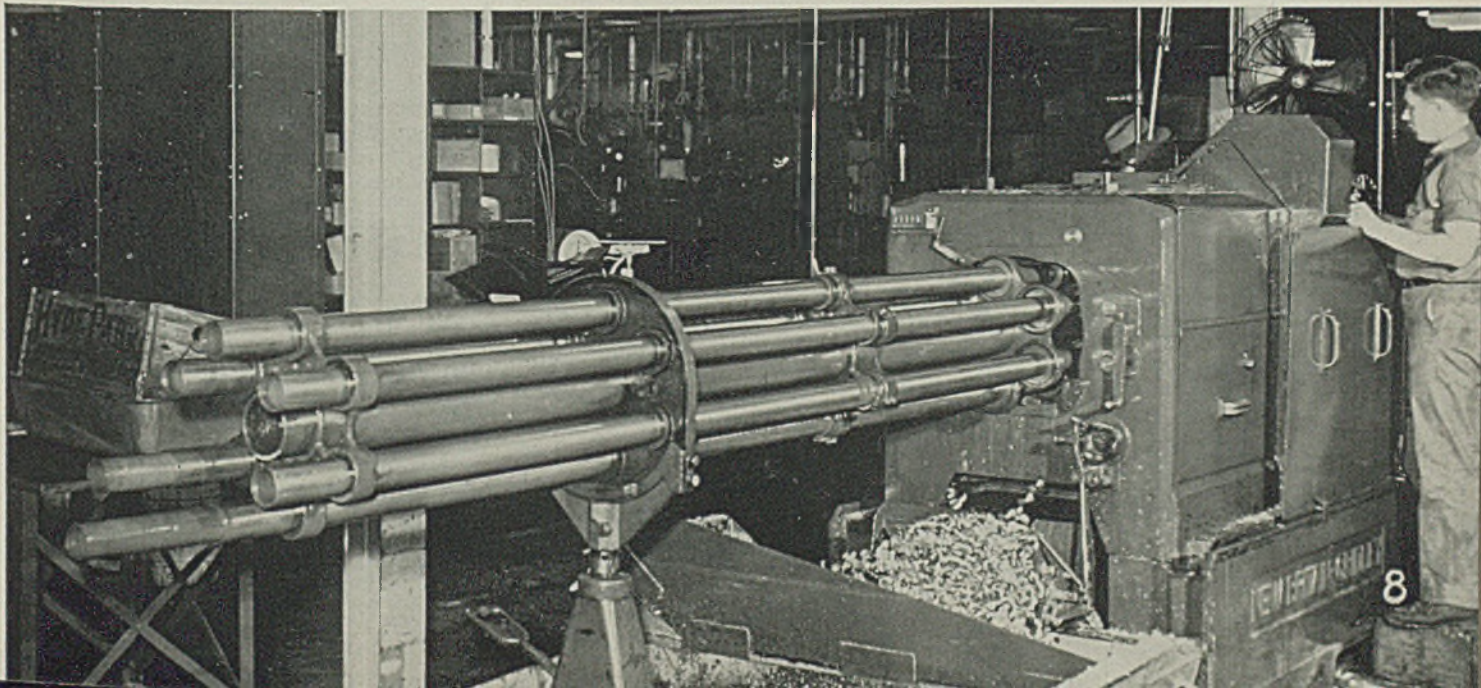
"The added facilities result in greater output.

"The policy enlists a great number of skilled workers for the job.

"It speeds up production.

"And it spreads vital defense work to a greater number of businesses."

*Any manufacturer who can benefit by having further details of this conversion job or who feels that he could make the conversion even more efficient or effective can get details from his nearest District Ordnance Office. Refer to WPB Release No. 234. All photos from Office of Emergency Management.*



# Most Drastic Regulation In American History "To Change Face of Industry"

**Use of steel in 400 important items of manufacture forbidden in all-out conversion drive . . . Nelson points to sweeping character of change . . . Military spending now at rate of more than thirty billion dollars annually**

MANUFACTURE of virtually all consumers' durable goods requiring critical metals will be halted within the next three months and the plants which formerly made those products converted to full war production—or else.

Demands for war materials have increased to an extent to warrant "changing the face of American industry," in the words of Donald M. Nelson, by issuance of drastic orders which mean inevitable industrial casualties and a lowered standard of living for the civilian population.

Two such orders were announced by Mr. Nelson last week. One was a new steel limitation order which will prohibit the use of steel in about 400 items. It also forbids the use of specifically listed materials as substitutes, including practically all of the metals and the scarce plastics.

The second order called a halt to all nonessential construction and limits new building to relatively small projects and war works.

Those with other limitation orders already issued (see tabulation on page 43) or in process of preparation will necessitate a period of difficult adjustment for industrial producers and their employes. It will force conversion to war production to an extent previously considered impossible.

Commenting on the new orders, Mr. Nelson said they mark the high point in the execution of a policy that was initiated with the closure

of the automobile industry early in February.

"This drastic type of order that results in a complete stoppage of production is a new and important weapon of total war. Those who are old enough to recollect, or who have had occasion to study the subject, know the role which American industry played in winning the last war," the WPB chief said.

## United States' War Financial Progress

July, 1940-March, 1912  
(In millions of dollars, cumulative)

	Funds Available	Contracts, Other Commitments*	Expenditures
1940			
July	\$12,325	\$ 4,026	\$ 186
Aug.	12,325	4,801	399
Sept.	18,480	10,268	633
Oct.	20,534	12,200	945
Nov.	20,515	13,190	1,336
Dec.	20,595	14,350	1,819
1941			
Jan.	20,823	15,722	2,408
Feb.	21,367	16,467	3,015
March	31,258	18,939	3,812
April	35,671	20,288	4,636
May	37,075	24,126	5,540
June	37,075	27,801	6,430
July	48,728	31,768	7,451
Aug.	57,120	35,852	8,641
Sept.	57,732	40,353	10,065
Oct.	64,203	45,615	11,723
Nov.	64,329	47,397	13,255
Dec.	76,508	52,529	15,252
1942			
Jan.	93,672	60,943	17,482
Feb.†	108,963**	81,835	19,873
March†	136,954**	n.a.	22,860

\*Includes contracts awarded and letters of intent to private industry, orders placed with federal establishments and commitments for pay, subsistence, travel and miscellaneous items. \*\*Excludes authorizations in the Naval Supply Act for fiscal year 1943, estimated roughly at about \$6,000,000,000. †Preliminary. n.a. not available.

"It is worth bearing in mind that during the entire course of the first World war, not a single limitation order was issued which completely prohibited the output of any civilian product.

"In August of 1918, or a year and four months after the United States entered the war, an agreement was made between the automobile industry and the War Industries Board to limit the output of the auto industry for the second half of 1918 to a quarter of its normal output.

"The next two or three months will be a period of difficult adjustment for the nation in general and the industrial producers and employes engaged in the operations which are restricted. The American consumer will shortly find that many of the items which he would purchase in the normal course can not be secured at all, or, at least cannot be secured without recourse to rationing procedures.

"All this is dictated, however, by a carefully worked out plan and program, planned to accord with the necessities of war and the desirability of maintaining the production of relatively essential civilian items and services. The metal-working industries which consume vast amounts of important raw materials, labor and machine tools, can now be diverted in large part to war production. This is a part of the process of total war in which our enemies have excelled. With our more abundant supplies of the consumers' goods in the homes and in stock, the nation will bring its metal industries completely into war production in an orderly fashion. This is the way of total all-out war and price of victory."

Reason for the curtailment in civilian goods manufacture is seen in the current expenditures for the war effort. During March such expenditures are estimated to have exceeded three billion dollars. Of this, more than two and a half billions represented munitions and war construction.

Thus the country today is producing war goods at a rate of more than 30 billions of dollars a year.

The enormity of this figure is emphasized by comparison with the total national income of 40 billions in the depression year of 1932. Of this amount, about one-third represented services, and two-thirds physical production. In March of this year the comparable output of physical production for war purposes alone exceeded an annual rate of 30 billions compared with approximately 25 billions of net physical output in 1932.

And the tempo of war spending is ever increasing.

Placing of orders has been tremendously accelerated since the at-

tack on Pearl Harbor, Dec. 7. In February, war contracts and other commitments totaled \$20,892,060,000, according to the WPB. This compares with \$8,414,000,000 in January, \$5,132,000,000 in December, and \$1,782,060,000 in November.

Between June, 1940, and the end of February, 1942, war commitments reached a total of \$81,835,

000,000. This was three-fourths of all funds voted by Congress for war purposes or made available by the Reconstruction Finance Corp. and its subsidiaries.

An accompanying table details the financial progress of the war effort by months.

In the "lean civilian economy" necessitated by the huge war ex-

penditures widespread rationing of consumers' durable goods will be required. In most cases repair and replacement parts will continue to be produced.

Virtually no new housing, except in defense areas, is permitted by the terms of the construction limitation order, L-41.

Equally binding upon property owners, builders and suppliers, the order prohibits not only the start of construction in most categories, but also the withdrawal from inventory and the purchase, sale or delivery of any material for use in such construction unless expressly authorized by WPB.

Order specifically provides that no residential construction except for maintenance and repair work may be started without permission if its estimated cost is \$500 or more. Similarly, no new agricultural construction may be started if its estimated cost is \$1000 or more. No other construction, including commercial, industrial, recreational, institutional, highway, roadway, subsurface and utilities construction, whether publicly or privately financed, may be initiated if the cost of the project amounts to \$5000 or more.

Specific types of construction are exempt from the provisions. These include:

1. Projects which will be the property of the Army, Navy, Coast Guard, Maritime Commission and certain other agencies of the federal government.

2. Projects to reconstruct or restore residential property damaged or destroyed after Jan. 1 by fire, flood, tornado, earthquake or the public enemy.

3. Projects of the type restricted or controlled by provisions of the orders in the M-68 series, which cover the production and distribution of petroleum.

#### May Stop Building in Process

Although the order applies only to projects not yet started, construction under way will be carefully examined by the WPB on an individual basis. Such projects may be stopped if the scarce materials—iron, steel, copper and others—can be put to more effective use in the war program.

In another conservation measure WPB last week assumed control over the manufacture and distribution of a substantial proportion of all industrial machinery. Order L-83 prohibits the production and delivery of new, second-hand and reconditioned machinery in 15 categories without WPB approval.

The machinery control order, WPB said, was designed to speed the conversion of plant facilities and skilled man-power into war production.

## Consumers' Durable Goods Banned by WPB

CONSUMERS' durable goods whose manufacture has been prohibited by WPB and products in which no critical materials may be used after the indicated dates are listed below. In parentheses after products in the latter group are the materials which may not be used in their manufacture

PRODUCT	ORDER NO.	PROHIBITION DATE
Amusement machines	L-21	April 30, 1942
Ash trays and smoking stands (metal)	L-13 & 62	May 31, 1942
Awning frames and supports (metal)	L-62	May 31, 1942
Billboards, metal signs	L-29	June 30, 1942
Burial vaults, morticians' goods (metal, except gold and silver)	L-64	June 30, 1942
Caskets (metal, except gold and silver)	L-64	June 30, 1942
Chairs, except shipboard use (metal)	L-13 & 62	May 31, 1942
Clothes racks (metal)	L-62	May 31, 1942
Clothes trees (metal)	L-62	May 31, 1942
Coat hangers, except wire hook for wood hanger (metal)	L-30	June 30, 1942
Curtain rods (metal)	L-30	June 30, 1942
Doors, except as required by underwriters' code (metal)	L-13	May 31, 1942
Door mats (metal)	L-62	May 31, 1942
Electric grills	L-62	May 31, 1942
Electric ironers	L-6-b	Apr. 15 & May 15, 1942
Electric irons	L-65	May 31, 1942
Electric roasters	L-65	May 31, 1942
Electric toasters	L-65	May 31, 1942
Electric waffle irons	L-65	May 31, 1942
Electric massagers & vibrators, except medical profession use	L-65	May 31, 1942
Flashlight cases (no iron & steel except essential uses)	L-71	May 31, 1942
Flexible steel mats and rugs (metal)	L-62	May 31, 1942
Furniture, except for shipboard (metal)	L-29 & 213	May 31, 1942
Gaming machines	L-21	Jan. 31, 1942
Hand mirrors (metal)	L-62	May 31, 1942
Hat racks (metal)	L-62	May 31, 1942
Juke boxes	L-21	April 30, 1942
Kitchen cabinets (home) (metal)	L-62	May 31, 1942
Lockers (metal)	L-13	May 31, 1942
Necktie racks (metal)	L-30	June 30, 1942
Ornamental steel jackets on heaters, water, gas, etc.	L-42	June 1, 1942
Outboard motors, except A-1-k or higher	L-80	Mar. 27, 1942
Partitions (metal)	L-13	May 31, 1942
Picture frames (metal)	L-62	May 31, 1942
Plant and flower supports (metal)	L-62	May 31, 1942
Portable washing machines	L-6-b	Apr. 15 & May 15, 1942
Pressing irons—boudoir & traveling	L-65	May 31, 1942
Radiator covers (metal)	L-62	May 31, 1942
Record makers and players	L-44	April 23, 1942
Road and street signs and posts (metal)	L-29	June 30, 1942
Safes and vaults, except A-2 or higher	L-13	May 31, 1942
Shoe trees (metal)	L-30	June 30, 1942
Signs (metal)	L-29	June 30, 1942
Smoking stands—smokadors (metal)	L-62	May 31, 1942
Soap receptacles (metal)	L-30	June 30, 1942
Soft drink dispensers	L-38 & 27	April 30, 1942
Sun lamps, except for medical profession only	L-65	May 31, 1942
Swivel chairs (metal)	L-13	May 31, 1942
Table tops for household use (metal)	L-62	May 31, 1942
Toilet paper holders (metal)	L-30	June 30, 1942
Tooth brush holders (metal)	L-30	June 30, 1942
Toys—all types involving specified scarce materials	L-81	June 30, 1942
Vacuum cleaners—household	L-18	April 30, 1942
Venetian blinds (metal)	L-62	May 31, 1942
Vegetable bins (metal)	L-30	June 30, 1942
Vending machines	L-27	April 30, 1942
Wastebaskets (metal)	L-13	May 31, 1942
Weighing machines, coin operated	L-21	April 30, 1942
Window display advertising, signs only (metal)	L-29	June 30, 1942
Windows (metal)	L-80	Mar. 28, 1942
Wire racks and baskets, except industrial (metal)	L-62 & L-13-b	May 31, 1942
Washing machines, household laundries	L-6-b	Apr. 15 & May 15, 1942
Phonographs	L-44	April 23, 1942
Metal cabinets, except: enameled filing cabinets, visible record equipment, cases and bases	L-13-b	May 31, 1942
Dry shavers	L-65	May 31, 1942
Electric dryers, hand and face	L-65	May 31, 1942
Electric broilers	L-65	May 31, 1942
Electric percolators	L-65	May 31, 1942
Food warmers	L-65	May 31, 1942
Mixers, whippers and juicers	L-65	May 31, 1942
Shoe racks (metal)	L-30	June 30, 1942
Radiators, large tubing	L-42	June 1, 1942
Refrigerators	L-5	April 30, 1942
Radio Receivers	L-44-a	April 23, 1942
Automobiles	(Various orders and dates)	

# Stupendous, Tremendous, the Words After Press Peeks Into Detroit Arsenals

## DETROIT

IN WHAT may be the first of a series of press tours through large war industries of the nation, two busloads of reporters, analysts, writers, and Army and Navy representatives last week visited a dozen leading plants in the Detroit area, inspecting the progress made in production of aircraft parts, anti-aircraft guns, naval ordnance, tanks, airplane engines, bombers, diesel engines, airplane engine parts and related items.

Everywhere the story was the same: More men at work. More women at work. More buildings up and more going up. More equipment installed. More products rolling from assembly lines. More man and women in training for early jobs in war production.

One of the high spots of the tour was a brief inspection of the \$60,000,000 bomber plant nearly completed at Willow Run, to be operated by the Ford Motor Co., supplying both completed four-motor bombers and bomber parts for a Southwest assembly plant. With total floor area exceeding 2,500,000 square feet, this project (see p. 53) is one of the most stupendous industrial enterprises ever

conceived. Assembly lines a half-mile in length, wing jigs 60 feet wide and weighing 30 tons each, conveyor systems 55 feet wide for moving wings during assembly, panel assembly fixtures with elevating platforms for riveters—these are just a few of the innovations in mass production of large aircraft, never before attempted. The building, which eventually may employ 60,000, adjoins a newly built airport with seven mile-long runways containing 1,000,000 square yards of concrete.

### Even Motorized Maintenance

In the plant proper are a mere 150,000 fluorescent lighting fixtures, 16,000,000 creosote blocks in the floors which are scrubbed daily by maintenance crew with motorized sweepers, 2,100,000 face brick, 2,500,000 common brick, 25,000 tons of structural steel, plus many thousands of tons more of conveyor support steel and interior structural work.

The plant shortly will be producing the Consolidated B-24 bomber—a four-engine heavy bomber with 110-foot wingspread—and was started just over a year ago on a site formerly covered with soy beans.

First equipment in the building arrived last fall and the first parts production began last October.

At the moment, for miles around the bomber plant, the landscape is a fever of activity. New express highways are going in, new sewers and water systems, extensive new housing projects. Hundreds of workmen are being hired daily. Training schools for all phases of aircraft manufacture have been started. Stocks of aluminum are on hand and have started through forming operations. Jigs and fixtures are being given preliminary tryouts, while erectors hasten the installation of the final phase of the plant structure.

Roscoe Smith, former head of the Ford village industries which dot the eastern Michigan area, is manager of the bomber plant. The directing genius behind its conception and construction is C. E. Sorenson, Ford manufacturing manager, and his capable construction department.

Building of jigs and fixtures for the bomber plant in itself has been a tremendous job, in which the Ford Rouge plant and some 60 outside shops participated. Some of this equipment is so large and complicated that no tool shop in the country could handle it; so it was developed by specialists in the Ford tool and die organization.

Out at the Detroit Tank Arsenal, or Chrysler Tank Arsenal, as it is more familiarly known, the M-3

## Unroll This Steel Mat To Make a Military Landing Field



ANOTHER type of mobile floors for airfields was introduced in the United States recently, consisting of heavy steel mesh. Here the mat is being unrolled at an eastern airport for test by Army Air Corps. The design has been used by

British forces. Grass grows up in the mat, effectually disguising its presence. Steel fabricators turning to war work have been bidding on various forms of aircraft landing surfaces, including perforated, interlocking plates. Wide World

tank of 28-ton size is rolling from three assembly lines at an accelerating pace, while preparations are under way for a changeover to a completely new model in a few months, the switch to be effected without any serious slackening in present production. A new bay is being added to one side of the arsenal, and virtually half the machinery now in the plant, used for manufacturing various subassemblies, will be moved to other plants of Chrysler Corp. to make way for expansion of final assembly facilities at the arsenal.

Along with other correspondents, the writer of this article was privileged to roll over the concrete test track at the arsenal in one of the 28-ton monsters as it came off the assembly line. Couched behind several inches of armor plate and in the midst of a hundred gadgets and meters, surrounded by soft rubber crash pads on the interior surfaces, the occupant of a tank has little time to meditate upon anything except the terrific roar of motors, gears and propelling track. The impression of brute force and power is awesome even without the guns firing.

A quick survey of aircraft parts production at Briggs Mfg. Co. shows this company to have extended both its rate of production and the variety of aircraft parts in production.

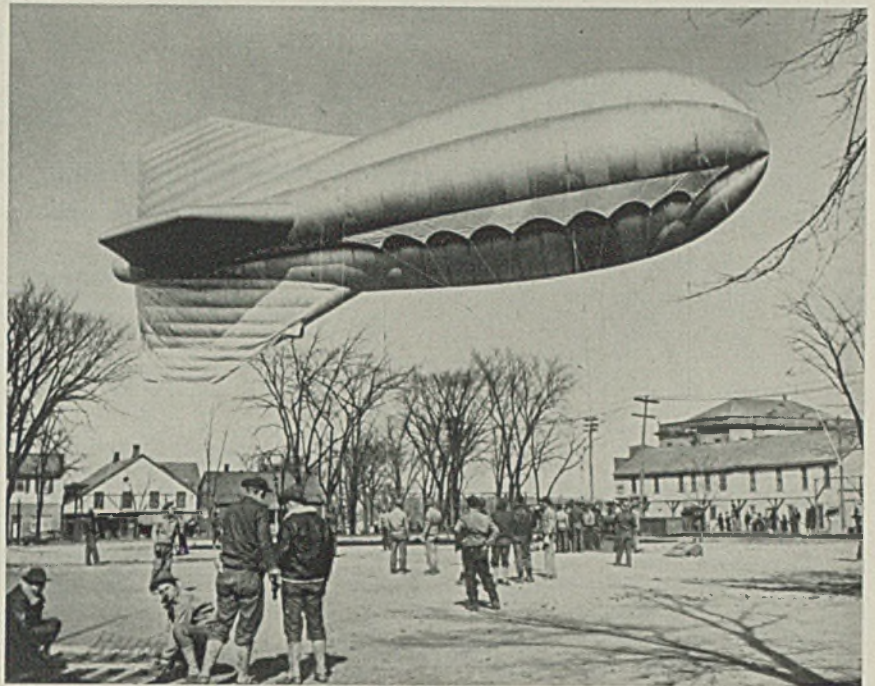
#### Use Colored Rivets

An innovation in the aluminum riveting practice at Briggs is the use of two different colors of rivets, one for day shift operators and one for night shift operators. By using different colors, it is easy to identify which shift performed the various riveting operations on finished parts, and defective work can be traced more quickly.

"Americanized" versions of two foreign-designed anti-aircraft guns, one a 20-millimeter and the other a 40-millimeter, are now in volume production. One automobile company is assembling the latter from parts supplied by a number of its different divisions. The smaller-caliber gun is one of many projects under way at the Detroit Naval Ordnance plant, and correspondents were treated to samples of actual firing tests on this weapon, which in flexibility and speed of fire is nothing less than devastating.

An interesting aspect of production of the 40-millimeter gun is that two assembly lines are operated side by side, one furnishing units for the Army and the other for the Navy. The Navy guns are built in pairs, are water cooled and have forged steel barrels instead of the centrifugally cast steel barrels of the Army gun.

Tour of the Pratt & Whitney en-



### Barrage Balloons To Protect Soo Locks and River

SAULT STE. MARIE, MICH.: This is the first of many barrage balloons that will float above the St. Mary's river and the Soo canal to help protect the locks and channels so that there may be no interruption in the flow of iron ore, coal, wheat and other cargoes. The waterways where saboteurs might do great damage are under constant surveillance. Armed guards are on practically all carriers. NEA photo

gine plant operated by Ford Motor Co. revealed that production of these twin-row 18-cylinder power plants is being scaled up steadily, and plans are under way for further expansion of production and test facilities.

The \$28,000,000 naval arsenal is the largest of three new Navy "job shops" and ranks in size with the Naval Gun Factory in Washington. In addition to guns, the arsenal supplies a wide variety of ordnance items such as fire control equipment, gun mounts, torpedo parts and the like. Requirements vary from day to day, depending upon the urgency of various needs. There are 14 buildings in the complete area which also includes homes for naval officers stationed there.

May 11, and three papers at the morning session May 12.

### Steel Engineers' Meeting Changed to May 11-12

Annual spring conference of the Association of Iron and Steel Engineers will be held in Royal Connaught hotel, Hamilton, Ont., May 11-12 instead of April 27 as formerly announced. Date was changed because a selective service registration was set for April 27. Plants of the Dominion Foundries and Steel Ltd., and the Steel Co. of Canada Ltd. will be visited. Two papers will be presented at the evening session,

### Speeds Delivery of Shells

B. F. Harris, president, Oil Well Supply Co., Oil City, Pa., subsidiary of U. S. Steel Corp., stated last week that the company completed Army orders for 1,000,000 anti-aircraft projectiles 62 days ahead of schedule.

Other Army and Navy articles under production are breech and firing mechanisms; tank rings; ship and airplane castings; diesel driven centrifugal pumps; housings for large Navy guns; and machining of larger size shells, the executive said.

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# REVISIONS AND ADDITIONS TO PRIORITIES—ALLOCATIONS—PRICES

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

## M ORDERS

- M-9-c-2: Copper in Jewelry**, effective April 4, 1942. Prohibits copper use in making jewelry after May 15, 1942. Until that date copper use limited to inventory of metal plated or alloyed with gold or silver prior to April 1, 1942, and not plated or alloyed in violation of any other order. Supersedes any conflicting provisions of M-9-c, as amended.
- M-38-c (Amendment): Lead**, effective April 6, 1942. Bans use of lead foil for cigarette packaging on May 1, regardless of inventories. Prohibits lead use immediately in buttons, costume jewelry, novelties and trophies. Permits manufacture of lead rods used in stained glass windows, and, when other materials impractical, making of foil for condensers, electrotyping and moulding lead, and dental X-ray equipment and supplies.
- M-43-a (Amendment): Tin**, effective April 4, 1942. Permits use of enough solder to manufacture cans permitted by Order M-81. Defines "automobile body solder" to include any tin-bearing material used as filler or smoother for auto or truck bodies or fenders.
- M-81 (Amendment): Tin Plate and Terne Plate**, issued April 6, 1942. Limits packing of condensed soup in tin plate after June 30 to certain specified kinds. Tin plate use until June 30 limited to rate in like 1941 period.
- M-104: Tin and Terne Plate Closures**, effective April 3, 1942. Use of tin or

tion of mineral deposits; construction subject to Order M-68; residential construction costing less than \$500 or restoration from fire or damage by nature or the enemy after Dec. 31, 1941; agricultural construction costing less than \$1000; construction authorized by OPM or WPB; other construction, including public works, costing less than \$5000. Existing restrictions on various material uses remain in effect. When priorities assistance not required, application for authority to begin construction made on PD-200 and PD-200A.

**L-52-a (Amendment): Bicycles**, effective April 7, 1942. Extends freeze order to cover bicycles with frames of more than 17 inches. Original minimum was 19 inches.

**L-63: Suppliers' Inventories**, effective April 6, 1942, revoking M-67. Covers wholesalers, distributors, jobbers, dealers and retailers furnishing automotive, aviation, builders, construction, dairy, electrical, farm, foundry, grain elevator, hardware, health, industrial, plumbing and heating, railroad, refrigeration, restaurant, textile mill, transmission and welding and cutting supplies from stock. Limits inventories of suppliers in eastern and central time zones to twice dollar value of supplies shipped from stock in second preceding month; in other zones inventories limited to shipments two months earlier. Permits acquisition of seasonal lines equal to purchases in peak season of not over 90 days in

previous year. Suppliers must record inventories and sales on PD-336 for WPB inspection. Order does not apply to suppliers with total inventory of less than \$20,000 or with inventory of each type of supplies of less than \$10,000.

**L-68: Garment Closures, and Associated Items**, effective April 1, 1942. Limits use of steel, zinc or zinc base alloy in making slide fasteners or parts to 50% of rate for year ended June 30, 1941. Bans use of copper or copper base alloy and restricts length of slide fasteners to 10 inches, except for trousers (may be 12 inches) and work jackets (may be 20 inches). Prohibits manufacture or delivery of slide fasteners made of steel, zinc, copper or their alloys for use on any of 32 specified articles. Bans copper use in making hooks, eyes, snap fasteners, buttons and other types of closures, restricts use of steel and zinc.

**L-84: Electric Heating Pads**, effective April 4, 1942. Production in 1942 limited to 50% of 1940 output, hospital type 100%. Rubber use in pad permitted only in latter type. Use of chromium and of resistance material of more than 50% nickel content prohibited. Resistance material use per unit limited to 1940 rate.

**L-86: Liquefied Petroleum Gas Equipment**, effective April 8, 1942. Prohibits installations with following exceptions: Material for maintenance or repair of existing equipment; installations started prior to Jan. 14, 1942 and completed

## Murray and Green Shake Hands—So What?



ALL was sweetness and light last week when CIO and AFL leaders publicly "buried the hatchet" at a Pittsburgh rally and pledged that the unions would forget past differences and solidly back the war effort. Shown above are William Green, left, AFL president, and Philip Murray, CIO president, shaking hands while Paul V. McNutt, federal security administrator, looks on

1942. Permits makers of paper and paper products to accumulate waste paper inventories without restriction.

## L ORDERS

- L-41: Construction**, effective April 9, 1942. Bans new construction, remodeling or rehabilitation, not including maintenance or repair, with following exceptions: For specified government agencies identified with the war effort; for activities directly connected with discovery, development or deple-

For additional revisions and additions please see STEEL of March 2, p. 39, March 9, p. 38, and March 16, p. 39, March 23, p. 35, March 30, p. 23, April 6, p. 46.

by May 15, 1942; installations in use prior to April 1, 1942 and subsequently withdrawn from use; containers exchanged in normal course of distribution; installations authorized by WPB. Application for such authority made on PD-397.

L-97: Railroad Locomotives, effective April 4, 1942. Freezes finished units in producers' hands and prohibits production or delivery except in accordance with schedules issued by WPB without regard to ratings heretofore assigned. L-97-a, April 4, applies same regulations to railroad cars.

### PRICE SCHEDULE

No. 67 (Amendment): New Machine Tools, effective April 7, 1942. Authorizes Norton Co., Worcester, Mass., to raise price of 150 Model No. 26 Hyprolap machines from \$7025 to \$7290 each.

No. 113—Iron Ore, effective April 10, 1942. Applies to ore produced in Minnesota, Wisconsin and Michigan. Maximums are weighted average spot prices, based on Lower Lake ports delivery, at which spot sales of such ore were made during 1941 shipping season. "Escalator" clause eliminated from unexpired contracts. Maximum for ore shipped from mines idle in 1940 and 1941 is equivalent of \$4.45 per gross ton, Lower Lake ports, for Mesabi Nonbessemer 51.50% iron, adjusted for grade and analysis. Base prices on other grades: Mesabi Bessemer \$4.60; old range nonbessemer \$4.60; Old Range Bessemer \$4.75; High Phosphorus \$4.35. Penalties for silica and fine structure and premium for lump ore for open hearth use are those prevailing in 1941. Producers must report by 10th of month on preceding month's production and sales. Sellers must report 1941 sales and prices.

### Republic Claims World Top for 24-Hour Plate Run

Republic Steel Corp. last week reported "a world record" in production of steel plate in a 24-hour period, between midnight of Tuesday and midnight of Wednesday. "The previous record was broken by about 30 per cent."

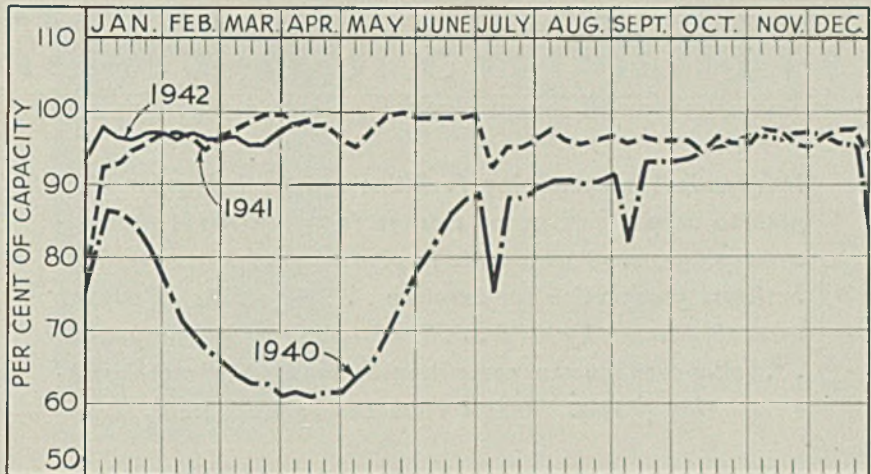
In his report to stockholders at the annual meeting in Jersey City, N. J., Wednesday, R. J. Wysor, president, said the company was setting records in vital defense materials but unless more scrap is obtained ingot tonnage will be reduced. Output of plates and electric furnace steel in March was "four times what it was two years ago".

### Plate Record National in Scope

In Washington, C. E. Adams, chief of WPB's Iron and Steel Branch, stated that an all-time record was made in plate shipments in March, with a total of 878,726 tons for the country. February shipments totaled 758,723 tons.

Deliveries from strip mills amounted to 306,195 tons in March, a substantial increase over February's 268,988.

Deliveries to shipyards for the Maritime Commission's merchant ship program increased 30 per cent in March over February.



## PRODUCTION . . . . Up

PRODUCTION of open-hearth, bessemer and electric furnace ingots last week increased ½-point to 98½ per cent. Six districts advanced, two declined and four were unchanged. A year ago the rate was 98 per cent; two years ago it was 61 per cent, based on capacity as of those dates.

**Chicago**—Receded ½-point to 104 per cent because of need for repair. Two producers increased output, two curtailed and two were unchanged. Scrap supply is better.

**Detroit**—Gained 4 points to 92 per cent, with 24 of 26 open hearths in production.

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

**Cincinnati**—Advanced 4 points to 96 per cent, highest since May.

**St. Louis**—Better scrap supply enabled additional furnaces to be lighted, increasing the rate 6 points to 93 per cent.

**Central eastern seaboard**—More scrap lifted production 2 points to 92 per cent.

**Cleveland**—Small changes by two interests balanced and the rate re-

mained at 90½ per cent. American Steel & Wire Co. blew in a relined blast furnace with capacity increased 15 per cent.

**New England**—Completion of repairs raised production 10 points to 90 per cent, with two interests at 100 per cent.

**Wheeling**—Steady at 82½ per cent for third consecutive week.

**Pittsburgh**—Held at 96½ per cent. All blast furnaces in the district will be operating in two weeks when No. 6 Carrie furnace of Carnegie-Illinois Steel Corp. resumes after temporary repair. Duquesne No. 3 of the same company was blown in Wednesday after relining.

**Buffalo**—Advanced ½-point to 93½ per cent as improved scrap supply was maintained.

**Youngstown, O.**—Down 2 points to 92 per cent on account of scrap shortage, 72 open hearths and three bessemer active. Addition of an open hearth by Republic Steel Corp. will raise the rate to 93 per cent this week.

### District Steel Rates

Percentage of Ingot Capacity Engaged In Leading Districts

	Week ended April 11		Same week	
	1941	1940	1941	1940
Pittsburgh . . . .	96.5	None	102	53
Chicago . . . . .	104	- 0.5	101.5	59
Eastern Pa. . . . .	92	+ 2	96	57
Youngstown . . . .	92	- 2	97	42
Wheeling . . . . .	82.5	None	88	73
Cleveland . . . . .	90.5	None	98.5	65
Buffalo . . . . .	93.5	+ 0.5	90.5	44
Birmingham . . . .	95	None	90	81
New England . . . .	90	+10	90	55
Cincinnati . . . . .	96	+ 4	94	56
St. Louis . . . . .	93	+ 6	98	45
Detroit . . . . .	92	+ 4	61	77
Average . . . . .	98.5	+ 0.5	*98	*61

\*Computed on basis of steelmaking capacity as of those dates.

### Tube Plant for Pittsburgh Steel Approved by WPB

Pittsburgh Steel Co., Pittsburgh, last week announced the approval by WPB of a \$10,000,000 naval and aircraft tube plant at Allenport, Pa., site of an existing plant which will be extended. Six major buildings will be erected to house new rolling equipment.

Surveys are under way to determine the availability of 1100 new workers required and adequate housing for them.

# Windows of WASHINGTON

**Independent warehousing facilities are pooled under ODT plan to supply emergency storage for government procurement program. Participants in plan assured immunity from antitrust prosecution for duration . . . All stocks of copper screening frozen by WPB . . . Track-laying tractor output cut . . . Labor-management committees in hundreds of metalworking plants. Report increases in production**



By L. M. LAMM

Washington Editor, STEEL

## WASHINGTON

A GROUP warehousing plan designed to permit more efficient use of storage facilities and to simplify dealings between warehousing companies and government procurement agencies has been developed by the Office of Defense Transportation, the War Department, and other government agencies.

Plan calls for pooling available storage space through emergency warehouse associations formed by public merchandise warehousemen in distribution centers throughout the country.

Program is already in operation in Kansas City, Mo., where a contract has been signed on behalf of the War Department and a newly-formed Federal Emergency Warehouse Association of Kansas City, made up of 11 local warehousing companies. The ODT's Division of Storage is aiding in the establishment of similar associations in New York, Philadelphia, Boston, Chicago and other cities where shortages of storage space are expected.

Under the group warehousing plan, a government procurement agency, instead of negotiating separate contracts with a number of individual companies, signs a single contract with a local warehouse association for a large block of space. A single government order may be issued for storage or shipment of materials by different companies. Each company is bonded to the association, to which it bills all charges. The manager of the association in turn bills all charges to the government.

All group contracts drawn up under the plan will be carefully studied by the ODT to assure that the rates to be charged, and the terms and conditions of storage, are reasonable. The plan will be conducted on a voluntary basis, all owners of storage facilities in a given locality being given an opportunity to take part in the pool.

Under an arrangement agreed to by the Department of Justice, ware-

house operators entering into group contracts which have been approved by the ODT during the war emergency will not be subject to prosecution under the antitrust laws.

## Stocks of Copper Screening Frozen by WPB Order

All stocks of copper screening in the United States, including uncut rolls in the hands of retailers, have been frozen by an amendment to Order M-9-c.

Manufacture of copper screening was stopped on March 31. Large stocks exist in the country in the hands of manufacturers, wholesalers and retailers that can be used by the military services, thus avoiding the use of additional copper to make new screening for them.

Adequate amounts of steel wire screening are available for civilian use.

## Production of Smaller Track-Laying Tractors Cut

Production of smaller track-laying tractors will be suspended after Sept. 1. WPB has ordered output curtailed between now and then to 3035 units, the order applying to those of 17 to 35 horsepower.

Purpose of the restriction is to increase facilities for making larger tractors needed by the armed forces. Manufacturers affected and quotas for each are: Allis-Chalmers Mfg. Co., 1000; Caterpillar Tractor Co., 1000; International Harvester Co., 600; and Cleveland Tractor Co., 435.

## 444 Labor-Management Committees Reported to WPB

Hundreds of labor-management shop production committees have been formed in war production plants and have resulted in increased output of vitally needed materials, according to reports received by WPB Chief Donald M. Nelson. By April 7, Mr. Nelson

had been notified of 444 companies which had actually placed the plan in effect. Since the WPB tabulation, scores more have been organized.

Some of the companies are offering rewards, usually in war bonds, for suggestions from employes that result in increased efficiency and production.

Plans for staggering shifts to keep machines employed 24 hours a day and seven days a week have been worked out by many committees.

Liberal use of posters and slogans to encourage workers to increase output is being made in most plants.

Among the metalworking plants reporting such committees to Mr. Nelson are: Bethlehem Steel Co., Bethlehem, Pa.; Republic Steel Corp., Cleveland; American Rolling Mill Co., Middletown, O.; Weirton Steel Co., Weirton, W. Va.; Reliance Foundry Co., Cincinnati; York Safe & Lock Co., York, Pa.; Cuno Engineering Co., Meriden, Conn.; Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.; Bendix Aviation Corp., South Bend, Ind.

## Production Requirements Plan Use Simplified by New Changes

Two modifications in the use of preference ratings under the Production Requirements Plan have been made by WPB. Both modifications simplify procedure and reduce the amount of clerical work involved.

In cases where a rating assigned under PRP is subsequently raised to a higher rating after appeal to the Production Requirements Branch, the applicant may notify his suppliers of the higher rating by letter instead of making out completely new purchase orders.

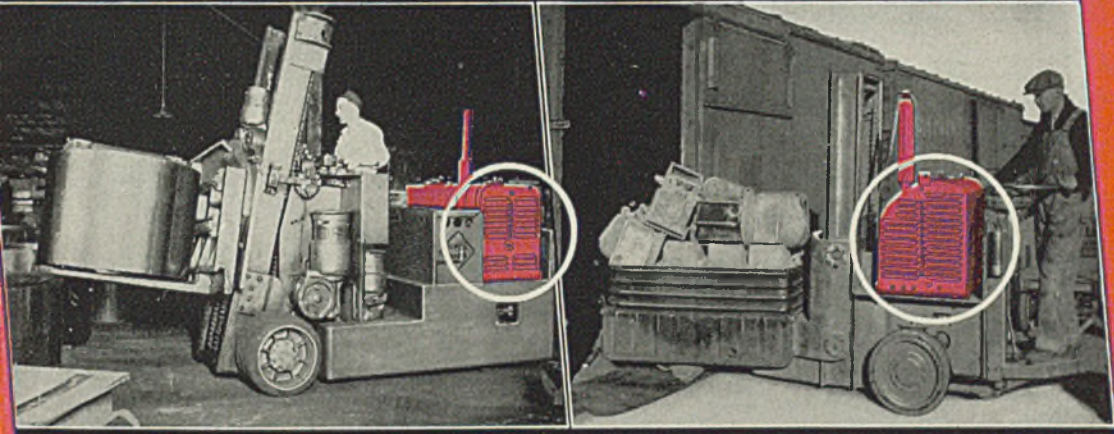
Another change in the application



# READY-POWER

**IT'S  
POWER  
THAT  
COUNTS**

**EQUIPPED ELECTRIC TRUCKS  
SAVE TIME—SAVE MONEY  
GIVE BEST OVERALL PERFORMANCE**



**PROVIDES Continuous Power**

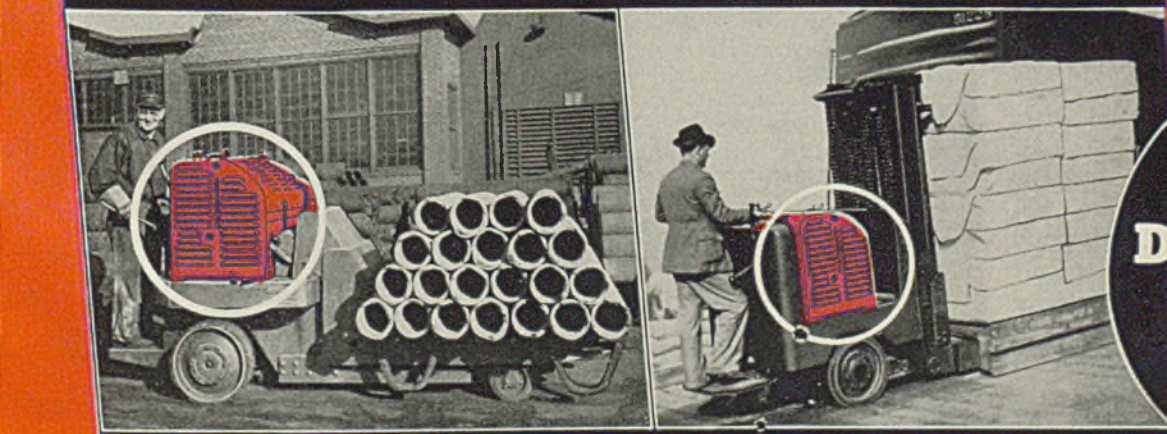
READY-POWER (Gas-Electric) units on new or existing electric truck equipment handle more loads per hour per day and per year than the same equipment battery powered. This means a saving in time as well as a saving in money by accomplishing a given amount of work in less time at a lower cost per ton handled. Thousands of users in all lines of activity have proven this. With today's higher wage rates and the accent on performance, be sure you get the best.



**PROVIDES Peak Performance**

For new or existing electric trucks we manufacture a complete line of Gas-Electric power units—not complete trucks. You can secure new trucks complete with READY-POWER from all truck manufacturers as we can supply you READY-POWER units to replace batteries for the trucks now in your plants. Prompt deliveries are now possible.

Write for information mentioning type of new trucks contemplated or make and type now operated.



**PROMPT  
DELIVERIES  
NOW!**

**THE READY-POWER COMPANY**

3842 GRAND RIVER AVENUE, DETROIT, MICHIGAN, U.S.A.



of PRP preference ratings permits a producer to make out a single order covering his requirements for the same material or product, even though he uses two or more different preference ratings which have been assigned to him.

This eliminates necessity for making separate purchase orders for each rating used. However, the purchase order must be made out in terms of the specific quantities to which the rating is assigned, and should not be made out with percentage figures.

#### Limitation on Production of Typewriter Parts Relaxed

Typewriter manufacturers can produce some parts and subassemblies in economic manufacturing lots, even though the result is production in excess of established quotas for completed typewriters, according to an official interpretation of Conservation Order L-54-a announced by the Director of Industry Operations.

This relaxation does not apply generally to parts production but is restricted to those parts which, because of their nature, cannot be produced economically in small quantities.

#### Manufacture of Electric Heating Pads Restricted

WPB has restricted the production of electric heating pads. It also has prohibited use of chromium and curtailed the use of rubber, nickel and electrical resistance material in the manufacture of such pads.

Under order L-84 the 1942 production of hospital-type electric heating pads is limited to the amount manufactured in 1940, and the production of pads for home use is limited to 50 per cent of the amount manufactured in 1940.

#### Lead Foil for Cigarette Packaging To Be Banned

Manufacturers of cigarettes have been ordered to cease use of lead foil for cigarette packaging on May 1, regardless of inventories on hand. The manufacture of metal foil for this purpose has already been prohibited.

Other prohibitions: Use of lead is prohibited immediately in buttons, costume jewelry, novelties and trophies.

Comes, the grooved lead rods that hold fitted pieces of stained glass windows together, may be produced no longer.

Foil for condensers, electrotyping and moulding lead, and dental x-ray equipment and supplies may be manufactured when other materials are impractical.

## Stocks of Nineteen Types War Supplies Ordered Restricted

WASHINGTON

INVENTORIES of 19 kinds of supplies, whether in the hands of wholesalers, distributors, jobbers, dealers, retailers, or branch warehouses, are strictly limited by Suppliers' Inventory Limitation Order L-63, issued by WPB.

Wholesalers and dealers affected by the order who are located in the eastern and central time zones are required to limit their inventories to twice the dollar value of sales of the specified types of supplies which they shipped from stock in the second preceding calendar month. Suppliers located in other time zones may have inventories equal to three times the corresponding amount. Shipments made directly from producers to customers in which the distributor acts only as an agent may not be included as a basis for calculating permissible inventory.

Suppliers whose total inventory at cost is less than \$20,000, and less than \$10,000 for any one of the listed types of supplies, are exempt from the terms of the order. Special provision is also made for inventories of seasonal supplies.

New order supersedes Suppliers' Order M-67, covering plumbing, heating and electrical supplies, which is revoked.

Types of supplies covered by Order L-63 include: Automotive, aviation, builders, construction, dairy, electrical, farm, foundry, grain elevator, hardware, health, industrial, plumbing and heating, railroad, refrigeration, restaurant, textile mill, transmission, welding and cutting.

Suppliers affected by the order are required to keep records of their inventory and sales on Form PD-336, and to keep this form in their files for at least two years.

Separate records must be kept for each type of supplies handled by the distributor or dealer.

Inventories of material frozen by the "L" or other orders should be included in the inventory records. The provisions of L-63 do not relieve suppliers from responsibility of compliance with any other applicable order or orders.

Suppliers affected by the new order whose inventories on hand at the time the order was issued exceed the permissible maximum, must not receive any deliveries of such supplies until the inventories are reduced below the maximum. How-

ever, when inventories are below maximum, suppliers may receive deliveries of minimum commercially procurable quantities, even though such deliveries would raise their inventories above the maximum.

#### Tin, Terne Plate Closures for Glass Containers Limited

Use of tin plate and terne plate as closures for glass containers has been brought under control by the WPB under Conservation Order M-104.

Order restricts the production of tin plate or terne plate crown caps for bottled beer and soft-drinks after a four-week period, and lists other specific products for which tin plate or terne plate closures may not be produced after a similar interim period.

Cover caps made of tin plate or terne plate, designed as closures for tomato catsup, chili sauce, and for home-use jars of jelly, jam, marmalade or preserves may no longer be produced. This restriction is effective immediately.

The WPB Containers Branch, which is administering the order, said that approximately 1600 tons of tin annually would be saved by the order, and that additions to be made to the lists of products for which tin closures are barred would save another 300 tons.

#### Aluminum Ingots Requisitioned When Owners Refused To Sell

Inventory and Requisitioning Branch last week moved to take over a quantity of aluminum, which its owners had refused to sell at prices established by the WPB. This was the first action of the kind to become necessary since the inauguration in February of a nation-wide campaign to salvage all idle stocks of aluminum in fabricators' hands.

J. Clem Kline & Son, Easton, Pa., in filing their report of stocks on hand, had claimed that 1000 pounds of high grade commercial aluminum ingots in their possession were required to fill rated orders. Subsequent investigation disclosed that the material was not needed for this purpose and the requisitioning orders were drawn up.

Other cases of refusal to sell are being studied by the branch, and it is expected that the WPB's requisitioning authority will be invoked in a number of them.

#### 78,000 Pounds of Copper Sheet Seized by WPB

Two lots of copper sheet, totaling 78,000 pounds, the property of J. M. Katz, New York, were seized last week for war purposes by order of the Inventory and Requisitioning Branch.

# WPB Control Over Rolling Stock May Bring Freight, Passenger Priorities

WASHINGTON

PRODUCTION and delivery of railroad locomotives, freight and passenger cars, except in accordance with schedules soon to be announced by WPB, were prohibited by the war board last week. All finished locomotives and cars in the hands of producers have been frozen pending the issuance of delivery schedules, expected this week.

The WPB orders, L-97 and L-97-a, stipulate that all manufacture of rolling stock shall conform to the schedules regardless of any preference ratings heretofore assigned.

Members of the Railroad Industry Advisory Committee met with the WPB Transportation Branch last week to discuss "the drastically limited number of locomotives and cars which may be turned out by individual shops."

## 18,000 Freight Cars Allowed

The railroad representatives were advised they will be allowed materials for 18,000 freight cars and 300 locomotives for domestic use during the remainder of this year. These are in addition to those previously authorized.

No materials will be authorized for passenger car construction except for cars included in previously approved programs.

Materials for lend-lease and Army requirements are in addition to the domestic program.

The curtailment is interpreted in many quarters as presaging inevitable priorities on both freight and

passenger movements. This likely will make tourist travel especially difficult, as available equipment, particularly locomotives, will be required for transporting war materials.

Two reasons for the orders were: Shortage of steel plate, castings and other materials; and the possibility that carriers which need new equipment to fulfill their part in the war program may not be getting it. It was pointed out that railroads in good financial position and farsighted management have been able to place their orders on producers' books months ahead of the less favorably situated roads. Notwithstanding, the latter carriers may be so located that their services are more vital to war effort.

Early in January of this year, the former Supply Priorities and Allocations Board approved a program providing for the construction of 36,000 new freight cars during the first quarter and continued work on more than 900 locomotives on order. The Iron and Steel Branch was instructed to grant as much priority aid in effecting the program as was possible without interfering with production of military goods. The board, however, emphasized the program was for the first quarter only and that it implied no commitments for materials after March 31.

The new action is in line with WPB's policy of directing all possible materials into equipment needed in the war effort, regardless of the shortage in civilian goods that may be caused.

## Nationwide "Spring Housecleaning" To Salvage Materials for War Asked

NATIONWIDE spring housecleaning for materials that can be salvaged for war production was called for last week by the WPB Bureau of Industrial Conservation.

"Vast quantities of the things we need would be brought to light by a concerted spring housecleaning," Lessing J. Rosenwald, chief of the bureau, said.

"Housecleaning in the average American home generally uncovers things which are considered worthless or too old for further use," Mr. Rosenwald pointed out. "Too often in the past, these collections of waste materials which had cluttered up attics, cellars and back-

yards have been destroyed or lost to further use by being carried away by municipal refuse collectors.

"This year the need for the return of waste materials into new production should be plain to all of us. Old metal ornaments, obsolete plumbing and heating equipment, broken tools—these can become parts of guns, planes and tanks; old tires and tubes, hot water bottles and bath mats can go into the production of reclaimed rubber so critically needed to replace our lost supply of crude rubber from the East; old rags will be made into wiping rags for use in war plants, and wastepaper is in demand for

conversion into cartons for the shipment of munitions and canned foods to our men in the field.

"Despite the fact that the Bureau of Industrial Conservation, through its salvage committees in 46 states, has stimulated the flow of household waste materials to a tremendous degree, I am sure that a nationwide, concerted housecleaning will bring to light additional vast quantities of the things we need. Here-and-now is an opportunity for every family in the United States to make an important and direct contribution to our war effort.

Business men, too, can lend important support to the spring housecleaning drive, Mr. Rosenwald stated. Shops, plants and factories, already co-operating in the salvage for victory program, were urged to make a special effort to increase the movement of obsolete equipment and similar waste materials.

Through state and local salvage committees organized by the bureau, the public has been instructed to sell waste material to local dealers or give the collections to anyone of a number of charitable organizations active in the salvage campaigns.

## Progress in Steel Expansion Found "Satisfactory"

WPB steel officials last week expressed satisfaction with the progress being made on the expansion program.

Projects are still coming up for consideration—for both federal and private financing—and are being forwarded to Defense Plant Corp. at a rate of several a day.

The latest projects individually are not running into the big money as did some of the earlier ones; in the aggregate, however, they amount to millions of dollars.

Efforts are being made to coordinate all the expansion work to the end that Army and Navy projects will clear through the WPB expansion unit. Both the Army and Navy have been lending funds to companies producing heavy forgings, armor plate and other critical products. The Army-Navy projects are reported to be included in the original 10,000,000-ton program.

Little publicity has been given to the funds loaned by the services to steel companies, but they are known to be substantial. Loans were only to firms making products for the services; they are over and above the funds supplied by the Defense Plant Corp.

# Large Quantities of Critical War Materials Requisitioned by WPB Unit

## WASHINGTON

IN MORE than 60 separate requisitioning actions large quantities of commodities in 17 categories, and the entire cargo of an Axis ship, have been seized for war uses by government agencies.

In addition to the material obtained as the result of these requisitioning orders, the WPB Inventory and Requisitioning Branch has succeeded in negotiating voluntary sales which have made available to war industries large quantities of critical materials frozen by conservation orders because they had been purchased before the outbreak of war for export to enemy and occupied countries, or for other reasons.

Another method employed by the branch to direct idle inventories of badly needed supplies into war production is represented by the broad salvage campaigns carried on with the assistance of the RFC. In these campaigns the branch establishes a schedule of prices to be paid from RFC funds for raw, semiprocessed and scrap materials found to be in possession of manufacturers prohibited by priority regulations from making use of them.

At present such programs are being conducted to salvage inventories of aluminum, white metal and nickel anodes held by owners not engaged in war production.

Similar programs will be initiated shortly to acquire known stocks of copper, brass and bronze, iron and steel, manila hemp and other critical items. Should an owner refuse to sell at prices established by the WPB, his property may be requisitioned and the question of compensation decided at a later date, in accordance with the terms of the legislation establishing the requisitioning authority.

Critical material seized under requisitioning orders up to March 25 includes the following:

Commodity or Property	Quantity
Copper .....	7,230,301 lbs.
Lead .....	550 tons
Manila Hemp..	570 bales
Silk .....	26,772 bales
Steel .....	11,000 tons
Tin Plate .....	1,354 tons
Iron and Steel	
Scrap .....	4,000 tons
Tin .....	278,864 lbs.
Toluol .....	262,544 gals.
Wax .....	119 bags
Wood Pulp ...	10,972,569 lbs.
Zinc Concentrates .....	5,000 tons
Boats .....	6
Cargo .....	5,000 tons, miscl.

Commodity or Property	Quantity
Steel Containers	2,700 drums
Machinery,	
Miscl. ....	
Three plants...	
Rail Track ....	49.7 miles

Voluntary sales by owners to fabricators, negotiated by Materials Disposition Section, Inventory and Requisitioning Branch, involved transfers of:

Commodity or Property	Quantity
Copper and	
Brass .....	4,066,705 lbs.
Steel .....	8,760 tons
Tin Plate .....	2,311 boxes
Iron and Steel	
Scrap .....	3,294 tons
Tin .....	883,942 lbs.
Lead .....	494,402 lbs.
Antimony .....	15,400 lbs.
Type Metal ...	189,523 lbs.
Zinc .....	34,000 lbs.
Tungsten Ore...	129,655 lbs.
Molybdenum	
Wire .....	3,341,000 meters
Molybdenum	
Concentrates	45 tons
Chrome Silicate.	500,000 lbs.
Wolframite ....	82 tons
Rubber .....	2,348 tons
Rubber Tires and	
Tubes .....	1,640 approx.
Toluol .....	41 tons
Sugar .....	40,000 tons
Kapok .....	700 bales approx.
Marine Engines.	\$89,000
Tractors .....	31
Trucks .....	296
Steel Mill Equipment .....	
Tools and Miscl.	
Machinery ...	81 lots

## Production of Fluorescent Lighting Fixtures Banned

Immediate cessation of production of fluorescent lighting fixtures, except for essential uses, or on contracts on which work had begun, was ordered last week by WPB.

For a period of 20 days from issuance of order, manufacturers may also produce fixtures and parts from materials now on hand.

The order, L-78, is expected to result in the saving of 35,000 tons of steel, 22,000 tons of copper, 5200 pounds of mercury, small amounts of aluminum, zinc, cadmium, and bakelite, and release the facilities of the industry for conversion to the production of essential war articles.

There are approximately 2000 companies which produce fluorescent lighting units and parts. Because of the relative youth of the industry, accurate data is not available on recent production and sales. It is estimated by the WPB Building

Materials Branch, however, that the dollar volume in 1942, on an unrestricted basis, would have been about \$100,000,000, representing 10,000,000 units.

The terms of the order prohibit the manufacture or assembly of any fluorescent lighting fixture or part, notwithstanding existing contracts or agreements, except on orders bearing a preference rating of A-2 or better.

## Prison Shop To Be Used To Produce War Materials

A separate section within the Bureau of Governmental Requirements to co-operate with state governments and federal procurement agencies in utilizing the fully equipped shops and skilled labor of prison industries in the war effort was announced last week by Maury Maverick, chief of the bureau.

The bureau has been promised the co-operation of virtually all states in making the facilities of prison shops available for the production of war goods, most of which would be purchased by other Allied governments warring against Hitler. The Prison Industries Section of the bureau is now studying procedures which would enable the prison industries to sell to the Defense Supplies Corp. for lend-lease purposes.

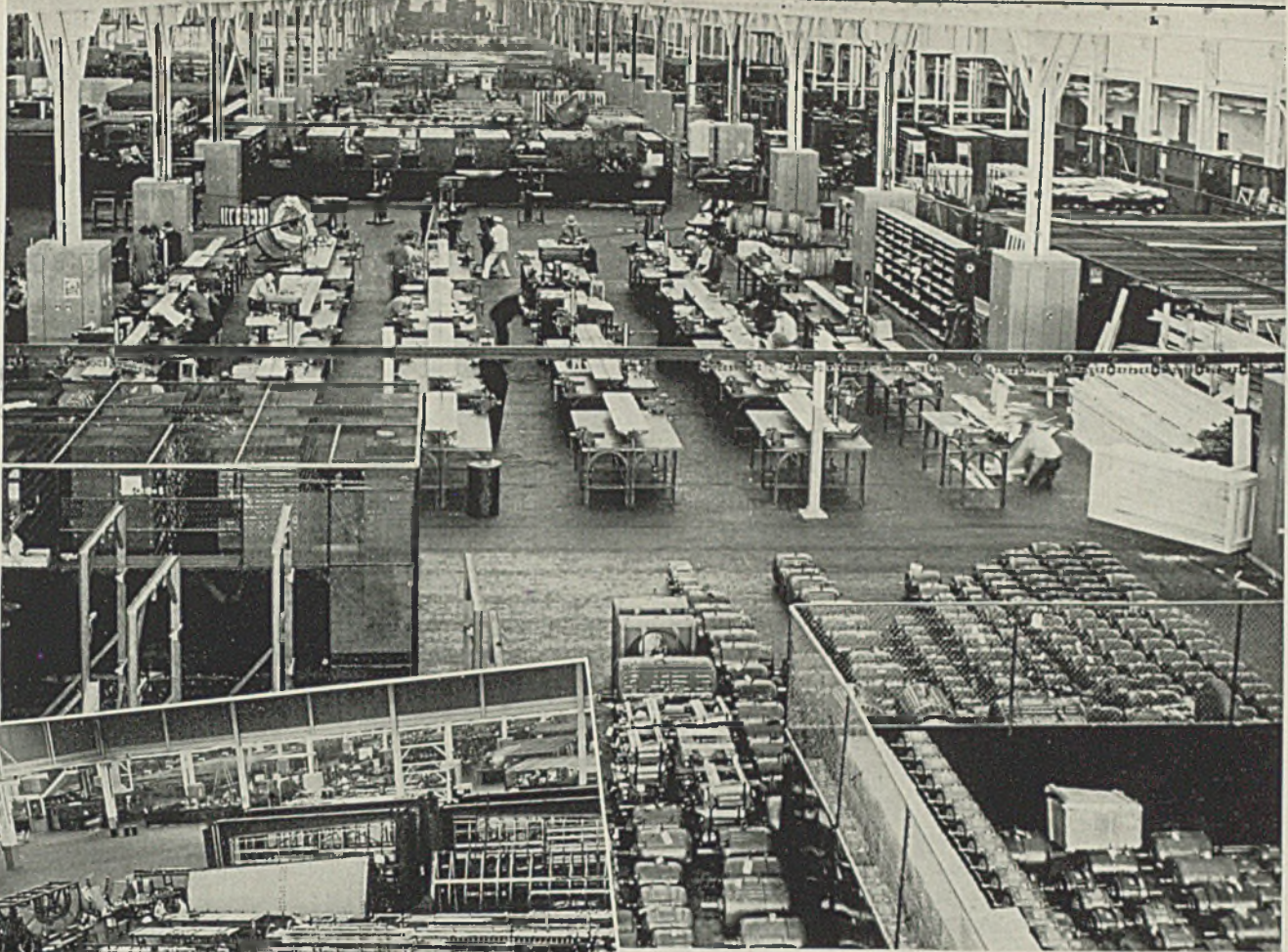
Department of Justice announced an Army ordnance contract for the manufacture of metal fins for aerial bombs has been awarded to the federal penitentiary at Lewisburg, Pa., which has a well-equipped machine shop.

## WPB Clarifies Order Covering Merchant Ship Construction

Only material which becomes a part of a merchant ship, and perishable tools, expendable materials and temporary equipment used up by the shipbuilder in constructing ships can be assigned preference ratings under General Preference Order P-7, the WPB has ruled.

P-7 assigns a preference rating in favor of the shipbuilder and each rated subcontractor "to be applied to deliveries of material and equipment entering directly or indirectly, at any stage of construction, into the construction" of certain specified merchant ships.

In the interpretation, it was stated that reference is made only "to that material which, in the final stage of production, becomes a part of a merchant ship, plus such cutting and other perishable tools, expendable materials, and equipment of a temporary character, as are used up by the shipbuilder in constructing ships. The rating assigned to this type of material may be applied either by a shipbuilder or by a rated subcontractor."



## Ford's Willow Run Bomber Plant Soon To Make "One an Hour"

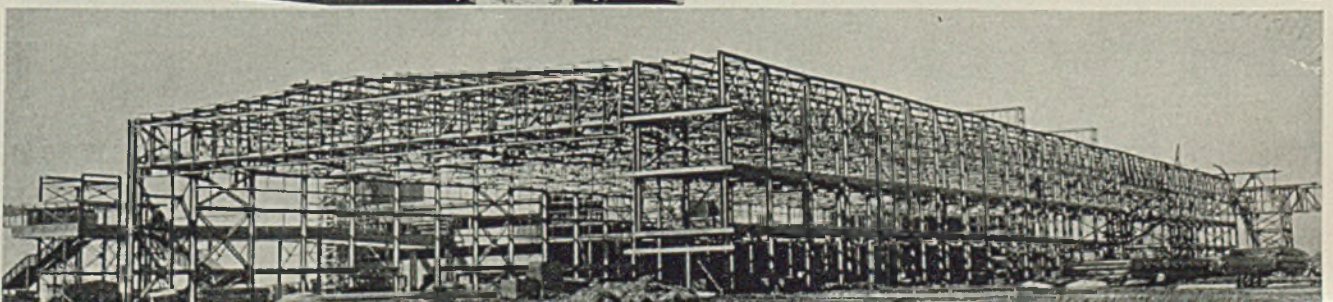
FOUR-MOTORED Consolidated bombers soon will be rolling out of the new Ford Willow Run, Mich., plant at a rate of one every hour. More than half a mile long and a quarter mile wide, the building has been constructed and tooled within the past year.

View of the manufacturing section is shown in photo at top of page. Behind this impressive front the assembly line section stretches for a half mile.

Upper left, huge jigs in which the bombers' center wing sections will be assembled, moving along from one operation to another in automobile assembly line style.

Lower left, tool shop, already completed, occupies a comparatively tiny corner of the building although it itself is enormous.

Bottom, hangars at the end of the assembly line will receive the completed 30-ton air dreadnoughts and prepare them for test flights. Twenty-two miles of runways criss-cross a flying field behind the hangars. NEA





YES, IT'S ONE OF "OUR BOYS" writing—but he's not being prejudiced. Hyatt's *do* play a major part in Army and Navy equipment ... in tanks and guns and planes and ships ... in the machines that make the machines of war. Everywhere, every day, precision-made Hyatt Bearings are serving well in America's drive toward victory.

Our young soldier's buddies in Department 9 at Hyatt are justly

proud of him—and he can be equally proud of them. For they are soldiers, too ... in the front lines of industry ... working with might and main, day and night ... keeping a steady flow of vital parts for the fighting

machines that our fighting men are using with such telling effect! Hyatt Bearings Division, General Motors Corporation, Harrison, N. J., Chicago, Pittsburgh, Detroit and San Francisco.



THE 50<sup>TH</sup> YEAR OF **HYATT** ROLLER BEARINGS

# Mirrors of MOTORDOM

**Fisher Body's forty-seven-day retooling for M-4 tank production a "miracle of conversion". Project now seven months ahead of schedule as Flint tank arsenal nears completion. Engineers develop new methods of forming armor plate and new fixtures for welding cast steel hulls . . . "Sacred cow" conventions of Army and Navy bring headaches . . . TWI Branch sends Chrysler supervisors to school**



By A. H. ALLEN  
Detroit Editor, STEEL

## DETROIT

FORTY-SEVEN days is almost unbelievably short time to get an M-4 tank into production in a retooled automotive shop, but such is the record claimed by the Fisher Body Division of General Motors. First of the welded 30-ton monsters was completed four weeks ago, and work on the project is now seven months ahead of original schedule.

At the rate war material is piling up at seaboard awaiting bottoms for shipment to the fighting fronts, considered opinion around here is that stop orders or slow orders may be forthcoming on some items, possibly military trucks, to prevent complete choking of rail and dock facilities. Tanks probably would not be included in such revised scheduling,

but it is certain that war production is now well ahead of capacity to move material abroad.

The quartermaster corps is renting storage facilities on both east and west coasts in the effort to clear dock space, but the stuff from the production lines keeps pouring in, bringing to mind the musical story of the Sorcerer's Apprentice who solved the magic of starting the water pumps to flowing automatically, but who then could not figure out how to shut them off.

