April 22, 1946

STEEL

The Magazine of Metalworking and Metalproducing

ESTABLISHED 1882

EDITORIAL CONTENTS, PAGE 43

2426 III Sh.

BIBLIOTEKA POLITECHNIKI ŚLĄSKIEJ

Please check your name when finished with this magazine and return to Eleanor

F. P. Peters_____

T. C. Du Mond_____

R. S. Burpo, Jr._____

E. F. Cone_____

H. A. Knight_____

H. R. Clauser_____

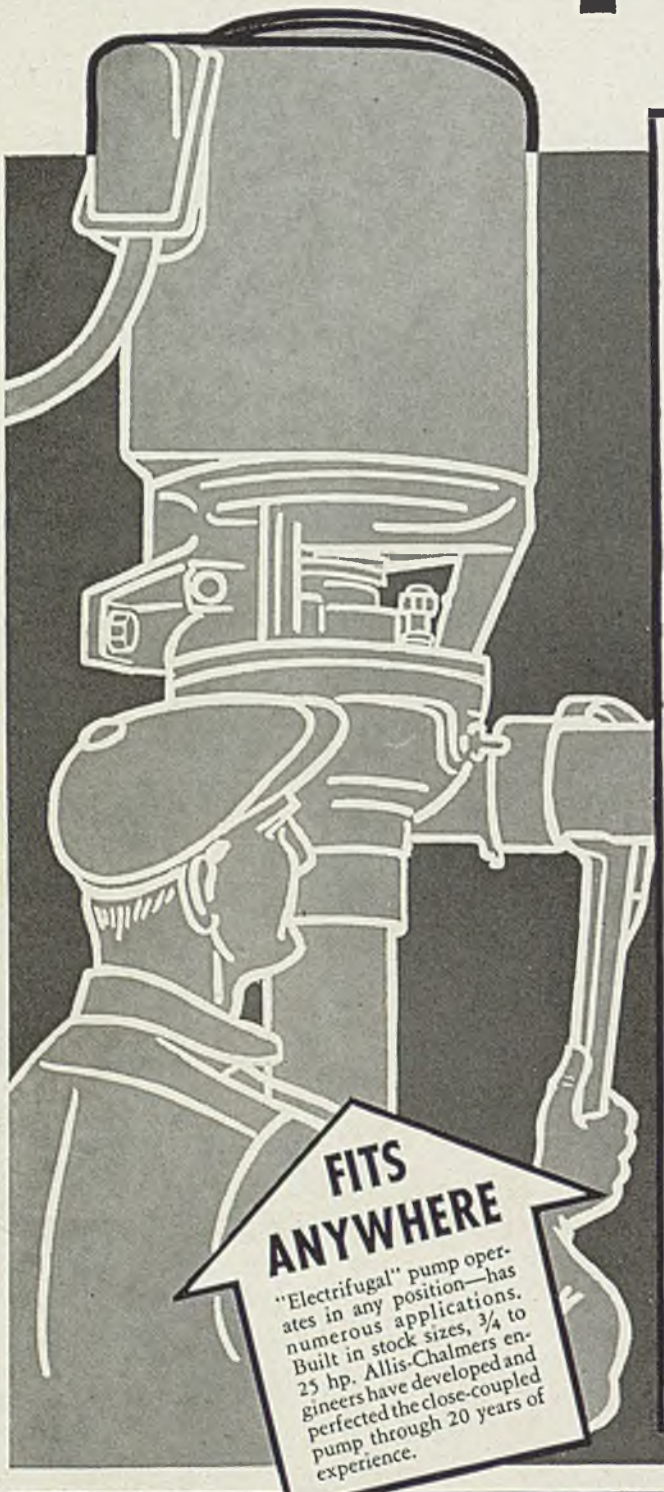
VALLEY MOULD & IRON CORP.

General Offices: HUBBARD, OHIO

Western Office: Chicago, Ill.

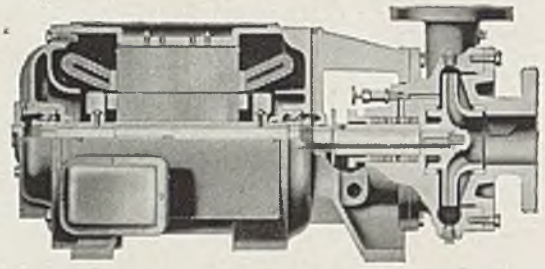
Northern Office: Cleveland, O.

Hook Up...AND Pump!



FITS ANYWHERE

"Electrifugal" pump operates in any position—has numerous applications. Built in stock sizes, 3/4 to 25 hp. Allis-Chalmers engineers have developed and perfected the close-coupled pump through 20 years of experience.



A-C "Electrifugal" Pump Cuts Installation Time

This compact "Package" pump comes fully assembled. No coupling to line up. Just bolt it down, make pipe and power connections — prime and pump! More than that, this pump costs you *less to buy — less to operate.* Read these interesting facts:

SIMPLE, COMPACT DESIGN

Motor and pump are built into one rigid frame, with rotor and pump runner on a single shaft. Result: one third less space — fewer parts — *lower cost.*

EASY TO SERVICE

Packings, rotor, impeller, and all moving parts are easy to get at. Quickly taken apart, checked, and reassembled. Down time is reduced to a minimum.

LOW MAINTENANCE

Ample bronze wearing rings, bronze water seal and valve — shaft sleeve and deflector — five packing rings — precision workmanship — and other quality features all add up to longer life, less maintenance cost.

UNDIVIDED RESPONSIBILITY

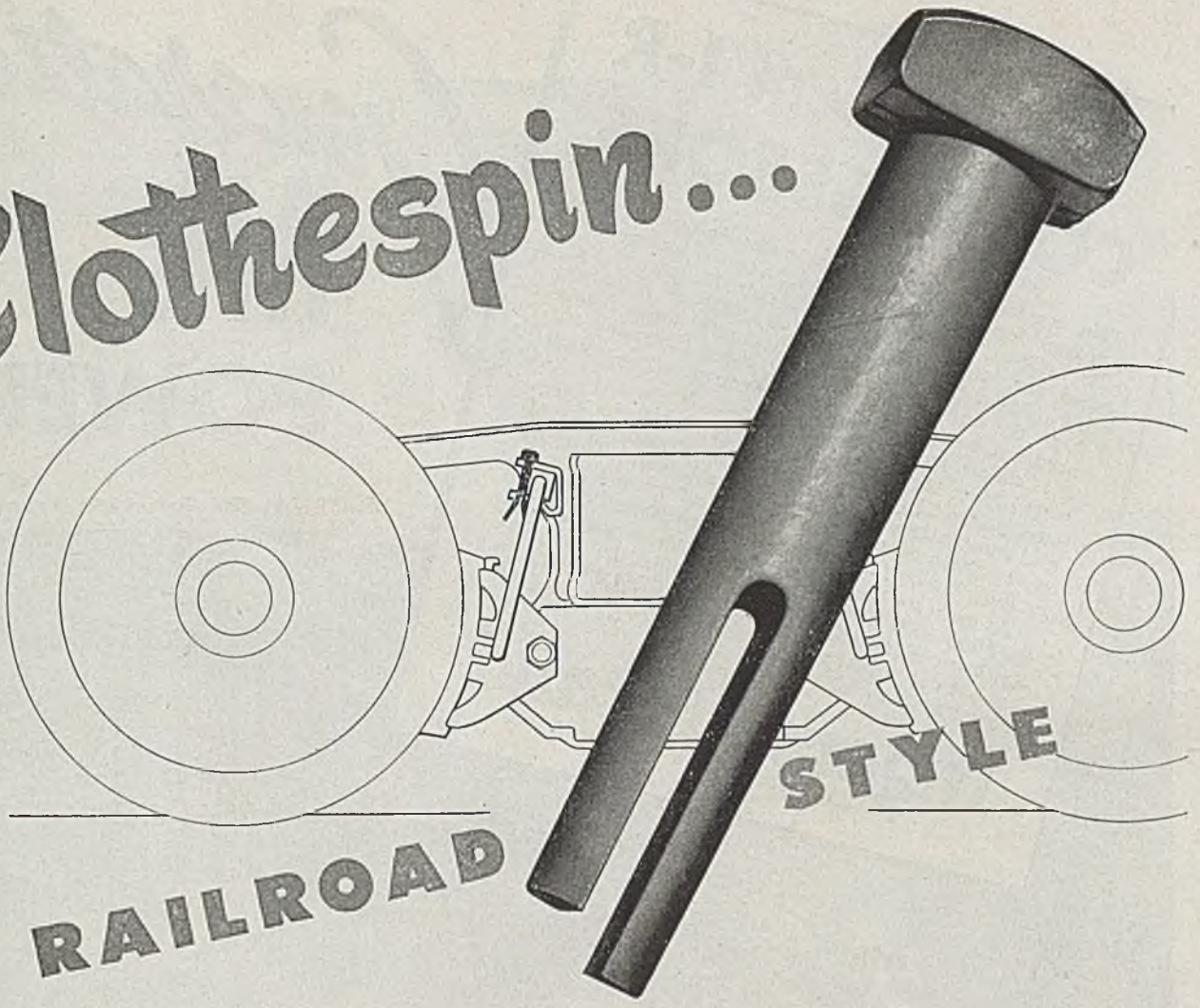
Allis-Chalmers builds both pumps and motors — backs them up with unsurpassed experience and reputation in both fields. Call your A-C office for help on any pumping problem . . . or write for bulletin B6059. ALLIS-CHALMERS, Milwaukee 1, Wisconsin.

HEAR THE BOSTON SYMPHONY
Every Saturday Evening, American Broadcasting Co.

ALLIS AC CHALMERS
Electrifugal **PUMPS**

COMPLETE LINE
of centrifugal pumps and motors. Single or double suction—single- and multi-stage—capacities to 170,000 gpm.
A 2010

Clothespin...



The husky clothespin-like split-end bolt shown above is known as a Brake Beam Hanger Retainer Pin. It sees service in the truck side frames of cars on several leading railroads.

Made from bars of SAE 1020 steel, the bolt is furnished in two sizes, ¾ in. x 4⅝ in. and ⅞ in. x 5 in. Its manufacture includes two unusual operations—punching the rounded-bottom slot in the shank, and cutting off one end so that it is ¼ in. shorter than the other.

This is but one of hundreds of types of fastenings, ranging from standard bolts and nuts to highly specialized items like set screws and continuous-thread tap-end stud-bolts, which are currently being turned out at Bethlehem's huge fastenings plant at Lebanon, Pa.

Have you a difficult fastenings problem? Lebanon Plant, with its skilled personnel and up-to-the-minute manufacturing equipment, is adept at finding the solution to such problems. Next time you need special fastenings—regardless of kind, shape or size—discuss your requirements with a Bethlehem engineer.

★ BETHLEHEM STEEL

Bethlehem makes every type of Fastening

. . . . with I-R

COMPRESSORS

The new PRE is the very latest in electric-driven compressor design. Look at the sturdy sealed frame, with its built-in, force-feed and filtered lubrication system, and full-floating crank- and crosshead-pin bearings. Main bearings have micrometer adjustments from the outside of the frame. Since the crankcase need not be opened for adjustment of any bearings, it is sealed, and thus stays clean.

These are the compressors equipped with air-operated, 5-step Clearance Control . . . a system originated and constantly improved by Ingersoll-Rand. This has always been conceded to be the best method of controlling the output of electric-driven compressors.

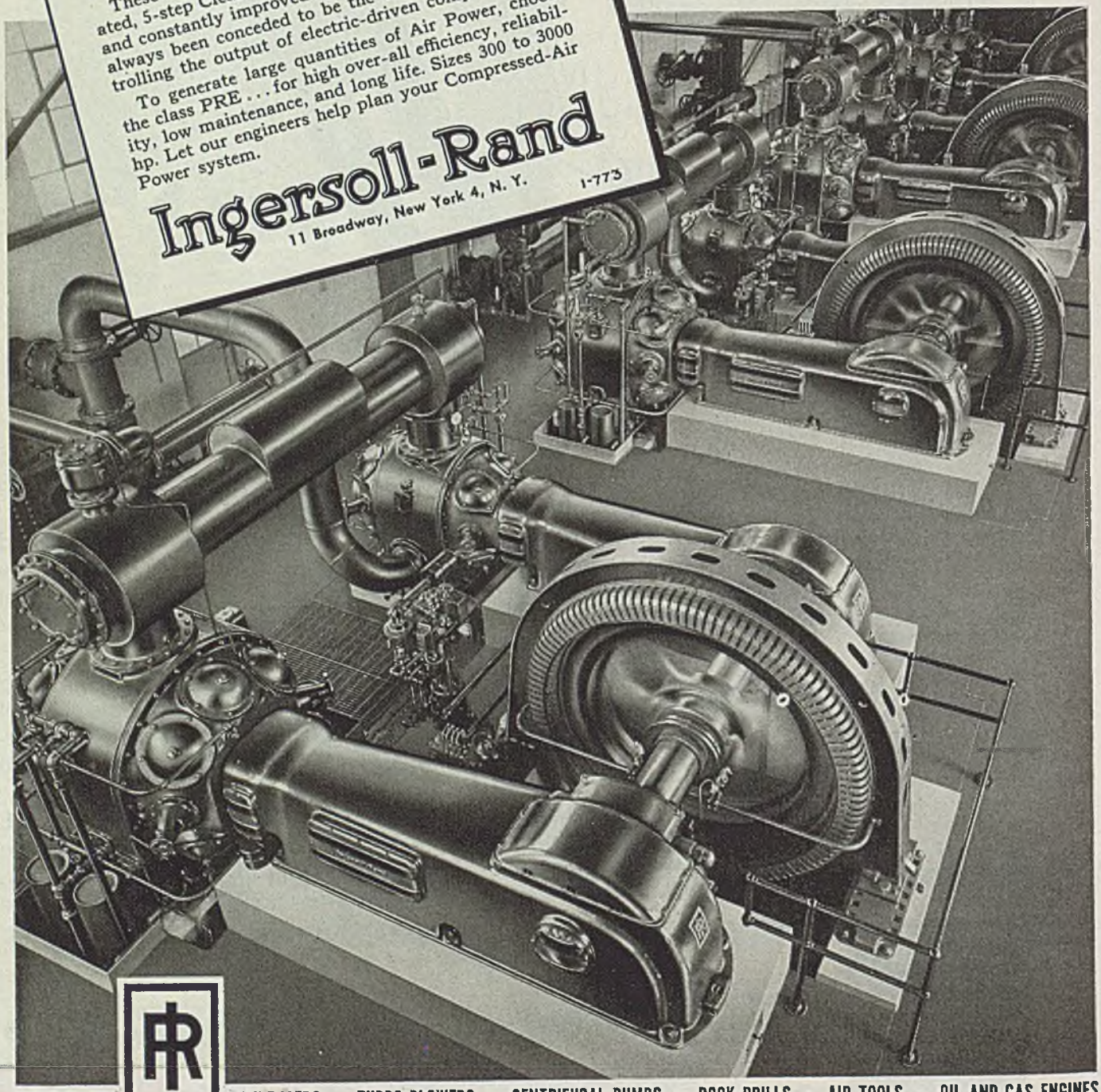
To generate large quantities of Air Power, choose the class PRE . . . for high over-all efficiency, reliability, low maintenance, and long life. Sizes 300 to 3000 hp. Let our engineers help plan your Compressed-Air Power system.

Ingersoll-Rand

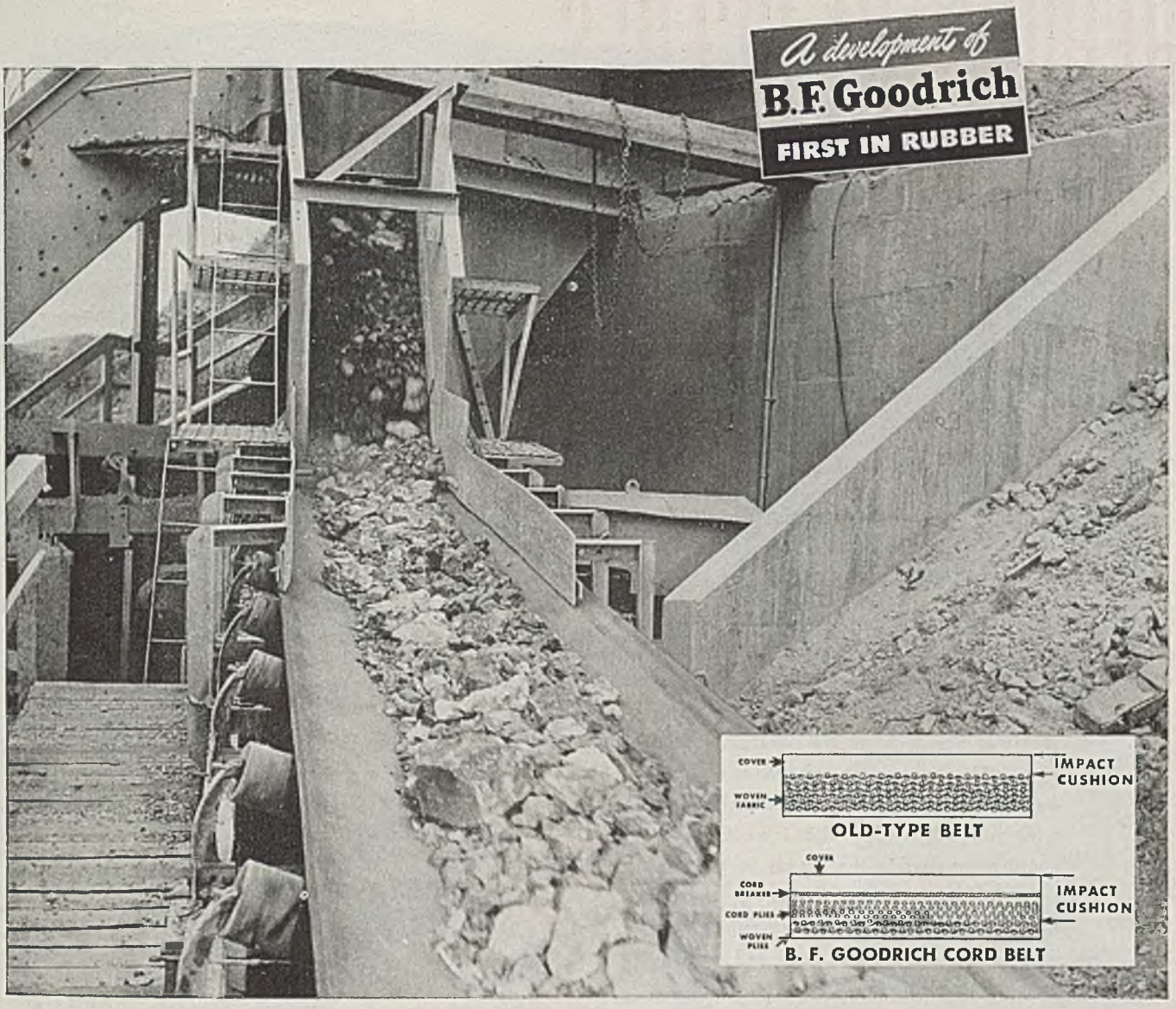
11 Broadway, New York 4, N. Y. 1-773

Generating AIR POWER

Four 700-hp PRE Compressors in mining service.



COMPRESSORS · CONDENSERS · TURBO BLOWERS · CENTRIFUGAL PUMPS · ROCK DRILLS · AIR TOOLS · OIL AND GAS ENGINES



Handles nearly 6,000,000 tons in 2 years—still no signs of wear!

Cord conveyor belt is a typical example of B. F. Goodrich product development

THIS was a tough one: minus 16" crusher run limestone; 10′ drop from a steep chute; average 800 tons per hour 12 hours a day with peak loads up to 1400 tons per hour.

No wonder the operator of this cement company selected B. F. Goodrich cord belt for the job. In this new construction, each cord in each ply is completely surrounded by rubber. Then a layer of parallel cords called a transverse breaker, also embedded in rubber, is laid *across* the belt — floating in rubber above the carcass and covered at the surface by another rubber layer.

Because each cord is embedded in rubber, the impact cushion, as shown in the diagram, is very much greater than that in conventional belt construction. And the transverse breaker allows the surface to give as the cords spread at the moment of heavy impact. Cutting and gouging are prevented due to the *lengthwise* stretch.

This shock absorbing action is responsible for the long, trouble-free life of the B. F. Goodrich cord belt. Often, it's 25% to 50% more than that of ordinary belts — occasionally a lot more. The belt in the picture has handled nearly 6,000,000 tons of rock in 2 years — *and shows no signs of wear.*

Ask your B. F. Goodrich distributor to tell you more about the cord belt. He can cite numerous case histories where substantial money savings have been made through the use of the cord belt. Or, if there's no distributor near you, please write *The B. F. Goodrich Company, Industrial Products Division, Akron, Ohio.*

B.F. Goodrich

RUBBER *and* SYNTHETIC *products*

BEHIND THE SCENES

with Shrdlu

Excessive Verbiage Is Confusing

We have always been strong advocates of the direct approach, editorially speaking. Our boys are trained never to use two words when one will do, and to use as few as possible without slipping into the cablese habit which, although economical of words, is hard to read. It sometimes hurts us a little, mentally, to read overworded passages like this one, which came in a letter from the Argentine:

> **"We have the honour of addressing to you for making known the state of respective service of subscription, and we are begging you would consider the detail explained below to obviate, as rapidly as it's possible, the lack of the material noted here. The incomplete collections lose the most part of its value, and therefore we hope you will resolve what is necessary to avoid anomalies in the supply of the material of subscription, increasing in this manner the reputation of your appreciated institution. Expecting you will answer promptly we reiterate the certainty of our prominent consideration, and ever ready to be of service to you in return, we remain gentlemen."**

In case you have difficulty in translating that English into English, we'll tell you how we have it figured out. They failed to receive a couple of issues recently, and want to complete their files by having us replace the missing numbers. The missing ones were sent out, on behalf of the good neighbor policy, by our never-sleeping circulation staff.

There's News in the Ads, These Days

After taking a copy of this week's issue and carefully studying the ads, we had a little talk with our advertising department. Seemed to us that the copy our good customers are running seems to be more informative, more helpful than ever. The advt. dept. reports that a lot of the "war babies" have cancelled their space, which was expected, although some of them are now in as strongly as ever with new products. The old-line advertisers are rolling along as usual, with good copy and a real story to tell, in the kind of language a metalworking executive can understand. The newer faces in our advertising columns are doing the same kind of a job — with reconversion and the competitive market just ahead.

How To Do It—Navy Style

Next week, in our April 29 issue we are going to show you how the Navy is fixing up its ships so they will be completely out of service and protected from rust and corrosion, yet can be prepared for active duty at the drop of a hat — or should we say the drop of a bomb? The story has its interesting points to industry. For example, wouldn't you like to be able to store all your steel stocks in a building where you could be sure no rust would ever form? This story will tell you how it's done in the Navy, which might give rise to a few good ideas on industrial storage problems.

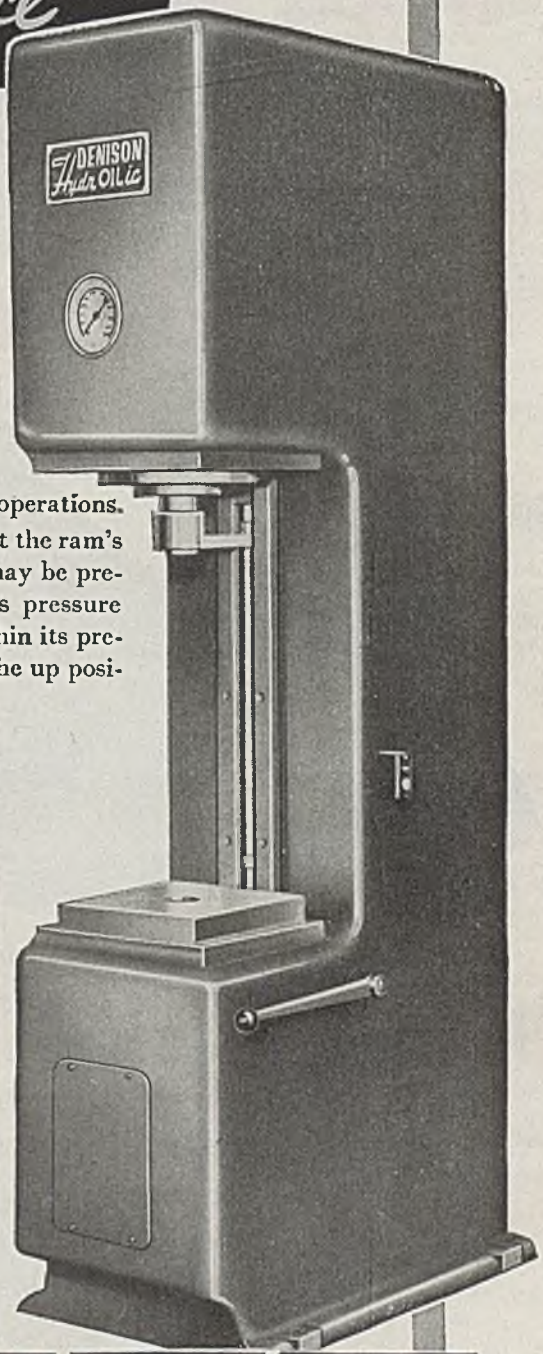
How Now, Brown Cow?

We are still having our problems with the cow picture. From the looks of the mail, some of you are also having your troubles. For example, Paul N. Dann, president of the Rattan Manufacturing Co., says that our explanation makes the picture even less clear, if possible, than most of the rules and regulations, including interpretations, which emanate from Washington. Than which, of course, there are no than whicher. He includes a sketch of his own, which he claims is superior to ours because anyone can find anything in it — including cows, if they so desire. We don't. Sumpter Turner of the Turner Equipment Co., from down in the tobacco auctioneer's home town of Goldsboro, N. C., says, "Before my entire organization is completely disrupted, will you kindly furnish us with the key to your alleged Hoax-stein cow? All of us are mumbling and talking to ourselves, so please have pity on us. Was it not unkind to subject us to such an ordeal so near to March 15th?" Well, we now have available reprints of that picture, so if any of you want to annoy your friends and provide a mental disturbance for your enemies, drop us a line and we'll be glad to send along extra copies.

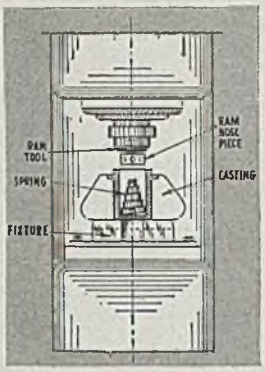
Vol. [illegible] No. 16, April 22, 1946 issue of STEEL, published every Monday at Cleveland Ohio. Entered as second class matter at the post office, Cleveland O., under act of March 3, 1879. U. S. and possessions, Canada, Mexico, Cuba, Central and South America, 1 year $6; 2 years $10; all other countries, 1 year $12. Current issues, 25c. Yearbook of Indusrty issue, $2 00.

(Editorial Contents—page 43)

An ASSEMBLY PRESS for Wide-Range Service



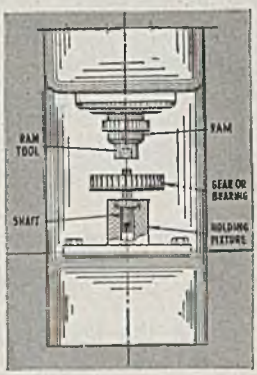
Because it is a Denison HydrOILic Press, and because it was designed specifically for assembly operations, the AC2 Series Units have the speed, power and control best suited for work of this nature.



And their utility is not limited to assembly . . . the open, C type frame with modern, all-welded construction, affords ample space—daylight opening, throat depth, work-table surface—for rapid tooling up on hundreds of operations.

Uniform pressure is applied throughout the ram's complete working cycle, and pressures may be predetermined and regulated. Ram exerts pressure upon contacting the work anywhere within its preset limits of movement, and returns to the up position when control lever is released.

Economical to own, operate and maintain, this completely self-contained unit will answer your need for an all-purpose press.



The AC2 units are available in 5, 15, 25, 50, 100 and 150-ton capacities. They exemplify the smooth, easily regulated, quality press performance available in all Denison HydrOILic presses.

Complete information on Denison HydrOILic products is available on request—write today.

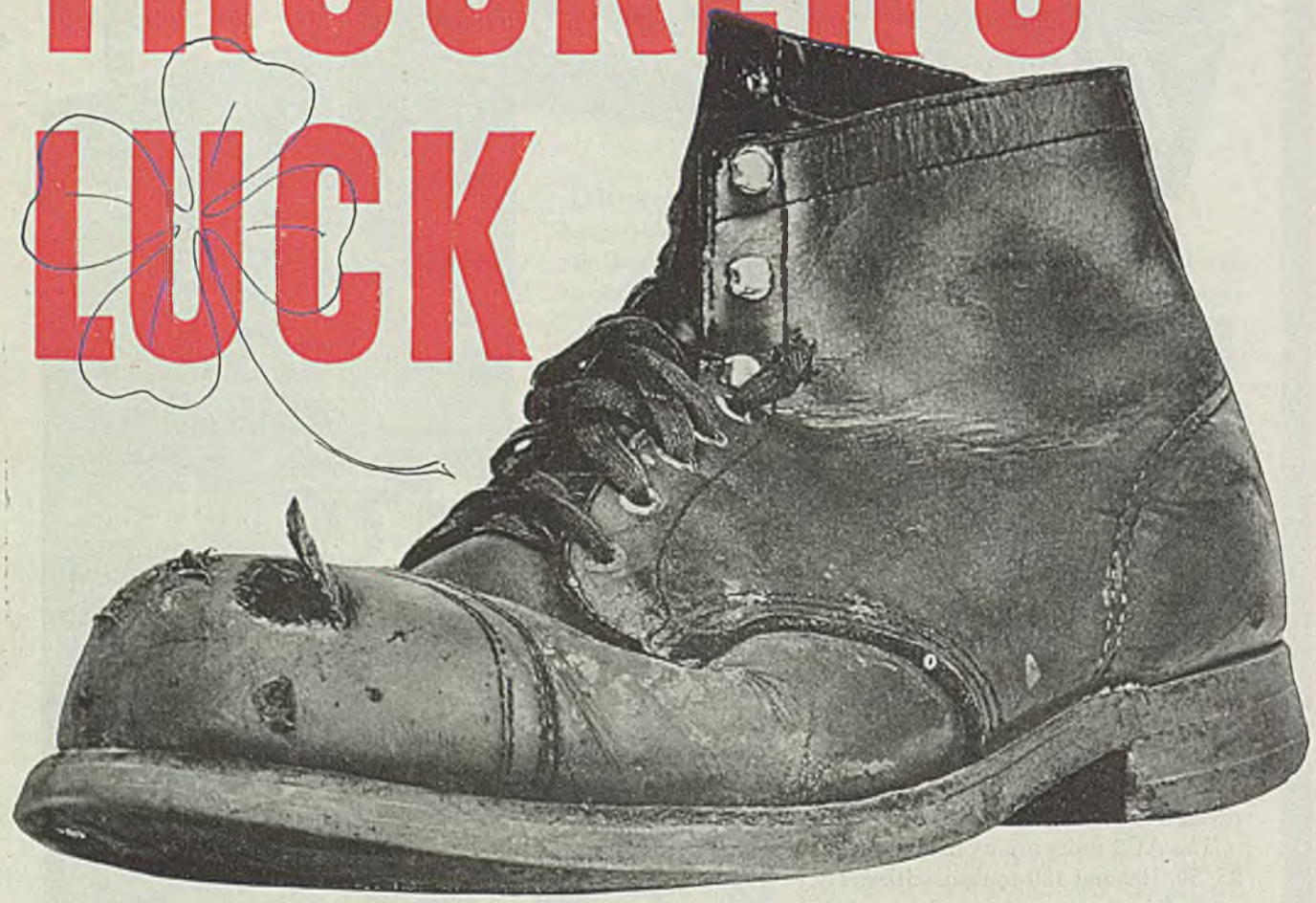
DENISON makes the MULTIPRESS!