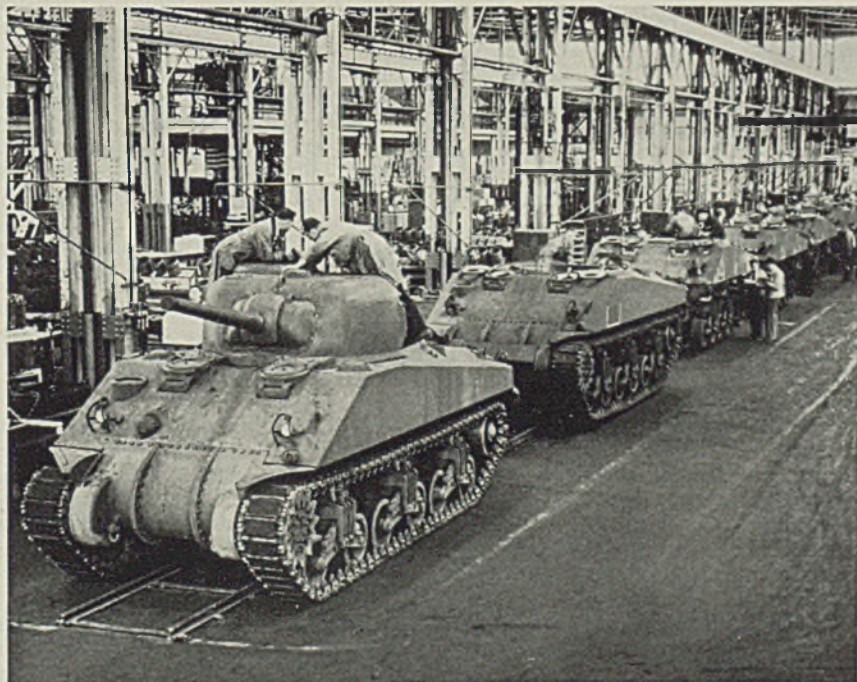
Fisher Body's tank arsenal near Flint, Mich., is not yet ready for assembly operations, but it is rapidly nearing completion. A number of key Fisher executives have been transferred from the Detroit area to the new arsenal as production

approaches the starting point.

Work started on the Fisher tank project in January, in a section of a body plant from which machinery was being cleared out as auto production drew to a close. Sixteen days later the last auto body was shipped and workmen attacked the final conversion of the plant to armament production. In March, 47 days after the project started, the first tank came off the line under its own power. Accompanying illustration shows the tank, with some others in various stages of construction lined up behind it. The first unit was largely a "hand built" job in the automotive sense, and the production line shown is not the one from which the tanks will drop off eventually.

Naturally, Fisher had a lot of help in getting this tank work under way. The Automotive Council for War Production's tank and armored car division is expediting interchange of information on tank production, having representatives from Fisher, Chrysler, American Car & Foundry, Ford, Cadillac, International Harvester, Mack and Yellow Truck on its roster. However, it should be pointed out that the welded M-4 design had never been built before, so Fisher engineers had to design and build a lot of new fixtures for welding the cast steel hull. Foremen had to be instructed in welding procedures, and welding operators trained in handling the heavy armor plate. Forming of this thick plate also is a difficult job and Fisher worked up some new ideas in this connection, principally in regard to shaping the armor plate to save welding. One instance of this forming saved the need for 64 inches of welding. Autobody presses are being used for the forming operations.

Adaptation of the principle of positioners, or turnover fixtures, is another factor aiding in mass pro-



ROLLING off the production line in General Motor's Fisher Body division—seven months ahead of schedule and only 47 days after the last auto body was shipped—these welded, 30-ton M-4 tanks represent another conversion achievement in automotive shops. Tank manufacture will be transferred to the new Fisher Tank Arsenal in Flint, Mich., upon its completion

duction techniques. Fixtures which hold parts in position while they are being welded were designed so that they revolve in a complete circle and elevate and lower lengthwise. Thus welding can always be done in a downward position, which is faster and makes for a better weld.

Most unusual fixture developed by Fisher engineers is the one for final hull assembly. This unit grips the entire tank hull and revolves side-wise or lengthwise for welding and assembly work. The fixture weighs 30 tons—as much as the completed tank itself.

### Quibbling Over Trifles

An example of some of the headaches which war production plants are running into is the following: A Pontiac plant had an order for a number of painted wood cases in which spare antiaircraft gun parts are packed for shipment. The order amounted to only about \$100,000, but the manufacturer after some study announced to the buyer, the Navy, that by a slight change in design and method of manufacture a \$32,000 saving could be effected, with no sacrifice of quality or strength. The Navy said no; the boxes had to be built according to specifications. Furthermore, the application of paint to the boxes cost something like \$1.25 apiece and rejects were running from 10 to 15 per cent, principally because of small scratches on the paint resulting from careless handling after painting. Boxes so rejected could not be touched up, but had to be completely stripped and repainted.

This may sound like quibbling over inconsequential, but it bears on the point that procurement policies of the services are a long ways behind those evolved over the years by leading industries in the country. Maximum production effort is impeded by just such things as failure to apply common sense to procurement; by sticking to the letter of specifications instead of to the intent of such specifications. In the last four months progress has been made, but there is still ample room for improvement.

Such things as insisting on a Class 3 fit on nuts and bolts for service where industry in general for years has approved a Class 2 fit and often a Class 1 fit basically are trifles, but, to borrow a phrase from Research staff, they are the "tre-Buck Weaver of the GM Consumer mendous trifles" which complicate the job of manufacture and supply and hence slow the production program. Realism and cold common-sense would help military procurement immensely.

Some of the "tremendous trifles" involved in retooling an automobile plant for war work are embodied in

the following case history of a plant which formerly produced transmission drive pinions for motor cars and undertook to convert its equipment to produce a similar pinion for a tank drive. The two parts are identical in function but vastly different in size. The automotive part weighs six pounds, is about a foot long and a couple of inches in diameter. The tank part is better than 3 inches in diameter, 3 feet long and weighs close to 75 pounds.

A machine production line of 39 machines; 194 tools, dies, jigs and fixtures; 153 precision gages, heat treating furnaces and straightening presses was required for producing the automotive pinion. To transfer the tank pinion to the same line meant all new tools, jigs, fixtures and the like, as well as an entirely different arrangement of machines. Moreover, in the entire lineup of 39 machines not one was large enough to handle the 3-foot 125-pound bar of forged steel out of which the tank part is machined. A new plant within a plant had to be built to make this one part. Many new and larger machines were purchased, all of which were completely tooled up for the new part. The term conversion does not mean much in a case like this, and there are many comparable situations.

### TWI Schooling Executives To Train Skilled Workers

Training Within Industry division of the WPB here announces that 13 educational supervisors, representing principal Detroit plants of Chrysler Corp., are attending a job instructor training institute as a part of a program for boosting skill of war plant workmen. A similar program has been under way for several weeks at the Ford airplane engine plant, and number of other smaller plants have adopted the technique, including: American Blower Corp., Carboly Co. Inc., Commercial Steel Treating Co., Detroit Edison Co., Essex Wire Co., Federal Motor Truck Co., Fisher Body Division, Great Lakes Steel Corp., Hudson Motor Car Co., Stinson Aircraft Division of Vultee Aircraft Inc., Vickers Inc., Gar Wood Industries, Allied Products Co., American Brakeblok Corp., Commonwealth Brass Corp., Detroit Moulding Co., Eureka Vacuum Cleaner Co., Gorham Tool Co., Holley Carburetor Co., Michigan Steel Casting Co., Micromatic Hone Corp., Modern Collet & Machine Co., National Stamping Co., Reynolds Spring & Wire Co., and Whitehead & Kales.

Essentially, the plan involves in-

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struction of plant executives by WPB experts in advanced training methods, so that they can return to their respective plants and make available similar instruction to shop foremen and group leaders.

Considerable agitation is developing for either a sharp modification of rationing regulations covering sale of new cars, or a complete scrapping of the rationing idea. New cars are not moving even in numbers permitted under rationing. Buyers generally appear convinced that they will not be given permission to buy, and those buyers who might receive approval are not interested in new cars now.

### Dealers Charge Discrimination

Car dealers point to the unfreezing of electric refrigerator stocks in the hands of dealers following an original clamping down on all sales, claiming that this relaxation is unfair and discriminatory against car dealers.

Ration boards generally are interpreting the qualifications of prospective buyers in the strictest sense of the official regulations, with the result that the stock of new cars in dealers hands at the first of the year has not been reduced even a little.

These cars are not improving with age. Special precautions are necessary to protect engine parts, transmissions, differentials, rubber and upholstery against damage even in good storage quarters. Nash, for example, has issued detailed instructions to its dealers telling how to prepare cars for long-term storage, and recommendations cover five typewritten pages. Doors should be left ajar, windows covered with paint or wrapping paper, cars set up on blocks, clutches disengaged, light oil put in each cylinder, fuel lines blown out with air, transmission and differential gears rotated at least every 90 days, tires deflated to 10 pounds, storage batteries charged at regular intervals, etc.

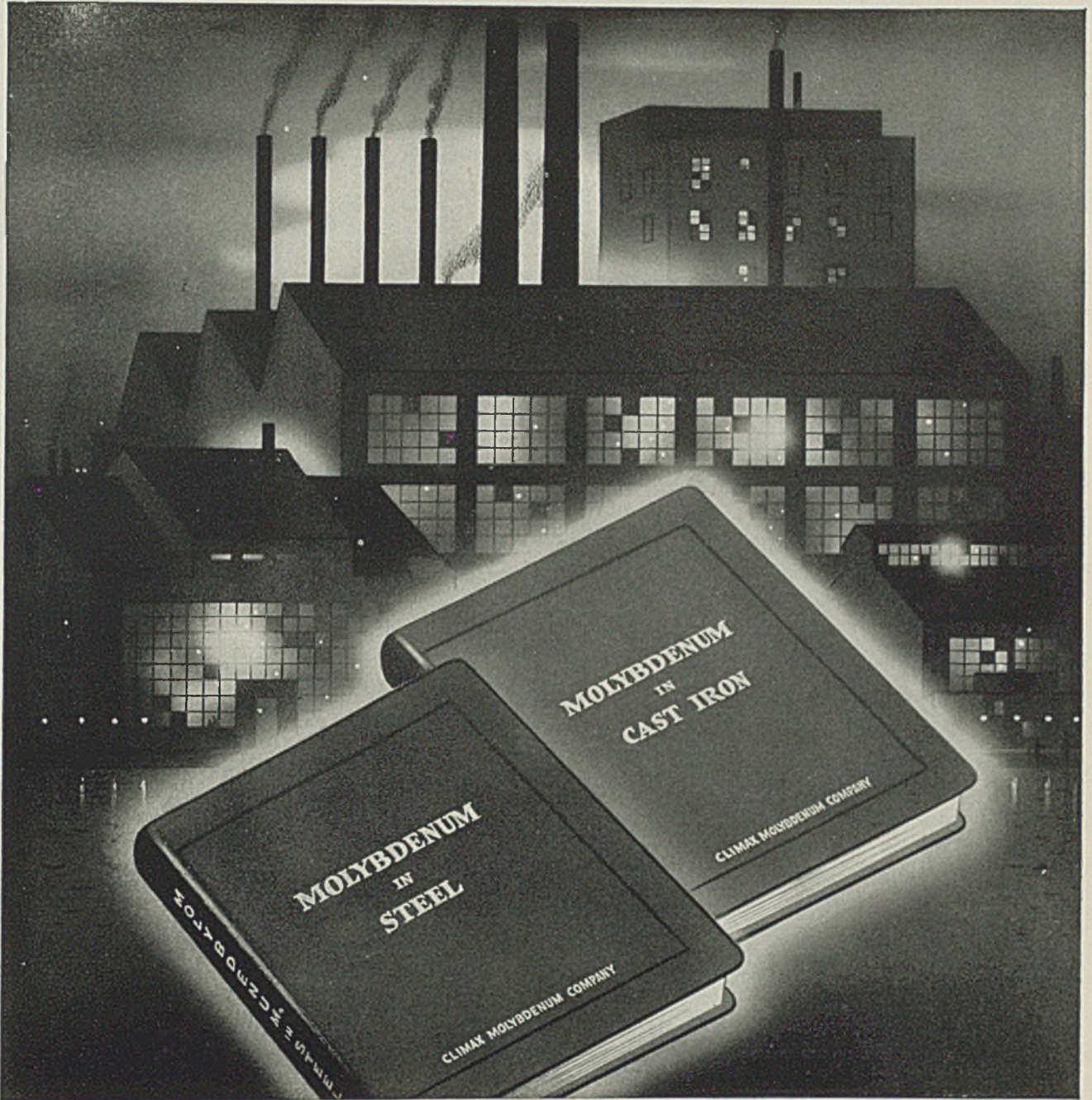
### Westinghouse Offers War Maintenance Service

To avert loss of war production time, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., last week organized a new maintenance sales department to keep Westinghouse motors and generators in industrial plants and powerhouses at maximum efficiency.

Harry R. Meyer, manager of the department, will have 50,000 different kinds of machine replacements at his disposal ready to send immediately to plants reporting breakdowns or loss of efficiency.

Westinghouse has 7,000,000,000 motors and generators operating.





## PRACTICAL DATA FOR PRESENT PROBLEMS

Here are two books designed to help users of Molybdenum steels and irons to conserve all alloying elements, and possibly steel and iron, by getting the most in the way of strength, toughness and wear resistance with the lowest alloy content.

**"MOLYBDENUM IN STEEL"** covers the fundamental metallurgy of Molybdenum steels. Heat treat-

ment - physical properties - applications - of a number of these steels are treated at length.

**"MOLYBDENUM IN CAST IRON"** covers the effect of Molybdenum in gray iron, giving suggested analyses for practical applications and detailed discussion of high strength (60,000 p.s.i. and up) irons.

Both books will gladly be sent free on request.

**Climax Molybdenum Company**  
**500 Fifth Avenue • New York City**

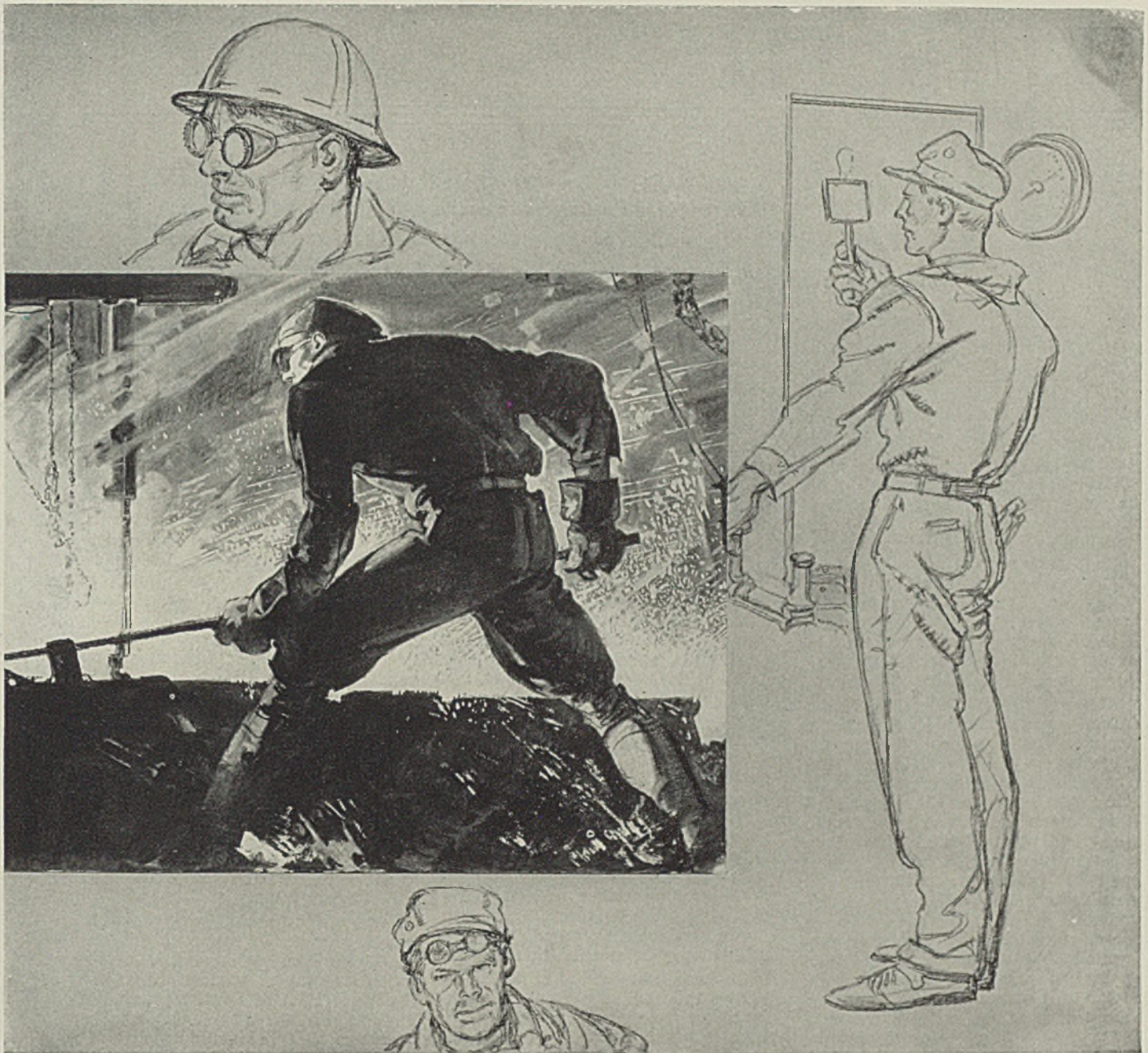


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# MEN OF STEEL HELP FIGHT THE WAR

Around the clock, twenty-four hours a day, seven days a week, the thousands of men at J&L are turning time into steel and more steel to arm our fighting forces. With their *will to do*, they are making new high records in steel production.

These gains that help step up our fighting power for the battles ahead are made by men and management who realize the price that must be paid to assure our freedoms. The individual skills these men employ are those of free men working in a spirit of free enterprise. They know what we are fighting for — many of them are sons and



FROM AN ORIGINAL DRAWING AND SKETCHES BY ORISON MACPHERSON

grandsons of men who came to America that they and their children might be free. They know what it takes to win — many of them fought in 1918. They know that production *today* backs up their sons and brothers and your sons and brothers in the war.

In this spirit, men of steel help fight the war. They fight it in the mines and quarries, on the Great Lakes, on the rivers, the railroads, at the coke ovens, the blast furnaces, the steel works, the blooming and finishing mills. They fight it by processing raw materials into booming, fiery steel — working the last full pound from the materials and machines under their command — speeding more and more steel, day and night, on its way to war.

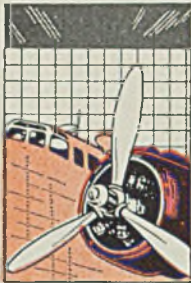
**JONES & LAUGHLIN  
STEEL  
CORPORATION**

**AMERICAN IRON AND STEEL WORKS  
PITTSBURGH, PENNSYLVANIA**



**PARTNER TO INDUSTRY  
IN WAR PRODUCTION**

# WING TIPS



*Experiments with low-alloy high-tensile steel sheets for trainer plane fuselages are encouraging. Ease of fabrication and assembly, plus conservation of critical metals, outweigh disadvantage of 3 per cent increase in gross weight . . . Rivets by the billions in the making . . . Coast companies organize production pool to co-ordinate activities . . . See precedent in Automotive Council for War Production*

ALTHOUGH it is a trifle premature to suggest that the aluminum shortage in the aircraft industries is going to be corrected by application of spot welded low-alloy high-tensile steel sheet and strip to fuselage structures, at least the first steps have been taken by North American Aviation, as mentioned here (March 30, p. 36) in the perfection of steel and wood members to replace aluminum in its AT-6A training planes.

It was late in 1940 when North American engineers began some tests on steel for airplane surfaces. They wanted some S.A.E. 1025 sheets, because in leafing through an old S.A.E. handbook they discovered this material heat treated had double the yield point of aluminum alloy. So they went to a local steel company in southern California and tried to get some sheets for experimental purposes. None were in stock, but the steel company suggested that a nearby stove company had some low-alloy high-tensile (Cor-Ten) sheets that might fit into the test program. The stove company was willing to let go of some of its stock so the work proceeded.

An experimental ship was built up with steel wings, wing center sections, wing tips, vertical stabilizers, rudders, elevators, flaps, ailerons and various pieces of cowling and fairing, replacing in all 996 pounds of aluminum alloy.

## **Weight Increase 3 Per Cent**

The steel structure weighed 12 per cent more than the comparable aluminum assembly, the higher strength of the steel permitting the use of thinner gages. The structural weight of an airplane is roughly 25 per cent of the gross weight, so the shift to steel brought an increase in gross weight of only 3 per cent, well within the authorized 3 per cent overload on the AT-6A trainer.

The experiments with steel have proved successful, but it should be pointed out that the change has not

been made as yet. Engineering is always well ahead of production, so it may be some time before steel trainers are rolling off assembly lines.

At least a start has been made, and it seems entirely logical that the company making it should be the one most closely related to the automobile industry. General Motors Corp. owns a substantial portion of the North American stock, and many of the latter company's executives and engineers are schooled in the automotive methodology of manufacturing, so it is natural they should pioneer the use of steel, a basic automotive material, in airplane structures.

## **Tougher Than Aluminum**

In contrast to aluminum, steel can be treated almost carelessly in manufacturing processes without damage. The admonition, "Scratched dural is scrapped dural" can be forgotten when steel is the material.

Given a light coat of oil before it leaves the mill, the steel sheet is protected from corrosion during fabrication. After an assembly is completed, it is dipped in a degreasing solution to remove the oil and then is rustproofed by the familiar phosphate process used widely in the automotive industry.

Even this latter process may be eliminated before steel aircraft assemblies get into mass production, by use of a new protective compound which can be sprayed on the sheet steel as soon as it arrives from the mill. The new compound prevents rusting and also does not interfere with spot welding operations.

It is also pointed out that the use of steel exterior surfaces eventually may eliminate some of the heavy armor plate used in combat craft, since projectiles will glance off a curved steel surface more readily than off a similar curved aluminum skin.

Steel sheets used by North American vary in thickness down to a

minimum of 0.010-inch, or about 32-gage. Modern aircraft design practice holds minimum thickness of aluminum alloy sheets down to 0.025-inch, or 24-gage. Steel, incidentally, is in cold-rolled finish. Type of structure used with steel is essentially the same as with normal aluminum alloy design—a stressed external skin reinforced by transverse internal ribs and bulkheads and by longitudinal internal stringers.

Similar fabricating and forming methods likewise can be used. Masonite dies and rubber blocks used in aircraft hydraulic presses, as well as zinc and lead dies used in drop hammers, can be applied equally well to steel sheets, according to North American engineers. They might get plenty of argument on this score from experts in pressed steel fabrication.

One of the major savings which steel permits is in riveting. The AT-6A trainer in aluminum requires 52,336 rivets of various sizes and shapes. Cost of riveted assemblies figures in the neighborhood of 5 cents per rivet, including drilling, cleaning, insertion of rivet, driving the rivet, inspection and the occasional waste of entire assemblies because of faulty rivets. Spotwelding can be handled by one operator at a rate of 350-1000 spots per minute and at an estimated cost of 0.1-cent per spot.

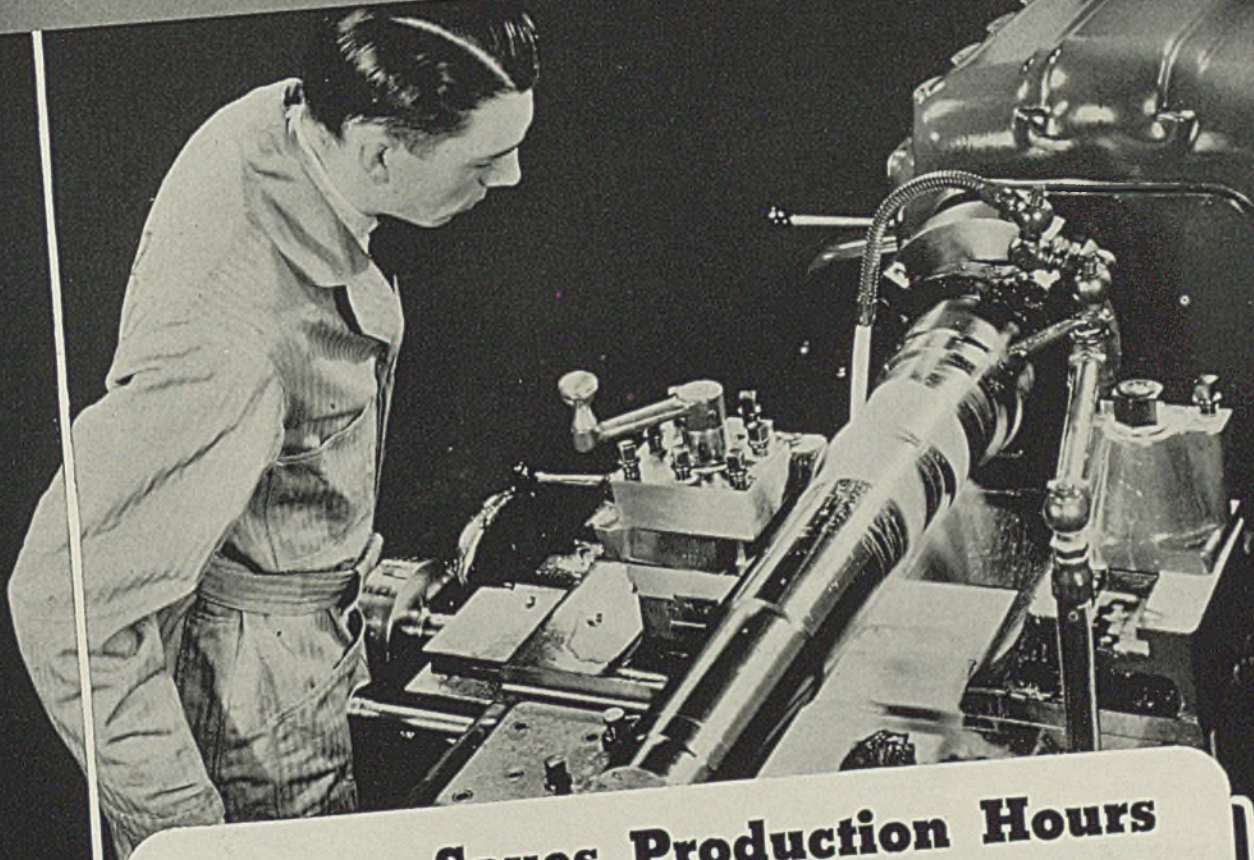
## **Welding Not a "Cure-All"**

It is of course not entirely a matter of comparative cost between riveting and welding. Even assuming welding were acceptable for all aluminum assemblies, still it would be difficult in some instances because of inaccessible joints. Furthermore, all spot welding machines must be closely controlled and, where operating on aluminum, must be checked frequently.

The expanding aircraft production program is stepping up demand for

*(Please turn to Page 63)*

# When Minutes Count



## Sunoco Saves Production Hours Prolongs Tool Life • Saves Down-time • Minimizes Rejects

Speed and more speed . . . production on a scale never before contemplated . . . this is the immediate objective of the machine tool industry.

One way to save vital production hours, to increase at once the output of available machine tools and trained manpower, is to put Sunoco Emulsifying Cutting Oil to work. This way is proved. Facts and figures are a matter of record.

Sunoco helps prolong tool life, increases output between grinds, reduces the unproductive time required for re-

grinding and resetting tools. This modern emulsifying cutting oil minimizes rejects by helping maintain close tolerances and good finish . . . thus saving essential materials and final finishing costs.

Sunoco, and Sun Oil Engineers—those "Doctors of Industry"—are ready to help in your all-out effort . . . to help you step up production, save time, tools and material wherever possible! Write

**SUN OIL COMPANY • Phila., Pa.**

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



### PERFORMANCE DATA

OPERATION—Turning  
5" diameter S. A. E.  
1045 Steel @ 270 R.P.M.

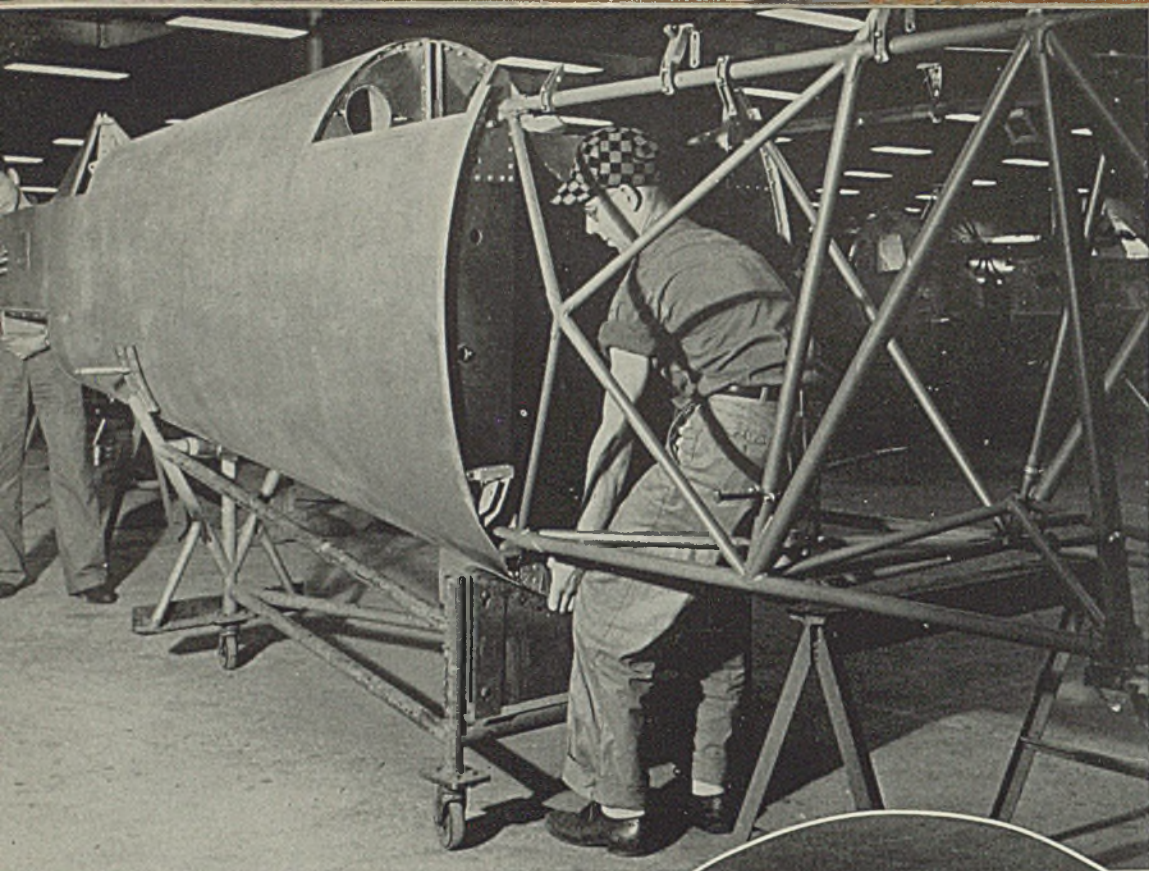
MACHINE—"American"  
Pacemaker Multi-Production Lathe.

CUTTING LUBRICANT—  
1 part Sunoco to 20  
parts water.

Courtesy of  
AMERICAN TOOL WORKS  
COMPANY

# SUNOCO

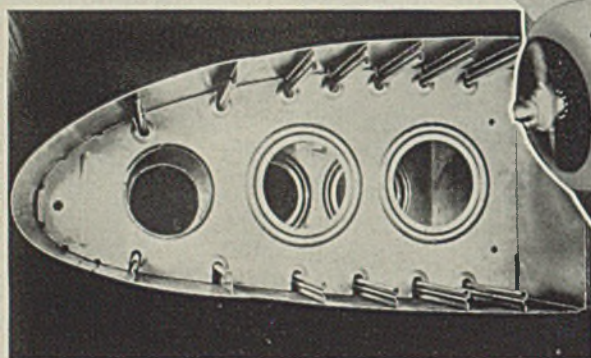
# SUN PETROLEUM PRODUCTS HELPING INDUSTRY HELP AMERICA



NORTH AMERICAN workers, left, at Dallas plant attach rear fuselage section, built of wood, to front section frame, of chrome-molybdenum steel tubing

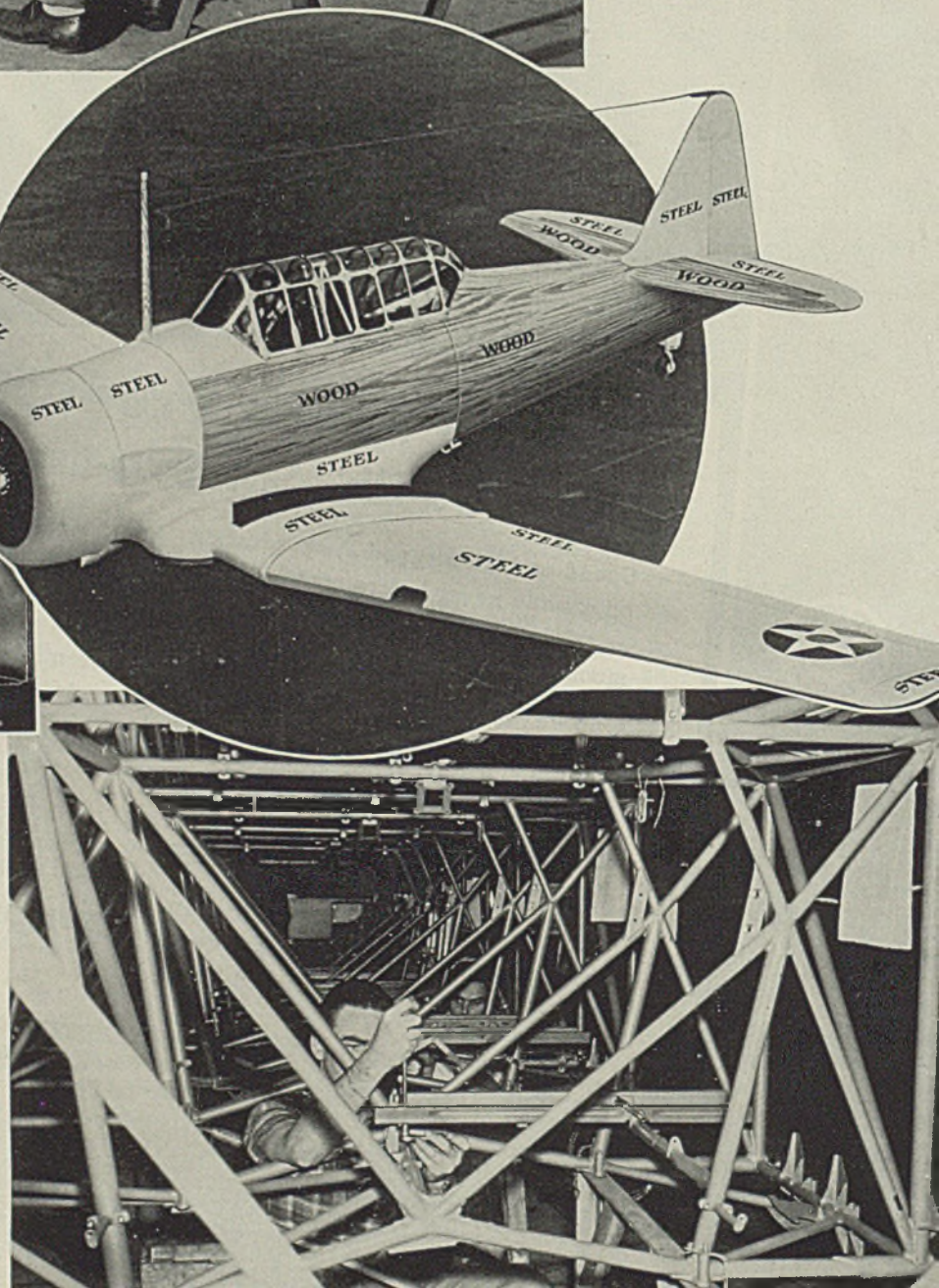
AT-6A advanced trainer, circle, with sections marked to illustrate which may be replaced by wood and low-alloy steel

## Steel, Wood Substituted for Dural in Trainers



ABOVE, cross-section of the new low-carbon, low-alloy steel wing for the training plane. Aluminum shortage prompted the experiments with alternate materials

WOOD floor being installed in tubular front fuselage of the AT-6A, one of the most popular of the advanced trainers. Almost identical ships have been delivered to the British and the Navy under other designations



## Wing Tips

(Concluded from Page 60)

aluminum rivets to tremendous totals. New programs for production of rivets by the billions are being shaped up, and it may be necessary to call on some of the screw and bolt companies to lend their heading machine capacity to rivet production, in spite of the fact that such headers are much slower than the newer types of rivet-making ma-

over the possibilities for cold-rolled low-alloy sheets in airplane manufacturing, but right now they have little if any excess capacity which might be devoted to such a product, so they are not saying much about the new development. Of course they are co-operating as far as they can on the development of a better aircraft sheet, the tentative goal now being a material which is 20 per cent better than the best now being made.

Steel used by North American thus far has been supplied by Columbia Steel Corp., U. S. Steel subsidiary. Research staffs of the corporation in Chicago and Pittsburgh now are said to be pushing the development of an improved material for further tests. There are a dozen other types of low alloy steel which likely would prove equally satisfactory.

Along with the steel development, North American has been successful in applying wood to certain structures of its training planes; in fact, has gone further with wood substitutions than with steel, in terms of actual use on finished planes. Wood assemblies are being supplied by Berkey & Gay, furniture makers in Grand Rapids, Mich. Fir, spruce, birch and mahogany are the woods which have proved most ac-



**MERRY-GO-ROUND** on the production line at Lockheed Aircraft Corp., Burbank, Calif., is this 250-ton single-action hydro-press with a rotary table that can handle more than 20,000 parts a shift. The rotary table was designed by Lockheed engineers. It requires only a few operators or feeders. After each has placed one or more small parts on the die as it wheels past him, the rotary table is turned one notch until all dies and the parts they are to form are pressed. Formerly all such forming was done on two heavier presses of 2500 and 4500-ton capacity, and requiring 20 operators to handle 12,000 parts in eight hours. The new press costs only one-third as much as the larger units, turns out nearly twice as many parts with less than half the manpower. NEA photo



tive Council for War Production by the automobile companies. There has been a fairly complete interchange of information on production practices and engineering developments among the airplane companies on the coast, so perhaps the new organization is merely the formalization of what has been going on for some time.

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# STRY

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**Max M. Gilman**, president, Packard Motor Car Co., Detroit, has resigned because of ill health.

**Malcolm R. Macdonald**, Chicago district manager of the War Production Board's priorities field service, has resigned to return to private business.

**Wayland S. Bowser**, formerly associated with the comptroller's office of Carnegie-Illinois Steel Corp., Pittsburgh, has been named comptroller, Blaw-Knox Co., Pittsburgh.

**Alfred Marchev**, who joined Republic Aviation Corp., Farmingdale, N. Y., last February, as assistant to the president, has been elected a vice president and assistant general manager.

**William E. Jones**, formerly associated with Pontiac Motor Division of General Motors Corp., is now affiliated with National Engineering Co., Chicago, as service engineer. He joined National Engineering Feb. 1.

**S. L. Bates**, associated with Wickwire Spencer Steel Co., New York, since 1936, has been appointed Buffalo district sales manager, with offices in the Rand building. Heretofore he has been covering the Ohio territory.



S. L. Bates

**J. C. Shaw**, aircraft engineer, has joined Young Radiator Co., Racine, Wis., and has been placed in charge of the engineering work of the enlarged aircraft products division of the company, headed by **J. J. Hilt**, vice president.

**H. C. Clement**, representative in the sales division, Central Station Department, General Electric Co., has been appointed assistant to the district manager, New York district. He has been continuously associated with the company since February, 1910.

**C. A. Cowdrey**, the past 17 years associated with Warner & Swasey Co., Cleveland, since 1939 in the capacity of sales promotion manager, has joined Drive-All Mfg. Co., Detroit, as sales manager.

**Joseph A. Bennett**, formerly secretary and treasurer, Amerlux Steel Corp., San Francisco, has joined the staff of **Harry D. Byers**, treasury representative for Westinghouse Electric & Mfg. Co., at San Francisco.

**Sidney Summerlee**, former production executive with Chrysler Corp. and Willys-Overland, has joined the Buffalo Arms Corp., Buffalo, in a similar capacity. The past year he has been in charge of converting the Willys-Overland plant to armament production.

**R. L. Kirkpatrick** has been appointed manager, renewal parts section, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Associated with the company since 1922 Mr. Kirkpatrick started as a tool grinder, was transferred to the cost department in 1924 and a year later became a price clerk in the renewal parts section. Since that time he has received experience in all phases of renewal parts work.

**J. A. Krugler**, formerly general sales manager, has been appointed vice president in charge of sales and purchases, Taylor Wharton Iron & Steel Co., Highbridge, N. J. **J. L. Lonergan** has been named



superintendent at Easton, Pa., plant. He became affiliated with the company in November, 1941, and prior to that was foundry superintendent, Pomona Pump Co., Pomona, Calif., and vice president and general manager, Morris Machine Works, Baldwinville, N. Y.

**Walter H. Friedline** has been appointed manager of sales, Lorain Division Products, Carnegie-Illinois Steel Corp. **Carroll Burton**, vice president and manager of sales, Lorain Division, has been granted leave of absence to join the War Production Board, Washington. Heretofore Mr. Friedline has been assistant manager of sales, Johnstown Products, Lorain Division.

**Charles P. Gilikson**, former factory representative at Minneapolis for American-Marietta Co., has been named assistant to **Roland G. Maus**, sales manager. He will make his headquarters at the company's main office in Chicago.

**David P. Calhoun Jr.**, St. Louis, has been named president, Trailer Co. of America, Cincinnati, succeeding **A. J. Woltering**, resigned. **C. J. Dalton**, controller, has become treasurer.

**F. W. Schooley**, hitherto in charge of the Los Angeles sales office of Chicago Bridge & Iron Co., has been transferred to an important naval construction project which the company is handling on the Pacific coast. The Los Angeles office has been closed and customers in that territory will now be served from the San Francisco district office, where **L. A. Elsener** is in charge.

**C. H. Vom Baur**, of Miller, Vom Baur & Pratt, consulting electro-metallurgists, Philadelphia, left April 2 for a foreign and friendly government to make an investigation and report on the further development of its iron and steel possibilities. He has been con-



C. H. Vom Baur



Walter H. Friedline

sultant to the Watertown Arsenal and was for two years technical director of the electric furnace department of the All Union Electrical Trust of the U.S.S.R. He has designed more than 250 electric furnaces for melting and smelting.

**William C. Hughes** has been elected president, Julius Blum & Co. Inc., New York, and **William Thurnauer**, treasurer, to succeed the late Julius Blum. Mr. Hughes has also been elected to the board of directors. He was formerly vice president, and Mr. Thurnauer, assistant treasurer.

**James L. Jones**, vice president and general manager, Joseph Dyson & Sons Inc., Cleveland, machinery forgings manufacturer, has resigned after 30 years' service with the company.

**Walter Williamson** has been elected executive vice president, Westinghouse Electric Supply Co., New York. **John H. Fisher** has been elected general manager and a director.

**R. G. Forsberg** has been appointed purchasing agent, Jessop Steel Co., Washington, Pa. He succeeds **R. J. Murray**, who is now secretary and assistant treasurer. Mr. Forsberg was formerly assistant purchasing agent, and before joining Jessop in April, 1941, served eight years in the purchasing department of Timken Roller Bearing Co., Canton, O.

**James Cope**, manager of the Washington office, Automobile Manufacturers Association, now the Automotive Council for War Production, has been placed in charge of the council's Washington reporting service, established to answer the needs of government for industry data and to report to the automotive companies on developments affecting the industry's war efforts.

**William H. McGaughey**, hitherto editor of *Automobile Facts*, becomes

manager of the council's public relations department in Detroit.

**Harlan V. Hadley**, head of the Detroit bureau of the *Wall Street Journal*, is joining the public relations staff as director of information services.

**W. A. Cramer** has been appointed assistant traffic manager, western district, Chicago; **D. M. Morewood** has been named assistant traffic manager, eastern district, Pittsburgh, and **R. N. Shields** has been made general supervisor, traffic department, eastern district, Pittsburgh, for United States Steel Corp. subsidiaries. Mr. Cramer has been assistant traffic manager, eastern district, since January, 1940. Mr. Morewood, hitherto has been general supervisor, traffic department, eastern district, while Mr. Shields formerly was supervisor, transportation bureau, eastern district.

**R. S. Campbell** has been elected president, New York Shipbuilding Corp., New York, to succeed **J. F. Metten**, who has become vice chairman of the board. Mr. Campbell will retain the office of general manager, a post he has held since 1934. **Henry Lockhart Jr.** has been re-elected chairman and made chief executive officer. **T. H. Bosset** has been named vice president, and **A. H. Mills**, chief engineer.

**Garfield A. Wood**, president, Gar Wood Industries Inc., Detroit, announces the following managers have been elected vice presidents of their divisions: **W. H. Hammond**, sales manager, Hoist, Body and Tank Divisions and director of branches; **J. B. Halle**, general manager, Road Machinery Division; **G. E. Robinson**, manager, Winch Division. They will continue their duties as managers.

**F. A. Ketcham**, former president, Graybar Electric Co. Inc., New York, has been elected chairman of



R. G. Forsberg

the board. **A. H. Nicholl** has been elected president; **G. F. Hessler, D. H. O'Brien, E. W. Cashman**, vice presidents, with headquarters in New York, and **W. P. Hoagland**, Chicago; **W. J. Drury**, New York, and **A. L. Hallstrom**, Philadelphia, field presidents.

**H. B. Higgins**, associated with Pittsburgh Plate Glass Co., Pittsburgh, since 1905, has been elected executive vice president. Mr. Higgins is also a director and has been a vice president since 1928. He heads the company's merchandising division and has been active in sales and distribution activities throughout his business career.

**H. V. Lauer**, since 1939 superintendent of the Joliet, Ill., coke plant, Carnegie-Illinois Steel Corp., has been appointed assistant division superintendent, Gary works coke plant and blast furnaces, including Joliet works. **H. H. Jones**, superintendent of maintenance at the Gary works coke plant, succeeds Mr. Lauer as superintendent of Joliet coke plant.

**C. V. Lauer**, second assistant superintendent of Gary works blast furnaces, has become first assistant superintendent of blast furnaces, succeeding **A. W. Vincent**, retired. He is succeeded by **G. P. Burks**, heretofore chief chemist of Gary works.

**E. C. Kennedy**, assistant to superintendent, Gary works coke plant, has been named assistant superin-

tendent of this plant. **O. W. Baldwin**, assistant chief chemist, Gary works, succeeds Mr. Burks as chief chemist, while **G. W. Rimmer** succeeds Mr. Baldwin as assistant chief chemist.

**E. K. Waldschmidt** has been appointed special representative on shell steel allocations for WPB. He had been associated with Jones & Laughlin Steel Corp., Pittsburgh, many years.

**Fred W. Cederleaf** has been appointed plant manager of the two Detroit plants of Republic Aircraft Products Division of Aviation Corp. The past three years he has been works manager, Dodge Mfg. Corp., Mishawaka, Ind.

**Hugo Weissbrodt** has been named chief of field operations for the War Production Board's Detroit region. Formerly general manager of International Harvester Co.'s Springfield, O., works, he has served with the WPB Automotive Branch staff since February.

**David P. Andrews**, formerly associated with American Sheet & Tin Plate Co., Carnegie-Illinois Steel Corp., and Great Lakes Steel Corp., has recently been appointed secretary in charge of sales, Crown Steel Sales Inc., Chicago. He has been identified with the steel industry the past 20 years in various sales capacities.

## DIED:

**Arthur G. Moulton**, 66, former vice president, Thompson-Starrett Co. Inc., Chicago, March 30, in that city.

**D. Chester Scull**, 72, master mechanic, who helped Edward G. Budd organize the Edward G. Budd Mfg. Co., Philadelphia, April 1, in that city.

**Allen Ames**, 82, vice president and general manager, Ames Iron Works, Oswego, N. Y., at time of his retirement some years ago, at his home in Syracuse, N. Y., March 31.

**Albert F. Schroeder**, 74, retired general manager, secretary and treasurer, Globe Machine & Stamping Co., Cleveland, April 6, at his home in Lakewood, O.

**Dr. Arthur N. Talbot**, 84, professor emeritus of engineering, University of Illinois, Champaign, Ill., in Chicago, April 3.

**George W. Burrell**, operations manager of Republic Aviation Corp., Farmingdale, N. Y., March 26.

**Franklin G. Hubbard**, 77, president, Lacey Mfg. Co., Bridgeport, Conn., April 2, at his home in Fairfield, Conn.

**Matthew J. Carney**, 67, former vice president and director, Union Carbide & Carbon Corp., New York, April 2, at his home in New Rochelle, N. Y.

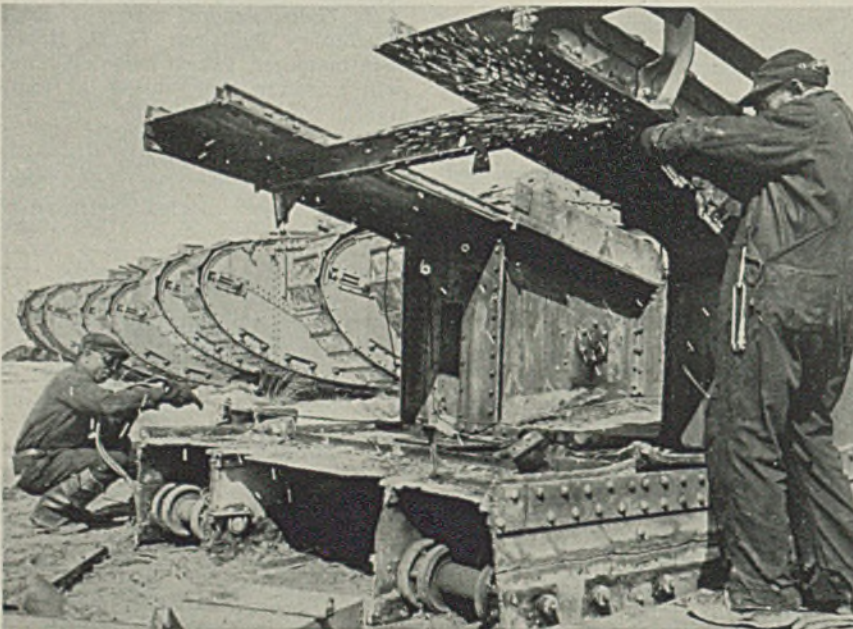
**Harry G. Steele**, 60, president, U. S. Electrical Motors Inc., April 2, in Pasadena, Calif. He was head of the motor firm the past 22 years.

## Wartime Credit Problem Analyzed by Expert

Credit problems in a war economy is discussed by Roy A. Foulke in the editorial foreword to the 1942 edition of *Fourteen Important Ratios*, a publication of the analytical report division, Dun & Bradstreet, New York. He urges frequent analysis of risks and discusses the problem of the non-war product manufacturer in his efforts to finance his business against a dwindling source of supply, and the war product manufacturer who frequently is burdened with heavy liabilities.

The ratios present a five-year study of 72 lines of business activity among 36 divisions of manufacturing, 24 of wholesaling and 12 of retailing. The pamphlet containing the analysis of credit problems is issued as a supplement to Mr. Foulke's basic study of ratios entitled *Behind the Scenes of Business*.

## World War Tanks Dismantled for Scrap



**OBSOLETE** World War I 50-ton tanks are being dismantled at Ft. Meade, Maryland. Scrap salvaged from the old units will be remelted, manufactured into modern weapons. The Army sold 178 of the units to a Baltimore scrap dealer who is handling the dismantling job. NEA photo

## Activities of Steel Users and Makers

STRIP steel for containers can be tin-plated "twice as fast with less electric power and a saving in tin" by use of the Halogen Tin Process, it was reported last week by E. I. Du Pont de Nemours & Co., Wilmington, Del. The process, a development of DuPont's electroplating division, employs a neutral solution which is said to eliminate sludging and the consequent waste of tin.

Farrel-Birmingham Co., Ansonia, Conn., has awarded general contract for construction of a plant in northern New York to the Turner Construction Co., New York. Plans provide for a one-story structural steel, brick and glass manufacturing building, 203 x 603 feet, with three craneways, power plant and office building. Cost is estimated at \$4,000,000.

Peerless Pump Division of Food Machinery Corp., Los Angeles and Canton, O., has acquired the Sterling Pump Corp., Hamilton, O., and Stockton, Calif. The Sterling plant at Hamilton will be consolidated with the Peerless manufacturing plant at Canton, while the Stockton plant will be merged

with the John Bean Mfg. Co., division of Food Machinery Corp., San Jose, Calif.

Rust Furnace Co., Pittsburgh, has received contracts for car-type furnaces from Pittsburgh Steel Foundry Corp., Glassport, Pa., for 18 units for heat treatment of castings, and from National Roll & Foundry Co., Avonmore, Pa., for five for heat treatment of rolls. Both installations represent extensions to present capacity.

Mathieson Alkali Works Inc., New York, plans erection of a plant to increase supply of ammonia and its derivatives. The new plant will be financed by Defense Plant Corp. and will be erected and operated under lease by the Mathieson organization.

Conversion of a long idle textile processing plant in Sunbury, Pa., to manufacture bulkier types of communication facilities for the government has been announced by Walter C. Evans, general manager, Westinghouse Broadcasting, Radio and X-Ray Divisions, Westinghouse Electric & Mfg. Co. Rehabilitating and equipping were begun in March and manufacturing operations are scheduled to start this month.

Stearns Magnetic Mfg. Co., Milwaukee, recently shipped "two

of the largest magnetic pulleys ever built." They were 48 inches in diameter and 64 inches long and weighed approximately 20,000 pounds each. They were installed in a copper mining and reduction plant.

"We Work for Victory and We Plan for Peace", a dramatically illustrated brochure designed to show what products Allis-Chalmers Mfg. Co. is making under wartime conditions and where and how these products are helping to produce more guns, tanks, planes and ships, is being distributed by the company. Nearly every phase of the nation's industrial production is represented, Allis-Chalmers producing a greater variety of capital goods.

Lodge & Shipley Machine Tool Co., Cincinnati, recently purchased a group of industrial properties at the northeast corner of West Eighth and Evans streets for prospective requirements. They contain 81,372 square feet of floor space.

"Ex-Cell-O—Working for Victory" is the title of a 24-page illustrated booklet recently issued by Ex-Cell-O Corp., Detroit. As pointed out in the introduction by Phil Huber, president and general manager, the company is now practically 100 per cent on war work.

Plant facilities have been extended from 210,000 square feet in 1938 to 640,000 square feet now, and employment from 900 to 6100. More than 250 of the company's workmen are serving with the armed forces.

Certified Core Oil & Mfg. Co. recently completed a core oil manufacturing plant at 3308 South Cicero avenue, Cicero, Ill., with storage and processing capacity of over 350,000 gallons.

Seven car-type heat treating furnaces are being built for the American Manganese Steel Division, American Brake Shoe & Foundry Co., at St. Louis, by Rust Furnace Co., Pittsburgh. Construction started six weeks after the order was received, the entire designing of the furnaces and placement of material being accomplished in that period. Total cost is about \$138,000.

Deliveries of locomotives in February totaled 100 units, compared with 89 in January, according to the Bureau of the Census. Total for two months is 189, against 108 in the corresponding two months in 1941. Of the February deliveries 66 were diesel-electric, 28 steam, three straight electric and three miscellaneous types.

## No Time Lost in Painting Shells in Canadian Plant



SLOWLY revolving on an overhead conveyor, these heavy shells pass through the painting room in a Canadian munition factory. A worker sprays on a protective coating with an air-pressure gun and the shells proceed to the next operation. Canadian Public Information photo, from NEA

# Forum Hears "Production Will Soar When Americans Feel Hurt of War"

## PITTSBURGH

SPEAKING on April 7 before a gathering of engineers and executives representing 100 leading machine tool companies and related industries, Frederick B. Heitkamp, vice president, American Type Founders Inc., Newark, N. J., made the following statement:

"With the same machine tools that work in the plants of this nation today, we can get 20 per cent better production—once the men operating these tools feel 'the hurt of the war.' With these same plants we can step up our output 30 per cent by subcontracting—when management 'feels the hurt of the war.'

"Already the nation is beginning to feel this hurt as lives are lost in the Philippines and on the high seas and that is why we already are beginning to get down to hard work.

"The average layman has no conception of the mass of details and the mass of work involved in converting to war production, and so naturally becomes impatient. That same layman, however, is going to be amazed and startled when our whole production machine—geared up as it never has been geared up before to the single purpose of winning a war—gets into full operation."

Mr. Heitkamp, who was for 15 years an executive of Cincinnati Milling Machine Co. and Cincinnati Grinders Inc., sees in a combination of plant conversion and subcontracting the answer to the problems which many companies

just now are having in taking on major war contracts.

Occasion of Mr. Heitkamp's address was the dinner at William Penn hotel at the conclusion of the seventh annual Machine Tool Electrification Forum sponsored by Westinghouse Electric & Mfg. Co. Regular sessions of the forum, held on April 6 and 7 at the company's plant in East Pittsburgh, dealt with joint problems of the machine tool and electrical industries, with particular emphasis on the special and pressing problems introduced by the war. Record attendance by key men in the machine tool industry testified to the tremendous importance which electrical drive and control has assumed in this industry since the first world war.

This was brought out forcibly by Tell Berna, general manager, National Machine Tool Builders' Association. Mr. Berna was chairman of the session devoted to the boosting of machine tool production through use of recently standardized electrical equipment developed through the joint efforts of machine tool builders and electrical manufacturers—in which activities past forums have played an important part.

Other speakers included: William P. Beattie, American Laundry Machinery Co., Cincinnati; V. T. Grover, American Can Co., Newark, N. J.; Lee M. Davis, Jones & Lamson

Machine Co., Springfield, Vt.; E. M. Taylor, Heald Machine Co., Worcester, Mass.; Prof. O. W. Boston, University of Michigan, Ann Arbor; Claude E. Greene, Monarch Machine Co., Sidney, O.; and L. F. A. Mitchell, G. A. Caldwell and C. B. Stainback of Westinghouse. On

## ADDITIONAL COPIES AVAILABLE

IF YOU would like extra copies of this week's poster, entitled "Do It Well and Give 'em Hell", for use on your factory or office bulletin boards they are available from STEEL, Readers Service Department, Penton Building, Cleveland, Ohio.

Tuesday, officials of the Westinghouse company greeted the entire group at a luncheon meeting.

Points brought out strongly by the forum this year are: Need for still further standardization and simplification of control equipment to insure interchangeability; speed up in production of direct current motors and controls for machine tool use; development of compact variable speed alternating current motor drive units; high accuracy in finishing the flanges and feet, and in armature shaft location, of motors for machine tool applications; and more general and more friendly acceptance of standardized machine tool electrical equipment on the part of big machine tool users—many of whom still insist on enforcing "their own needlessly troublesome specifications."

REPRESENTATIVES of the machine tool and electrical industries gathered in the Westinghouse auditorium during one of the technical sessions of the Machine Tool Electrification Forum in East Pittsburgh, April 6 and 7



**DO IT  
AND GIVE 'EM**

**WELL**

**HELL**

**WAR PRODUCTION "CHIEF" DONALD M. NELSON ASKS:**

**"Are YOU doing everything in your power TODAY to put more weapons into the hands of our fighting men?"**

# New Projects for More Steelmaking Capacity in Canada

TORONTO, ONT.

ALTHOUGH Canada's iron and steelmaking capacity has been increased about 40 per cent since the outbreak of war, projects under way or planned will add 10 to 20 per cent more. At present the Dominion has 11 blast furnaces with daily capacity of 5600 tons and steel ingot and castings capacity is 3,164,000 tons annually.

Scheduled for completion within six months are two 1000-ton blast furnaces and additional open hearths. Algoma Steel Corp. Ltd., Sault Ste. Marie, Ont., has announced an expansion program representing expenditure of more than \$17,000,000. It will include a blast furnace, 86 coke ovens and large additions to rolling capacity. Dominion Steel & Coal Corp. Ltd., Sydney, N. S., is spending about \$5,000,000 on additions, including a blast furnace and open hearths. Steel Co. of Canada Ltd., Hamilton, Ont., is undertaking important plant enlargements. Dominion Foundries & Steel Ltd., Hamilton, Ont., has announced further expansion costing about \$5,000,000. Atlas Steels Ltd., Welland, Ont., will install additional electric furnaces.

Department of Munitions and Supply has ruled that all orders on books of steelmakers Dec. 1, 1941, and not filled since that date, have been canceled and must be treated as new orders, subject to approval of the steel controller. It is estimated the cancellations will total about 500,000 tons, many of which are duplications.

F. B. Kilbourn, steel controller, has announced that importation of high-speed steel, carbon or alloy steel from the United States is forbidden except under license. Department of Munitions and Supply has forbidden purchase of gages or cutting tools from any place outside Canada, except under license, to prevent competitive bidding on the open market for such material.

By agreement with manufacturers production of chain link fencing will be stopped at the end of April and no sales will be made after May 31, Department of Munitions and Supply announces. Retailers will be permitted to dispose of stocks. After April 30 only light weave fencing for farm use will be made. This is to provide more steel for war use.

Although February production of steel and iron in Canada, fell considerably below the January total,



## Parade in Honor of 3500 Trainees

PAYING tribute to 3500 men in training as shipfitters, 7000 men from the shipfitters shop of the New York Yard recently paraded in review through the plant during their lunch hour. Photo shows the procession moving toward a reviewing stand holding officials of the yard. Official Navy photo from NEA

because of the short month, aggregate for two months this year was approximately 25 per cent greater in steel ingots and castings and 40 per cent in pig iron than in the corresponding period last year. Comparisons, in net tons, are as follows:

	Steel Ingots, castings	Pig Iron	Ferro- alloys
Feb., 1942 . . .	242,921	143,973	17,358
Jan., 1942 . . .	259,016	163,156	18,004
Feb., 1941 . . .	193,417	102,104	12,847
2 mos., 1942 . . .	501,937	307,129	35,362
2 mos., 1941 . . .	402,067	217,559	29,906

Imports of iron and steel products into Canada in February were valued at \$31,318,000, compared with \$30,794,000 in February, 1941. They included: Vehicles, \$7,946,000; machinery, except agricultural, \$6,469,000; rolling mill products, \$6,436,000; farm implements, \$1,883,000; engines and boilers, \$1,679,000; pig iron, semi-finished steel, \$999,000; tools, \$696,000. Exports totaled \$37,569,000, approximately three times the \$12,746,000 value of exports in February, 1941. Automobiles and parts, valued at \$20,866,000, constituted the largest item.

## Wire Group Elects Officers; Plans Meetings

At the annual meeting of the Wire Association, Waldorf-Astoria, New York, March 23, the following officers were elected:

President C. E. Johnson, superintendent rod and wire mills, Bethlehem Steel Co., Sparrows Point, Md.

Vice Presidents: Sidney Rolle, assistant manager, Scomet Engineering Co., New York, and D. D. Buchanan, manager of operations, Union Drawn Steel Division, Republic Steel Corp., Massillon, O.

Executive Secretary: R. E. Brown, publisher, *Wire & Wire Products*, Stamford, Conn.

Two regional meetings for 1942 were authorized, one in Worcester, Mass., April 17; the other in Pittsburgh, the latter part of May.

The annual convention will be held in Detroit, Oct. 12-16 and will be limited to three days, the fourth day being left open for those desiring to survey the National Metal Congress exhibit.

## Sound Film Shows Proper Grinding, Setting of Tools

IN A PREVIEW held in the offices of Penton Publishing Co., April 8, and attended by the staffs of STEEL and the other Penton publications, Walter K. Bailey, vice president, Warner & Swasey Co., Cleveland, introduced a new and highly important development in the nation-wide machine shop training program conducted for the past year and a half by the Operator's Service Bureau of his company. This is of great importance in speeding up the basic training of thousands of new operators of turret lathes and of lathes in general—now demanded throughout industry because of war production.

Through long experience in dealing with "in-plant" training of operators, representatives of the Operator's Service Bureau have found that the greatest hindrance to most effective use of turret lathes and other machine tools are faulty grinding and faulty setting of the cutting tools. As a result of this experience a sound movie film entitled "Chips" has been made in which right and wrong methods of tool grinding and tool setting are analyzed through some of the most striking and unusual super-slow motion photography ever achieved in the metalworking field.

### Shows Right and Wrong Methods

The performance of correctly and incorrectly ground and set tools is shown—greatly enlarged and in slow motion—on various metals in the manner indicated in the "stills" presented herewith, in which the radial marks on the work indicate increments of  $\frac{1}{8}$ -inch. Action has been so greatly slowed down—to 100th actual cutting speed—that the effects of factors such as clearance, rake, coolant, and "built-up edge" are clearly apparent even to persons with no previous machine tool experience.

The rest of the film is devoted to detailed instruction as to how the most desirable speeds, feeds, finishes, tool life, broken chips, etc., can be attained by following a few simple practical rules of grinding, setting and coolant application. This includes proper methods of grinding chip breaker slots on the top of the tools and hand honing to refine edges and surfaces.

Preceding the film there is a personal talk by an experienced representative of the Operator's Service Bureau, who in the case of

the Penton presentation was W. J. Pelich, editor of the Warner & Swasey publication *Blue Chips*. To drive home the important points a large model tool is used with separable pieces which are removed one by one to demonstrate successive steps in grinding. Following the presentation, Mr. Pelich, or one of the several other competent tooling experts who have been especially trained to be sent out into the field with these films and demonstrate models, answers specific questions from the audience. At the end of the session, which usually takes about one hour, booklets are distributed which summarize all important points brought out with the help of diagrams and numerous "stills" from the movie film.

This entire program has been designed for presentation in plant meeting rooms at change of shifts or at other hours most convenient to operators and trainees. It will be made available—under the guidance of one of the trained Operator's Service Bureau staff—to metalworking plants and training institutions throughout the industry.

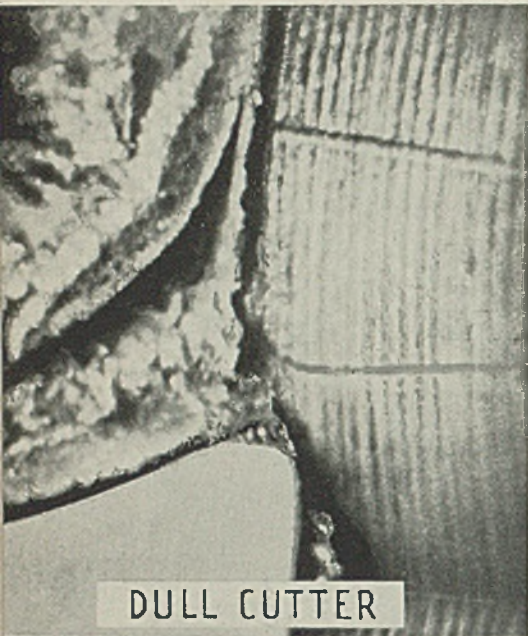
## Demonstrate New Method for Melting Down Automobiles

A REVOLUTIONARY new method for converting old automobiles into a product resembling pig iron was demonstrated April 4 at the plant of Hetzler Foundries Inc., Rochester, N. Y. Six old automobiles, after being stripped of tires, battery, upholstery, glass and copper radiator, were chaged into a cupola and converted into approximately 13,000 pounds of scrap which was sand-cast into pigs.

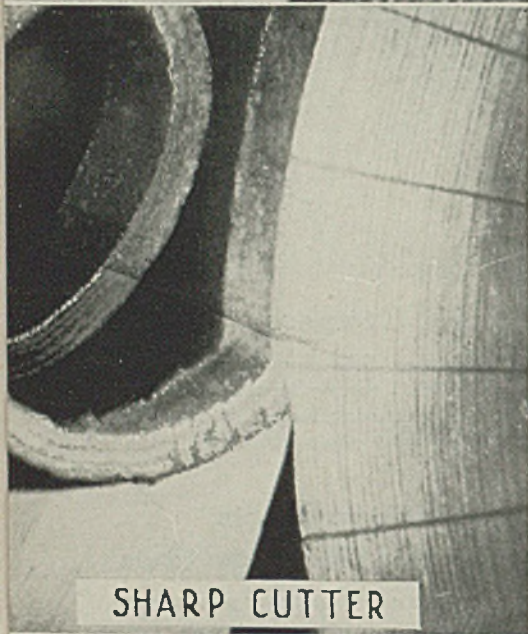
Analysis of the resulting metal revealed it to be quite close to that of pig iron of foundry grade: Silicon 0.28, graphitic carbon 0.02, combined carbon (total carbon 2.42), phosphorus 0.051, sulphur 0.143, chromium 0.09, nickel 0.13, copper 0.69. The following elements were found in amounts of less than 0.01 per cent: Tin, tungsten, vanadium, molybdenum, cadmium, antimony, lead, magnesium and zinc.

The demonstration was conducted by the National Smelting, Refining & Machine Corp., Buffalo, under a patent developed by Henry C. Thomas, Buffalo, and owned by the Universal Research Corp., Kenmore, N. Y.

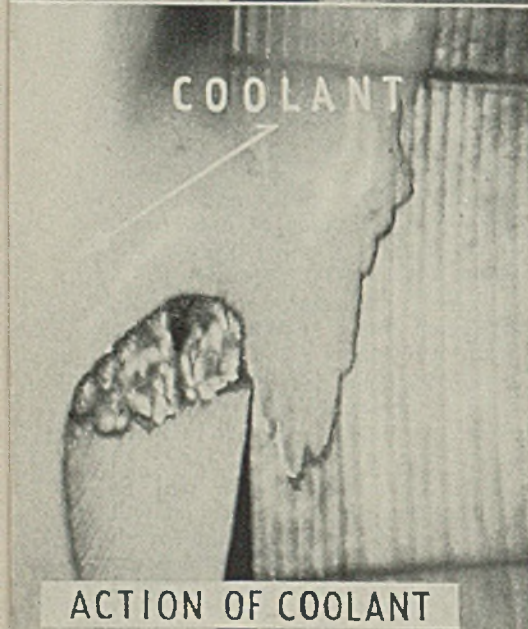
The National company has plans (Please turn to Page 135)



DULL CUTTER



SHARP CUTTER



COOLANT

ACTION OF COOLANT

## Use 598 Sheets of Government Forms For \$40.90 Order

IN streamlining industrial operations, as recently called for by Donald M. Nelson, director, War Production Board, one condition which merits scrutiny is the amount of "paper work" required in putting through orders for essential war materials.

An example of this excessive "paper work" is a recent order for arc welding electrodes received by Lincoln Electric Co., Cleveland. The order was prepared in accordance with all government regulations. By itself it occupied only one sheet of paper, but it was accompanied by 199 priorities, each of which occupied three sheets of standard 8½ x 11-inch mimeograph paper, making a total of 597 sheets, all of which required typed fill-ins. In addition each of the 199 priorities required two signatures, one by a notary, evidenced by a notary seal. The weight of these priority extension

papers was 5¼ pounds.

The material called for was 700 pounds of arc welding electrodes to be used in essential production. The total price, exclusive of freight, was \$40.90.

The chief point about the incident—by no means an extreme case—is that more time was spent with pen, pencil and typewriter in putting through the extra papers required for the order than for actually producing the material ordered. The cost of extra paper work in man-hours also greatly exceeded the cost of producing the electrodes. Another important point is the serious delay resulting from the need for obtaining the 199 priorities.

"The question raised here—not in criticism but in an effort to remedy a condition believed contrary to the best interests of war production—is whether a large part of this paper work might not be eliminated and the time and effort saved re-directed to the nation's main job of producing war equipment," says the company. "The man-hours of work applied to handling this one order by the manufacturing concern where it was issued were sufficient to produce a sizable volume of the concern's finished product.

"Since this paper work is a stand-

ard requirement throughout war industry, literally millions of man-hours must be spent in this non-productive work, whereas this effort could be applied to actual war production. This includes not only the time spent by companies in writing orders but also the time required in checking and handling the mass of papers by the company filling the order."

## Find Few Priority Violations Among Thousands of Firms

OPERATIONS of 3500 firms have been surveyed for priorities violations by the WPB Compliance Branch since June, L. J. Martin, assistant chief, Bureau of Priorities, announced last week. More than 10,500 additional companies are now being investigated, and surveys of 7100 companies are being prepared.

Industries in which surveys have been completed include aluminum, primary steel producers, primary copper fabricators, steel mills (scrap allocations), public housing, copper ingot makers and rayon. Investigations under way: Copper foundries, copper scrap and pig iron users. Surveys being prepared: Chromium and nickel, private housing and steel warehouses.

Of the 3500 complete reports received by the branch, more than 1600 revealed no violations of priority orders. Approximately the same number of firms were found to have committed minor violations, largely through misunderstanding. These received letters explaining priority regulations.

A small number of the reports indicate violations of varying degrees of seriousness. These reports are now being studied, and punitive action will probably be recommended in the case of the more serious examples.

Of the 35 suspension orders, affecting 46 firms and one individual, issued so far as a result of the branch's findings, five were in cases disclosed in the course of industry-wide surveys, and 30 were the result of information supplied by other branches of WPB, government agencies, and the public.

The industry-wide surveys are conducted with the assistance of investigation staffs loaned for the purpose by other federal agencies. Cooperating with the WPB to date have been the Wage and Hour Division of the Department of Labor, Federal Trade Commission, Home



Owners Loan Corp., and the Geological Survey, General Land Office and National Park Service of the Interior Department. Relations have been established with a total of 13 federal agencies, which will make available to the WPB the services of approximately 3550 investigators.

Under provisions of the Second War Powers Bill recently signed by President Roosevelt, the activities of the branch will take on a greater severity, since the bill provides for criminal prosecution of violators of priority regulations. Penalties of up to one year in jail and a \$10,000 fine may be imposed in cases of proven violation.

Heretofore, it has been possible to impose penalties only by the issuance of suspension orders, which deny to the violating company the right to deal in or fabricate the scarce material involved in its illegal activities. While these orders have been effective as punitive measures in many cases, there are instances in which their use would impair the war effort by cutting off needed production.

A "flying squadron" of special investigators is being set up by the branch so that prompt action may be taken in special cases, and plans for the development of field operations include the establishment of investigation units in each of the WPB's regional and district offices.

Compliance commissioners will be assigned to the 13 regional offices. They will sit in conference with the respondent companies, and hear explanations offered by those charged with violations. After a study of evidence, a compliance commissioner will report his findings and recommendations to Washington. If his recommendations are for punitive action, and are accepted, the Director of Industry Operations will issue a suspension order, or refer the case to the Department of Justice for criminal proceedings, depending upon the circumstances and the degree of culpability involved.

## February Tool Shipments Totaled \$93,100,000

Value of new machine tools, presses and other metal working machinery shipped during February was \$93,100,000, according to George C. Brainard, chief, WPB Tools Branch.

Shipments of machine tools alone amounted to 20,307 units with a total value of \$84,355,000. During January 19,266 units, valued at \$83,546,794, were shipped.

Orders for steam boilers booked in February numbered 1031, compared with 1012 in January and 845 in February, 1941, the Bureau of the Census reports.

## 21,000,000 Tons Of Steel Made in First Three Months

All prior records for a month's output of steel ingots and castings were broken in March with 7,392,911 net tons, the American Iron and Steel Institute reports.

This exceeded by more than 150,000 tons the previous peak of 7,236,068 tons in October, 1941, and was more than 260,000 tons greater than the 7,124,003 tons in March, 1941. In February, 1942, with three less working days, 6,521,056 tons were produced.

Total in the first quarter was 21,038,889 tons, nearly 4 per cent more than 20,276,709 tons made in the first three months last year. During first quarter the industry averaged 96.3 per cent of capacity. In January and February operations ranged between 95 and 96 per cent but toward the close the rate was nearly 99 per cent.

March production averaged 1,668,829 tons per week, a new peak, compared with 1,630,264 tons per week

in February and 1,608,127 tons per week in March, 1941. The best previous record of weekly production was 1,633,424 tons, established in October, 1941.

Continued inability to obtain full requirements of raw materials, principally scrap, coupled with the fact that midwinter weather presents obstacles to most efficient operation, are chief reasons why steel output in first quarter was approximately 800,000 tons below rated capacity.

In the accompanying table the institute has revised its figures for January and February and 1941.

### U. S. Steel's Production At New Top in March

United States Steel Corp. subsidiaries in March established all-time records by making nearly 2,000,000 tons of blast furnace products and almost 2,600,000 tons of steel ingots and castings. A new record was also made in March in output of steel plates, when approximately 300,000 tons were rolled.

Carnegie-Illinois Steel Corp. plants in the Chicago area broke 19 monthly production records, 12 at South Chicago, five at Gary and two for the district.

# The BUSINESS TREND



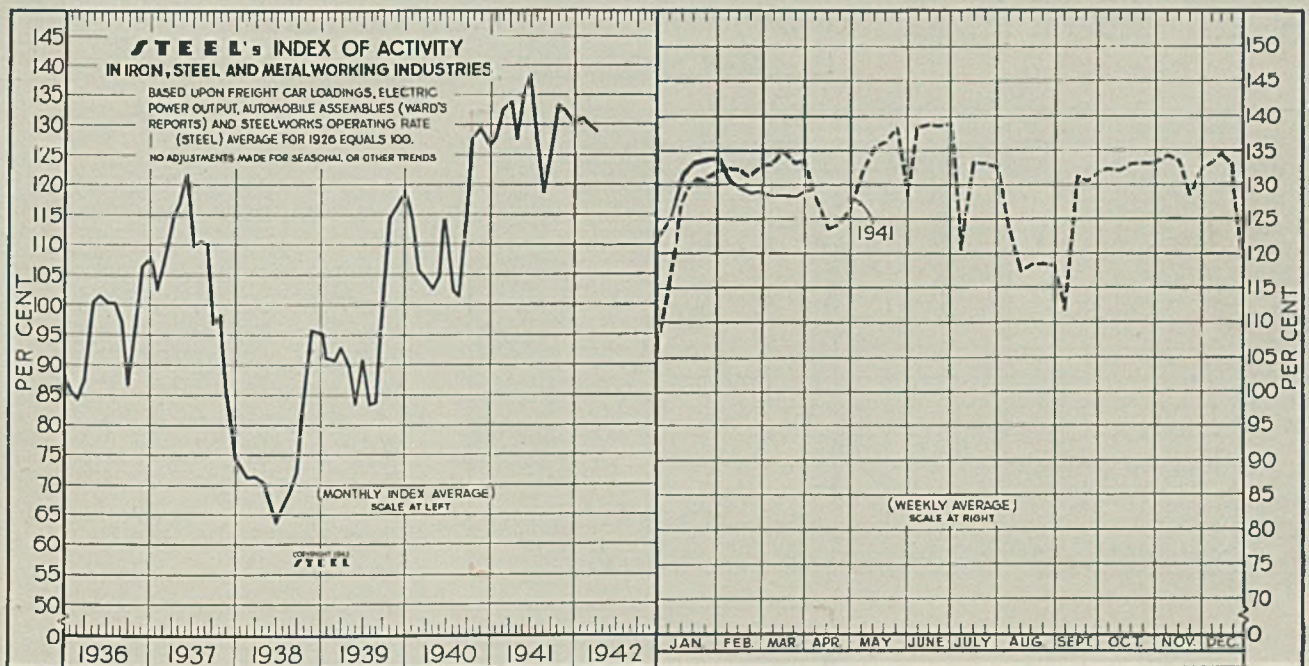
## Output of War Goods Advancing Sharply

PRODUCTION of war material continues to mount at an encouraging rate, with volume more than offsetting the rapid decline in the numerous consumers goods lines. Although actual reports on production of specific types of war equipment are not revealed now, some indication of the extent of the upward trend is shown by the Federal Reserve Board's index covering transportation equipment industries. This index bulks together statistics of aircraft, rail car plant output, locomotives, automobile parts and assemblies, shipbuilding and tank production. It had advanced to 280 by last November, the country's last peacetime month. As a result of the changeover in

the automobile industry the index eased to 275 during December. However, in January and February it turned sharply upward to 302 and 315 respectively, and a further advance to 330 is estimated for March.

Steel ingot production advanced one half point to 98 per cent during the week ended April 4, to reach a new high for this year on both a percentage and tonnage basis. Output during March established a monthly peak of 7,392,911 net tons, topping the former record of 7,243,683 tons registered in October, 1941.

STEEL'S index of activity held steady at the 129.1 level during the latest period.

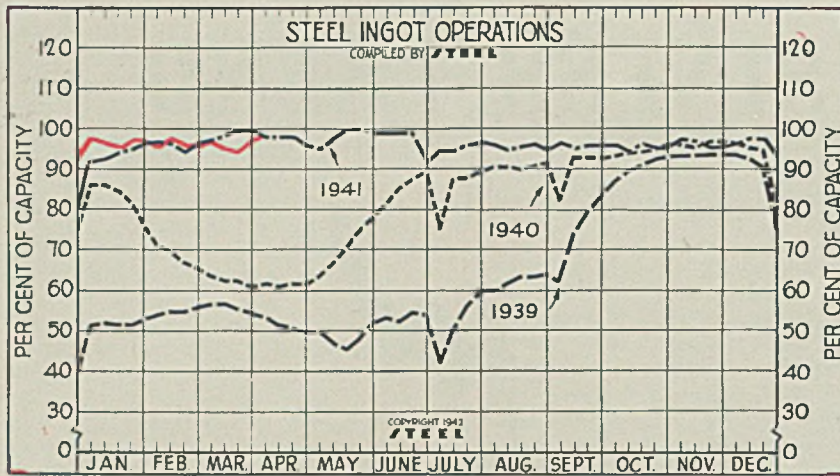


STEEL'S index of activity remained unchanged at 129.1 in the week ended April 4:

Week Ended	1942	1941	Mo. Data	1942	1941	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931
Jan. 24.....	133.7	130.7	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
Jan. 31.....	133.9	132.0	Feb.	129.6	129.3	105.8	90.8	71.1	106.8	84.3	82.0	73.9	48.2	55.3	75.5
Feb. 7.....	130.6	132.7	March	128.6	133.9	104.1	92.6	71.2	114.4	87.7	83.1	78.9	44.5	54.2	80.4
Feb. 14.....	129.8	132.3	April	.....	127.2	102.7	89.8	70.8	116.6	100.8	85.0	83.6	52.4	52.8	81.0
Feb. 21.....	129.0	131.2	May	.....	134.8	104.6	83.4	67.4	121.7	101.8	81.8	83.7	63.5	54.8	78.6
Feb. 28.....	129.1	133.0	June	.....	138.7	114.1	90.9	63.4	109.9	100.3	77.4	80.6	70.3	51.4	72.1
Mar. 7.....	128.3	133.1	July	.....	128.7	102.4	83.5	66.2	110.4	100.1	75.3	63.7	77.1	47.1	67.3
Mar. 14.....	128.3	135.0	Aug.	.....	118.1	101.1	83.9	68.7	110.0	97.1	76.7	63.0	74.1	45.0	67.4
Mar. 21.....	128.1	133.5	Sept.	.....	126.4	113.5	98.0	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3
Mar. 28.....	129.1	133.9	Oct.	.....	133.1	127.8	114.9	83.6	98.1	94.8	77.0	56.4	63.1	48.4	59.2
April 4.....	129.1†	128.9	Nov.	.....	132.2	129.5	116.2	95.9	84.1	106.4	88.1	54.9	52.8	47.5	54.4
			Dec.	.....	130.2	126.3	118.9	95.1	74.7	107.6	88.2	58.9	54.0	46.2	51.3

†Preliminary.

April 13, 1942



### Steel Ingot Operations

(Per Cent)

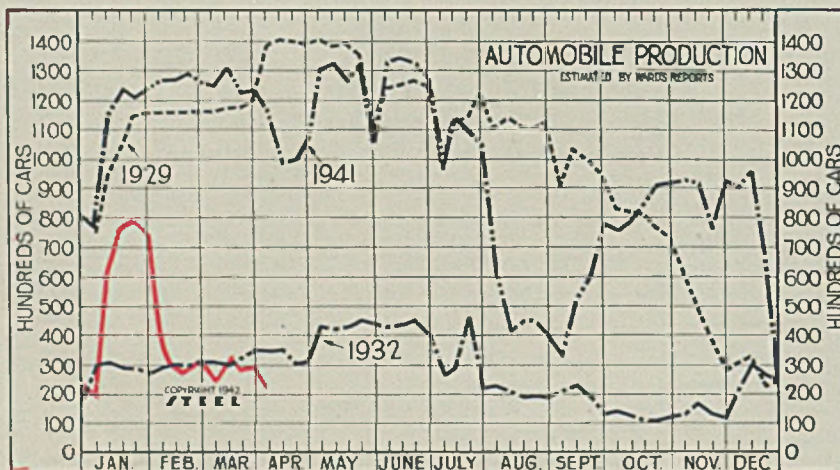
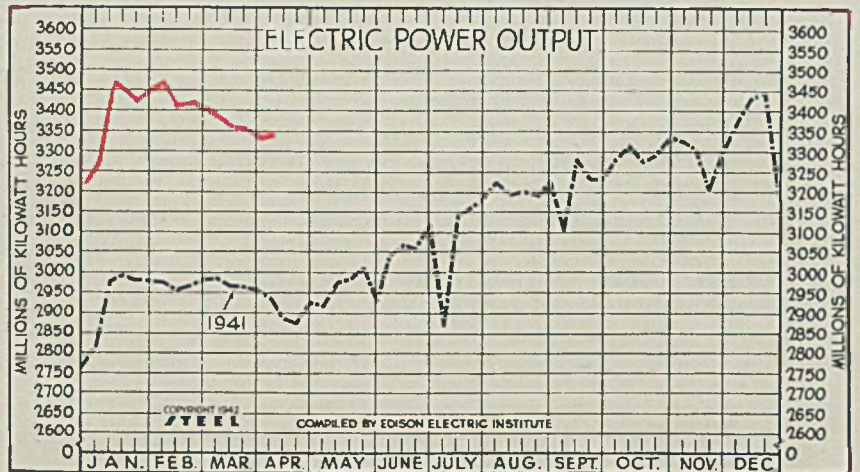
Week ended	1942	1941	1940	1939
April 4	98.0	98.0	61.5	53.5
Mar. 28	97.5	99.5	61.0	54.5
Mar. 21	95.5	99.5	62.5	55.5
Mar. 14	95.5	98.5	62.5	56.5
Mar. 7	96.5	97.5	63.5	56.5
Feb. 28	96.0	96.5	65.5	56.0
Feb. 21	96.0†	94.5	67.0	55.0
Feb. 14	97.0	96.5	69.0	55.0
Feb. 7	96.0	97.0	71.0	54.0
Jan. 31	97.0	97.0	76.5	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

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

### Electric Power Output

(Million KWHD)

Week ended	1942	1941	1940	1939
April 4	3,349	2,938	2,494	2,244
Mar. 28	3,346	2,956	2,524	2,272
Mar. 21	3,357	2,964	2,508	2,258
Mar. 14	3,357	2,965	2,550	2,276
Mar. 7	3,392	2,987	2,553	2,285
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



### Auto Production

(1000 Units)

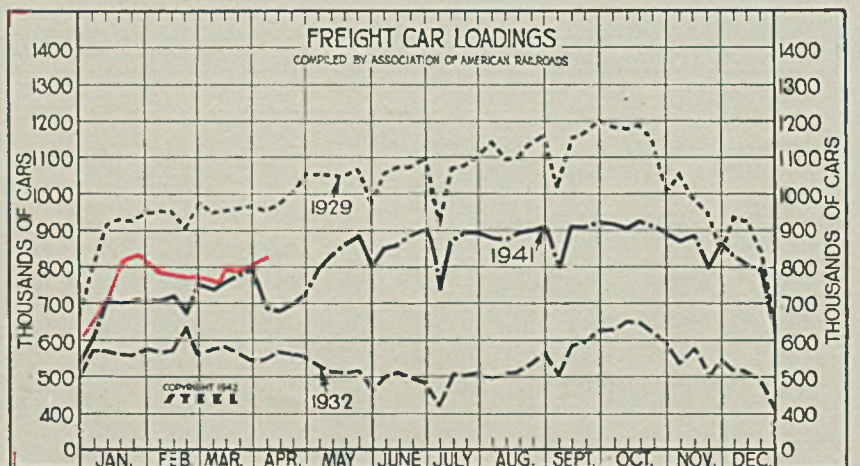
Week ended	1942	1941	1940	1939
April 4	22.3	116.3	101.7	87.0
Mar. 28	28.9	124.2	103.4	86.0
Mar. 21	28.9	123.8	103.4	89.4
Mar. 14	30.6	131.6	105.7	86.7
Mar. 7	24.5	125.9	103.6	84.1
Feb. 28	30.1	126.6	100.9	78.7
Feb. 21	25.7†	129.2	102.7	75.7
Feb. 14	29.8	127.5	95.1	79.9
Feb. 7	37.1	127.7	96.0	84.5
Jan. 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

†Canadian trucks and automobiles and United States trucks, since Feb. 21.

### Freight Car Loadings

(1000 Cars)

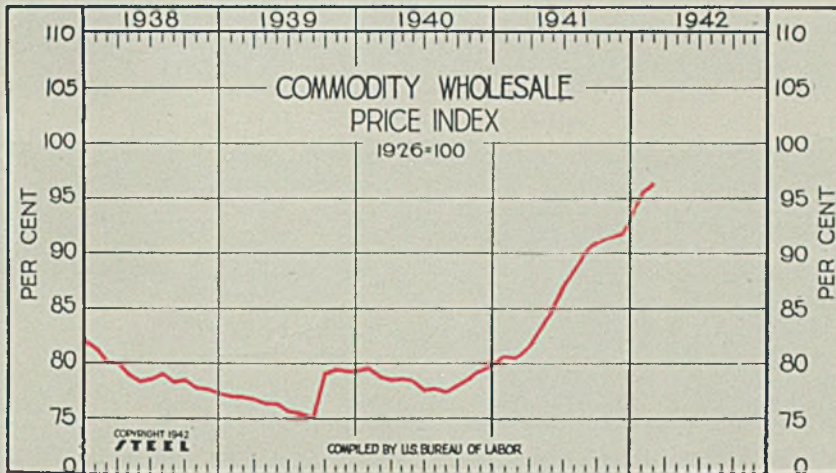
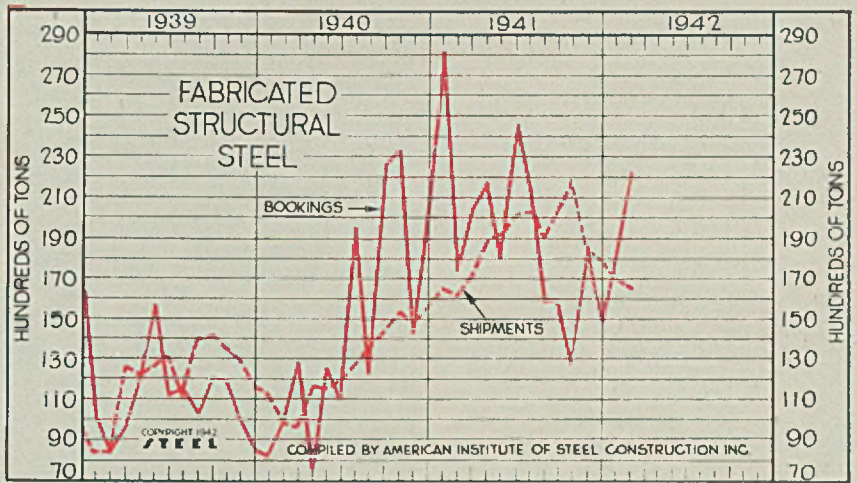
Week ended	1942	1941	1940	1939
April 4	829	683	603	535
Mar. 28	805	792	628	604
Mar. 21	797	769	620	605
Mar. 14	799	759	619	595
Mar. 7	771	742	621	592
Feb. 28	781	757	634	599
Feb. 21	775	678	595	561
Feb. 14	783	721	608	580
Feb. 7	784	710	627	580
Jan. 31	816	714	657	577
Jan. 24	818	711	649	594
Jan. 17	811	703	646	590
Jan. 10	737	712	RRR	587
Jan. 3	674	614	592	531



### Fabricated Structural Steel

(1000 tons)

	Shipments			Bookings		
	1942	1941	1940	1942	1941	1940
Jan.	158.9	164.6	110.9	180.3	281.2	81.7
Feb.	153.7	161.4	97.2	220.2	173.6	98.9
Mar.	170.2	95.9	206.1	128.3	206.1	128.3
Apr.	189.8	116.3	218.0	73.8	218.0	73.8
May	191.9	115.6	179.9	126.8	179.9	126.8
June	200.5	119.1	246.9	109.7	246.9	109.7
July	203.0	127.1	214.8	194.9	214.8	194.9
Aug.	189.3	134.9	158.7	122.5	158.7	122.5
Sept.	204.1	142.8	158.8	225.5	158.8	225.5
Oct.	217.7	153.2	128.7	233.1	128.7	233.1
Nov.	182.6	147.0	184.0	141.9	184.0	141.9
Dec.	176.1	155.5	146.4	203.1	146.4	203.1
Tot.	2251.1	1515.5	2297.0	1748.1		



### All Commodity Wholesale Price Index

U. S. Bureau of Labor  
(1926 = 100)

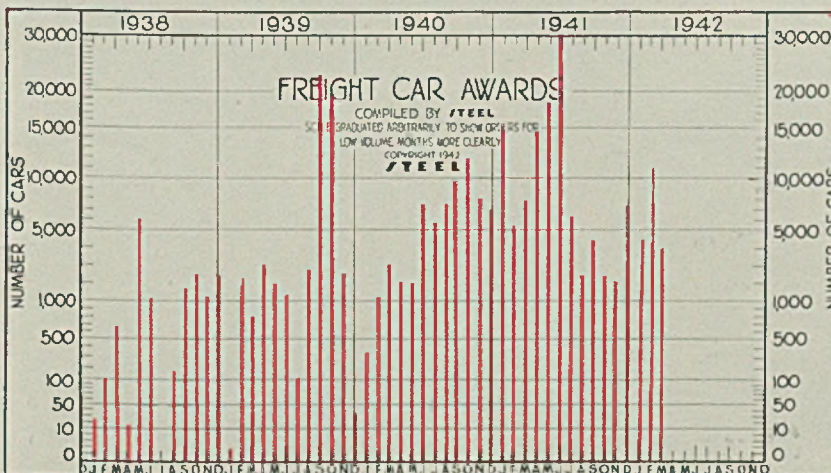
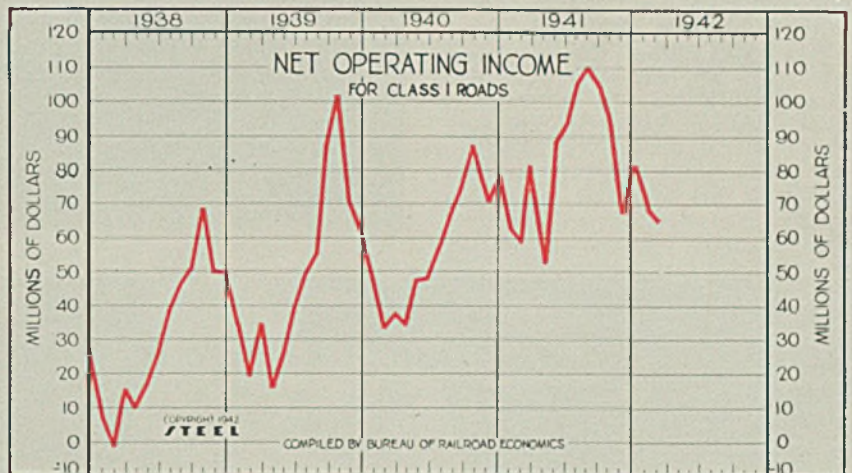
	1942	1941	1940	1939	1938
Jan.	96.0	80.8	79.4	76.9	80.9
Feb.	96.7	80.6	78.7	76.9	79.8
March	81.5	78.4	76.7	79.7	79.7
April	83.2	78.6	76.2	78.7	78.7
May	84.9	78.4	76.2	78.1	78.1
June	87.1	77.5	75.6	78.3	78.3
July	88.8	77.7	75.4	78.8	78.8
Aug.	90.3	77.4	75.0	78.1	78.1
Sept.	91.8	78.0	79.1	78.3	78.3
Oct.	92.4	78.7	79.4	77.6	77.6
Nov.	92.5	79.6	79.2	77.5	77.5
Dec.	93.6	80.0	79.2	77.0	77.0
Ave.	87.3	78.5	77.1	78.4	

### Class I Railroads Net Operating Income

(Unit: \$1,000,000)

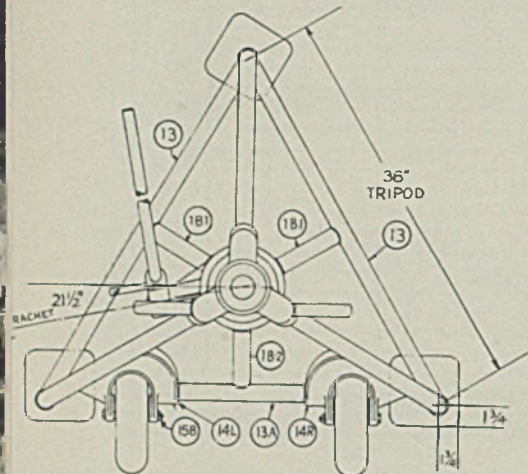
	1942	1941	1940	1939
Jan.	\$68.97	\$62.02	\$46.01	\$32.95
Feb.	66.49	58.48	32.86	18.64
Mar.	80.63	37.03	34.38	
April	52.57	34.12	15.32	
May	88.63	47.41	25.17	
June	93.26	48.09	39.17	
July	106.31	57.73	49.00	
Aug.	111.32	66.53	54.57	
Sept.	104.07	74.72	86.53	
Oct.	93.66	87.64	101.72	
Nov.	68.76	72.00	70.41	
Dec.	80.55	78.79	60.95	
Average.	\$83.29	\$56.84	\$49.02	

\* Indicates deficit.

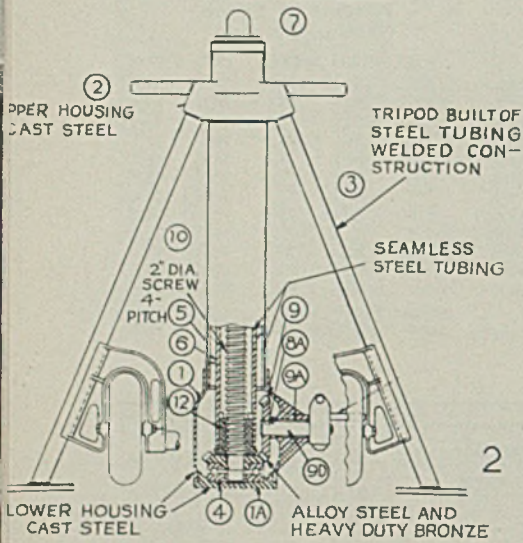


### Freight Car Awards

	1942	1941	1940	1939
Jan.	4,253	15,169	360	3
Feb.	11,725	5,508	1,147	2,259
March	4,080	8,074	3,104	800
3 mos.	20,058	28,741	4,611	3,062
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	
Total	121,499	66,889	57,775	



15 10" DIA. SOLID RUBBER WHEEL USED ONLY FOR TRANSPORTING TRIPOD. IN JACKING POSITION TIRES ARE FREE FROM LOAD.



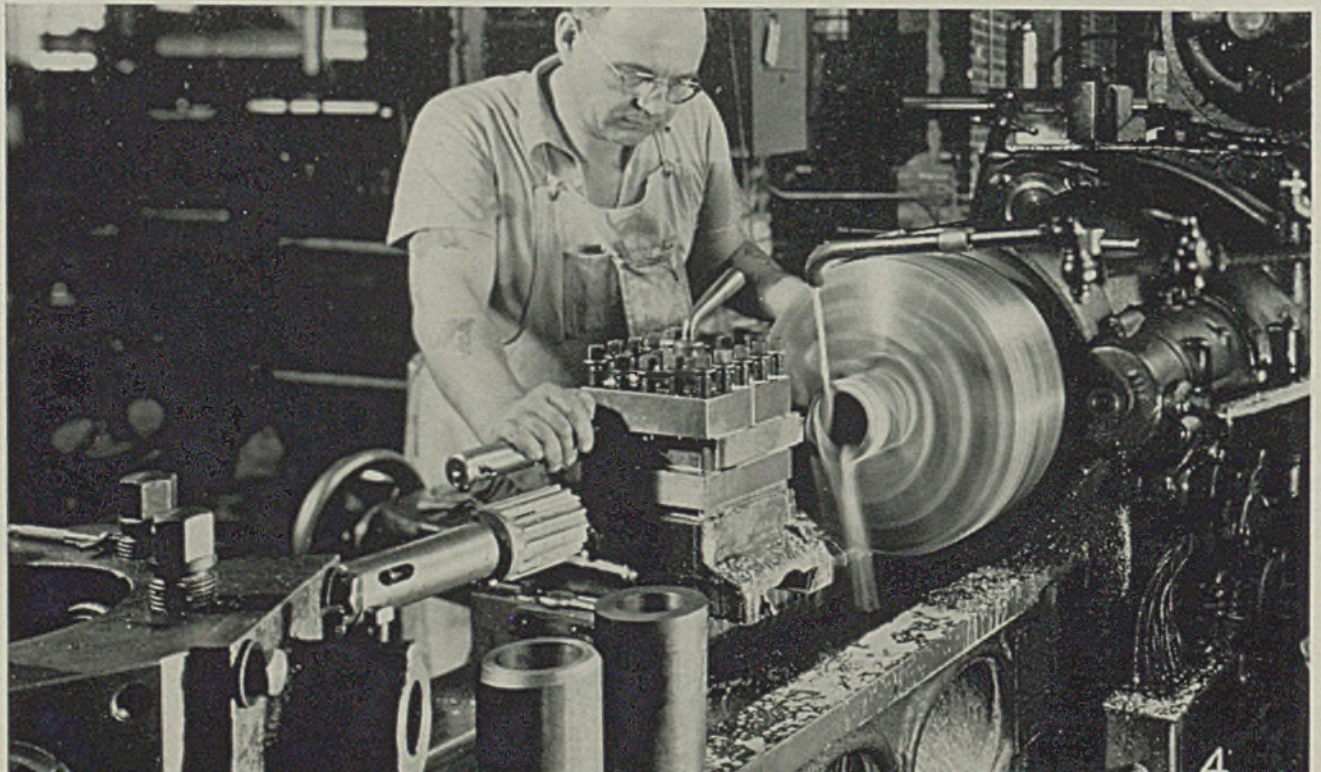
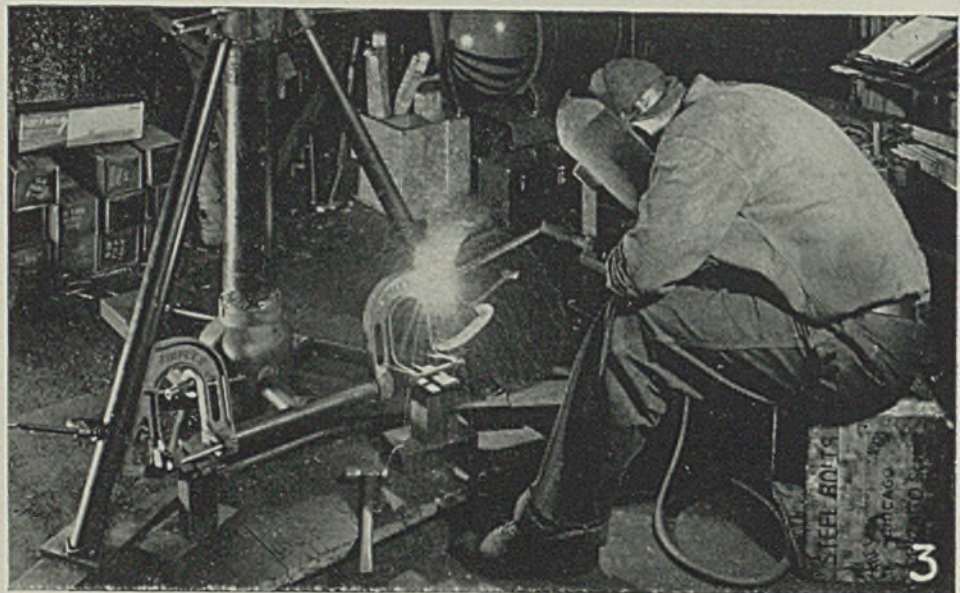
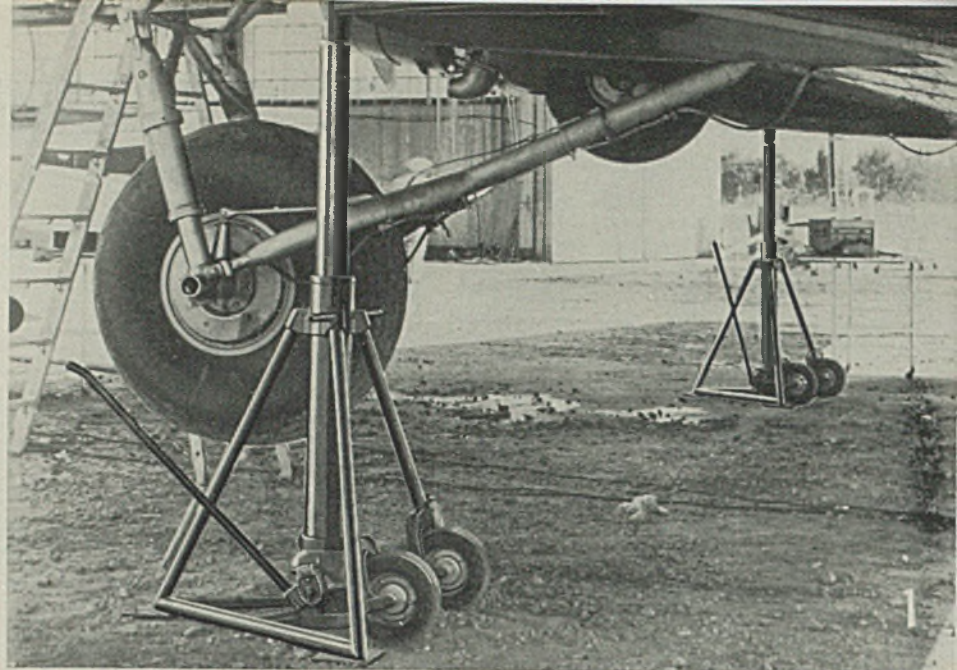
UPPER HOUSING CAST STEEL

TRIPOD BUILT OF STEEL TUBING WELDED CONSTRUCTION

SEAMLESS STEEL TUBING

LOWER HOUSING CAST STEEL

ALLOY STEEL AND HEAVY DUTY BRONZE



# JACKS

...for aircraft maintenance and other special work

AT THE plant of Templeton, Kenly & Co., 1020 South Central avenue, Chicago, a variety of jacks for industrial and special applications is built including those for aircraft maintenance work such as the two illustrated in Fig. 1.

Only a few of the operations and parts can be analyzed here, but the cross-section diagrams will furnish clues to most of the important members of typical jacks. All critical parts are heat treated and checked for hardness. Assembled jacks are tested at 150 per cent of rated load.

Considerable seamless steel tubing is employed, especially in the tripod jacks shown in Figs. 1, 2 and 3. Such tripod jacks are being used extensively in aircraft work where the seamless tubing combines light weight with high strength. Too, it lends itself well to fabrication into assemblies by welding.

Fig. 2 shows an 18-ton Simplex wing jack designed for use in maintenance and related work on the larger size aircraft employing three or more engines. Here the sleeve, which is recessed to receive the nut in which the screw of this jack turns, is a seamless tube of SAE 1020 steel, 3½ inches in outside diameter, 2¾ inches inside diameter, 35¾ inches long.

Purchased in pieces 71¾ inches long, each end of the tube is reamed to form a recess 3 inches in diameter before the tube is sawed into two lengths. In assembling, the sleeve is housed inside another seamless steel tube which is 5 inches outside diameter with a ¼-inch wall. Ends of the larger

By HERBERT CHASE

tube are recessed into top and bottom steel castings and are welded to these castings. Most of the remainder of the frame is built of welded steel tubes and fittings.

In Fig. 3, the type of jack shown in Fig. 2 is being welded. Note the star-shaped fixture on the floor on which the assembly rests during welding, each leg of the jack fitting into a pocket on the floor frame. In fabricating this jack and wing supports shown in Fig. 1, some 30 joints are welded in about an hour.

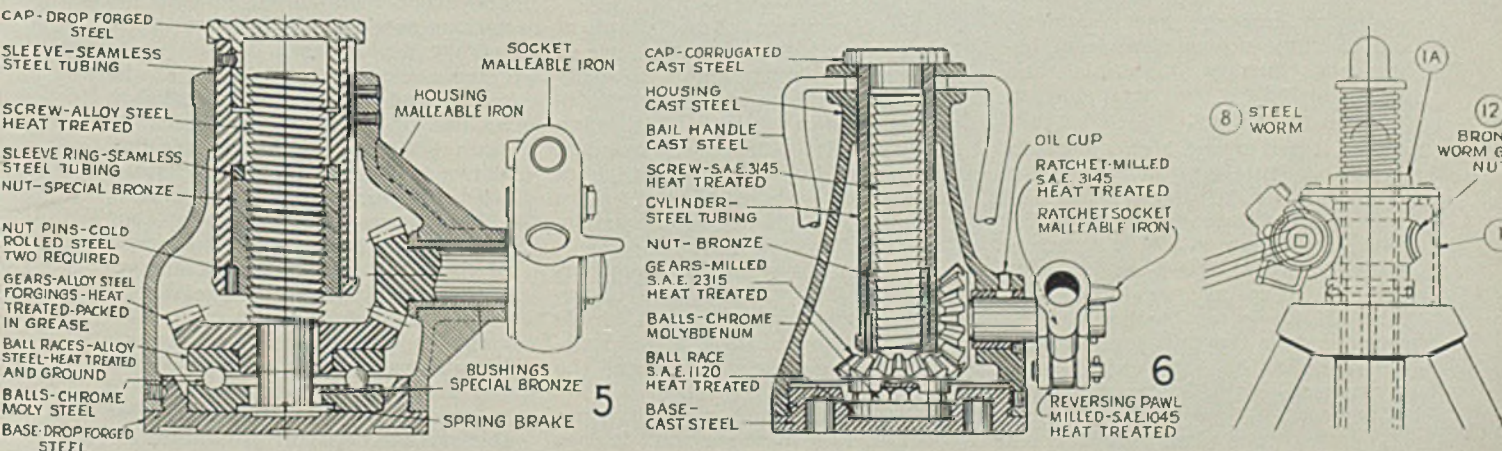
A typical seamless tube used for the center section of the tripod jack is fabricated from SAE 52100 steel 3.872 inches outside diameter and 2.537 inches inside diameter, purchased with a hardness of 190 to 210 brinell. Machining is done on a turret lathe setup shown in Fig. 4 where turret tools bore and ream recesses in each end and tools in the cross slide bevel the ends outside and face them. Time required is about 30 minutes per piece. Outside diameter is finished in a subsequent operation during which grooves are also cut. Then the keyway is milled. Fig. 5 shows this sleeve to be one of the major load-carrying members.

The heavy-duty jack in Fig. 5 uses the tube being machined in Fig. 4. Notice particularly the odd shape of the screw threads in the jack. These are designed so the heavy thrust on the threads is

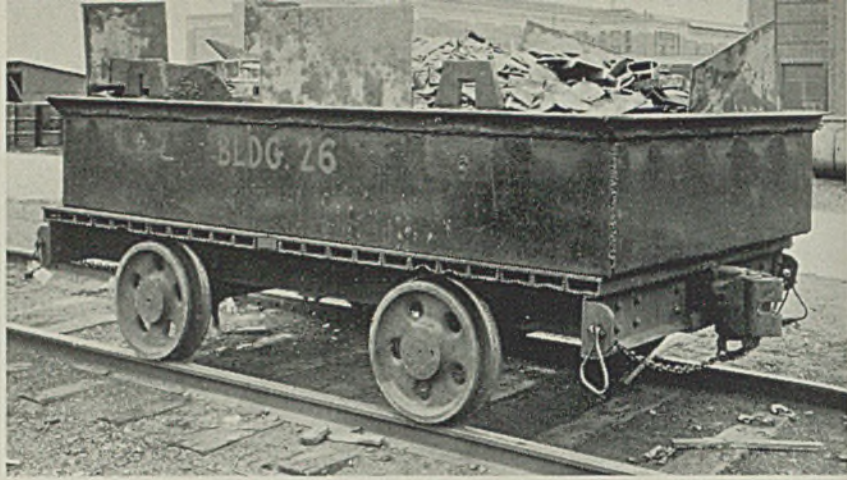
carried by surfaces which transmit this thrust longitudinally. Creating large radial thrust components, as would be the case in ordinary thread outlines, is thus avoided. Note the special alloy-steel heat-treated races for the chromium-molybdenum steel ball bearings and the drop-forged steel base and cap. Note also that a spring brake is incorporated at the bottom of the lower ball race. The special bronze thrust nut is held in place in the seamless steel tube by means of two cold-rolled steel pins and is seated against a sleeve ring made from a seamless steel tube.

A somewhat lighter design of jack is shown in Fig. 6. Here cap and base are of cast steel and the center sleeve is made from a seamless tube of SAE 1020 steel with an outside diameter of 2 inches, inside diameter of 1¾ inches. Very little machining is needed here.

A wing jack in Fig. 7 is somewhat similar to those in Figs. 1, 2 and 3. Rated 10 tons, the upper section makes use of a worm and worm wheel for turning the nut which elevates and lowers the load-carrying screw. In this jack the screw itself is a seamless tube of SAE 1020 steel 3¼ inches outside diameter, 1¾ inches inside diameter and 37 15/16 inches long. On this tube there is cut a 2-pitch double-lead modified-acme thread having a 6-degree 4-minute helix angle. To elevate or lower the jack quickly, a speed crank is provided. For elevating the jack under load, a lever bar operates a worm driving a nut through a reversible ratchet mechanism.



**The**  
**"Erie Plan"**  
**Can Help Every**  
**Industrial**  
**Community**



**To**  
*Get in the Scrap*

**This effective plan is serving as a model for a nation-wide salvaging campaign fostered by the Bureau of Industrial Conservation of the War Production Board. Importance of segregating scrap carefully is stressed**

THE "ERIE PLAN" for salvaging scrap was worked out and put into effect by leading manufacturing interests of Erie, Pa. Operations for the first four months prove it a great success. The program has the full endorsement and approval of the Bureau of Industrial Conservation of the War Production Board. In fact this program is serving as a model for a nationwide salvaging campaign being fostered by the bureau. The plan was designed to secure the active participation of industry to conserve raw materials and to fully utilize scrap and by-products, surplus materials and parts, including the scrapping of obsolete machinery.

That it has proved highly satisfactory is evident from an increase of approximately 10 per cent in the production of iron, steel and nonferrous metal scrap at Erie, where normally between 80,000 and 100,000 tons of scrap are produced each year. However, on the basis of experience over the first four months the plan has been in operation, it is expected this will be exceeded by 10 per cent.

Details of the plan, how it is set

up, the organization for securing co-operation of everyone involved and its method of operation are detailed in the accompanying Table 1. At Erie, the plan is handled by a 7-man executive committee headed by F. E. Bliven, supervisor of salvage, General Electric's Erie works. He already had a large background of experience in connection with the establishment of a complete salvaging system for the Erie works of General Electric before he took over the Erie program.

The Foremen's Association of Erie has been of great assistance in making the plan function smoothly since its members are in daily contact with the problem. This group meets regularly for an interchange of ideas and helpful hints. Speakers familiar with the subject also are brought in to provide additional information.

The plan has several definite purposes, one of which is the uncovering of dormant scrap. A single plant contributed 1800 tons in the form of obsolete equipment and the like.

While uncovering of such scrap is definitely a one-time shot, it does

help unearth much scrap so urgently needed now.

A more important long-term purpose is proper segregation of scrap as it is produced at the source. Most companies in Erie now are segregating material by grades and analyses. While offhand it would appear that considerable extra work would be involved in cleaning off a machine and the surrounding area between operations, members of the Erie committee point out that once a system is established really little time is lost. Further, the better housekeeping actually makes for improved operating efficiency, which often more than pays for the additional time required in the cleaning and segregating operation.

More rapid turnover is another objective. Co-operation of local scrap dealers has made it possible to turn material over several times as fast as in the past. Where formerly scrap was allowed to accumulate for several weeks before it was collected, material is now picked up daily where the volume warrants.

Erie has approximately 100 plants, of which the General Electric works is the largest. Over a period of years here, Mr. Bliven has evolved a salvage system which not only converts waste to useful material but which actually shows a profit. The salvage department is a distinct section with its own organization and facilities. A standard-gage railroad switching system and paved roads between the buildings connect the various sections of the plant to the salvage department.

Intraworks industrial cars are interchanged with each divisional shop by use of a 15-ton gas-electric or storage-battery locomotive like that shown in Fig. 2. Motor trucks and tractors operate on the paved roads.

The organization set up at General Electric is an excellent example of the lengths to which salvage operations may extend. The system not only reclaims iron and steel scrap as well as nonferrous metals but also paper, rags, lumber, oil and the many other items required in manufacturing operations. In 1941 this salvage department handled 40-



Fig. 1. (Left, above)—Trays are taken to salvage section on flat cars which are same size as tray—5 x 10 feet. Nonferrous metals are accumulated in drums and taken to salvage section as shown in Fig. 2

Fig. 2. (Above)—Industrial locomotive and flat cars which run on standard gage intraplant railway system carrying scrap material to salvage section. Locomotive is 15-ton unit

000,000 pounds of material, including 34,000,000 pounds of iron and steel scrap, 3,000,000 pounds of nonferrous metals, and 3,000,000 pounds of nonmetallics.

While war work has caused the closing of the refrigerator production lines, the output of electric locomotives, heavy electric motors and generators and similar equipment is being continued at the authorized schedule rates and is supplemented with a vast amount of war work. No radical change in salvage operations, however, is involved for changes are largely in analyses of material rather than type.

The salvage department designed and built large trays 5 x 10 feet in size and 20 inches deep for accumulating and handling iron and steel scrap. One of these is shown in Fig. 3. It is made of heavy plate and structural sections welded together with attachments for handling by crane. These large trays are placed conveniently in the departments where machining and flame cutting operations are conducted.

Scrap material is accumulated in the trays by grades. When filled the trays are picked up by crane, loaded on flat cars of the intraplant railroad system and transported to the salvage section. Fig. 1 shows a typical tray loaded on one of the industrial flat cars ready to carry a load of scrap to the salvage department. Note that the tray is same size as bed of flat car—5 x 10 feet. Trays have a capacity of 20,000 pounds of plate scrap or 12,000 pounds of sheet clippings, or 7000 pounds of turnings.

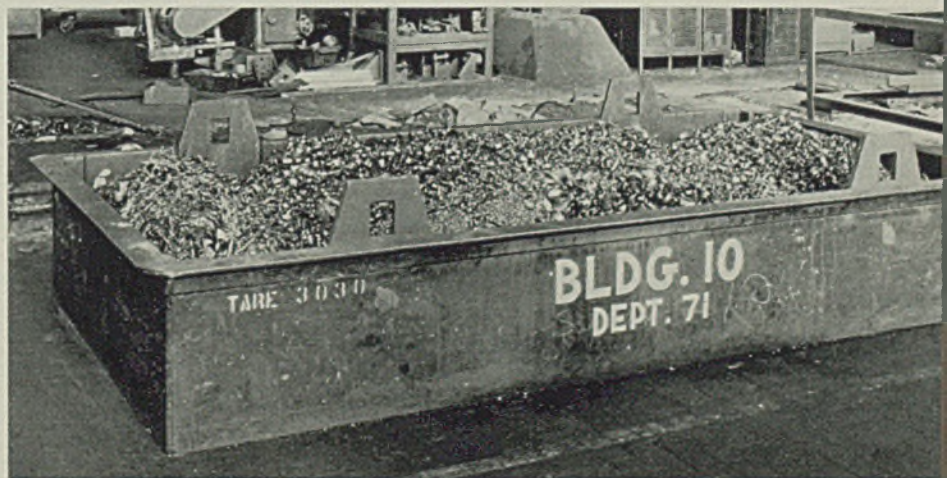
Iron and steel scrap are handled in an area outside the salvage building. A portion of this area is shown in Fig. 4. The trays are unloaded into bins here, a separate bin being provided for each type of scrap. Grades requiring no further process-

ing such as heavy melting steel, alloy-free turnings, punchings and low-phosphorus plate scrap are loaded into railroad cars and shipped to consumers. Sheet clippings are hydraulically compressed in a baler located at one end of this scrap yard. Outgoing shipments average about a car and a half a day.

Nonferrous metal scrap is segregated at the point it is produced, using standard drum-type containers which are transported on the flat cars of the intraplant railroad to the salvage section. A tag attached to each drum identifies and indicates the source of its contents so the proper plant department may be credited. Containers for each division are identified by a color band.

Some grades of nonferrous scrap require no processing and can be

Fig. 3—Scrap "pan" built of welded plate and structural sections is 5 x 10 feet, 20 inches deep, handles up to 20,000 pounds of plate scrap per load. Here "short turnings and borings" are sorted properly, ready to be taken to salvage section



sent directly from production to the brass foundry for remelting and casting into ingots. Examples include three grades of naval bronze and commutator copper bars.

Other nonferrous metal scrap requires varying amounts of work in the salvage section. Turnings of commutator copper are first run through a fanning mill to blow out the mica and subsequently are sent through a magnetic separator to remove any trace of iron. Long and stringy brass turnings must be crushed and, along with brass borings, passed through a magnetic separator.

While some contamination of nonferrous borings and turnings by iron cannot be prevented, the segregation of the various types of alloys is well maintained in the shop. In fact, 90 per cent of this material can be sent back to the foundry for reuse after the iron has been eliminated. In 1941 the nonferrous foundry was supplied with 1,500,000 pounds of usable nonferrous scrap. The malleable foundry also received 1,000,000 pounds of carefully graded borings and turnings, malleable iron, plates and cut rail scrap from which the nonferrous metal had been completely removed.

Heavier nonferrous scrap also must be sorted, but this is a relatively simple matter in the case of items such as brass rod ends which



are segregated and returned to the brass mill. Nickel-coated copper, which looks like tinned copper, is not segregated so easily. Mixed monel metal and certain grades of

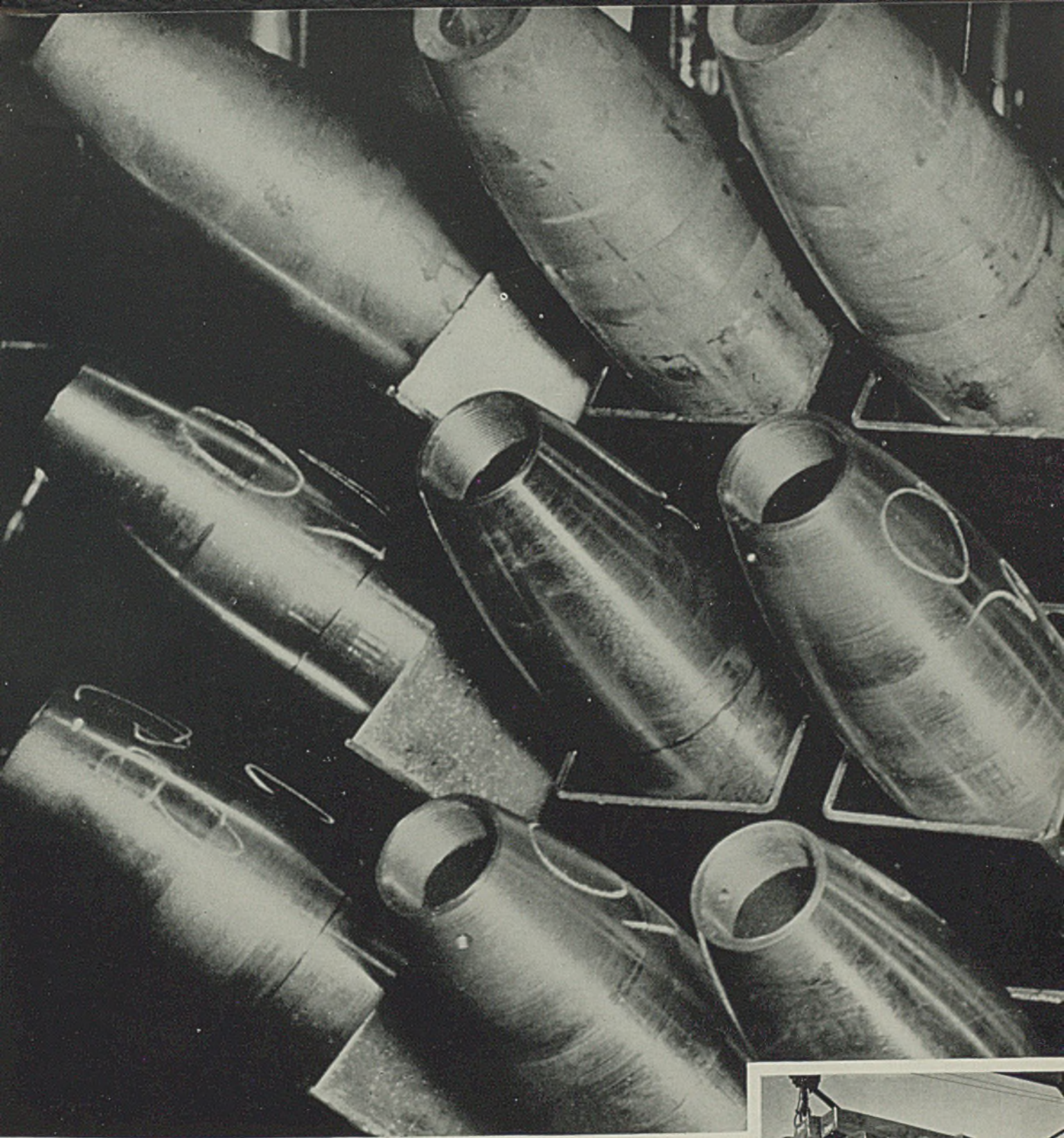
stainless steel are heated to approximately 212 degrees Fahr. At this temperature the monel is nonmagnetic and so can be separated out.

Babbitt is sweated from broken

bronze bearings and the respective materials sent back to the plant for reuse. Plate brass cannot be used and is sold to local dealers. Silver-copper material resulting from sold-

TABLE I—The "Erie Plan" of Industrial Conservation

- I—Leading executives of the city's large and small industries and trade and business associations attended an organization meeting and set up an Executive Committee from within the members of their own group. (In Erie, Pa., the Manufacturers Association of Erie and the Erie Foremen's Association were represented on the executive committee. In other cities other associations may be represented.)
- II—The executive committee established an Advisory Committee by selecting and securing the services of other executives engaged in the manufacture of products containing critical commodities, to-wit:
- A—Iron and steel scrap
  - B—Nonferrous metals (brass, copper, aluminum, lead and zinc)
  - C—Waste paper
  - D—Scrap rubber
  - E—Cotton and woolen rags
  - F—Burlap bags
  - G—Malleable iron
  - H—Lumber
  - I—Gray iron
  - J—Wood
  - K—Miscellaneous products.
- III—The Executive committee and the Advisory committee, working together, set up a program of aims and objectives as follows:
- A—Wrecking of abandoned and obsolete machinery and equipment.
  - B—Speed the return of scrap and waste materials through existing channels to mills and refineries.
  - C—Utilization of all critical materials to the best advantage.
  - D—Minimize waste and spoilage.
  - E—Selective handling and segregation of scrap and overage at the source.
  - F—Avoidance of contamination.
  - G—Reuse, wherever possible, of blanks, cut downs, short ends, clippings, etc.
- IV—To carry out these aims and objectives the executive committee set up the following salvage procedure and methods:
- A—Arranged in every plant for the appointment of a "Salvage Department Manager," or for the delegation of some one individual in each plant to be responsible for the wrecking of obsolete machinery, equipment, etc.
  - B—Arranged to train men, if necessary, in the definition of scrap, its nature, its handling and its salvage. (Small concerns were able to allot a man part time only, or assign a man for full time only during the period of the initial clean up campaign. Larger operations required the full-time work of one or more men, to continue indefinitely.)
  - C—Arranged for a system of periodic reports on scrap collected to be made by every plant to the Executive committee. (Weekly reports were considered to be best, at least during the first several weeks of the initial campaign.)
- V—The individual "salvage managers" in the various plants designated their own plant and departmental salvage committees, system of handling, procedure, reporting, etc.
- A—The salvage managers' group arranged in their own plants the proper system to be followed in the matter of wrecking obsolete machinery, disposing of out-of-date or discontinued finished products and other stored materials not likely to be used in the immediate future.
  - B—The salvage managers also arranged for meetings of their own group to report plans, progress, and results for the benefit of all plants co-operating.
  - C—The salvage managers' group adopted a simple 3-point salvage program to be put into effect by employees in each of the individual plants, as follows:
    - 1—Conserve material, minimize waste and spoilage.
    - 2—Separate unavoidable scrap and cut down at the source. Avoid contamination.
    - 3—Sort blanks, short ends, cut downs, clippings, with a view to their reuse either in the department or plant or by some other department or plant in the district.
- VI—At the same time that the mechanics of the foregoing organization plan were set in motion, the Executive Committee and the Advisory Committee prepared to be ready to serve in the following capacities:
- A—Formulate instruction for those heading up the salvage activity.
  - B—Furnish technical advice.
    - 1—To indicate the proper collection, segregation and disposal of scrap by classification into iron, steel, nonferrous, etc.
    - 2—To supply data pertaining to all government regulations. (WPB has set up control of the channelling of certain items of scrap, to-wit: aluminum, copper scrap, brass mill scrap, alloy steel, rubber and others.)
    - 3—To list for purposes of channelling and assisting in the disposal of scrap all buyers, dealers, brokers, or consumers of scrap, according to the classifications which are established. (It was proposed only to list the local buyers, but the committee arranged to be able on request to furnish data to assist wherever necessary.)
    - 4—To distribute WPB posters and general pamphlets of informative nature. This and other WPB activities are covered later in this outline.
    - 5—To enlist the support of local manufacturing, production and trade associations for the purpose of bringing to the attention of all classes of management the advantages accruing through such activity.
    - 6—To extend the work of the committee as future developments require to follow up all phases of the campaign and keep it alive, active and continuous.
    - 7—To assemble and keep all records of scrap collected and salvaged by all plants, as reported by the latter, and evaluate the complete effort in a report to WPB.
- VII—The Executive Committees and the salvage managers' group further consigned to themselves the job of finding out and reporting for future guidance the answers to the following questions:
- A—What considerations constitute the resistance to the extension of practices and procedures proved practical and profitable in certain organizations to other organizations apparently operating on a comparable basis?
  - B—To what extent can practices and procedures used by large concerns be adapted feasibly to plants of moderate and small size?
  - C—What is the reason, if any, for undue accumulation or sluggish movement of waste materials?
  - D—What are the possibilities, if any, of putting to use in other plants equipment considered obsolete in certain plants having more advanced production methods or of speeding obsolescence and scrapping of unused equipment?
  - E—What are the possibilities of utilizing in other plants supplies considered obsolete?
  - F—What items of waste, if any, are difficult to dispose of either locally or nationally?
- VIII—Following the activities in connection with the sponsoring of the initial meeting of executives by the WPB's Bureau of Industrial Conservation, the Executive Committee appointed a member to serve as liaison contact with the bureau's Industrial Salvage Section to secure all the information and assistance the section is prepared to furnish, to-wit:
- A—Make available the services of a thoroughly experienced salvage engineer for consultation on specific problems as and if needed during the period of the program.
  - B—Supply speakers and salvage consultants for important meetings.
  - C—Serve as a clearing house for information on plans and procedures which have proved practical and profitable in other industries.
  - D—Arrange for a system of awards to be provided by the bureau.
  - E—Supply posters, displays, notices, cartoons, press releases and other publicity. To date one large 2-color poster headed "Get in the Scrap" has been produced and will be available to all industries throughout the country participating in salvage programs. Three other posters to be used in the continuation of the work are in production. Leaflets such as "Salvage for Victory" issued by the WPB's Bureau of Industrial Conservation are available for distribution to all industrial workers.



*Steel makes history . . .* Day and night, Steel is pouring from our ladles, rolling from our mills to be transformed into guns and shells, tanks and trucks, tools and machinery. In every emergency since 1826 we have answered the call to arms. Once again we are working to the limit of our capacity in time of war so that we can serve you better in a free America after the Victory is won.

## **ALAN WOOD STEEL COMPANY**

MAIN OFFICE AND MILLS: CONSHOHOCKEN, PA. District Offices and Representatives: Philadelphia, New York, Boston, Atlanta, Buffalo, Chicago, Cincinnati, Cleveland, Denver, Detroit, Houston, St. Paul, New Orleans, Pittsburgh, Roanoke, Sanford, N. C., St. Louis, Los Angeles, San Francisco, Seattle, Montreal.