DENISON EQUIPMENT in APPLIED HydrOILics

The **DENISON** Engineering Co.
1163 DUBLIN ROAD, COLUMBUS 16, OHIO

Write today for full details on **DENISON** *HydrOILic Presses*

TRUCKER'S LUCK



Factory truck carrying 700 lb. load rammed against trucker's foot when he disobeyed safety rules and pulled instead of pushed. The blow gashed a hole in the leather of his shoe, might have smashed his toes. But the Lockrim* armor plate steel toe box in his Lehigh Safety Shoe saved him from injury. Every day such accidents convince workers that Lehighs give them "lucky toes." Lehighs give them more than luck. These safety shoes are **engineered to fit into industry.** There's a particular model for every type of job . . . for every floor condition. That's why safety-minded management more and more looks to Lehigh for authoritative aid when and wherever foot and underfoot problems occur. Why don't you?

FREE! Pay envelope enclosure with ten similar case histories will convince any skeptic that safety shoes pay. No advertising. Send for sample or enough to cover your payroll.

*T. M. REG

LEHIGH ALLENTOWN, PA.

SAFETY SHOE CO., INC.

WESTERN OFFICE: 12th AND SPRUCE, ST. LOUIS 2, MO.

Here's what your money buys in a NORTHWEST

- **Simplicity of Design**
  —for easy upkeep.
- **Cast Steel Bases with Cast Ste Machinery Side Frames**
  —plenty of strength — keep shaf in alignment.
- **"Feather-Touch" Clutch Contr**
  —easy operation with feel of t load always present. No fear shut down because of control failur
- **Cushion Clutch**
  —reduces overloads on parts und power, reduces clutch adjustme and lengthens cable life.
- **Helical Gear Drive**
  —there is no finer power take-o
- **Uniform Pressure Swing Clutch**
  —trouble-free — fewer adjustmen smoother operation.
- **Ball and Roller Bearings on a high speed shafts**
  —minimum loss of power to frictic
- **Northwest Worm Boom Hoist**
  —boom up, boom down, there is jumping, no chattering, just velv action under power both up a down.
- **Northwest Steering**
  —positive traction on both crawle while turning as well as when g ing straight ahead on all larg Northwests.
- **Crawler Gears fully enclosed**
  —full protection against rou going.
- **Handles any type of equipme and is quickly converted Shovel or Dragline!**
  —clamshell, magnet, hook blo timber tongs—any type of handli tool that can be attached to a ca can be used on a Northwest, or can be quickly converted to shovel or dragline by simply char ing booms.

Here is a combination of advanta that is exclusively Northwest. Th assure a flexibility that takes it ar where and permits the handling any type of material in locatio and at costs impossible for a machi limited by tracks or overhe structures. Plan your plant expa sion and modernization to ha Northwest Crawler Crane mater handling.

4 to 44 tons

NORTHWEST ENGINEERING COMPANY
1805 Steger Bldg. • 28 E. Jackson Blvd. • Chicago 4, Ill.

NORTHWEST

Okayed!

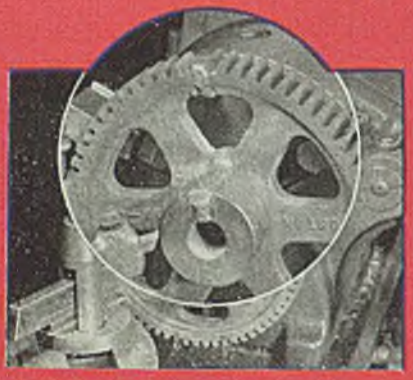
BY THOUSANDS OF WELDERS . . .

NICKEL-ARC

The electrode that gives you MACHINABLE WELDS ON CAST IRON

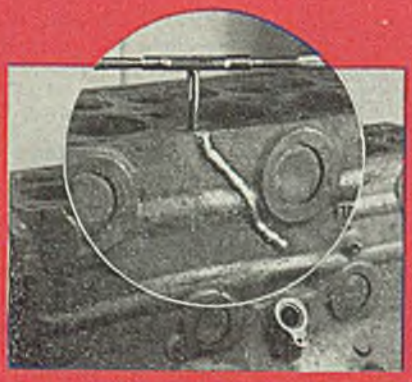
Thousands of cast iron welders, who have seen NICKEL-ARC'S superiority **proven,** will tell you that it does a more efficient, faster, more economical job. Here's how:-

1. NICKEL-ARC has the smoothest arc ever produced.
2. After machining or grinding, the weld deposit closely matches the color of cast iron.
3. Cracks are eliminated in multiple pass welds.
4. NICKEL-ARC may be used with any welding machine—in downhand, vertical or overhead position with equal ease.

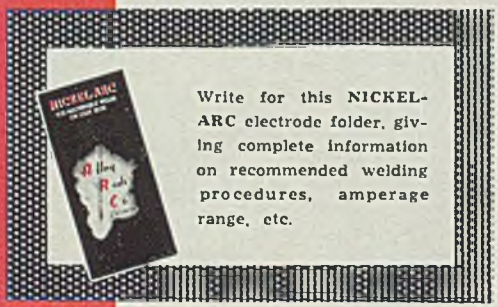


AC or DC all position welding

Easily machinable welds with no pressure or porosity



Withstands hydrostatic pressure



Write for this NICKEL-ARC electrode folder, giving complete information on recommended welding procedures, amperage range, etc.

Alloy Rods Co.

MANUFACTURERS OF STAINLESS AND ALLOY ELECTRODES

ALLOY RODS COMPANY YORK, PA.

TEXROPE
"MAGIC-GRIP" SHEAVES make the job easy!

JUST slide it on the shaft — move it into exact alignment, using a straightedge if desired — then tighten three cap screws. It's easy as that.

Sheave and bushing come completely assembled. No hammering, no filing or reaming. The patented "Magic-Grip" Sheave gives a powerful clamp fit without backlash, shear or wobble. Yet it can be taken off as easily as it goes on.

You save manhours and money the first time you mount a Texrope "Magic-Grip" sheave — and every time after. In addition, there are no set screws to score shaft. And because you don't *hammer* it on, you can't damage motor bearings!

These advantages cost you nothing extra. For details call your A-C office or dealer, or write for Bulletin B6310. ALLIS-CHALMERS, MILWAUKEE.

V-BELTS

TEXROPE complete line — Sizes, types for every power transmission problem and condition.

ALLIS AC CHALMERS
TEXROPE V-BELT DRIVES
ORIGINATORS OF THE MULTIPLE V-BELT DRIVE

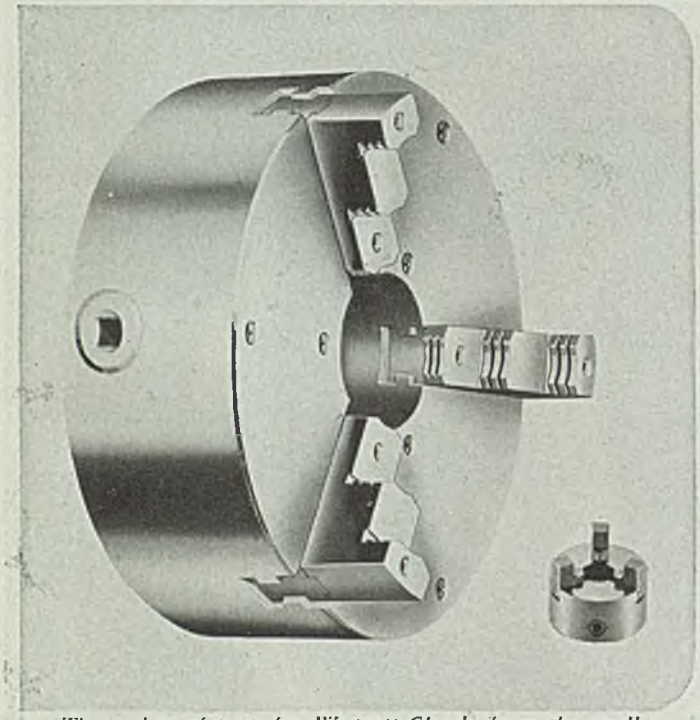
SHEAVES

"MAGIC-GRIP" . . . TEX-STEEL . . . TEXDRIVE . . . Speed changers and VARI-PITCH sheaves.

HEAR THE BOSTON SYMPHONY: *Every Saturday Evening, American Broadcasting Co.*

A 2008

One New WARNER & SWASEY



The variety of parts for Westcott Chucks from the small 2" up to the 12" diameter chuck are machined on a single 2-A Warner & Swasey Turret Lathe.

The Westcott Chuck Company, Oneida, New York, makes fine chucks—machining work that calls for high precision.

It makes them in a wide range of sizes.

Chuck parts were being produced on four old style turret lathes—not too economically because these old models could not hold extreme accuracy. They were used only for roughing cuts, and separate finishing operations were required.

A new Warner & Swasey 2A Turret Lathe was purchased. It was found that this *one* new machine could handle *both* rough and finish operations and outproduce the *four* old turret lathes. Its wide range of capacity enabled it to be used readily on many sizes of chuck parts.

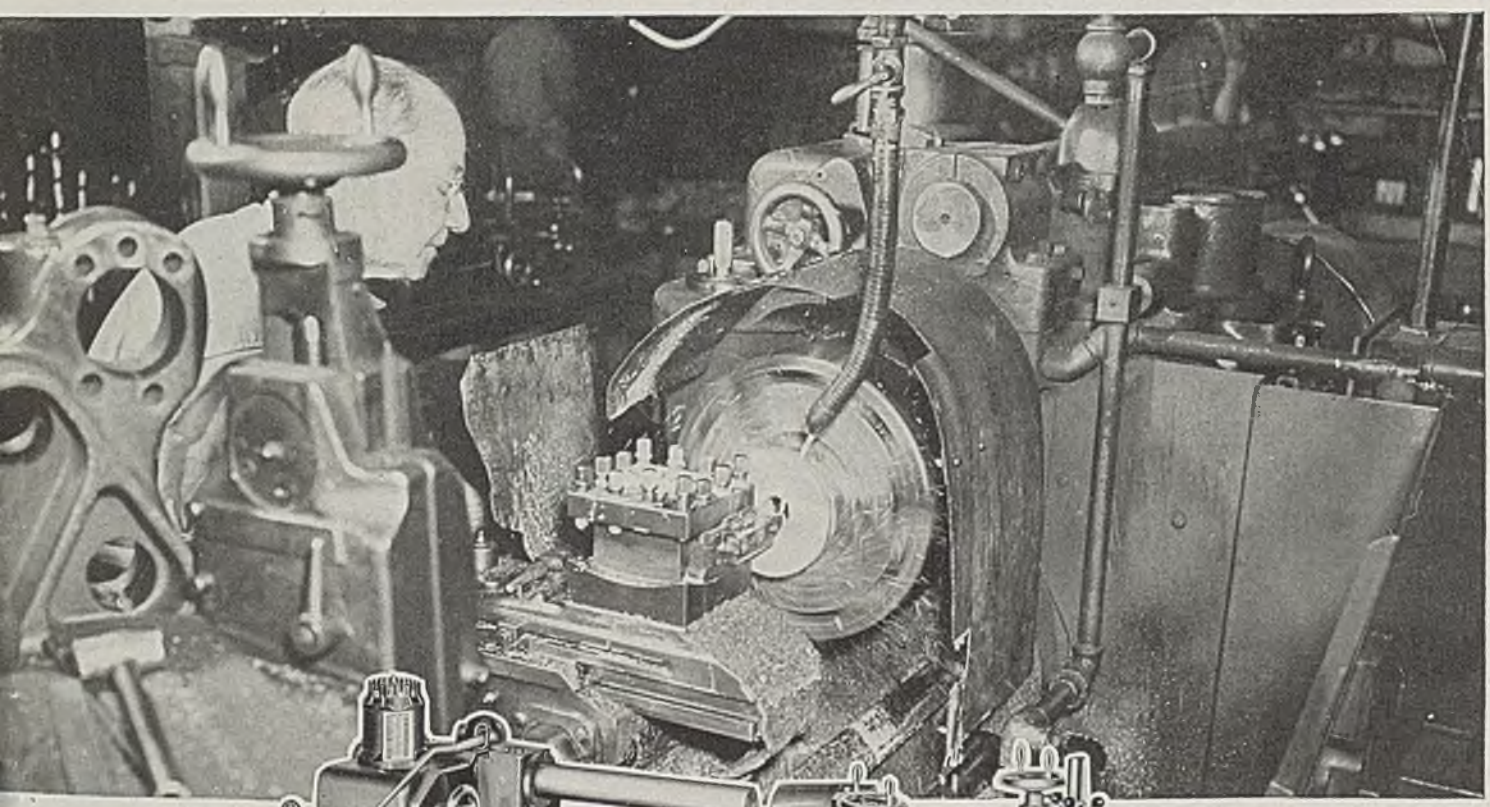
The experience of the Westcott Company can be paralleled in hundreds of plants . . .

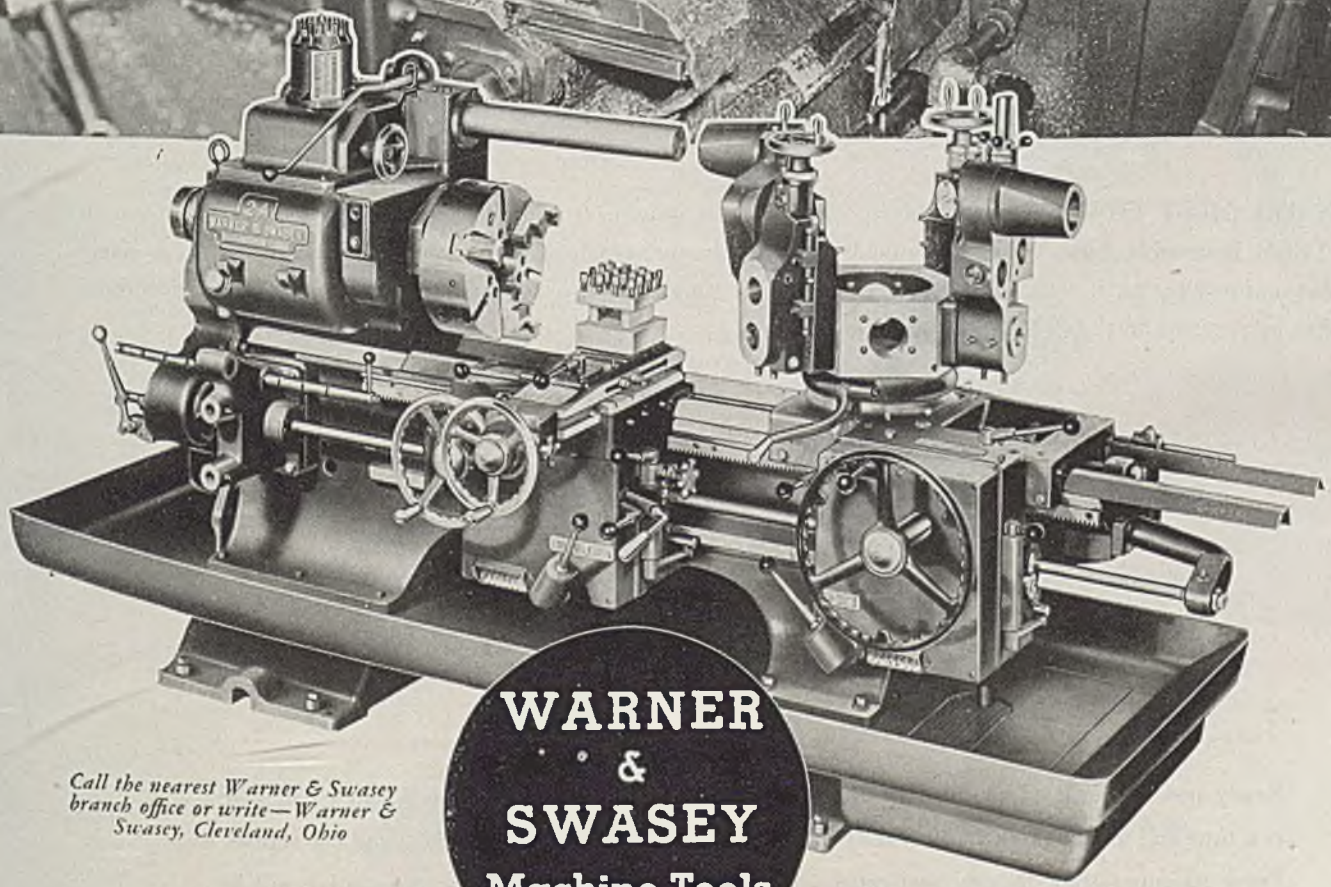
Why not avail yourself of the experience and specialized knowledge of a Warner & Swasey field representative?

- New Warner & Swaseys incorporate a number of improvements that may be extremely profitable on your particular work.
- Accessory equipment also can be installed on many older model Warner & Swaseys to increase productivity.
- A new Warner & Swasey Multiple Spindle Automatic now makes short runs practical and profitable.
- Warner & Swasey Precision Tapping and Threading Machines bring radically new principles that result in remarkable increases in production.

TURRET LATHES, MULTIPLE SPINDLE AUTOMATICS, PRECISION TAPPING & THREADING MACHINES

does the work of four old machines





Call the nearest Warner & Swasey branch office or write—Warner & Swasey, Cleveland, Ohio

WARNER & SWASEY
Machine Tools
Cleveland

YOU CAN MACHINE IT BETTER, FASTER, FOR LESS . . . WITH A WARNER & SWASEY

NEW... *and Ready for Immediate Delivery!*

PNEUMATIC IMPACT WRENCH

by Thor

MORE POWER— *for Faster, Positive Driving and Removing of Nuts, Bolts and Cap Screws.*

LONGER LIFE— *through amazingly simple, sturdy, new impact mechanism.*

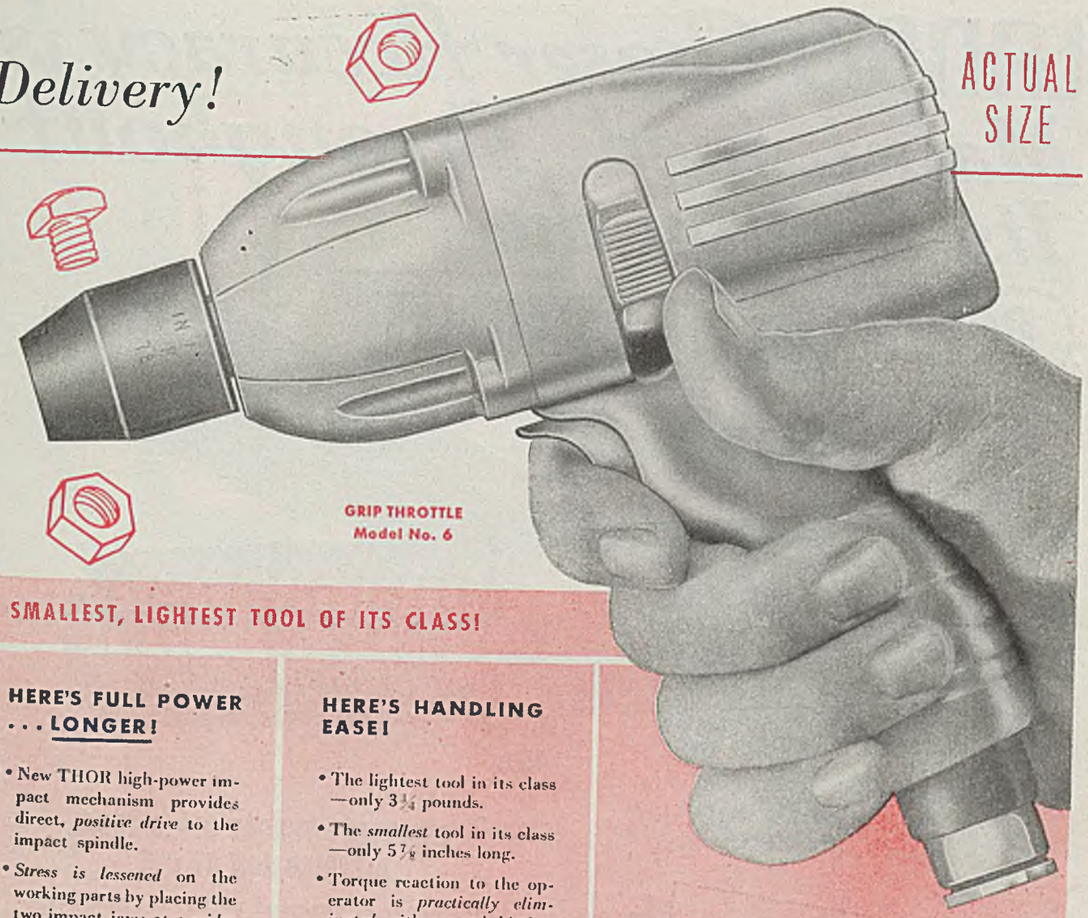
EASILY THE MOST POWERFUL tool of its class, the new THOR Reversible Impact Wrench quickly and surely *drives and removes* nuts, bolts and cap screws up to ⅜" I.D. Far lighter and more compact—only 3¾ pounds in weight; 6 inches long—it is easy to handle even in hard-to-reach places. Pneumatic powered, it is extremely simple in construction for long life and fool-proof operation.

A revolutionary, new impact mechanism—exclusive with Thor—delivers *direct* blows that *automatically* assure maximum striking power. Because this mechanism is so simple . . . eliminating springs, gears, threads and screws . . . the tool *stays on the job longer without losing its original impact force!* Simplified design also lessens stress, permits use of sturdier parts and provides smoother operation—to reduce wear and substantially increase tool life.

Ready now for immediate delivery, the *new* Thor ⅜-inch capacity Impact Wrench will save you time and money on any heavy-duty job of driving and removing nuts, bolts and cap screws. Prove its superiority on your own work—your nearest Thor branch or representative will be glad to arrange an early demonstration.

INDEPENDENT PNEUMATIC TOOL COMPANY
600 West Jackson Boulevard, Chicago 6, Illinois

Birmingham Boston Buffalo Cleveland Detroit Los Angeles Milwaukee New York Philadelphia
Pittsburgh St. Louis Salt Lake City San Francisco Toronto, Canada London, England



ACTUAL SIZE

GRIP THROTTLE
Model No. 6

SMALLEST, LIGHTEST TOOL OF ITS CLASS!

HERE'S FULL POWER . . . LONGER!

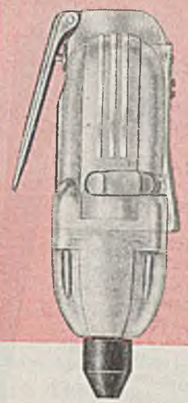
- New THOR high-power impact mechanism provides direct, *positive drive* to the impact spindle.
- *Stress is lessened* on the working parts by placing the two impact jaws at a *wider* radius to the spindle center.
- Because a new face for each jaw is *rotatively* delivered to the anvil for each blow, the impact jaws *naturally* wear longer—and wear *evenly* to retain full striking power.
- Short, rigid, spindle shank delivers blow *close to the work — provides powerful, positive impact.*

HERE'S HANDLING EASE!

- The lightest tool in its class —only 3¾ pounds.
- The *smallest* tool in its class —only 5⅞ inches long.
- Torque reaction to the operator is *practically eliminated* with smooth-hitting impact mechanism.
- Motor reverses quickly, simply by pressing convenient side button *without changing grip on handle.*

AUTOMATIC LUBRICATION!

- Oil reservoir in handle automatically feeds proper amount of lubricant to motor with compressed air.



LEVER THROTTLE
Model No. 6L
For vertical suspension work, furnished in place of grip throttle, if specified, at no extra charge.

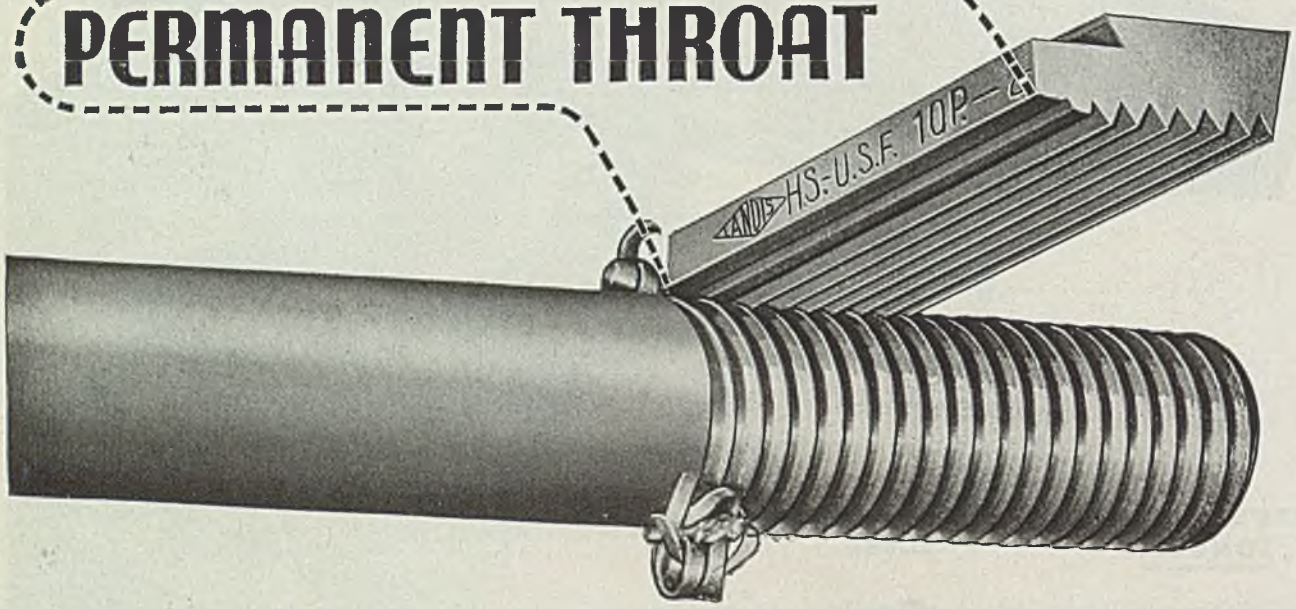
Coming Soon!
MORE NEW THOR IMPACT WRENCHES—in ½", ⅝", ¾" and 1¼" CAPACITIES. *Watch for Them!*

Thor **PORTABLE POWER TOOLS**

PNEUMATIC TOOLS • UNIVERSAL AND HIGH FREQUENCY ELECTRIC TOOLS • MINING AND CONTRACTORS TOOLS

LANDIS *Chaser Accuracy Is Maintained Throughout Its Life by the*

PERMANENT THROAT



12 Features of the LANDIS TANGENTIAL CHASER

1–Permanent throat permits close to shoulder threading throughout life of chasers
2–Rake angle range covers all machinable materials
3–Free cutting condition permits maximum cutting speeds
4–Simple grinding operation renews entire cutting edge and leading feature
5–Line contact with work lessens friction and minimizes thread distortion
6–Leading feature insures thread of accurate lead
7–Lateral absorption of cutting strain reduces vibration and chaser breakage
8–Right and lefthand threading feature reduces chaser equipment
9–Standard chasers thread all diameters with proper chaser holders
10–Interchangeability of chasers lowers operating cost
11–Chaser length provides exceptionally long life and low tool cost
12–Permanent throat gives equal distribution of cut

PERMANENT THROAT GIVES EQUAL DISTRIBUTION OF CUT

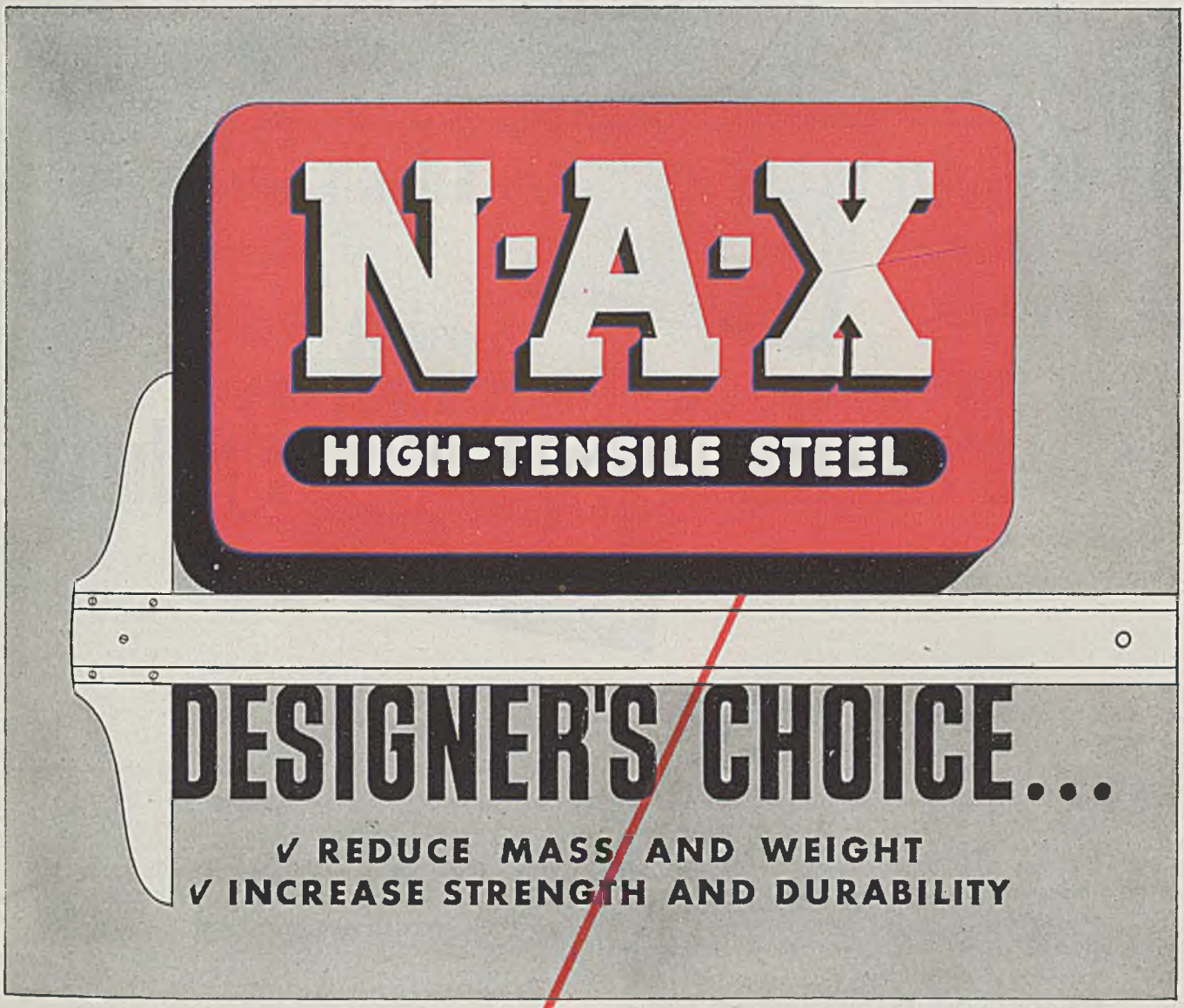
The throat is designed so as to enable the chasers to distribute the cut equally.