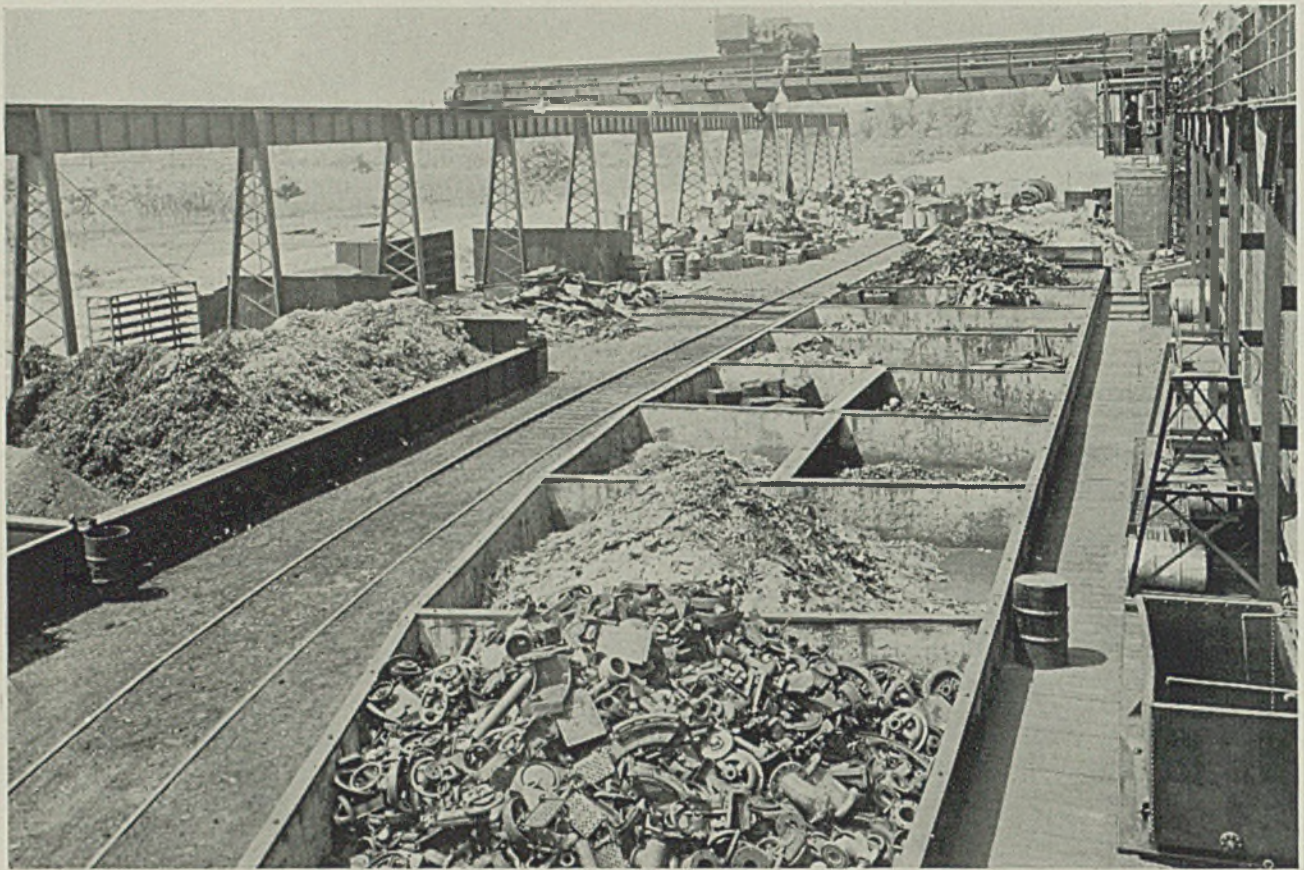


Fig. 4. (Above)—A portion of the iron and steel scrap yard at Erie Works of General Electric Co. showing 325-foot craneway serviced by a 20-ton crane. Note bins for accumulating material by grades. Baling press is located in far background. Some 17,000 tons of scrap was shipped from this yard in 1941

ering and brazing operations is shipped to a refinery for recovery of both metals, the latter sometimes running 300 ounces per ton.

Cadmium scrap usually goes back into the plant for plating purposes. Lead is by no means overlooked, inserts from abrasive wheels being removed, for example. Broken abrasive wheels are shipped to another firm and crushed for recovery of the component materials. Seven or eight barrels of brass from the bases of burned out electric lamps are collected each year.

Aluminum scrap also is carefully segregated and shipped back to the original source in compliance with a WPB regulation. Types produced in quantity are briquetted to facilitate handling. Segregation requires extreme care since it is pointed out that 38 alloys, for example, normally has a dull appearance but may be rolled bright.

Tool steel scrap gets the same treatment as other materials. Cutting tools, hacksaw blades, drills, etc., are collected from all over the plant and sorted out by types and grades. In all instances the carbon steel shanks are burned off.

The salvage department also is set up to handle the dismantling of obsolete plant equipment. In ad-

dition, an enormous quantity of paper, mostly in the form of box board, is reclaimed. Usable boxes are folded and held until required. The remainder of the paper scrap is baled and shipped to a mill in car-load lots.

Salvage facilities include a small but complete oil refinery and a solvent recovery system which treat 10,000 to 15,000 gallons of both oils and solvents each year. Any grade of oil and any type of solvent can be handled. Many of the oils after cleaning are combined with an emulsifier and returned to the shop as a base for cutting oils.

Success of the salvage operations is largely due to close liaison with all production divisions. Mr. Bliven as head of the section maintains close contact with all production divisions personally, thus effecting close co-operation with the department heads, foremen and individual workers. The unexpected visitor to any department finds the aisles and open areas exceptionally clean and a minimum of scrap adjacent to any machine, even while it is in operation.

Of course many other Erie companies have worked out excellent salvage and reclamation systems, all of which are similar in that they

emphasize the importance of segregating the material properly so that maximum value can be obtained from it.

## Standard on Enamelled Steel Effective Sept. 30

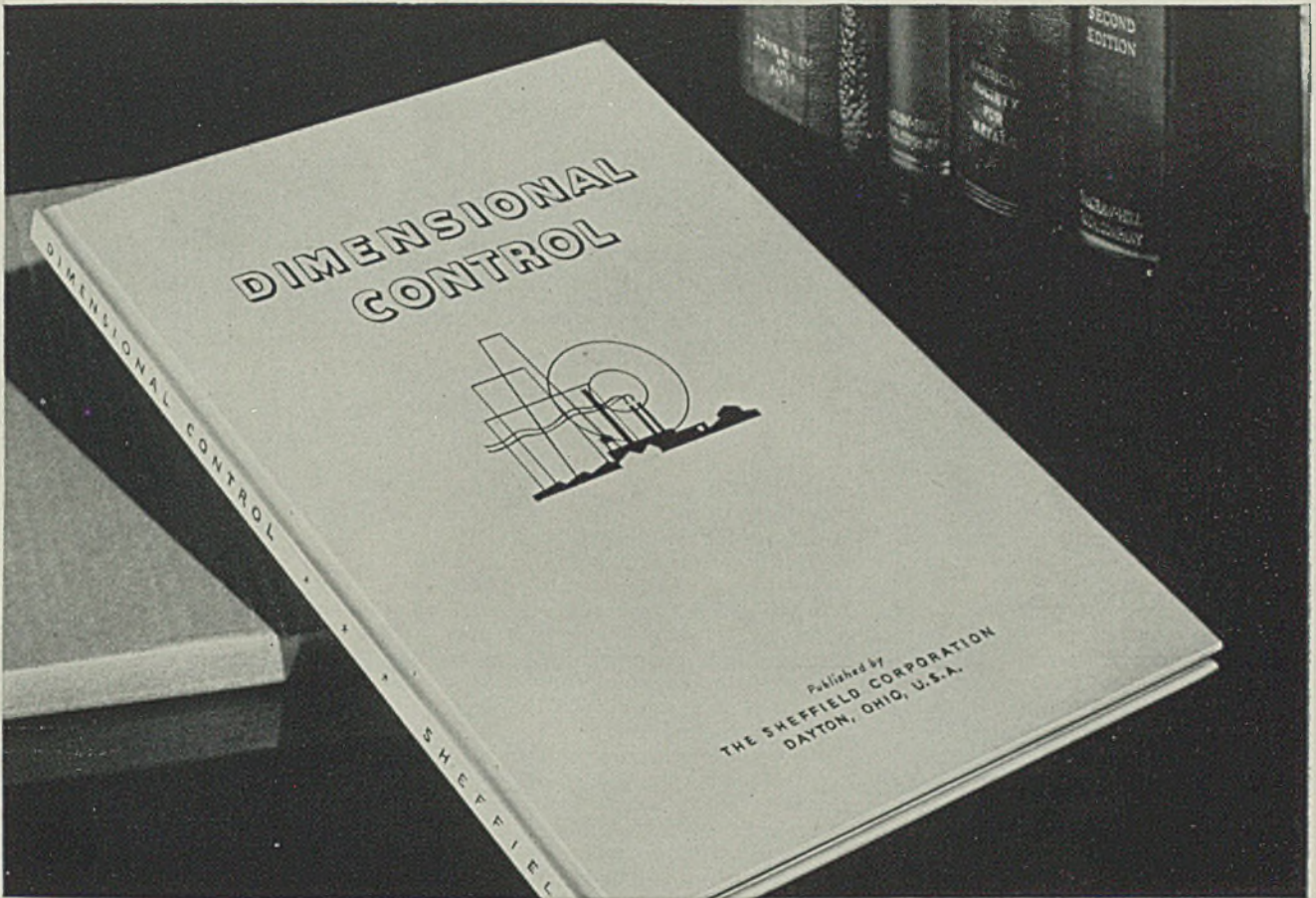
A recommended commercial standard for multiple-coated, porcelain-enamelled steel, circulated for acceptance in February and now identified as CS100-42, may be considered effective for new production from Sept. 30 of this year, according to the United States Department of Commerce, Washington. This was the announcement released by the Division of Trade Standards after having received signed acceptances from a number of manufacturers, distributors and users estimated to represent a satisfactory majority.

## Metal Cutting Methods

Many cutting "tips" on the use of various types of cutting machines including saws, abrasive wheels, shears and files are embodied in a new 71-page booklet entitled, "Metal Cutting Methods," recently issued by Simonds Saw & Steel Co., Fitchburg, Mass. Besides engineering data, this pocket-size publication contains drawings of various type saws, their tooth structure and illustrates methods of holding work during cutting operations.

# DIMENSIONAL CONTROL

*A New Textbook*



"Dimensional Control" is a new basic text on gages and their use in industrial inspection. It has been written for Engineering students, members of Defense Training Courses, and men in Industry who want a more complete knowledge of this phase of their work.

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Position \_\_\_\_\_  
Street and No. \_\_\_\_\_  
City and State \_\_\_\_\_



# From Automobile To AIRPLANE ENGINES

**Back of the ability of this plant to produce its quota of Allison aircraft engines is a story of unusually effective planning and methods of detailing to workmen the various steps in manufacturing the parts**

CONVERSION of peacetime facilities to war production is no new story at the Cadillac Motor Car Division of General Motors Corp. for the manufacture of aircraft engine parts was started there over two years ago. The smooth manner in which this conversion has been made is largely credited to the familiarity of its personnel with precision workmanship. According to Nicholas Dreystadt, general manager of Cadillac, back of the record that has found the plant always ahead of its Allison schedule is a story of unusual planning.

"Regardless of whether this is a long or short war, our war production has been engineered on a sound basis," comments Mr. Dreystadt. "For this reason our Allison efficiency today compares favorably with that of our automobile produc-

tion which we have been improving for 40 years."

The full description of the success of the conversion to new and strange products of course would cover considerable latitude. The ability of automobile workers to readjust themselves should be mentioned as one of the most important factors, ranking in importance with advances in production processes. But to focus upon a single factor that contributed powerfully to the success of this changeover, the planning job is cited.

Everyone associated with factory practices has a knowledge of "route sheets." Such sheets contain the manufacturing information which the tool engineers prepare from the blueprint of a particular part. Each step is listed in its proper sequence for the guidance of foremen and

Key step in the simplification of Allison aircraft engine part manufacturing sequences by Cadillac is the interpretation of route sheet information by sketches. Below is a draftsman drawing a profile of an Allison drive gear, a version of which will be used to guide machinists

the various machine setup men.

When H. A. Barber became production superintendent of the Cadillac-Allison factory, he saw the need for simplification of procedure beyond the route sheets. Tasks were new to all employes. In addition, the average worker was not fully experienced. A shortage in skilled manpower had been brought about by the sudden boom in war production activities. Cadillac trained much of its personnel and this training, while thorough, had necessarily been limited by the emergency.

With his assistants he devised a system for transferring each manufacturing step on the route sheets to separate information sketches. A staff of General Motors Tech students was recruited for the program. At one time more than a score of undergraduates and graduates were engaged in preparing the sketches and supplementary data.

"There is nothing very complex about this nor does it present a revolution in industrial methods," explains Mr. Barber. "But see how well it works in meeting our problems.

## Aircraft Changes Occur Often

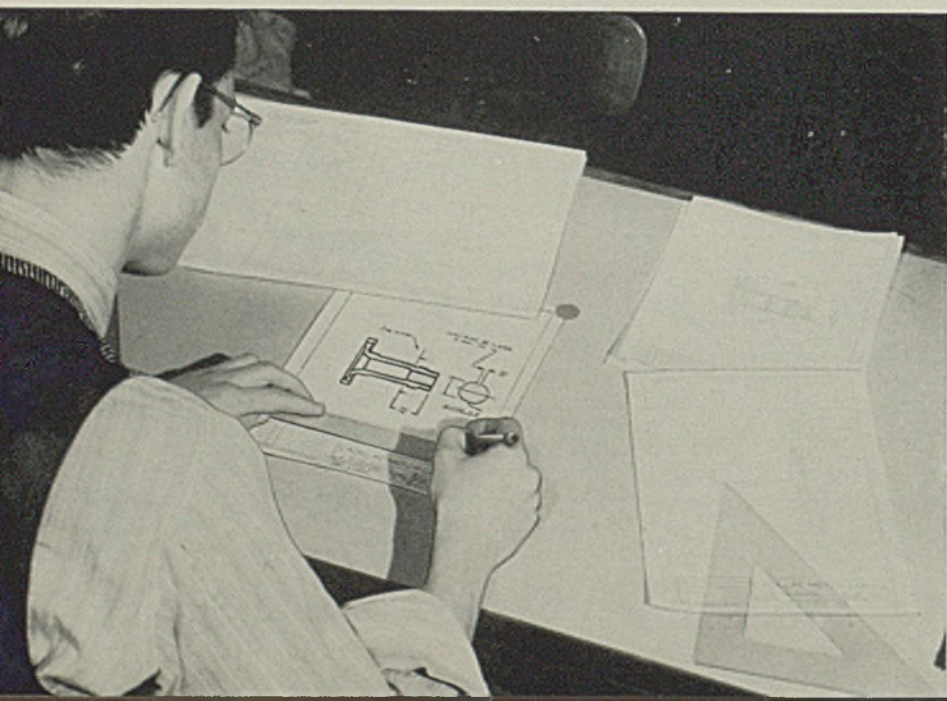
"Under ordinary automobile part procedure, a foreman consults the route sheet and outlines a job to a machinist. The machinist follows these instructions over a period that may last for the entire model run. He soon becomes accustomed to his assignment.

"The production of aircraft engine parts imposes greater difficulties. Changes in specifications often occur, which would not be true of automotive parts. Tolerances are precise and inflexible.

"With the Cadillac-Allison innovation, the machinist is handed an up-to-the-minute sketch that carries all of the information he needs to know about his operation. The sketch fits into a holder at the machine and remains there until the operation is changed. While route sheets still exist, they are given a graphic rather than a verbal interpretation.

"Machine setup time also has been appreciably reduced. Here again we short-circuited the route sheets. The job-setter refers to the information card given him by the production foreman. It tells him what tools he needs for the new setup. There is very little wasted effort."

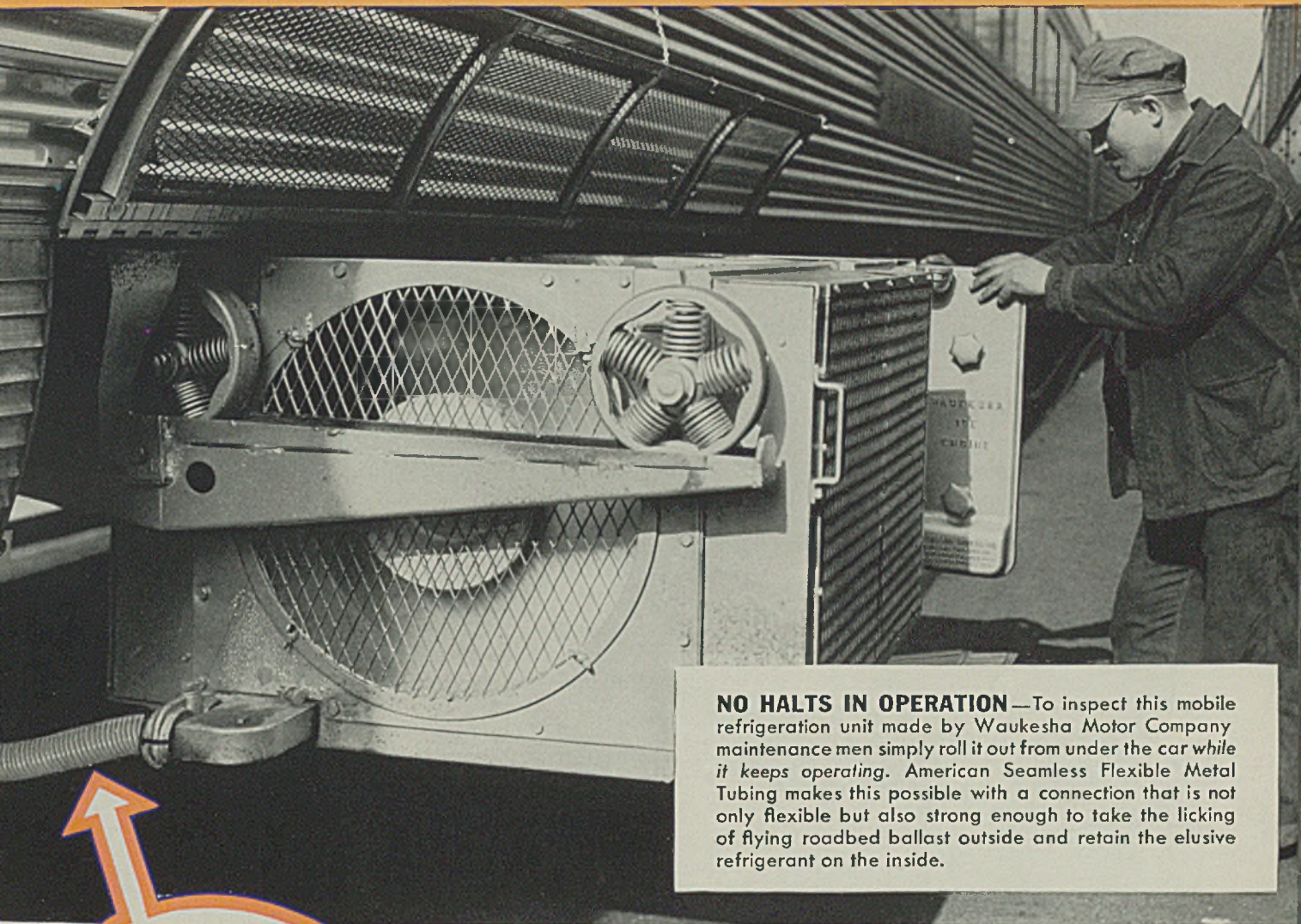
Mr. Barber estimates that the Cadillac-Allison system comprises 3500 information cards. Their placement is recorded with such detail that anyone of them can be changed within a few minutes. Much of the previous lag in putting a part revision order into effect has been eliminated. This in itself is important with the current demand for defense production speed and the added burden on machines.



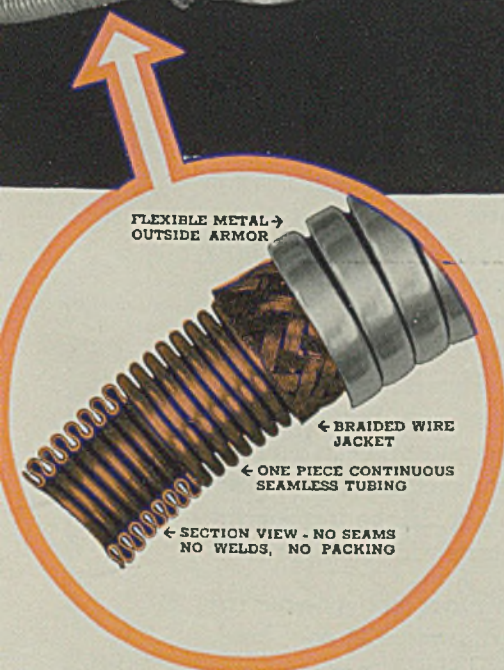
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Manufacturer of this mobile refrigeration unit says:

*"The performance records of our units... are infinitely better than they would be if this roll out feature were not made possible by your flexible tubing."*



**NO HALTS IN OPERATION**—To inspect this mobile refrigeration unit made by Waukesha Motor Company maintenance men simply roll it out from under the car while it keeps operating. American Seamless Flexible Metal Tubing makes this possible with a connection that is not only flexible but also strong enough to take the licking of flying roadbed ballast outside and retain the elusive refrigerant on the inside.



There's a strength advantage in American Seamless Flexible Metal Tubing as well as flexibility. Riding beneath this fast moving streamliner, roadbed ballast impinges forcefully on the connector's exterior. But, all-metal construction effectively withstands the rigorous service.

This combination of strength and flexibility has dictated the use of American Flexible Metal Hose and Tubing through-

out industry as dependable connectors for the conveying of oil, steam, liquids, solvents and gases.

Naturally, your government has recognized the advantages of American Metal Hose. Today, it is working almost exclusively for our national war effort, directly in giant bombers and indirectly in helping to maintain uninterrupted production in war-vital plants.

42196

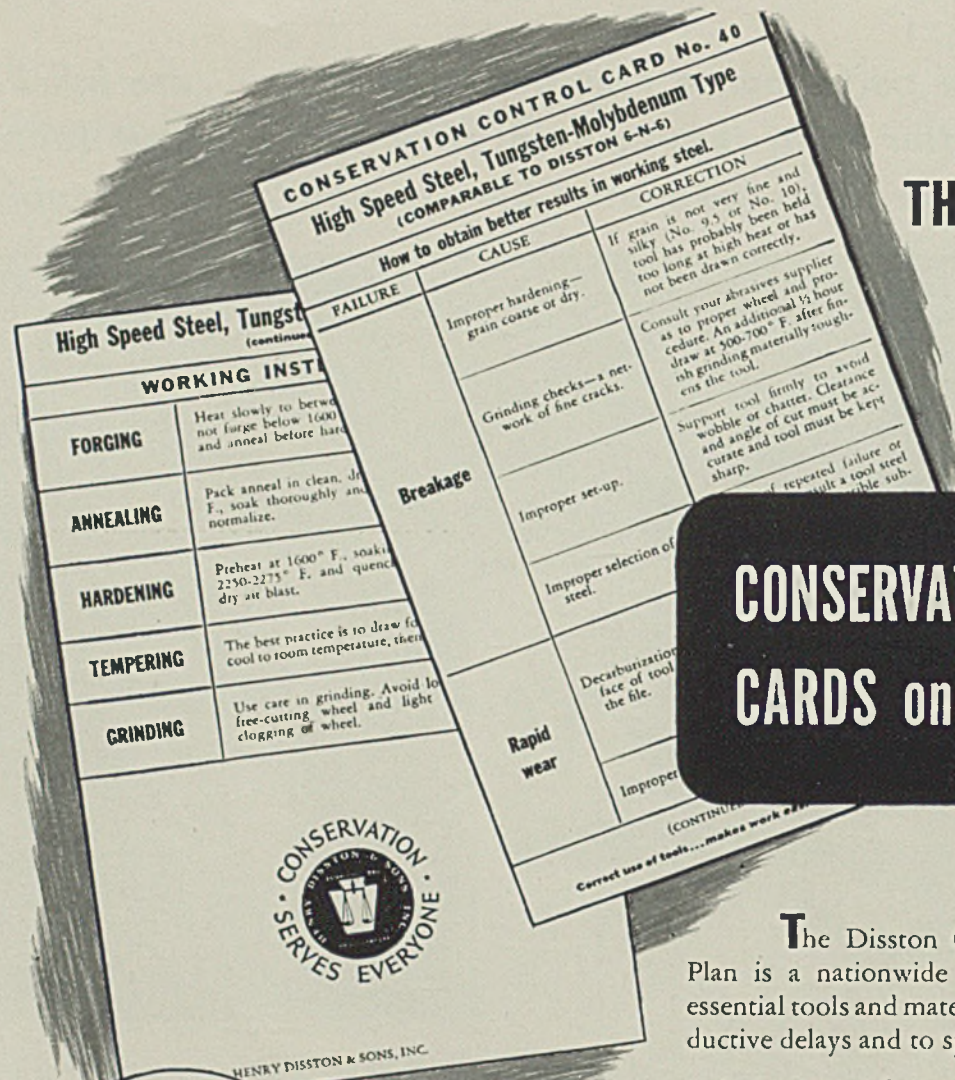
## American Metal Hose

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.....	No. 42	Air-Hardening, High-Carbon High Chromium Steel (Comparable to Disston Croloy)
.....	No. 43	Oil-Hardening Tool Steel (Comparable to Disston Mansil)
.....	No. 44	Chrome-Tungsten Chisel Steel (Comparable to Disston Keystone)
.....	No. 45	Nickel-Chrome, Oil-Hardening Tool Steel (Comparable to Disston Nicroman No. 827)

Company.....  
Street.....  
City..... State.....  
Attn:..... Position.....

BY APPROACHING the subcontracting work to be done on a .30-caliber gun mount as if it were a problem in plant management and production scheduling, a Mohawk Valley manufacturer of pneumatic tube conveyors will make delivery of a quantity of gun mounts five months ahead of the original scheduled delivery date, says the Contract Distribution Branch of the War Production Board, New York, according to *Supervision*, East Stroudsburg, Pa.

Seventeen subcontractors and 20 sources of supply, including foundries, forge shops, etc., are doing 65 per cent of the work needed in the manufacture of the 130 different parts of the gun mounts. When the order was placed with the Mohawk Valley firm last June, delivery dates were scheduled to commence April 1, 1942, and delivery to be completed by Aug. 1, 1942. The first 1000 gun mounts were delivered before the end of January, and the entire job will be completed in March.

Although the plan was developed in connection with the manufacture of a gun mount, the methods worked out can be applied to the subcontracting of a wide variety of war orders.

When the conveyor company obtained its contract, commercial items were separated and the sources of supply lined up. Work on the gun mount was broken down and the parts to be made by the subcontractors were separated from the work to be done by the prime contracting firm.

Potential subcontracting manufacturers within a radius of 150 miles were invited to the plant where

they and their tool engineers carefully studied the blueprints and selected the pieces they thought they could make most advantageously.

The next step consisted of tool analysis and tool drafting for all parts, whether made by the prime contractor or subcontracting firms. Tool work over and above that which could be handled by the prime contractor's tool room was done by outside firms on an hourly basis,

which varied from \$3 to \$4.50 per hour. Upon completion of the special tool, jig or fixture, the subcontractor was handed the tool and necessary parts and was given an experimental order of \$50.

The soundness of the procedure is evident in the fact that out of 18 potential subcontractors, only one quoted an excessive price per piece due to having originally overestimated his machine tool capacity. In addition, the conveyor company gave considerable technical advice, obtained new machine tools where needed, and delivered all necessary materials to the subcontractors.

A simple performance graph for each operation was developed. Since a specific job was assigned to a subcontractor, he gradually became a specialist on that particular item and by degrees introduced short cuts, thereby accelerating production.

In fact, production on one item, a triple threaded screw, was more than doubled. Under ordinary conditions, a thread of this type would be produced by thread grinding at the rate of 3 pieces per hour. Since there were no thread grinders available, and since "necessity is the mother of invention," the prime contractor's tool designers and the subcontractor developed a method of cutting this thread on an ordinary engine lathe at the surprising rate of 6 to 8 pieces per hour or better.

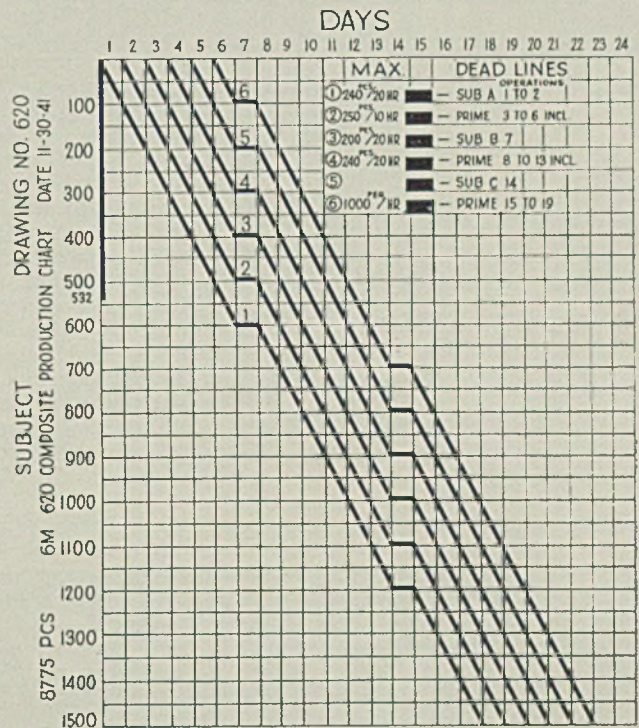
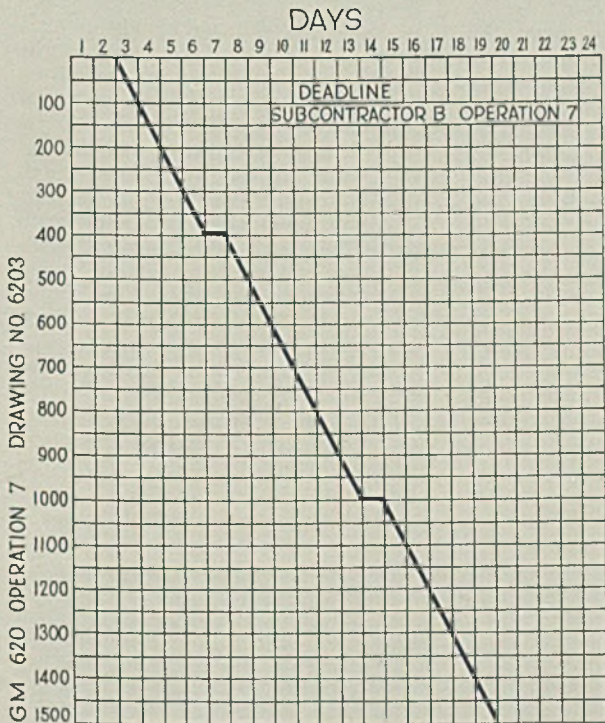
Adherence by the subcontractor to the theoretical performance graph, developed for the particular item he was working on, made possible the synchronizing of production on the 130 different parts of a gun mount so that the actual production of fin-

(Please turn to Page 119)

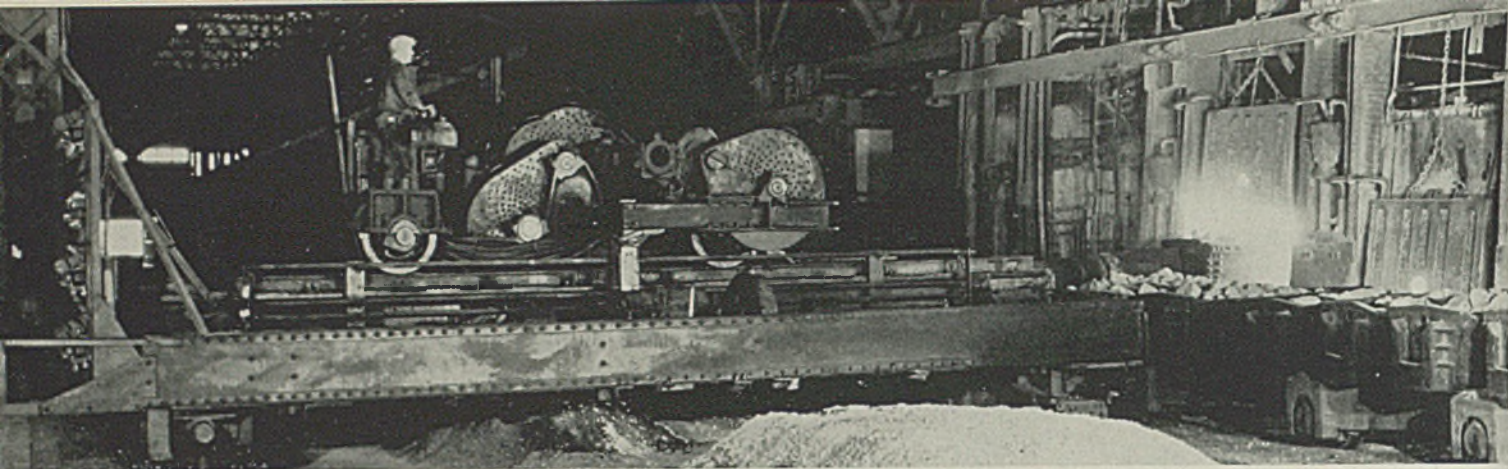
## Mohawk Valley Plan

**... speeds production of war items 55 per cent; advances delivery five months; is widely applicable to other war work**

Graph A, left, production chart for a single operation. From *Supervision* Graph B, right, composite production chart. Heavy diagonal lines show production schedules to be followed by various subcontractors so entire series of operations can be tied together for efficient assembly of completed parts. Line 1 shows operations 1 and 2 to be performed by subcontractor A. Line 2 shows operations 3 to 6 to be performed by prime contractor. Line 3 shows operation 7 to be performed by subcontractor B. Similarly, line 4, operations 8 to 13, prime contractor; line 5, operation 14, subcontractor C; line 6 operations 15 to 19, prime contractor







Charging machine operator charging limestone into an open-hearth furnace

# The Manufacture of HIGH-QUALITY, LOW-COST STEEL

## General Characteristics of Steelmaking

By PAUL J. McKIMM  
Cleveland

AN IMPORTANT phase of fluxing is to charge a slight deficiency of limestone prior to that required for the scrap and iron silicon. This should be added before the lime boil has been completed and while the bath contains sufficient carbon to permit the proper refinement. Otherwise a carburizing agent is necessary which means time. Therefore, it is best to charge all the lime at one time. A sufficient quantity must be added to take care of all variables that may be encountered so that there exists an ample amount for the poor charge and an excess quantity for the better and clean scrap particularly where the iron is on the low side of the silicon range. This procedure consistently produces the best results in steel quality control.

Burned lime for enriching the slag generally falls short of its intended purpose because if it slacks, the efficiency is lessened. Then, too, it often is added at the wrong time. Suitable material for improving the slag is a good grade of raw lime about egg size. This must be added at the proper time.

Where scrap heats or charges have up to 30 per cent or so iron, it is often advantageous to use burned lime or special fluxing compositions.

An ideal flux is one that possesses ample free lime to be beneficial for suitable refining of the bath before final furnace additions and refinement. It contains about 41.00 per cent CaO and 59.00 Fe<sub>2</sub>O<sub>3</sub> and ranges from an all-dicalcium ferrite to practically an all-calcium ferrite. If the composition were 25.0 per cent CaO and 75.00 per cent Fe<sub>2</sub>O<sub>3</sub>, the entire

flux would have a melting point around 2220 degrees Fahr. With an increasing amount of dicalcium ferrite this compound flux would fuse at 2220 degrees. A flux within these percentages of Fe<sub>2</sub>O<sub>3</sub> and CaO would possess no free lime.

In the lime-ferric oxide system the flux may be calculated, omitting the lesser constituents to 100 per cent lime-ferric oxide, by considering CaO as 91.5 and Fe<sub>2</sub>O<sub>3</sub> as 8.5 per cent.

The quantity of lime has little effect on the time of the heat. As previously mentioned the controlling factor in reducing the time is the technique of charging and the melting phase. If a heat is processed with 8 per cent lime though the quality of the metallic charge called for 9 to 10 per cent, the time is extended because the heat shapes up with greater difficulty and necessitates the extension of time. Rather than have a deficiency of lime under the circumstances an experienced first helper would prefer to add another box or so of stone holding the view that when he has ample lime he works with the least effort and makes the best time and obtains the utmost in quality.

### Fluorspar Is Charged

Where a deficiency of lime exists, excessive amounts of fluorspar are used on the claim that the slag is heavy; actually it is overburdened. Even though the slag volume has been increased, little fluorspar is required. This is evident by comparing heats with various amounts

of fluorspar additions. Usually heats with the least slag volume for a given metallic charge were given the most fluorspar while those with the greatest slag volume were given the least. Moreover, when heats require considerable fluorspar, lime in some form or other was added.

An important function of the lime is to form a basic slag. Without sufficient basicity dephosphorization not only is impossible but interferes with the sulphur reduction. Lime and iron oxide slags are necessary to control the amount of phosphorus. The amount of lime required is dependent primarily on the amount of silicon in the charge which changes to silica as well as the phosphorus present. Usually the phosphorus content of the iron is not permitted to reach a point where too great an amount of additional lime is required, thus interfering with salvaging value of the slag. The maximum phosphorus content of the iron is about 0.100 per cent; above this extra lime is needed. Generally calculation is for silica, calcium oxide and phosphorus where the phosphorus in the slag forms calcium phosphate, Ca<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub>, and ferrous phosphate, Fe<sub>2</sub>(PO<sub>4</sub>)<sub>2</sub>. Sufficient excess lime and iron oxide are needed above that required for the silica, etc., to suffice for all of the phosphorus, which is usually shown as P<sub>2</sub>O<sub>5</sub>, phosphorus pentoxide.

Phosphorus is a valuable indicator to show how the heat was shaped up or refined. The phosphorus content of the metal will always be below 0.010 per cent. Steel made from a 45 per cent iron charge as well as low-carbon rimmed steel usually is made with a slag of 21 to 25 per cent iron oxide and with the silica



# WHICH?

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able. This means not only long service but the most economical service too, because with lighter weight the insulating value is greater and heat losses are lower.

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generally under 12 per cent. When the silica in the slag increases to about 15 per cent the phosphorus starts to increase to about 0.012 to 0.015 per cent. When silica reaches 17 to 19 per cent the phosphorus becomes an issue, sulphur begins to increase and the steel quality becomes affected. Cracking and/or tearing of the ingot occurs during the blooming operation which necessitates surface conditioning. These characteristics arise as a result of the refining practice; the phosphorus content merely denotes that the steel was not properly made.

The most logical procedure for making low-sulphur steel is to use a low-sulphur iron. Then any sulphur above normal in the steel will be dependent on the fuels and/or slag condition. If sulphur is high in the iron or in the scrap as sometimes is the case, sulphur reduction in the furnace is generally slow and expensive. Lime, manganese, slag fluidity and a low-sulphur fuel, excepting blast-furnace gas are needed for a low-sulphur content plus the extent of the boil because the reaction only takes place at the slag-metal interface and the greater the contact between metal and slag the faster sulphur is removed.

When natural gas is used for combustion in the open-hearth furnace a much higher sulphur iron can be charged whereas with producer gas the charge must be low in this constituent. The general use of fuels today is somewhat a complex problem because many plants are on straight oil or tar; straight coke-oven gas or mixed with oil, tar and coke-oven gas. It is possible to have a low-sulphur content of the charge and finish with a high-sulphur steel due to pickup from the fuel; this always occurs during the meltdown before slag is formed. With a high-sulphur fuel especially under a slow or insufficiently oxidizing atmosphere it is not uncommon for the scrap to absorb ten points or more of sulphur. The sharper working furnace, therefore, has a more rapid meltdown and a more oxidizing flame thus decreasing the sulphur pickup. Sulphur pickup under these conditions is further regulated by the size and shape of scrap; the greater the surface areas exposed, the greater the sulphur pickup.

Ideal practice, therefore, is to keep the sulphur in the iron low which is accomplished by proper burdening, operations and metallurgical investigation. Often sulphur removal is done after the iron is cast, either treating it in the runners or iron ladles or even in the mixer. External desulphurization is done usually in the runners or ladles with calcium carbide and soda ash additions. Soda ash is effective when approximately 10 pounds is added per ton of metal for a sulphur removal of



Determining temperature of a "heat" by an optical pyrometer

only about 0.010 per cent.

A good example is found in a plant having sharp working furnaces and oil for fuel, charging about 44 per cent iron having a sulphur content under 0.025; manganese, 1.75 to 2.00; and silicon, 0.85 to 1.15 per cent. The final steel sulphur rarely exceeds 0.025 per cent. If the sulphur in the iron should reach 0.030 to 0.032 per cent the final steel analysis is always the same as the iron. In other words, the iron-sulphur content plus the pickup of the charge yields a figure in the final results comparable to that existing in the charged iron.<sup>1</sup>

#### Oreing Practice

Opinion varies concerning the influence of oreing practice on the quality and workability of the ultimate steel during the working of a heat in the open-hearth furnace. Some operators maintain that close oreing is detrimental, that is, where any amount of ore is added too close to tapping time. Still others maintain that the quantity of ore irrespective of the time lapse from last ore addition to tap is the injurious factor on steel quality. In fact, one large producer of high-quality cold-reduced strip maintains a standard practice of diverting all heats from

cold-reduced to hot-rolled strip where more than two boxes (9000 pounds) of ore are used in the respected heat. Time of oreing or the time the ore is in the bath is such as to permit it to thoroughly work through. The same feature is true as to the amount of ore additions necessary to reduce the carbon to a good working point or where further reduction can be accomplished readily with rods or poles (sapplings). If a greater amount of ore is necessary it is important that it be completely worked through the bath before further additions are made. Attention must be paid to the slag because it is often necessary to add lime when excessive ore additions are necessary. In other words the manner of oreing supersedes the amount or time factor and under wide difference in oreing practice the bath can be properly shaped up and refined to the desired quality. The lime used for conditioning the slag especially for excessive ore requirements should be "egg-size" raw lime. This is more effective than burned lime which tends to slack and decreases in efficiency.

In melting with a fairly high residual manganese and with a high silicon iron or with a silicon reboil this procedure is feasible when the charge is free of adhering oxide and other "dirts". Further elimination is natural by the system of reactions or by increasing the rate of elimination by the additions of ore.

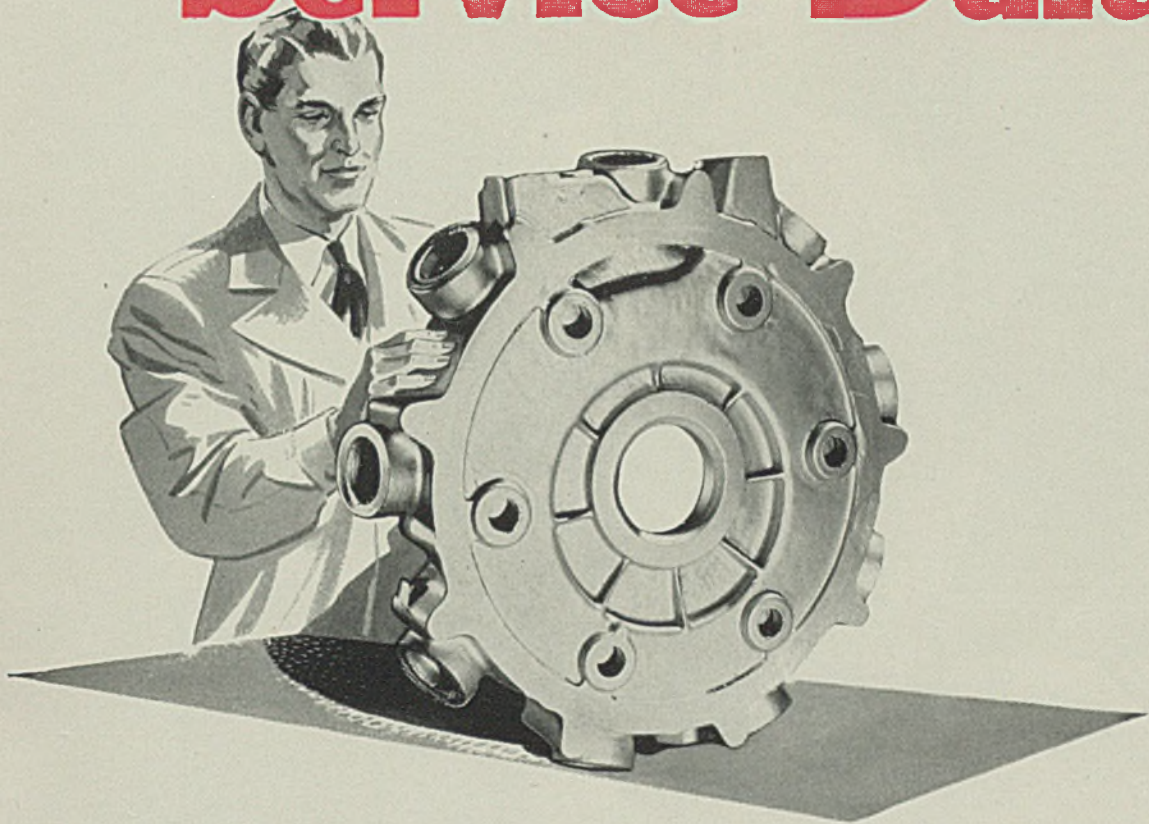
Iron oxide present in the charge reacts with the initial silicon and manganese which is further increased by heavy oxidation due to the furnace atmosphere and to the induction of air. This process is valuable inasmuch as the reaction is selective. The silicon produces silica which during the early stages of melting reacts with the iron oxide to form particles of such size that they readily coalesce and rise to the slag. As melting progresses these particles are so finely divided that their ability to pass up through the liquid metal is retarded; hence, the danger of contamination of the ultimate steel.

The molecular silica formed by reaction between silicon and a small amount of the iron oxide is incapable of imparting lightness to the slag because of the minuteness of the particle which coalesces readily.

As iron oxide reacts with silicon and manganese at much lower temperatures than is the case with carbon, it can be assumed that the reaction is selective, especially toward the finishing period of the heat. During the early stages of working, the reactions are confined mostly to carbon and as both the carbon and the temperature decreased, the reaction changes to that of silicon and manganese. For this reason it is

<sup>1</sup> "Data Relating to Basic Open-Hearth Steel Practice" and "Action of Sulphur in Basic Open-Hearth Steel Practice," A. N. Diehl, American Iron and Steel Institute Yearbook, 1926.

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thought that 0.08 to 0.09 per cent carbon is an ideal amount for all low-carbon steels. At this range a microstructure is obtained that produces desirable drawing features. Furthermore at this point better residual manganese is retained because during this period the manganese elimination is slight.

In oreing a heat primarily consideration must be allowed for the method of working because many operators begin working long before sufficient lime is up, while others do not begin until after the sulphur test has been taken. Often when heats are ored down too rapidly the carbon is reduced to the desired degree though temperature is lacking. The heat is ready chemically but has to be held up for temperature or additions of thermit material which provide heat units. Tapping the heat before proper temperature is attained results in inclusions and skulls.

The heat should have ore additions decreasing in amount as the system of carbon elimination progresses so that toward the end of

the heat, the desired carbon is reached at the same time as the temperature. The heat then can be finished, tapped and poured into molds free of ladle skull or at least not more than about 1000 pounds. Oreing should be carried far enough so that after the last ore has completely worked through the bath a few points of carbon remain. One to three steel rods can be used. Green poles (tree sapplings) create a more power action. They "kick" so strongly that a man cannot hold them down in the bath. Green poles are far superior to steel rods for reducing the final carbon drop in acid furnace practice where reduction is slow.

Shortly after ore additions the operator will thicken the slag. If the slag becomes thin at this stage it is because of an excessive amount of iron oxide. Since this oxide has been added for a specific purpose, it should be permitted to function uninterrupted until the reactions have completed themselves. Thick slag decreases the concentration of iron oxide and, hence, slows down

the speed of reaction between iron oxide and carbon.

With 0.20 to 0.30 per cent carbon steel there should be an excess of iron oxide over that necessary to convert the initial silicon and manganese to oxide for cleansing the steel of impurities. Oreing should proceed until the metal is thoroughly clean and while the carbon usually is reduced below that needed for tapping it is brought up to the proper content by the addition of three or four bags of coal in the ladle or of pebble graphite. With the still higher carbon forging grades 0.30/0.35 to 0.40/0.45 per cent carbon or the alloy grade series, oreing and/or other medium of carbon elimination should be carried on until all of the lime is up and the bath slag equilibrium is in proper shape regardless of how low the carbon decreases. With such grades the heat should be finished off and taken out thereby "catching the carbon coming down". In case the carbon has to be reduced to 0.12 to 0.16 per cent, then extensive recarburization with hot metal "drinks" will be required to maintain a high-quality steel.

Some favor killing-off excess iron oxide with 15 per cent ferrosilicon until the bath becomes quiet. However, the addition of silicon to an over-oxidized bath produces finely divided silica which in the absence of sufficient iron oxide to produce fayalite ( $2\text{FeO}; \text{SiO}_2$ ) results in steel with excessive oxide or complex nonmetallic inclusions. Hence, killing off these excessive actions should be done with mediums containing little silicon.

The bath in an oxidized condition is saturated with gases and when cold scrap or iron is added an evolution of gases take place. Metal added to an oxidized bath promotes a boiling action and supplies carbon with which excess iron oxide can react. Therefore, the bath should be prepared for the final additions by charging a box of pig iron containing around 1.00 per cent silicon.

*(To be concluded)*

## New Bulletins Deal With Buckling Problems

"The Buckling of Compressed Bars by Torsion and Flexure" and "Flexural-Torsional Buckling of Bars of Open Section" are the titles of two new bulletins written by Dr. J. N. Goodier, professor of mechanics of engineering and recently published by the Cornell University engineering experiment station, Ithaca, N. Y. These, also known as bulletins No. 27 and 28 respectively, present a mathematical analysis of certain peculiar types of buckling which are encountered in tests of aircraft components.

## Hardens 70,000 Tappets Per Day



MORE than 100 per minute or about 70,000 tappets per day are hardened by a single automatic machine in a large auto plant. Each tappet is made of cast iron with a steel insert hardened by induction heating brazed to its top. Brazing is done in a brazing furnace by melting a copper wire around the joint. The unhardened pieces are inserted in holes in the rim of a rotating wheel that revolves slowly

through a high-frequency field supplied by a Westinghouse 180-kilovolt-ampere 3000-cycle generator as shown above. Both the seat and shoulder of the tappet ends are heated to 1500 degrees Fahr. and quenched in about 3 seconds. The heating process is continuous; each piece is quenched as it drops by gravity into the quenching tank below and is carried away on a conveyor shown at extreme right.

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AND SC ONE-WAY FIRED PITS ARE  
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● STEEL, everyone realizes, is the basic metal upon which our ultimate victory depends. Every weapon of modern warfare except aircraft is made of 90% steel. The need for more and better alloy steels becomes a paramount production problem.

There is, within each organization in the steel industry, a constant urge to improve production, to raise the standards of quality, to improve yield, to lower operating cost. There is the ceaseless pressure of war production which drives the industry on toward the seeking of new and better methods and equipment.

Many companies are looking to their soaking pits for improvement. Old style pits are being replaced by modern SC one-way pits because... first cost is less; they are more economical to operate; they provide greater ingot capacity within existing buildings; provide more convenient arrangements and require less floor space, make possible uniform heating and easier control of pit operation, reduce scale losses and are fully automatic.

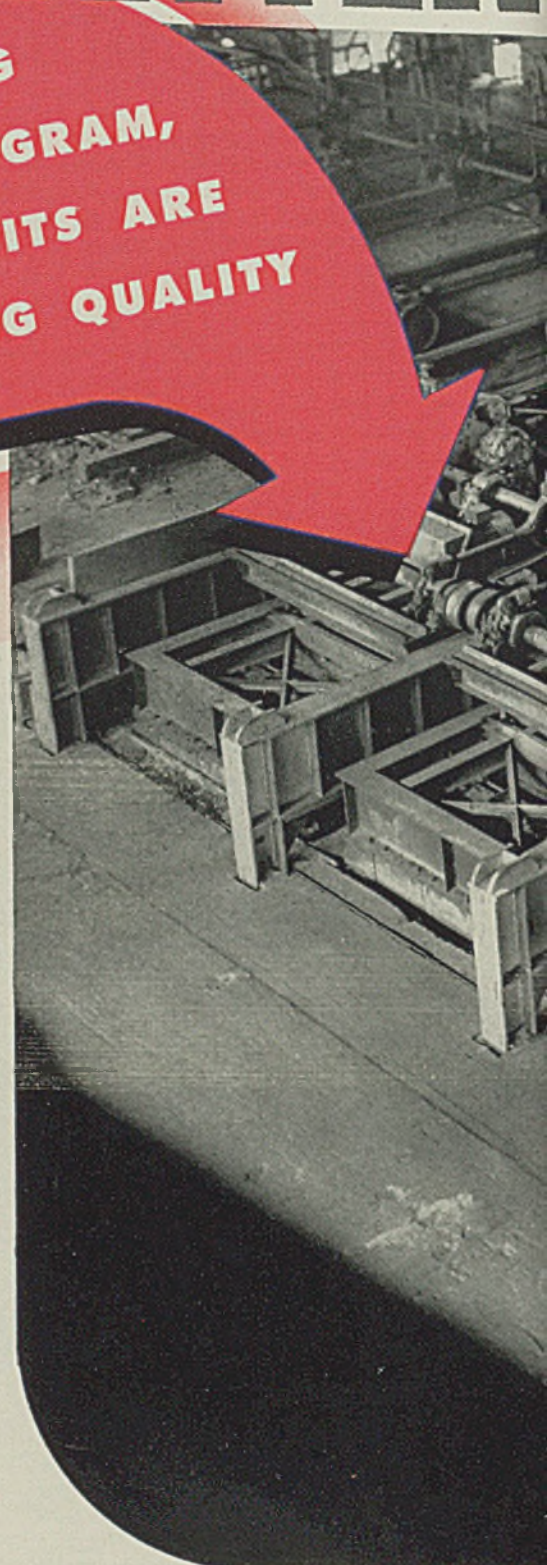
Most pits now in use can easily be replaced by up-to-date one-way fired pits, increase pit capacities with more economical operation. Designs are available for coke oven gas, producer gas, oil, blast furnace gas, natural gas or a combination of these fuels. SC engineers will gladly assist in laying out plans for improving quality and increasing yield of more and better alloy steels.

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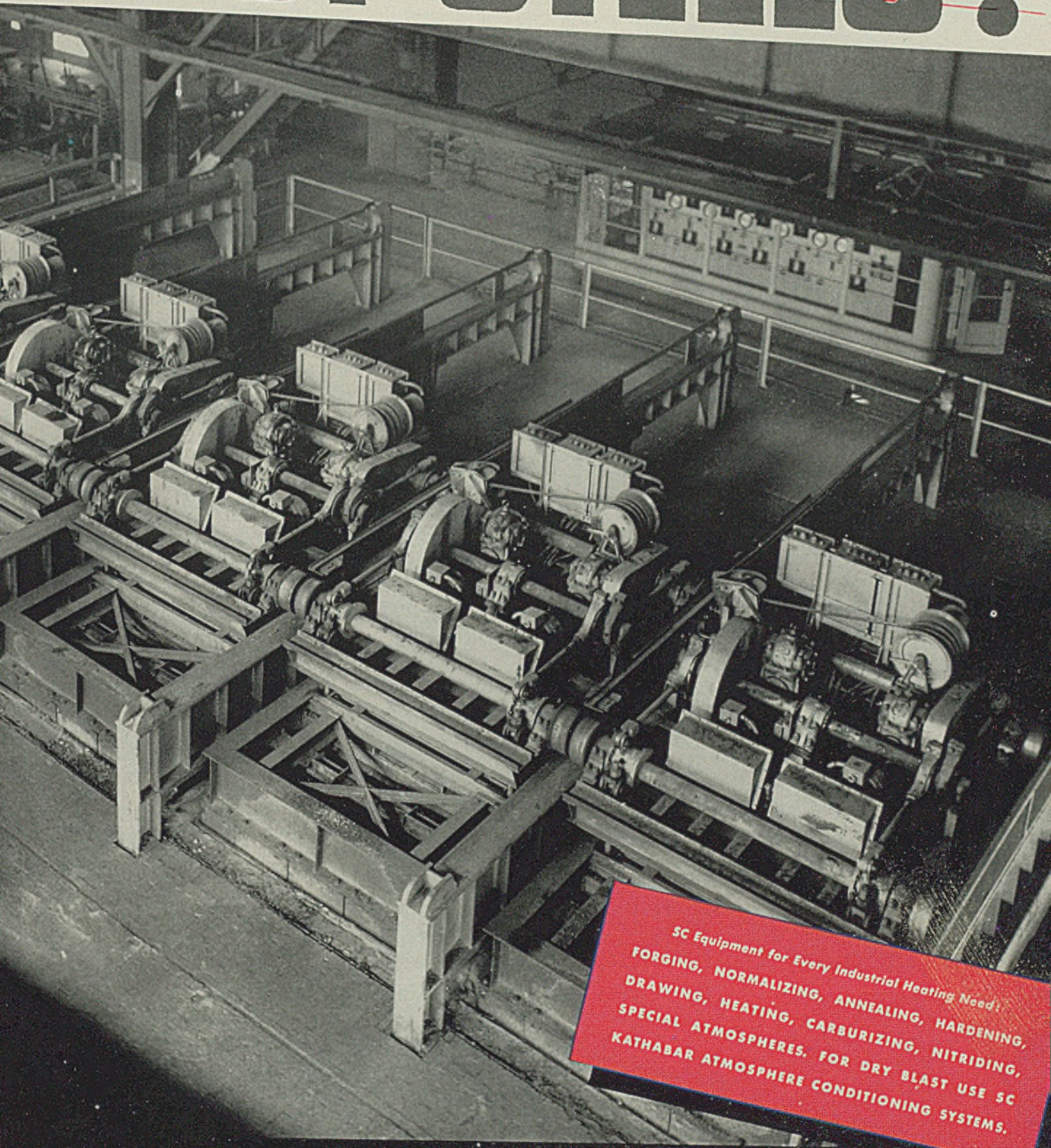


## SURFACE SC COMBUSTION

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# EVAPORATOR ASSEMBLIES

... resistance welded at high speed in special production setup

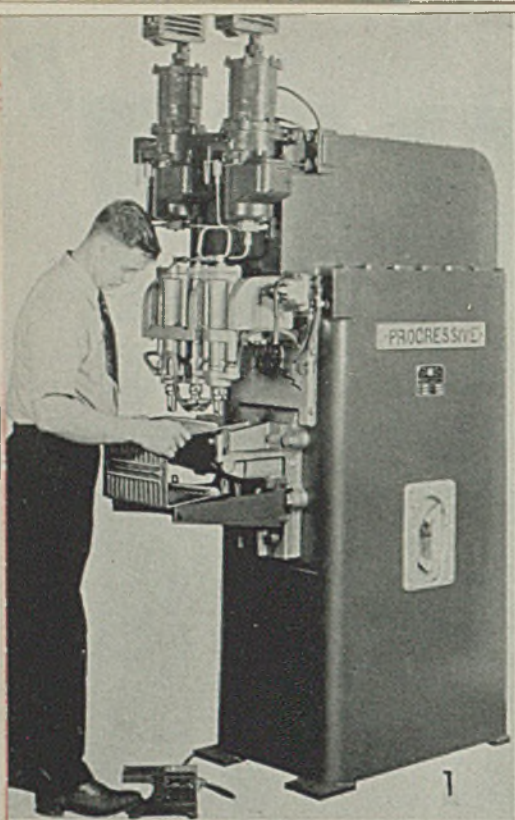


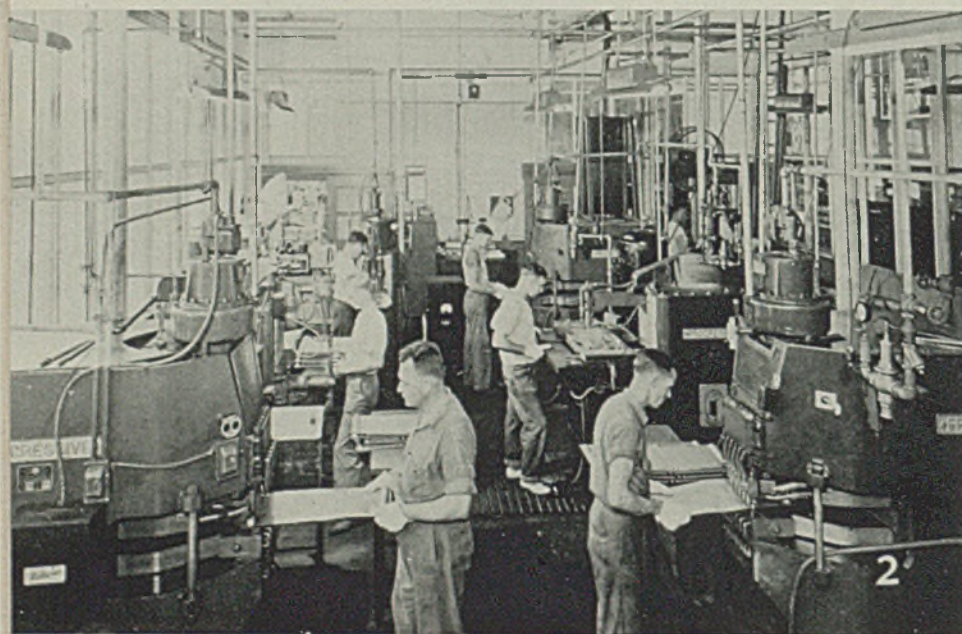
Fig. 1—Projection welder used to secure mounting brackets and thermostat clips to fabricated evaporator

Fig. 2—Part of the welding setup at Sunbeam for fabrication of refrigerator evaporators. At left and right are the multi-spot welders, while in the background are the pedestal welders for welding baffles and center rows of spots. Equipment includes seven spot welders and two seam welding machines

Fig. 3—Closeup of multi-spot welder which makes from four to six spot welds at one time, depending on evaporator size

Fig. 4—Pedestal welder with ratcheting indexing fixture. All welding equipment furnished by Progressive Welder Co., 3050 East Outer drive, Detroit

96



inside the refrigerating compartment.

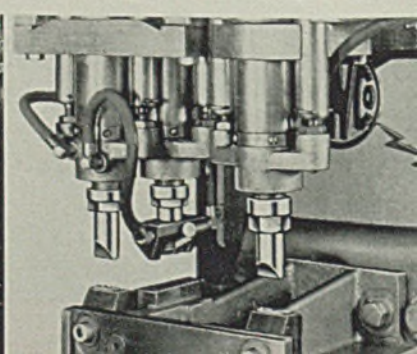
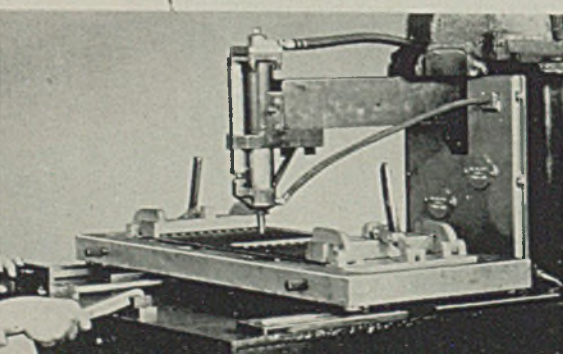
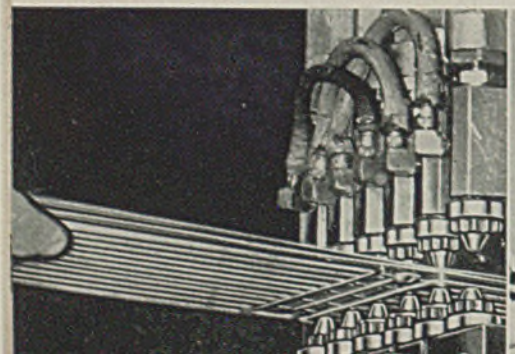
In fabricating the evaporator assembly, the panels are first trimmed to size and one panel formed on die-equipped presses. The formed evaporator half goes first to a standard Progressive pedestal-type hydraulic spot-welder equipped with a double gun head. On this machine the baffle is spot welded into one of the channels in the formed panel. This is done with two spot welds being made simultaneously and in series by the two welding guns.

The baffle is placed in the movable head of the machine, where it is held in place on the fixture by two fingers. The panel is located over the lower electrodes. As the machine head moves down, the baffle is automatically located and welded in place. On completion of the weld, the fingers release automatically and the head returns, permitting removal of the assembled unit.

This panel half now goes to another spot welder equipped with a horizontally indexing (or ratcheting) table, Fig. 4. Both halves of the evaporator are placed in this fixture. The machine is started and automatically welds a series of 20 spots on one side of the center channel. The unit is then reversed in the fixture and a similar series of spots is welded down the other side of the channel. The machine is capable of a production of some 90 pieces per hour, for both series of operations.

The assembly now goes to one of three multiple-spot welding machines. These have six electrodes spaced so as to weld between each pair of channels on one side of center of the evaporator. On these machines, Fig. 3, rows of spots are now welded between each two channels, the spots being spaced approximately  $\frac{1}{2}$ -inch apart by the operator, who advances the unit this amount every time the upper electrodes release. The machine auto-

Fig. 5—Closeup of projection welder showing mounting brackets in place



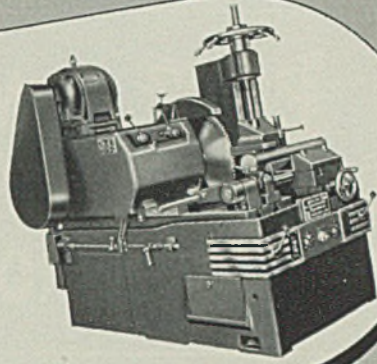


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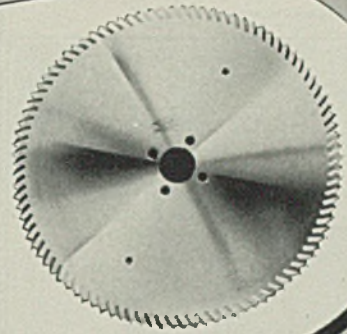


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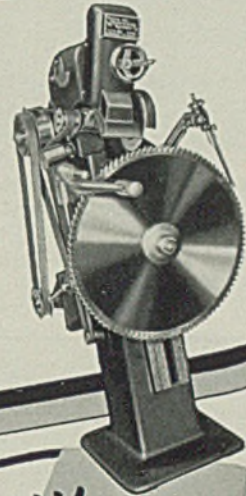


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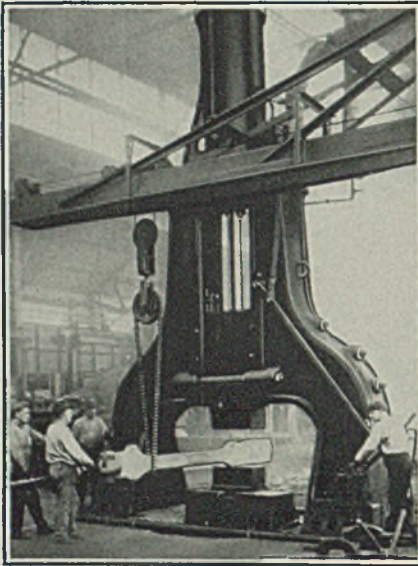


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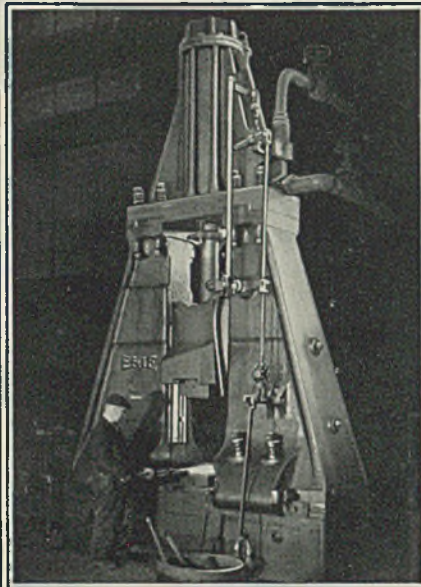
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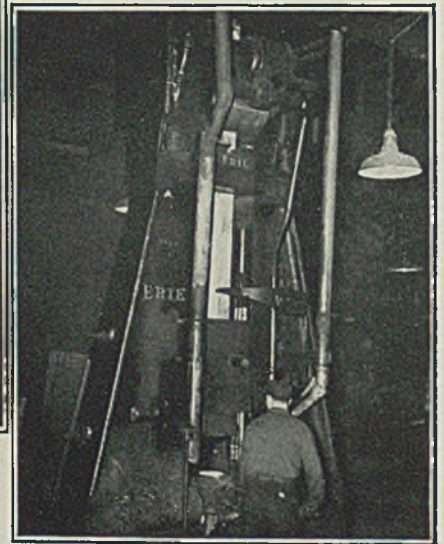
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# ERIE

## BUILDS Dependable HAMMERS

matically repeats the welding operation as long as the operator keeps his foot on the starting switch.

The evaporator is now turned around and the same operation is performed on the other half of the evaporator—either on the same machine or on one of the other Progressive multi-spot welders. Design of the machines and evaporators is such that for smaller sizes of evaporators the end guns are merely cut out and the machine then welds four or five spots at a time instead of six. Welders are hydraulically operated and are controlled with electronic timers and contactors.

From the multi-spot welders, the evaporators go to two seam welders on which the outer edges of the assembly are welded together to seal them.

After press trimming the outer edge of the assembly, the evaporator is bent into a U-shape on a forming press. It now goes to a projection welder on which the hanger brackets and thermostat control mounting clip are welded to the assembly, Fig. 1.

As shown in the closeup, Fig. 5, there are three welding points. The two mounting brackets are welded

on with the left and right electrode, while the center unit locates and projection welds the thermostat bracket to the evaporator. The mounting brackets are shown in position in Fig. 5.

The evaporator is now ready for assembling of copper tubing in place, brazing on of tubing, cleaning and pressure testing. Evaporators are required to withstand normal internal gas pressure of 250 pounds per square inch and a bursting pressure of 450 pounds per square inch. One reason why this is possible is the large diameter of the spots, which prevents tearing of parent metal around the periphery of the welds.

All the welding machines are controlled through tube type contactors and synchronous electronic sequence timers which may be adjusted at the touch of a dial for welding times ranging from only ½-cycle of current to a weld time of approximately 60 cycles. This synchronous timing equipment provides sufficient adaptability so the equipment can be set to weld either stainless or low-carbon steel or other alloys. Further, consideration to possible changes in welding requirements

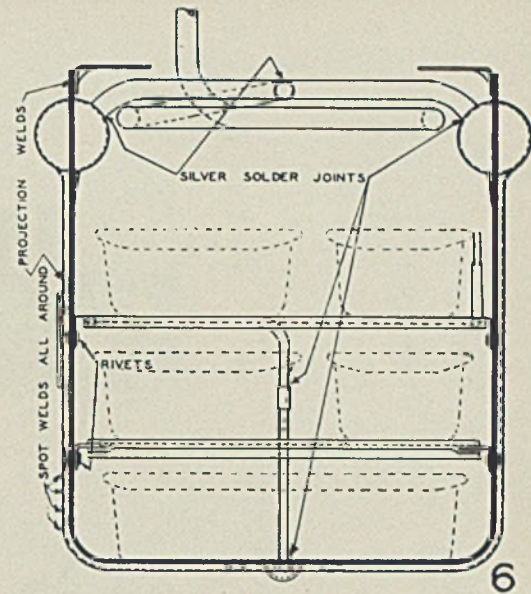


Fig. 6—Finished evaporator

was given when the equipment was first selected and designed. The synchronous timing equipment also eliminates the variable effect of transient currents set up when contactors start the flow of welding current at any time except when the net value of the alternating current is zero.

## SPINS PARTS IN VACUUM

### In New Testing Technique

A STRESS-COAT analysis system for testing rotors to determine stresses at high speeds has been developed by General Electric Co., Schenectady, N. Y. The part to be tested is coated with a brittle varnish and suspended on a vertical shaft through the top of a vacuum chamber 2 feet in diameter

and 1½ feet high with massive steel walls, seen in Fig. 1.

When the part is revolved at high speed, centrifugal force exerts stress to strain the metal, causing cracks to form in the varnish and remain after the stress is removed. These cracks always form at right angles to the stress

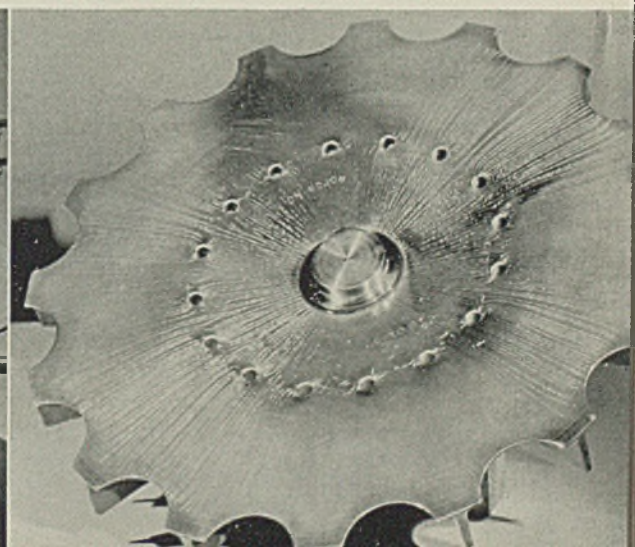
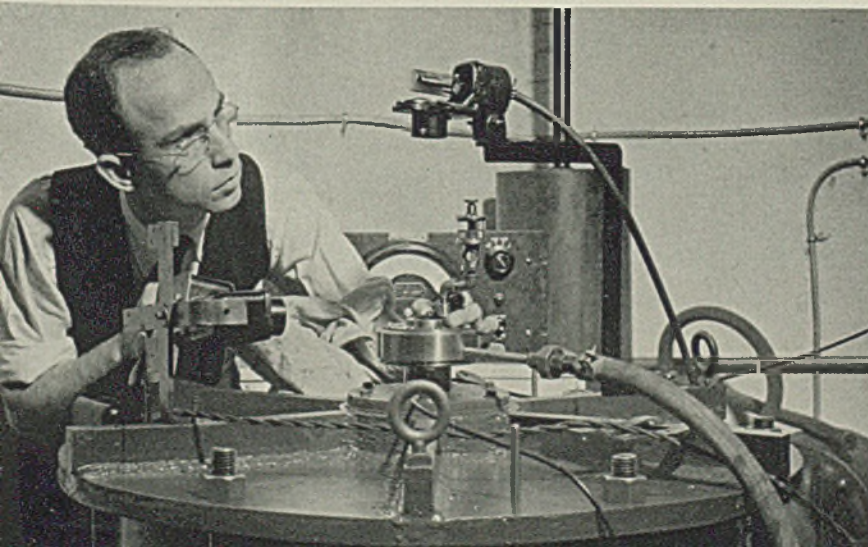
and become more numerous as the stress increases so a definite pattern is formed showing the direction and comparative magnitude of stress at every point on the test piece. See Fig. 2. If a vacuum chamber were not used, friction of air would cause the varnish to soften so no cracks would be formed. Also it would prohibit the high rotational speeds that are practical in a vacuum.

This vacuum chamber also is used for the testing to breakage of rotors, including those on the turbo-superchargers which make high-altitude bombing planes effective. A 5-pound turbine driven by compressed air spins wheels weighing 10 to 20 pounds at speeds up to 1000 revolutions per second—60,000 revolutions per minute—said to be

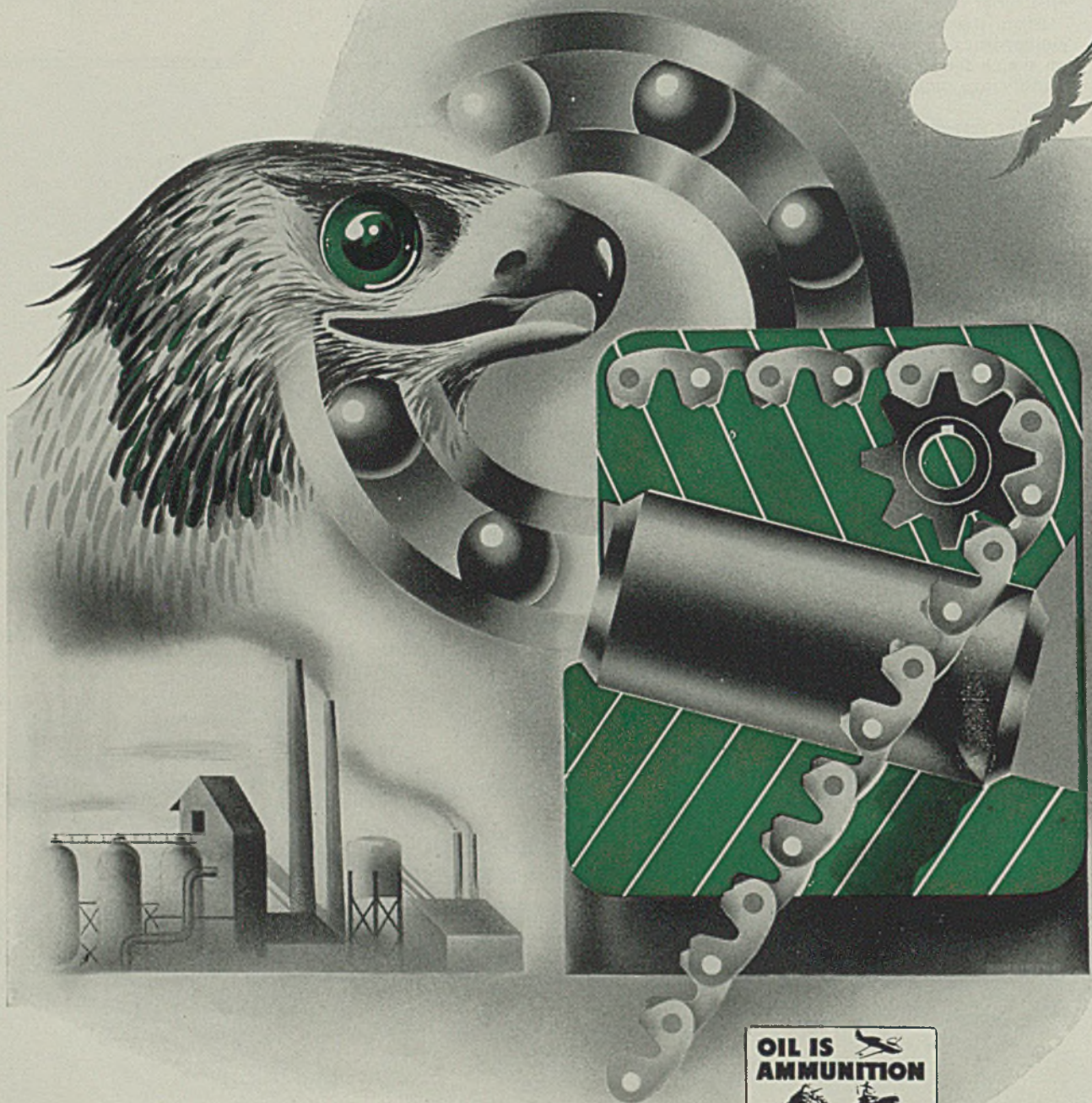
(Please turn to Page 120)

Fig. 1—(Left, below)—Heavy metal rotors are spun at speeds up to 60,000 revolutions per minute in this vacuum chamber. In front of operator's left thumb is a mirror attached to top of shaft, which reflects light into photocell directly above it to record speed attained

Fig. 2—(Right, below)—This is a typical "stress-coat" pattern formed on a metal rotor spun at high speed. It indicates graphically the stresses to which the part was subjected—their direction as well as their comparative magnitude



# they watched



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# their bearings

*"like a hawk"*

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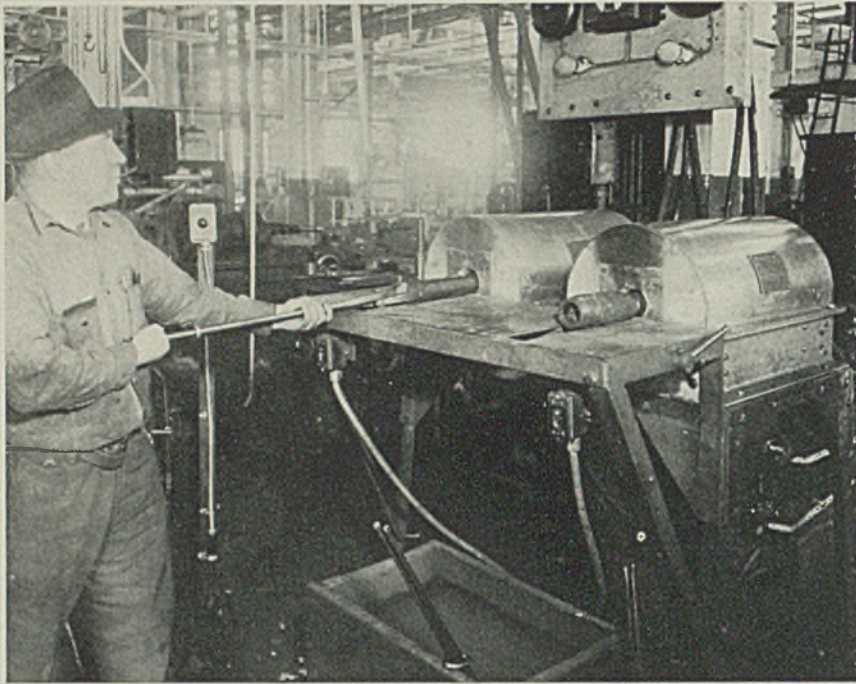


Fig. 1—Here 2 $\frac{3}{8}$ -inch bar stock is being heated prior to forging into 75-millimeter shell. Note automatic timing equipment above the induction heaters. Units made by Ajax-Electrothermic Corp., Trenton, N. J.

## Principles and Metallurgy of

# INDUCTION HEATING

PERHAPS no other field of applied science has extended its boundaries so rapidly within this present generation as induction heating. Inaugurated during World War I, it has become almost indispensable in the battle of production in which we are now engaged for it is continually finding new and useful applications in the manufacture of airplanes, tanks, guns, shells, engines and the machines we need to make them.

**What Is Induction Heating?** For the purposes of surface hardening, for example, high-frequency alternating electric currents of some 2000, 10,000 or upward of 100,000 cycles per second are carried through inductor coils in such a manner that the resulting magnetic field cuts that portion of the work that is to be heated. When a magnetic material, such as steel, comes within the influence of this field, each molecule of the steel tends to align itself in the direction of the magnetic lines of force, each individual molecule behaving exactly as though it were a tiny magnet having a certain freedom of rotation. As the polarity of the field changes, the effort of the molecules to adjust themselves causes energy losses which appear as heat.

This effect tends to be concentrated near the surface for metal below is partly shielded by that above. The higher the frequency,

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

the more marked does this effect become. It is known as the skin effect, and the frictional action that produces heating of the steel is called hysteresis, a characteristic closely related to the magnetic qualities of the steel.

As the temperature of the steel increases to the critical point, it becomes nonmagnetic, the alpha form giving way to gamma iron in which the carbides are dissolved. Beyond the critical range, when the steel is in the austenitic state, all hysteresis heating ceases and heating depends entirely on eddy currents caused by changes in the flux. Even below the critical temperature these eddy currents are largely responsible for the heating effect, since hysteresis plays a minor role. Many nonmagnetic materials such as aluminum, copper and carbon can be heated readily by electric induction because of the effect of these eddy currents. Thus almost any nonmagnetic substance that conducts electricity readily can also be heated by electric induction.

Another characteristic of steel

which has an important bearing on the result of exposing it to a rapidly changing magnetic field is the increase in electrical resistance as the temperature rises. As the temperature reaches quenching level, this characteristic decreases the intensity of the effect of the eddy currents to a fraction of its original value while the steel was cold. Since also there is a tendency toward the concentration of the heating effect in the region near the surface of the piece, the extent to which the austenitic state extends toward the interior is readily adjusted by controlling the frequency, the amount of power supplied and the period of application.

Fig. 2 is a schematic diagram of an inductor block and its magnetic field during the heating of a bar. Fig. 3 exhibits a typical curve of hardness distribution in a piece surface hardened by electric induction.

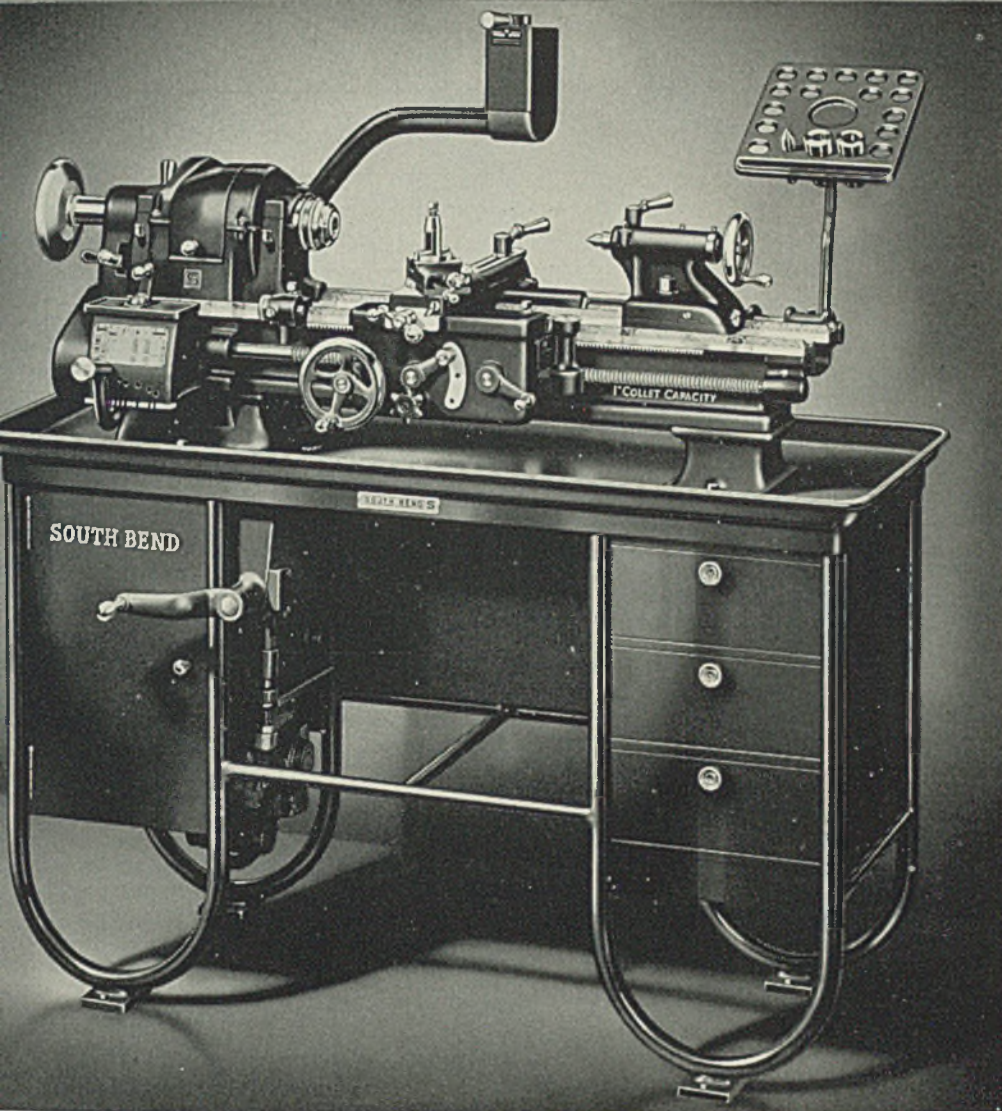
As might be expected, the rapidity of the heating rate as compared with conventional methods produces certain physical differences in the product. While many minutes may be necessary to bring the piece up to quenching temperature in an ordinary gas or oil-fired furnace, induction heating may put the carbides in solution in less than a second. Such speeds can attain maximum hardness and absence of carbides in plain carbon steels having carbon contents as high as 0.5 per cent. In any case, the solution rate is such as to involve no more than a matter of a few seconds.

**Metallurgy:** In discussing this matter before the Electrochemical Society, Dr. H. B. Osborn Jr. of the Ohio Crankshaft Co., Cleveland, said that in view of the extremely rapid transformation of pearlite to austenite accomplished by induction heating and the tendency for this to occur between the lower and upper limits of the critical range, a considerable amount of free ferrite might be anticipated. This, however, is not the case unless the heating is stopped at the instant diffusion has been completed within the ferrite boundaries. There is a preferential removal of carbides over ferrite and a major portion of the ferrite persists until most of the carbides have become diffused.

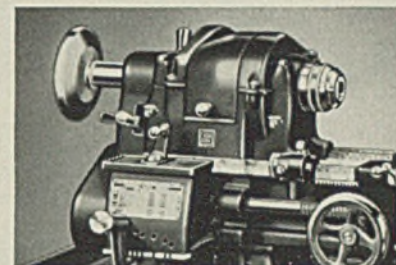
The next step in this rapid diffusional process involves the removal of free ferrite and the formation of a fine homogeneous structure which is retained on quenching. He further notes that induction heating has a stimulating effect, appar-

# PRECISION

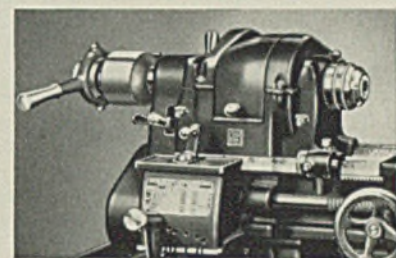
## PLUS SPEED AND VERSATILITY



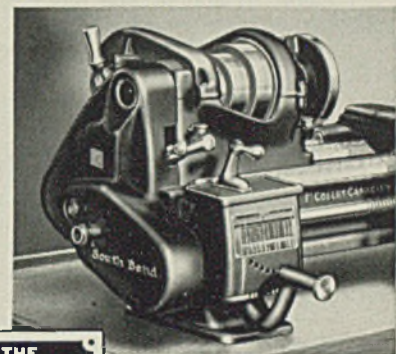
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Above. Headstock end of lathe showing Quick Change Gear Box. ★

Left. Index chart showing threads and feeds available through Gear Box.

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	CENTER	8 .0418	9 .0372	10 .0334	11 .0304	11 1/2 .0291	12 .0279	13 .0257	14 .0239
	RIGHT	16 .0209	18 .0186	20 .0167	22 .0152	23 .0145	24 .0139	26 .0129	28 .0119
OUT	LEFT	32 .0104	36 .0093	40 .0084	44 .0076	46 .0073	48 .0070	52 .0064	56 .0060
	CENTER	64 .0052	72 .0046	80 .0042	88 .0038	92 .0036	96 .0035	104 .0032	112 .0030
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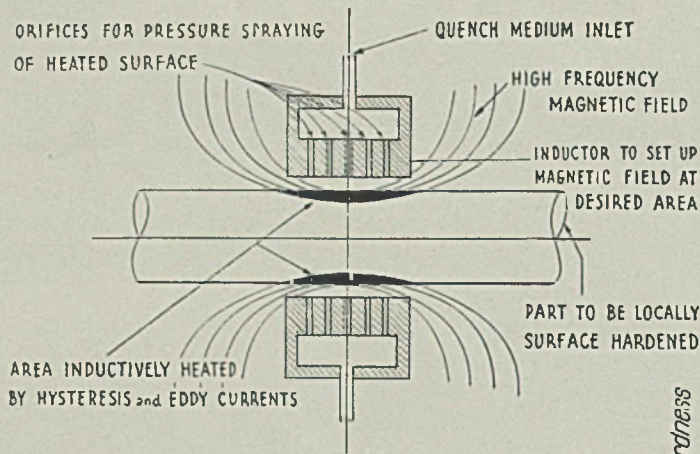
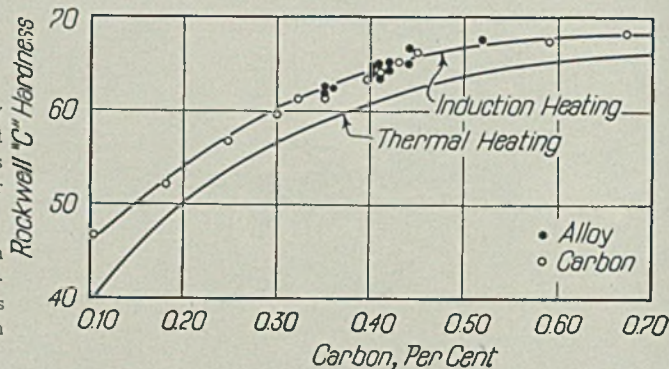
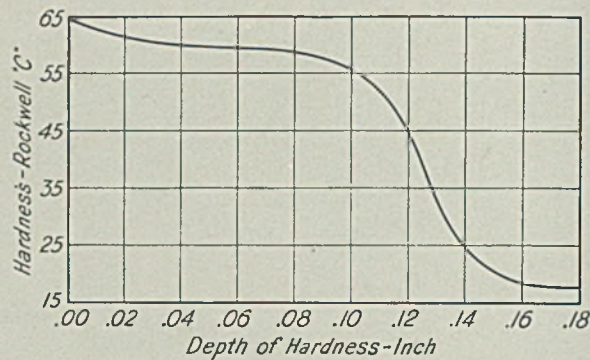


Fig. 2. (Directly Above)—Localized surface hardening of steel by induction heating is diagrammed here. High-frequency current applied for a few seconds produces the temperature desired, is immediately followed by quenching through orifices in inductor coil. Area and depth hardened can be controlled precisely

Fig. 3. (Upper right)—Typical hardness distribution curve for an induction-hardened bearing surface. Note gradual drop in hardness between hardened area and core. (Lower right)—Curves showing maximum hardnesses obtainable for varying carbon steels, according to Ohio Crankshaft Co., Cleveland



ently, on carbide solution and the production of a homogeneous austenitic condition. This in turn gives rise to a fine, nodular type of martensite that is more readily apparent in plain carbon steels than in alloy steels on account of the nodular characteristics of most alloy martensite.

The essential elements composing surface-hardening equipment include, of course, the inductor itself, which may be a single turn of copper designed to fit the piece to be hardened or may consist of several turns of copper tubing suitably shaped. In addition, suitable arrangements must be provided to supply the quenching medium through orifices; a transformer and capacitor; automatic timing controls; and a high-frequency generator. While some consideration must be given to the design of the inductor for any given piece, it appears entirely satisfactory to induction harden pieces of irregular shape because of the natural tendency of the rapidly fluctuating magnetic field to follow the contour of the part. Automatic timing controls eliminate the human element completely and easily attain a degree of accuracy within 0.1-second.

Certain features of the frequency converters used are of interest. Generally these are of the motor-generator type, designed for 2000, 3000 or 10,000 cycles and having capacities up to 1000 kilowatts. Smaller units of the spark gap oscillator type of some 7.5 to 30-kilowatt capacity are also used at frequencies above 100,000 cycles. In addition, vacuum tube units with outputs up to 50 kilowatts are available with still higher

frequencies. High efficiency in a generator set is maintained by adjusting the power factor as near to unity as possible by introducing the proper amount of capacities into the circuit. The power required for any particular hardening operation is controlled and maintained by field excitation of the generator. Should the characteristics of the steel change sufficiently during the heating action as to affect the power output with fixed excitation, an automatic control system can be used to change the external resistance of the field circuit at short intervals while the power is on. Were this not done, a longer and perhaps undesirable heating cycle would result.

In selecting the frequency for any particular task, consider that if a surface heat is desired, high frequency and high power are required; while if the piece is to be heated uniformly to some depth (as for forging), the frequency selected must allow the necessary depth of penetration and the power must be low enough to permit transmission of heat to the interior by conduction without overheating the surface if uniformity of temperature is to be secured throughout the cross section.


In the case of melting installations, since the diameter of the charge is uniform, it becomes possible to select the most economical frequency for each particular metal. An important advantage of induction heating in melting is that the metal contacts only the refractory lining and the air above it, so no contamination from external sources can occur. Thus, save for possible de-gasification during melt-

ing, the resulting product is the sum total of the original contents of the crucible.

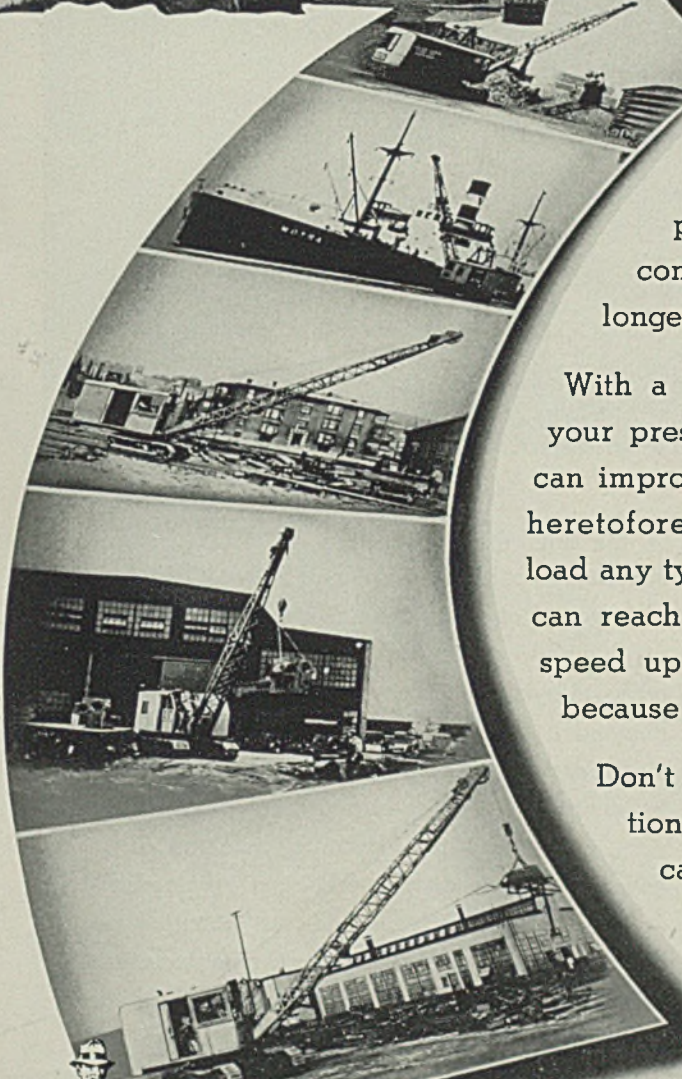
Further, a stirring action is produced by the alternating magnetic field, which if moderate, assists in refining and mixing the charge. The degree of agitation is most marked at low frequencies. Then too, while starting up with broken scrap, the electrical discontinuity of the charge calls for a high induced current to initiate the heating which at low frequencies implies a heavy primary current since the heating effect is proportional to the square of the product of ampere turns and frequency. Thus from several points of view it is advantageous to employ fairly high frequencies in induction melting operations.

The successful applications of the practice of induction heating to surface hardening, forging and melting cover a wide field. Such diverse accomplishments as the hardening of the nose shell of the armor-piercing type, the surfaces of crankshaft bearings, the internal surfaces of cylinders for airplane and diesel engines, the wearing surfaces of bearings, and rolls, shear blades, rail surfaces and so on, are everyday achievements; while annular pieces such as the tires of railroad car wheels and gun liners are readily heated by these means for shrinking in place. For forging purposes, uniform temperatures are readily attained in the blank—a most important consideration, since any variation in the temperature between one side and the other, or between the inside and outside, will probably result in eccentric blanks.

The steel used for casting guns by



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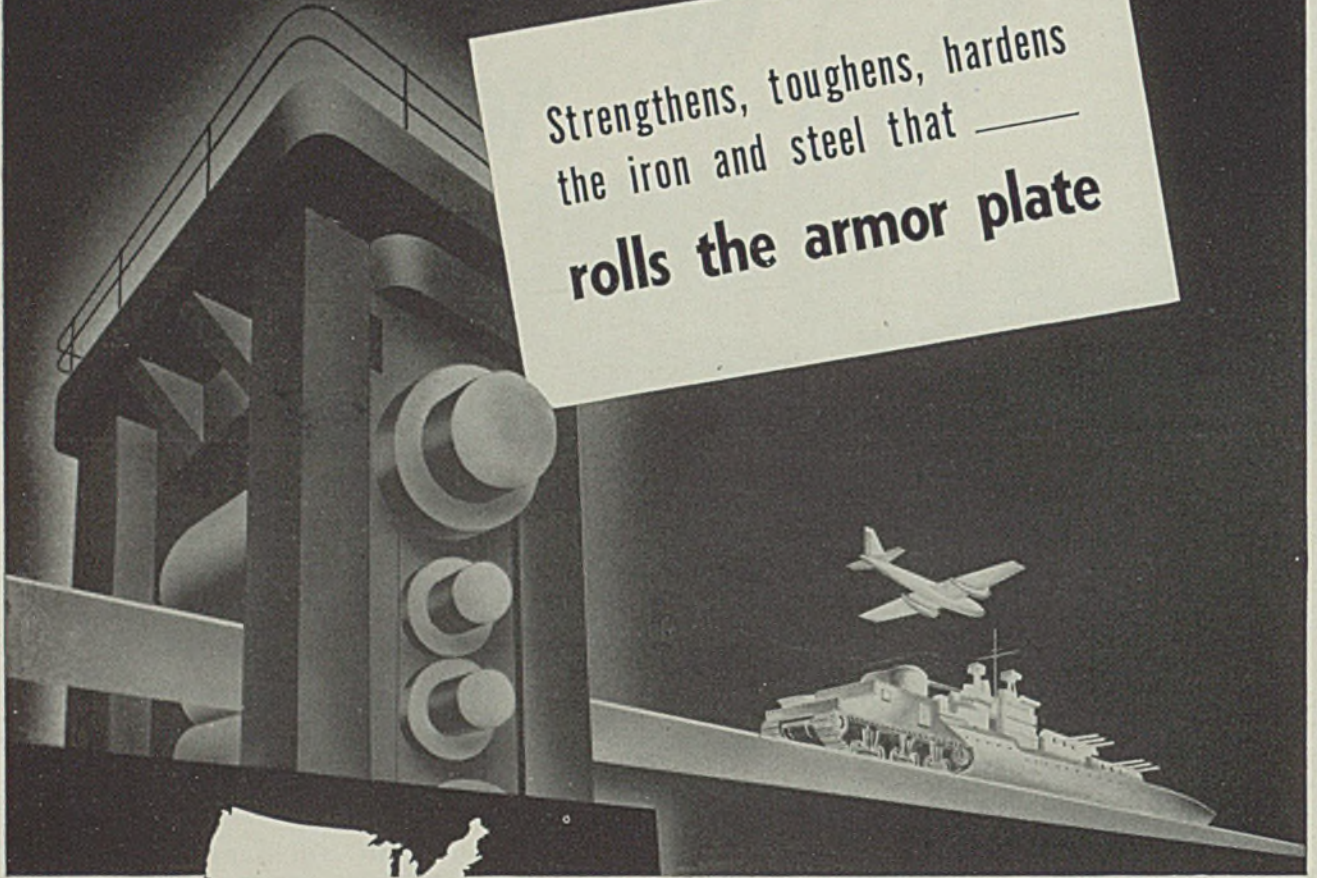
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Molybdenum-iron and molybdenum-steel rolls give entirely successful performance, where other alloys have been thought indispensable,

in the hot and cold rolling of plates, sheets, and shapes of high-grade steels for special uses. This is one of many new developments in the employment of Molybdenum, with or without other alloying elements, to meet emergency demands. The rolled products turned out, in most cases, themselves also owe something of their virtue to a Molybdenum content. Hardness, toughness, high strength, machinability, and other important properties are obtained as needed. Correct advice and convenient supplies are offered to any American manufacturer. Literature will be mailed on request.



**MOLYBDENUM**  
**CORPORATION OF AMERICA**  
GRANT BUILDING • PITTSBURGH, PA.

the centrifugal method is preferably melted by this means since alloying is rapid and melting losses are low. As in the case of cast iron pipe the liquid steel is poured into a rotating mold, where it is allowed to freeze. The application of a hydrostatic head due to centrifugal force in the rotating mold floats any slag particles to the inner surface of the tube, from which point they are easily removed in machining.

Arrangements for heating a bar prior to forging are shown in Fig. 1. The original cost of induction heating units is, of course, high in comparison with the gas or oil-fired furnace, but their convenience, flexibility and the absence of a hard scale on steel heated for the forge are extremely important assets. Then too, there is a degree of comfort around the induction heater, with its extremely low heat losses, which is unknown to the ordinary furnace operator.

Wherever the melting of high-grade bronze or expensive alloy steels has to be done with a mini-

mum of loss and segregation; or the highest temperatures have to be reached; or moderate temperature in certain portions of the parts under treatment; or particularly uniform heating is demanded, an induction heating unit can be had to meet the need. If a fire hazard exists, induction heating offers an answer to that problem. Equally important, the heating action is always fast.

### Offers New Paper for Dry-Developed Prints

Deeper, sharper blue or red lines against a white background may now be obtained with the use of the new improved Vapopaper for ammonia dry-developed prints recently introduced by Frederick Post Co., Box 803, Chicago. It is said to be faster and tougher than previous products, its 50 per cent rag content basic paper stock enabling it to stand up under creasing and hard usage.

Another feature of the product is that every shipment or different

shipments is entirely uniform both as to speed and color.

### Issues 41st Edition of "How To Run a Lathe"

To increase the effectiveness of its lathe operators' handbook for war training purposes, South Bend Lathe Works, Department 65, 425 East Madison street, South Bend, Ind., is releasing the forty-first edition of its widely known book, "How To Run a Lathe". This latest edition features a number of changes in text material and illustrations.

The latest information on the operation and care of metal working lathes is embodied in the new publication. It covers such subjects as the operation of lathe units, grinding cutter bits, making accurate measurements, plain turning, chuck work, taper turning, boring, drilling, reaming, tapping, cutting screw threads, reference tables etc.

Copies of the edition are available for 25 cents from the company.

## SEVENTEEN-ROLL UNIVERSAL MACHINE

. . . straightens and untwists bars and shapes

HIGH-SPEED straightening and untwisting of bars and shapes have been combined in one operation in a new patented universal machine designed and built by the Sutton Engineering Co., Pittsburgh. Hereto-

fore, two operations have been required to do this job—one for straightening and one for untwisting, the latter usually having been done by hand.

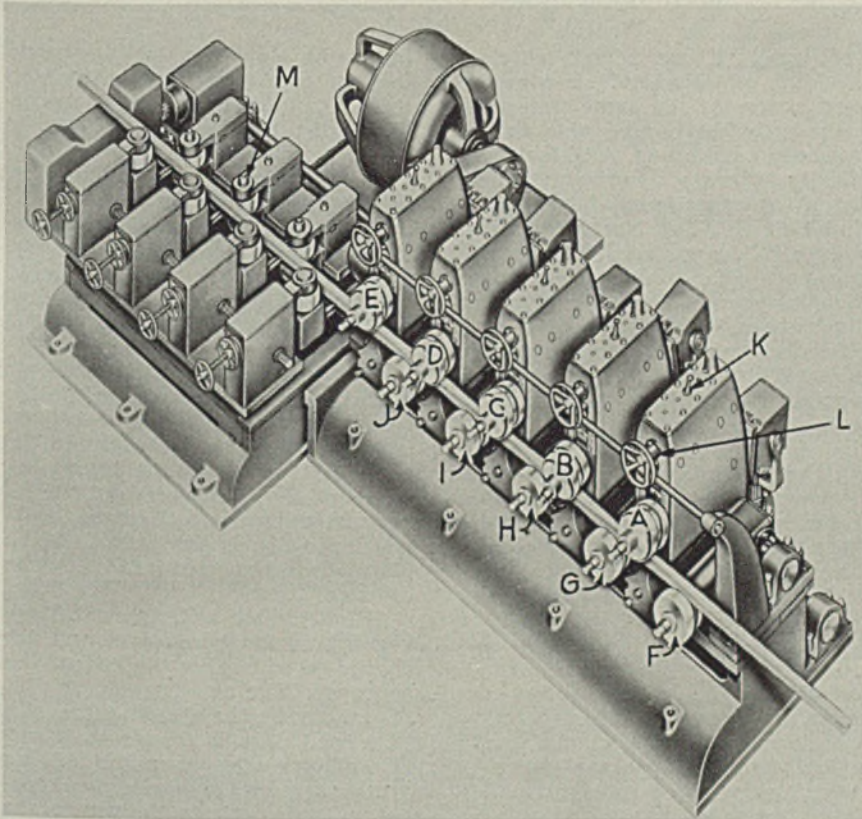
The machine is built with ten hor-

izontal and seven vertical rolls. All 17 rolls are driven and all center distances are adjustable. Untwisting is accomplished by tilting the top rolls in the horizontal shaft unit designated A, B, C, D, and E, in directions opposite each other. The bottom rolls F, G, H, I, and J, remain stationary and the material, therefore, is untwisted over these rolls. The amount of tilt to the top rolls is progressively lessened in order to first untwist the bar just beyond its yield point and then gradually remove this twist so that the bar is completely untwisted before it reaches the 7-roll horizontal shaft unit. Twisting the bar beyond its yield point insures a uniformly untwisted bar regardless of the degree of twist in any piece before it is passed through the machine.

In addition to untwisting, this machine removed camber from all sections in both the horizontal and vertical plane.

The 7-roll vertical attachment, M, is adjustable up and down and side-wise through a motor drive in order to line up this unit with the horizontal shaft unit. The five tilting rolls are equipped with indicators to show the amount of tilt, and all rolls are equipped with indicators showing the relative position to the pass line. Clutch handle, K, and handwheel, L, roll A are adjusted up and down in a parallel direction or tilted to any desired degree.

All rolls are driven by enclosed  
(Please turn to Page 120)



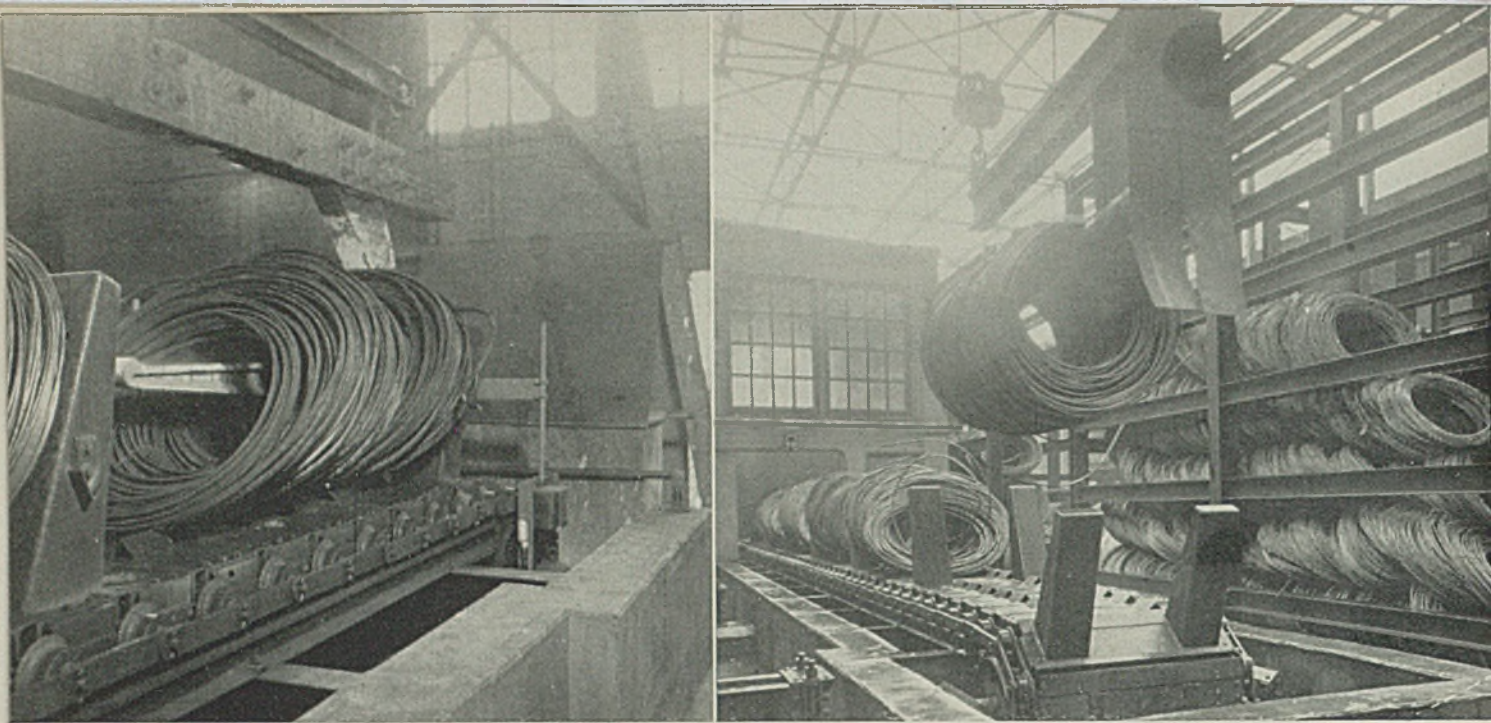


Fig. 1. (Left, above)—Apron conveyor moves coils only arm of picklehouse crane hook which is positioned between the two uprights against which the coils lean. Crane takes group of coils to pickling tanks. Leg of gantry supporting picklehouse crane can be seen in background. Illustrations by Link-Belt Co., 307 North Michigan avenue, Chicago

Fig. 2. (Right)—This is the outdoor portion of the apron conveyor. An overhead crane operates a heavy C-hook to lift the coils from the storage racks at right, placing them on the conveyor. Note canvas strips in front of crane hook for intercepting beam light actuating photocell interlock

## PICKLING CAPACITY INCREASED

... by mechanization of materials handling system, resulting in lower costs and faster transfer of coils of steel rod

REDUCED costs, speedier handling, and a 25 to 50 per cent increase in capacity of its pickling department were achieved at Buffalo Bolt Co., North Tonawanda, N. Y., by integration of an efficient system of yard storage and handling with an apron conveyor of transporting coils of steel rod into the picklehouse.

Previous to installation of the new handling equipment, the coils of steel rod, weighing up to 750 pounds each, were loaded in the yard upon a narrow-gage industrial car which several men pushed along its track into the picklehouse to a point within reach of the crane lift. Crane then picked up the coils and dipped them successively into sulphuric acid tank to remove scale and rust, rinsing tank, and liming tank to neutralize acid and lubricate rod to facilitate manufacture. This handling method was both laborious and slow. In fact, it limited the capacity of the entire pickling installation.

The first step in modernization of this handling system in an endeavor to utilize full capacity of the pickling equipment was the erection of steel storage racks in the yard as shown

in Fig. 2. These permit efficient stacking of coils and so conserve yard space. At the same time they make coils easily accessible to the overhead yard crane. A 56-foot electrically operated horizontal steel apron conveyor manufactured by Link-Belt Co., 307 North Michigan avenue, Chicago, was installed to transport coils from the yard into the picklehouse. See accompanying illustrations.

Sections of conveyor apron are mounted between two strands of long-pitch strap-link roller chain, seen at close hand in Fig. 1. These chains travel on T-rail tracks forming part of the conveyor-supporting framework, which in turn is secured to the floor of a 6-foot deep concrete pit, as are the motor and speed reducer drive. A Silverlink roller chain, seen at right in Fig. 3, connects reducer with head shaft of conveyor.

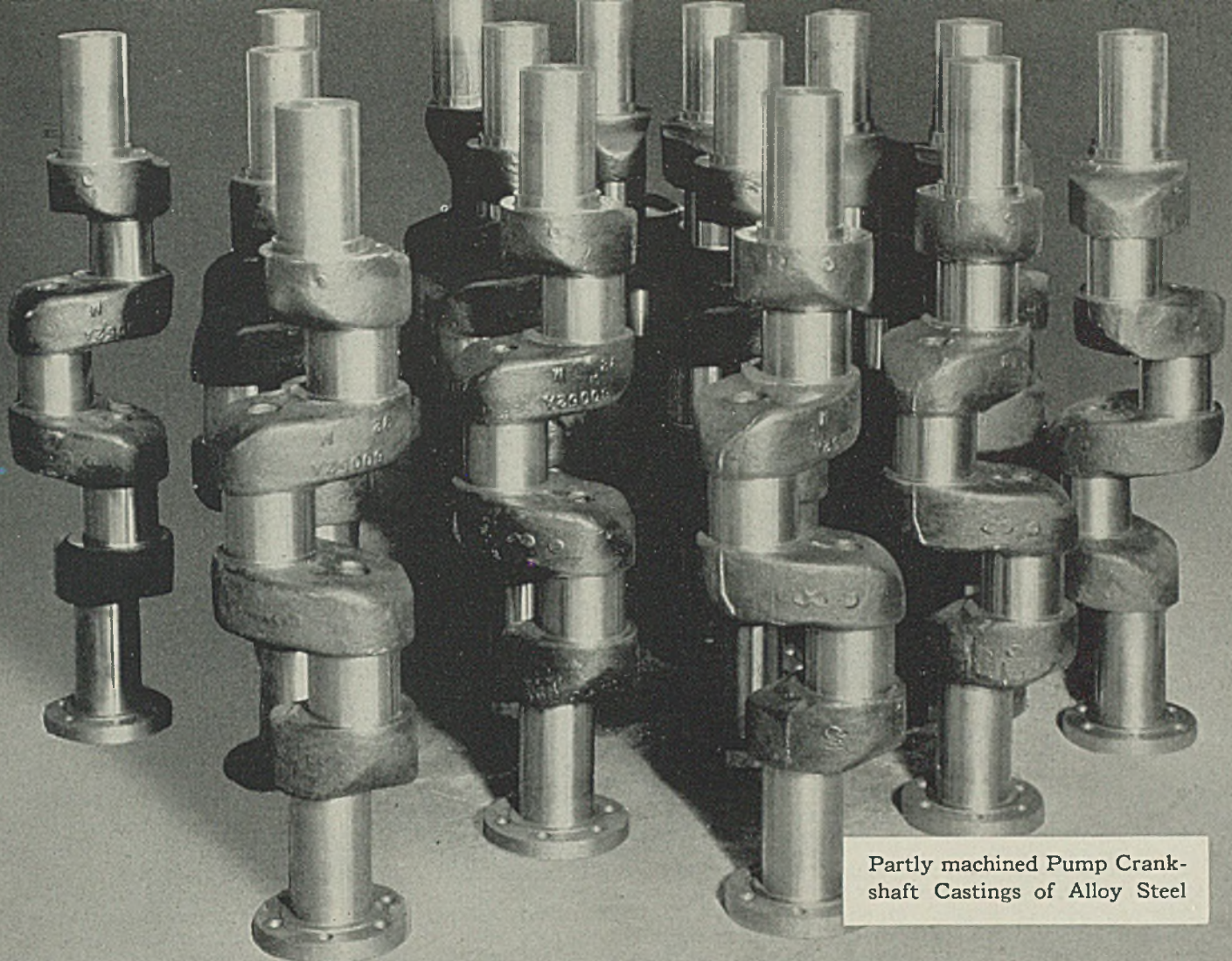
To the back of each cross channel making up the endless apron conveyor are welded two short angles, legs down, to form triangular rests which prevent sidewise shifting of coils. Welded to every eighth channel, 8 feet apart, are two steel hold-

ing arms sloped to let the crane-load of coils rest against the forward set of arms, thus definitely confining the load to the position in which it is first placed.

The entire conveyor is of extremely rugged construction and can hold up to 28 tons of coils—seven crane-loads of 4 tons each. However, the weight of the crane-loads now being handled is 2 tons each, or a total of 14 tons on the conveyor at any one time.

A photo-electric cell prevents operation of the conveyor while the outdoor crane is placing a load on it because the beam of light to the cell is intercepted by the descending load and by the pieces of canvas suspended in front of crane hook, which are clearly seen in Fig. 2. The photocell is connected into the motor control.

A limit switch at head end of conveyor prevents over-travel and discharge of coils over the end of the conveyor. The power would be shut off automatically should there still be a load of coils on foremost section of conveyor when the holding arms started to descend around conveyor headwheels to the return run



Partly machined Pump Crankshaft Castings of Alloy Steel

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- 2 Metal distributed where it will do the most good; maximum strength with minimum weight.
- 3 Widest range of mechanical properties.
- 4 Good machining qualities, low finishing costs, better streamlined appearance.
- 5 High rigidity, minimum deflection, accurate alignment, close tolerances and better fit.
- 6 Readily weldable in composite structures.
- 7 High fatigue resistance, maximum endurance and longer life—ideal for critically stressed parts.

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They make possible the exact weight distribution that puts extra strength where you need it, without excess metal to pay for and machine off. They afford a wide choice of mechanical properties. Differential hardening is easy, or welding into composite structures.

They cut down machining and assembly time, often by combining many parts into a single steel casting. And their ability to absorb hard knocks and deliver long wear is unquestioned.

Ask your own foundry to show you ways to improve your product or save you money with Steel Castings. Or write to Steel Founders' Society, 920 Midland Bldg., Cleveland, Ohio. No obligation of course.

IMPROVE YOUR PRODUCT WITH

# STEEL CASTINGS

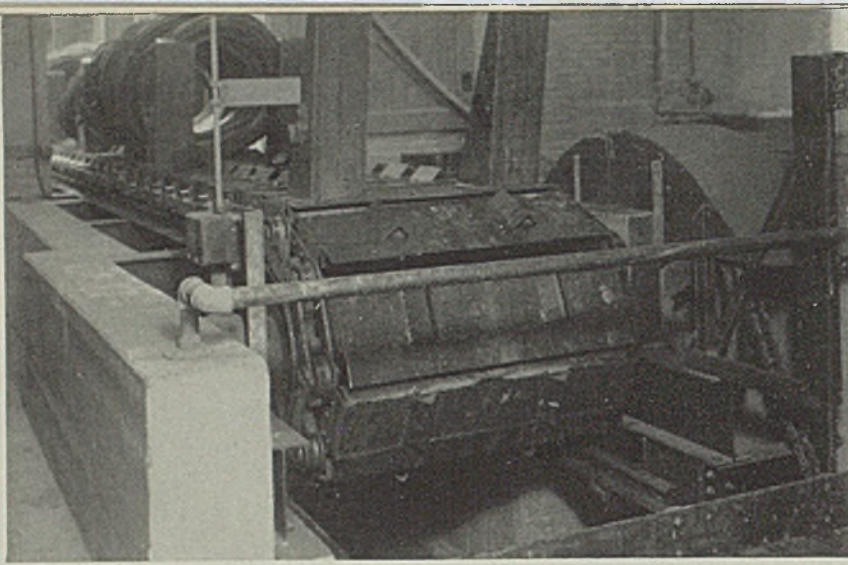


Fig. 3—Delivery end of the apron conveyor. Pushbutton control station is at extreme right. Conveyor is driven through chain at right. Overtravel is prevented by coils striking limit switch which looks like a flag just to left of conveyor head

in pit. This is accomplished by contact of foremost coil with a projecting plate, shown in Figs. 1 and 3, secured to the switch operating mechanism, tripping the switch

upon off power to the conveyor, stopping it instantly.

The outside overhead crane serving the storage yard is equipped with a long horizontal hook designed

to lift a number of coils at a time. These are picked up off the racks and placed on the conveyor as indicated with each load approximately filling the space between succeeding pairs of holding arms.

To advance the conveyor, the picklehouse attendant presses a pushbutton at the head end of the conveyor inside the picklehouse, see Fig. 3. Conveyor moves forward 8 feet in about 5 seconds. Thus, there can always be practically an entire conveyerful of coils available for pickling by simply pressing the starting button to advance the conveyor another 8 feet.

Attendant in the picklehouse next operates a gantry crane inside the building, which carries the coils from the apron conveyor to the pickling tanks. This crane has an overhead span supported at one end on an overhead rail extending along one wall of the room. At operator's aisle end, the crane is supported by a gantry leg (visible in background of Fig. 1) mounted on a T-rail track extending along floor. The attendant rides on a platform close to the floor.

## A "Conveyor-Powered" Machine

Ordinarily a materials handling system is designed to "carry" parts from one part of a plant to another in order to free manpower for more essential tasks. At the plant of Fedders Mfg. Co. at Owosso, Mich., however, not only was the materials handling system doing its original job, but also it was so integrating the actions of other equipment for the automatic production of complicated automobile radiators that they appeared to be "popping"

out of an industrial Automat.

Requiring a countless number of soldered joints, the copper tubes and fins together with the solder of the radiator was placed (before conversion) in position on the electrically operated Mechanical Handling Systems conveyor. The whole assembly immediately passed through a flux spray and then on into an oven. The oven heating cycle was operated in synchronism with the conveyor movement by

Westinghouse electrical controls.

After a fixed time in the oven, long enough to make the solder flow, the conveyor started again and moved the radiator core into a press where it was held flat and square while an air blast "cooked" it and solidified the solder. The air blast also was controlled automatically in time with the conveyor and press movement. When the core was cooled sufficiently, the press opened and placed the core again on the conveyor, which delivered it at the conveyor end.

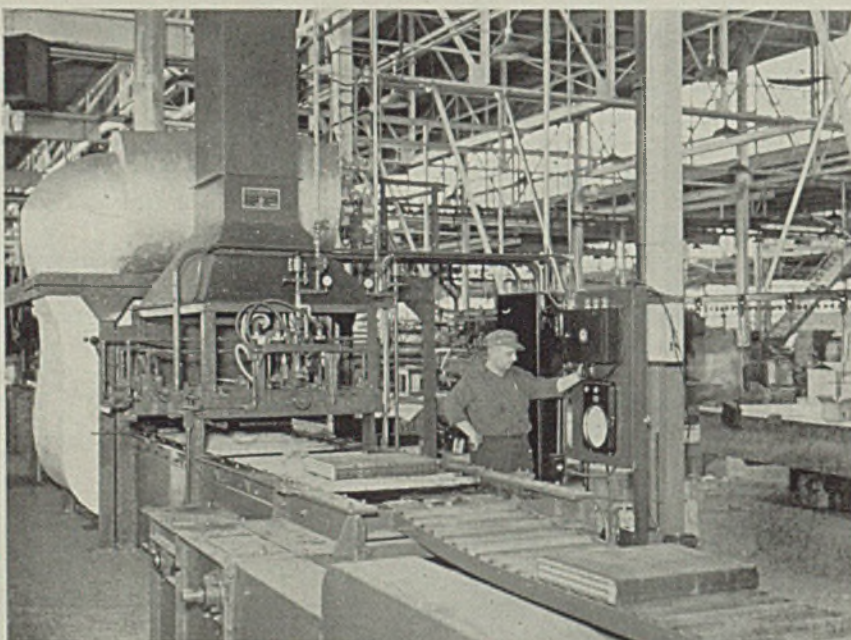
Entire operation of the oven and press were automatic, and both were controlled in sequence with the intermittent movement of the conveyor—making several ordinarily manually operated machines actually a large automatic unit.

## New Metal Cleaner

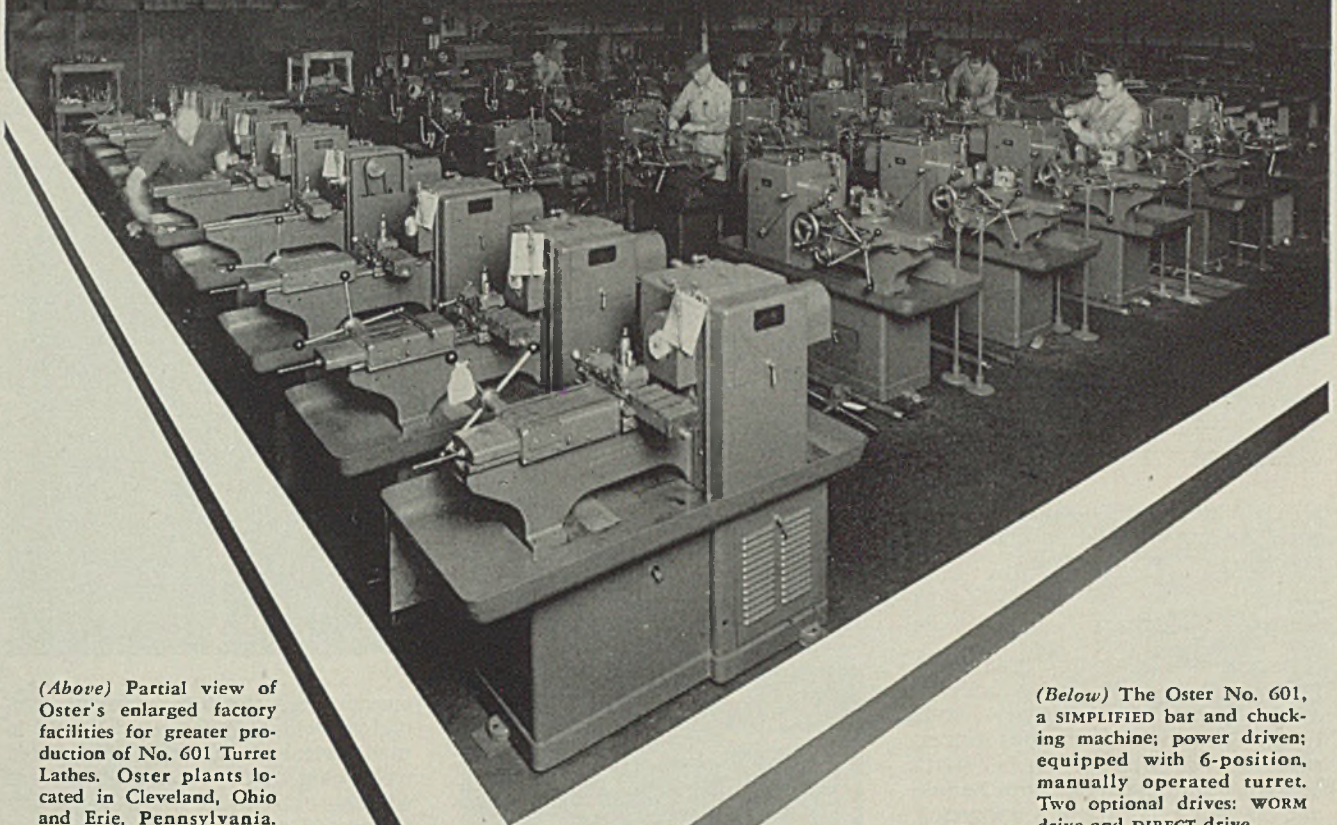
### Retards Corrosion

A metal conditioner, Deox-X, reported to stop oxidation and to make paint coatings last five times longer is announced by Protective Coatings Inc., 10391 Northlawn, Detroit. A liquid, it is used in its natural form or may be heated for removing oil from surfaces being treated more rapidly.

To remove corrosion, and inhibit further corrosion the product is merely applied by the dipping method or by brush or spray. It can be used on all metals including galvanized sheets.



# VICTORY STARTS HERE!



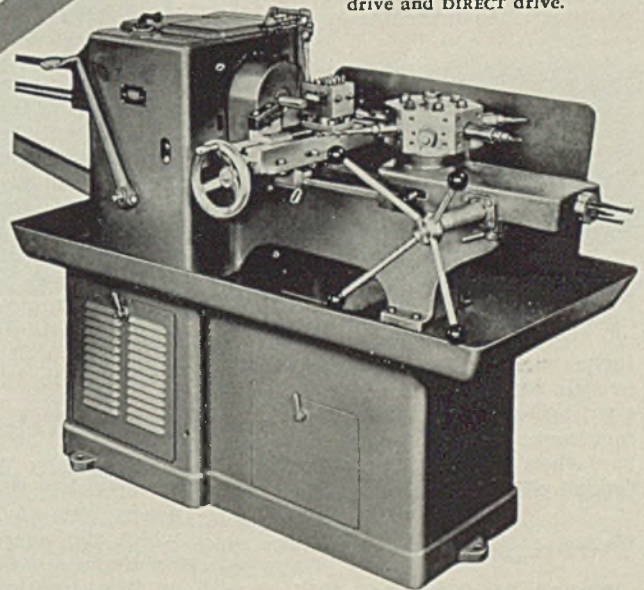
(Above) Partial view of Oster's enlarged factory facilities for greater production of No. 601 Turret Lathes. Oster plants located in Cleveland, Ohio and Erie, Pennsylvania.

(Below) The Oster No. 601, a SIMPLIFIED bar and chucking machine; power driven; equipped with 6-position, manually operated turret. Two optional drives: WORM drive and DIRECT drive.

● Months before war was declared, demands for the new Oster No. 601 Simplified Turret Lathe were a signal to increase factory space quickly. When the war broke, enlarged factory space was ready to absorb the still greater demands for those versatile bar and chucking machines. *Oster knew that Victory starts with production!*

Batteries of Oster No. 601s are now in action on first and second operation work in diversified war industries. Notable has been the success of those machines used to speed production of 20, 37 and 40mm shells. (Details on request).

Advantages of Oster No. 601 machines are explained graphically in Catalog No. 27-A. *Important memo:* The No. 601 costs less than \$2000, without tools. Delivery? **12 WEEKS OR LESS!**



**Let's GO!**

**THE OSTER MFG. CO. • 2037 East 61st St., Cleveland, Ohio**

Rush, by return mail ..... copies of Catalog No. 27-A which contains full description and detailed illustrations of No. 601 Turret Lathe.

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ADDRESS .....

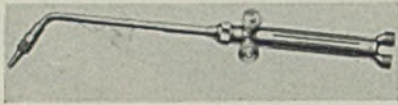
CITY..... STATE.....



# Industrial Equipment

## Small Welding Torch

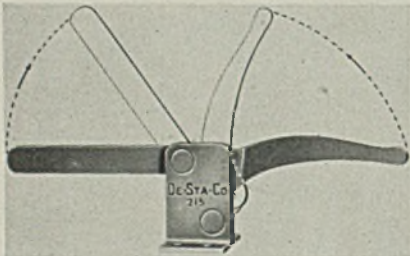
Weldit Acetylene Co., 638 Bagley street, Detroit, announces a new welding torch measuring but 13 inches long and weighing less than  $\frac{1}{2}$ -pound. It features a replace-



able tip nut and is said to be especially suitable for sheet metal and aircraft welding work.