The initial accuracy of the chaser is maintained throughout its life. The cutting edge is renewed each time the chaser is reground, however no grinding is done on the throat or "lead" angle—it remains permanent and is not altered in any way.

The Finest Thread Cutting Tool in Industry

LANDIS
MACHINE COMPANY
WAYNESBORO, PA., U.S.A.

THREADING MACHINERY—THREAD CUTTING DIE HEADS—COLLAPSIBLE TAPS



By taking advantage of the high inherent properties of N-A-X HIGH-TENSILE steel—great strength and toughness, exceptional formability, outstanding resistance to impact and fatigue, with good weldability and resistance to corrosion—manufacturers can have their choice of two fundamental improvements in product design:

1 Where reduction of weight means efficiency, lighter sections of N-A-X HIGH-TENSILE steel can be used without sacrifice of strength. Its high properties take the place of mass.

2 Where increased strength and life characteristics are desirable, the use of N-A-X HIGH-TENSILE steel in the same sections will provide a stronger, tougher, longer-lasting product.

Certainly these demonstrable advantages are worthy of your consideration in the conquest of postwar markets.

GREAT STEEL FROM GREAT LAKES

GREAT LAKES STEEL
Corporation
N-A-X ALLOY DIVISION • DETROIT 18, MICHIGAN
UNIT OF NATIONAL STEEL CORPORATION

War-born Ideas for Peacetime Products:

B&W TUBES SAVE TIME . . .

. . . CUT COSTS

Hydraulic lift jacks on Army Tankdozer (1) and on material handling truck (2) are both encased in B&W Tubing.

From a wide variety of war production requirements successfully solved by forming and/or machining ordnance items from B&W Mechanical Tubing come many cost-cutting, time-saving ideas for making better peacetime products. Bomb and rocket casings, elevator and catapult structures, aircraft struts, propeller shafts, hydraulic assemblies, tank treads and bushings, engine bearings . . . these are just a few of the war-born applications of B&W Tubing that suggest design and production shortcuts to improved quality, lower manufacturing costs and greater profits in new equipment for industrial and civilian uses.

Hundreds of different precision parts and structural members can be machined and formed from easy-to-work, dimensionally accurate B&W Tubing . . . and faster, more uniformly, in fewer operations and with less scrap loss than from solid stock. Now is the time to find out how you can take advantage of tubular parts in your products.

B&W can help you . . . in two important ways: By sharing its broad and diversified experience in matching tubing — both seamless and welded — to mechanical uses with your designers and engineers, and by supplying either kind of tubing of the proper analysis, size, gauge, temper and finish for each job. Get in touch with the nearest B&W office today for prompt reliable advice.

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Water-Tube Boilers, for Stationary Power Plants, for Marine Service • Water-Cooled Furnaces • Superheaters • Economizers • Air Heaters • Pulverized-Coal Equipment • Chain-Grate Stokers • Oil, Gas and Multi-fuel Burners • Refractories • Process Equipment.

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WELDED TUBE DIVISION, ALLIANCE, OHIO • SEAMLESS TUBE DIVISION, BEAVER FALLS, PA.

TA-1344

earthbound or skyborne

they have this in common

To solve the complex problems arising in the operation of such mighty airliners as the Lockheed Constellation, Foote Bros. have developed Power Units, light in weight, compact in size, that apply power exactly where it is needed at the force required, whether it be measured in ounces or tons.

In small personal planes, these units will relieve the pilot of many manual operations and in jet propulsion engines they have proved of great value in operating accessory drives.

Because Foote Bros. Power Units permit great flexibility in the transmission and control of power, many other applications have been developed other than aircraft. On road construction machinery, printing presses, radar antenna drives and literally hundreds of other types of equipment—these compact, efficient units can aid in assuring more instantaneous response—in providing quieter, better operation. They make performance more nearly automatic and assure more precise control.

Foote Bros. engineers will work with you on the design of a Power Unit to meet your specific need.

A recently issued bulletin on Power Units giving complete engineering data on "packages of power" will be sent on request. Also available is a bulletin on Aircraft Quality Gears. Mail the coupon.

FOOTE BROS.

Better Power Transmission Through Better Gears

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Gentlemen: Please send me Bulletins checked below.
☐ Power Unit Bulletin ☐ Aircraft Quality Gear Bulletin

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Position.....

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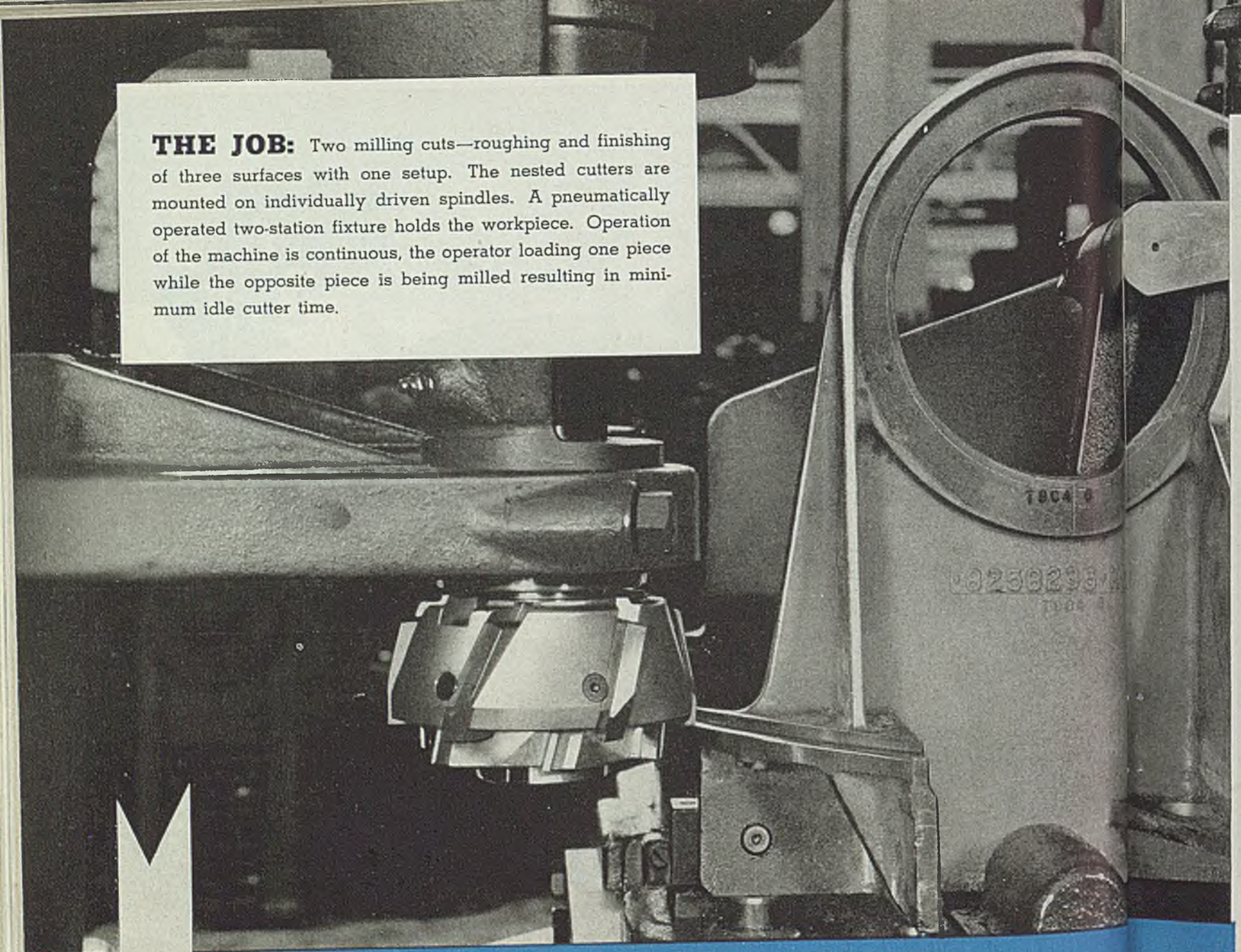
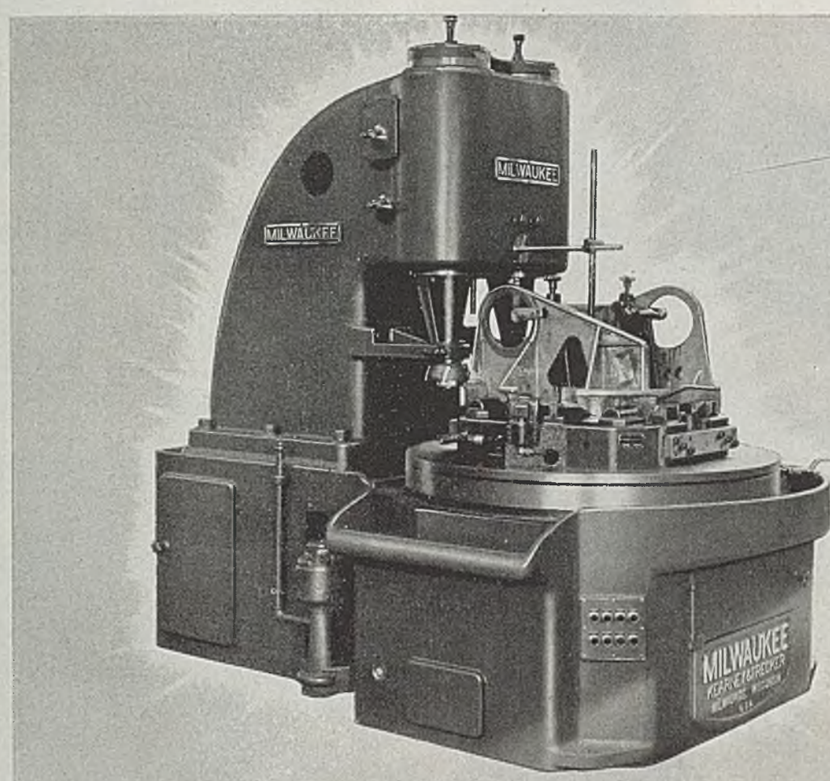
Address.....

City.....*State*.....



THE JOB: Two milling cuts—roughing and finishing of three surfaces with one setup. The nested cutters are mounted on individually driven spindles. A pneumatically operated two-station fixture holds the workpiece. Operation of the machine is continuous, the operator loading one piece while the opposite piece is being milled resulting in minimum idle cutter time.



THE MACHINE: Kearney & Trecker Vertical Spindle Rotary Table Milling Machine — expressly designed for this mass production operation.

The two-spindle upright on this machine is mounted on sliding ways for lateral adjustment. Each vertical spindle is driven by a 5 hp motor and is quill-mounted to facilitate cutter location. A 3 hp motor drives the 48-inch rotary table. Rate of table movement is controlled by trip dogs in the T-slot on the table periphery, providing both feed and rapid traverse movement at any setting.

Rough and Finish MILLING ••

OF THREE SURFACES IN A CONTINUOUS "ONE-MACHINE" OPERATION

ENGINEERING **EIS** INVESTIGATION SERVICE

KEARNEY & TRECKER CORPORATION

Milwaukee 14, Wisconsin

The specially designed Vertical Spindle Rotary Table Milling Machine is another example of many special machine tool problems solved by the Engineering Investigation Service of Kearney & Trecker Corporation.

"Engineering Investigation Service" studies your specific production problems and makes recommendations for the necesary equipment. This equipment may be a special machine, a special attachment for a standard machine, a special workholding fixture, or special cutters.

Of vital importance to the user of Kearney & Trecker Engineering Investigation Service is the background of 40 years experience of the Kearney & Trecker organization in the designing and building of precision, high-speed production machine tools.

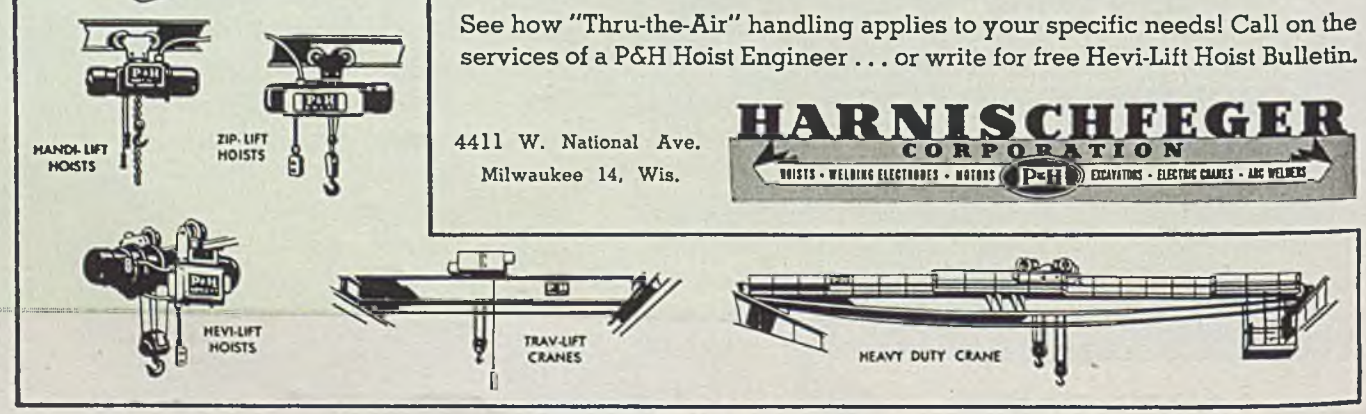
the Secret of LOW-COST Handling

Yes, literally, it's under his thumb . . . the means to handle heavy loads with an absolute minimum of time and effort. Push buttons do it all, raising, lowering, moving — placing loads exactly where they're wanted.

So wide are the applications of P&H Hevi-Lift Electric Hoists that many materials can be handled "Thru-the-Air" all the way from raw to finished state! And you save all the way, for there's no rehandling, no drain on workers' energies—no delays to keep skilled hands waiting.

See how "Thru-the-Air" handling applies to your specific needs! Call on the services of a P&H Hoist Engineer . . . or write for free Hevi-Lift Hoist Bulletin.

P&H ELECTRIC HOISTS



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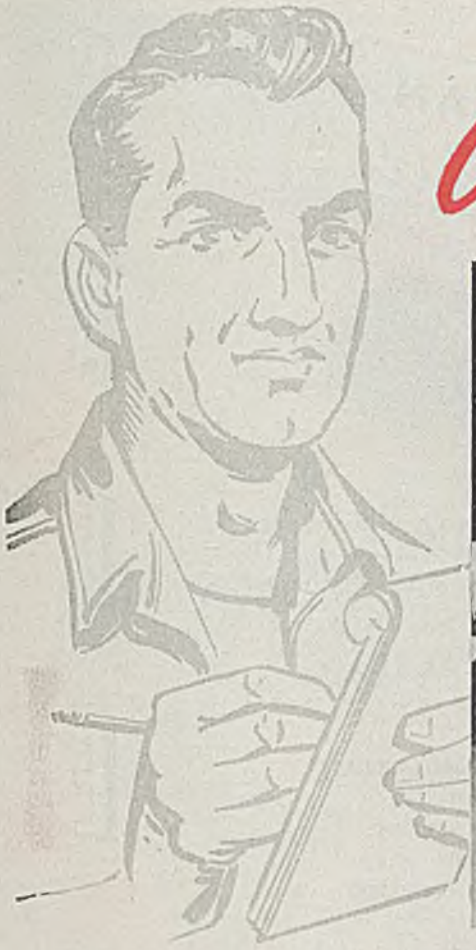
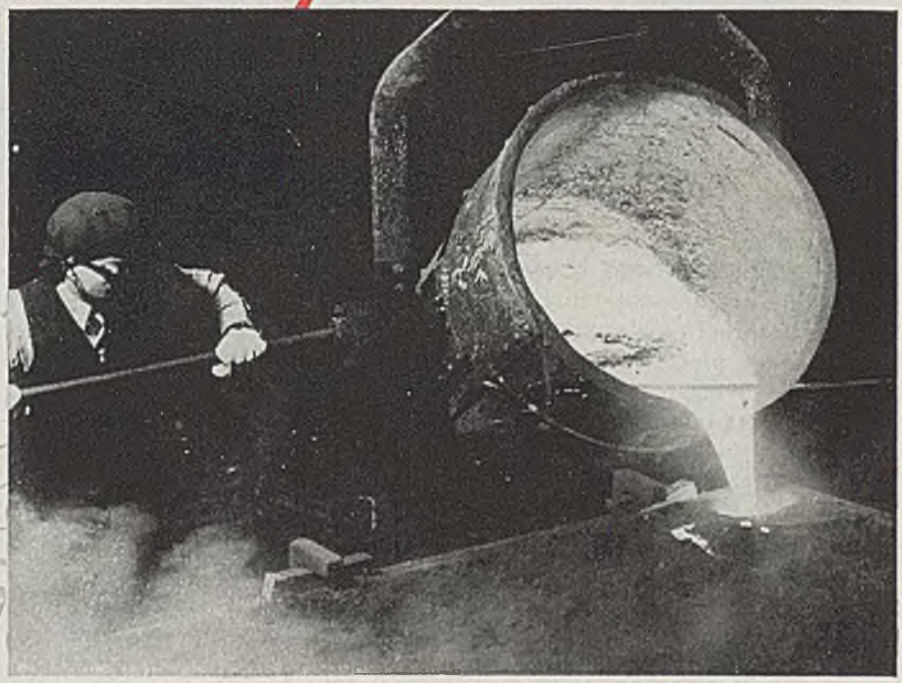
HARNISCHFEGER CORPORATION
HOISTS • WELDING ELECTRODES • MOTORS P&H EXCAVATORS • ELECTRIC CRANES • ARC WELDERS



Always at Your Elbow



AN *Experienced* FOUNDRY SPECIALIST

He's the Republic Pig Iron Metallurgist, a practical, down-to-earth foundryman, who knows many valuable short-cuts for boosting production efficiency and cutting unit casting costs.

From years of actual experience, he is well acquainted with foundry practice and foundry methods. Yet, he is a skilled metallurgist, trained to know and understand irons, their melting and pouring characteristics, and other details which are essential to insure top quality in finished castings.

If you have a production problem that needs solving, or if you would like to make sure that your foundry is operating at its peak efficiency, do not hesitate to call in the Republic Pig Iron Metallurgist. It will place you under no obligation, whatsoever.

Just let us know when you would like him to visit your plant.

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GENERAL OFFICES • CLEVELAND 1, OHIO
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Republic PIG IRON

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"REPUBLIC" (Northern) Foundry, Basic and Malleable

"PIONEER" (Southern) Foundry and Basic

REPUBLIC STEEL

ALSO TRUSCON FOUNDRY FLASKS • REPUBLIC CORE WIRE • FOUNDRY NAILS

A WAR RECORD YOU CAN APPLY TO *Small Parts*

Salem Installed several hundred continuous annealing furnaces and auxiliary equipment IN ALL 18 small arms ammunition plants. Many millions of small parts were produced rapidly under close heating control.

This war record illustrates how annealing and other heating operations can be tied into production lines. Salem co-ordinates production by placing the heating operation as close as possible to the next operation.

LOOK AT THE RECORDS and then let Salem engineers show how you can apply the following two big advantages to your small parts production . . . (1) economical handling . . . (2) closer control of heating and cooling cycles.

18 for 18

Salem installed equipment in all of these small arms ammunition plants.

United States Rubber Company
3 Ordnance Plants

Remington Arms Company
6 Ordnance Plants

Western Cartridge Company
1 Ordnance Plant

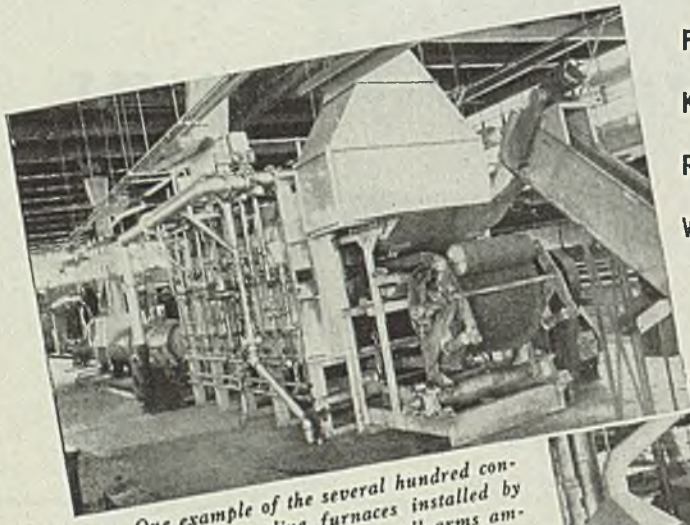
Chrysler Corporation
1 Ordnance Plant

Federal Cartridge Corporation
2 Ordnance Plants

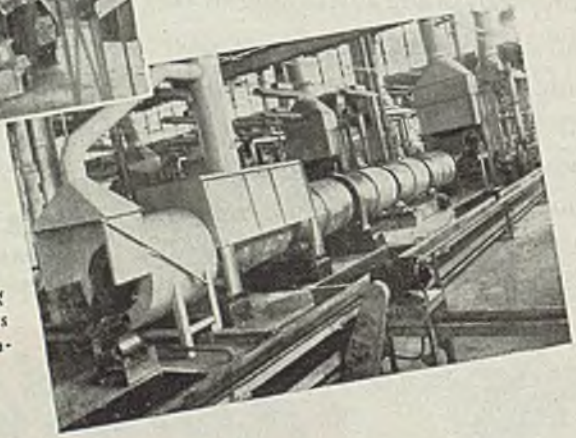
Kelly Springfield Engineering Co.
1 Plant

Revere Copper and Brass, Inc.
3 Plants

Winchester Repeating Arms Co.
1 Plant



One example of the several hundred continuous annealing furnaces installed by Salem in ordnance and small arms ammunition plants.



A pickling, washing and drying line for processing small parts after annealing, used in conjunction with the furnace.

SALEM

SALEM FURNACES

"Engineered Heat"

SALEM ENGINEERING COMPANY • SALEM • OHIO
TORONTO, ONTARIO, CANADA • LONDON, ENGLAND

DEALERS SAY,

"It's certain to sell"

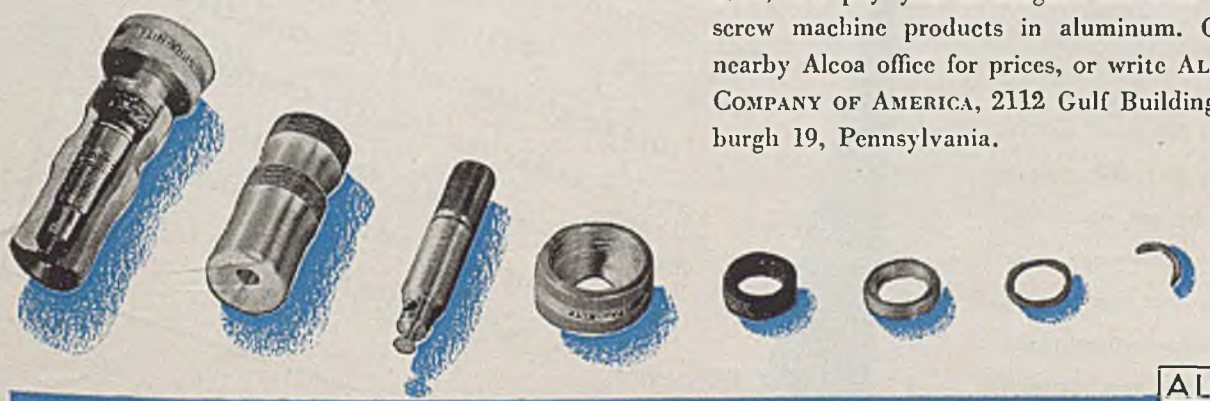
It's made of
Alcoa Aluminum Screw Machine Stock

Put this nozzle on a hardware counter and it's bound to catch the shopper's eye. Thus, Alcoa Aluminum helps make another sale.

The manufacturer tells us that his costs, using Alcoa Aluminum Screw Machine Stock, are comparable to the costs of materials he has used before. So he gets a bonus in the form of a better looking, faster selling product.

Alcoa Aluminum Screw Machine Stock machines at high speeds. With it costing less today than in 1940, it'll pay you to refigure the cost of your screw machine products in aluminum. Call the nearby Alcoa office for prices, or write ALUMINUM COMPANY OF AMERICA, 2112 Gulf Building, Pittsburgh 19, Pennsylvania.

Stile-Craft Manufacturers of St. Louis make this good-looking garden hose nozzle, using 7/8", 1" and 1-5/16" 17ST Alcoa Aluminum Screw Machine Stock.



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ALCOA REG. T. M. ALUMINUM

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"MOHICAN"	ATLAS STEELS LIMITED
"BETHLEHEM HM"	BETHLEHEM STEEL COMPANY
"MO-CUT"	BRAEBURN ALLOY STEEL CORPORATION
"STAR MAX"	CARPENTER STEEL COMPANY
"MOLITE M-1"	COLUMBIA TOOL STEEL CO.
"REX T-MO"	CRUCIBLE STEEL CO. OF AMERICA
"DI-MOL"	HENRY DISSTON & SONS, INC.
"HI-MO"	FIRTH-STERLING STEEL COMPANY
"REX T-MO"	HALCOMB STEEL COMPANY
"MOGUL"	JESSOP STEEL COMPANY
"TATMO"	LATROBE ELECTRIC STEEL CO.
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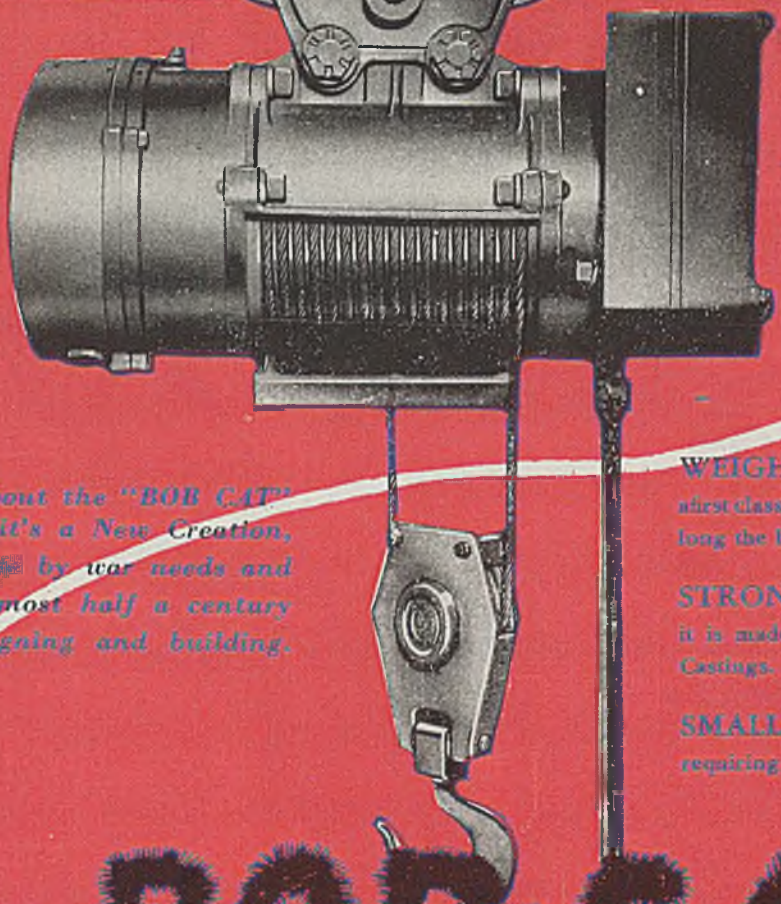
The Lightest Smallest STRONGEST



Everything about the "BOB CAT" is Exclusive—it's a New Creation, brought to life by war needs and backed by almost half a century of hoist designing and building.

WEIGHS about one half of any other first class hoist—therefore "pulls" or "handles" long the beam much easier.

STRONGEST hoist on the market, as it is made entirely from Steel Forgings and Castings.

SMALLEST in outside dimensions — requiring minimum space.

The BOB-CAT

ELECTRIC CABLE HOIST

is the hoist to hitch to, as it will exceed your most imaginary dreams.

Ask your Jobber or Mill Supply Dealer. The "live ones" will be stocking them.

Write us for details and interesting Bulletin.

LISBON HOIST AND CRANE COMPANY

PIONEERS OF BETTER HOISTS, LIFTING AND CONVEYING EQUIPMENT

DIVISION OF THE WRIGHT FILE CO.

SIMONDS
Red Tang
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...they keep your File-Costs down

RED TANG FILES have the same basic tooth-design as Simonds Metal-Cutting Saws. So Red Tangs *cut,* instead of *scrape* . . . remove more metal with less elbow-grease. That's why workers like them. *And here's why YOU will like them:* They last longer . . . and deliver more and better work per file-dollar. Order Simonds Red Tang Files from your Industrial Supply Distributor, or from the nearest Simonds office listed below.

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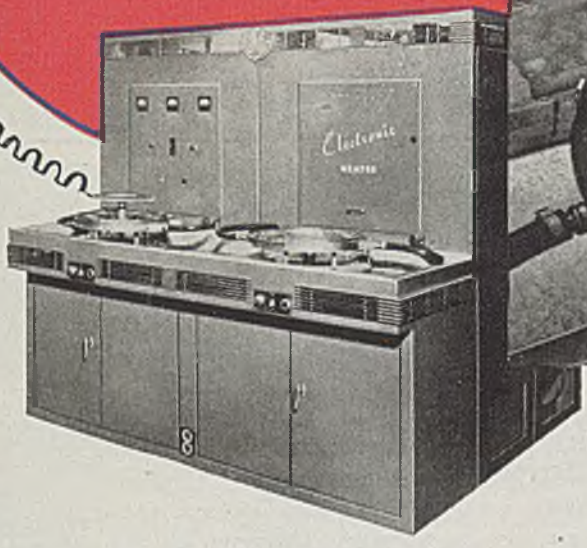
G-E electronic heater adds life . . . cuts production time of automobile starter ring gears



G-E 50 kw electronic heater, used at Studebaker's South Bend plant

HEAT-TREATING time has been reduced and the gears have been tested to withstand four times the number of starts expected in the normal life of the car.

It used to take 2½ hours to heat and temper these gears—now it can be done in 20 seconds and the entire process is completed in the machining department—in proper manufacturing sequence.

Induction hardening, with the electronic heater, is eliminating costly, time-consuming operations in many plants. Since only the teeth are hardened and then quenched in a matter of seconds, distortion is reduced to a minimum.

The General Electric Company is anxious to give you the benefit of more than 20 years experience in industrial heating. Brazing, soldering, annealing, hardening—let our heating specialists give you an unbiased recommendation on the best type of heating equipment for your job. As manufacturers of furnaces as well as electronic heaters, G.E. can supply the equipment best-suited to your needs. *General Electric Company, Schenectady 5, N. Y.*

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Because Wickwire Spencer Valve Spring Wire is recognized for its high dependable quality, it is used extensively by spring manufacturers who serve America's automotive industry. And valve spring wire is but one of many specialty wires for which the name Wickwire Spencer is famous.

Whether you need a soft ductile wire for severe forming or a strong, tough, hard drawn or tempered wire, we can meet your needs. Our metallurgists will be happy to study your problem and determine the best wire for your requirements.

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It will be worth your while to investigate our capacity and ability to serve you. There is no obligation.

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Exceptional HEAT UNIFORMITY

...with MAEHLER ovens...

. . . mean more uniformly baked cores

RECENT TESTS SHOW . . . temperature variations of only 5°

93.6%
OF MAEHLER'S PRODUCTION
IS DEVOTED TO REPEAT ORDERS!

. . . . . There is no better proof of the superiority of Maehler ovens and furnaces.

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MAEHLER'S leadership in developing the recirculating air heat system for industrial ovens has resulted in a line of equipment that gives heat uniformity that is virtually *perfect!* Recent tests show that a Maehler oven operating at 500°F fully loaded maintained a heat uniformity within 5°, through high volume and rapid air heat circulation and highest grade instruments. This kind of temperature control means uniform baking . . . no under-baked nor over-baked cores.

Maehler core and mold ovens are available in a complete range of oil fired, gas fired and electrically heated units, incorporating the Maehler recirculating principle for high uniformity and output, at low cost.

Let us quote you on your requirements.

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Industrial Ovens and Furnaces for Core Baking, Mold Drying, Heat Treating, Enameling, etc.

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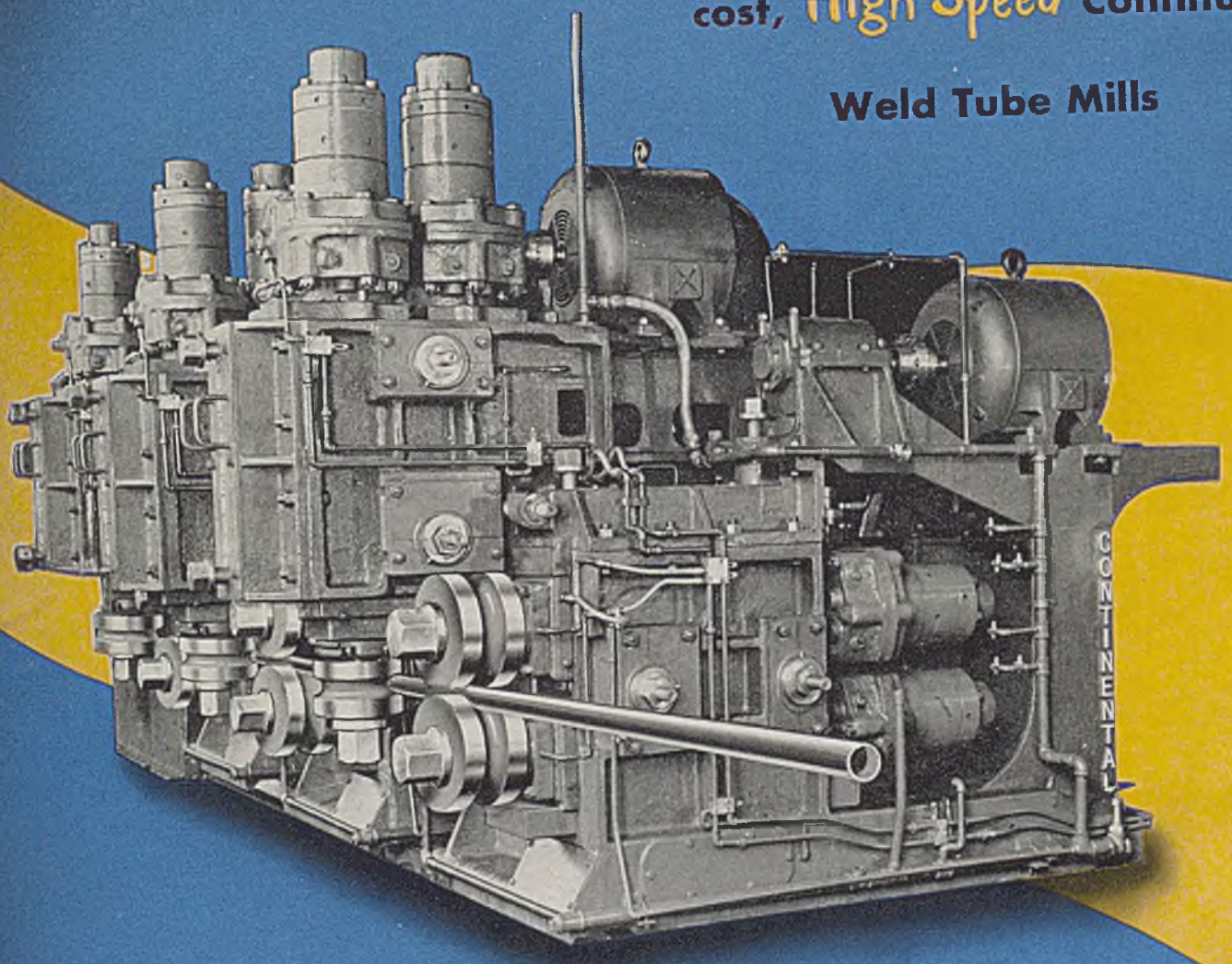
designs and builds modern, low cost, High Speed Continuous Weld Tube Mills



Capable of high, sustained production over long periods with minimum maintenance, this rugged ½" to 4" Continental Continuous Weld Tube Mill embodies many new engineering developments and improvements.

Like all CONTINENTAL EQUIPMENT—it was designed and built to provide greater output at lower UNIT cost.

Let Continental Engineers work with you in the designing and building of your needed equipment.

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62,000 pound Continental Castings

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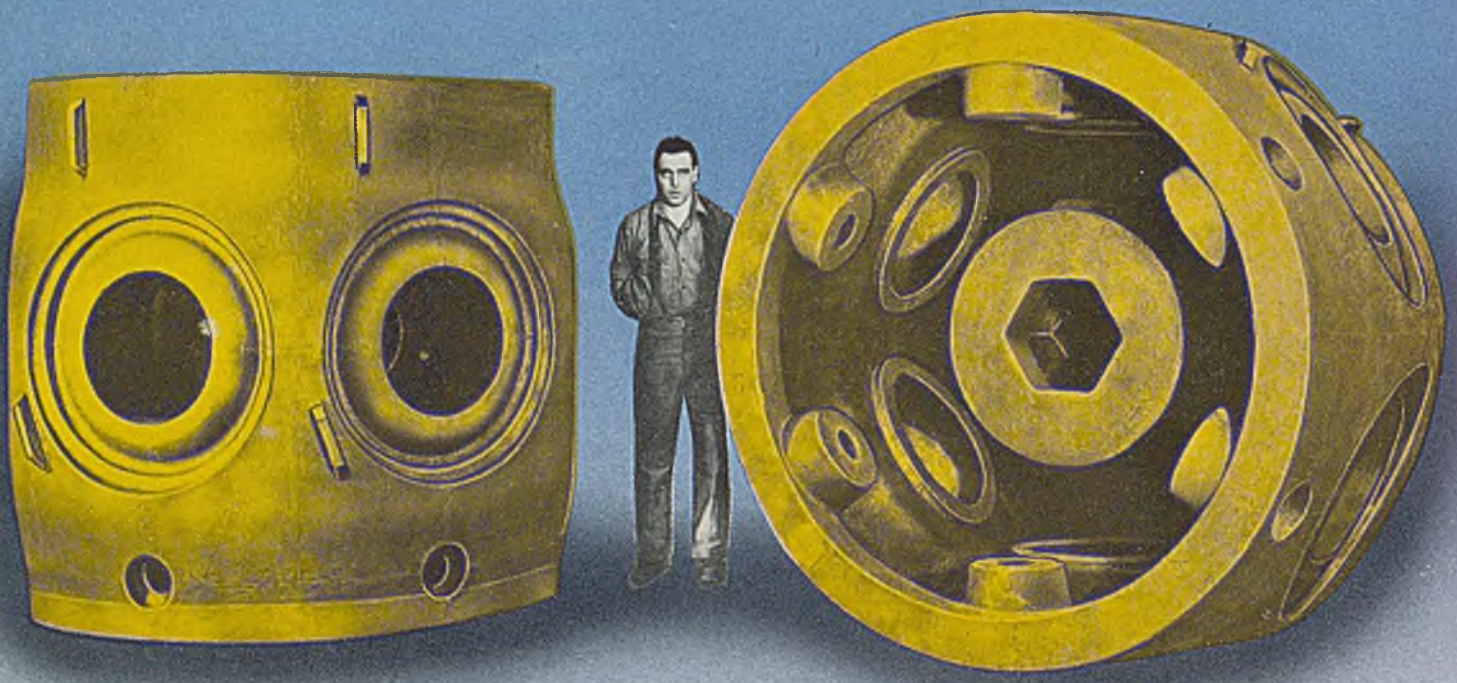

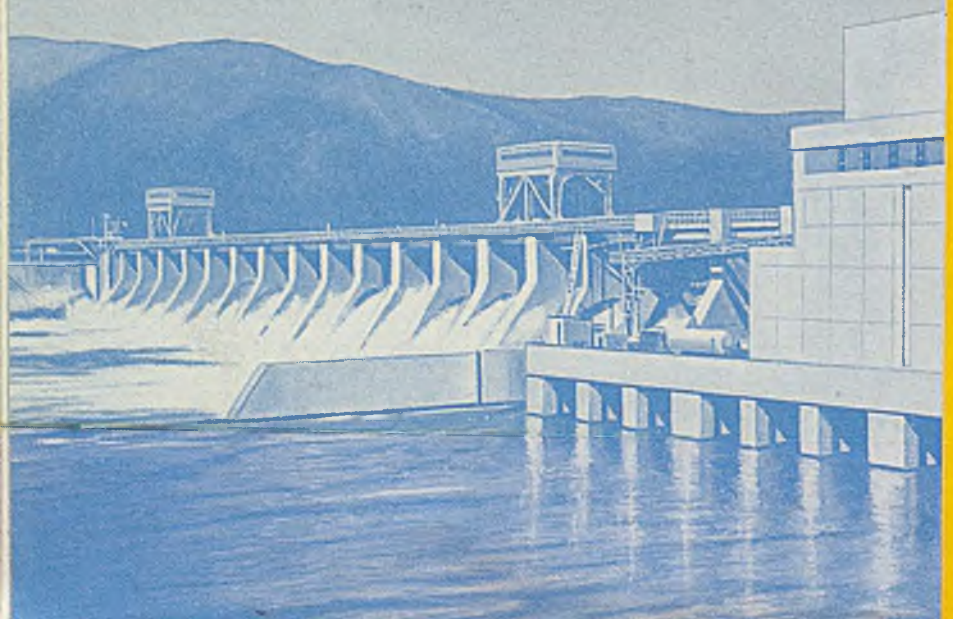

Outstanding skill in research, design, engineering and manufacture is available for ordinary *"production line"* 50 pound castings up to difficult, unusual castings that weigh as much as 250,000 pounds.

When you need Steel Castings of any type *—call on Continental.*

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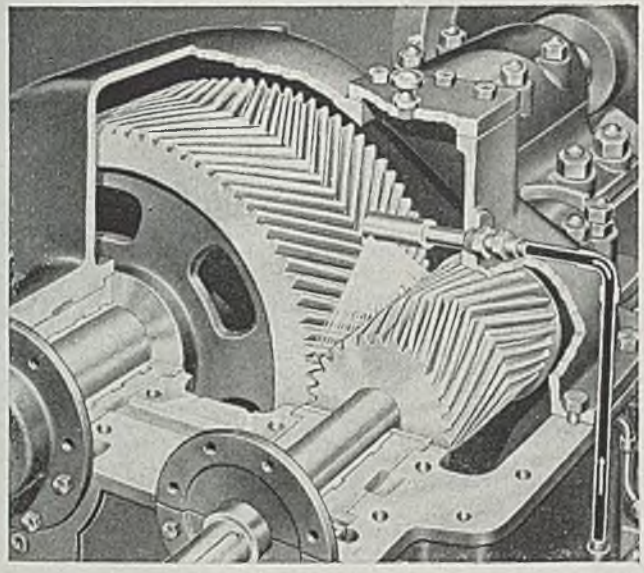
Are you shipping or storing valuable machinery?



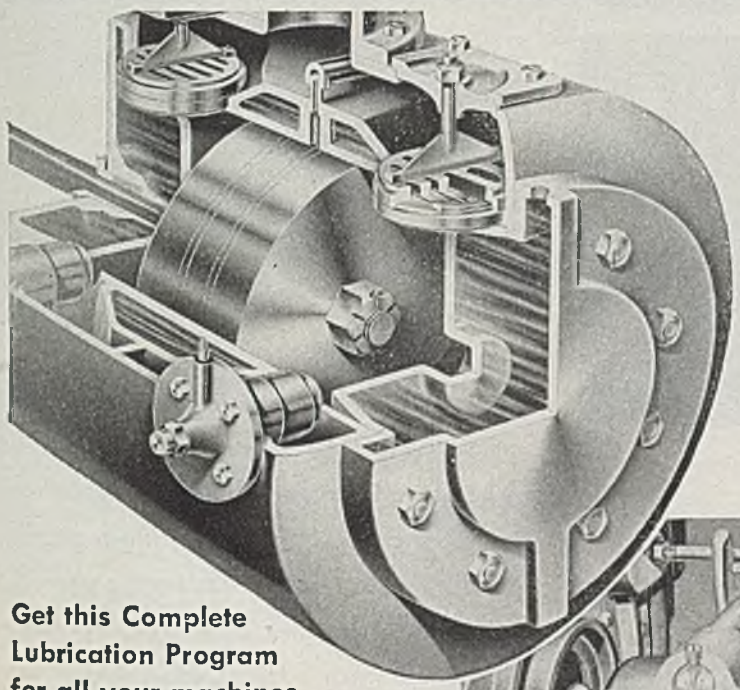
Here's new "inside" protection against rust!

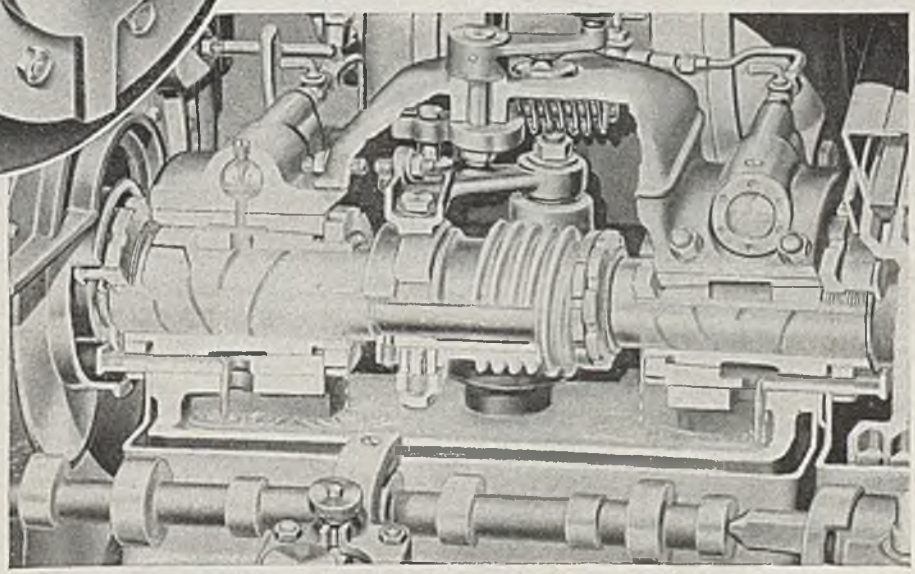
SOCONY-VACUUM has developed two new rust preventives to protect the internal surfaces of intricate machinery during storage and shipment.

The new products, S V Sova-Kotes 501 and 503, are applied in the same manner as regular lubricating and hydraulic oils. They possess sufficient stability and lubricating properties to permit their use for "run-in" applications.

Tests show 30 to 40 times greater protection against rust than regular operating oils. Complete information on correct application are available now in a special Socony-Vacuum bulletin. Get your copy now from your local Representative.

RUST IS WASTE
Sova-Kote your metal





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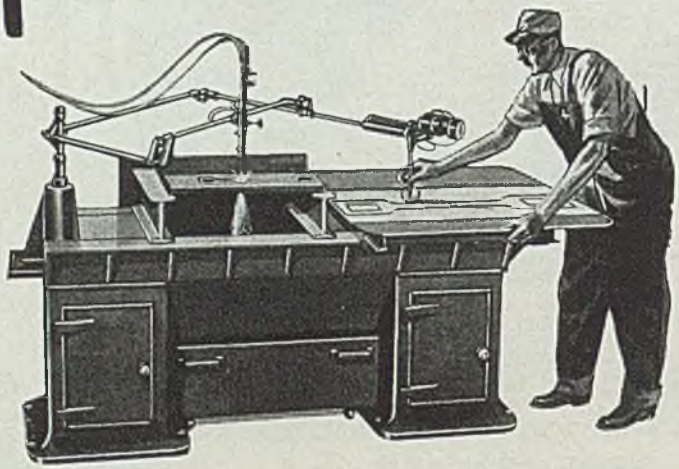
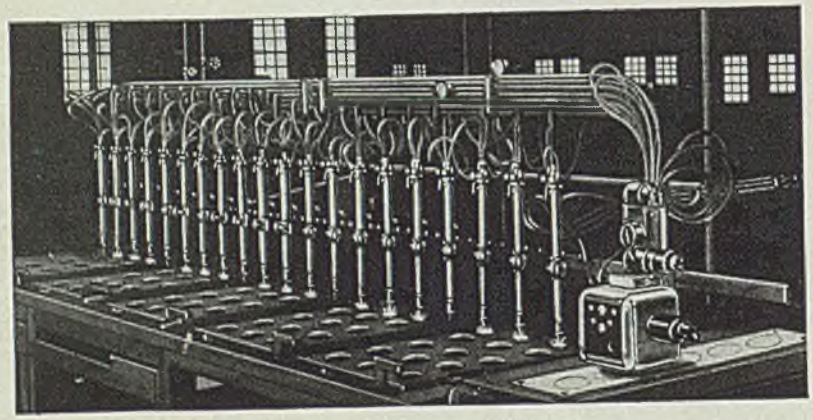
Yesterday *A Major Advance*

When Airco first introduced the process of machine gas cutting, history was made. This first machine cut a variety of shapes from plate with speed and accuracy.





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Continuing to pioneer, Airco developed a wide range of cutting machines—from the small, portable radiagraphs to large shape cutting machines such as the oxygraphs and travographs—engineered to meet every type of steel cutting requirement. Today's machines, incorporating advanced principles of design, operate faster and with a still higher degree of precision. As a further advancement in machine gas cutting, Airco recently introduced the "Electronic Bloodhound." This tracing device faithfully reproduces the desired design utilizing merely a simple outline drawing or silhouette.

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Airco's Technical Sales Division is at the call of metal fabricators in applying Airco processes in the solution of their problems. For additional information, get in touch with your nearby Airco office or write: Air Reduction, 60 E. 42nd St., New York 17, N.Y. In Texas: Magnolia Airco Gas Products Co., Houston 1, Texas.

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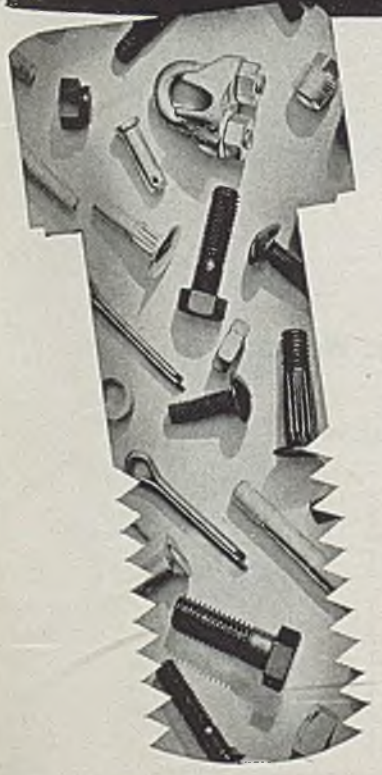
ORIGINATORS OF MODERN OXYACETYLENE METHODS FOR THE METAL WORKING INDUSTRIES

It all depends on your point of view



SIX BLIND HINDUS argued furiously, so the old fable goes, about the appearance of an elephant, which none had ever seen. Permitted to touch an elephant, each obtained a different idea of what the animal was like, and the argument continued, for each now was sure his conception was correct from his point of view.

Ever so often a customer tells us . . . "*I didn't know you made THAT!*" And when that happens we realize once again that to some customers, Lamson & Sessions is a source of supply for *stove bolts* . . . to another, a source of "1035" *cap screws* . . . and to still another, a source of *machine and carriage bolts.* During the war period, Lamson & Sessions became known to many new customers. To some of those we were primary producers of *tractor bolts* . . . or close tolerance *aircraft studs, bolts, and nuts* . . . and to still others we are a source for Lamson *Lock Nuts,* only. These customers, we realize, never had reason to *buy anything* else from us, never *needed anything* else, and therefore *never cared* what else we made.

As a matter of fact The Lamson & Sessions Company is one of a very small group of "full line" manufacturers—offering a complete line of almost every conceivable standard fastening—and making "special" headed and threaded products to specifications.

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Right now Lamson & Sessions has open capacity for making very large bolts and cap screws. Some of our bolt-making equipment is scheduled for months ahead, but other departments have a comparatively small back-log of orders. Send your inquiries to Lamson for products of ½-inch x 6-inch and larger, and we can probably give you unusually prompt service *for the time being.*

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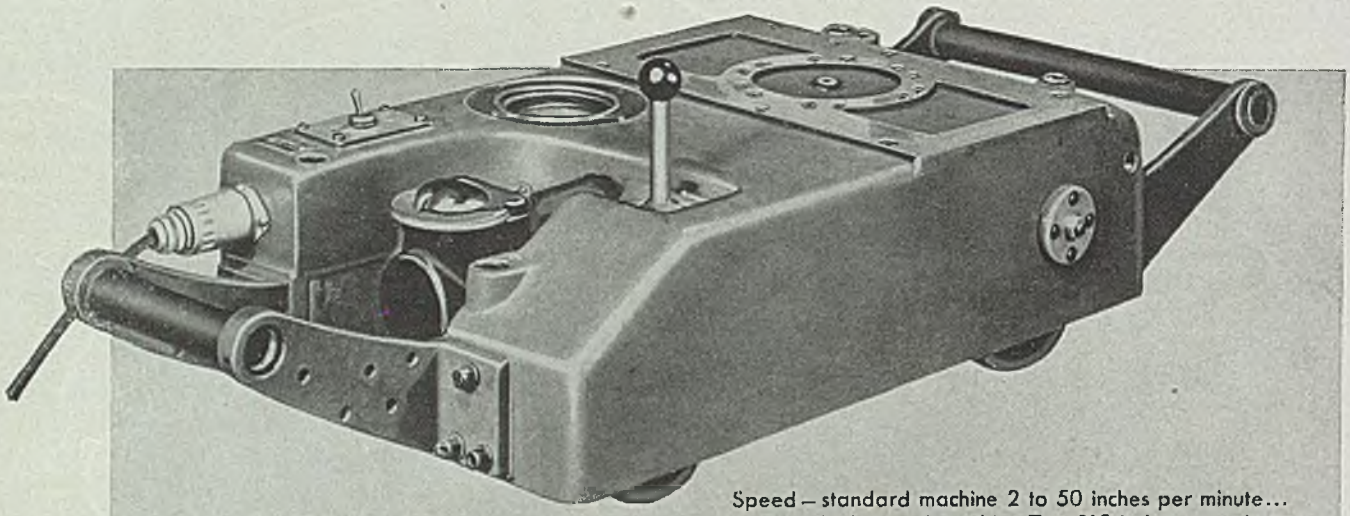

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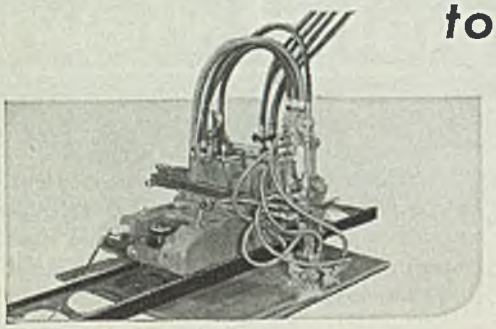

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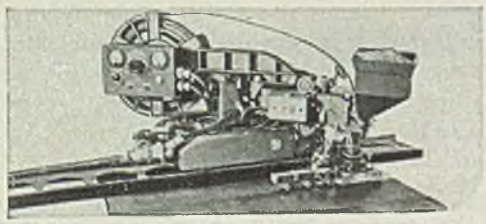
Bevel-Cutting
Heavy Duty Cutting
Plate-Edge Preparation



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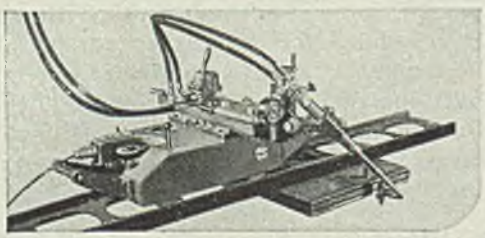

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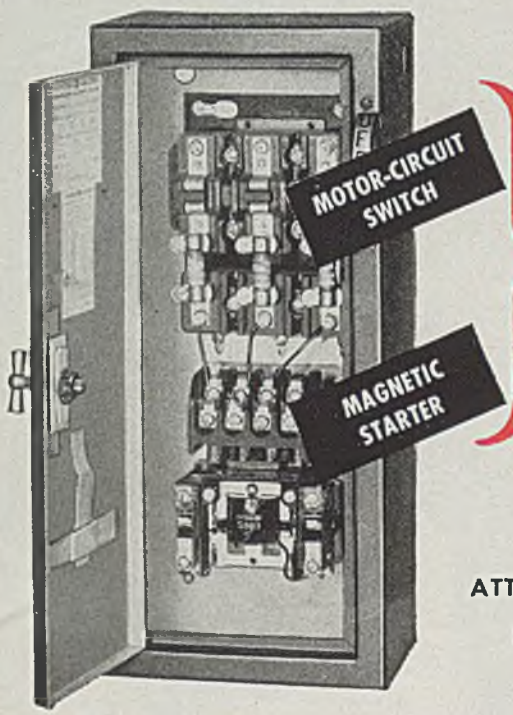

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ATTRACTIVE IN APPEARANCE . . .

DESIGNED TO BLEND WITH MODERN MACHINES

Advantages of Combination Starters

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4. ***Reliable motor protection*** — Protection devices co-ordinated at factory.
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Suitable for general-purpose indoor applications where atmospheric conditions are normal.	Made for corrosive atmospheres and hazardous locations. All arcing parts and terminals (of forms for hazardous locations) are at least six inches under oil.	For use in steel mills, cement mills, and other locations where the dust content of the atmosphere is heavy.	Designed to withstand internal explosions. The flanges are ground to tolerances which will not permit the escape of gases.	Suitable for outdoor use, and for damp places indoors, such as dairies, breweries, and ship docks.

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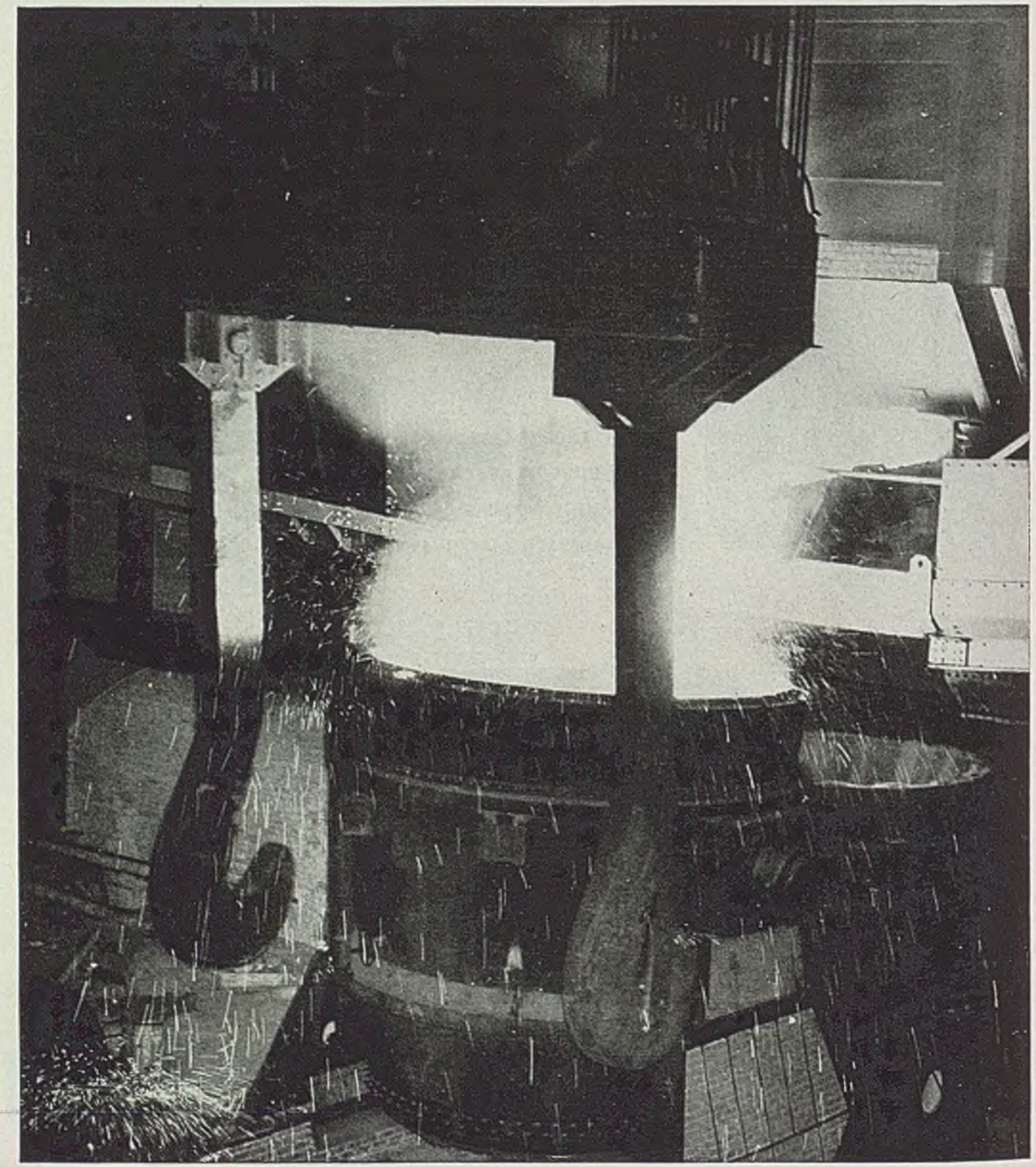

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The marked decrease in the number of inclusions, the result of effective deoxidation and agglomeration, brings about the elimination of harmful segregations. Unusually clean, sound ingots are produced. Castings have superior microstructure and possess improved ductility and high strength.