## Toggle Clamp

Detroit Stamping Co., 3445 West Fort street, Detroit, is now offering a new light-duty horizontal style toggle clamp which develops a pressure ratio of 50:1. When in "shut" position (as illustrated) both handle and clamping bar are in a horizontal position. Measurements are 8  $\frac{11}{16}$

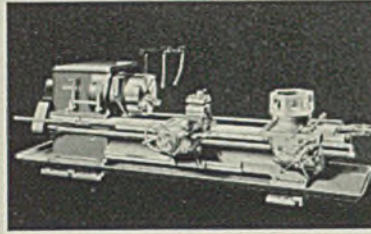


inches across, 2  $\frac{3}{16}$  inches high overall, and 1  $\frac{1}{8}$  x 2  $\frac{1}{16}$  inches at the base. Illustration indicates movement of handle and clamping bar, when clamp is being released to "open" position.

## Turret Lathe

Gisholt Machine Co., 1217 East Washington avenue, Madison, Wis., announces two new saddle type turret lathes, the 3R and 4R to meet urgent wartime requirements. These will be available in large quantities in September and October respectively with delivery dates being governed purely by preference ratings. In view of their design for large-scale production, however, the machines must be built on readily available machine tools and from materials ob-

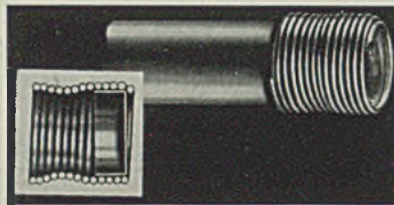
tainable in the large quantities necessary. General specifications on



these machines are as follows: 3R—5  $\frac{1}{8}$ -inch spindle bore; 21-inch chuck; 28  $\frac{1}{2}$ -inch swing over ways; 26-inch swing over carriage wing; 21  $\frac{1}{2}$ -inch swing over cross slide. 4R—9  $\frac{1}{4}$ -inch spindle bore; 24-inch chuck; 31-inch swing over ways; 27  $\frac{1}{2}$ -inch swing over carriage wing; 24  $\frac{1}{2}$ -inch swing over cross slide.

## Metal Caps

Tube Seal-Cap Inc., 215 West Seventh street, Los Angeles, announces a new line of flexible metal caps designed to protect plain end and bonded tubing from handling knocks and shocks and to seal out dirt, dust and moisture. Called

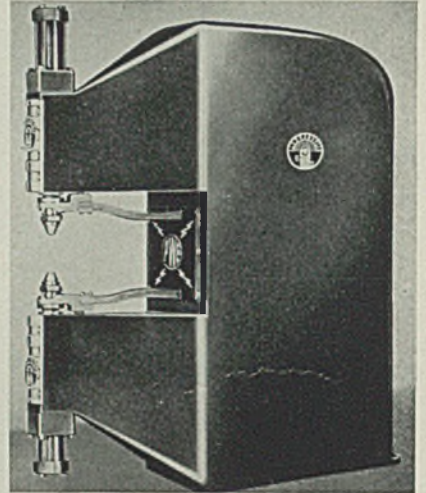


Flex-caps, units in the line can be reused many times. Each is equipped with a steel spring of hourglass design which, when turned in a counter-clockwise direction, expands to accommodate the tubing which it seizes firmly when released. The metal caps cannot be knocked off and will not pull off until turned off when removal is necessary, according to the company. Caps are available to fit all standard tubing from  $\frac{3}{16}$  to 2 inches.

## Forge Welder

Progressive Welder Co., 3050 East Outer Drive, Detroit, has introduced a new Temp-A-Trol forge welder in which the temperature at the weld itself automatically controls weld and heat treating current and operating cycle, and which is completely self-compensating for all such variations as normal difference in metal thickness, induction and short-circuiting losses, presence of scale, etc. Designed for resistance welding of heavy sections and of special alloy steels—such as homogeneous and face-hardened armorplate and for shipbuilding—it is said to be the only spot welding method approved by recognized bureaus for such purposes. It reduces the human

element in selecting welding and heat-treating cycles to a mere setting of the dials to the actual temperatures desired. Another advantage of controlling welding current and cycle through weld temperature is that it provides automatic compensation for current loss due to varying amounts of the work introduced in the throat of the welder. The welder also compensates for



current loss through adjacent completed welds. When a spot weld is made close to another completed weld, part of the "welding" current will short circuit through the already completed weld, causing a variation in the actual amount of current used for welding and in the size of the weld nugget. With new unit this loss is meaningless since amount of current is automatically increased to compensate for the loss. Detailed information on the new process will be furnished at present only to organizations engaged in or contracted to engage in war production work, according to the company.

## Steel Helmet

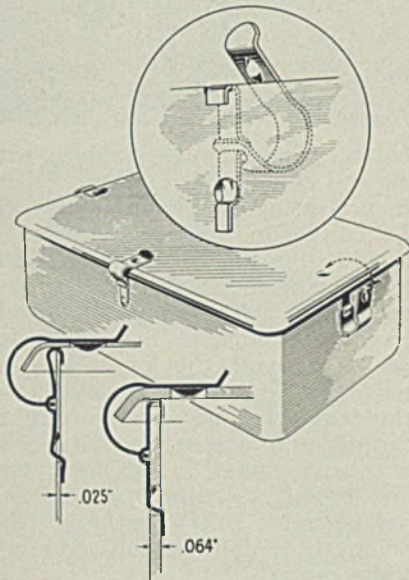
B. F. McDonald Co., 1428 South Hope street, Los Angeles, announces a military type steel helmet known as the McDonald airaid hel-



met for use by civilians. It features a shock absorbing headband which is interchangeable to assure a comfortable fit. Spacing between the metal shell of the hat and headband provides adequate ventilation. All helmets are furnished with a chin strap and are available in sizes from 6 3/4 to 7 3/4. The helmet is said to give protection against falling fragments and cushions the wearer's head against heavy shocks and blows from falling timber and masonry. It weighs a little more than 28 ounces.

### Junction Box Clip

Tinnerman Products Inc., 2039 Fulton road, Cleveland, has placed on the market a new junction box Speed clip that is said to enable box covers to be attached in less than one-fourth the usual time. It is a two-piece affair that can be snapped by hand into holes in the sides of boxes or other enclosures. The clip is constructed so it can be



used on boxes ranging from 0.025 to 0.064-inch in thickness. Both parts of clip are of high carbon spring steel. One part snaps into a hole in the side of a junction box, while the second part hinges on the first and has an integrally formed dimple on the end which snaps into a hole or mated dimple in the box cover.

### New Motors

General Electric Co., Schenectady, N. Y., has placed on the market three new motors—a vertical general-purpose polyphase motor, a vertical shielded polyphase motor (1 to 20-horsepower) and a vertical shielded single-phase motor (1 to 5 horsepower). The shielded-type is especially suited to pumping applications, and the general-purpose motor is suitable for use in the machine

# Proved Time-Savers for ALL-OUT PRODUCTION



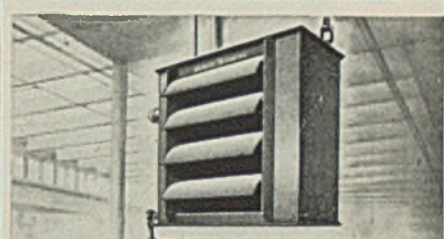
**IF ALL OUT PRODUCTION** means expansion or reconditioning of your plant, Grinnell can probably save you valuable construction time or help you maintain uninterrupted production, through these 5 services...



1—Grinnell Prefabricated Piping saves construction time.



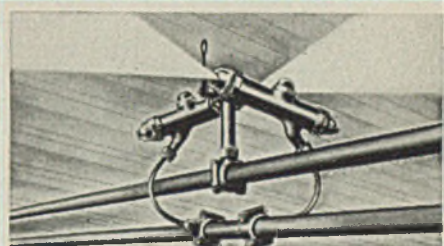
2—Grinnell Automatic Sprinklers, installed with minimum disruption, guard against time and material loss by fire.



3—Grinnell Thermollers provide efficient, uniform heating—help speed output.



4—Grinnell Pipe Fittings for stronger, tighter pipe connections, minimize repairs and delays.



5—Amco Humidification Systems help textile mills speed production of uniforms and defense fabrics.

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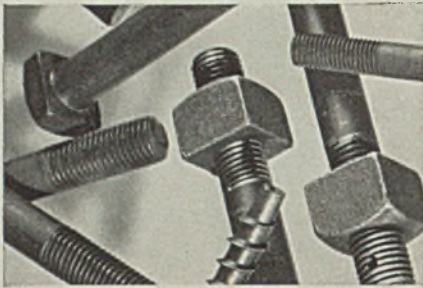
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# GRINNELL

WHENEVER PIPING IS USED FOR DEFENSE

## Why Are Black Bolts Black?

■ Coincidental is the fact that black bolts . . . the common garden variety bolt used on all sides of you . . . are made from green rods. The truth is green rods are not actually green and black bolts are not naturally black . . . they are black for a purpose and this black finish means a great deal to you and to industry.



Common bolts are common only because they are mass-produced . . . this brings needed economy to permit their extensive use in thousands of applications . . . and the black finish completes the economy picture by providing the cheapest possible protection against ordinary rust and corrosion before and while the bolt is in use.

To form this black, baked-on oil coat, the bolts, following heat treatment, are quenched in a special oily compound at a carefully controlled temperature. As the sizzling bolt strikes the quenching compound, a tough, water-repellent finish of baked-on black oil is formed on all surfaces, giving Oliver Bolts their characteristic black color and serviceability . . . ever-ready ability to withstand atmospheric conditions.

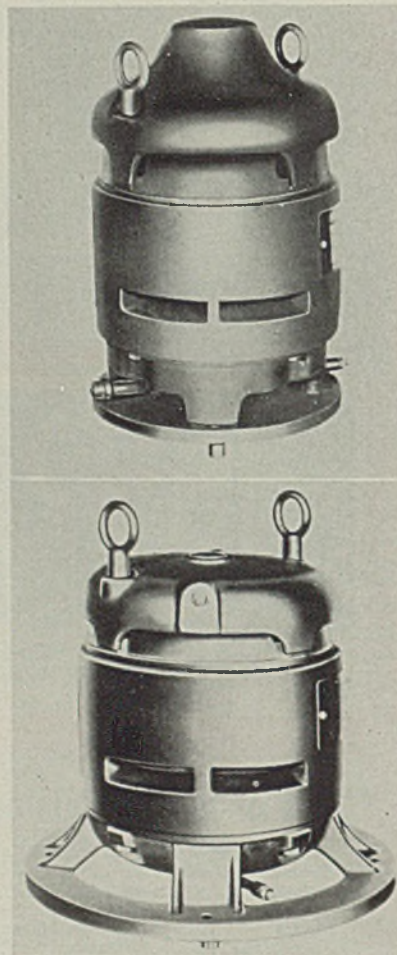
The black finishing of Oliver Bolts was as carefully developed and is as accurately controlled as the precision forming, threading and heat treating operations that have long earned recognition and acceptance for Oliver Bolts, Nuts and Steel Fasteners. Whatever your fastening uses may be for the duration . . . the complete, experienced and proved facilities of Oliver Iron and Steel Corporation provide a thorough and economic steel fastener service for all War Program and essential applications.



tool industry as well as for agitators, mixers, and similar applications.

The cast iron frame and cover of the general purpose motors provide added protection to electrical parts. Accurate alignment of each of these motors to the driven unit is assured by machined rabbets on the stator frame and base. Also, rotating weight and thrust are solidly transmitted to the supporting base through the lower bearing. All openings in this motor are shielded to bar entrance of chips or other falling objects. Accessibility of grease fittings allows rapid lubrication without disassembly of the motor, the location of eyebolts makes the motor easy to handle. Speed measurements are taken by removing the monogram cap from the upper end shield.

The polyphase shielded-type motors are available in either solid-

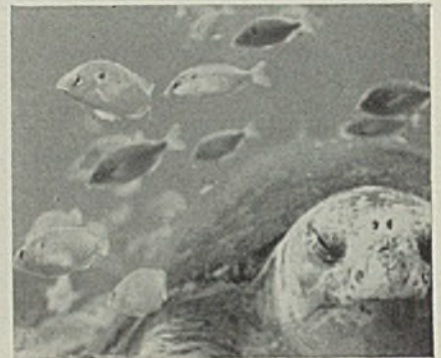


shaft or hollow-shaft construction, while the single-phase shielded-type motors are available only in solid-shaft construction. Both shielded types are for normal-thrust or high-thrust applications. The cover is contoured to deflect dripping liquids and falling objects. All openings in the stator frame and end shields are protected against the entrance

## 20,000 Leagues under . . . Sold by the Pound

■ Jules Verne's veritable prediction of ships operating 20,000 leagues under the sea has proved very realistic and is becoming increasingly serious with submarine warfare serving all nations as a way of overcoming air superiority.

Down into the briny depths where blackout always holds forth go men and machines of destruction. Soon, too, may come undersea craft for freight . . . for military transport . . . for secret missions free from aerial attack. This will take tons of steel, huge motors, tremendous fuel tanks,



batteries, gages, valves, cables, wiring and hundreds of other materials. As crucial as any material required . . . bolts, nuts and rivets . . . tons of them . . . must lock the seams, batten the bulkheads, seal the compartments . . . even fasten the valves. Every one must be absolutely dependable to do the job it was intended to do and in addition take the *extra shock-load* when it occurs. Strange as it seems, these vital links of construction . . . these bolts, nuts and rivets . . . are made by the million . . . sold cheaply by the pound . . . and yet answer every specification.

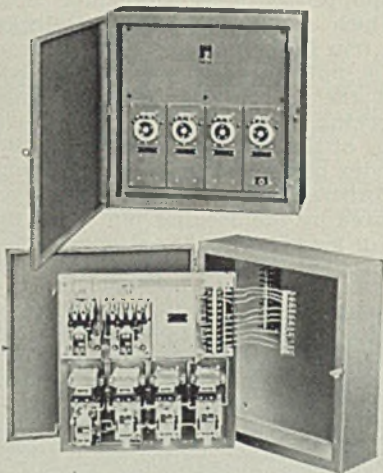
Important to submarine and ship construction . . . to hundreds of other uses in armament and to thousands of uses in industry are Oliver Steel Fastenings. You may be operating under direct contract or sub-contract . . . perhaps you are manufacturing your regular products . . . at all events you are working under pressure—therefore, look to Oliver Iron and Steel for dependable fastening counsel and complete cooperation.



of splashing liquids. Air is discharged downward at low velocity. To facilitate installation and impeller adjustment in pump installations, these motors can be obtained with hollow shafts. In such installations, the pump shaft passes through the hollow motor shaft and is supported on the upper end by an adjusting nut. Torque is supplied to the pump shaft by either a non-reversing ratchet or jaw-type coupling. The nonreversing ratchet eliminates motor reversal. The jaw-type coupling is a simple means of connecting the motor to the driven machine.

### Welder Control

Industrial Controller Division, Square D Co., 4041 North Richards street, Milwaukee, has introduced a new Safront resistance welder control the construction of which places all electrically energized parts behind a protective panel, eliminating any danger of shock while timing adjustments are made. Its calibrated timer adjustments are completely accessible on the panel front. Design of the control provides a separate pneumatic timing device

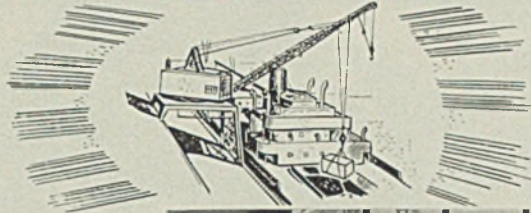


for each step of the welding cycle. Timing periods from 3 to 100 cycles are obtained accurately by turning a small knurled wheel. The control interiors swing out to expose operating parts. A separable connector permits panel removal without disturbing external connections. Both timers and relays can be serviced with standard tools.

### Steel Parts Box

Pressed Steel Division, Truscon Steel Co., 6100 Truscon avenue, Cleveland, is offering a newly designed corrugated steel box and platform unit equipped with a hinged-end door for handling small hot or cold forgings and other small metal parts. Its bottom is of smooth, heavy gage steel which, when placed on a rack and tilted

**NO Jar NO Bump NO Jolt**



Interior view of crane-cab at eastern railroad pier, showing compact EC&M Master Switches conveniently grouped within easy reach of the operator.

*with*

## EC&M FREQUENCY RELAY CONTROL

● You, too, can make a "cushioned landing" with this new EC&M Frequency Relay Control. It permits *weaker values of torque* so essential to smooth and slow lowering of light and intermediate loads, safeguards against speeding in lowering heavy loads—*enables operator to achieve results previously impossible on A-c Motor-Hoists.*

Management and engineers have "raised their sights" for crane performance since seeing this outstanding EC&M control operate. Its extreme accuracy of operation and characteristic EC&M dependability give greater value in crane operation.

THE ELECTRIC CONTROLLER & MFG. CO.  
2700 E. 79th STREET CLEVELAND, OHIO



Please send A-c Magnetic Controller Booklet 930

Name .....

Address .....

**MOTOR CONTROLS • BRAKES • LIMIT STOPS • MAGNETS**

"5 P. M. BUT FRESH AS A DAISY . . .  
SINCE WE CHANGED TO  
PHILLIPS SCREWS!"



"AND DON'T FORGET!  
PHILLIPS SCREWS  
COST LESS TO USE."

## Less Fatigue • Power Driving • Fewer Operations = 50% Less Assembly Cost with Phillips Screws

It's less work to do more work with Phillips Recessed Head Screws!

Let's analyze that. Phillips Screws cling to the driver — giving the operator one free hand to steady the job. Snug contact between driver and recess means more efficiency — no strength wasted as when trying to hold blade driver in slotted head. That's *less work*.

Now: *more work*. Operators have higher output because, with no

danger of driver slippage, power drivers can be used in more cases. Fewer operations, too: no pilot holes, no withdrawing crooked screws, no split screw heads, no burrs to file off.

Phillips Screws are saving manufacturers 50% in screwdriving time, which also means: assembling *two* parts for the *price of one!*

Write to any of the firms listed below for further facts.



**PHILLIPS RECESSED HEAD SCREWS**  
**GIVE YOU 2 for 1** (SPEED AT LOWER COST)

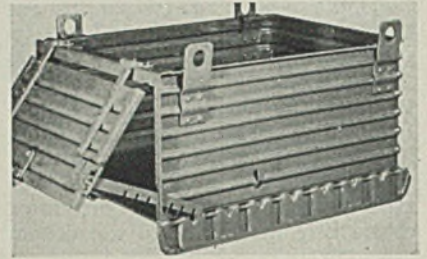
WOOD SCREWS • MACHINE SCREWS • SHEET METAL SCREWS • STOVE BOLTS • SPECIAL THREAD-CUTTING SCREWS  
• SCREWS WITH LOCK WASHERS

U. S. Patents on Product and Methods Nos. 2,046,343; 2,046,837; 2,046,839; 2,046,840; 2,082,085; 2,084,078; 2,084,079; 2,090,338. Other Domestic and Foreign Patents Allowed and Pending.

American Screw Co., Providence, R. I.  
The Bristol Co., Waterbury, Conn.  
Central Screw Co., Chicago, Ill.  
Chandler Products Corp., Cleveland, Ohio  
Continental Screw Co., New Bedford, Mass.  
The Corbin Screw Co., New Britain, Conn.  
International Screw Co., Detroit, Mich.  
The Lamson & Sessions Co., Cleveland, Ohio  
The National Screw & Mfg. Co., Cleveland, Ohio

New England Screw Co., Keene, N.H.  
The Charles Parker Co., Meriden, Conn.  
Parker-Kalon Corp., New York, N.Y.  
Pawtucket Screw Co., Pawtucket, R.I.  
Phoell Manufacturing Co., Chicago, Ill.  
Russell, Burdall & Ward Bolt & Nut Co., Port Chester, N.Y.  
Scovill Manufacturing Co., Waterbury, Conn.  
Shakeproof Inc., Chicago, Ill.  
The Southington Hardware Mfg. Co., Southington, Conn.  
Whitney Screw Corp., Nashua, N.H.

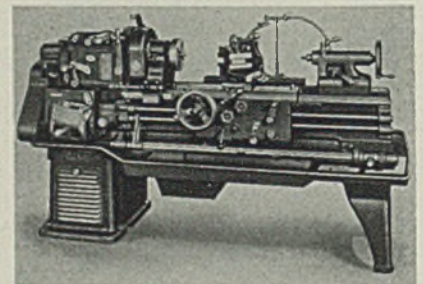
approximately 30 degrees, allows parts to flow easily through the door opening upon a table or other place convenient to the worker. A slotted bar on one side of the door



makes it easy to hold the door open as much as desired and controls flow of material from the box. The unit may be used with forked trucks, and it may be equipped with tiering or crane lugs for storage and handling.

### Automatic Feed Stop

Cincinnati Lathe & Tool Co., 3207 Disney street, Oakley, Cincinnati, is now offering a new multiple length automatic feed stop for its lathes designed to cope with present heavy production demands. It is fully equipped with six adjustable stops which are indexed automatically by a trip lever mounted in the apron. The unit also can be set to any one of the six positions by raising the locking pin found on the rear bearing of the stop rod, then turning the index control to the desired setting. Positive indexing, however, is assured by the locking pin when the trip lever is used. Stop dogs of the automatic unit may be set within 1/8-

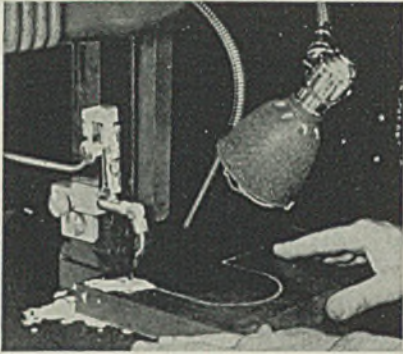


inch of each other and will stop the feed to the carriage within 0.002-inch. The illustration shows the feed stop mounted on the front of one of the company's lathes.

### Saw Lubricator

Continental Machines Inc., 1301 Washington avenue, South, Minneapolis, is offering a new Doall saw lubricator which aids in obtaining straighter cuts and finer finishes at the same time extending the life of the saw. The coolant attachment is connected directly on the post above the saw guide, a flexible feed line directing the coolant to the correct

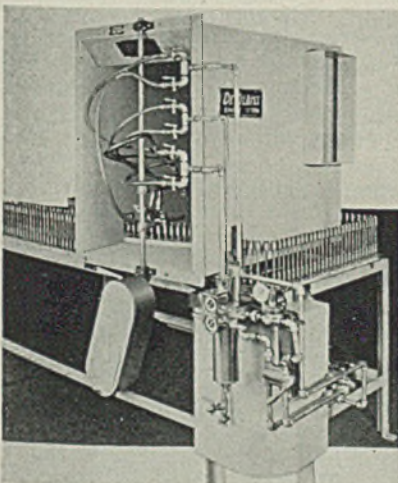
position. A feed control valve on the attachment allows operator to regulate the flow of coolant to the work. In tests conducted in contour sawing of a large number of materials, it was found that the application of a small amount of a suitable coolant



to the saw, directly at the point where the saw enters the work, greatly extends the life of the saw and increases the cutting speed. On metals having a relatively low tensile strength such as aluminum, copper, leaded brass, zinc, etc., the coolant adequately prevents buildup of the metal on the saw or on the sides of the material.

### Painting Machine

DeVilbiss Co., Toledo, O., has introduced a new automatic machine for painting small shell. It is capable of coating exteriors of 20 millimeter shell at a rate of 2000 per hour. The machine is built around a "chain-on-edge," variable speed conveyor which is long enough to allow for a 10-minute drying time at a production rate of 1000 shell per hour or a 5-minute drying time at a production rate of 2000 shell per hour. Spindles for supporting the shell are of the removable type and are equipped with flat surface pulleys for rotation inside the spray booth. They are rotated by means of a separate variable speed drive. Spray guns of the unit are automatic and of the air piston type



April 13, 1942

# Little Things -

## Save Big Things

★ Right fittings and attachments get more efficient use from chains and save many tons of metal in extra links.

American Chain Division of Acco has kept its fittings and attachments abreast of modern design in welded and weldless chains of all sizes for all purposes. Shown above are a few of the many S-hooks, toggles and special attachments, all of which save time, money and material. We believe we provide the most complete assortment, and every day our chain fittings are selected by an increasing number of inventors, engineers, designers, shop foremen and others who want more speed and less waste.

Our cotter pins are also in great demand—both the Campbell type and the conventional Acco type. We draw our own wire and are very particular that sizes are uniform. Shanks are perfectly parallel and close all the way to the shoulder. Easy to insert—tumbled clean—packed in substantial boxes that are plainly labeled and numbered. Yes—these cotter pins are another example of little things that save big things from premature wearing out.

There is an American chain for every requirement and with it the correct accessories—from S-hooks to Grab Hooks and Slip Hooks which are used on Sling Chains and other heavy duty chains. To get the best service from chains use the right fittings and attachments. Please write if you have any questions.

### AMERICAN CHAIN DIVISION

York, Pa., Boston, Chicago, Denver, Detroit, Los Angeles,  
New York, Philadelphia, Pittsburgh, San Francisco



**AMERICAN CHAIN & CABLE COMPANY, Inc.**  
BRIDGEPORT • CONNECTICUT

equipped with adjustable cam-operated spray controls. The 10-gallon pressure feed paint tank included is equipped with an air motor-driven agitator. Other units that make up the machine are a spray booth, exhaust fan, air transformer and the necessary air and fluid hose, control valves, fittings and connections.

### Street Lighting Unit

Westinghouse Electric & Mfg. Co., Edgewater Park, Cleveland, announces a new type SG-10 luminaire

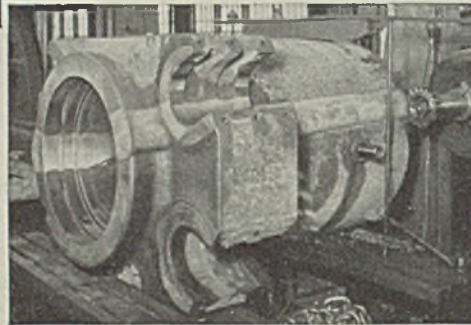
for lighting streets in the vicinity of war plants, army cantonments and for protective lighting of fences around vital industrial areas. It is said to be highly efficient, its effectiveness being 12 to 15 degrees higher than the corresponding line of previous Reflectolux and Refractolux units. Reflector housing of the luminaire is of heavy gage steel porcelain enameled inside and out with a ground coat, and one outside coat of green enamel. A silvered glass reflector which has a metallic backing contributes to the high re-

flectivity of the unit. For symmetric distribution three globes are available; long blown globe in clear or alabaster glass; short blown globe in clear or alabaster glass, or short pressed globe in clear glass. For asymmetric distribution, refractor globes are also available in four designs: A C-way distribution for narrow streets, a B-way distribution for wide streets; a 2-way distribution for center mounting; and a 4-way distribution for intersection center mounting. These are of clear glass with the prisms on the inside and rectilinear design on the outside.

# 25 TON CYLINDER

QUICKLY  
REPAIRED  
by  
THERMIT WELDING

Thermit welded  
cylinder — back in  
service in 3 weeks  
— as good as new.



Thermit welding has been aptly called "Industry's Master Maintenance Tool," as there are many cases where no other method will repair a broken part as quickly, effectively and economically.

Take the case of a large rubber factory where production was seriously delayed, due to the breaking in two of a 25 ton hydraulic cylinder.

Three weeks later the Thermit welded cylinder, machined and tested, was working continuously 24 hours a day under a pressure of six thousand pounds per square inch. Five thousand pounds of forging Thermit were used—making the weld one of record proportions.

### ALSO FOR FABRICATION

Send for booklet, "Thermit Welding," which describes many applications of this 40 year old process—including the fabrication of large units. Through the use of simple forgings, small castings or flame-cut shapes, the cost of large, intricate castings is eliminated.

## THERMIT WELDING

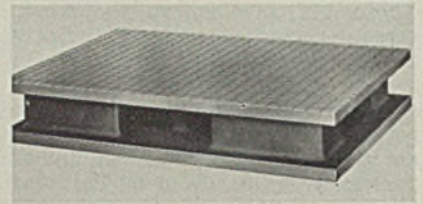
METAL & THERMIT CORP.,  
120 BROADWAY, NEW YORK, N. Y.

ALBANY  
CHICAGO  
PITTSBURGH  
SO. SAN FRANCISCO  
TORONTO

Specialists in welding for nearly 40 years.  
Manufacturers of Murex Electrodes for arc welding and  
of Thermit for repair and fabrication of heavy parts.

### Bench Blocks

Challenge Machinery Co., Grand Haven, Mich., has introduced new duplex bench blocks which feature working surfaces, both top and bottom. They are available in three



combinations—furnished with one surface smooth and the other grooved in 1/2-inch widths for lapping of metal-to-metal joints—with both sides smooth, in which case one surface may be used for working purposes and the other held in reserve for layout, assembly and inspection—both surfaces grooved for lapping 1/2-inch mesh. The blocks also can be supplied with either or both surfaces hand-scraped. The projection of the top and bottom sections of these semisteel units provides a convenient ledge for clamping measuring instruments.

### Air Raid Truck

Service Caster & Truck Co., 640 North Bronwood avenue, Albion, Mich., announces an "air raid" truck designed to carry necessary equipment to cope with incendiary bombs. Of steel construction, with the exception of the deck and mounting board, which are of wood, it is 52 inches long and 27 inches wide. It incorporates a push handle to facilitate transportation. The mounting board is placed in the center of the truck, rigidly braced



at both top and bottom. Measuring 23 x 52 inches, it has enough room for fire extinguishers, fire axe and other equipment. Running gear of the truck consists of two 8-inch swivel casters at the rear and two 8-inch "rigids" at the front. No fire equipment is included with the truck.

## New Resurfacers Needs No "Setting" Period

A plastic floor resurfacer which can be applied without interrupting floor traffic is announced by Flash-Stone Co. Inc., Philadelphia. It is a ready mixed material which upon being rolled or tamped into a hard surface can be used immediately.

Being a plastic, the product is held together by cohesion. Under heavy traffic conditions, it is said, one of its basic ingredients releases gums which have been undergoing natural vulcanization, and which in turn is responsible for its long life.

Although highly resistant to lubricating oils and other destructive materials, the product will bond directly to oily or clean concrete, steel, stone, wood or brick floors. It is suitable for both interior and exterior use.

## Mohawk Valley Plan

(Concluded from Page 87)

ished gun mounts was speeded by 55 per cent. The simplest form of the performance graph developed was that used for a piece which had but one operation to be performed on it (see Graph "A"). The deadline shown on the graph represents the delivery schedule which a subcontractor must follow.

A theoretical performance schedule would have been worthless were it not for the fact that the conveyor company kept in contact with the subcontractor several times each day through a group of alert young tool draftsmen working as expeditors.

Each expeditor was assigned a certain number of subcontractors in order to avoid confusion and in order to become intimately acquainted with them and with the problems involved.

Each was furnished an automobile by the company or used his own automobile on a mileage basis—consulting daily with the subcontractor, picking up finished material and delivering it to the receiving room in the prime contractor's plant and obtaining help for the subcontractor whenever the latter encountered difficulties which threatened to slow up deliveries.

Finished pieces were inspected at the subcontractor's plant by close

teamwork with local Army Ordnance inspectors. In fact, in some cases, *Army inspectors were available on as little as 15 minutes notice.*

No special machines, special tools or material for the production of the gun mounts were available until after Oct. 16 of last year because of the fact that the order carried an A-1D priority.

The physical equipment and the material for the gun mounts were collected between the dates of Oct. 16 and Dec. 10. The company is working approximately 80 per cent of its capacity on war orders and employs 560 people, including an engineering staff of 60. It operates

two 10-hour shifts, 60 hours per week, paying time and a half for overtime over 40 hours.

When the finished pieces arrived at the receiving room of the prime contractor's plant, they were taken over by two control men who expedited the parts through the plant, sending them into stock ready for assembly or forwarding them on for subsequent work operations.

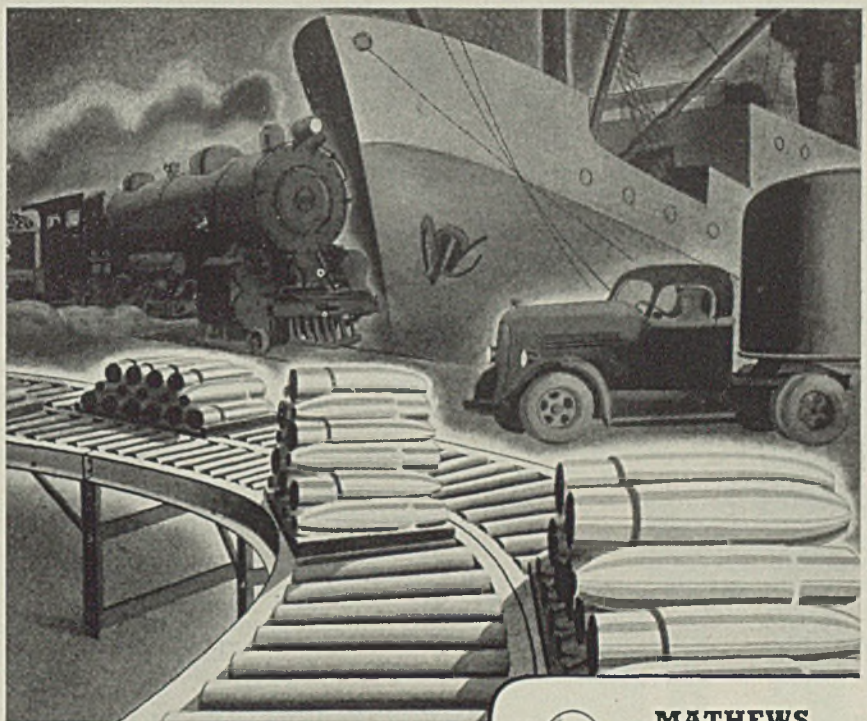
Production operations in the parent plant were charted similarly to the operations performed by the subcontractors. Each piece had its performance graph so that it arrived in the stockroom ahead of the deadline date. (See Graph "B").

# Prime movers

## ... FOR AMERICAN WAR PRODUCTION

● The great units of America's transportation system, her trucks and trains, depend heavily upon another transportation system to keep them rolling—the modern conveyer system! Without conveying equipment to speed materials to and from processing machinery, and into the cars and holds of ships, the transportation of vital war material would slow down considerably. Ships would remain longer in port—carloadings would fall off.

Long Mathews engineering hours are devoted entirely these days to the development of equipment for handling war material so that our prime movers can get it to where it is needed in less time.



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,  
PENNSYLVANIA**

**MATHEWS CONVEYERS FOR MECHANIZED PRODUCTION**



## Tile Flooring Prevents Static Electricity

An asphalt tile which prevents accumulation of static electricity is announced by the Building Materials Division of Armstrong Cork Co., Lancaster, Pa. It is said to be especially suitable as a resilient flooring in arsenals, shell-loading plants and industries in which static electricity or an open flame at any time presents a safety hazard.

Referred to as conductive asphalt tile, the development provides a surface condition which results in less than 0.1 megohm resistance to static electricity under certain specific conditions, according to the announcement.

Other features of tile are: It can be used immediately after being laid, it withstands fast trucking, is odorless and will not attract or sustain vermin.

## Spins in Vacuum

(Concluded from Page 99)

the highest ever attained on such comparatively large objects. To obtain such speeds in open air, thousands of horsepower would be required to overcome air resistance or "windage."

At these high speeds, a pound

mass exerts a centrifugal pull of over 100 tons, and wheels literally

## Plastic Noses for Shell



A NEW plastic that is strong enough to be substituted for aluminum in the windshields, or streamlined noses, of anti-tank and anti-aircraft shell has been developed at the Westinghouse Research Laboratories, East Pittsburgh, Pa. Dr. A. Allen Bates, manager of the chemical and metallurgical department at the Laboratories, is shown here demonstrating how the new plastic nose fits onto the anti-tank projectile. On the table is an anti-aircraft shell

explode, the fragments having enough energy to penetrate several inches of armorplate since they travel at speeds up to 1400 miles per hour. Sometimes in these break tests the vacuum chamber is lined with removable lead bricks to minimize impact damage to the fragments so they can be examined to gain information as to the nature of the break. Chamber usually is exhausted to an air pressure 0.0061 of atmospheric pressure.

Number of revolutions per minute is measured with an electric eye. Top of air turbine shaft carries a 2-faced wedge-shaped mirror on which shines a light beam. It is reflected upward to a photocell twice every revolution. Resulting electrical impulses operate a frequency meter that indicates the revolutions per minute on a dial. See Fig. 1.

## Oil Heater Standard Effective Next Year

Having received signed acceptances from manufacturers, distributors and users estimated to represent a satisfactory majority, National Bureau of Standards, United States Department of Commerce, Washington, announces that commercial standard CS101-43, dealing with flue connected oil burning space heaters equipped with vaporizing pot type burners may be considered effective for new production from Jan. 1, 1943.

The standard was recently formulated at a general conference, and later circulated for written acceptance under the date of Feb. 2. As soon as printed copies are made they will be available by those interested only upon request.

## Roll Machine

(Concluded from Page 107)

gears which run in oil. Machine bed is made of welded construction and the housings from steel castings. The machine is of roller bearing construction throughout.

This universal machine also is built with a 7-roll vertical attachment in which only three of the seven rolls are driven. Of these seven rolls, only four idlers have adjustable center distances. This arrangement makes a workable machine since practically all of the straightening is done in the 10-roll horizontal shaft unit before the bar reaches the second unit. Since untwisting takes place entirely in the 10-roll unit, it is not affected in any way by the 7-roll vertical attachment.

Either machine is built in all sizes, and rolls are furnished for various sections of bars and shapes.



# SAVE . . .

## COSTLY REPAIRS AND LOST PRODUCTION TIME

Today—more than ever, you cannot afford costly breakdowns of vital machinery, nor loss of man hours of work due to "abrasive dust" in your plant.

Trap this "dust menace" right at the source as it comes off grinding and buffing wheels with Torit Self-contained Dust Collectors.

You'll SAVE not only costly repairs, but initial installation and operating cost, because Torits are portable units—easily placed near dust sources—and economical to operate because suction is provided only when machines are operating.

Torit Dust Collectors are available in sizes to fit your requirements. Write today for bulletin giving Torit features, specifications and prices.

**TORIT**  
**MANUFACTURING COMPANY**  
281 Walnut St.      St. Paul, Minn.

# TORIT Dust Collectors

SELF-CONTAINED UNITS

# Helpful Literature

## 1. Abrasive Cleaning

Vapor Blast Manufacturing Co.—6-page folder describes "Vapor Blast" cleaning, telling what it cleans, how it operates, and cost of operation. Features of process are enumerated in detail. Facsimile letters from users are included.

## 2. Illuminated Magnifier

E. W. Pike & Co.—4-page illustrated bulletin gives complete details about application, design and operation of "Flash-O-Lens" illuminated magnifier. Various types, in plug-in and battery operated models, are described and users are listed.

## 3. Magnetic Equipment

Stearns Magnetic Manufacturing Co.—12-page bulletin 701 deals with type K gravity induction separator which is particularly suited for treating materials of highly reluctant magnetic values. It also contains facts on company's laboratory facilities available for industrial research work.

## 4. Core Ovens

Lanly Co.—12-page illustrated bulletin describes construction features of company's ovens which are made in variety of types and sizes for heat treating metals, for baking cores and molds, for baking finishes and for curing rubber. Typical ovens are shown.

## 5. Calendar

Continental Machines, Inc.—illustrated 40 x 22-inch calendar, beginning with month of March, 1942 and ending with February, 1943, contains 12 comprehensive lessons on metal working. It shows mechanical operation, terms, cutting tools and chips produced by each type of machine tool. Photomicrographic studies of material cut are included.

## 6. Resistance Welding

P. R. Mallory & Co.—78-page illustrated bulletin is second edition of company's "Resistance Welding Data Book." It treats subjects of spot, projection, roller seam, and butt and flash-butt welding, as well as, properties and characteristics of various welded metals. Miscellaneous tables and an index are included.

## 7. Rechargeable Batteries

Ideal Commutator Dresser Co.—4-page illustrated bulletin tells of wet cell type storage battery that fits standard flashlight cases and may be recharged with small transformer charger. Features and advantages of batteries are enumerated in detail. Chargers are also described.

## 8. Scales

Toledo Scale Co.—4-page illustrated bulletin No. 2032 describes "Printweigh" scale which automatically record weights on cards or continuous strips. Illustrations show machines being used in mines, textile plants, coal yards, steel mills, and postoffices.

## 9. Wood Fabricating

Service Industries Inc.—16-page illustrated bulletin is titled "Fabricating To Specifications With Industrial Masonite." It describes facilities and equipment for bending, die cutting, punching and other operations used in fabrication of this pressed wood product. Action photographs show fabricating operations, and specimens of typical products.

## 10. Brake Shoes

American Brake Shoe & Foundry Co.—32-page pictorial, "Your Share of a Million Dollars," depicts importance of brake shoes in railroad transportation. Purpose, research, features and other facts about railroad brake shoes are related.

## 11. Clutch Data

Morse Chain Co.—6-page illustrated bulletin K-6 covers clutch applications for indexing, free-wheeling and backstop operations. It presents principles, characteristics, advantages and construction details of company's indexing and free-wheeling clutch lines.

## 12. Portable Power Plant

Ready-Power Co.—4-page illustrated bulletin No. 92-B describes standard model H "Ready-Power" industrial truck power plant which generates 36, 48 or 60 volts and may be mounted on two or five ton trucks. Details are shown in large illustration.

## 13. Metal Duplicating

O'Neil-Irwin Manufacturing Co.—32-page illustrated bulletin, "The Di-Acro System of Metal Duplicating Without Dies," explains die duplicating tools and their application. These tools include the bender, brake and shear, each in two sizes, which permit duplicating metal shapes without use of dies.

## 14. Brass & Bronze

Hammond Brass Works—18-page illustrated bulletin is entitled "Practical Data On Brass And Bronze Castings." It contains excerpts from Bureau of Standards on nomenclature of copper alloys, as well as photomicrographs and tables of physical and chemical characteristics of various alloys cast by this company. Representative castings are pictured.

## 15. Acid Inhibitor

William M. Parkin Co.—8-page booklet, "Making Acid Behave with NEP", describes this product for metal pickling applications. Purpose of inhibitor is explained and savings to be effected are outlined.

## 16. Cutting Torch

National Cylinder Gas Co.—4-page illustrated bulletin No. NR-141 explains features and applications of "Rego" cutting torches for cutting and piercing operations. Specifications are given on standard torches and tips for various specific applications.

## 17. Transformers

Jefferson Electric Co.—8-page illustrated bulletin 411CT deals with control, signaling and power circuit transformers. Explained are applications, construction and design features. Tables give capacities, ratings for secondaries and primaries, and catalog numbers. Sketches show principal dimensions.

## 18. Copper Products

Revere Copper & Brass Inc.—34-page bulletin, "Revere Weights & Data," deals with copper, brass and bronze products. Some of data included are wire gages, weight formulas, melting points and densities, conversion tables, metric equivalents, weight conversion tables, areas of squares and circles, and chemical properties.

## 19. Dust Collector

Pangborn Corp.—24-page illustrated bulletin No. 903 gives complete data on type CH all-metal cloth screen dust collectors. Features of this design are shown. Elevation and cross section views show construction. Specifications are included on standard sizes.

## 20. Milling Machine

Sundstrand Machine Tool Co.—6-page illustrated bulletin No. O-1 gives complete specifications, typical cost reducing operations, cuts and cycles obtainable, and general descriptions of No. O hydraulic "Rigidmil." Illustrations point out salient features.

## 21. Metal Cutting Saws

E. C. Atkins & Co.—32-page illustrated booklet, "Guide to Metal Cutting Efficiency," presents details of the new "Atkins Curled-Chip" system of metal cutting as applied to circular milling saws, segmental cold saws, power hacksaw blades and hacksaw blades. Other pertinent data on metal cutting are included.

## STEEL Readers' Service Dept.

1213 West Third St., Cleveland, Ohio

XX  
4-13-42

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**STEEL**

Penton Building

CLEVELAND, OHIO

Readers' Service Dept.

**22. Marking Equipment**

Jas. H. Matthews & Co.—20-page illustrated bulletin, supplement B to catalog No. 146, pictures wide variety of steel marking dies, steel type, type holders, marking machines and special marking devices. Also shown are samples of markings produced and parts marked.

**23. Resistors**

International Resistance Co.—Folder, printed on heavy stock, contains chart giving essential data on over 122 sizes of 18 standard types of fixed and variable resistors for general industrial requirements. Information is included on wattage and voltage ratings, dimensions, maximum and minimum resistance values obtainable, types of terminals and mountings, and temperature coefficients.

**24. Heat Insulation**

Johns-Manville Sales Corp.—Illustrated folder IN-101A contains conductivity and heat transfer charts, as well as service recommendations on Superex block insulation for temperatures from 600 to 1900 degrees Fahr. One of charts facilitates selection of proper proportional thicknesses of insulation for various surface temperatures for maximum insulating efficiency.

**25. Welded Construction**

Graver Tank & Manufacturing Co.—4-page illustrated bulletin, "Welded Construction," shows typical welding operations performed and lists equipment built by company, including storage tanks, fabricated steel plate, water softeners, filtration systems, X-raying and stress relieving.

**26. Controls**

General Controls Co.—48-page illustrated catalog No. 51 gives details of line of regulators, control systems, and solenoid valves. Included are such new products as small motor operated valves, 3-way magnetic lever valves, sensitive direct current relays and magnetic valves for all types of systems. It is comprehensive reference on pressure, temperature and flow controls.

**27. Weld Timers**

Westinghouse Electric & Manufacturing Co.—7-page illustrated leaflet No. 18-343 describes sequence and weld timers for automatic control of resistance welders. Definitions and general information about sequence and weld timing, pulsation and spot welding are given. Timers are described.

**28. Screw Machine Tools**

Boyar-Schultz Corp.—6-page illustrated bulletin No. T1041 presents full details regarding design and operation of the new screw machine box tool for use with hand and automatic screw machines. How tool saves set-up time, reduces grinding time, minimizes rejections and lowers tooling costs are explained.

**29. Pumps**

Geo. D. Roper Corp.—124-page illustrated catalog describes line of rotary pumps. Operating data and construction details are given for eight series of pumps. Information is listed to aid pump buyers in selecting proper pump for a specific application, as well as installation data.

**30. Pressure Recorders**

The Foxboro Co.—32-page illustrated catalog No. 22-A contains factual information on instruments for measurement and recording of industrial pressures of all kinds, in ranges from 1 inch of water to 20,000 pounds. In addition to listing ranges, application information is included. Instrument mounting, available cases, electric signal systems and accessories are covered.

**31. Power Presses**

General Manufacturing Co.—12-page illustrated bulletin on "G-F-P" presses gives details of machines and accessories for straightening, pressing, assembling, broaching, burnishing, riveting and forming operations. Specifications are given for various sizes of flexible power presses.

**32. Direct Fired Heaters**

Dravo Corp.—12-page illustrated bulletin No. 502 gives details of oil and gas-fired unit heaters for industrial use. Typical installations are shown to indicate flexibility of application of these units. Specifications are given for various models.

**33. Grinder Dressing**

Diamond Tool Co.—Illustrated instruction card gives important information of value in correct dressing of precision grinding wheels. By following instructions, wheels, diamonds and workers time is conserved.

**34. Centrifugal Castings**

Shenango-Penn Mold Co.—2-page bulletin No. 141 lists products, metals and alloys cast, range of sizes of castings and machining facilities. Tabulated list of sizes of bronze solid and tubular castings carried in stock. Illustrations show views of warehouse and of display at recent Metal Show.

**35. Boiler Linings**

The Ramtite Co.—16-page illustrated technical bulletin, "The Better Method of Setting and Lining Return Tubular Boilers," explains improvements in methods of setting and relining. Engineering properties of "Ramtite" plastic refractories are included.

**36. Electric Hoists**

Wright Manufacturing division, American Chain & Cable Co.—12-page illustrated bulletin on "Speedway" electric hoists gives complete information on this equipment. Features, applications, details specifications and other data are included.

**37. Floor Gratings**

Borden Metal Products Co.—4-page illustrated bulletin on gratings, floor armor, safety steps and bridge decking gives details and specifications on this line of products. Instructions for applying gratings and steps are given.

**38. Motor Control**

Cutler-Hammer, Inc.—36-page illustrated publication No. CS-151 is devoted to details of "Unitrol" system of motor control. What system is, details of construction, application, features and ratings of equipment are given.

**39. Angle Beveling Machine**

Thomas Machine Manufacturing Co.—4-page illustrated bulletin describes construction and operation of machine designed to bevel angles, channels, Z-bars, and bulb angles after work is properly heated in furnace. One set of rolls is furnished with each machine. Series of sketches show various operating positions of rolls.

**40. Prefinished Metals**

American Nickeloid Co.—Illustrated wall chart, entitled "Prefinished Metals", contains samples of bright and satin finished chrome plated steel, unpolished copper plated steel, bright brass plated steel, bright finish chrome plated brass and unpolished nickel plated steel. Features of these products and their use in conserving metals.

**41. Colloidal Graphite**

Acheson Colloids Corp.—6-page technical bulletin is No. 210.5 of series pertaining to applications of colloidal graphite to industry. It treats mode of occurrence, origin description and uses, chemical properties, manufacture of artificial graphite, and lubricating characteristics.

**42. Spline & Gear Grinders**

Fitchburg Grinding Machine Corp.—20-page illustrated bulletin describes spline and gear grinders. Details of machines, their application and operation, and other pertinent information are given on various types and models.

**43. X-Ray Diffraction**

General Electric X-Ray Corp.—20-page illustrated bulletin 7A-560 describes "XRD" X-ray diffraction unit. Included is complete description of operation and construction of machine, as well as general discussion of X-ray diffraction. Explained are various applications to metallurgy, chemistry and the process industries.

**44. Metal Cutting Saws**

Racine Tool & Machine Co.—Card-board binder contains bulletins listing descriptions and specifications on line of metal cutting machines. Covered are utility saws, hydraulic metal cutting machine, "Shear Cut" production saw, and heavy duty metal cutting machines.

**STEEL Readers Service Dept.**

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# Stoughton Views Strikes and Lack Of Scrap as "Brake"

STRIKES and shortages of certain metals continue to be the greatest "brake" on America's war effort, Bradley Stoughton, president, American Society for Metals, stated in addressing members of the society's Cleveland chapter April 6.

"Farthest behind in production, contrary to common understanding, is shipbuilding, due chiefly to strikes," he said. "Last week, over the entire nation, 31 strikes were in progress in various industries—more than at any time since Pearl Harbor."

In referring to the metal situation, Dr. Stoughton, who is the chief of the War Production Board's heat treating equipment unit, declared that steel output this year should exceed that of 1941 by 10,000,000 tons. He expressed doubt about this goal being attained, owing to the scrap situation. (Raw steel output in 1941 totaled 82,836,000. Production in the first three months this year was at an annual rate of 84,000,000 tons).

Aluminum supply looks fairly good, according to Dr. Stoughton. Production is gaining steadily. When in full swing, the aluminum industry will require about 10 per cent of the total electric power in the country, which, he said, explains the present campaign to conserve power.

## Steel Shell Cases To Save Copper

"Although this country produced only 356 tons of magnesium in one recent year, the situation today is somewhat better," he said, "for around 352,000 tons of magnesium will be produced in 1942."

A bright spot in the copper situation is the recent adoption of steel for cartridge and shell cases by the Ordnance Department. Complete substitution is expected by fall. He estimated 800,000 tons of copper will be saved by this change.

Nickel seems to be the most critical metal, in Dr. Stoughton's opinion. Ninety per cent is produced on this continent, but output will fall short of requirements.

About 50 per cent of vanadium is produced in Peru and the other 50 per cent in the United States. Production can be stepped up somewhat in this country, but the situation in South America is doubtful.

Zinc is no longer a source of anxiety, due to increased plant capacity.

Tin supply seems to be in fair

shape. We have quite a stockpile in the United States and with the aid of substitutions we should not have any serious trouble. We have about two year's supply of manganese on hand, and two new plants in Montana will aid considerably with this supply.

Tungsten, however, is not very tight. More and more of this metal is being produced each month.

Although molybdenum was considered to be plentiful, so much of it is being used that WPB has placed it under allocation. The chromium situation, Dr. Bradley concluded, is being aided steadily by substitutions.

## Makes Substitute Finish For Polished Metals

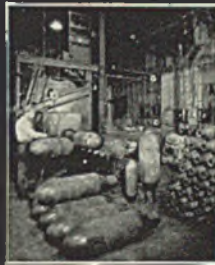
A colored transparent finish for use on polished metal as a substitute for electroplating and bronze-powder finishes is announced by Maas & Waldstein Co., Newark, N. J.

The finish, which is being sold under the name of Platelustre, consists of a concentrated enamel of desired color added to a clear lacquer. When applied on polished metals, it makes them resemble copper, brass, bronze, color-treated aluminum and steel, according to the manufacturer.

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Pangborn ROTOBlast Tables, Barrels and Special Cabinets—many operating twenty-four hours a day—are cutting blast cleaning time schedules right and left. Gray iron, steel, alloy and malleable castings; forgings; steel products including shells, bombs, armor plate, tank and gun parts are being DELIVERED—TODAY—because of Pangborn ROTOBlasting.

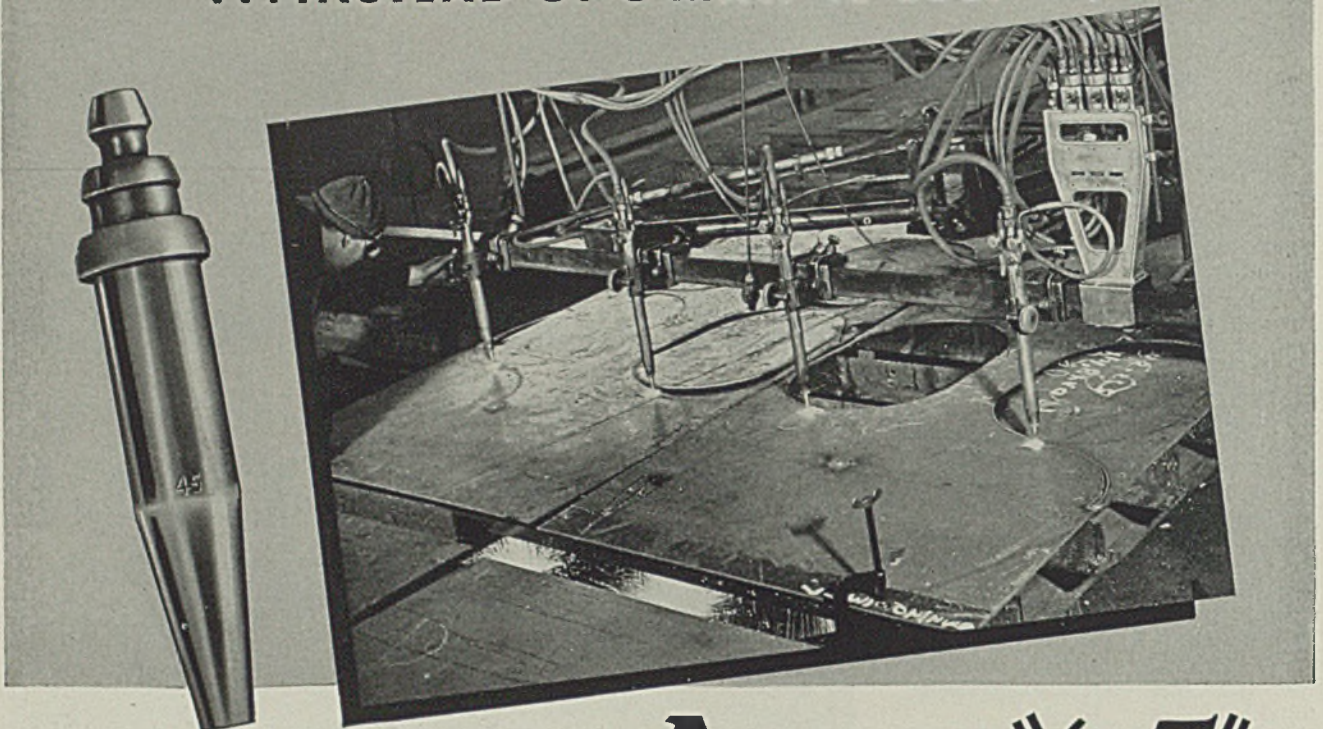
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**HIGH SPEED MACHINE CUTTING TIP**

At this plant, an Airco Travograph is flame cutting four identical shapes, 77" in periphery, from 5/16" steel plate in 2 min. 42 sec. — with the new Airco "45" High Speed Machine Cutting Tips.

1 min. 3 sec. — this is the saving in time now made possible by the Airco "45" in this multiple cutting operation, which until recently required 3 min. 45 sec. with conventional tips.

Airco "45" was developed to bring you maximum cutting speeds — at a time when

speed became essential to the country's war efforts. It increases the speed of machine gas cutting by 20 to 30% — without sacrifice in the quality of the cut and with no increase in oxygen consumption.

If your plant is engaged in war production and utilizes Airco oxyacetylene machines for cutting steel up to 8" thick, we urge you to ask your nearest Airco office for further details or to request our 8-page bulletin on Airco "45".

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# Steel Output Limited

## To Direct War Needs

*War Production Board cuts durable consumer goods. Steel mills loaded with highest priority orders. Ingot output at new high*

WITH virtually every unit of the steel industry exceeding all previous production figures War Production Board is putting further limits on uses outside the war effort, to conserve every ton for most needed use.

At the end of May production of nearly all classes of durable consumer goods will be halted, all but essential construction work stopped and control over all steel in consumer inventories will be complete. By these means the present tremendous outpouring of steel will be utilized for the nation's main purpose, defeat of the nations at war with us.

Cutting off supply of steel for all but war purposes will have little effect on steelmakers as they have been unable for some time to promise deliveries on orders in lower priority brackets and requirements for the general run of durable consumer goods have not been given consideration.

Most producers of plates, sheets, shapes and bars can promise nothing definite below A-1 preference, with priority going back to the ingot. Some producers can do little better on pipe, wire and some other products which until recently could be supplied at lower ratings without difficulty.

Producers with bessemer facilities are able to make better promises than on open-hearth steel. This is true in certain types of merchant pipe, tie plates and bars, but as more products are diverted to bessemer steel these deliveries are tightening.

Mills are confronted with a heavy volume of high-priority orders onto which are superposed many direct allocations, which force frequent revision of rolling schedules. One important producer has notified customers that no orders can be accepted under A-2 rating. Another producer has been able to ship some A-3 tonnage recently.

Considerable canceling is being done, mainly of tonnages placed long ago, with no possibility of being reached. In spite of these orders being removed from mill books backlogs increase steadily as orders exceed shipments.

Steelmaking operations last week advanced  $\frac{1}{2}$ -point to 98 $\frac{1}{2}$  per cent as small gains were made in half the districts. Cincinnati advanced 4 points to 96 per cent, Detroit 4 points to 92, St. Louis 6 points to 93, eastern

Pennsylvania 2 points to 92, New England 10 points to 90 and Buffalo  $\frac{1}{2}$ -point to 93 $\frac{1}{2}$ . Chicago receded  $\frac{1}{2}$ -point to 104 per cent and Youngstown 2 points to 92. Rates were unchanged at Birmingham, 95; Cleveland, 90 $\frac{1}{2}$ ; Pittsburgh 96; and Wheeling 82 $\frac{1}{2}$  per cent.

March production of steel ingots and castings reached the highest mark ever attained by the industry, 7,392,911 net tons, more than 150,000 tons above the previous record, made in October, last year, and more than 260,000 tons above the output of March, 1941. First quarter production was 21,038,889 tons, which is nearly 4 per cent more than was made in the corresponding quarter last year. As a parallel to this achievement United States Steel Corp. subsidiaries established all-time production records of almost 2,000,000 tons of blast furnace products and nearly 2,600,000 tons of steel ingots and castings; its steel plate production of 300,000 tons for the month is also a record.

Scrap supplies continue to improve and while steelmakers still work on narrow margin they are able to put in service some of the idle capacity which has kept down steel production the past few months. No reserves are being accumulated, all receipts being melted at once. Shortages occur in some areas and not all open hearths are able to operate. Collections from remote sources and dormant supplies, combined with continuous flow from wrecked automobiles, contribute most largely to the increased tonnage. Supplies from the upper lakes are expected to start moving within a short time in sufficient volume to give further aid.

Ceiling has been set by Office of Price Administration on Lake Superior iron ore prices at the level in effect for the 1941 season, \$4.45 per gross ton, lower lake ports, for Mesabi non-bessemer, the base grade. The order provides that on special contracts no prices shall exceed those of last year on similar contracts, nullifying "escalator" clauses and providing a formula for mines idle last year. Further study is to be made of captive ore prices, leading to such action as may be considered appropriate.

Composite steel and iron prices are steady, subject to OPA ceilings. Finished steel composite is \$56.73, semi-finished steel \$36, steelmaking pig iron \$23.05 and steelmaking scrap \$19.17.

# MARKET IN TABLOID ★

## *Demand*

*Continued increase for war purposes.*

## *Prices*

*Iron ore ceiling established.*

## *Production*

*Up  $\frac{1}{2}$ -point to 98 $\frac{1}{2}$  per cent.*

# COMPOSITE MARKET AVERAGES

	Apr. 11	Apr. 4	Mar. 28	One Month Ago Mar., 1942	Three Months Ago Jan., 1942	One Year Ago Apr., 1941	Five Years Ago Apr., 1937
Finished Steel .....	\$56.73	\$56.73	\$56.73	\$56.73	\$56.73	\$56.73	\$61.95
Semifinished Steel ....	36.00	36.00	36.00	36.00	36.00	36.00	40.00
Steelmaking Pig Iron.	23.05	23.05	23.05	23.05	23.05	23.05	22.84
Steelmaking Scrap....	19.17	19.17	19.17	19.17	19.17	19.17	21.27

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	Apr. 11	Mar.	Jan.	Apr.	Pig Iron	Apr. 11	Mar.	Jan.	Apr.
	1942	1942	1942	1941		1942	1942	1942	1942
Steel bars, Pittsburgh.....	2.15c	2.15c	2.15c	2.15c	Bessemer, del. Pittsburgh.....	\$25.34	\$25.34	\$25.34	\$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	2.48	2.47	2.47	Basic, eastern, del. Philadelphia.....	25.34	25.365	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	2.217	2.215	2.215	No. 2 foundry, Chicago.....	24.00	24.22	24.22	24.22
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	2.215	2.15	2.21	No. 2X, del. Phila. (differ. av.).....	26.215	26.24	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.....	31.54	31.44	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	24.19
Sheets, hot-rolled, Gary.....	2.10	2.10	2.10	2.10	Ferromanganese, del. Pittsburgh.....	125.63	125.39	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					
Bright bess., basic wire, Pitts.....	2.60	2.60	2.60	2.60					
Tin plate, per base box, Pitts.....	\$5.00	\$5.00	\$5.00	\$5.00					
Wire nails, Pittsburgh.....	2.55	2.55	2.55	2.55					

### 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
Re-rolling 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

### Scrap

Heavy melting steel, Pitts.....	\$20.00	\$20.00	\$20.00	\$20.20
Heavy melt. steel, No. 2, E. Pa.....	18.75	18.75	18.75	18.00
Heavy melting steel, Chicago.....	18.75	18.75	18.75	18.80
Rails for rolling, Chicago.....	22.25	22.25	22.25	22.65
No. 1 cast, Chicago.....	20.00	20.00	20.00	22.31

### Coke

CConnellsville, furnace, ovens.....	\$6.25	\$6.25	\$6.25	\$5.50
CConnellsville, foundry, ovens.....	7.25	7.25	7.25	6.00
Chicago, by-product fdry., del.....	12.25	12.25	12.25	11.85

## STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Following are maximum prices established by OPA Schedule No. 6 issued April 16, 1941, revised June 20, 1941 and Feb. 4, 1942. The schedule covers all iron or steel ingots, all semifinished iron or steel products, all finished hot-rolled, cold-rolled iron or steel products and any iron or steel product which is further finished by galvanizing, plating, coating, drawing, extruding, etc., although only principal established basing points for selected products are named specifically. All seconds and off-grade products also are covered. Exceptions applying to individual companies are noted in the table.

### Semifinished Steel

Gross ton basis except wire rods, skelp  
Carbon Steel Ingots: F.o.b. mill base, re-rolling qual., stand. analysis, \$31.00  
(Empire Sheet & Tin Plate Co., Mansfield, O., may quote carbon steel ingots at \$33 gross ton, f.o.b. mill.)

Alloy Steel Ingots: Pittsburgh base, uncropped, \$45.00.

Re-rolling Billets, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Sparrows Point, Birmingham, Youngstown, \$34.00; Detroit, del. \$36.00; Duluth (bil.) \$36.00.

(Wheeling Steel Corp. allocated 21,000 tons 2" square, base grade re-rolling billets under leasehold during first quarter 1942 at \$37, f.o.b. Portsmouth, O.; Andrews Steel Co. may quote carbon steel slabs \$41 gross ton at established basing points.)

Forging Quality Billets: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, \$40.00; Detroit, del. \$42.00; Duluth, \$42.00.

(Andrews Steel Co. may quote carbon forging billets \$50 gross ton at established basing points.)

Open Hearth Shell Steel: Pittsburgh, Chicago, base 1000 tons one size and section: 3-12 in., \$52.00; 12-18 in., \$54.00; 18 in. and over, \$56.00.

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, \$54.00.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Point, Youngstown, \$34.00.

(Empire Sheet & Tin Plate Co., Mansfield, O., may quote carbon steel sheet bars at \$39 gross ton, f.o.b. mill.)  
Skelp: Pittsburgh, Chicago, Sparrows Pt., Youngstown, Coatesville, Ib., \$1.90.

Wire Rods: Pittsburgh, Chicago, Cleveland, Birmingham, No. 5—9/32 in., inclusive, per 100 lbs., \$2.00.  
Do., over 9/32—47/64-in., incl., \$2.15. Wor-

cester add \$0.10 Galveston, \$0.25. Pacific Coast \$0.50 on water shipment.

### Bars

Hot-Rolled Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, base 20 tons one size, 2.15c; Duluth, base 2.25c; Detroit, del. 2.25c; New York del. 2.51c; Phila. del. 2.49c; Gulf Ports, dock 2.50c, all-rail 2.59c Pac. ports, dock 2.50c; all rail 3.25c. (Phoenix Iron Co., Phoenixville, Pa., may quote 2.35c at established basing points.) Joslyn Mfg. Co. may quote 2.35c, Chicago base.)

Rail Steel Bars: Same prices as for hot-rolled carbon bars except base is 5 tons.  
(Sweet's Steel Co., Williamsport, Pa., may quote rail steel merchant bars 2.33c f.o.b. mill.)

Hot-Rolled Alloy Bars: Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 2.70c Detroit 2.80c.

	Alloy Diff.	S.A.E.	Alloy Diff.
2000.....	0.35	5100 Spr. flats.....	0.15
2100.....	0.75	5100 80-118 Cr.....	0.45
2300.....	1.70	6100 Bars.....	1.20
2500.....	2.55	6100 Spr. flats.....	0.85
3100.....	0.70	Carb., Van.....	0.85
3200.....	1.35	9200 Spr. flats.....	0.15
3300.....	3.80	9200 Spr. rounds.....	0.40
3400.....	3.20	squares.....	0.40
4100 15-25 Mo. 0.55 T	1.51-2.00	1300 Mn. mean.....	0.10
46.00 .20-.30 Mo. 1.51-2.00		Do., carbon under	0.20 max. .... 0.35
1.50-2.00; Ni. 1.20			

Cold-Finished Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base 20,000-39,999 lbs., 2.65c; Detroit 2.70.