Photomicrographs, sulfur prints and macro-etches prove that FERROCARBO-S is most effective in eliminating the oxide and sulfide stringers which cause cracks and low ductility in forgings. Also, it is particularly successful in the reduction and dispersal of inclusions in fine-grained steels.

FERROCARBO-S is both simple and economical to use. It is equally effective in open hearth and in electric furnace practice.

For further, detailed information on FERROCARBO-S, write Dept. J - 46, The Carborundum Company, Refractories Division, Perth Amboy, New Jersey.

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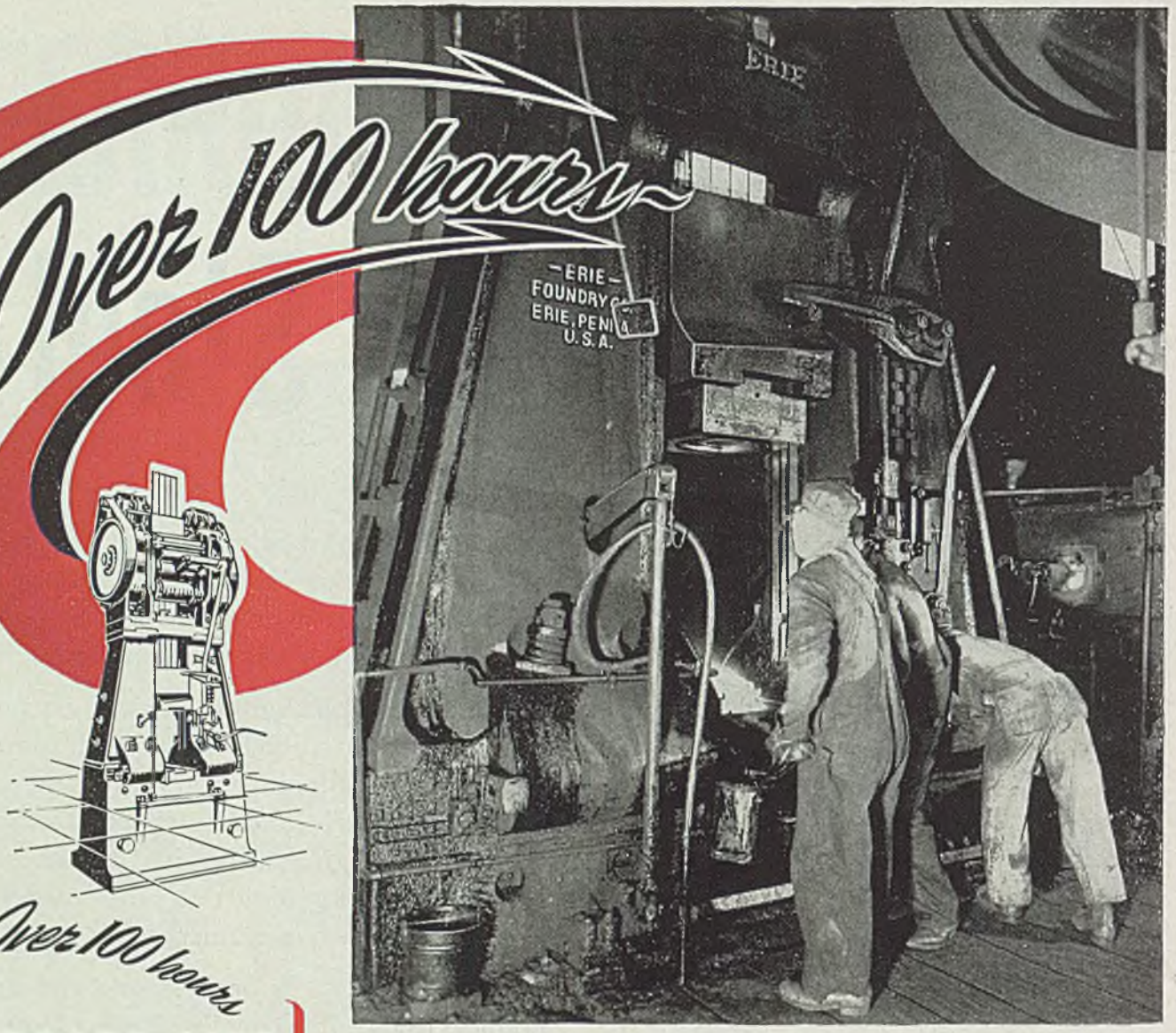

Over 100 hours

BOARD LIFE on 7500 Lb. and 6000 Lb.

Erie Board Drop Hammers . . .

POSITIVELY equalized pressures between rolls and boards at all times results in longer hammer board life.

Recent reports from a large user of Erie Board Drop Hammers state that "the 2½ inch thick hammer boards in our 7500 lb. Erie hammers are run about 56 hours . . . then we have them dressed down to 2 inch thickness and get an additional 48 to 56 hours on these same boards in our 6000 lb. hammers".

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Complete description of Erie Board Drop Hammers is given in bulletin 339 . . . with further details on head construction page 22. *Write for this bulletin today.*

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STEEL

The Magazine of Metalworking and Metalproducing

VOL. 118, NO. 16 APRIL 22, 1946

NEWS

TECHNICAL

FEATURES

MARKETS

NEXT WEEK...

Advantages of Hot Oil in Quenching

Car-Type Stress-Relieving Furnaces Handle Huge Units

Automatic Mechanical Pickler Cuts Costs in Half

Advanced Metal Preservation Methods of the Navy

Failure of Autobody Sheet in Deep Drawing

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As the EDITOR VIEWS the NEWS

Imperative Pruning Job

Consider cost of the federal government from the standpoint of three generations in an American family. When the father, now 56, came into the world in 1890, his per capita share of the annual cost of federal government was $4.61 and his share of the national debt was $17.92. When his son or daughter was born in the early twenties, the per capita cost of government was $34.83 and the per capita debt was $200.10. Now, when grandchildren are arriving, cost of government is $722.33 per capita annually and national debt is $1853.01 per person.

That children of today incur an annual cost of federal government 157 times greater and a national debt 103 times greater than those confronted by their grandparents should cause every citizen to decide whether present tendencies in Washington are sound.

This question is particularly pertinent now. Government spokesmen are elated that federal income is exceeding outgo. This reassuring condition, due entirely to the automatic curtailment of war activity, may lead the public to overlook the necessity of scaling down non-war federal activities to reasonable dimensions. Unless the public takes a positive stand in regard to the cost of federal government, Washington will build a bureaucracy even greater than the top-heavy structure that existed before the war.

That this danger is real is proved by estimates given to the House Appropriations Committee by the Bureau of the Budget. The bureau estimates the number of civilians on federal payrolls will shrink to 2,010,950 by June 30, 1946 and to 1,710,167 by June 30, 1947. However, these reductions are accounted for chiefly in the War and Navy departments and in wartime agencies. The estimates call for sharp increases over prewar levels in the treasury, commerce, labor, justice and state departments. For instance, the Department of Commerce, which had 13,385 employees in December, 1939, is scheduled to have 46,200 in June, 1947. The Department of Labor, with 6675 in 1939, is to have 35,555 in 1947.

Such ridiculous increases must mean that the present administration intends that the central government shall increase its penetration into private affairs—that it take over functions heretofore handled privately or by local governments.

This tendency must be reversed if the children of today are to live unregimented lives. They deserve freedom to think and act for themselves. We must protect them from the meddling of an unneeded and expensive foster-motherhood of Washington bureaucracy. Prune most executive departments to below prewar size!

STEEL
April 22, 1946

ACCENT ON SELLING: Keynote of the spring meeting of the National Machine Tool Builders' Association was voiced by President William P. Kirk when he said, "The function of the machine tool is to cut costs. The biggest problem before our country today is that of inflation. Inflation means danger of higher prices. High prices can be forestalled by cutting production costs. Therefore, our industry holds the key to prevention of inflation. And so it is that machine tool builders today are granted the strongest sales argument in the history of our industry. Let us use it properly and vigorously."

This accent on "selling" was prevalent throughout the program. One speaker urged every builder to "get right down among the grass roots and tell people in his own neighborhood what the industry is, what machine tools are and what they mean in the lives of all of us." Almost every speaker touched on problems, such as disposal of surplus machines, accelerated depreciation and OPA price rulings, in which the solution lies in a better under-

(OVER)

standing by government and the public of the vital role of machine tools. To promote this understanding is one of the sales jobs to which Mr. Kirk referred.

Selling understanding, as well as goods, is a "must" under present conditions. —p. 54

° ° °

MIRACLES FROM SAND: Silicones have become the basis for a new branch of the chemical industry and constitute an interesting new line of materials for application in the metalworking industries.

The primary raw material in silicones is sand, modified by chemicals made from brine, coal and petroleum. In equipment characteristic of synthetic chemical plants, these materials are transformed into high-temperature electrical insulation, water-resistant surface treatments, low-temperature lubricants, fluids for diffusion pumps and heat-stable rubber compounds. Perhaps other applications may emerge from this youthful science of molecule engineering. —p. 78

° ° °

INTERPRETING RUSSIA: Dr. Charles Prince recently told the Army Industrial College that Russia's policies and objectives are not the enigma that Winston Churchill says they are. He claims that Soviet spokesmen repeatedly tell us what Russia is trying to do and that we do not believe them.

Russia is totalitarian and wishes to be considered as such. She is distrustful of Britain and the United States and does not try to conceal that fact. She is bent upon developing spheres of influence because of this distrust. Dr. Prince says we should try to understand Russia on the basis of these frankly-admitted objectives and not try to evaluate her aims according to our own moral, ethical, political and economic standards. Above all, he urges, we should maintain a perpetual inventory of what Russia is doing in the Russian-dominated countries. —p. 61

° ° °

OPA GETS A SPANKING: What a spanking the House gave OPA last Wednesday afternoon and evening! It reflected annoyance with the dumbness and absurdity of some aspects of the administration of price control rather than a clear-cut opposition to price control in principle. Chester Bowles invited this explosion by his persistent browbeating of Congress.

The Senate probably will tone down the House amendments somewhat. OPA will be continued, but with a gradually reduced range of authority. This will not please extremists on either side, but it conforms to majority opinion. —p. 56

SIGNS OF THE TIMES: When the alarm whistle sounded, Ernie Gustafson, operation's officer of the army engineers at Duluth, looked out of his office window and saw a 16,000-ton iron ore freighter bearing down upon the famous aerial lift bridge which connects Duluth and Park Point, Minn. The lift span was only half-way up, not high enough to clear the freighter! How the span happened to stop at this point and what the operator had to do to free it and to raise it just in time to avert disaster (p. 96) constitutes a thrilling story of man and machine. . . . Britain's labor government, after considering the British steel industry's plan for rehabilitation (p. 51), has decided to go ahead with its program of nationalizing the industry. If and when this threat is carried out, the United States will be the only nation with a sizable iron and steel industry that is not government-owned. . . . Of the $118 million of loans made by banks under the Blanket Participation Program of RFC during the first year of its operation (p. 58) 88.6 per cent have been for amounts of $100,000 or less. . . . Motordom thinks that light-weight, low-priced automobiles developed by Ford and Chevrolet (p. 65) will be on the market in a year or two. . . . President of the San Francisco Foreign Trade Council estimates China will require $3 million of carbon steels, $1 million of pig iron and more than $4½ million of alloy steels in 1946 (p. 70) and that during the first three years of reconstruction China will purchase $2 billion of capital goods. . . . Frequency with which NLRB is validating unions of supervisory personnel (p. 52) prompts the Foremen's League to charge that this notoriously biased government agency is encouraging the unionization of management. . . . A comprehensive study by the National City Bank of New York shows that the net income after taxes of 1017 leading manufacturing corporations in 1945 (p. 53) averaged only 3.9 cents per dollar of sales. This is meager reward for the effort that goes into a business enterprise under present conditions. . . . B. E. Hutchinson, vice president of Chrysler Corp., had a punch in every sentence when he told 600 parts-makers that the impact of government on industry threatens the public interest in three specific areas (p. 66): OPA controls, industrial labor relations and federal fiscal policy.

E. L. Shaner

EDITOR-IN-CHIEF

Every Order Must First Pass Metallurgical Control

The Inland metallurgists in charge of control are real critics and every order sent to the mill must first pass them before steel can be processed. They take one order at a time, check to see if it is similar to a previous order; if not, they examine blueprints of the part, and may even call at the customer's plant to study the method and equipment for fabrication. After they have thoroughly studied an order they designate what type of steel is to be furnished, and how it is to be processed.

Metallurgical control is another of the many methods Inland uses to assure the right quality steel for each order entered by a customer. Inland Steel Company, 38 South Dearborn Street, Chicago 3, Illinois.

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...take guesswork out of heat treating

with this –

The exact chemical content of each heat of steel is determined by laboratory tests.

and this –

Jominy End-Quench Test interpretation gives accurate heat treatment response data.

and this –

Tensile strength tests are used to double check the exact physicals attainable with this alloy.

and this –

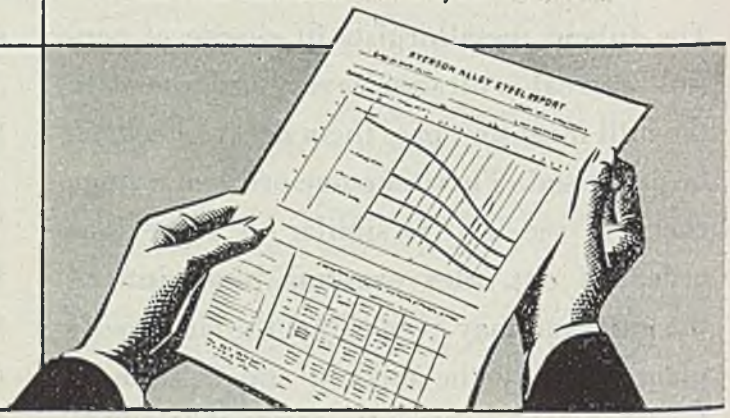
Each bar of steel is identified with stamped heat symbols and painted color marks.

and again –

Inspection before shipment guarantees that the steel delivered is exactly as was ordered.

to give you this –

A Ryerson Alloy Steel Report containing complete data as determined by tests (accurately charted, fully explained), is supplied with every Alloy shipment at no extra cost.



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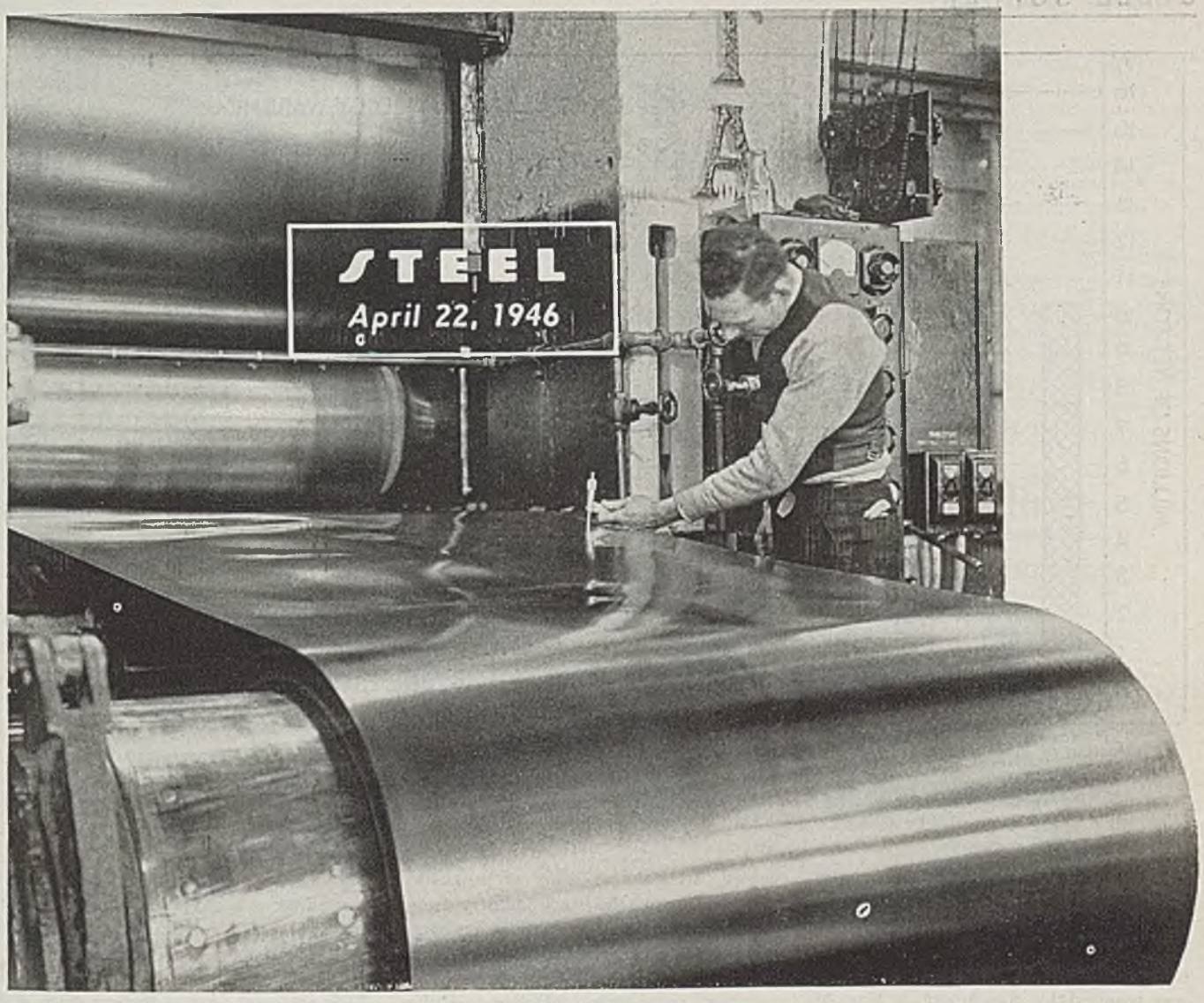


Cold-rolled strip steel coming from the 4-high mill to the reeler at the Sparrows Point, Md., plant of the Bethlehem Steel Co. Operator is testing for thickness

Steel Orders Pile Up on Mill Books

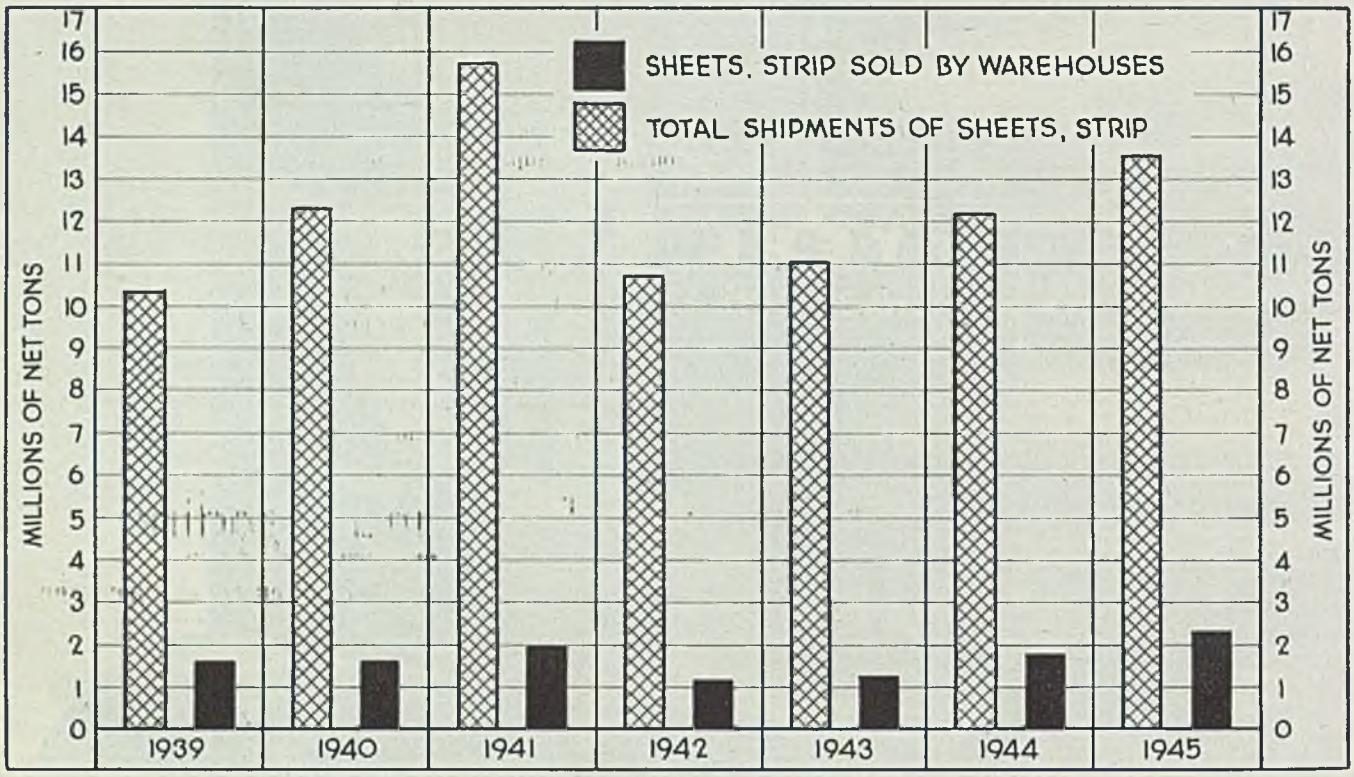
Tonnage load heaviest experienced in peacetime. Producers meet current needs of consumers by rationing output. Little relief in prospect with over 10 million tons of ingots lost from potential 1946 production by work stoppages

STEEL supply is in the tightest position ever experienced in peacetime. Mill order books are loaded with tonnage, some of which cannot be delivered for months. Rolling schedules are so jammed with orders, the steelmakers for weeks past have been turning away business. They just can't accommodate any more volume, especially in flat rolled products such as sheet and strip, and are declining to entertain new tonnage pending clarification of the production outlook which now is dependent upon settlement of the coal miners' strike.

Shipments of finished steel to consumers are being pressed to the limit of mill production. But the tonnage is far below that required to meet current manufacturing demands, to say nothing of building stockpiles. Consumers' inventories are so low that in some cases shops have been forced to close temporarily pending receipt of deliveries from the mills. Many metalworking plants are operating on little more than a day-to-day basis.

For the second time within a month the Ford Motor Co. last week was forced to curtail production for an indefinite period because of the lack of steel and shortage of parts. Some 45,000 of the company's production workers were affected by the shutdown. A week's shutdown in Ford plants beginning Apr. 3 idled some 35,000 workers.

Buyers, large and small, are caught in the squeeze which is particularly severe in the case of new business ventures, which, lacking established mill or warehouse connections, are finding it almost impossible to obtain steel in any quantity. Even government surplus steel is scarcer than had been anticipated. Mill rejects, which in normal times find a ready outlet through secondary steel jobbers, are in smaller supply than usual.



Production of sheet and strip steel since 1939 and the tonnage distributed through steel warehouses are depicted in chart above. Warehouses are playing an increasingly important role in supplying the small and new steel consumers who find it difficult to get on mill books due to the present tight supply situation

"Why can't we get steel?" consumers are asking on every hand, pointing out that capacity to produce now is greater than at any time in previous peacetime history. Steelmaking capacity on Jan. 1 was reported by the American Iron & Steel Institute at 91,890,560 tons of ingots and castings, down from a wartime peak of 95,505,280 tons in 1945, but 10 million tons greater than at the outset of the war, and 20 million tons, or 30 per cent, greater than available capacity in 1929.

At present, open-hearth steel capacity is rated at 81,236,250 tons annually, off about 2,900,000 from a year ago. Electric furnace capacity is rated at 5,500,290 tons, an increase of 45,000 tons over 1945. Bessemer capacity, however, is down sharply, being rated at 5,154,000 tons against 5,874,000 on Jan. 1, 1945. Blast furnace capacity is up, being rated currently at 67,340,590 tons compared with 67,313,890 tons a year ago.

Steel capacity is much larger than at any time before the war. Capacity, however, is not synonymous with production, the latter being dependent upon a combination of forces and factors, only one of which is physical plant. For example, facilities are unbalanced in some instances with ingot capacity, though sharply up as compared with prewar, still reported being 20 per cent or more inadequate to keep finishing facilities occupied at 100 per cent of capacity.

Transition of the steel industry from war to peacetime production has met with considerably more difficulty than had been anticipated. Steelmakers point out that reconversion of many of the mills involved installation and rehabilitation of much equipment. This takes time. Further, to produce steel products demanded for the peacetime market requires more labor than was required to produce heavy wartime steel items. Much labor was lost to the military services during the war. Some veterans have returned to their old jobs but the steel mills still need hundreds of skilled workers. This shortage, coupled with the shorter work-week, is a bar to capacity steel output.

Ten Million Tons Already Lost

Strikes in steel and coal have cut deeply into potential steel production this year. More than 10 million tons of ingots and more than 7 million tons of finished steel already have been lost to the year's output by the steel and coal strikes. Several million more tons will be added to this total in the next few weeks unless the coal strike is ended since steel mill coal stocks are dwindling rapidly foreshadowing early drastic curtailment in production. The industry had staged a sharp recovery from the steel strike, in the matter of a few weeks rising from a low point of 5 per cent ingot operations at mid-February to around 90 per cent just before the coal strike was called Apr. 1. Since the miners walked out steel operations have dropped to 74.5 per cent, with a further sharp decline in the offing.

To what extent the industry will be able to make up over the remainder of the year the early-year loss in production is anyone's guess. As a general thing it is not believed that even under the most favorable conditions after the coal strike is settled can the industry expect to produce more than 70 million tons of ingots this year. This means a finished steel output of around 50 million tons, 10 per cent less than in 1945, though it will be about 40 per cent greater than finished steel production in 1939.

Producers are agreed that despite their best efforts they will be unable to match demand for months to come. In some products they are now booked to capacity over the remainder of the year. Some orders on books may be duplicate tonnage and may wash out as conditions improve. However, the steelmakers see little hope of being able to provide promptly all the steel for which there now is a waiting market. Consequently, voluntary rationing of production based on prewar tonnage requirements of customers will be continued indefinitely by

(*Please turn to Page* 158)

British To Go Ahead on Steel Nationalization

Scheme for public ownership of industry to be pushed, Minister of Supply announces in House of Commons

BRITISH government has decided to proceed with nationalization of a large part of the iron and steel industry of the country, special announcement of Minister of Supply in House of Commons Wednesday revealed.

British supply minister's statement in Commons as issued by British Information Service in United States, follows:

"The House will remember that on 19th November, 1945, in announcing government's plans for socialization of industries, Lord President of Council stated that coalition-government had invited iron and steel industry to submit a report on improvements required to put the industry on an efficient operating basis, and that his Majesty's government proposed to await this report before taking final decisions on future organization of the iron and steel industry.

"A report prepared by the British Iron & Steel Federation was received and has been considered. It set out plans for development and modernization of the industry over the next five to seven years at an estimated cost of £168,000,000 ($672 million). Proposals were also made to effect certain rationalization of production in order to achieve maximum plant efficiency.

"Reports have also been received from the joint iron council dealing with the iron foundry side of industry.

"The government welcomed these reports as an important contribution to planned development of this basic industry.

"After full consideration, the government has reached the conclusion that the position of the industry and its importance in the national economy necessitate a large measure of public ownership and that legislation for this purpose should be prepared.

"Meanwhile, immediate discussions will take place in order to insure that urgent modernization and development schemes are carried through without delay. The government is anxious to secure the utmost co-operation with both management and workers during the period which will be necessary for preparation and putting into effect a scheme of public ownership. For this period I propose to establish a Control Board. This board will replace the existing iron and steel control and will be responsible to me for general control and supervision of the industry."

New Standard Proposed For Carbon Steel Plates

A voluntary simplified practice recommendation covering thickness of carbon steel plates has just been submitted to producers, distributors and users by the National Bureau of Standards, Washington. Its adoption would retain many of the benefits of simplification practices imposed during the war, the bureau said.

The recommendation provides that thickness of carbon steel plates may be specified in measurement by inches or by weight per square foot. If inches are specified, the thickness will range from 3/16-inch to 2 inches, inclusive. Where weight is used the range will be from 7.65 pounds per square foot to 81.6 pounds. Plates over 2 inches and up to 6 inches thick progress in increments of 1/8-inch. Those over 6 inches thick advance in increments of ¼-inch.

Present, Past and Pending

■ OFFERS PATENTS ON STAINLESS STEEL TUBE MANUFACTURE

WASHINGTON—Alien Property Custodian is offering to American industry 14 U. S. patents on stainless steel tube manufacture, seized from enemy nations. Several of these patents are said to be new designs which are practical for use in this country.

■ GM EMPLOYMENT EXCEEDS PRESTRIKE LEVEL

DETROIT—Hourly-pay employees in General Motors plants involved in the recent UAW-CIO strikes reached 176,227 as of Apr. 13, compared with about 175,000 when the strike started last Nov. 21. Employment increased about 88,000 during the first two weeks of this month.

■ GE OPERATIONS HAMPERED BY MATERIALS SHORTAGES

SCHENECTADY, N. Y.—General Electric Co.'s apparatus department reports output of many types of devices has reached prestrike levels but that manufacture of some products has been delayed as much as 6 to 10 weeks, due to materials shortages.

■ ALLEGHENY LUDLUM EXPANDING ITS FACILITIES

BRACKENRIDGE, PA.—Allegheny Ludlum Steel Corp. will place in operation this year additional facilities for production of stainless and electrical strip at its West Leechburg, Pa., plant. An expansion of facilities to make carbide cutting tools, a new series of mining tools, and other new carbide products recently developed is underway at the Ferndale, Mich., plant.