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base 3.35c; Detroit 3.45c; Galveston, add \$0.25, Pacific Coast \$0.50.

Turned, Ground Shafting: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base (not including turning, grinding, polishing extras) 2.63c; Detroit 2.70c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base 2.15c; Detroit del. 2.25c; Gulf ports, dock 2.50c, all-rail 2.59c; Pacific ports, dock 2.80c, all-rail 3.25c.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, base 2.15c; Detroit, del. 2.25c; Gulf ports, dock 2.50c, all-rail 2.59c; Pacific ports, dock 2.80c, all-rail 3.25c.  
(Sweet's Steel Co., Williamsport, Pa., may quote rail steel reinforcing bars 2.33c, f.o.b. mill.)

Iron Bars: Single refined, Pitts, 4.40c, double refined 5.40c; Pittsburgh, staybolt, 5.75c; Terre Haute, common, 2.15c.

### Sheets, Strip

Hot-Rolled Sheets: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Pt., Middletown, base 2.10c; Granite City, base 2.20c; Detroit del. 2.20c; Phila. del. 2.28c; New York del., 2.35c Pacific ports 2.65c.  
(Andrews Steel Co. may quote hot-rolled sheets for shipment to Detroit and the Detroit area on the Middletown, O. base.)

Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.05c; Granite City, base 3.15c; Detroit del. 3.15c; New York del. 3.41c; Phila. del. 3.39c; Pacific ports, 3.70c.

Galvanized Sheets, No. 24: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base 3.50c; Granite City, base 3.60c; New York del. 3.74c; Phila. del. 3.63c; Pacific ports 4.05c.  
(Andrews Steel Co. may quote galvanized sheets 3.75c at established basing points.)

Corrugated Galv. Sheets: Pittsburgh, Chicago, Gary, Birmingham, 29 gage, per square 3.31c.  
Culvert Sheets: Pittsburgh, Chicago, Gary, Birmingham, 16 gage, not corrugated, copper alloy 3.60c; copper iron 3.90c, pure iron 3.95c; zinc-coated, hot-dipped, heat-treated, No. 24, Pittsburgh 4.25c.  
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 grade.....	3.20c	3.95c	3.30c
Armature.....	3.55c	4.30c	3.65c
Electrical.....	4.05c	4.80c	4.15c
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; Pacific ports 2.75c. (Joslyn Mfg. Co. may quote 2.30c, Chicago, base.)

**Cold Rolled Strip:** Pittsburgh, Cleveland, Youngstown, 0.25 carbon and less 2.80c; Chicago, base 2.90c; Detroit, del. 2.90c; Worcester base 3.00c.

**Commodity C. R. Strip:** Pittsburgh, Cleveland, Youngstown, base 3 tons and over, 2.95c; Worcester base 3.35c.

**Cold-Finished Spring Steel:** Pittsburgh, Cleveland bases, add 20c for Worcester; .26-.50 Carb., 2.80c; .51-.75 Carb., 4.30c; .76-1.00 Carb., 6.15c; over 1.00 Carb., 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 Terns:** Pittsburgh, Chicago, Gary, No. 24 unassorted 3.80c.

**Manufacturing Terns:** Pittsburgh, Chicago, Gary, 100-base box \$4.30; Granite City \$4.40.

**Roofing Terns:** Pittsburgh base per package 112 sheets, 20 x 28 in., coating I.C., 8-lb. \$12.00; 15-lb. \$14.00; 20-lb. \$15.00; 25-lb. \$16.00; 30-lb. \$17.25; 40-lb. \$19.50.

### Plates

**Carbon Steel Plates:** Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, Coatesville, Claymont, 2.10c; New York, del., 2.30-2.55c; Phila., del., 2.15c; St. Louis, 2.34c; Boston, del., 2.42-67c; Pacific ports, 2.65c; Gulf Ports, 2.45c. (Central Iron & Steel Co. may quote carbon steel plates at 2.35c at established basing points; Granite City Steel Co. may quote ship plates 2.25c, f.o.b. mill.)

**Floor Plates:** Pittsburgh, Chicago, 3.35c; Gulf ports, 3.70c; Pacific ports, 4.00c.

**Open-Hearth Alloy Plates:** Pittsburgh, Chicago, Coatesville, 3.50c.

**Wrought Iron Plates:** Pittsburgh, 3.80c.

### Shapes

**Structural Shapes:** Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.10c; New York, del., 2.28c Phila., del., 2.22c; Gulf ports, 2.45c; Pacific ports, 2.75c. (Phoenix Iron Co., Phoenixville, Pa. may quote carbon steel shapes at 2.30c at established basing points.)

**Steel Sheet Piling:** Pittsburgh, Chicago, Buffalo, 2.40c.

### Wire Products, Nails

**Wire:** Pittsburgh, Chicago, Cleveland, Birmingham (except spring wire) to manufacturers in carloads (add \$2 for Worcester): Bright basic, Bessemer wire 2.60c Galvanized wire 2.60c Spring wire 3.20c

**Wire Products to the Trade:** Standard and cement-coated wire nails, polished and staples, 100-lb. keg \$2.55 Annealed fence wire, 100 lb. 3.03 Galvanized fence wire, 100 lb. 3.40 Woven fence, 1 1/2 gage and lighter, per base column 67 Do., 11 gage and heavier 70 Barbed wire, 80-rod spool, col. 70 Twisted barless wire, col. 70 Single loop bale ties, col. 59 Fence posts, carloads, col. 69 Cut nails, Pittsburgh, carloads \$3.85

### Pipe, Tubes

**Welded Pipe:** Base price in carloads to consumers about \$200 per net ton. Base discounts on steel pipe Pittsburgh and Lorain, O.; Gary, Ind. 2 points less on lap weld, 1 O.; less on butt weld. Pittsburgh base only on wrought iron pipe.

Steel			Iron		
In.	Blk.	Galv.	In.	Blk.	Galv.
1/2	56	33	1/2	24	3 1/2
3/4 & 1	59	40 1/2	3/4	30	10

1/2.....	63 1/2	51	1-1 1/2.....	34	16
3/4.....	66 1/2	55	1 1/2.....	38	18 1/2
1-3.....	68 1/2	57 1/2	2.....	37 1/2	18

Steel				Iron			
In.	Blk.	Galv.	In.	Blk.	Galv.	In.	Blk.
2.....	61	49 1/2	1 1/4.....	23	3 1/2	2 1/2-3.....	64
2 1/2-3.....	64	52 1/2	1 1/2.....	28 1/2	10	3 1/2-6.....	66
3 1/2-6.....	66	54 1/2	2.....	30 1/2	12	7-8.....	65
7-8.....	65	52 1/2	2 1/2, 3 1/2, 3 1/2.....	31 1/2	14 1/2	9-10.....	64 1/2
9-10.....	64 1/2	52	4.....	33 1/2	18	11-12.....	63 1/2
11-12.....	63 1/2	51	4 1/2-8.....	32 1/2	17		
			9-12.....	28 1/2	12		

**Roller Tubes:** Net base prices per 100 feet, f.o.b. Pittsburgh in carload lots, minimum wall, cut lengths 4 to 24 feet, inclusive.

O. D.	SIZES	Seamless		Steel	Iron
		Hot	Cold		
1"	13	\$ 7.82	\$ 9.01		
1 1/4"	13	9.26	10.67		
1 1/2"	13	10.23	11.72	\$ 9.72	\$23.71
1 3/4"	13	11.64	13.42	11.06	22.93
2"	13	13.04	15.03	12.38	19.35
2 1/4"	13	14.54	16.76	13.79	21.63
2 1/2"	12	16.01	18.45	15.16	
2 3/4"	12	17.54	20.21	16.58	26.57
3"	12	18.59	21.42	17.54	29.00
3 1/4"	12	19.50	22.48	18.35	31.38
3 1/2"	11	24.63	28.37	23.15	39.81
4"	10	30.54	35.20	28.66	49.90
4 1/2"	10	37.35	43.04	35.22	
5"	9	46.87	54.01	44.25	73.93
6"	7	71.96	82.93	68.14	

### Rails, Supplies

**Standard rails,** over 60-lb., f.o.b. mill, gross ton, \$40.00.

**Light rails (billet),** Pittsburgh, Chicago, Birmingham, gross ton, \$40.00.

**\*Relaying rails,** 35 lbs. and over, f.o.b. railroad and basing points, \$28-\$30.

**Supplies:** Angle bars, 2.70c; tie plates, 2.15c; track spikes, 3.00c; track bolts, 4.75c; do. heat treated, 5.00c.

\*Fixed by OPA Schedule No. 46, Dec. 15, 1941.

### Tool Steels

**Tool Steels:** Pittsburgh, Bethlehem, Syracuse, base, cents per lb.: Reg. carbon 14.00c; extra carbon 18.00c; special carbon 22.00c; oil-hardening 24.00c; high carb.-chr. 43.00c.

High Speed Tool Steels:				
Tung.	Chr.	Van.	Moly.	Pitts. base, per lb.
18.00	4	1		67.00c
18.00	4	2	1	77.00c
18.00	4	3	1	87.00c
1.5	4	1	8.5	54.00c
	4	2	8	54.00c
5.50	4	1.50	4	57.50c
5.50	4.50	4	4.50	70.00c

### Stainless Steels

Base, Cents per lb.—f.o.b. Pittsburgh

CHROMIUM NICKEL STEEL					
Type	Bars	Plates	Sheets	H. R. Strip	C. R. Strip
302.....	24.00c	27.00c	34.00c	21.50c	28.00c
303.....	26.00	29.00	36.00	27.00	33.00
304.....	25.00	29.00	36.00	23.50	30.00
308.....	29.00	34.00	41.00	28.50	35.00
309.....	36.00	40.00	47.00	37.00	47.00
310.....	49.00	52.00	53.00	48.75	56.00
311.....	49.00	52.00	53.00	48.75	56.00
312.....	36.00	40.00	49.00		
*316.....	40.00	44.00	48.00	40.00	48.00
*317.....	50.00	54.00	58.00	50.00	58.00
*321.....	29.00	34.00	41.00	29.25	38.00
†347.....	33.00	38.00	45.00	33.00	42.00
431.....	19.00	22.00	29.00	17.50	22.50

STRAIGHT CHROMIUM STEEL					
Type	Bars	Plates	Sheets	H. R. Strip	C. R. Strip
403.....	21.50	24.50	29.50	21.25	27.00
**410.....	18.50	21.50	26.50	17.00	22.00
416.....	19.00	22.00	27.00	18.25	23.50
†420.....	24.00	28.50	33.50	23.75	36.50
430.....	19.00	22.00	29.00	17.50	22.50
†430F.....	19.50	22.50	29.50	18.75	24.50
442.....	22.50	25.50	32.50	24.00	32.00
446.....	27.50	30.50	36.50	35.00	52.00
501.....	8.00	12.00	15.75	12.00	17.00
502.....	9.00	13.00	16.75	13.00	18.00

**STAINLESS CLAD STEEL (20%)**  
304..... \$118.00 19.00  
\*With 2-3% moly. †With titanium. ‡With columbium. \*\*Plus machining agent. ††High carbon. †††Free machining. †††Includes annealing and pickling.

**Basing Point Prices** are (1) those announced by U. S. Steel Corp. subsidiaries for first quarter of 1941 or in effect April 16, 1941 at designated basing points or (2) those prices announced or customarily quoted by other producers at the same designated points. Base prices under (2) cannot exceed those under (1) except to the extent prevailing in third quarter of 1940.

**Extras** mean additions or deductions from base prices in effect April 16, 1941.  
**Delivered prices** applying to Detroit, Eastern Michigan, Gulf and Pacific Coast points are

deemed basing points except in the case of the latter two areas when water transportation is not available, in which case nearest basing point price plus all-rail freight may be charged.

**Domestic Ceiling prices** are the aggregate of (1) governing basing point price, (2) extras and (3) transportation charges to the point of delivery as customarily computed. **Governing basing point** is basing point nearest the consumer providing the lowest delivered price. **Emergency basing point** is the basing point at or near the place of production or origin of shipment.

**Dislocated tonnage:** Producers shipping material outside their usual marketing areas because of the war emergency may charge the basing point price nearest place of production plus actual cost of transportation to destination.

**Seconds** or off-grade iron or steel products cannot be sold at delivered prices exceeding those applying to material of prime quality.

**Export ceiling prices** may be either the aggregate of (1) governing basing point or emergency basing point (2) export extras (3) export transportation charges provided they are the f.a.s. seaboard quotations of the U. S. Steel Export Co. on April 16, 1941. **Domestic** or export extras may be used in case of Lease-Lend tonnage.

### Bolts, 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., 3/8 and 1/2 x 6-in. and shorter.....	63 1/2 off
Do., 3/4 to 1 x 6-in. and shorter.....	61 off
1 1/4 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 in 15,000 of 3-inch and shorter, or 5000 over 3-in.

Step bolts.....	58 off
Plow bolts.....	65 off

Nuts		
Semi-finished 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	per lb.
Square Head Set Screws	
Upset, 1-in., smaller.....	68 off
Headless, 1/2-in., larger.....	58 off
No. 10, smaller.....	60 off

### Piling

Pittsburgh, Chicago, Buffalo..... 2.40c

### Rivets, Washers

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham

Structural.....	3.75c
3/4-inch and under.....	65-5 off
Wrought washers, Pittsburgh, Chicago Philadelphia, to jobbers and large nut, bolt manufacturers l.c.l.....	\$2.75-3.00 off

### Metallurgical Coke

Price Per Net Ton	
Beehive Ovens	
Connellsville, furnace.....	\$6.00
Connellsville, foundry.....	7.00-7.50
Connellsville prem. fdry.....	7.25-7.60
New River, foundry.....	8.00-8.25
Wise county, foundry.....	7.50
Wise county, furnace.....	6.50

Hy-Product Foundry	
Kearny, N. J., ovens.....	12.15
Chicago, outside delivered.....	11.50
Chicago, delivered.....	12.25
Terre Haute, delivered.....	12.00
Milwaukee, ovens.....	12.25
New England, delivered.....	13.75
St. Louis, delivered.....	12.25
Birmingham, ovens.....	8.50
Indianapolis, delivered.....	12.00
Cincinnati, delivered.....	11.75
Cleveland, delivered.....	12.30
Buffalo, delivered.....	12.50
Detroit, delivered.....	12.25
Philadelphia, delivered.....	12.98

### 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 hold face, delivered light face.

	No. 2 Foundry	Basic	Bessemer	Malleable
<b>Bethlehem, Pa., base</b>	\$25.00	\$24.50	\$26.00	\$25.50
Newark, N. J., del.	26.62	26.12	27.62	27.12
Brooklyn, N. Y., del.	27.65			28.15
<b>Birdsboro, Pa., del.</b>	25.00	24.50	26.00	25.50
<b>Birmingham, base</b>	\$20.38	\$19.00		
Baltimore, del.	25.67			
Boston, del.	25.12			
Chicago, del.	\$24.47			
Cincinnati, del.	24.30	22.92		
Cleveland, del.	24.12	23.24		
Newark, N. J., del.	26.24			
Philadelphia, del.	25.51	25.01		
St. Louis, del.	\$24.12	23.24		
<b>Buffalo, base</b>	24.00	23.00	25.00	24.50
Boston, del.	25.50	25.00	26.50	26.00
Rechester, del.	25.53		26.53	26.03
Syracuse, del.	26.08		27.08	26.58
<b>Chicago, base</b>	24.00	23.50	24.50	24.00
Milwaukee, del.	25.17	24.67	25.67	25.17
Muskegon, Mich., del.	27.38		27.38	
<b>Cleveland, base</b>	24.00	23.50	24.50	24.00
Akron, Canton, O., del.	25.47	24.97	25.97	25.47
<b>Detroit, base</b>	24.00	23.50	24.50	24.00
Saginaw, Mich., del.	26.45	25.95	26.95	26.45
<b>Duluth, base</b>	24.50		25.00	24.50
St. Paul, del.	26.76		27.26	26.76
<b>Erie, Pa., base</b>	24.00	23.50	25.00	24.50
<b>Everett, Mass., base</b>	25.00	24.50	26.00	25.50
Boston	25.50	25.00	26.50	26.00
<b>Granite City, Ill., base</b>	24.50	23.50	24.50	24.00
St. Louis, del.	24.50	24.00		24.50
<b>Hamilton, O., base</b>	24.00	23.50		24.00
Cincinnati, del.	24.68	24.68		25.35
<b>Neville Island, Pa., base</b>	24.00	23.50	24.50	24.00
†Pittsburgh, del.				
No. & So. sides	24.69	24.19	25.19	24.69
<b>Provo, Utah, base</b>	22.00			
<b>Sharpsville, Pa., base</b>	24.00	23.50	24.50	24.00
<b>Sparrows Point, Md., base</b>	25.00	24.50		
Baltimore, del.	26.05			
<b>Steelton, Pa., base</b>		24.50		25.50
<b>Swedeland, Pa., base</b>	25.00	24.50	26.00	25.50
Philadelphia, del.	25.89	25.39		26.39
<b>Toledo, O., base</b>	24.00	23.50	24.50	24.00
Mansfield, O., del.	26.06	25.56	26.56	26.06
<b>Youngstown, O., base</b>	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, .84; 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	9.01-9.50 \$35.50
7.01-7.50	31.50	9.51-10.00 36.50
7.51-8.00	32.50	10.01-10.50 37.50
8.01-8.50	33.50	10.51-11.00 38.50
8.51-9.00	34.50	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 Ferrosilicon

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.		31.54

Southern	f.o.b. blast, high phos.	\$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; \$30.81 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%).

**Phosphorus Differential:** Basing point prices are subject to a reduction of 38 cents a ton for phosphorus 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%.

**Ceiling 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.

**Exceptions to Ceiling Prices:** Pittsburgh Coke & Iron Co. (Sharpsville, Pa. furnace only) and Struthers Iron & Steel Co. may charge 50 cents a ton in excess of basing point prices for No. 2 Foundry, Basic, Bessemer and Malleable.

**Export Prices:** In case of exports only, the governing basing point nearest point of production may be used, plus differentials and export transportation charges.

# Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick Super Quality	Pa., Mo., Ky.	\$64.60
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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

First quality	Ohio	43.00
Intermediate		36.10
Second quality		36.00

## Malleable Bank 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. Chewelsh, 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., tide, 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

<b>Ferromanganese, 78-82%</b>	Less than 200-lb. lots	14.25c
Carlots, duty pd., seab'd.	67-72% low carbon, cts. per pound:	
Carlots, del. Pittsburgh		125.63
Carlots, f.o.b. So. f'ces.		140.00
Add \$10 for ton, \$13.50 for less ton, \$18 for less than 200-lb. lots.		
<b>Spiegel Eisen, 19-21% gross ton, Palmerton</b>		\$36.00
<b>Manganese Briquets, Contract</b>		
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.		
<b>Manganese Electro, 99.9+%, less car lots</b>		42.00c
<b>Chromium Metal, per lb. contained chromium</b>		
Contract	Spot	
98% Cr. ton lots	80.00c	85.00c
88% Cr. ton lots	79.00c	84.00c
<b>Ferrocolumbium, 50-60% f.o.b. Niagara Falls, per lb. contained Cr on contract</b>		\$2.25
Less-ton lots		2.30
(Spot 10c higher)		
<b>Chromium Briquets, per lb., freight allowed</b>		
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
<b>Ferrochrome, 66-70% freight allowed, 4-6% carbon, per pound contained (chrome)</b>		
Carloads	13.00c	
Ton lots	13.75c	
Less-ton lots	14.00c	

50%	Carloads	Ton lots	Less ton lots	1.25
Unitage	\$ 74.50	\$87.00	20-25% C. 0.10 max., in ton lots per lb. contained	
75%	1.50	1.75	Ti	1.35
Unitage	1.80	2.00	Less-ton lots	1.40
85%	170.00	188.00	(Spot 5c higher)	
Unitage	2.00	2.20	<b>Ferro-Carbon-Titanium, 15-20% Titanium,</b>	
90-95%	10.25c	11.25c	6-8% C	3-5% C
(Above for contracts; spot ¼c higher)			Carlots, contract, f.o.b. Niagara Falls, freight allowed to destinations east of Mississippi and north of Baltimore and St. Louis	\$142.50
<b>Silicon Metal, Spot ¼-cent higher (Per Lb., Contracts):</b>			1% Iron	2% Iron
Carlots	14.50c	13.00c	Less-ton lots	13.50c
Ton lots	15.00c	13.50c	Less-ton lots	13.75c
Less-ton lots	15.25c	14.00c	Less 200 lbs.	15.50c
Less 200 lbs.	15.50c	14.00c	<b>Silicon Briquets, Contract</b>	
<b>Silicon Metal, Spot ¼-cent higher (Per Lb., Contracts):</b>			carloads, bulk freight allowed, per ton	\$74.50
Carlots	14.50c	13.00c	Packed	80.50
Ton lots	15.00c	13.50c	Ton lots	84.50
Less-ton lots	15.25c	14.00c	Less-ton lots, per lb.	4.00c
Less 200 lbs.	15.50c	14.00c	Less 200-lb. lots	4.25c
<b>Silicomanganese,</b>			Spot ¼c higher on less ton lots; ¾c higher on ton lots and over.	
Carbon	1¼%		<b>Silicon Metal, Spot ¼-cent higher (Per Lb., Contracts):</b>	
Carloads			Carlots	14.50c
(contract)	\$128.00		Ton lots	15.00c
Ton Lots			Less-ton lots	15.25c
(contract)	140.50		Less 200 lbs.	15.50c
Freight allowed spot \$5 above contract			<b>Silicomanganese,</b>	
<b>Ferrotungsten, (All prices nominal) Carlots, per lb. contained tungsten</b>		\$1.90	Carbon	1¼%
<b>Tungsten Metal Powder, (Prices Nominal) 98-99 per cent, per pound, depending upon quantity</b>		\$2.55-\$2.65	Carloads	
<b>Ferrotitanium, 40-45% f.o.b. Niagara Falls, per lb. contained in ton lots</b>		\$1.23	(contract)	\$128.00

# WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials. As of April 16, 1941

	Soft Bars	Hot-rolled Strip		Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets			Cold Rolled Strip	Cold Drawn Bars		
		Bands	Hoops				Hot Rolled	Cold Rolled	Galv. No. 24		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	...	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	3.42	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	...	...
Chattanooga*	3.80	4.00	4.00	3.85	3.85	5.80	3.75	...	4.50	...	4.39	...	...
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	4.20	4.25	...	4.75	4.45	6.00	4.65	7.00	5.70	...	5.75	...	...
Los Angeles	4.50	4.95	6.80	4.50	4.50	6.75	4.65	6.50	5.85	...	6.10	10.35	9.55
San Francisco	3.95	4.50	6.25	4.65	4.35	6.35	4.55	6.40	6.10	...	6.80	10.80	9.80

\*Not named in OPA price order.

## 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, 500-999, Los Angeles, 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)

	S.A.E. Hot-rolled Bars (Unannealed)				
	1035-1050 Series	2300 Series	3100 Series	4100 Series	6100 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	3.35	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	5.85	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	...	8.00	7.85	8.65
Los Angeles	4.80	9.55	8.55	8.40	8.80
San Francisco	5.45	9.80	8.80	8.65	9.05

## EUROPEAN IRON, STEEL PRICES

Dollars at \$4.02½ per Pound Sterling

Export Prices f.o.b. Port of Dispatch—

By Cable or Radio

### BRITISH Gross Tons f.o.b. U.K. Ports

	£	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	5 6.20	1	10 9

British ferromanganese \$120.00 delivered Atlantic seaboard duty-paid.

### Domestic Prices Delivered at Works or Furnace—

	\$25.79	£	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	7.36	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††
Shapes	2.77c	15	8	0††
Ship plates	2.91c	16	3	0††
Boiler plates	3.06c	17	0	6††
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	3.30c	18	7	0

(a) del. Middlebrough 3s rebate to approved customers. ††Rebate 15s on certain conditions.

## Ores

### Lake Superior Iron Ore Gross ton, 51½% Lower Lake Ports

Old range bessemer	\$4.75
Mesabi nonbessemer	4.45
High phosphorus	4.35
Mesabi bessemer	4.60
Old range nonbessemer	4.60

### Eastern Local Ore Cents. unit, del. E. Pa. 63%, contract

Foundry and basic 56-63%, contract	12.00
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### Foreign Ore Cents per unit, c.i.f. Atlantic ports

Manganiferous ore, 45-55% Fe., 6-10% Mang. N African low phos.	Nom.
Spanish, No. African basic, 50 to 60%	Nom.
Chinese wolframite, net ton, duty pd.	\$24.00
Brazil iron ore, 68-69% ord.	7.50c
Low phos. (.02 max.) F.O.B. Rio Janeiro	8.00c
Scheelite, imp.	23.50-24.00

### Chrome Ore Gross ton c.i.f. Baltimore; dry basis; subject to penalties for guarantees

Indian and African, 2.8:1 lump, 48%	\$39.00
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South African (excluding war risk)	
No ratio lump, 44%	28.00
Do., 45%	29.00
Do., 48%	34.00
Do., concentrates, 48%	33.00
Do., 50%	34.00

Brazilian (nominal)	
2.5:1 lump, 44%	31.00
2.8:1 lump, 44%	32.50
3:1 lump, 48%	41.00
No ratio lump, 48%	35.00-35.50
Do., concentrate, 48%	33.00-33.50

Philippine (nominal)	
No ratio lump, 45%	32.00
2.8:1 lump, 48%	40.00
Do., concentrate, 48%	39.00
2.5:1 concentrate, 48%	36.50
No ratio concentrate, 48%	34.00
No ratio lump, 48%	35.00

Rhodesian	nominal
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### Manganese Ore

Including war risk but not duty, cents per unit cargo lots	
Caucasian, 50-52%	65.00
S. African, 48%	66.00
Indian, 50%	66.00
Brazilian, 48%	...
Chibean, 48%	...
Cuban, 51%, duty free	83.00-85.00

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												
	OPEN HEARTH GRADES*	Machine Shop Turnings	BLAST FURNACE GRADES*	Low Phos. Grades	Billet, Bloom, Forge Crops	Heavy Structural, Plate	3 ft. and less	2 ft. and less	1 ft. and less	Cut Auto Scrap	Alloy-Free Low Phos. & Sulphur Turnings	First Cut Heavy Axle & Forge Turnings	Electric Furnace Bundles
Pittsburgh, Brackenridge, Butler, Johnstown, Midland, Monessen, Sharon, Steubenville, Weirton, Canton, Youngstown, Warren, Claymont, Coatesville, Harrisburg, Conshohocken, Phoenixville	\$20.00	\$16.00	\$16.00	\$25.00	\$22.50	\$21.50	\$20.00	\$20.50	\$21.00	\$20.00	\$18.00	\$19.50	\$21.00
Bethlehem	18.75	14.75	14.75	23.75	20.75	20.75	18.75	19.25	20.25	18.75	16.75	18.25	19.75
Buffalo	19.25	15.25	15.25	24.25	21.75	20.75	19.25	19.75	21.25	18.25	17.25	18.75	20.25
Cleveland, Middletown, Cinchinnati, Portsmouth, Ashland	19.50	15.50	15.50	22.00	20.00	21.00	19.50	20.00	21.50	18.50	17.50	19.00	20.50
Detroit	17.85	13.85	13.85	22.85	20.35	19.35	18.85	18.35	19.85	17.85	15.85	17.35	18.85
Picudo	18.75	14.75	14.75	23.75	21.25	20.75	19.75	19.25	20.75	18.75	16.75	18.25	19.75
Chicago	18.25	14.25	14.25	23.25	20.75	19.75	18.75	18.25	20.25	18.25	16.25	17.75	19.25
Kokomo	18.00	14.00	14.00	23.00	20.50	19.50	18.50	18.00	20.00	18.00	16.00	17.50	19.00
Duluth	17.50	13.50	13.50	22.50	20.00	19.00	18.00	17.50	19.50	17.50	15.50	17.00	18.50
St. Louis	17.00	13.00	13.00	22.00	19.50	18.50	17.50	17.00	19.00	17.00	15.00	16.50	18.00
Birmingham, Atlanta, Alabama City, Los Angeles, San Francisco, Pittsburg, Calif., Minnetonka, Colo.	16.50	12.50	12.50	21.50	19.00	18.00	17.00	16.50	18.50	16.50	14.50	16.00	17.50
Seattle	14.50	10.50	10.50	19.50	17.00	16.00	15.00	14.50	16.50	14.50	12.50	14.00	15.50
Portland, Ore.	.....	.....	.....	.....	15.50	14.50	13.50	13.00	15.00	13.00	11.00	12.50	14.00

## RAILROAD SCRAP

	Heavy Melting Steel	Scrap Ralls	2 ft. and under	18 in. and under
Pittsburgh, Wheeling, Steubenville, Sharon, Youngstown, Canton	21.00	23.50	24.00	24.50
Philadelphia, Wilmington, Sparrows Point	19.75	22.25	22.75	23.25
Cleveland, Cinchinnati, Middletown, Ashland, Portsmouth	20.50	23.00	23.50	24.00
Chicago	19.75	22.25	22.75	23.25
Buffalo	20.25	22.75	23.25	23.75
Detroit	18.25	21.75	22.25	22.75
Pittsburgh	16.50	21.25	21.75	22.25
Kokomo	19.00	21.75	22.25	22.75
Duluth	17.00	20.00	20.50	21.00
Kansas City, Mo.	18.00	21.00	21.50	22.00
St. Louis	18.50	20.50	21.00	21.50
Birmingham	18.00	20.00	20.50	21.00
Los Angeles, San Francisco	18.00	20.50	21.00	21.50
Seattle	15.50	18.00	18.50	19.00

## CAST IRON SCRAP OTHER THAN RAILROAD

(Shipping point prices in gross tons)	Group A	Group B	Group C
No. 1 Cupola Cast	\$18.00	\$19.00	\$20.00
No. 1 Machinery Cast, Drop Broken, 150 lbs. & Under	18.00	19.00	20.00
Clean Auto Cast	18.00	19.00	20.00
Stove Plate	18.00	19.00	20.00
Unstripped Motor Blocks	17.50	18.50	19.50
Heavy Breakable Cast	17.50	18.50	19.50
Charging Box Size Cast	17.00	18.00	19.00
Miscellaneous Malleable	20.00	21.00	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, dealers No. 1 bundles, dealers No. 2 bundles and No. 1 busheling. Blast Furnace Grades refer to mixed borings and turnings, slowning turnings, No. 2 busheling and cast iron borings. Add \$5 for chemical borings and turnings, slowning turnings, No. 2 busheling and cast iron borings. A basing point includes the switching district of the city named. The Pittsburgh basing point includes the switching districts of Bessemer, Homestead, Duquesne, Munhall and McKeesport, Pa. Cinchinnati 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 crops and electric furnace bundles may exceed open hearth price, and electric furnace bundles may exceed blast furnace price, if material is delivered to the consumer direct from the original industrial producer.

Commission: No commission is payable except by a consumer to a broker for services rendered. The commission to exceed 50 cents per gross ton. No commission is payable unless: The broker guarantees the quality and delivery of an agreed tonnage the scrap is purchased at a price no higher than the maximum allowed; the broker sells the scrap to the consumer at the same price at which he purchased it; or the broker does not split the commission with the seller of the scrap, with another broker or sub-broker, or with the consumer. Commissions must be shown as separate item on invoice. 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 prices 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 within the basing point; and (2) for shipping points located outside a basing point, the price 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, \$6.65 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 (plus freight rate increase March 18, 1942) the prices listed in the table for the nearest basing point. Certain exceptions specified in Revised Price Schedule No. 4 (Amendment 1) 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 Pittsburg and to shipments of electric and foundry grades from Michigan; to shipments of turnings to ferroalloy producers and of borings to chemical users. Delivered prices of scrap shipped under WPB allocations may exceed prices at nearest basing point by more than \$1, provided most economical transportation is used.

Unprepared Scrap: Above prices are for prepared scrap. Maximum prices for unprepared scrap are \$2.10 less (railroad grades \$3.50 less) than for the corresponding grades of prepared scrap, except for heavy breakable cast. 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, Washington 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. Colorado scrap is remove scrap for Colorado consumers only.

## Sheets, Strip

Sheets & Strip Prices, Page 126

Sheet sellers do not expect much contraction of demand for steel sheets as a result of the further curtailment of durable consumer goods production. So much already has been done in cutting off civilian goods manufacture that the remaining cut is small. Despite this, sheet bookings are heavier than ever and deliveries cannot be promised much below A-1.

A recent feature in war demand is for airplane landing mesh and it is estimated fully 10,000 tons is being figured. One type calls for 1 x 3/16-inch flats. Most of this demand bears A-1-c priority.

Narrow cold strip orders are about equal to shipments, with bookings growing heavier. Little hot-rolled strip is available for re-rollers below A-2 and alloy material is being allocated. Buying runs heavily to high-carbon stock and deliveries are being extended, especially on heat-treated material. Some cancellations have followed restrictions on durable consumer goods.

## Plates

Plate Prices, Page 127

Diversion of many plate requirements to strip mills still leaves plate mills in a position where they can turn out little under A-1-a priority. As strip-plate production continues to expand and high-rated consumer industries attain better inventory position the burden on sheared plate mills may be eased.

Plate allocations in March were fairly satisfactory and it is understood producers shipped 15,000 tons in excess of the schedule. The quota has been raised 15,000 tons for April.

Demand for high-rated miscellaneous fabricated work is heavy, with orders accumulating in the A-1 group, notably among boiler shops and fabricators of large tanks. Substantial tonnage of tank work in lower priorities is being held up and numerous storage units are being redesigned for reinforced concrete. Used plates normally going to scrap, are being bought frequently for refabrication. Floor plates are active and deliveries have lengthened to 10 or 12 weeks, direct orders to mills limiting volume available to warehouses.

Plate tonnage allocated to New England shipyards in April is less than in March, some estimates placing it at about 60 per cent.

Share of plate output coming from the stripsheet mills continues to build up. Figures released by the American Iron & Steel Institute show a sharp decline in sheet output from a year ago, and this tonnage presumably represents plate output. The total is now better than 400,000 tons per month from these mills. This figure, incidentally, was mentioned in error in the issue of March 9 as being an annual output.

March plate production, according to government figures, totaled

878,728 tons, compared with 758,723 tons in the preceding month. Production of strip plate amounted to 306,195 tons, against 268,988 tons in February. April production was scheduled to exceed that of March, despite one less working day. Shipyards in March received 30 per cent more tonnage than in the preceding month.

## Bars

Bar Prices, Page 126

Demand for steel bars for war needs is increasing, new orders for shell steel being imposed on larger specifications against old orders. Most shell steel is cold-finished

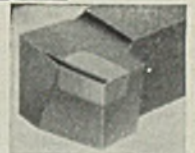
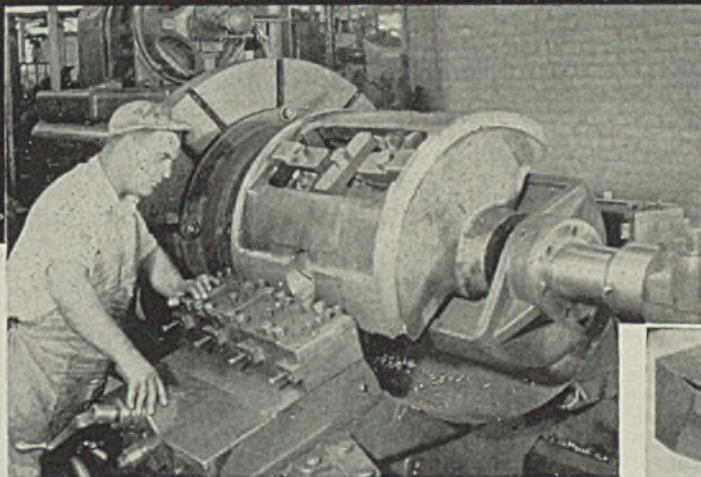
open-hearth material of heat treating grades. The best most producers can do on hot-rolled bars is 60 to 75 days on high ratings. Deliveries of bessemer steel bars are about the same, heavy demand for the latter narrowing the former spread.

Heavy allocations of heat-treated alloy bars for Russia under lend-lease have been given preference in rolling and have deferred deliveries of high-rated domestic tonnage in the case of several producers. Some eastern mills now have orders extending through third and into fourth quarter.

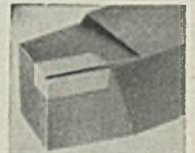
Purchases of steel bars, notably alloys, by arsenals is heavy, prob-

# Interrupted Cuts — WON'T INTERRUPT PRODUCTION

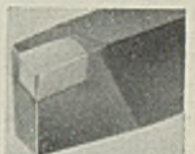
## When KENNAMETAL is in the tool rest



STYLE 21 TOOL



STYLE 11 TOOL



STYLE 19 TOOL

Because of its superior tensile strength (305,000 lbs. per sq. in.) KENNAMETAL can be used in making interrupted cuts without danger of tool breakage. The illustration shows four KENNAMETAL Style 11 tools machining a cast armor steel tank rotor on a 48" x 84" engine lathe. Turning speed is 165 surface ft./min. with a feed of 0.014" per rev. and a depth of cut ranging from 1/4 to 1/2". Large 1" x 2" tool shanks are employed to provide adequate support for the KENNAMETAL tips and the tools are staggered so that only one tool hits the work at a time.

If interrupted or jump cuts are causing excess tool breakage and consequent delays in your plant, investigate the superior strength, hardness and crater resistance of KENNAMETAL. Write for free copy of the new vest pocket manual for KENNAMETAL users. It explains in detail how to get the utmost in production from your KENNAMETAL tools.



### MCKENNA METALS Co.

200 LLOYD AVE., LATROBE, PENNA.

Foreign Sales: U. S. STEEL EXPORT CO., 30 Church St., New York  
(Exclusive of Canada and Great Britain)



ably the highest for war-time operations to date, practically all shops in the east placing large tonnages, 1600 tons of alloy for Frankford going to LaSalle Steel Co., Chicago, at 5.22c at a recent opening.

## Pipe

Pipe Prices, Page 127

Decline in general building construction, with a further deep cut resulting from the recent order of War Production Board stopping all nonessential building cuts deeply into the use of merchant pipe. Various large war projects will require much pipe but restriction on general building is expected to be felt keenly.

Boiler and mechanical tubing is in heavy demand but with orders now governed more strictly by high priority deliveries are not as extended as early in the year. One large producer can offer deliveries on most of its A-1 priorities in four to five weeks. Airplane tubing is governed largely by direct allocation.

Second quarter steel pipe quotas are being taken by distributors with indications that full requirements of lap-weld will be harder to fill and direct mill shipments heavier. Less pipe will be available to warehouses under the blanket quota and current sales are geared to replacements with high ratings.

Cast pipe buying is limited except for high-rated tonnages for which pig iron allocations are being made monthly.

## Wire

Wire Prices, Page 127

Bookings by most wire mills this month are substantially ahead of shipments. Much of current orders is for extended delivery in specified quantities into fourth quarter and beyond, with better than A-1-j rating. High carbon material predominates and two to five heat treatments are frequently required. Flat wire is in less demand than round. Rod supplies are less than requirements and sufficient only for higher priorities, this being true of integrated mills as well as non-integrated.

Specifications for normal needs are being revised frequently, bright wire being substituted for tinned and steel is replacing copper, brass and aluminum wire. Alloy requirements are being eliminated where possible.

## Rails, Cars

Track Material Prices, Page 127

Control of production and allocation of locomotives, freight and passenger cars is being assumed by War Production Board. All finished units in hands of builders have been frozen and a schedule will govern deliveries regardless of previous preference ratings.

WPB is expected to issue an order shortly limiting purchase of new rails to tonnages equal to relaying rails returned by the rail-

roads. Scarcity of the latter is believed to have brought about this move. Relayers are needed for tracklaying at government projects where they serve as well as new steel.

Federal court has given the St. Louis Southwestern permission to sell two lots of 85-pound relaying rails and accessories, totaling 3064 tons, to the United States government at \$28 per ton. These rails will be used at government ordnance plants.

## Reinforcing Bars

Reinforcing Bar Prices, Page 127

A large tonnage of reinforcing bars is backing up because ratings are too low for mills to consider it. Under these circumstances suppliers are competing keenly for work carrying A-1 priority. Most present demand is for government work. Curtailment of private construction by WPB probably will make little difference in the situation.

## Structural Shapes

Structural Shape Prices, Page 127

Fabricators generally regard halting of nonessential construction as of little importance as their bookings are about 90 per cent or better for war construction. Nonrated work for some time has been negligible. Some private work has come out recently without rating but has not been considered.

Demand for fabricated steel has increased recently, due to a number of war orders and as a result deliveries are possible only at higher ratings. Heavy demand is met for steel piling, all under top rating.

WPB has issued an order halting nonessential construction using materials needed for war. Buildings costings less than \$500 are exempt, as are needs for maintenance and repair. Commercial, industrial, institutional or highway utility projects costing \$5000 and upward may not be started except on specific authority.

## Pig Iron

Pig Iron Prices, Page 128

Pig iron supply is in easier situation than in other branches of the steel and iron industry. While steel deliveries are confined in general to A-3 priority or better, pig iron allocations in some instances reach to A-10 and occasionally some iron is shipped on B classifications for repair and replacements.

A blast furnace in the East which had planned to blow out for relining in May has postponed that action for about a month. Some foundries have had difficulty obtaining war work while others have developed much and some whose normal production falls into war requirements, such as pressure pipe makers, have abundant work. One foundry of the latter class, with a blast furnace connection of its own, made application this month for

pig iron shipments from other producers.

Pig iron producers in the East who consume much imported ore have appealed to Washington for lower freight rates on iron ore from Gulf ports to their furnaces. Instead of unloading at Baltimore as usual, many ships are landing at New Orleans and Mobile, because of submarine threats in the Atlantic, which means a long rail haul. A commodity rate is being sought to supplant the class rates in effect.

In general, allocations are providing sufficient supply but Ohio river consumers of southern iron find supply somewhat slow, though not yet sufficiently delayed to hamper operations.

## Higher Pig Iron Price Requested by Mystic

Application by Mystic Iron Works, Everett, Mass., for a higher price on pig iron than the present ceiling is being considered by Office of Price Administration. It is possible other requests for a higher price are on their way to Washington but have not been received.

E. & G. Brooke Iron Co., Birdsboro, Pa., had been permitted to charge more than the maximum price but the \$1 premium was withdrawn. At the moment it is said no producers are charging more than the maximum set by OPA.

## Scrap

Scrap Prices, Page 130

Steelmaking scrap supply continues to increase, as a result of better weather conditions and intensive drives to pry loose dormant supplies in various directions. Material from automobile wrecking operations is coming out steadily and is expected to continue for some time, until the supply is exhausted. Fewer cars will go into wreckers' hands this year, it is believed, as cars will be kept in service as long as possible.

Freer flow of automobile engine blocks is helping the cast scrap situation. Low phosphorus scrap continues scarce and electric and acid furnace operators have difficulty obtaining plate scrap sufficient for an economical charge.

A direct reflection of the better supply is the increased rate of operation by steelmakers in several districts where open hearths had been idle for lack of material. Buffalo consumers have improved their condition materially and expected shipments from the head of the lakes is relied on to keep them supplied through the navigation season.

OPA officials in charge of scrap express satisfaction with the situation and contend that the industry must be satisfied, in view of the volume being supplied. The price schedule has been in effect for a year, being one of the first to be promulgated, though it has been amended several times. No revision in grades or prices is under consideration.

Used rails sold for structural

purposes, fence posts and similar uses, are to be sold at maximum prices provided in price schedule No. 4, applying to scrap materials, and not under schedule No. 46, relaying rails, according to a ruling by OPA. Schedule No. 46 applies only to rails actually to be used for relaying. It was also held that freight rates on relaying rails apply when they are to be relaid rather than rates on scrap rails.

A movement is on foot in New England to reclaim an estimated 100,000 tons of abandoned street railway rails. At Portland, Me., 2800 tons will be removed by WPA. Excess of cost over selling price will be absorbed by WPA. Wrecking of the Atlantic avenue elevated structure in Boston has been started, about 9000 tons to be salvaged.

## Iron Ore

Iron Ore Prices, Page 129

Lake Superior iron ore has been placed under a price ceiling by Office of Price Administration at approximately the level of last season's price. Regulation No. 113, effective April 10, provides that the published Lake Erie 1941 season price of \$4.45 per gross ton for Mesabi nonbessemer ore, 51.50 per cent iron content, delivered at lower lake ports is recognized as the base for relating prices of other grades. Sales of ore under continuing long-term contracts at prices exceeding those at which deliveries were made last season are forbidden. Since the greater part of all market ore normally moves under long-term contracts the 1942 price will be substantially unchanged from 1941.

In renewing long-term contracts which have expired the seller must base his maximum price on the weighted average price of spot sales in 1941. "Escalator" clauses are rendered inoperative for price purposes. Where they were in effect in 1941 the 1942 price can be no higher than last year.

Sales f.o.b. upper lake ports can not exceed the lower lake price less lake freight. Sales at mine cannot exceed the lower lake prices less lake and rail freight.

One from mines idle in 1940 and 1941, with shipments only from stockpiles, may be at the equivalent of \$4.45, delivered lower lake ports for the base grade. Before making sales on this basis the producer must obtain written OPA permission. Producers selling no ore in 1941 must price ore at a figure not above the weighted average spot price of a seller situated in substantially similar circumstances. OPA will furnish this information.

The new regulation applies only to market, merchant and noncaptive ore. Action on captive ore prices will follow investigation of that situation.

Three ore-carrying interests have advanced rates three cents per ton on iron ore from Lake Superior ports to lower lakes ports, from 77 to 80 cents. Rates from Marquette and Escanaba are expected to be raised a proportionate amount.

## Pacific Coast

Seattle—Two major projects in the Pacific Northwest are under way, the \$20,000,000 gun relining plant in Idaho and an \$18,500,000 housing contract at Vancouver, Wash. Morrison-Knudsen Co., Boise, Idaho, has been instructed to proceed with the former job and temporary buildings are already under construction. At Vancouver, bids are in for the first units. Construction contracts have been awarded by Kaiser & Co. for a large shipyard in Oregon. United States engineer, Seattle, has awarded contracts to Sound Construction & Engineering Co., Seattle, A. G. Homann,

Olympia, Hansen & Weidner, Spokane, and others for various buildings in this area, details a military secret.

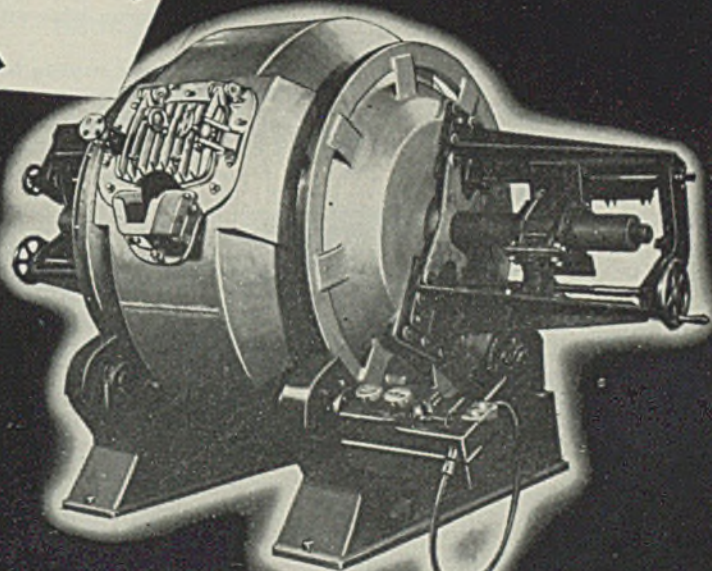
Tacoma is considering bids for the \$11,000,000 second Nisqually power project. Guy F. Atkinson Co., San Francisco, offered on a cost-plus basis, estimated at \$6,768,361, but this is not acceptable to the board. L. E. Dixon, Los Angeles, the only other bidder, asks \$7,747,440, in excess of funds available. Pennsylvania Transformer Co. is low, \$88,182, for six transformers and Allis-Chalmers Mfg. Co. is low at \$80,880, for another group of four units.

Placement of high priority ton-

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The Detroit Furnace is a most useful metallurgical foundry production tool. Today, when armament production is so vital, the importance of Detroit Furnace speed, flexibility and economy stands at an all time high. These inherent characteristics of the Rocking Electric Furnace result in lower metal losses, thorough uniformity, better quality and greater economy. For all around performance you simply cannot beat a Detroit Furnace. It does more things better.

Write for further facts or better still let us arrange for you to see a few of these furnaces in operation and talk to their owners yourself. Get the low-down first hand from those who know.



**DETROIT** ELECTRIC FURNACE DIVISION  
 KUHLMAN ELECTRIC COMPANY • BAY CITY MICHIGAN

nages of shapes and concrete bars is keeping backlogs at high levels. Bethlehem Steel Co. has booked about 20,000 tons of reinforcing bars for defense projects, these being expansion of original contracts and is low for 1000 tons of shapes for power stations for Bonneville Power Administration. Northwest Steel Rolling Mills has taken 500 tons of merchant bars and 200 tons of reinforcing for various military jobs. Columbia Steel has the award for 1251 tons of shapes for 14 bridges for the Alaska Road Commission and Pacific Car & Foundry Co. has taken 600 tons for various defense projects. Alaska Road Commission, Seattle, will receive bids April 10

for about 100 tons of corrugated metal culvert pipe.

Scrap buyers report the market easier, receipts increasing. This is due both to improved weather conditions and better understanding of regulations. Dealers seem more reconciled to the situation, although claiming there is not sufficient margin to permit them to prepare material for use. Mills and foundries are consuming large quantities of scrap and are unable to increase inventories.

### Canada

Toronto, Ont.—As a result of action taken by the Canadian steel

controller, orders totaling upward of 500,000 tons of steel have been canceled by steel producers in this country. Despite these big cancellations mill backlogs continue at record levels. While Canada's steel making capacity has been substantially increased in the past two years, output still falls far short of meeting even war requirements and many war industries are operating at less than 75 per cent capacity.

Production of plates is being stepped up and one mill with rated capacity of 15,000 tons per month, last month produced upward of 22,000 tons. It also is reported that shipbuilders are to proceed with construction of war vessels which were held in abeyance due to shortage of steel and preference given to merchant vessels. The government is taking practically all plate output, and also is giving close supervision to sheet and strip sales.

Merchant bar demand continues at record level with deliveries being pushed farther back, to the end of the year. Inquiries for bars are in large volume but orders being accepted are only those directly associated with war work.

Structural steel fabricators are maintaining capacity production, with backlogs running to the end of the year. Some 20,000 tons are pending in connection with recently announced plant expansions.

Merchant pig iron sales are better than 8000 tons weekly. Improvement is reported in iron and steel scrap offerings. Some betterment is reported from rural districts where collections of agricultural scrap are being made and some auto wreckers are providing fair tonnage.

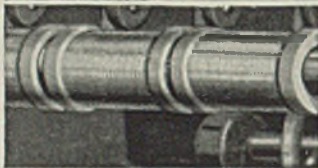
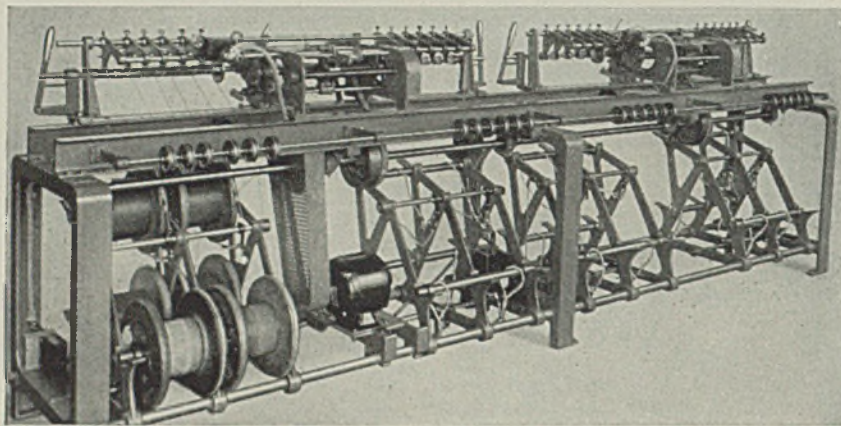
### Steel in Europe

Foreign Ore Prices, Page 129

London—(By Cable).—Great activity is being manifested in the steel and iron market during second quarter. Pig iron from domestic ore and coke supplies is plentiful. Semi-finished steel output is expanding. Demand continues intense for ship steel, boiler and tank plates, colliery and railroad material. Demand for special alloy steels is light. Foundries are slightly more active.

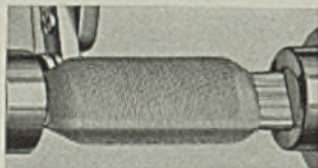
### Equipment

New York—Flood of machine tool orders reaching builders and dealers last month broke all records. So great was the urge to get orders in before April 1 many units were placed without full specifications or quotations. This rush to get machine tool orders on the books results from indirect warning deliveries would be further delayed by likely revised priority and allocation problems. Currently, deliveries of metal-working tools are controlled by what amounts to allocations, which is having increasing effect on shop schedules, some machines being moved forward at the expense of others, need being the factor. Pro-



Above: FIDELITY Screw Traverse Machine winds wire on conventional type wooden or metallic spools.

Below: FIDELITY Spooling Machine with new hydraulic control to wind wire on flat or square sticks from brake-controlled reels.



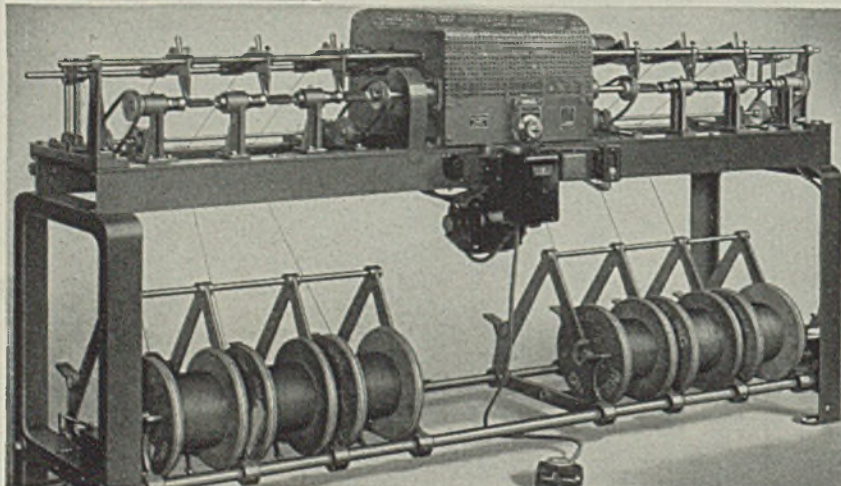
## FIDELITY WIRE SPOOLING MACHINES ... from Reels or Coils ... to Sticks or Spools

Precision winding at high speed, with unvarying weight and even lay of wire on spool or stick—these are outstanding advantages of FIDELITY Wire Spooling Machines. They are quickly adjusted to required length, thickness or spacing—simple to operate, minimum labor attention and low horsepower.

Write for illustrated folder describing four types of standard machines and operating specifications.

## FIDELITY MACHINE COMPANY

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ducers of cutting tools, chucks and other fixtures are swamped and barely able to keep pace with demand; machines are sometimes shipped without complete complement of such parts, which are installed after delivery.

Harnischfeger Corp., Milwaukee, at \$92,500, has been awarded three bridge cranes for a navy yard under Bureau of Yards and Docks, spec. 10860. Two bridge cranes and four wall cranes went to Shepard-Niles Crane & Hoist Corp., Montour Falls, N. Y., \$54,382.

## Steel Corp. Shipments Best March, 1st Quarter

United States Steel Corp. shipments of finished steel in March were the largest in history for that month and the total for first three months exceeded any prior first quarter. March shipments were 1,780,938 net tons, an increase of 164,

(Inter-company shipments not included)

	Net Tons			
	1942	1941	1940	1939
Jan.	1,738,893	1,682,454	1,145,592	870,866
Feb.	1,616,587	1,548,451	1,009,256	747,427
Mar.	1,780,938	1,720,366	931,905	845,108
3 mos.	5,136,418	4,951,271	3,086,753	2,463,401
Apr.	1,687,674	907,904	771,752	
May	1,745,295	1,084,057	795,689	
June	1,668,637	1,209,684	807,562	
July	1,666,667	1,296,887	745,364	
Aug.	1,753,665	1,455,604	885,636	
Sept.	1,664,227	1,392,838	1,086,683	
Oct.	1,851,279	1,572,408	1,345,855	
Nov.	1,624,186	1,425,352	1,406,205	
Dec.	1,846,036	1,544,623	1,443,969	
Total, by				
Mos.	20,458,937	14,976,110	11,752,116	
Adjustment		†37,639	*44,865	
Total	15,013,749	11,707,251		

†Increase. \*Decrease.

351 tons over 1,616,587 shipped in February and 60,572 tons over 1,720,366 tons in March, 1941.

First quarter total was 5,136,418 tons, compared with 4,951,271 in the first three months last year. Other comparisons are given in the accompanying table.

## Demonstrate New Method For Melting Automobiles

(Concluded from Page 70)

for a new melting plant at Buffalo to cost \$2,000,000, to have capacity for melting down old cars at the average rate of 1000 cars daily, into a little more than 1000 tons of metal per 24 hours. It is to consist of six cupolas of special design, each 108 feet high and 12 feet in diameter, so as to permit top charging of old cars without having to do any disassembling. Coke will be fuel and the process will closely resemble standard cupola practice. While cost data have not been revealed the company believes that the resulting pigs can be sold profitably at the OPA pig iron price. No contracts yet have been placed as the com-

pany's financing has not been completed. Arrangements have been made wherein, after financing, the plant is to be constructed by John W. Fowler & Co., Buffalo, and the equipment installed by the Whiting Corp., Harvey, Ill.

The company also plans to build similar melting plants at Tacoma, Wash.; Springfield, Mo.; Denver; Gary, Ind.; Winston-Salem, N. C.; Tuscaloosa, Ala.; Waco, Tex., one at a point between Los Angeles and San Francisco, one near Bridgeport, Conn., and one in Southwestern Minnesota. These plans are based on this reasoning: Motor vehicles in

this country number about 32,000,000 of which at least 2,500,000 are scrapped per year. About 6,000,000 now are waiting to be junked, or a total of more than 6,000,000 tons of metal of quite similar analysis as pig iron. The company believes that there will be a permanent place for this melting process since the rate of automobile scrapping probably will be accelerated after the war.

S. R. Goetz is operating vice president of the National Smelting, Refining & Machinery Corp., with headquarters at 2548 Elmwood avenue, Buffalo.

# A RUNNER GOOD FOR TEN HEATS

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Yes, it is commonplace to hear of Mexaloy packed runners in basic open-hearth practice lasting for ten and more heats before a new covering need be applied over the brick. This is made possible because of the mixture's resistance to the cutting and dissolving action of metals and their slags . . . In addition to runners, Mexaloy refractory mixtures prove ideal for packing ladle bottoms and nozzle wells—keeping the steel clean and up to an ultimate in quality . . .

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## Nonferrous Metal Prices

April	Copper			Straits Tin, New York		Lead N. Y.	Lead Fac. St. L.	Zinc St. L.	Alumi- num 99%	Anti- mony Amer. smelter	Nickel Cath- odes
	Electro. del.	Lake, del.	Casting, refinery	Spot	Futures						
1-10	12.00	12.12 1/2	11.75	52.00	52.00	6.50	6.35	8.25	15.00	14.50	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

(In cents per pound, carlots.)

### Copper

No. 1 heavy	9.50-10.00
Light	7.50-8.00

### Brass

No. 1 composition	9.00- 9.50
Light	6.00- 6.60
Heavy yellow	6.50- 7.00
Auto radiators	7.25- 7.75
Composition turnings	7.75- 8.25

### Zinc

Old	5.25- 5.75
New clippings	6.75- 7.25

### Aluminum

Clippings	10.50-11.00
Cast	10.00-10.50
Pistons	10.00-10.50
Sheet	10.00-10.50

### Lead

Heavy	5.12 1/2-5.62 1/2
Mixed babbitt	6.00- 7.00
Electrotype shells	5.00- 5.75
Stereotype, Linotype	6.50- 7.50

### Tin and Alloys

Block tin pipe	45.00-47.00
No. 1 pewter	37.00-39.00
Solder joints	9.50-10.00

### SECONDARY METALS

Brass ingot, 85-5-5-5, l.c.l.	13.25
Standard No. 12 aluminum	14.50

## Nonferrous Metals

**New York**—Capacity of plants to consume metals is beginning to outrun this country's ability to produce and import raw materials. In copper, for instance, pressure now is on shell production so that copper is being shipped to brass mills in larger tonnages, thereby reducing the flow to wire and other mills.

**Copper**—Stopping of practically all civilian durable goods output by May 1 will open up considerable copper for war work. Recovery of an estimated 100,000 to 250,000 tons of semifinished copper which has been blocked from normal usage by WPB orders will ease the supply situation further.

**Lead**—Available supply continues to range between 75,000 and 80,000 tons monthly, or sufficient for all war requirements.

**Zinc**—Production came to 79,139 tons in March while consumption totaled 61,564 tons.

**Tin**—Strict restrictions on use continues to support stocks in this country, including those held by MRC, at a satisfactory level.

## Warehouse

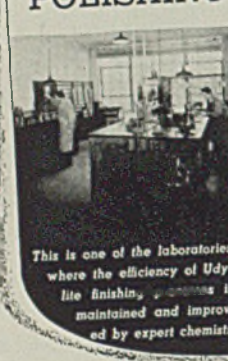
### Warehouse Prices, Page 129

Warehouses find increasing difficulty in keeping up stocks, in spite of measures intended to relieve their situation. Virtually no steel is obtainable on A-9 rating and extension of priority ratings is necessary on practically all they can obtain from mills. Stocks are small and consumers normally dependent on this source are handicapped in completing fabrication of high-rated products.

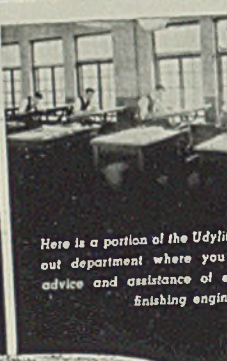
Inquiries for structural material are confined almost entirely to extensions of war production facilities and other jobs carrying high rating. Demand for cold-rolled rounds is exceptionally active in some areas.

# UDYLITE


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This is the laboratory where all Udy-lite products are developed and constantly tested under actual plant operating conditions.

For prompt, dependable metal finishing information, call on Udylite. No organization is better equipped to give you information gained from installing plating, polishing and anodizing departments in many leading manufacturing plants throughout the country. ● Trained plating engineers and electrochemists are at your service. These men know metal finishing and they can help you plan a new installation or revise your present one for

greater efficiency. They know, also, that you want information quickly. ● Udylite has a complete line of equipment . . . second to none in terms of quality and efficient performance. ● and supplies . . . for every metal finishing need. Salts, acids, anodes, buffing and polishing materials—everything required. ● Call Udylite for prompt service on your finishing requirements. You pay no more for Udylite dependability.

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## Plant Expansion, Construction and Enterprise, Government Inquiries, Sub-Contract Opportunities, Contracts Placed and Pending

### 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.

#### PUGET SOUND NAVY YARD, BREMERTON, WASH.

- 5153—Bearing compound, QR-50,000 pounds; gun-slushing compound, QR-30,000 pounds, lubricating cup grease, QR-36,000 pounds. Bids April 15.
- 5162—Spring hinges, sash lifts and locks and latches, QR miscellaneous. Bids April 15.
- 5165—Pig iron, QR-160,000 pounds. Bids April 16.
- 5166—Fuel-oil-heater tubes, seamless, diameter outside  $\frac{3}{4}$ -inch, thickness .065, length 5 feet 2 inches, QR-1000. Bids April 16.

- 5119—Steel tubing. QR-13,500 pounds. Bids April 16.
- 5128—Round heat-treated bar steel. QR-6000 pounds. Bids April 16.
- 5042—Universal joints. QR-400. Bids April 15.
- 5138—Class AN heat-treated bar steel. QR-40,000 pounds. Bids April 16.
- 5117—Steel rudder-stock forgings. QR-16. Bids April 16.
- 5044—Zinc, wire, metallizing for metal spray guns. QR-10,000 pounds. Bids April 15.
- 5069—Nickel, remelting. QR-30,000 pounds. Bids April 15.

### 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.

Cleveland office, Division of Contract Distribution, WPB, Union Commerce building, is seeking contractors for the following:

- S-129: Subcontractor having screw machines and turret lathes, to 2" bar capacity, medium size milling machines, to machine complete fuse and nose adapters, and adapter sleeves. Delivery requirement—8,000 of each of three pieces per week, starting immediately. Materials— $1\frac{1}{2}$ " hex bar stock SAE CD-WD-1314 and steel tubing SAE WD 1010 to 1035. Tolerances close. Blueprints on file.
- S-130: Facilities consisting of turret lathes, automatic screw machines, milling machines, gear cutters, medium size drills, horizontal boring mills to fabricate various parts consisting of aluminum, bronze, and copper (bar stock and castings), 650 each of 21 items per month. A-1-A priority. Material to be furnished by prime contractor. Blueprints on file.
- S-131: Subcontractor to machine airplane strut parts, consisting of steel tubing and forging (SAE steel X 4130.) Machine tools indicated are No. 4A Warner & Swasey Universal or equal; No. 4H Libby or equal; medium size milling machine; heavy duty internal and external grinding machines, horizontal broaching machines, medium size drill presses; heat treating, welding, sand-blasting, chrome and cadmium plating facilities. Deliveries ranging from 5 to 150 per month of ten items. Tolerances close. Material to be furnished by subcontractor. Blueprints on file.
- D-45: Subcontractor to furnish small aluminum castings, also subcontractor

with machine tools consisting of automatics, hand screw machines to  $\frac{3}{4}$ -inch, Blanchard grinder, broaching machines, lapping, No. 3 Warner & Swasey machine, Head boremates and hand mills. Materials, steel bar stock, bronze and aluminum. Tolerances close. Blueprints on file.

Philadelphia office, Contract Distribution Branch, Production Division, WPB, Broad Street Station Building, reports the following subcontract opportunities:

- 14-B10-2: Government is lining up facilities to produce primer M22A1 and primer M-28A1. Material to be furnished by contractor, is seamless brass tubing and brass rods. Tools required are automatic screw machines,  $\frac{3}{4}$ -inch capacity, stamping and drawing presses and annealing equipment.
- 14-B10-3: Government is lining up facilities to produce fuze, point, detonating, M-48. Materials, to be furnished by contractor, are aluminum alloy rod, brass rod, steel bar or forgings, gilding metal, sheet aluminum, sheet cork, onlonskin paper, aluminum base alloy die castings, corrosion-resisting steel and steel music wire. Tools required: Automatic screw machines up to  $2\frac{1}{2}$ -inch capacity, cadmium plating and die casting facilities, stamping and draw press equipment. Need for automatic screw machines for this work is vital.
- 14-B10-4: Government is lining up facilities for producing tracer and igniter, shell, No. 12 MK 1/L Internal. Materials, to be furnished by contractor, are cold-drawn bar steel WD x 1314; brass rod, aluminum alloy rod-condition T, sheet lead, onlonskin

paper and strip brass. Tools necessary are: Automatic screw machines up to 1-inch capacity, threading and cadmium plating facilities. Plans and specifications at this office.