■ MANGANESE STEEL CASTINGS AND PRODUCTS PRICES RISE

WASHINGTON—Ceiling prices for manganese steel castings and products have been increased 9.6 per cent, effective Apr. 22.

■ WRIGHT AERONAUTICAL SELLS PATERSON PLANTS

PATERSON, N. J.—Wright Aeronautical Corp. has sold its properties here, known as Plants 1 and 2, to Aero Holding Co. of New Jersey, subject to approval of Wright stockholders and final acquisition of title to the Wood-Ridge plant from War Assets Administration.

■ RULES MINNESOTA OWNS IRON ORE UNDER LAKES

DULUTH, MINN.—St. Louis county district court here has ruled that the state is owner of iron ore under Syracuse lake below low water mark. This automatically decides outcome of a $5 million case pending in Brainerd where large deposits of ore under Rabbitt lake on the Cuyuna range are involved. Youngstown Mines Corp. is one of the defendants in the latter litigation.

■ STERLING ENGINE BUYS HIGH-SPEED DIESEL BUSINESS

BUFFALO—Sterling Engine Co. has purchased the National Supply Co.'s high-speed diesel engine-manufacturing business, along with equipment valued at $2 million.

■ EDGECOMB ESTABLISHES MILFORD, CONN., WAREHOUSE

MILFORD, CONN.—Edgecomb Steel of New England Inc. has been organized and has established a steel warehouse here. Joseph H. Roberts, vice president, Edgecomb Steel Corp., Hillside, N. J., is president.

■ WAR, NAVY DEPARTMENTS RELEASE CRITICAL MATERIALS

WASHINGTON—War Department recently declared surplus about $1,400,000 of steel tubing, cold-drawn and hot-rolled steel, zinc slabs, and other basic metals. Navy Department released $32,846,000 of critical reconversion materials during the first week in April.

April Ingot Loss Set at Million Tons

Sharper curtailments in steel production as result of coal strike in offing. Effects spreading to steel consumers, railroads, utilities

MORE than a million tons of steel ingot production will be lost in April as a direct result of the soft coal strike. Should the suspension continue into the early part of May, the loss will increase sharply and soon may force a virtual shutdown of production.

Many large producers who have been able to maintain production thus far now are on the point of sharply curtailing operations and those who already have been seriously affected will make even deeper cuts. Coal stocks in practically all districts are dwindling rapidly.

Cognizance of the effect the coal strike is having on steel production and on other metalworking companies was taken last week by one Washington official, John D. Small, Civilian Production Administration chief, who saw the reconversion effort crumbling under pressure of the mine suspension. Effects of the miners' walkout is spreading to the railroads and soon will affect the utilities, Mr. Small said.

Elsewhere in Washington a near-complacency regarding the coal strike apparently existed. Late last week, Secretary of Labor Schwellenbach found nothing in the situation to become alarmed about and said the coal supplies had not yet reached a critical point. Little apparent progress was being made toward settling the walkout.

Steel ingot production last week lost only slight ground from the preceding week, STEEL's operating rate dropping one point to 74.5 per cent of capacity.

Effect of the cutback in steelmaking due to coal shortage continued spotty, with United States Steel Corp. subsidiaries in Pittsburgh and Chicago being affected most sharply. U. S. Steel subsidiaries in the Pittsburgh district last week operated at 45 per cent of capacity, against 53.5 per cent in the preceding week, and 102.9 per cent in the week immediately preceding the mine walkout.

Output of plates, bars and pipe have been sharply reduced to about 50 per cent of capacity, while production of wire, sheet and strip has been maintained at near capacity. The corporation estimates the ingot production loss in the Pittsburgh district to date exceeds 300,000 tons and that 16,000 workers have been made idle.

Further reductions in operations are scheduled for this week.

Youngstown district operations dropped 10 points last week to 60 per cent of capacity. Sharon Steel Corp.'s Farrell Works has been shut down due to lack of fuel.

Eastern seaboard operations dropped three points. Chicago district operations were maintained. Cleveland producers are continuing at a high rate and one producer has blown in a blast furnace which had been down for repairs. Detroit steelmaking held at 88 per cent last week.

While coal posed the big problem for steel producers, another obstacle was faced in the continued strike of many iron ore miners in the Lake Superior district. Late last week, agreements had been reached by only three mining companies and the United Steelworkers.

STRIKE VANDALISM: This damage is typical of that inflicted on homes of several nonstriking employees of the Anaconda Copper Co. in Butte, Mont. Gangs of men, women and teenagers traveling by truck and automobile toured the streets armed with axes and clubs. After giving the exterior of this house the going over pictured, the vandals swarmed through the house, breaking mirrors, furniture and destroying other property. NEA photo

Foremen's League Charges NLRB Decisions Encouraging Unionization of Management

EIGHTEEN decisions by the National Labor Relations Board within recent weeks are setting a pattern for unionization of foremen, charges the Foremen's League, Pittsburgh, which is opposing organization of supervisory workers into production workers' groups.

"Since the board's decision in the Jones & Laughlin vs. United Mine Workers case on March 9, the NLRB has opened the floodgates to the unionization of management," the league charges.

"It is obvious that what is happening is the circumvention of the will of Congress as expressed in the Wagner Labor Act," declared William Adams Littell, executive secretary of the league.

Harry P. Jeffrey, Dayton, O., national counsel for the league, declared the board's ruling in the California Packing Corp. case completes the cycle by which the board provides for the organization of management representatives. In the Packard Motor Car decision last year, the NLRB ruled that foremen could organize in independent unions. In the Jones & Laughlin case it ruled they could join

rank-and-file unions. Now in the California Packing Corp. case it has ruled that foremen can join affiliate or auxiliary unions which are part of big labor organizations.

"This is a serious blow to management," Robert F. Loetscher, president of the league, declared. "It now appears that action by Congress, clearly clarifying the foremen's status under the Wagner Act, is about the sole recourse left."

The following 18 cases have been decided in favor of unions since the Jones & Laughlin case:

American Smelting & Refining Co., Perth Amboy, N. J. (Mar. 8)
The Celotex Corp., Marreco, La. (Mar. 8)
Kelsey-Hayes Wheel Co., Detroit (Mar. 11)
Air-Way Electric Appliance Corp., Toledo (Mar. 14)
Fireboard Products Inc., Los Angeles (Mar. 12)
Federal Mogul Corp., Detroit (Mar. 11)
Heyden Chemical Corp., Fords, N. J. (Mar. 15)
Ludlow Typograph Co., Chicago (Mar. 21)
Allied Steel Castings Co., Chicago (Mar. 21)
Columbia Machine Works Inc., Brooklyn, N. Y. (Mar. 21)
Westinghouse Electric Corp., Springfield, Mass. (Mar. 28)
Curtis Bay Towing Co. of Pennsylvania (Mar. 25)
Worthington Pump & Machinery Corp., Holyoke, Mass. (Mar. 28)
Armour & Co., Syracuse, N. Y. (Mar. 29)
Essex Wire Corp., Highland Park, Mich. (Mar. 29)
Auto-Lite Battery Corp., Syracuse, N. Y. (Mar. 25)
Wilson & Co. Inc., Chicago (Mar. 29)
California Packing Corp., Yakima, Wash. (Apr. 7)

Corporate Income After Taxes Fell 4 Per Cent in 1945; Sales Lower

Manufacturing companies report sales volume down 9 per cent from 1944. Study by National City Bank of New York reveals considerable variances among major divisions of business. Post-V-J cutbacks wiped out operating earnings for many concerns

NET INCOME after taxes of leading corporations in 1945 declined 4 per cent from 1944, a comprehensive summary by the National City Bank of New York reveals.

The bank's report shows also that the rate of return on net worth declined again, as it had done in the previous three years, and that the average profit per dollar of sales continued around the low levels which were the rule during the war years.

"As a whole, 1945 was a year of smaller volume than 1944, both in output and in dollar sales, reflecting the cutback of war production. The decline in volume, together with increased wage rates, rising material prices and other cost-increasing factors, depressed earnings before taxes," the bank pointed out. "Part of the drop, however, was absorbed by the resulting decrease in federal income taxes."

Net income (after taxes) of 2806 leading corporations covered in the bank's tabulation totaled $4,969,000,000 in 1945, or 4 per cent less than the $5,160,000,000 of 1944. The trend of earnings during the year varied considerably among major divisions of business, the range being from an improvement of 9 per cent in wholesale or retail trade (in which sales increased) to a decline of 30 per cent in transportation.

Net worth of the 2806 corporations was $65,581,000,000 at the beginning of 1945, and represented around 45 per cent of the total net worth of all active corporations in the country. Average return on this net worth was 7.6 per cent compared with 8.2 for the same companies in 1944. The recent peak of return on net worth shown in the bank's tabulations was 9.2 per cent for 1941, and the decline since has been uninterrupted.

However, aggregate figures shown in such a tabulation conceal many irregularities, the bank pointed out. Compilation for full calendar or fiscal years conceals the sharp drop in earnings of many manufacturing companies after V-J Day, which in many cases wiped out operating earnings entirely and has led to a number of reductions or omissions of dividends.

Tax Adjustments Change Picture

In interpreting the 1945 figures and comparing them with prior years, accounting and tax adjustments resulting from the ending of the war and the settlement of government contracts must be considered, the bank summary pointed out.

Of 1017 manufacturing companies reporting sales figures, the total sales in 1945 were $54,751,000,000, a 9 per cent decrease from 1944, upon which the net income after taxes (including income from investments and other sources as well as from sales) was $2,124,000,000, or an average of 3.9 cents per dollar of sales. This compares with 3.3 cents in 1944 and with 7.5 cents in 1940. Forty-three iron and steel companies averaged 3 cents per dollar of sales in 1945, compared with 2.6 cents in 1944. Their 1945 sales totaled $5,661,093,000, and their net income after taxes was $169,501,000.

Percentage of Net Income to Sales of Leading Corporations†

(In Thousands of Dollars)

No. of Cos.	Manufacturing	Sales 1945	Net Inc.* 1945	% Net Inc. to Sales 1945	% Net Inc. to Sales 1944
19	Baking	$ 812,425	$ 26,715	3.3	3.1
12	Dairy products	1,691,079	36,179	2.1	2.1
18	Meat packing	4,108,790	35,011	0.9	0.9
22	Sugar	544,399	25,638	4.7	6.1
32	Other food products	1,627,518	52,655	3.2	4.3
45	Beverages	2,220,644	79,450	3.6	4.1
12	Tobacco products	1,636,181	66,341	4.1	4.2
39	Cotton goods	678,794	22,715	3.3	3.1
44	Other textile products	1,300,961	58,657	4.5	2.8
27	Leather and shoes	676,119	20,267	3.0	3.1
22	Rubber products	2,561,788	64,338	2.5	2.7
18	Wood products	312,107	12,201	3.9	3.7
54	Pulp, paper products	1,170,410	50,778	4.3	4.5
43	Chemical products	2,155,384	159,348	7.4	5.4
20	Drugs, soap, etc.	1,073,564	68,639	6.4	6.5
12	Paint and varnish	428,762	13,552	3.2	3.4
30	Petroleum products	4,962,272	346,311	7.0	7.0
41	Cement, glass, stone	859,148	38,366	4.5	4.9
43	Iron and steel	5,661,093	169,501	3.0	2.6
10	Agricul. implements	1,409,586	51,250	3.6	3.7
37	Bldg., heat., plum. equip.	871,779	31,414	3.6	4.0
37	Electrical equipment	2,528,410	72,963	2.9	2.9
93	Machinery	1,789,291	63,698	3.6	3.2
16	Nonferrous metals	779,224	49,813	6.4	8.6
107	Other metal products	2,589,775	93,649	3.6	3.8
21	Autos and trucks	5,479,753	246,935	4.5	3.1
43	Auto equipment	1,419,926	39,302	2.8	2.8
16	Railway equipment	748,563	29,552	3.9	3.1
19	Aircraft and parts	1,255,842	15,668	1.2	1.2
65	Other manufacturing	1,396,945	82,699	5.9	4.7
1,017	Total manufacturing	$54,750,532	$2,123,655	3.9	3.3

* Net income, after taxes, includes income from investments and other sources as well as from sales.

† Tabulation by National City Bank of New York.

Builders Advise Surplus Government Machine Tools Be Sold, Put To Work

Atlantic City convention devoted to discussion of depreciation policies, trend of OPA rulings, revamped foreign and domestic sales strategy to meet postwar conditions. Saltonstall tells members government must tailor services to country's needs

By GUY HUBBARD
Machine Tool Editor, STEEL

ATLANTIC CITY, N. J.

ABOUT 400 executives, representing top management of machine tool companies building 90 per cent of the industry's output, attended the 44th spring meeting of the National Machine Tool Builders' Association, at the Ambassador, April 15-17.

Presiding was William P. Kirk, 1945-46 president of the association, who is vice president, Pratt & Whitney Division, Niles-Bement-Pond Co., West Hartford, Conn. Among guests were officers of the American Machine Tool Distributors' Association, many of whose problems are closely related to those of the builders.

Mr. Kirk in the opening address, set forth the convictions of the association in regard to surplus machine tools now owned by the government. Here is the gist of his statement:

1. It is an economic crime not to use good machine tools. Therefore they should be put to work on behalf of full productivity and full employment.

2. It is to the advantage of the machine tool industry to have these surplus machines put to work. A dammed-up surplus will continue to be a threat to the sale of new machines until it is drained off. Furthermore, practical experience has demonstrated that the more good machine tools any user company has, the more new machines it buys.

In reviewing the general situation, Mr. Kirk said, "As long as our industry advocates measures and procedures that will benefit the largest number of people in the long run, we are on safe ground. This simply is another way of saying that any profit which we make is our reward for benefiting humanity. As a matter of fact, I would like to lay down that as the principle for the entire free enterprise system.

"I believe that humanity can benefit more by the free enterprise system than by any other system thus far presented to mankind. However, it is up to us to prove it. I want to see the machine tool industry in the front rank in making that proof. This brings me to consideration of the foremost job confronting our industry today—that of salesmanship.

"The function of the machine tool is to cut costs. The biggest problem before our country today is that of inflation. Inflation means danger of higher prices. High prices can be forestalled by cutting production costs. Therefore, our industry holds the key to prevention of inflation. And so it is that machine tool builders today are granted the strongest sales argument in the history of our industry. Let's use it properly and vigorously."

Another speaker who likewise emphasized the importance of sales, was Herbert L. Tigges, vice president and sales manager, Baker Bros. Inc., Toledo, O. He bore heavily on the point that the salesmen are the front line troops of the machine tool builder and as such must be equipped for action which will do credit to and win business for their company.

James Y. Scott, president, Van Norman Co., Springfield, Mass., in dealing with government policy on surplus disposal, struck at the delay in scrapping machines 25 or more years old, and in delay in distribution of government tools to educational institutions. Better legislation is in order on both these matters.

In a paper delivered by Tell Berna, general manager of the association, for its author, Louis Polk, president, Sheffield Corp., Dayton, O., it was advocated that every machine tool builder should "get right down among the grass roots and tell people in his own neighborhood what the industry is, what machine tools are and what they mean in the lives of all of us."

In a paper on "Impact of Depreciation Policies on New Equipment Purchases," Frederick Blackall Jr., president and treasurer, Taft-Peirce Mfg. Co., Woonsocket, R. I., began as follows: "I would like to read an important pronouncement. 'Businesses large and small, must be encouraged by the government to expand their plants and to replace their obsolete or worn-out equipment with new equipment. To that end the rate of depreciation on these new plants and facilities for tax purposes should be accelerated. That means more jobs for the workers, increased profits for the business man and lower cost to the consumer.'

"Now, gentlemen, the foregoing statement is not an edict of the National Association of Manufacturers, nor is it the brain child of the National Machine Tool Builders Association. It isn't even one of those economic dictums handed down by the Machinery & Allied Products Institute.

"No, gentlemen, that statement was made by our late President Franklin D. Roosevelt, in an address to the nation from Chicago on Oct. 28, 1944. It is a matter of public record. It was a proposal by the administration of intended policy.

"And yet no discernible step has been taken in the halls of Congress or elsewhere to effectuate this policy. I know of no other single step in the field of taxation which would contribute more effectively to a building-up of our national productive efficiency and to the maintenance of our national industrial plant in productive and competitive efficiency, than would this one."

The highlight of the meeting was the appearance of Sen. Leverett Saltonstall of Massachusetts, as a guest speaker at the banquet Tuesday evening, April 16.

The main theme of his address was that, like what machine tool builders do for their customers, the government in this country must do more to tailor its services to the needs of industry. Despite the fact

Calendar of Meetings . . .

Apr. 22-24, American Management Association: Conference, Hotel Pennsylvania, New York. Association headquarters are at 330 West 42nd St., New York 18.

Apr. 22-27, Society of the Plastics Industry: National Plastics Exposition, Grand Central Palace, New York. Association headquarters are at 295 Madison Ave., New York 17.

Apr. 24-26, American Institute of Electrical Engineers: Northeastern district meeting, Hotel Statler, Buffalo. Association headquarters are at 33 West 39th St., New York 18.

Apr. 25-26, American Institute of Mining & Metallurgical Engineers: Twenty-ninth annual open-hearth steel and blast furnace and raw materials conferences, Chicago. A. B. Parsons, 29 West 39th St., New York 18, secretary.

Apr. 26-30, International Lighting Exposition: Stevens Hotel, Chicago.

Apr. 28-May 2, American Ceramic Society Inc.: Forty-eighth annual meeting, Hotel Statler, Buffalo. Ross C. Purdy, 2525 North High St., Columbus 2, O., general secretary.

Apr. 29-30, American Mining Congress: Annual Coal Convention, Cincinnati. Julian D. Conover, American Mining Congress, Washington 4, secretary.

Apr. 30, Traffic Club of Pittsburgh: Annual dinner, William Penn Hotel, Pittsburgh. C. F. McBride, Pittsburgh Steel Co. Inc., is president.

May 1-2, Iron & Steel Institute: Annual general meeting to be held at the institute's headquarters at 4 Grosvenor Gardens, London, S. W. 1, England.

that the doctrine of less individual opportunity and more security, has won a strong foothold in England, the average American still is in favor of more or less unlimited opportunities even if a little less security may be involved. There are altogether too many pipelines to Washington, and altogether too many of them penetrate state lines, the senator said.

"Russia wants peace—we want peace," he stated, "but we must work with Russia with realism and firmness." This will be true especially when it becomes apparent to what an extent our lines of security—and those of Great Britain—have approached those of Russia. In his estimation, we must work hard to make UN a success and we must recognize our responsibilities to UNRRA.

In a tribute to the machine tool builders, Senator Saltonstall said, "Your industry is America at its best, because it is to such a high degree responsible for the turning out of more and better work at less cost and in the creation of more and better jobs for our citizens. It is that kind of team play that makes America go. That is the kind of team play that we need in our government affairs."

New Firm Takes Over Plant Of Ellwood Steel Tube

Ellwood-Ivins Steel Tube Works Inc., recently organized with capital of $300,000, has acquired the Ellwood Steel Tube Works with plant in Oak Lane, suburb of Philadelphia. The new company is headed by R. R. Lawson, Norristown, Pa., formerly executive vice president, Summerill Tubing Co., and plans to modernize the Ivins property, with a view eventually to expanding its line to include tubing of stainless and other alloys and special metals. Production at present is confined to plain steel tubing one inch outside diameter and smaller.

New company has also acquired Machine Engineers, an organization with plant at King of Prussia, Pa., and will utilize facilities for various machining and fabrication operations in connection with tubing as well as continuing to carry on other types of machine work.

Other officials of the new company are Theodore Heske, vice president and general manager, Wayne A. Slater, secretary-treasurer, L. H. Brown, chief engineer, and C. W. Johnson, purchasing agent. Messrs. Heske, Slater and Johnson also had been previously associated with the Summerill company. Mr. Brown was owner of the Machine Engineers firm.

The original Ivins company is said to have been the first to draw seamless tubing in this country. It was organized in 1876 and incorporated in 1889.

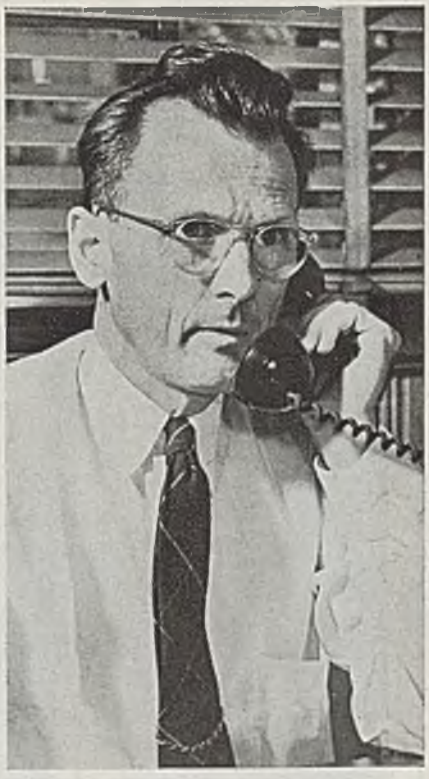
Better Tooling Held Best Means For Cutting Manufacturing Costs

President of National Tool & Die Manufacturers, speaking at meeting of organization's directors, points out that ingenuity in special tooling is greatest of cost reducers on production work. Strikes holding up orders

BETTER tooling offers the most practical means of holding down manufacturing costs in spite of mounting wage rates, Richard F. Moore, president, National Tool & Die Manufacturers Association, told the association's board of directors at their two-day session at the Hotel Pennsylvania, New York, recently.

Directors from all of the association's 20 tool centers were represented at the meeting.

"Ingenuity in special tooling is the greatest of all cost reducers on production work," Mr. Moore said, referring to the specially designed dies, jigs, fixtures, cutting tools, molds, gages, and special machinery which make mass-production possible.



RICHARD F. MOORE

To illustrate his point, Mr. Moore, who is president of the Moore Special Tool Co., Bridgeport, Conn., cited a wartime instance where a sudden increase in the desired quantity of a certain airplane part led to a careful study of means for speeding up production and cutting costs. The amount spent for tooling was increased from $600 to $15,000, with the result that the cost per part dropped from $7.50 to $1.15. Since the initial order was for 250,000 pieces, the savings on this order alone amounted to more than $1,500,000.

"The 3000 contract tool and die shops", said Mr. Moore, "have as vital a job to do in helping industry reach new peacetime levels as they had in making possible the records in war production that amazed the world."

The greatest handicap faced by the special tooling industry, according to Mr. Moore, is the continuing shortage of skilled tool and die sinkers. The association has developed an apprenticeship program especially adapted to the training of veterans. By four years of carefully supervised work a junior journeyman can be developed. Further years of experience are required to make a top-flight tool and diemaker. Such men are among the highest paid of all craftsmen.

George S. Eaton, the association's executive secretary, reported that long strikes in the automobile, electrical apparatus, farm equipment, and steel industries have resulted in holding up orders for dies, jigs, fixtures and other special tooling needed for new models. Mr. Eaton predicted that the extended shutdowns would cause some manufacturers to continue present models through 1946, abandoning ambitious programs for new lines. This is especially true in such products as air conditioning units, electric fans, and automobiles.

Current problems raised by the administration's wage-price policy were discussed, and reports were received from the committees on apprenticeship, planning, fact-finding and ethics.

Mining Congress To Meet In Cincinnati, Apr. 29-30

Approximately 2000 coal operating men from all the nation's coal fields are planning to meet in Cincinnati, Apr. 29 and 30, for the annual convention of the American Mining Congress to discuss the economic future of the coal industry and to consider the latest developments in operating practices.

House Votes To End Price Control March 31, 1947; Guarantees Profits

Amendment-riddled extension bill goes to Senate, where somewhat more liberal treatment may be accorded it. Administration spokesmen view House action as "repeal of price control." Vote follows heated sessions before committees in both houses

AN AMENDMENT-riddled OPA extension bill was adopted last week by an angry and rebellious house and the fate of price control in the months to come were handed over to the Senate.

The bill voted by the House would extend price control only nine months after the present law expires on June 30; it would guarantee cost plus reasonable profit on all items manufactured, grown or produced, regardless of the past profit experience of the industry or trade; it would terminate all price rollback subsidies on farm products next Dec. 31 and terminate meat subsidies on June 30 of this year when the present act expires.

The bill approved by the House, by a vote of 355 to 42, was bitterly assailed by price control proponents in the administration. Paul Porter, OPA chief, called the bill the "repeal of price control."

The Senate is expected to be somewhat more generous in its treatment of the extension bill than was the House, although it was considered likely many of the amendments voted by the House would be retained in the Senate version. Hearings were being held before the Senate Banking & Currency Committee last week.

There it was lambasted by some industry spokesmen as an "economic perversion" of a program designed to control consumer goods and rents and warmly defended by administration spokesmen.

Administration Asks Extension

Testifying before the Senate Committee, Chester Bowles, former OPA administrator and now economic stabilizer, Paul Porter, OPA chief, and John W. Snyder, reconversion director, urged that price control be continued without crippling amendments.

In addressing the Senate committee, Mr. Porter asserted more controls would be removed as soon as they no longer are needed and promised more attention will be given in the future to claims for price relief.

The National Association of Manufacturers, which has been conducting an active campaign against continuance of price control, has released a pamphlet charging OPA with "deliberate and vicious distortions." It contended it is a practical impossibility for OPA to set fair prices on 8,000,000 items and police these prices for 3,000,000 business organizations throughout the country.

A modified stand on the issue was taken by the Committee for Economic Development. In a statement by its Research Committee, made public yesterday by Paul Hoffman, CED chairman, the committee recommended retention of some controls until the spring of 1947 and in the case of rents for an even longer period.

CED emphasized four conclusions:

1—Price control has no permanent place in the peacetime American economy. The restoration of an economy of free prices in the near future must be a primary objective. Long continued price control is a threat to all our freedoms;

2—The abandonment of price control on June 30, 1946, would leave us unprotected against a dangerous rise in prices;

3—A quick and orderly termination of price control can only be assured by a positive program embracing both measures of decontrol and courageous fiscal and monetary policies to combat inflation;

4—During the limited period of its extension, the inequities and obstacles to production which result from price control must be reduced by streamlining present procedures.

ASK OPA EXTENSION: More than 500 women from all 48 states descended on the Capitol last week to ask extension of the Office of Price Administration. Here two of their representatives present to Rep. Adolph J. Sabath (Dem., Ill.) a petition five city blocks long and containing the signatures of 500,000 persons. NEA photo

Prices cannot be centrally controlled for any sustained period without inefficiency, inequity, breakdown of respect for law and, most important, serious danger to our personal and political freedoms. There are hazards in eliminating price control too soon, but the dangers in continuing it too long are even greater.

CED makes four recommendations as to changes needed "so that we can live with price control for a limited period." These are:

1. Follow a resolute and affirmative policy in progressively suspending price ceilings. Remove controls first from those commodities which are not essential in the basic standard of living or critical in reconversion, or which show an approximate balance between demand and supply. The principle of vigorous, progressive liquidation should apply to cost-of-living subsidies as well as to price ceilings.

2. Extend the use of automatic pricing procedures, under which producers compute their own ceilings, subject to OPA review, and with heavy penalties provided for fraud.

3. Base price determinations on the actual record of industry operations, adjusted for definite abnormalities visible in the record, but without attempting to forecast the future development of costs and revenues.

4. Liberalize the standards for price relief.

No Price Increase for Steel Scrap in Sight

Current ceiling prices for iron and steel scrap are adequate and no increase will be granted in the foreseeable future, Office of Price Administration has announced. OPA says the scrap industry advisory committee is in accord with this view.

Members of the advisory committee, according to Warren Huff, OPA Metals Price Branch executive, agree with OPA that supplies of scrap, which admittedly are seriously short, will increase steadily during the next several months for the following reasons:

1. The spring and summer seasonal increase is getting under way now that the weather is more favorable for the collection and preparation of scrap.

2. The resumption of industrial production due to the settlement of strikes will increase the supply.

3. Release of more government surplus and its speedy marketing by the War Assets Administration will add to the scrap supply.

4. Large scale ship breaking is getting under way in some parts of the country.

General Raise of 25 Per Cent Sought in Rail Freight Rates

REQUEST by the nation's railroads for a general 25 per cent increase in freight rates makes exceptions on certain items, including iron and steel, iron ore, coal and coke, and crushed stone and slag, on which lesser increases are sought. The exceptions are designed to avoid undue disruption of competitive relations and commercial conditions.

Proposed maximum raises on excepted items include: 80 cents per ton on iron and steel; 6 cents per 100 pounds on petroleum and its products in tank cars; and 10 cents per hundred pounds on lumber and wood pulp. On iron ore the proposal is to increase all rates by 12 cents a ton; coal and coke rates would be increased by from 15 to 40 cents a ton; sand, gravel, crushed stone, and slag would be increased by 20 cents per ton and various other specified products of mines by 20 to 40 cents a ton; and cement, brick, building tile, and lime would be increased 50 cents a ton.

The 80 cents per ton increase would apply on iron and steel, pig iron, rails, fastenings, frogs and switches. On cast iron pipe and fittings, iron and steel pipe and fittings, nails and wire, and iron and steel rated fifth class, railway car wheels, axles and trucks, 4 cents per 100 pounds. Other than when included in iron and steel lists, the increase would be a flat 25 per cent.

On scrap iron and steel the rate would be increased 80 cents per ton at commodity rates; other than commodity rates, 25 per cent.

The increase on coke would be 15 cents per net ton on rates up to 75 cents; 20 cents on rates from 76 cents to $1; 30 cents on rates up to $1.50; and 40 cents per net ton on rates over $1.50.

The railroads also asked that the existing 10 per cent increase in basic passenger fares awarded in 1942 be made permanent.

The roads asked that the proposed freight rates be permitted to become effective on May 15.

The roads declared that they face a critical emergency in 1946 with their combination of prewar rates and postwar costs and they predicted that without the 25 per cent freight rate increase, net railway operating income would be almost wiped out and that there would be an enormous deficit in net income. The requested increase would provide the railroads with $625 million additional revenue for 1946.

The Office of Price Administration immediately began to study the railroads' request after it was submitted last week to the Interstate Commerce Commission to determine whether to intervene. The OPA is authorized to intervene when rate increases would have inflationary results.

GOVERNMENT CONTROL DIGEST

OFFICE OF PRICE ADMINISTRATION

Metal Cots, Beds and Bedsprings: Manufacturers' ceiling prices increased by amount of steel cost increases since 1942, or from 15 to 30 cents per unit, effective Apr. 20 on cots and double deck beds, and Apr. 22 on bedsprings and beds. Increases amount to about ½-cent per pound of steel used. Steel cost increases heretofore uncompensated by price increases on manufactured products total $9 a ton on high carbon steel wire used in bedsprings and $7 a ton for bar stock used in frames. (MPR-188, 213; OPA-T-4398)

Cast Iron Boilers: Manufacturers provided with an individual price adjustment procedure, effective Apr. 22. (MPR-272)

Nails, Staples, Tacks: Price control suspended on the following ferrous nails, staples and tacks: Cut nails and cut spikes, cut tacks, and lead-head nails and other nails or staples made of two or more materials, except nails covered by RPS-6 and horseshoe nails, thumb tacks and map tacks covered by MPR-188. Price control also suspended on all nonferrous nails, tacks, escutcheon pins and staples covered by GMPR. (SO-129)

Used Machinery: Resellers of used machinery must use a new method for determining base prices in order to compute selling prices. Effective Apr. 13, resellers must use the manufacturers' list price in effect on the base date in computing selling prices. (MPR-136)

Resinous-Coated Steel Sheets: Manufacturers of resinous-coated steel sheets now permitted to use the same pricing methods and seek the same form of adjustment that other building material makers use. (MPR-592; OPA-T-4377)

Electric Motors: Manufacturers of fractional horsepower electric motors and of integral electric horsepower motors and generators now may sell them on an adjustable pricing basis, effective Apr. 16. (MPR-136; OPA-T-4373)

Cans: Producers of packers' tin cans and condensed milk cans may apply to OPA for permission to modify their maximum prices by changes in discounts, special allowances and credit terms. Permission will be granted only when the changes proposed will be compensated by appropriate reductions in the applicant's maximum prices for the commodities. (MPR-350; OPA-T-4403)

CIVILIAN PRODUCTION ADMINISTRATION

Building Materials: Makers of copper magnet wire, warm-air furnaces, asphalt and tarred roofing products, building board, gypsum board and lath may apply for "CC" preference ratings. Producers of specialized machinery for making asphalt and tarred roofing materials may also apply for "CC" ratings for: Construction materials; maintenance, repair and operating supplies; capital equipment; and production materials, except iron and steel products in the forms and shapes listed in schedule 1 to order M-21. (PR-28; CPA-290)

Warm-Air Furnaces: Warm-air furnaces have been placed on the list of materials obtainable with housing ("HH") ratings. Manufacturers must set aside 70 per cent of their output to fill "HH" rated orders, effective Apr. 15. (PR-33; CPA-290)

Loans Under Blanket Participation Program of RFC Total $118 Million

Applications increasing rapidly. Nearly 3000 banks co-operating with RFC in program. Plan primarily designed to aid small business, with 88.6 per cent of loans being for $100,000 or less. Top limit raised by $350,000 at requests of participating banks

BANK loans under the Blanket Participation Agreement plan described by Charles B. Henderson, president, Reconstruction Finance Corp., in the Dec. 31, 1945, issue of STEEL, pp.42-45, are increasing rapidly from month to month both in number and in the total amount of money involved.

Total for the first year of the plan, from Apr. 1, 1945, through March of 1946, was 2498 loans coming to $118 million. More than half of these loans were made since Jan. 1. In January there were 341 loans for $15,360,000, in February 386 loans for $17,700,000, and in March 567 loans for $26,100,000.

The number of banks working with the RFC under the plan is 2878. Of these banks 94 operate in cities of 1 million or more, and 101 of the banks have deposits in excess of $100 million each. Some of the participating larger banks include:

Corn Exchange Bank & Trust Co., New York; Brooklyn Trust Co., Brooklyn, N. Y.; Fidelity Union Trust Co., Newark. N. J.; Manufacturers National Bank, Detroit; Citizens Commercial & Savings Bank, Flint, Mich.; Central National Bank, Battle Creek, Mich.; Merchants National Bank, Cedar Rapids, Iowa; City National Bank and Trust Co., Chicago; First Bank & Trust Co., South Bend, Ind.; First National Bank, St. Louis; American Exchange National Bank, St. Louis.

The plan contemplates helping small business primarily, and 28 per cent of the loans under it have involved $10,000 or less, 88.6 per cent have been for $100,000 or less. They are mostly of a capital nature and are due for maturity usually in two to ten years. A fair percentage of the loans are for the purpose of facilitating capital equipment such as machine tools. Smallest loan was $240 for capital equipment for a chicken fattening plant in Mississippi. Largest have run a little more than $300,000. Recently the RFC raised the top limit from $250,000 to $350,000 at the request of participating banks. By another recent change the RFC makes or participates in loans to contractors for residential construction.

The RFC charge is ½ of 1 per cent when the bank assumes responsibility for 50 per cent or more of the loan, and ¾ of 1 per cent when the RFC has to guarantee the principal up to 50 per cent or more. Banks are permitted to charge up to 4 per cent on the RFC-guaranteed portion and up to 6 per cent on the remainder of the loan.

BACK TO PARK BENCH OFFICE: Weathered oak bench in Central Park, New York, is the only office of Bernard Baruch, United States Delegate to the United Nations' Atomic Energy Committee and adviser to many Presidents. Above, Mr. Baruch is shown conversing with Franklin D. Roosevelt Jr., son of the late President, and Morris V. Rosenbloom, former Navy lieutenant. NEA photo

VETS FAVOR TRAINING

Initial mass assertion of the voice of World War II veterans—a voice that is expected to exert a dominant influence on national policies in the years to come—has taken the form of a universal military training program adopted jointly by the three major organizations. These are the American Legion, the Veterans of Foreign Wars and the Disabled American Veterans. Membership of these organizations totals about 5,000,000 and is rapidly increasing. All three are represented by men thoroughly trained in pressure group tactics.

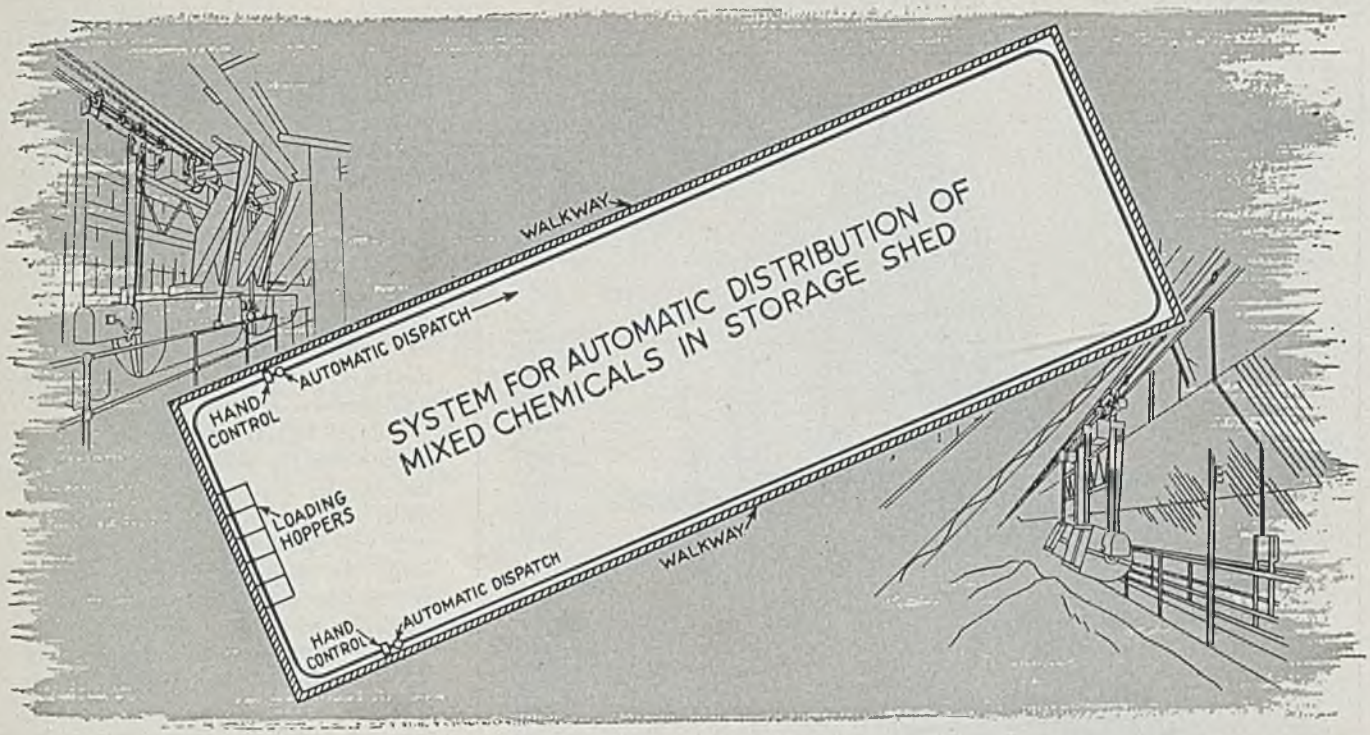
Congress so far has shown a disposition to wait until after the 1946 elections before putting universal military training to a vote, but this situation may change as a result of increased demands for early action plus the psychological effect of the aggressive policies of the Union of Soviet Socialist Republics.

LEGAL END OF WAR

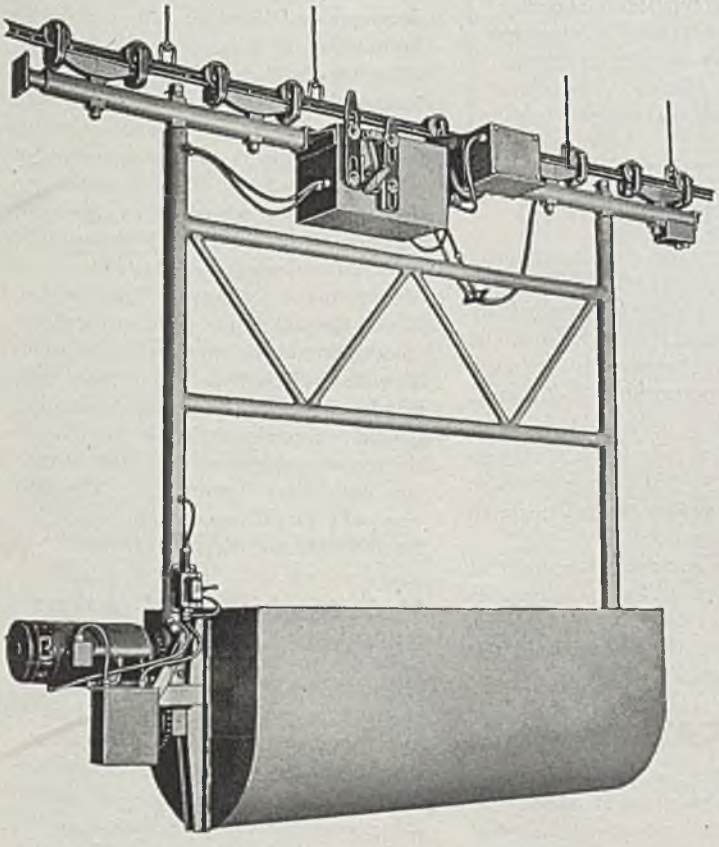
H. R. 5842 introduced in the House by Rep. Frank W. Boykin (Dem., Ala.) would fix the legal end of the war as Sept. 1, 1945,—"for the purposes of the Act of Oct. 6, 1917, relating to the publication or disclosure of an invention by the grant of a patent during the time the United States is at war, and for the purposes of the act of Aug. 21, 1941, relating to filing of applications for patents in foreign countries." This makes a total of 11 such resolutions now pending in Congress—ten in the House and one in the Senate. Most would set the legal date as the final day of actual war. One sets Aug. 14, 1945, another Sept. 2, 1945, and a third Dec. 7, 1945. The legal end of the war can be established either by Congress or by a Presidential proclamation.

NAVY RATINGS LISTED

Copies of a new catalog of Navy enlisted ratings, recently distributed by the Navy to 2400 selected companies and business groups to aid the postwar employment of Navy veterans, may be had at $1 each from the Superintendent of Documents, Washington 25, D. C. In-



10 Years of Automatic Operation



AUTOMATIC handling is not new with American MonoRail. This system has been in operation over 10 years. Since the original system was installed, two additional automatic carriers have been added. It has been continuously operated day-in and day-out with remarkably few replacement parts.

The automatic dumping bucket carries a cubic yard — travels to movable stop at 150 f.p.m.— dumps automatically — returns to loading station at 400 f.p.m. Movable stops are set to where material should be dumped. The carrier does all the dumping after being loaded and dispatched from the loading station.

Whatever your handling problem may be, there's an American MonoRail System best suited to your individual needs. Consultation in connection with any handling problem is available without obligation.

THE AMERICAN MONORAIL COMPANY

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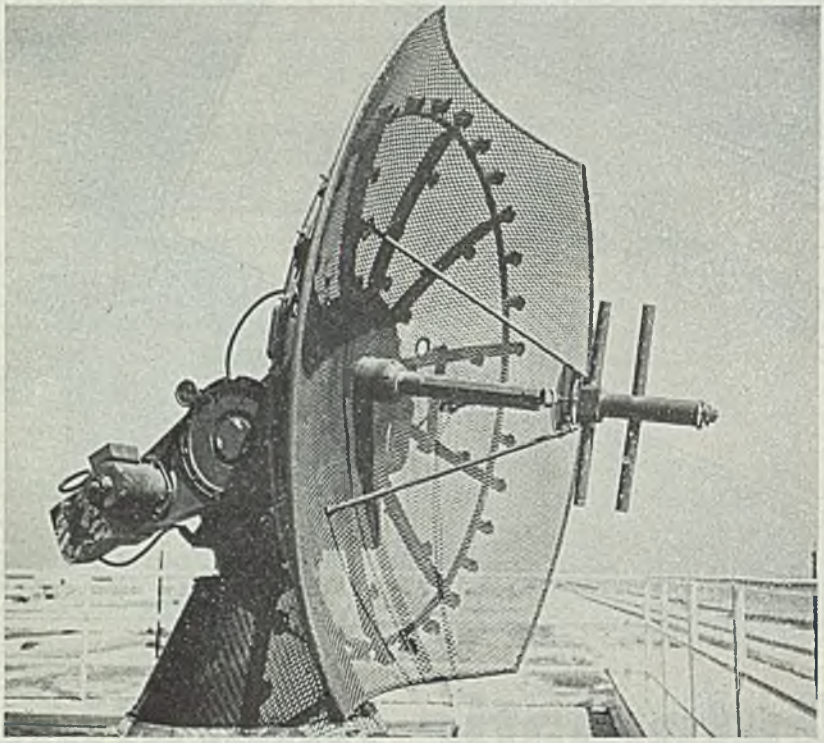


BEATS WEATHER: Navy-developed system of ground controlled approach to facilitate landing of plane in bad weather was demonstrated recently at the Naval Air Station, Banana River, Fla. Photo shows a closeup of sensitive radar equipment that records the position of planes above an airport, permitting operators of planes to "see" clearly, regardless of weather and to systematize and control their landing approaches

tended primarily for personnel managers, job counselors and employers, this 441-page book entitled *Special Aids for Placing Naval Personnel in Civilian Jobs* lists the 526 enlisted ratings in the Navy and describes the duties and knowledge involved in each. Beside each rating, or group of ratings, it carries a list of related civilian jobs for which the Navy veteran might qualify with varying degrees of additional training. Some 10,000 copies of the book are in use by the United States Employment Service in assisting Navy veterans to find suitable jobs.

TO STAY OPEN NIGHTS

Plans to keep the Patent Office search room open at night have been completed, following disclosure that present facilities are overcrowded during the day by searchers and others interested in available patents.

The Patent Office is undergoing the biggest boom in its history, according to the director, Casper Ooms, resulting chiefly from activity by large corporations, which are reported now to be filing hundreds of applications on new devices and patents developed during the war.

WOULD ENLARGE FSO

Doubling of foreign service personnel engaged in commercial or economic representation abroad is recommended by the Advisory Committee on Commercial Activities in the Foreign Service, in a report to the Department of Commerce.

The 1947 budget request of the Foreign Service Office was for 500 officers for such activity, but the committee stated that this number is inadequate to meet the changing needs.

The committee also recommended that all foreign service officers engaged in such fields should be brought home at intervals of 18 months, for study in this country of industrial needs.

MORE EDUCATION

Army Air Forces is instituting a science educational program in response to a broad educational movement launched recently by Secretary of War Patterson. Under arrangements made by Maj. Gen. Curtis E. LeMay, deputy chief of Air Staff for Research and Development, Dr. R. E. Gibson of Johns Hopkins Laboratory, Silver Springs, Md., gave the first of a series of four lectures on nuclear physics at the Pentagon, March 26, before AAF headquarters personnel. Other scientists will carry on the program which, at the beginning, will fill in broad outlines so as to provide the nontechnical staff with a rudimentary knowledge of modern physics and chemistry.

Later a second series—for the benefit of those nontechnical officers who have shown special interest in the preliminary course, as well as for technical officers who use scientific information in their planning duties at AAF headquarters—will be conducted.

General LeMay also has in progress, in co-operation with educational institutions, the development of a program under which selected AAF officers and men will be sent to civilian schools to study for bachelor of science degrees and to take postgraduate training in the sciences. Also under way is the establishment of a scientific advisory board to the commanding general of the AAF, to act as a co-ordinating agency "through which the partnership of industry, research foundations and the AAF will function for the advancement of scientific research and development."

While the educational program for Army officers in general still is under development, Secretary Patterson reports formulation of a basic decision. It provides for "a chain of educational institutions from the branch basic schools for new officers up to schools for top level staff officers and commanders of major Army units. Officers would progress from one school to a higher one between tours of duty with troops in the field. They would also attend schools of the major commands, so that Air Force, Ground Force and Service Force officers would be thoroughly acquainted with the functions of the other commands and could co-ordinate planning. Consideration also is being given to exchange of student officers and instructors with Navy institutions. The plan also calls for advanced training of National Guard and Reserve officers.

U. S. Machine Tool Makers To Have Exhibits at Paris

Twenty-two American manufacturers of machine tools will be represented at the Paris Fair to be held in Paris, France, from May 25 through June 10. In addition, American producers of various other products will participate.

This international sample fair is the second event of this kind to be held in Paris since liberation of France. Before the war such trade fairs were held regularly in autumn and in spring.

Numerous other trade fairs are scheduled for this year in France and in other European countries.

Perpetual Study of What Goes on in Russian-Dominated Countries Asked

Army Industrial College told Soviets still are guided by deeply imbedded psychological factors which brought revolution to Russia and will spread concepts as far as possible to obviate external threats to attainment of their objectives

FOR MANY years to come the dominant outside influence upon our thinking and upon our policies will grow out of developments in the Union of Soviet Socialist Republics, so that there should be some group in our governmental structure that can keep a perpetual inventory of "what is going on in about one-sixth (and pretty soon it will be one-fifth) of the globe. No amount of effort, time or energy devoted to that particular task is too great."

This recommendation was voiced, in a recent lecture before the Army Industrial College, by one of the country's leading experts on Soviet Russia—Dr. Charles Prince. Born in the Ukraine, Dr. Prince was brought to the United States at the age of 15. He received his education at St. Louis, Washington and Georgetown Universities, and at the University of Chicago. Since graduation from his college courses he has served in a number of important capacities requiring observation of activities of foreign governments. Among other connections, he served as chief analyst of the Foreign Broadcast Intelligence Service of the Federal Communications Commission and, until recently, was an economist on the staff of the Chamber of Commerce of the United States. Dr. Prince now plans to devote his time exclusively to studying Russian developments and writing about their significance.

Russian Policy No Mystery

"Although I worked in the government for two and a half years," said Dr. Prince, "I am at a loss to understand why some of our policy-making people at the very top are guided by the epigram pronounced by Winston Churchill —namely, that the Russian policy is an enigma inside a riddle, wrapped in mystery.

"Nothing could be further from the truth—for the Soviet spokesmen, the men actually in charge of making and executing Soviet policy—have announced in no uncertain terms, months and years in advance, what their philosophy is and the methodology by which they intend to execute and translate that philosophy into practice.

"What is it that the Soviets are after? Although twenty-eight years have passed since the establishment of the Soviet regime, they are still guided by the deeply imbedded psychological factors which drove them toward making the revolution in Russia and spreading it out as far as they can in order to obviate any external threat that might interfere with attainment of their objecives. Of all the countries in the world, there is no other where the political, economic, psychological and geographic factors are so closely interlocked, and so closely woven in the shaping of policies.

DR. CHARLES PRINCE

"According to published Soviet pronouncements, there are certain basic tenets from which they will not deviate, come what may. Much of the current distrust of the USSR results from our refusal to read what Soviet spokesmen are writing about world affairs."

Soviet policies, Dr. Prince's observations have indicated, are shaped by a few men. The outstanding single man responsible for industrial and military and economic mobilization within the Soviet Union, in his opinion, is Levrenti P. Beria. The latter, although ostensibly occupying an anonymous position, actually is director of the Soviet party's secret military police, known as the N. K. V. D., "which has permeated every fiber of the entire Soviet Union as well as of the ten countries in Europe which have recently fallen under Soviet auspices, and the five countries in the Far East."

In the foreign field, said Dr. Prince, the outstanding man is Andrei Y. Vyshinsky. "You probably read the testimony of our late President Roosevelt, as well as that of President Truman, that at those conferences where Stalin did not bring Vyshinsky with him forty-eight hours after the conference closed you had hedgings, whereas at those conferences where Vyshinsky was present the Soviets insisted that the agreements effected at those conferences be carried out both in spirit and in letter," said Dr. Prince.

It does not help matters, he went on, to refer to the USSR as a democracy. "If there is one thing that they definitely resent it is to present them in the light of a democracy," declared Dr. Prince. "Vyshinsky has reiterated time and again that the regime of the Soviets is an 'absolute totalitarian state.' The Soviet regime is totalitarian, always has been and, so far as the present leadership is concerned, will remain so."

Soviet intellectuals do not make any attempt to philosophize on the ideological differences between their form of totalitarianism and that of the Germans and the Japanese. "To the credit of Soviet spokesmen, it should be noted that they make the blunt statement that anyone who is against the Soviet system is a Fascist. Whereas the Japanese and Germans glorified war per se, Soviet spokesmen contend that they do not glorify war per se. They contend that they would prefer to continue the present state of affairs without resorting to war, and even in their forms of aggression they rationalize their resort to predatory courses of action.

No Apologies Offered

"They do not offer any apologies. They have resorted to predatory measures in establishing what they call their spheres of influence or security zones and have gone so far as citing chapter and verse in advance, and have charted their course country by country. There is no use to apologize for them in this country because they themselves do not want to be presented as not resorting to aggressive predatory measures."

One factor to bear in mind, said Dr. Prince, is that the present Soviet leaders are convinced, rightly or wrongly, that a small group in the United States is endeavoring to isolate the Soviets at the behest of the British.

"During the past two years we cannot read a single issue of one of their authoritative journals without finding that some

spokesman has repeated this charge. What is more important, when Molotov came here last April (1945) he told it to President Truman but apparently it did not register. So Molotov deemed it necessary to make that statement in his opening address at San Francisco . . . Incidentally, that speech, trimmed of its social amenities at the beginning and at the end, contains two or three paragraphs in the middle which form the heart of the whole question—they reflect the atmosphere of mistrust . . . .

"The present Soviet leaders are convinced it is folly to expect the Soviets to co-operate fully with either the United States or with Great Britain as long as there are obstructionist elements in the British foreign office who seek to prevent the spread of the concept of Sovietism in various parts of the world and particularly in the countries the Soviets have earmarked as their sphere of security."

Soviet spokesmen have made it clear that they are in dire need of the so-called $6 billion loan we have offered them but, said Dr. Prince, it is abundantly clear that they are not going to deviate from their basic objectives to obtain such a loan. And absence of a consistent American policy works to their advantage.

Americans Aid Armament Building

"On the other hand," said Dr. Prince, "there is Secretary Byrnes threatening not to recognize this or that puppet government and simultaneously there are American firms building munition factories for the Soviets. In December of 1945, American firms were building ordnance plants, munition factories and rubber and tire factories. A good many American technicians were recently sent by a few large corporations to the USSR and the salaries of these American engineers have been deposited in advance in two banks in this country, one in New York and one in Washington. Thus when Molotov is facing Secretary Byrnes and Byrnes tells him that we resent their predatory activities here and there Molotov can afford to smile because there is no relationship between our words and our deeds. This has reflected itself in the Soviet domestic and foreign policy all along the line."

There is no mystery as to what the USSR proposes to do in neighboring European countries, said Dr. Prince.

"They propose to change the entire economic function of the Danube river waterways and to industrialize all countries around the Danube river and to integrate them and interlock them into the Soviet economy, so much so that they will become not only beholden to the Soviet political and economic structure but they will be dependent on it. They are going to shift the rivers, the flow of freight, etc., and they are going to change and establish factories along the Danube banks where they will be directed from and geared to Soviet Russia.

"Of equal significance is the Soviet penetration into Korea, Manchuria, Sinkiang, Outer Mongolia and Northern China. The Soviet government last fall canceled contracts for approximately 300 locomotives with two American manufacturers because it took over intact two locomotive works in Manchuria which had been built by the Japanese."

Dr. Prince said that the Soviets now realize that they have been ill-advised on a number of occasions—as during the series of purges when they liquidated some of their leading intellectuals. Of late they have proven to be masters of psychological warfare and today are the leaders in morale building and morale sustaining techniques. In dealing with the Slavic peoples they emphasize the "Pan-Slav" theme. They make use of all people who are potentially useful. They are using thousands of German technicians. From wherever they are available the Soviets bring in scientists to accelerate their research programs, such as operating blast furnaces on pure oxygen instead of air.

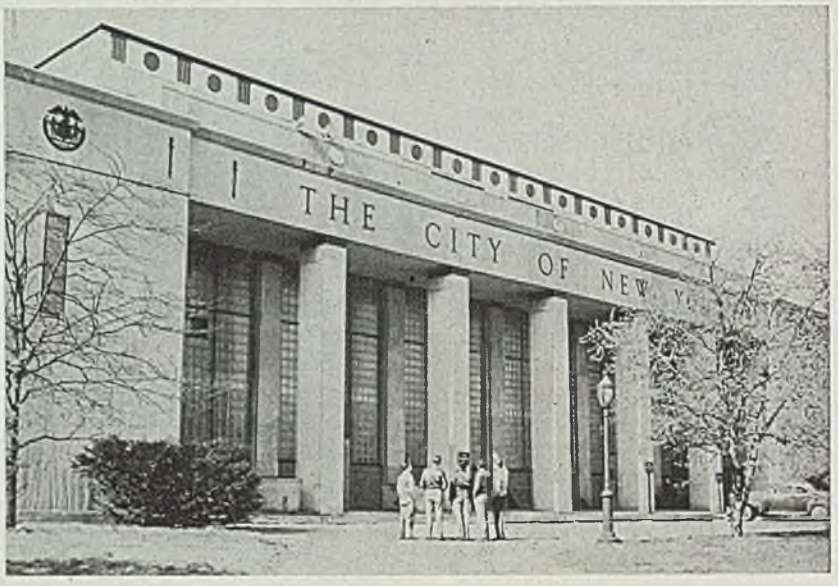
"The Soviets have a special technique for directing the economy in the Far East; they have the local people to do the job for them. They have what they call the Far Eastern Institute and there they have trained thousands of Chinese and Koreans since 1931. The Soviet government has built power plants, radio stations, telephone systems, various plants and factories, all managed by people trained at the institute.

"The Soviets have had their eyes consistently on natural resources in neighboring countries. They have acquired aluminum deposits in Hungary, uranium in Czechoslovakia, coal, zinc and oil in Poland, copper, zinc and aluminum in Yugoslavia, etc. It was no accident when Molotov pleaded for Tripolitania and Trieste since they give access to huge deposits of uranium and thorium."

In their actions in relation to Iran and Turkey, said Dr. Prince, the Soviets are carrying out plans which have been in formulation for 15 years. Incidentally, he said, Stalin personally has had the direction of Soviet activities in that area; he was born there and knows every foot of the ground. What has been going on in Iran, he said, will be going on in Turkey in the coming months.

One of the angles the Russians have in mind when they are eager to get oil concessions in Iran and elsewhere is the extent to which Great Britain and the United States have acquired oil rights abroad.

"Take the oil agreement of Aug. 8, 1944," pointed out Dr. Prince. "That means we control oil reserves that are located 200 miles from the Russian border. In addition, the United States, within its own borders, produces about 64 per cent of the total oil production,



UN AUDITORIUM: The New York City building in Flushing Meadow, site of the 1939-40 World's Fair, will be renovated at a cost of $1,250,000 to be used as an auditorium for the meeting of the United Nations General Assembly, scheduled to open Sept. 3. NEA Photo

whereas the Soviets produce only about 10 per cent of the world production of petroleum."

Of fundamental importance in the Soviet scheme are two manpower training organizations about which practically nothing is known in this country. One is the Osoaviakhim—which means the Society for the Furthering of Defense, Aviation and Chemical Upbuilding of the USSR. This organization laid the foundation for the universal military training of the entire population fit to bear arms. The other is the F. Z. O. —which means Industrial Training Schools.

In these schools millions of boys are trained—starting at the age of 15—and are indoctrinated in the "sacred" concepts of industrial mobilization. As a result of this indoctrination there is no opposition to carrying out the labor laws under which, when a plant is moved to a new location hundreds or thousands of miles away, the workers attached to that plant also are moved.

"If you will look over Pravda or Investia," said Dr. Prince, "you will find editorials and pictures glorifying the fact that these workers do not want to be transplanted 3000 miles away; they do not want to be transferred, and yet since it is a government necessity there is no choice on the part of the workers."

Mass Movements Are Not Unusual

Being used to this sort of thing in their own country, the Soviets do not see anything unusual in moving millions of people under the Potsdam agreement. There are possibly 8,000,000 lives, said Dr. Prince, involved in the transfer of population from eastern Germany into Poland and Bulgaria, Yugoslavia, etc. The program, said Dr. Prince, is ruthless, inhumane and predatory and President Roosevelt—when he agreed to it—made the reservation that the movement of population should be effected in as humane a manner as possible.

There is not a plant manager, a factory foreman, anywhere in the Soviet Union who has not been screened both politically and technically, said Dr. Prince. "The leaders of the training schools go through this process of apprenticeship on the political and technical fronts simultaneously. A man may turn out to be the best engineer, but if he has not met the political test of the party in power he is not placed in any responsible post. On the other hand, if he is not such a perfect engineer, but has met the political test, he is put in the top position and has an associate who is the actual technician.

"There are three to four million of these men who are in the key positions, and they constitute the elite—a new class, a new nobility. The rise of this new elite may offer a serious problem in that these people may come to disregard some of the basic principles of the Soviet Union. They have developed a conspicuous class consciousness; such men cannot carry their own bags, cannot shine their own shoes; they have a private automobile and they send their children to private schools.

"That is a problem facing the Soviets now. They do not want, necessarily, to have this rising heirarchy, this new elite to become entrenched in power."

The USSR is determined to build a strong Navy—second to none, said Dr. Prince.

"References in the Soviet press indicate that they have 12 naval colleges and that they are training thousands of naval officers and men. One of their arguments is that they have to build a navy to challenge the potential threat to their security emanating from the British navy, which will be second in force only to that of the United States. Their argument is that they have to build up a navy second to none—that is their phrase—at least, to be second only to that of the United States—in order to retain their spheres of security which they have earmarked in Europe, in the Far East and in the Near East. They are leaving no stone unturned in the building of a powerful naval fleet.