- 14-B10-5: Government is lining up facilities to produce booster, M20A1. Materials, to be furnished by contractors, are strip and rod brass, aluminum base alloy die castings, gilding metal, sheet aluminum, sheet cork, onlonskin paper, aluminum foil, rod steel, music wire. Tools necessary are: Stamping and drawing presses, cadmium plating facilities, threading facilities and, most important, automatic screw machine facilities up to 2-inch capacity. Plans and specifications at this office.

- 13-13-1: A Conshohocken, Pa., firm requires subcontracting facilities on the following items: Special rubber gaskets of various sizes, 2 to 12 inches diameter; drop forgings, small to medium; screw machine products,  $\frac{1}{2}$  to 3-inch bar stock requiring automatic screw machines; steel fabrication; discs, rings and bulkheads,  $3\frac{1}{2}$ -inches diameter and smaller; woodworking of patternmaking type. Material to be furnished by prime contractor. Plans and specifications at this office.

- 15-B10-2: A Cleveland firm requires subcontracting facilities on airplane landing gear, various types of cylinders and pistons. Material required, bar steel, steel tubing and steel forgings, to be furnished by prime contractor. Tolerances .001. Quantity 75 per month to 500 per month, depending on part. Equipment required: Single-spindle automatic screw machines all sizes up to  $5\frac{1}{2}$ -inch, turret lathes all sizes up to 7-inch, engine lathes, millers, drill presses, external and internal precision grinders, heat treating and sand blasting equipment, atomic welding and magnaflux.

- 16-B8-1: A Philadelphia firm requires subcontracting facilities on: Seamless steel tubing from .84 to 15-inch diameter, 38,700 feet required. Hydraulic manifolds required, steel castings under 500 pounds. Material to be furnished by subcontractor. Tolerances .001 to .005. Electric steel manifold castings average 400 pounds, corrosion resisting steel castings up to 500 pounds, alloy steel castings up to 500 pounds; open-hearth steel castings up to 15,000 pounds, 1800 feet of  $1\frac{1}{2}$ -inch seamless steel pipe tubing .120 wall x 1.90 O.D. type A. Navy spec. 44-T-33. This is rush item. Drawings and specifications on file at Philadelphia office.

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

- 18-A-315: Large prime contractor has six (6) automatic screw machine items to sublet. Quantities varying from 5000 to 50,000 pieces each. Machine required— $2\frac{1}{2}$ " six spindle Gridley or four spindle Acme. Machining time in minutes given for each item, also price agreeable to prime contractor. Subcontractor to furnish material. Blueprints available at this office.
- 25-N-327—WELDMENTS: Chicago prime

contractor needs three sizes of work holding fixtures consisting of structural steel sections with positioning plates, reinforcing ribs, and component parts. These units will weigh 4000, 9000 and 13,000 pounds respectively. Blue prints can be examined at prime contractor, Navy priority. Subcontractors are to furnish all materials.

3-A-305: Urgent requirement of automatic screw machine work. 7,000,000 pieces, 700,000 per month, 20,000 per subcontractor. Requires automatic screw machine—1½" hex bar and 2¼" round bar. Includes two threading operations. Stock cold drawn S.A.E. 1320.

10-F-A-123: Special request has been made to secure additional prime contractors for the manufacture of 37-mm. shot. This work will carry high priorities. Machine requirements: 4, 6 or 8-spindle Greenlee, Gridley, Cone

or Acme automatic screw machines with bar capacity of 1½ to 1¾-inch; hand screw machine with capacity of 1½-inch for second operation; centerless grinders; swaging equipment; hardening and heat treating equipment. Hardening, heat treating and centerless grinding may be subcontracted.

New York office, Contract Distribution Branch of WPB, 122 East Forty-Second street, New York, reports the following subcontract opportunities:

S-80: New York City concern manufacturing tanks for army ordnance is seeking subcontractors with special machining facilities to complete 1000 tank turrets of cast armor steel. Tolerances desired are .010. Machines needed: two vertical boring mills with tables 110 or 120 x 32 inches; two horizontal boring machines with mill-

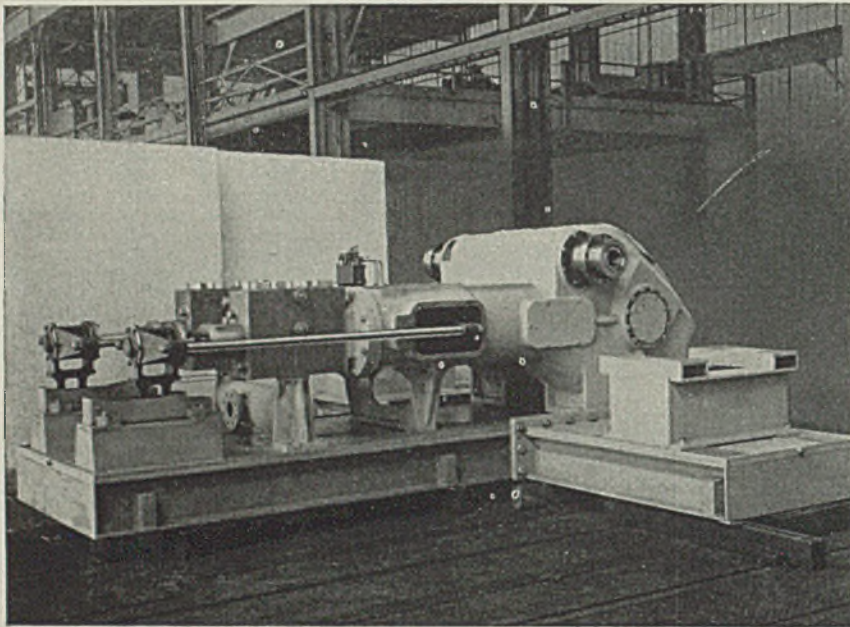
ing equipment, table to hold fixture 85 x 80 x 32 inches, 6-inch spindle or larger; or planer-type miller with adjustable horizontal swivel head and vertical head adjustable on cross rail, to hold fixture 85 x 80 x 32 inches; one seven-foot arm radial drill or two 4-inch radial drills to hold fixtures 85 x 80 x 32 inches; large crane-way with 10-ton crane. Steel castings will be furnished by prime contractor. Drawings at this office.

S-81: New Jersey firm working on army orders seeks subcontractors with facilities for forming 50,000 pieces of magnesium tubing, 6-inches long, two inches O.D. and 1-inch I.D. Materials furnished by prime contractor. Machines needed are either extrusion press or deep draw press of 150-ton capacity with 24-inch stroke.

S-82: New York City firm making parts for submarines on navy contract needs subcontractors who can machine 750 aluminum castings to close tolerances. Castings, to be furnished by prime contractor, are 36 inches high, 24 inches long and 24 inches wide. Milling, drilling, grinding, honing and boring facilities are needed.

S-83: New York City manufacturer working on instrument parts seeks subcontractors for the following parts: 10,000 gears, 60-tooth, hard brass, length .30-inch, diameter ¾-inch. 20,000 machine screws, No. 1, 64-thread, flat head, brass or steel, nickel plated, 3/16-inch long. 20,000 machine screws, No. 8, 35-thread, round head, brass or steel, nickel plated, length ½-inch.

S-84: New York City firm making up important order of hand tools for the army is seeking subcontractors who can produce 14,000 pliers and end wrenches of tool steel, 5½ inches long. Design presents certain variations from standard. Subcontractor must have toolsteel forging facilities.



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HORIZONTAL DOUBLE ACTING DUPLEX TYPE PLUNGER PUMPS designed for 90 to 250 gallon per minute delivery at pressures of 2850 to 5000 lb. per square inch.

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ENGINEERING CORP. PITTSBURGH, PA.  
Rolling Mill Machinery Hydraulic Presses

## STRUCTURAL SHAPES .

### SHAPE CONTRACTS PLACED

- 8000 tons, fabricating shop, eastern shipyard, to Bethlehem Steel Co., Bethlehem, Pa., through Hughes-Foulkrod, Philadelphia, contractor.
- 7600 tons, building, Curtiss-Wright Corp., to Duffin Iron Works, Chicago; (to be fabricated by Four V Structural Steel Companies, Chicago.)
- 1800 tons, explosives plant, Pennsylvania, to Bethlehem Fabricators Inc., Bethlehem, Pa.; E. B. Badger & Sons Co., Boston, contractor.
- 1251 tons, 14 bridges for Alaska Road Commission, Valdez and Fairbanks, Alaska, to Columbia Steel Co., San Francisco.
- 1100 tons, power plant, Aluminum Co. of America, Jones Mills, Ark., to Ingalls Iron Works Co., Birmingham, Ala.
- 1000 tons, all-welded shop building, navy

### SHAPE AWARDS COMPARED

	Tons
Week ended April 11	24,194
Week ended April 4	44,693
Week ended March 28	27,510
This week, 1941	41,148
Weekly average, 1942	23,724
Weekly average, 1941	27,373
Weekly average, March, 1942	18,011
Total, 1941	459,653
Total, 1942	332,135

Includes awards of 100 tons or more.

yard, to Bethlehem Fabricators, Inc., Bethlehem, Pa.; Sanders Engineering Corp., Portland, Me., contractor; bids in on 2000 tons for building 174, same yard.

1000 tons, three oil cracking plants, Pennsylvania, New Orleans and Texas, 650 tons to Bethlehem Fabricators Inc., Bethlehem, Pa. and 350 tons to Masher Steel Co., Houston, Tex.; E. B. Badger & Sons Co., Boston, contractors.

750 tons, plant No. 4, Consumers Power Co., Jackson, Mich., to Milwaukee Bridge Co., Milwaukee.

600 tons, miscellaneous contracts not specified, to Pacific Car & Foundry Co., Seattle.

600 tons, shop building, General Electric Co., Fitchburg, Mass., to Grossier & Shlager Iron Works, Somerville, Mass.; J. W. Bishop Co., Boston, contractor.

250 tons, repairs to bridge No. 2, Ft. Smith, Ark., for Missouri Pacific railroad, to Bethlehem Steel Co., Bethlehem, Pa.

243 tons, addition to Allison Division, General Motors Corp., to Hugh J. Baker & Co., Indianapolis.

Unstated, shipyard in Washington state, to Columbia Steel Co. and Bethlehem Steel Co., by Everett-Pacific Co.

**SHAPE CONTRACTS PENDING**

2800 tons, widening Whitestone bridge, New York; only bid received rejected and will be readvertised.

1350 tons, gun emplacements, east coast, bids in to United States engineers, Providence, R. I. and Boston.

1000 tons or more, structures for nine substations for Bonneville Power Administration, Portland, Oreg., Bethlehem Steel Co., Portland, low at \$70,746.

440 tons, bridge, eastern navy yard; bids April 10.

200 tons, piling, Wilmington, Del.

150 tons, access road bridge, Avenue E at Fortieth street, Bayonne, N. J.; bids April 24, E. Donald Sterner, state highway commissioner, Trenton; also 53 tons, reinforcing bars; project rating A-1-E.

100 tons or more, tideflats power substation, Tacoma, Wash.; Western Ornamental Works, Tacoma, low at \$10,196.

& Son, Lynchburg, Va., contractor. 230 tons, warehouse extension, army fort, Texas, to Peden Iron & Steel Co., Houston, Tex.; H. H. Moeller, San Antonio, contractor.

200 tons, defense projects in Washington state, to Northwest Steel Rolling Mills, Seattle.

110 tons, state bridge, Hull, Mass., to Joseph T. Ryerson & Son Inc., Cambridge, Mass.; Berke-Moore Co., Newton Center, Mass., contractor.

Unstated tonnage, construction contract NOy 4415, supplemental agreement two, additional facilities, navy yard, Norfolk, Va., to Virginia Steel Co., Richmond; Allen J. Soville, Richmond, contractor.

**REINFORCING STEEL PENDING**

4000 tons, filtration plant, Philadelphia

board of public works, priority A-4; bids April 15.

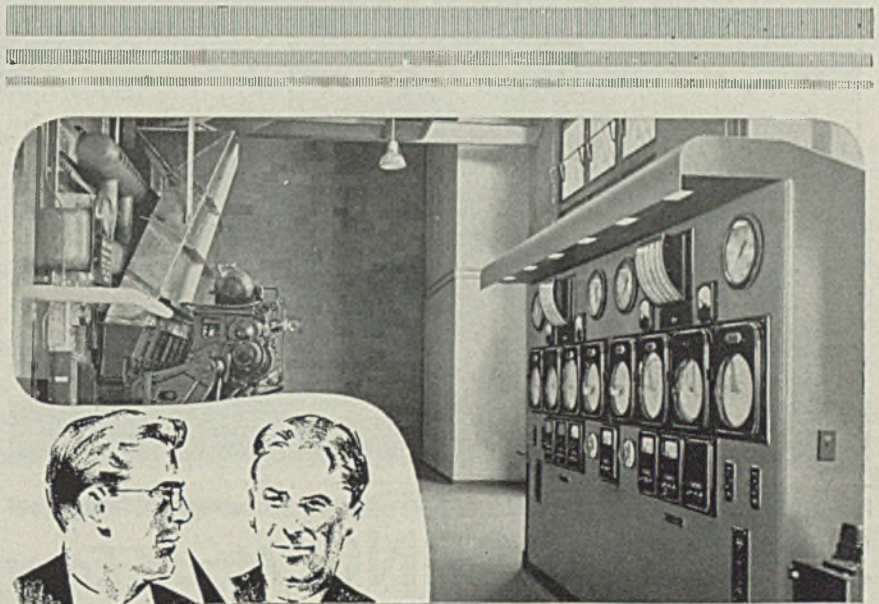
240 tons, addition, South Bend Lathe Works, South Bend, Ind., to Republic Steel Corp. through Olney J. Dean Steel Co., Cicero, Ill.; Thomas L. Hickey & Co., South Bend, Ind., contractor.

Unstated, 36 reinforced concrete bins for proposed 800,000-bushel grain elevator; bids to Port of Seattle in about 30 days.

**RAILS, CARS ...**

**CAR ORDERS PLACED**

Des Moines Electric Railway Co., Des Moines, Iowa, seven trolley coaches



**"WE SELECTED HAYS CONTROL BECAUSE IT IS EASIER FOR OUR OPERATORS TO UNDERSTAND"**

**REINFORCING BARS . .**

**REINFORCING STEEL AWARDS**

15,000 to 20,000 tons, enlargement of previous contracts for defense projects in Alaska and Washington state, to Bethlehem Steel Co., Seattle.

400 tons, hospital buildings, Durham, N. C., to Bethlehem Steel Co., through Caudwell Wingate Co., New York.

400 tons, bridges 7 and 8, War department, Building road network, Arlington, Va., to Rosslyn Steel & Cement Co., Washington; Guy H. Lewis

**CONCRETE BARS COMPARED**

	Tons
Week ended April 11	18,840
Week ended April 4	6,550
Week ended March 28	7,180
This week, 1941	22,833
Weekly average, 1942	8,730
Weekly average, 1941	13,609
Weekly average, March, 1942	9,201
Total, 1941	170,279
Total, 1942	122,225

Includes awards of 100 tons or more.

*...So said* **THE CHIEF ENGINEER**

of the above boiler room located in a midwest municipal light plant. He went on to explain to two engineers\* who were investigating several combustion control systems —

"Our men lived with Hays Automatic Combustion Control in our old plant for several years and they liked its simplicity, and its positive operation. Because it was easier to understand than the other systems on the market they took a keener interest in it and produced better results."

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\*The result of this interview was the sale of complete Hays Automatic Combustion Control for 7 boilers in a large automotive product plant.

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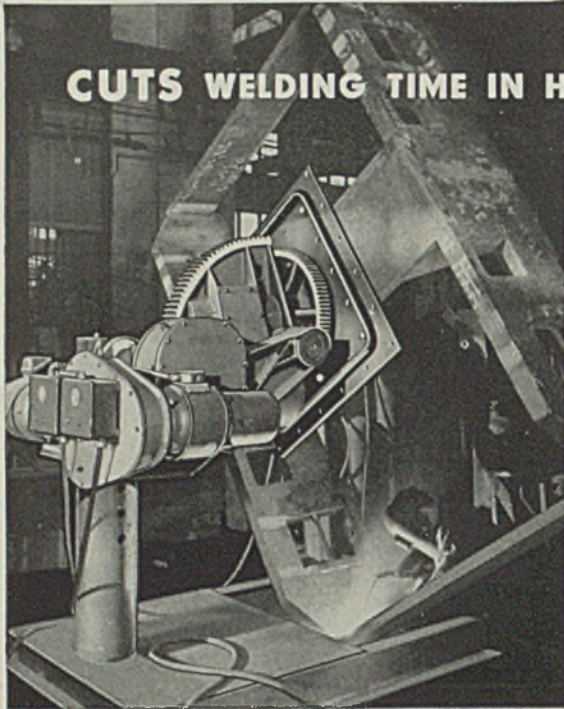
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is being preferred more and more over other control systems for very definite reasons. In the first place it is completely electric, which simplifies design, installation and operation.

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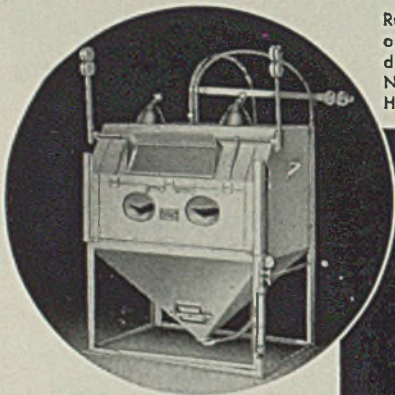
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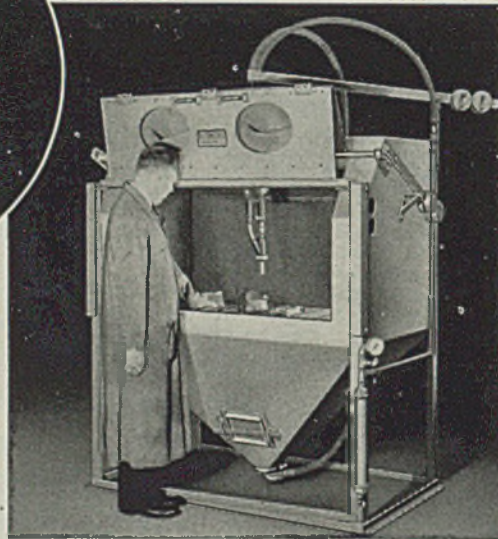
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National Railways of Mexico, 500 fifty-ton box cars, to American Car & Foundry Co., New York; in addition to 200 fifty-ton tank cars noted in a recent issue as going to this builder, and brings the total number of freight cars recently bought by this railroad up to 1470, the remainder going to the Magor Car Co., Passaic, N. J.

### CAR ORDERS PENDING

Illinois Central, 1000 fifty-ton hopper cars; bids asked.

### LOCOMOTIVES PENDING

Bessemer & Lake Erie, five 2-10-4 and two 0-8-0 type steam locomotives; bids asked.

Western Pacific, six 4-8-4 type steam locomotives; pending.

### BUSES BOOKED

A.e.f. Motors Co., New York; Twelve 33-passenger for Southeastern Greyhound Lines, Lexington, Ky.; ten 36-passenger for San Diego Electric Railway Co., San Diego, Calif.; eight 36-passenger for Memphis Street Railway Co., Memphis, Tenn.; Seven 41-passenger for Worcester Street Railway Co., Worcester, Mass.; six 29-passenger for Dixie Motor Coach Corp., Dallas, Tex.; four 41 passenger for Eastern Massachusetts Street Railway Co., Boston; three 33-passenger for Union Bus Co., Jacksonville, Fla.; two 29-passenger for Norfolk Southern Bus Corp., Norfolk, Va.; two 43-passenger for Navy Department, Washington.

## PIPE . . .

### CAST PIPE PLACED

300 tons, 6 and 8-inch, for Port Angeles, Wash., also 40 tons 24-inch (sewer project), Bremerton, Wash., to H. G. Purcell, Seattle, for U. S. Pipe & Foundry Co., Burlington, N. J.

### CAST PIPE PENDING

198 tons, 8 to 12-inch, Chleopce Falls, Mass.; bids in.

113 tons, 6, 8 and 10-inch, Medford, Mass., R. D. Wood & Co., Florence, N. J., low.

### STEEL PIPE PLACED

650 tons, gas distribution system, Bastrop, Tex., to National Tube Co., through Holland Page Co., Austin, Tex.

## PLATES . . .

### PLATE CONTRACTS PLACED

100 tons, metal culverts for Alaska Road Commission, to Washington Corrugated Culvert Co., Seattle.

100 tons or more, two 1200-ton lights, United States engineer, San Francisco, to Steel Tank & Pipe Co., Portland, Oreg., Inv. 322.

### PLATE CONTRACTS PENDING

100 tons or more, 7044 ft. 12 to 60-inch corrugated metal culverts; bids to Alaska Road Commission, Seattle, April 10; No. 09766.

100 tons or more, 140,000-gallon welded steel water storage tank, for Grand Coulee; bids to Denver, April 27; Spec. No. 1628-D.

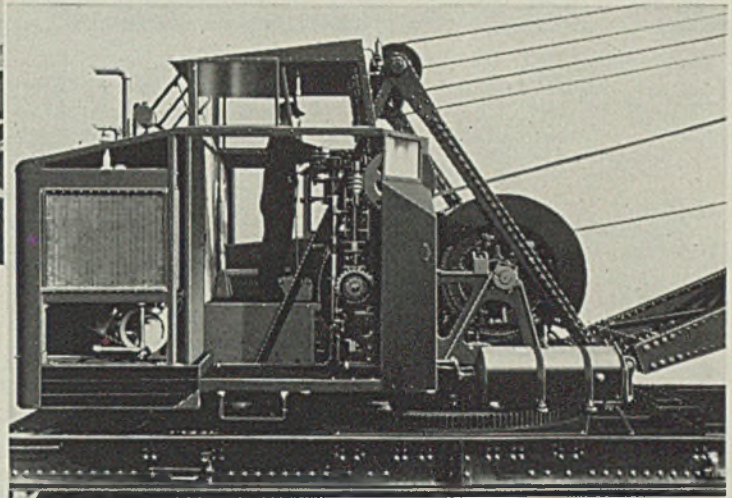


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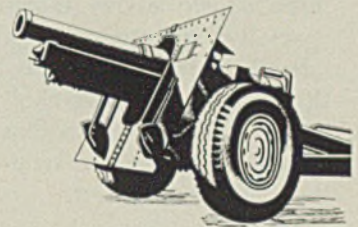
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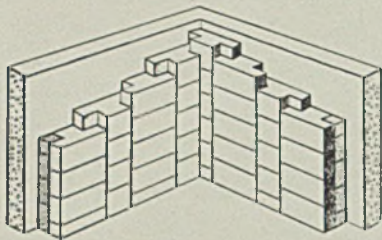
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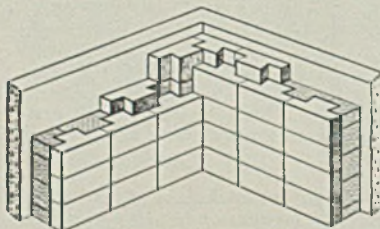
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STEUBENVILLE, OHIO

**CONSTRUCTION**

**and ENTERPRISE**

**Connecticut**

BRIDGEPORT, CONN.—United States Aluminum Co., M. C. Erskine, 2190 Post road, Fairfield, Conn., plans factory alterations and additions costing \$115,000. C. G. MacFarquhar, 2190 Post road, Fairfield, engineer.

BRIDGEPORT, CONN.—Bodine Corp., 317 Mountain Grove street, has plans by H. C. Elton, 1188 Main street, for two-story addition. Cost \$40,000.

COS COB, CONN.—New York, New Haven & Hartford railroad. E. E. Ovlatt, chief engineer, New Haven, Conn., has plans for power plant improvements costing \$500,000.

HAMDEN, CONN.—High Standard Mfg. Co., 1337 Dixwell avenue, will erect one-story 125 x 450-foot factory addition costing \$170,000.

HARTFORD, CONN.—Hartford Special Machine Co., 287 Homestead avenue, has let contract to R. G. Bent Co., for one and two-story 80 x 195-foot addition. Estimated cost \$75,000.

NEW BRITAIN, CONN.—New Britain Machine Co., 140 Chestnut street, has awarded contract for one-story 90 x 120-foot plant to Haason & Downes, 55 West Main street. Estimated cost \$40,000.

NEW HAVEN, CONN.—L. F. Caproni, architect, 1221 Chapel street, will soon let contract for factory for Snow & Petrelli Mfg. Co., 25 Fox street. Estimated cost \$250,000.

SPRINGDALE, CONN.—Stamford Rolling Mills Co. plans steel mill additions. Estimated cost over \$40,000.

TORRINGTON, CONN.—Torrington Co., 59 Field street, has let contract for two-story 70 x 104-foot factory to Torrington Building Co., 187 Church street. Cost estimated at \$62,000.

WEST HARTFORD, CONN.—Hartford Steel Ball Co., 12 Jefferson avenue, has given contract to Louis W. Slocum Inc., 261 North Main street, for two-story 52 x 209-foot factory. Cost estimated at \$65,000.

**Massachusetts**

AGAWAM, MASS.—Research & Engineering Co., 1341 Main street, will erect factory costing \$40,000.

BOSTON—E. D. Badger Co., 75 Pitts street, Boston, has been awarded contract for a manufacturing plant in West Virginia.

**Rhode Island**

PAWTUCKET, R. I.—Collyer Insulated Wire Co., 249 Roosevelt avenue, has let contract for two-story 85 x 145-foot plant to Central Engineering & Construction Co., 210 Main street. Estimated cost \$110,000.

PROVIDENCE, R. I.—Circular Tool Co. Inc., 765 Allen avenue, has asked bids for factory additions costing over \$50,000. C. H. Lockwood, 171 Westminster street, architect.

**New York**

BEDFORD, N. Y.—American Cytoscope Makers Inc., 1241 Lafayette avenue, New York, J. Klinkel, agent, Poundridge road, Bedford Village, plans factory. Estimated cost \$95,000.

FALCONER, N. Y.—Swanson Machine

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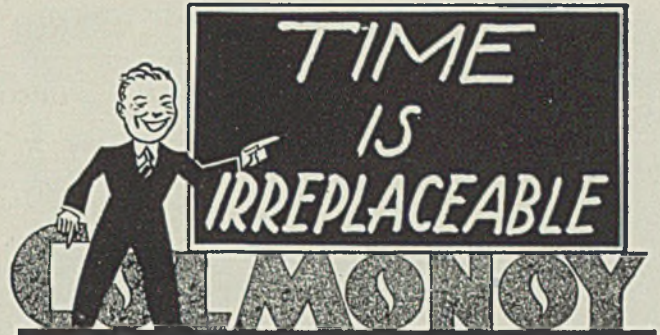
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# G. A. WELDING *Shop Notes*

## AFTER THE WAR ... WHAT?

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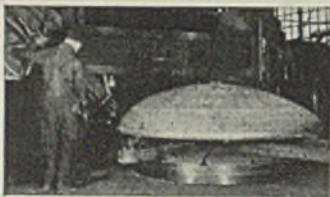
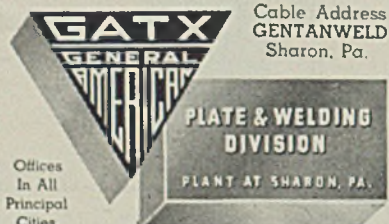


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Principal  
Cities

Co., L. Swanson, president and manager, Jamestown, N. Y., will take bids soon on one-story 150 x 200-foot plant addition costing \$150,000. Beck & Tinkham, Bailey building, Jamestown, architects.

**JAMESTOWN, N. Y.**—Jamestown Iron Works, T. F. Maher, president, 20 Taylor street, plans one-story 50 x 60-foot machine shop addition. Estimated cost \$40,000.

**JAMESTOWN, N. Y.**—Marlin Rockwell Corp., 420 Chandler street, will soon let contract for one-story plant addition costing \$40,000. Beck & Tinkham, Bailey building, Jamestown, architects.

### Ohio

**CANTON, O.**—Brown Construction Co., Canton, has contract for additions to plant of Canton Drop Forge & Machinery Co., including machine shop, forge shop, and other buildings. (Noted Feb. 2.)

**CLEVELAND**—Saco Corp. has had plans prepared by Edward G. Hoefler, 5005 Euclid avenue, for \$80,000 factory and office to be erected on East 176th street.

**CLEVELAND**—American Stamping Co., E. H. Kreuger, secretary, plans addition to factory at 978 East Sixty-fourth street.

**CLEVELAND**—H. K. Ferguson Co., Hanna building, has been awarded \$20,000,000 contract to build a magnesium plant in the State of Washington for Electro Metallurgical Co., subsidiary of Union Carbide & Carbon Corp., 30 East Forty-second street, New York.

**CLEVELAND**—Marquette Metal Products Co., 1145 Galewood drive, has let contract to Cleveland Construction Co., for addition to manufacturing and office space. (Noted March 30).

**CLEVELAND**—Ohio Piston Co. has awarded contract to J. L. Hunting Co. for addition to its plant at 53-10 Hamillon avenue, 80 x 118 feet. (Noted March 30).

**CLEVELAND**—Thornton Co., 6901 Morgan avenue, has given contract to Gillmore-Carmichael-Olson Co., for 100 x 120-foot addition to its plant. (Noted March 23).

**CLEVELAND**—National Malleable & Steel Castings Co., 10600 Quincey avenue, is planning \$1,500,000 expansion program at Sharon, Pa., plant.

**CLEVELAND**—Sommers & Adams Co., 18511 Euclid avenue, has asked federal aid on proposed expansion of manufacturing facilities.

**COLUMBUS, O.**—Carroll Chain Co., 2000 Buck street, has awarded contract for one-story addition to E. Elford & Son, 555 South Front street. Cost estimated at \$40,000.

**YOUNGSTOWN, O.**—William B. Pollock Co. has let contract to Heller-Murray Corp. for plant expansion, estimated to cost \$400,000, including equipment.

### Pennsylvania

**PITTSBURGH**—E. I. Weigand Co., E. I. Weigand, president, 7500 Thomas boulevard, has plans by Prack & Prack, 417 Martin building, for one-story 50 x 100-foot factory addition.

**READING, PA.**—J. H. Sternbergh, general manager, American Die & Tool Co., Second and Buttonwood streets, is rehabilitating, enlarging and improving former plant of Mt. Penn Stove Co.

**TITUSVILLE, PA.**—Jackson & Ludwick are rebuilding woodworking plant destroyed by fire. Cost over \$40,000.

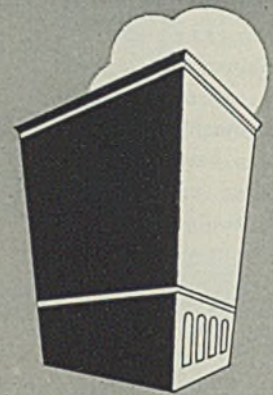
**WILKES-BARRE, PA.**—Empire Corp., South Franklin street, plans one-story plant addition costing \$100,000, including equipment.

### Michigan

**DETROIT**—Brothers Accessories Corp. has been incorporated to manufacture aircraft equipment. Harry F. Brothers, 2615 Nebraska avenue, is correspondent.

**DETROIT**—Grinnel Machining & Mfg. Co., 9656 French road, has been incorporated with \$50,000 capital to do machining and general manufacturing. Harvey H. Goldman, 19548 Canterbury, correspondent.

**DETROIT**—Victory Tool & Stamping Co., 2423 McKinstry avenue, has been organized to engage in tool, die and stamping business. William E. Dow-



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ling, 18400 Pennington drive, correspondent.

**DETROIT**—Campbell Construction Co. has been awarded contract for an addition and alterations to the factory of Murchey Machine & Tool Co.

**DETROIT**—Service Diamond Tool Co., 9218 Wyoming avenue, has been organized to manufacture diamond products and deal in tools. Louis Small, 18515 Griggs avenue, correspondent.

**KALAMAZOO, MICH.**—Miller-Davis Co., Kalamazoo, has contract for alterations and repairs to factory of Kalamazoo Stove & Furnace Co.

**ROYAL OAK, MICH.**—Lawson-Leschke Co., 110 East Sixth street, Royal Oak, has been incorporated to manufacture

machinery. Correspondent, Elmer H. Leschke, 17385 Pinehurst.

### Illinois

**CHICAGO**—Well Pump Co., 215 West Superior street, will build one-story 100 x 100-foot factory, for which contract has been let to Kaye Construction Co., 220 South State street. Estimated cost \$40,000. I. Karlin, 220 South State street, architect.

**CHICAGO**—G & W Electric Specialty Co., 7780 Dante avenue, has asked bids for two-story plant addition, costing approximately \$50,000.

**SPRINGFIELD, ILL.**—Gar Wood Industries Inc., plans erection of plant here for manufacture and assembly of bulldozer equipment for tractors.

### Alabama

**DOTHAN, ALA.**—City plans extension to existing sewage system and addition to sewage treatment plant costing \$201,000.

**ROANOKE, ALA.**—City, K. L. Hooper, mayor, will construct filter plant and will install pumping equipment. Estimated cost \$21,000.

### Maryland

**BALTIMORE**—Hajoca Corp., Walnut street building, Philadelphia, will soon let contract for one-story, 140 x 250-foot warehouse; also one-story 26 x 200-foot pipe shed. Estimated cost \$100,000.

### Kentucky

**LOUISVILLE, KY.**—H. J. Scheirich Mfg. Co., 4460 Louisville avenue, plans rebuilding burned plant.

### Georgia

**WEST POINT, GA.**—Batson-Cook Co. has contract for addition to building of West Point Foundry & Machinery Co.

### North Carolina

**CHARLOTTE, N. C.**—Colonial Mfg. Co. Inc., G. C. Pauls, president, will erect manufacturing plant at 2130 South boulevard.

### Missouri

**KANSAS CITY, MO.**—Allmetals Mfg. Co., operated by Glenn Bundy, has leased and will remodel building at 1316 Oak street.

**NEOSHO, MO.**—City will construct \$280,000 water facilities and \$248,000 sewage facilities.

**ST. LOUIS**—Midwest Piping & Supply Co., 1510 South Second street, will erect \$90,000 addition. Fruin-Colnon Contracting Co., Merchants-Laclede building, general contractor.

### Wisconsin

**MILWAUKEE**—Owner, care of W. M. Trapp, architect, 2116 North Third street, is preparing plans for one and two-story 85 x 120-foot factory.

**MILWAUKEE**—Pressed Steel Tank Co., 1445 South Sixty-sixth street, West Allis, has asked bids for one-story 100 x 400-foot addition. Eschweiler & Eschweiler, 720 East Mason street, architects.

### Texas

**DALLAS, TEX.**—Shredded Steel Co., H. H. Johnson, manager, with temporary offices in Adolphus hotel, Dallas, plans construction of plants to manufacture shredded iron from discarded tin cans. Work is under supervision of Frank Shaw, field engineer for Defense Plant Corp., with headquarters in the Cliff Towers hotel, Dallas.

**DICKINSON, TEX.**—Galveston water control and improvement district No. 1, will take bids soon on \$72,000 sanitary sewage disposal system; has federal grant of \$52,000.

**HOUSTON, TEX.**—MacKie & Kamrath, 2017 West Gray street, will have plans ready for bids soon for extension to plant of General Metals Corp.

**TEXARKANA, TEX.**—City plans sewage disposal plant and has grant of \$832,000. J. J. Rady, engineer, Majestic building, Fort Worth, Tex.

### Idaho

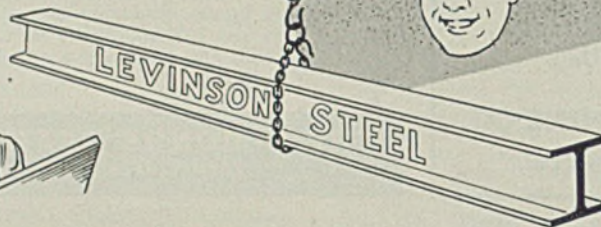
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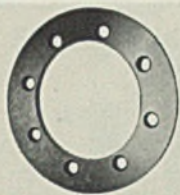
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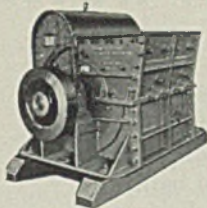


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### California

**HUNTINGTON PARK, CALIF.**—Contract has been awarded for erection of one-story factory on Bickett street here for Pacific Pump Works, 5715 Bickett street. Estimated cost \$24,000.

**LOS ANGELES**—Henry Kaiser Co., Latham Square building, Oakland, Calif., has tentative plans for synthetic rubber plant in Los Angeles area, consisting of three units, which will cost approximately \$25,000,000.

**LOS ANGELES**—Sklar Steel Products Co. has been incorporated with capital of \$33,000, by Harry B. and

Bertha A. Sklar, of Los Angeles, and E. D. Landers, San Francisco. Corporation is represented by Landers, Welgel & Crocker, 275 Bush street, San Francisco.

**LOS ANGELES**—Standard Steel Co. has been incorporated with \$25,000 capital by R. S. Burns, Milan Medivogich and S. E. Brown. Corporation is represented by R. S. Burns, 411 West Fifth street, Los Angeles.

**LOS ANGELES**—Western Bearing Co. has been incorporated with 100 shares no par value stock by L. J. and Mabel Smullen, Los Angeles, and L. G. Munchof, Glendale, Calif. Correspondent: Cecil W. Collins, 3700 East Olympic boulevard, Los Angeles.

**TRONA, CALIF.**—United Engineers & Constructors, 816 West Fifth street, Los Angeles, have been awarded contract for an additional chemical plant for American Potash & Chemical Co. here, estimated to cost approximately \$1,000,000.

### Washington

**SEATTLE**—Alaska Copper Works, 4501 East Marginal Way, is making plant alterations, including construction of craneway.

### Canada

**HAMILTON, ONT.**—Barber Die Casting Co. Ltd., 68 Sanford avenue North, is having plans prepared for plant addition to cost about \$50,000.

**HAMILTON, ONT.**—United Gas & Fuel Co. Ltd., 82 King street East, is considering plans for carbored water-gas plant on Depew street to cost \$1,500,000, principal expenditure to be on equipment. T. P. Pinckard is general manager.

**OTTAWA, ONT.**—Instruments Ltd., 240 Sparks street, has awarded general contract to George A. Crain & Sons, 285 Clemow avenue, for plant addition, 50 x 100 feet, to cost about \$30,000, with equipment.

**TORONTO, ONT.**—Research Enterprises Ltd., Eglinton avenue East, has given contract to Milne & Nicholls Ltd., 57 Bloor street West, for construction of maintenance building and other plant extensions to cost about \$500,000.

**WALLACEBURG, ONT.**—Wallaceburg Brass Ltd., Wallace street, has plans and will let contract soon for plant addition to cost about \$25,000, with equipment.

**WALLACEBURG, ONT.**—Schultz Die Casting Co. of Canada Ltd., Wallace street, will build plant addition 180 x 200 feet, to cost about \$40,000, with equipment. John Mathven, 92 1/2 King street West, Chatham, Ont., architect.

**WESTON, ONT.**—Moffat's Ltd., 23 Denison avenue, is taking bids for one-story plant addition to cost about \$75,000, including equipment.

**WINDSOR, ONT.**—Ford Motor Co. of Canada Ltd. has completed plans for another plant addition to cost \$65,000.

**WINDSOR, ONT.**—Windsor Steel Products Co., 1637 Erie street East, has plans for plant, costing \$35,000 with equipment.

**WINDSOR, ONT.**—Advance Machine & Tool Co., 1164 Albert road, has plans and will call bids immediately for plant addition costing \$35,000, including equipment.

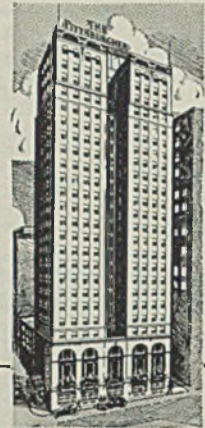
**WINDSOR, ONT.**—Windsor Utilities Commission, Gordon B. Ellis, chairman, in association with Ontario Hydro Electric Power Commission, is having plans prepared for substation on Walker road, building to cost \$20,000 and

equipment \$50,000.

**MONTREAL, QUE.**—Canadian Pacific railway, Windsor station, is having plans prepared and will place contracts soon for addition to car repair shops, costing \$25,000, equipment extra.

**MONTREAL, QUE.**—R.C.A. Victor Co. Ltd., 976 Lacasse street, has given general contract to J.L.E. Price & Co. Ltd., 680 Sherbrooke street West, and work will be started immediately on plant addition to cost about \$35,000, equipment extra.

**STE. ANNE DE BEAUPRE, QUE.**—Distillery Ltd., care of Ludger Cantin, president, 427 St. Vallier street, Quebec City, is having plans prepared by Raoul Chenevert, architect, 50 Cote du Palais, Quebec, for addition to plant here to cost about \$100,000 with equipment.



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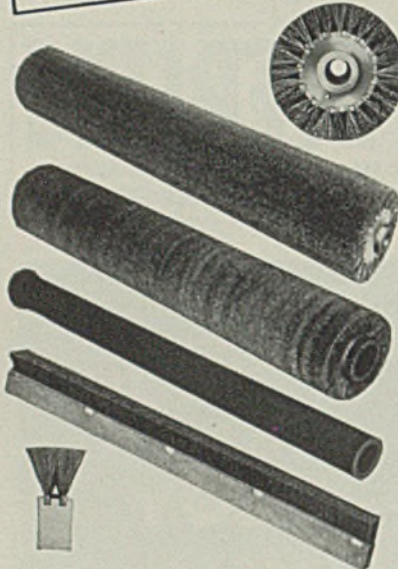
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# ◆ ◆ ADVERTISING INDEX ◆ ◆

Where-to-Buy Products Index carried in first issue of month.

	Page		Page		Page
<b>A</b>					
Abraslve Co. ....	—	Bryant Chucking Grinder Co. ....	—	Erie Forge Co. ....	—
Acheson Colloids Corp. ....	—	Bryant Machinery & Engineering Co. ....	—	Erie Foundry Co. ....	98
Acme Galvanizing Corp. ....	92	Buffalo Galvanizing & Tinning Works	92	Euclid Crane & Hoist Co. ....	—
Acme Steel & Malleable Iron Works	92	Bullard Co., The ....	—	Eureka Fire Brick Works ....	—
Ahlberg Bearing Co. ....	—	Bundy Tubing Co. ....	—	Ex-Cell-O Corp. ....	—
Air Reduction ....	124	<b>C</b>			
Ajax Electrothermic Corp. ....	—	Cadman, A. W., Mfg. Co. ....	—	Fafnir Bearing Co., The ....	—
Alan Wood Steel Co. ....	81	Carborundum Co., The ....	17	Fairbanks, Morse & Co. ....	—
Allegheny Ludlum Steel Corp. ....	—	Carey, Phillip, Mfg. Co., The ....	—	Fanner Mfg. Co. ....	92
Allen-Bradley Co. ....	—	Carnegie-Illinois Steel Corp. ....	—	Farquhar, A. B., Co., Ltd. ....	—
Alliance Machine Co. ....	—	Carpenter Steel Co., The ....	—	Farval Corp., The ....	—
Allis-Chalmers Mfg. Co. ....	—	Carter Hotel ....	—	Ferracute Machine Co. ....	—
Inside Front Cover		Cattle, Joseph P., & Bros., Inc. ....	—	Fidelity Machine Co. ....	134
Alrose Chemical Co. ....	141	Cellcote Co., The ....	—	Finn, John, Metal Works ....	92
American Agile Corp. ....	—	Central Screw Co. ....	116	Firth-Sterling Steel Co. ....	147
American Air Filter Co., Inc. ....	—	Chambersburg Engineering Co. ....	—	Fitchburg Grinding Machine Corp. ....	—
American Brass Co., The ....	85	Chandler Products Corp. ....	116	Fitzsimons Co., The ....	—
American Bridge Co. ....	—	Chicago Metal Hose Corp. ....	—	Ford Chain Block Division of Ameri-	—
American Broach & Machine Co. ....	—	Chicago Perforating Co. ....	147	can Chain & Cable Co., Inc. ....	—
American Cable Division of American	—	Chicago Rawhide Mfg. Co. ....	—	Foster, Frank B. ....	150
Chain & Cable Co., Inc. ....	—	Cincinnati Grinders, Inc. ....	—	Foster, L. B., Co., Inc. ....	150
American Chain & Cable Co., Inc.,	—	Cincinnati Milling Machine Co. ....	—	Four V Structural Steel Companies ...	—
American Cable Division ....	—	Cincinnati Shaper Co., The ....	—	Foxboro Co., The ....	—
American Chain & Cable Co., Inc.,	—	Clark Controller Co. ....	—	Frantz, S. G., Co., Inc. ....	—
American Chain Division ....	117	Cleereman Machine Tool Co. ....	—	Fuller Brush Co. ....	148
American Chain & Cable Co., Inc.,	—	Cleveland Automatic Machine Co. ....	—	<b>G</b>	
American Chain & Cable Co., Inc.,	—	Cleveland Cap Screw Co. ....	16	Gage Structural Steel Co. ....	—
Ford Chain Block Division ....	—	Cleveland-Cliffs Iron Co. ....	—	Galland-Henning Mfg. Co. ....	—
American Chain & Cable Co., Inc.,	—	Cleveland Crane & Engineering Co. ....	—	Galvanizers, Inc. ....	92
Page Steel & Wire Division ....	—	Cleveland Hotel ....	142	Garrett, Geo. K., Co. ....	—
American Chain Division of American	—	Cleveland Punch & Shear Works Co. ....	—	General Abrasive Co., Inc. ....	—
Chain & Cable Co., Inc. ....	117	Cleveland Tramrail Division, Cleve-	—	General American Transportation	—
American Chemical Paint Co. ....	—	land Crane & Engineering Co. ....	—	Corp. ....	144
American Engineering Co. ....	—	Cleveland Twist Drill Co., The ....	29	General Blower Co. ....	150
American Foundry Equipment Co. ....	—	Cleveland Worm & Gear Co., The	—	General Electric Co. ....	—
American Gas Association ....	—	Inside Back Cover		Gisholt Machine Co. ....	11
American Hard Rubber Co. ....	—	Climax Molybdenum Co. ....	57	Globe Brick Co., The ....	—
American Hot Dip Galvanizers Asso-	—	Clinton Bridge Works ....	—	Granite City Steel Co. ....	—
ciation ....	92	Cold Metal Products Co. ....	—	Grant Gear Works ....	—
American Lanolin Corp. ....	—	Colonial Broach Co. ....	—	Graver Tank & Mfg. Co., Inc. ....	—
American Metal Hose Branch of The	—	Columbia Steel Co. ....	—	Graybar Electric Co. ....	—
American Brass Co. ....	85	Columbus Die, Tool & Machine Co. ....	147	Great Lakes Steel Corp. ....	—
American Metal Products Co. ....	—	Commercial Metals Treating, Inc. ....	—	Greenfield Tap & Die Corp. ....	—
American Monorail Co. ....	—	Cone Automatic Machine Co., Inc. ....	—	Gregory, Thomas, Galvanizing Works	92
American Nickeloid Co. ....	147	Continental Machines, Inc. ....	—	Grinnell Co., Inc. ....	113
American Pulverizer Co. ....	—	Continental Roll & Steel Foundry Co.	—	Gruendler Crusher & Pulverizer Co. ....	147
American Roller Bearing Co. ....	—	Continental Screw Co. ....	116	<b>H</b>	
American Rolling Mill Co., The ....	—	Continental Steel Corp. ....	—	Hagan, George J., Co. ....	—
American Screw Co. ....	116	Cooper-Bessemer Corp. ....	—	Halden Machine Co., The ....	—
American Shear Knife Co. ....	—	Copperweld Steel Co. ....	—	Hanlon-Gregory Galvanizing Co. ....	10, 92
American Steel & Wire Co. ....	—	Corbin Screw Corp. ....	116	Hanna Engineering Works ....	—
American Tinning & Galvanizing Co.	92	C-O-Two Fire Equipment Co. ....	—	Hanna Furnace Corp. ....	—
Ampeco Metal, Inc. ....	—	Cowles Tool Co. ....	147	Hannifin Mfg. Co. ....	—
Amsler-Morton Co., The ....	—	Crane Co. ....	—	Harbison-Walker Refractories Co. ....	—
Andrews Steel Co., The ....	—	Crawback, John D., Co. ....	—	Harnischfeger Corp. ....	—
Apollo Steel Co. ....	—	Crosby Co., The ....	149	Harper, H. M., Co., The ....	—
Armstrong-Blum Mfg. Co. ....	—	Cuban-American Manganese Corp. ....	—	Harrington & King Perforating Co. ....	145
Atkins, E. C., & Co. ....	—	Cullen-Friestedt Co. ....	140	Hays Corp., The ....	139
Atlantic Stamping Co. ....	92	Culvert Division, Republic Steel Corp.	—	Heald Machine Co. ....	—
Atlantic Steel Co. ....	92	14, 15		Heppenstall Co. ....	—
Atlas Car & Mfg. Co. ....	—	Cunningham, M. E., Co. ....	—	Hevl Duty Electric Co. ....	24
Atlas Drop Forge Co. ....	—	Cutler-Hammer, Inc. ....	—	Hill, James, Mfg. Co. ....	92
Atlas Lumnite Cement Co. ....	—	<b>D</b>			
<b>B</b>					
Babcock & Wilcox Co. ....	89	Darwin & Miller, Inc. ....	—	Hindley Mfg. Co. ....	—
Balloy, Wm. M., Co. ....	—	Davis Brake Beam Co. ....	—	Hobart Bros. Co. ....	147
Baker-Raulang Co. ....	—	Dayton Rogers Mfg. Co. ....	—	Homestead Valve Mfg. Co. ....	—
Baldwin Southwark Division, The	—	Dearborn Gage Co. ....	—	Horsburgh & Scott Co. ....	—
Baldwin Locomotive Works ....	18	Denison Engineering Co., The ....	—	Hubbard & Co. ....	—
Bantam Bearings Corp. ....	—	DeSanno, A. P., & Son, Inc. ....	—	Hubbard, M. D., Spring Co. ....	92
Barnes, Wallace, Co., Division of As-	—	Detroit Electric Furnace Division,	—	Huther Bros. Saw Mfg. Co. ....	—
sociated Spring Corporation ....	22	Kuhlman Electric Co. ....	133	Hyatt Bearings Division, General Mo-	—
Basic Refractories, Inc. ....	5	Detroit Leland Hotel ....	144	tors Corporation ....	54
Bay City Forge Co. ....	—	Diamond Expansion Bolt Co., Inc. ....	92	Hyde Park Foundry & Machine Co. ....	—
Bay State Abrasive Products Co. ....	—	Diamond Tool Co. ....	—	<b>I</b>	
Bellevue-Stratford Hotel ....	—	Dietert, Harry W., Co. ....	—	Ideal Commutator Dresser Co. ....	—
Bellis Heat Treating Co. ....	—	Disston, Henry, & Sons, Inc. ....	86	Illinois Clay Products Co. ....	—
Belmont Iron Works ....	147	Dow Chemical Co., The ....	91	Independent Galvanizing Co. ....	92
Berger Manufacturing Div., Republic	—	Downs Crane & Hoist Co. ....	—	Industrial Brownhoist Corp. ....	141
Steel Corp. ....	14, 15	Dravo Corp., Engineering Works Div.	—	Ingersoll Steel & Disc Division, Borg-	—
Berkeley Equipment Co. ....	—	Dravo Corp., Machinery Div. ....	—	Warner Corp. ....	—
Bethlehem Steel Co. ....	1	Duffin Iron Co. ....	—	Inland Steel Co. ....	36
Birdsboro Steel Foundry & Machine	—	<b>E</b>			
Co. ....	—	Easton Car & Construction Co. ....	—	International Nickel Co., Inc. ....	34
Bissett Steel Co., The ....	—	Economy Engineering Co. ....	—	International Screw Co. ....	116
Blanchard Machine Co. ....	—	Edison Storage Battery Div. of Thom-	—	International-Stacey Corp. ....	92
Blaw-Knox Co. ....	—	as A. Edison, Inc. ....	—	Iron & Steel Products, Inc. ....	150
Blaw-Knox Division, Blaw-Knox Co.	—	Elastic Stop Nut Corp. ....	—	Isaacson Iron Works ....	92
Bliss & Laughlin, Inc. ....	—	Electric Controller & Mfg. Co. ....	115	<b>J</b>	
Bloom Engineering Co. ....	—	Electric Furnace Co., The ....	—	Jackson Iron & Steel Co., The ....	—
Bower Roller Bearing Co. ....	—	Electric Storage Battery Co. ....	—	James, D. O., Mfg. Co. ....	—
Bridgeport Brass Co. ....	—	Electro Alloys Co., The ....	—	J-B Engineering Sales Co. ....	—
Bristol Co., The ....	13, 116	Electro Metallurgical Co. ....	7	Jessop Steel Co. ....	—
Brooke, E. & G., Iron Co. ....	149	Elmes, Charles F., Engineering Works	—	Jessop, Wm., & Sons, Inc. ....	—
Brosius, Edgar E., Co. ....	—	Enterprise Galvanizing Co. ....	147	Johns-Manville Corp. ....	—
Brown & Sharpe Mfg. Co. ....	—	Equipment Steel Products Division of	—	Johnson Bronze Co. ....	—
Brown Instrument Co., The ....	—	Union Asbestos & Rubber Co. ....	92	Johnson Steel & Wire Co., Inc. ....	—
		Erdle Perforating Co., The ....	—	Jones & Lamson Machine Co. ....	—
				Jones & Laughlin Steel Corp. ....	58, 59
				Jones, W. A., Foundry & Machine Co. ....	—

# ◆ ◆ ADVERTISING INDEX ◆ ◆

Where-to-Buy Products Index carried in first issue of month.

	Page		Page		Page
Joslyn Co. of California	92	New York & New Jersey Lubricant Co.	—	Socony-Vacuum Oil Co., Inc.	—
Joslyn Mfg. & Supply Co.	92	Nlagar Machine & Tool Works	—	South Bend Lathe Works	103
<b>K</b>					
Kardong Brothers, Inc.	—	Niles Steel Products Div., Republic Steel Corp.	14, 15	Southington Hardware Mfg. Co.	116
Keagler Brick Co., The	142	Nilson, A. H., Machine Co.	151	Standard Galvanizing Co.	92
Kearney & Trecker Corp.	32	Nitralloy Corp., The	26	Standard Steel Works	—
Kemp, C. M., Mfg. Co.	—	Norma-Hoffmann Bearings Corp.	—	Stanley Works, The	—
Kester Solder Co.	—	Northwest Engineering Co.	105	Steel & Tubes Division, Republic Steel Corp.	14, 15
Kidde, Walter, & Co., Inc.	—	Norton Co., The	—	Steel Founders' Society of America	109
King Fifth Wheel Co.	—	<b>O</b>			
Kinnear Mfg. Co.	—	Ohio Crankshaft Co.	—	Steelweld Machinery Division, Cleveland Crane & Engineering Co.	—
Kirk & Blum Mfg. Co.	151	Ohio Electric Mfg. Co.	147	Sterling Grinding Wheel Div. of The Cleveland Quarries Co.	—
Koppers Co.	—	Ohio Galvanizing & Mfg. Co.	147	Strom Steel Ball Co.	—
Koven, L. O., & Brother, Inc.	92	Ohio Knife Co., The	—	Strong Steel Foundry Co.	—
Kron Co., The	—	Ohio Locomotive Crane Co., The	147	Stuart, D. A., Oil Co.	—
<b>L</b>					
Lake City Malleable Co.	Back Cover	Ohio Seamless Tube Co., The	—	Sturtevant, B. F., Co.	—
Lakeside Steel Improvement Co., The	—	Ohio Steel Foundry Co., The	—	Sun Oil Co.	61
Lamson & Sessions Co., The	8, 9, 116	Oliver Iron & Steel Corp.	114	Superior Steel Corp.	146
Landis Machine Co.	—	O'Neil-Irwin Mfg. Co.	—	Surface Combustion Corp.	94, 95
Lang Machinery Co.	150	Orr & Sembower, Inc.	143	Sutton Engineering Co.	—
La Salle Steel Co.	25	Oster Mfg. Co., The	111	Swindell-Dressler Corp.	—
Latrobe Electric Steel Co.	—	<b>P</b>			
Layne & Bowler, Inc.	—	Page Steel & Wire Division American Chain & Cable Co., Inc.	—	<b>T</b>	
LeBlond, R. K., Machine Tool Co., The	—	Pangborn Corp.	123	Taylor-Wilson Mfg. Co.	—
Leeds & Northrup Co.	28	Parker, Charles, Co.	116	Tennessee Coal, Iron & Railroad Co.	—
Lee Spring Co., Inc.	6	Parker-Kalon Corp.	116, 154	Thomas Machine Mfg. Co.	—
Lehigh Structural Steel Co.	92	Parkin, William M., Co.	141	Thomas Steel Co., The	—
Leschen, A., & Sons Rope Co.	145	Fawtucket Screw Co.	116	Thompson-Bremer & Co.	—
Levinson Steel Co., The	146	Penn Galvanizing Co.	92	Tide Water Associated Oil Co.	100, 101
Levinson Steel Sales Co.	—	Pennsylvania Industrial Engineers	—	Timken Roller Bearing Co., Front Cover	—
Lewin-Mathes Co.	—	Pennsylvania Salt Mfg. Co.	—	Timken Steel & Tube Division, The Timken Roller Bearing Co.	—
Lewis Bolt & Nut Co.	92	Perkins, B. F., & Son, Inc.	—	Tinnerman Products, Inc.	—
Lewis Foundry & Machine Division of Blaw-Knox Co.	—	Pheoll Mfg. Co.	116	Titanium Alloy Manufacturing Co.	—
Lewis Machine Co., The	—	Philadelphia Gear Works	—	Toledo Stamping & Mfg. Co.	149
Lincoln Electric Co., The	—	Phoenix Mfg. Co.	—	Tomkins-Johnson Co., The	—
Lincoln Hotel	143	Pike, E. W., & Co.	—	Torlt Manufacturing Company	120
Linde Air Products Co., The	—	Pittsburgh Crushed Steel Co.	—	Torrington Co., The	—
Link-Belt Co.	20, 21	Pittsburgher Hotel, The	148	Truscon Steel Co.	14, 15
Logemann Bros. Co.	—	Pittsburgh Gear & Machine Co.	145	<b>U</b>	
Lovejoy Flexible Coupling Co.	—	Pittsburgh Lectromelt Furnace Corp.	—	Udylite Corp., The	136
Lubriplate Division Fiske Brothers Refining Co.	—	Pittsburgh Rolls Division of Blaw-Knox Co.	—	Union Carbide & Carbon Corp.	—
Lyon Metal Products, Inc.	—	Plymouth Locomotive Works Division of The Fate-Root-Heath Co.	19	Union Drawn Steel Div., Republic Steel Corp.	14, 15
<b>Mc</b>					
McKay Machine Co.	—	Poole Foundry & Machine Co.	—	Union Steel Products Co.	—
McKee, Arthur G., Co.	—	Porter, H. K., Co., Inc.	—	United Chromium, Inc.	—
McKenna Metals Co.	131	Pressed Steel Tank Co.	—	United Engineering & Foundry Co.	—
<b>M</b>					
MacDermid, Inc.	—	<b>R</b>			
Mackintosh-Hemphill Co.	—	Racine Tool & Machine Co.	—	United States Graphite Co.	135
Macklin Co.	—	Ransohoff, N., Inc.	—	United States Steel Corp., Subsidiaries	—
Macwhyte Co.	—	Raymond Mfg. Co., Division of Associated Spring Corp.	—	United States Steel Export Co.	—
Machler, Paul, Co., The	—	Reading Chain & Block Corp.	—	<b>V</b>	
Mahr Manufacturing Co.	—	Ready-Power Co.	49	Valley Mould & Iron Corp.	—
Mallory, P. R., & Co., Inc.	—	Rellance Electric & Engineering Co.	—	Vanadium-Alloys Steel Co.	—
Mathews Conveyer Co.	119	Republic Steel Corp.	14, 15	Vanadium Corporation of America	—
Mathews, Jas. H., & Co.	—	Revere Copper and Brass, Inc.	—	Van Dorn Iron Works Co., The	—
Maurath, Inc.	—	Rhoades, R. W., Metaline Co., Inc.	—	Vaughn Machinery Co., The	27
Mercury Mfg. Co.	—	Riverside Foundry & Galvanizing Co.	92	Veeder-Root, Inc.	—
Mesta Machine Co.	31	Robertson, H. H., Co.	—	<b>W</b>	
Metal & Thermit Corporation	118	Roebing's, John A., Sons Co.	—	Waldron, John, Corp.	—
Michlana Products Corp.	—	Rollway Bearing Co., Inc.	30	Walker-Turner Co., Inc.	—
Micromatic Hone Corp.	—	Roosevelt Hotel	—	Wall-Colmonoy Corp.	143
Midland Structural Steel Co.	—	Roper, George D., Corp.	—	Warner & Swasey Co.	—
Midvale Co., The	—	Ruemelin Mfg. Co.	140	Washburn Wire Co.	—
Missouri Rolling Mill Corp.	92	Russell, Burdsall & Ward Bolt & Nut Co.	116	Watson-Stillman Co., The	—
Moltrup Steel Products Co.	—	Ryerson, Joseph T., & Son, Inc.	147	Wayne Chemical Products Co.	—
Molybdenum Corporation of America	106	<b>S</b>			
Monarch Machine Tool Co., The	2, 3	Sadonia Ltd.	145	Wean Engineering Co., Inc.	—
Monarch Steel Co.	—	Salem Engineering Co.	23	Webb City and Cartersville Foundry and Machine Works	—
Morgan Construction Co.	—	Samuel, Frank, & Co., Inc.	—	Weinman Pump & Supply Co., The	—
Morgan Engineering Co.	—	San Francisco Galvanizing Works	92	Weirton Steel Co.	12
Morton Salt Co.	—	Sanitary Tinning Co., The	92	Welding Equipment & Supply Co.	—
Motch & Merryweather Machinery Co.	97	Scalfe Co.	—	Wellman Bronze & Aluminum Co.	—
Motor Repair & Mfg. Co.	150	Schloemann Engineering Corp.	138	Wellman Engineering Co.	—
<b>N</b>					
National Acme Co.	—	Seovill Mfg. Co.	116	Westinghouse Electric & Mfg. Co.	—
National Automatic Tool Co., Inc.	—	Scully Steel Products Co.	—	West Penn Machinery Co.	—
National Bearing Metals Corp.	—	Sellers, Wm., & Co., Inc.	—	West Steel Casting Co.	149
National Broach & Machine Co.	—	Shakeproof, Inc.	116	Wheeling Steel Corporation	147
National Carbon Co., Inc., Carbon Sales Division	—	Shaw-Box Crane & Hoist Division, Manning, Maxwell & Moore, Inc.	—	Whitcomb Locomotive Co., The	—
National Cylinder Gas Co.	—	Sheffield Corp., The	83	Whitehead Stamping Co.	—
National-Erie Corp.	—	Shell Oil Co., Inc.	—	Whitney Screw Corp.	116
National Lead Co.	—	Shenango Furnace Co., The	—	Wickwire Brothers, Inc.	—
National Roll & Foundry Co.	—	Shenango-Penn Mold Co.	—	Wilcox, Crittenden & Co., Inc.	92
National Screw & Mfg. Co.	116	Shepard Niles Crane & Hoist Corp.	—	Williams, J. H., & Co.	149
National Steel Corp.	12	Shuster, F. B., Co., The	—	Wilson, Lee, Engineering Co.	—
National Telephone Supply Co., Inc.	92	Silent Hoist Winch & Crane Co.	—	Witt Cornice Co., The	92
National Tube Co.	—	Simonds Gear & Mfg. Co.	145	Wood, R. D., Co.	—
New Departure, Division General Motors Corp.	—	Simonds Saw & Steel Co.	—	Worth Steel Co.	—
New England Screw Co.	116	SisalKraft Co., The	—	Wyckoff Drawn Steel Co.	—
New Jersey Zinc Co.	—	SKF Industries, Inc.	—	<b>Y</b>	
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# This *protective* step leads to 49\* more!



Carbon analysis in P-K Laboratory—first step in Quality-Control routine.

Parker-Kalon's Quality-Control Laboratory makes sure that every P-K Socket Screw has the right beginning. Thorough laboratory tests of the raw material are followed by numerous tests and inspections that result in Parker-Kalon's high standard of quality. Physical and mechanical characteristics must surpass all working requirements.

The Parker-Kalon Laboratory controls the entire production of these Socket Screws. This is your assurance of 100% dependability! "Doubtful screws"—screws that *look all right* but some of which fail to *work right*—have been eliminated by a complete step-by-step Quality-Control routine which has no counterpart in the screw-making industry.

This protection against costly delays and rejects caused by "doubtful screws" is ample reason why essential war production industries specify P-K Socket Screws. Besides, they cost no more! Parker-Kalon Corp., 194-200 Varick Street, New York.

\*49 separate "check-ups" on Cap Screws alone!



## Quality-Controlled

Complete test and inspection routine covers: Chemical Analysis; Tensile and Torsional Strength; Ductility; Shock Resistance under Tension and Shear; Hardness; Head diameter, height and concentricity; Socket shape, size, depth and centrality; Class 3 Fit Threads; Clean-starting Threads.



REPORT ON INCOMING MATERIAL

Size: 304" Heat: 949 Supplier: A.S.M.  
 Date Rec'd: 2/14/42 P.M. No. 6421 Analysis: S.A.E. 3135L Notes: B - Backyard Tap  
 No. Cells: 15 No. Samples: 15 Tested by: L.O. Date: 2/14/42  
 Approved by: L.O.

Cell No. & Size	Carbon Analysis	Max. Tensile Load in lbs.	Min. Tensile (Min. in spec.)	% Yield in Spec.	A.S. Hard	A.C. Hard	A.C. Time	Structure	Scale
5th - 304"	36%	5020	69,250	71.3%	77.5	50	40.5		
22" - 304"	36%	4900	67,600	71.3%	76.5	50	40	Fine grain .000"	
17" - 304"	36%	4900	68,740	74.4%	77	51	44.5		
9" - 304"	36%	4970	66,750	69.9%	77	52.5	46		
23" - 304"	37%	5090	66,600	72.1%	78	50	40.5		

Drawn at 775° F for 60 minutes—  
 Wire OK for all operations—

Form 701 (Rev. 2)

# PARKER-KALON

Quality-Controlled

## SOCKET SCREWS

Give the Green Light to Defense Assemblies