"And we are having a very strong hand in it, because American citizens are over there now helping to expedite the building of a powerful Red navy on all oceans."

Soviets Wary of Outside World

Of the Soviet budget for 1945-1946, announced some weeks after V-E Day, said Dr. Prince, 45.1 per cent was appropriated specifically for military purposes. This situation, he felt, did not indicate any intention on the part of the USSR to extend world revolution by force of arms. Neither did it reflect a fear by the Soviets of attack by the United States. Rather, he felt, it arose out of the Soviet suspicions of the outside world. To some extent these suspicions grew out of such causes as the British announcement that the British would arm some 300,000 Poles who refused to co-operate with the Soviets, also out of the United States announcement of a proposal to utilize 4 to 5 million German soldiers—prisoners of war in France—who were seen by the Soviets as a potentially effective army against Soviet interests. Too, the Soviets got the impression that we were organizing a new army, to include especially the still intact French army. They formed the impression that we were organizing or giving support to the organization of 9 to 10 million troops that might rise against the Soviets.

The USSR now has 8 million men under arms and, said Dr. Prince, that is a serious problem. With no war to fight, it is necessary to give them something to do to keep them from getting restless. Further complicating the situation is the fact that the standard of living of the Russian soldier is higher than that of any civilian in the Soviet Union. While a global war may not occur within our generation, a series of "little wars" already is in progress.

Dr. Prince declared that the Russians give us absolutely no credit for the fact that seven-tenths of the relief administered by the UNRRA is coming out of American pockets.

"The Soviets have announced from the start—Professor Voskresensky has written two solid articles on it—that we are not interested in relief any more than the man in the moon. That is their belief. You and I think we have done a great deal of good. But they do not think so. They say that we are interested in the UNRRA because we want to preserve some areas to favor our industrial interests."

We are wrong in trying to evaluate the Soviet phenomenon by the measuring rod of our standard of morals, ethics, politics and economy after having had 155 years of cumulative experience and having arrived at a degree of maturity in our national status, declared Dr. Prince. The Soviets, he pointed out, have not had "one single solitary year of peaceful existence. They have been on a military footing since the first of October, 1928."

A defect in our educational system, Dr. Prince said, is that whereas the Soviets have been in existence 28 years, not a single university or college in the United States has undertaken to give a comprehensive course "evaluating or studying or appraising the political and economic structure of the Soviet Union.

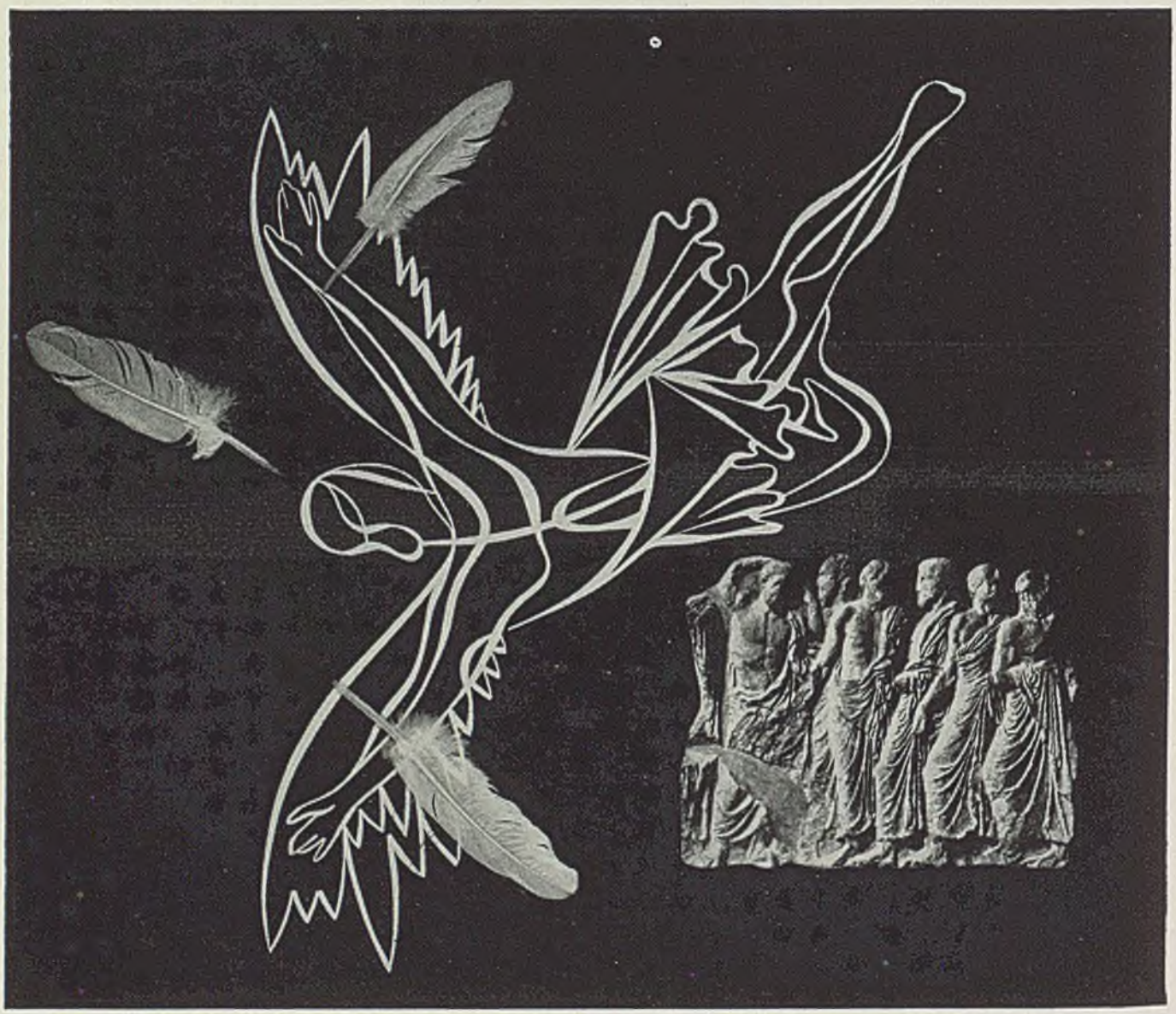
"It is time we undertook to make a serious and unbiased appraisal of this phenomenon with which we are faced. We can ill afford to be carried away by the four or five very high government officials of the United States who have been in the habit of singing panegyrics to the Soviet leaders, or being carried away by the deeply imbued anti-Soviet attitude. One is as deleterious as the other. There are enough facts at our disposal to form an intelligent, fair and comprehensive evaluation of the military and industrial potential of the Soviet Union."

BETTER SURE THAN SORRY

According to olden legend Icarus flew too near the sun, only to spin in when his wings failed to stand the stress at high temperature. Here was an early case of serious trouble due to misplaced confidence in materials.

There are many applications for steel nowadays where creep strength (the ability of steel to keep working when the heat is on) makes a tremendous difference. Molybdenum steels, being noted for their creep strength, are economical preventives of high temperature trouble.

Icarus had no accurate data on materials to guide him. A wealth of tested, practical facts about Molybdenum steels for elevated temperature service is available on request for today's engineers and designers.



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CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOLYBDENUM APPLICATIONS.

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MOLY

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By A. H. ALLEN *Detroit Editor, STEEL*

Light-weight economy cars developed by Chevrolet and Ford good bets to be on market within next year or two. Ford model may use 5-cylinder engine company has had under test. Chevrolet asks permission to build two plants near Cleveland

DETROIT

ALTHOUGH no tooling programs for them are active as yet, the light-weight economy utility passenger cars developed by Chevrolet and Ford look like good bets to be on the market within the next year or so, following official announcement from Ford to the effect a "low-price car division" has been organized in line with plans originally discussed in 1944. A. B. Pease, present assistant director of sales, will be general manager of the new division, with C. H. Carroll. director of purchasing, becoming assistant general manager. Their successors will be named shortly.

Curiously, Ford says additional manufacturing facilities for the new car will be sought immediately, suggesting the possibility that operations might be removed from the present Rouge and Highland Park plants. In view of the fact Mercury production has been transferred to the Lincoln Division, and truck and bus production is now in process of being removed to the Highland Park plant, it does not seem likely a move out of the 1200-acre Rouge plant would be necessary to accommodate the new model. There is still ample room at the Rouge for further building, and the company has acquired the large structure there built during the war for manufacture of the Pratt & Whitney aircraft engine. Engine test cells were not included, and likely will be torn down.

No Details Revealed Yet

No disclosure has been made on details of the Ford low-price car, but the guessing around Detroit is that it will be powered by the in-line 5-cylinder engine company engineers have had under test for several years, with a body design of the light-weight high-strength monocoque type. It is interesting to note in preliminary references to the new models Ford uses the term "low-price" while Chevrolet identifies its project as a "light car."

Chevrolet has applied to the CPA for permission to proceed with construction of its new Cleveland plants. One will be a manufacturing plant of approximately 1,000,000 square feet floor space, including power house and administration building, to be erected in Brook Park, O., between Hummel and Engle roads, for production of motors, axles, transmissions and other components. The second unit will be in the village of Parma, covering about 1,500,000 square feet at the corner of Brookpark and Stumpf roads. It will include pressed metal, body and final car assembly, as well as power house, administrative offices, service parts and engineering buildings. Employment will run to about 5000 in each plant, or, translated into terms of finished cars, perhaps 500-1000 units daily.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

Tabulated by Ward's Automotive Reports

	1946	1941
January	121,861	524,073
February	83,841	509,332
March	141,555†	533,878
Week ended:		
April 6	47,735†	116,253
April 13	49,425†	99,260
April 20	56,000*	99,945

†Revised. *Preliminary estimate.

Not to be outdone by these ambitious announcements, Henry Kaiser and J. W. Frazer have declared they will begin production in September of a "radically new low-priced car" at the Long Beach, Calif., plant recently acquired from the DPC. Presumably, this refers to the Kaiser model which was displayed recently at the K-F Willow Run plant where it is slated for assembly around July 15. Hints have been dropped that the price may be under $1000.

A new 1947 line of Studebaker Champion and Commander models will be unveiled for the press at the Palmer House in Chicago this week, public announcement scheduled to be made shortly. The South Bend, Ind., plants have been out of production for the past several weeks incident to setting up for new model production and the separation of truck and passenger car operations. Truck output has continued, and passenger cars should be rolling by May 1. About 20,000 of the 1946 Champion models were completed prior to the shutdown.

Price increases authorized by the OPA in General Motors models apply only to those cars built up to the time of the strike last fall, and take no cognizance of increased wage and materials costs experienced since that time. The prices now released have been adjusted upward from 1942 levels to cover engineering improvements, ranging as follows: Pontiac, $66 to $95, average $81; Oldsmobile $86 to $124, average $107; Buick $60 to $138, average $77; and Cadillac, $148 to $417, average $286.

Costs Continue To Be A Problem

Further advances seem inevitable, despite the efforts of the OPA to force dealers to absorb them by reducing their discounts another 2 per cent. Dealers already have absorbed the equivalent of 2½ per cent in their normal discount, and manufacturers currently are facing a 7-10 per cent increase from last fall in labor and materials costs. In the light of such conditions, the enthusiasm over the prospects of a new low-price economy model can be appreciated. Obviously, in the face of the disparity between 1941 and 1946 manufacturing and materials costs, about the only way to build a $1000 car these days is to re-engineer it completely from bumper to bumper, and that is exactly what Ford and Chevrolet, possibly to be joined by some others, are proposing to do.

Replacement parts manufacturers and dealer groups both went to bat with the OPA in Washington last week, the former bitterly protesting the retention of ceiling prices on replacement parts which has forced virtual suspension of manufacture of many vitally needed repair parts for older models because they cannot be produced profitably, while the dealers charge the price control agency with trying to saddle them with the en-

(Material in this department is protected by copyright and its use in any form without permission is prohibited)

BACK TO PEACE: Engines on the assembly line of the Cadillac Division of General Motors in Detroit. During the war these engines, adapted to war needs, powered Cadillac-built light tanks

tire cost of the $80 million wage boost given the CIO with government blessing.

Three specific areas in which the impact of government on industry threatens the public interest with undue hardship were put under the microscope in a recent hard-hitting speech before 600 partsmakers by B. E. Hutchinson, vice president and chairman of the finance committee of Chrysler Corp. They are: 1. OPA price controls, 2. industrial labor relations, and 3. federal fiscal policy as related to deficit financing and the tax structure.

On removal of OPA price controls: "During the war more than half of our industrial production was lost, so far as serving civilian needs was concerned. There is a great dearth of desperately needed civilian goods of all kinds. How are we getting along in our efforts to fill this need? And what are the obstacles? One of the principal ones is sheer inability to find out at what price the products of industry can legally be sold under OPA regulations. . . . .the only cure for this situation is the outright abandonment of any and all attempts to control prices by governmental edict, and the reestablishment of our industrial economy on the basis of a free market for goods and services of every description. This should be done at once.

"Wouldn't that bring on inflation? Wouldn't prices go up? Almost certainly prices on almost everything would go up, and nobody can tell you how much. So would production go up, and how. Prices would not go up any higher than free men with money in their pockets are ready to pay as willing buyers, and that would undoubtedly be something less than prices currently prevailing in the black markets today . . . and then what? Under competitive forces prices will come down. Perhaps there will be a collapse, a depression. Perhaps there will. There have been before. The country always worked out of depressions and went on to new heights of prosperity until 1929. That was the first depression the government tried to manage, and we did not get out of that one until World War II came along and took us out."

On labor relations: "Chrysler Corp. was bargaining collectively with an organization of its employees before the Wagner Act was passed. We have no more idea that relations with some 80,000 employees can be carried on without some organized procedures than we have that America will revert to the horse and buggy for personal transportation. We do feel, however, that these relationships with our employees, to be mutually satisfactory, will have to become more responsible and will have to be carried out in better faith. They will have to be directed more to the promotion of increasingly efficient production than has been the case in the last decade, before they can be regarded as satisfactory to labor, industry or the public."

On fiscal policies: "As a nation we are already in debt for an amount approximating the total value of our tangible national assets. We are, in fact, broke. And yet we continue to conduct our national fiscal affairs with as carefree abandon as ever characterized any profligate spendthrift. . .there are more civilian employees on the federal payroll than there were on V-J Day. We are solemnly discussing lending between 3 and 4 billion dollars to the British, the proceeds of which will be used to buy goods in our already threadbare markets, while the bonds which will be issued to raise the money we lend them will put us further into debt, and further augment in our banking system the already threatening currency and credit inflation.

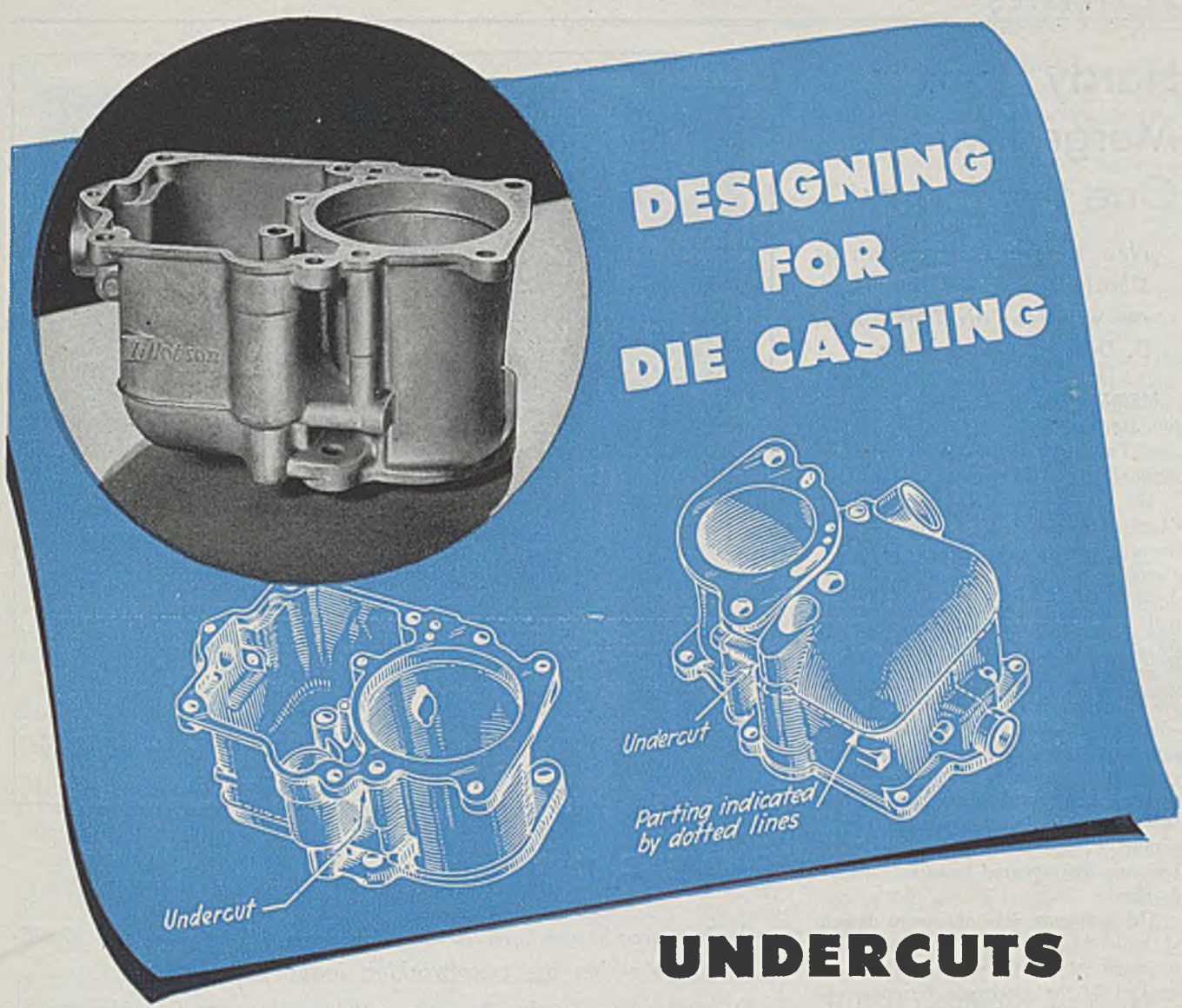
"In our national financing we do not even keep a score. In Congress one committee deals with taxation, while another is responsible for raising revenue, without even the slightest attempt to effect any co-ordination between the two. Bills are introduced into Congress and passed, without even a pretense at appraising their probable cost, or inquiry as to whether or not there is a prospective tax revenue to meet the financial obligation undertaken.

"Everyone knows this, and no one seriously disputes it. The thing that is amazing is that in the face of these obvious facts, knowing that conditions prevail in the conduct of our federal fiscal affairs that would not be tolerated for a moment in a business, and would bring on inevitable disaster if they were, we calmly ignore them at the very point where they are of the utmost importance to all of us, and assume that somehow, sometime everything is going to be lovely."

Darrin To Build Custom Car

Howard A. Darrin, industrial stylist and designer of bodies for Kaiser-Frazer, has developed a model of his own, featuring radical styling and revolutionary design for which he is taking orders for delivery in the fall. Priced at $1950, the car will be built in a plant in Redondo, Calif., near Los Angeles, where Darrin maintains sales offices. The designer hopes to build 500 of the custom jobs this year and is looking toward 50,000 next year, with possible transfer of production operations to a Hayes Body plant in Grand Rapids, Mich. The car has 105-inch wheelbase, 90-horsepower 6-cylinder Continental engine, hydraulic jacks on all four wheels, plastic body, novel suspension system, etc. It must be considered still in the blueprint stage.

Buick has signed five-year lease on the Fisher Body tank arsenal at Grand Blanc, Mich., which will be converted to a service and parts building, releasing the present service building at Flint for housing engineering personnel and permitting greatly expanded service and parts operations.



UNDERCUTS

In designing die castings, undercuts (recesses in casting walls) are usually avoided since they necessitate slides or "knockout" cores in the die and thereby increase production costs. There are occasions, however, when undercuts can be completely justified, as in the die casting here discussed:

The designers of the illustrated zinc alloy die cast carburetor body were anxious to minimize the amount of metal required per casting since the production run on this part is very large. Considerable metal was eliminated through the use of the undercuts indicated on the drawing, and this saving easily offset the extra die cost involved in providing slides. Furthermore, the undercuts made section thickness of the casting more uniform, which is highly desirable because uniformity of section tends to avoid unequal shrinkage.

There are also cases where interior undercuts, of the type requiring loose cores ("knockouts"), are justified even though the time of the casting cycle is increased and the die cost is higher. *There is no logic, however, in employing undercuts of any kind when they provide no compensating advantages.*

Additional data on undercuts will be found in our booklet "Designing For Die Casting." To insure that you will get the most from your die casting dollar, ask us—or your die casting source—for a copy of this booklet.

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The Research was done, the Alloys were developed, and most Die Castings are based on
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Hardy Firms Merged Into One Company

New organization, known as Charles Hardy Inc., to operate with four divisions. John D. Dale is president

MERGER of Charles Hardy Inc. and the Hardy Metallurgical Co., both of New York, into a single organization has been effected.

The new organization is known as Charles Hardy Inc., a Delaware corporation, and has four divisions: Metal, chemical, technical, and specialties. Each division, while operating in its own field, will lend practical assistance to other divisions in supplying materials and efficient service to the corporation's domestic and foreign accounts.

Officers of the new corporation are: President, John D. Dale; vice president in charge of sales, F. H. Mulligan; vice president in charge of research and development, J. J. Cordiano; secretary, Samuel V. D. Kilbourn; treasurer, E. E. Lejeune; and assistant treasurer, Charles J. Hardy.

The company has appointed Harold C. Miller to take charge of research and development in powder metallurgy as applied to the electronic ferromagnetic powders. Mr. Miller, who served in the Army four years, was released from service in December, 1945, with the rank of major. In addition to his academic training in electrical engineering, Mr. Miller had wide experience in the electronic field while with the Ordnance Research Center, Aberdeen Proving Ground, Aberdeen, Md.; the Westetrn Cartridge Co.; and the Seismograph Service Corp.

Roebling Builds New Office And Warehouse in Chicago

A new office building and warehouse is being constructed in Chicago for John A. Roebling's Sons Co. of Illinois. The new building, designed with provision for future expansion, is located at 5525 West Roosevelt Road.

The structure is planned and located to facilitate material handling and to expedite customer service. The site, the company said, will provide exceptional transportation advantages because of the proximity of railroads entering and leaving the Chicago area.

STAFFS POOLED: Engineering and research staffs of the Nordstrom Valve Co. and Edward Valves Inc., both affiliated with Rockwell Mfg. Co., have been pooled to give impetus to their product development program. Co-ordinated staff, left to right, rear row: E. E. Matheson, sales manager, Nordstrom; A. J. Kerr, vice president of sales, Rockwell Manufacturing; E. E. Hedene, chief engineer, Nordstrom Oakland Plant; W. F. Rockwell Jr., vice president and general manager, Rockwell Manufacturing; C. B. Johnson, chief engineer, Nordstrom Pittsburgh Plant; W. A. Marsteller, vice president, Edward Valves; David MacGregor, chief engineer of Edward Valves; W. F. Crawford, president, Edward Valves. Front Row: G. F. Scherer, director of research, Nordstrom; L. H. Carr, director of research, Edward Valves

BRIEFS . . .

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

Kennametal Inc., Latrobe, Pa., cutting tools and parts manufacturer, has established a district office in American Bank Bldg., 600 Grant St., Pittsburgh, to distribute and service its products in western Pennsylvania and West Virginia.

—o—

Emerson Electric Mfg. Co., St. Louis, has announced its postwar expansion program which involves moving all its facilities to a $5 million plant at 8100 Florissant Ave., that city, following lease arrangements with Reconstruction Finance Corp.

—o—

Northern Equipment Co., Erie, Pa., has appointed Kissick Co., Philadelphia, as sales and service representative for southern New Jersey, southeastern Pennsylvania, eastern Maryland and Delaware.

—o—

Dostal Per-Mold Foundry Co., Detroit, has been organized by Joseph L. Dostal, formerly vice president and general manager, Foundry Division, Eaton Mfg. Co., Cleveland, Julian G. McIntosh, attorney, and J. A. McIntosh, president, McIntosh Stamping Co. The company has purchased the Die Typing Corp. plant at Pontiac, Mich., and will produce gray iron castings for the automotive, refrigerator and home appliance industries.

—o—

Jessop Steel Co., Washington, Pa., has organized Jessop Export Sales Corp. with offices in the Evening Post Bldg., 75 West St., New York 6. The company also has formed a special Alloy Division to advise users of alloy steels in their reconversion programs.

—o—

A. M. Castle & Co., iron and steel distributor, has opened its new warehouse at 3660 Marginal Way, Seattle. The building contains approximately 70,000 square feet.

—o—

Chicago Metal Hose Corp., Maywood, Ill., has acquired the entire capital stock and assets of Apex Machine Co., Elgin, Ill., and will operate it as a division in conjunction with its Elgin plant.

—o—

Rheem Mfg. Co., San Francisco, has

announced that construction will begin this month on a factory for its new company, Rheem de Mexico, S. A., at Tlalnepantla, near Mexico City. The company will make inexpensive water heaters and space heaters.

—o—

Metal Carbides Corp., Youngstown, has opened a branch office and warehouse at 166 Bloomfield Ave., Newark 4, N. J.

—o—

American Brake Shoe Co., New York, has contracted to purchase Progressive Foundry Works Inc., Rochester, N. Y., subject to approval of the latter company's stockholders. It will be operated as a division.

—o—

Philco Corp., Philadelphia, has announced plans to produce and sell a complete line of mobile radio-telephone equipment to provide dial telephone service in automobiles, trucks, busses and taxicabs as well as police and fire equipment.

Sullivan Industries Add Two Units to Illinois Plant

Construction of two factory units costing $100,000, which will provide 50,000 additional square feet of floor space, was started last week at the Wood Products Division, Sullivan Industries Inc., Sullivan, Ill., it was announced by Paul I. Temple, president.

One of these new units will be equipped with new machinery to manufacture domestic and export shipping crates for Frigidaire Division, General Motors Corp., Detroit., under a long-term contract which is said to involve orders in excess of $3 million. The other unit will be occupied by the company's Tool Division.

Full production at the new units is expected to be reached by May 15, although some production may be under way by the end of this month in the prefabricated factory units which are being erected.

Republic Steel Plant Gets Award for Safety Record

Extraordinary achievement in industrial safety has resulted in presentation of the National Safety Council's Distinguished Service to Safety award to the South Division of Republic Steel Corp. in Canton, O. The award was based upon the attainment of more than 5,250,000 man hours worked without having experienced a lost time accident.

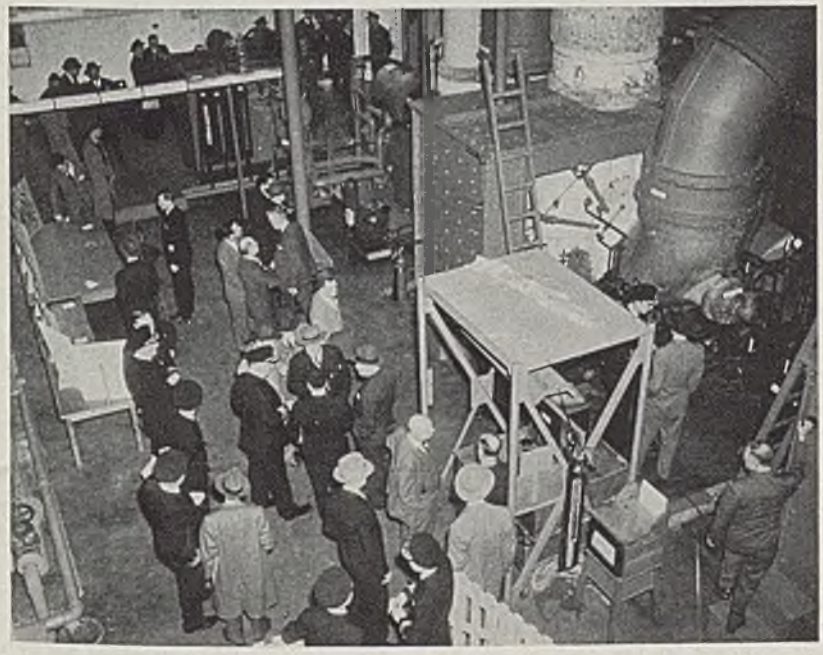
Export Company Organized To Deal in Steel Products

Edstrand Bros. Inc., 14 Wall St., New York, has been organized to engage in general export business, principally steel and allied products. Homer W. Orvis of Orvis Bros. & Co., New York, is president; Winston E. Worme, formerly assistant manager, New York office, Phoenix Iron Co., executive vice president; Rudolph G. Nettel, Orvis Bros. & Co., vice president and treasurer; and Donald Marks, Baer & Marks, New York, secretary. All are members of the board of directors which also includes L. F. Muccio, Rye, N. Y., and K. R. Edstrand, Trelleborg, Sweden.

The company has already signed contracts to make all purchases in this country for Broderna Edstrand Aktiebolaget (steel warehouses), Malmo, Sweden, and its associated companies, and for Elektriska Stevsningsaktiebolaget (welding equipment manufacturers), Gothenborg, Sweden.

Carnegie-Illinois To Help Workers Raise Gardens

Carnegie-Illinois Steel Corp., Pittsburgh, recently announced a planned program of employee gardening to help ease the impending food pinch. Basing the program on experience gained during the war, when thousands of employees planted and raised crops in victory gardens, the United States Steel Corp. subsidiary is prepared to assist planting enthusiasts on such points as securing and maintaining adequate plots, soil testing, garden tips, etc. Gardening pamphlets will be distributed and canning instructions will be made available.



UNVEIL GAS TURBINE: Technical and science editors of national magazines are shown inspecting a previously secret gas turbine built for the Navy by the Allis-Chalmers Mfg. Co., Milwaukee, at a press preview at the Naval Engineering Experiment Station at Annapolis, Md.

Dallas Company To Make Stainless Steel Utensils

Verson Mfg. Co., Dallas, Tex., newly formed corporation affiliated with Verson Allsteel Press Co., Chicago, has announced plans to manufacture a line of stainless steel kitchen utensils in a $900,000 plant which is now being built. The company, which will get into production about Sept. 1 when the plant is completed, expects to expand its line to include kitchen sinks, bathtubs, washing machine tubs, and tanks as soon as materials are available.

Officers of the company include: David C. Verson, chairman of the board; John Verson, president; Leon J. Krysinski, executive vice president. Ralph E. Verson is works manager.

Loewy Engineering Holds Anniversary Celebration

Loewy Engineering Co. Ltd., London, Eng., famous throughout the world as a builder of heavy hydraulic machinery and rolling mills, celebrated the tenth anniversary of its founding on Apr. 1.

Westerners See China as Steel Outlet

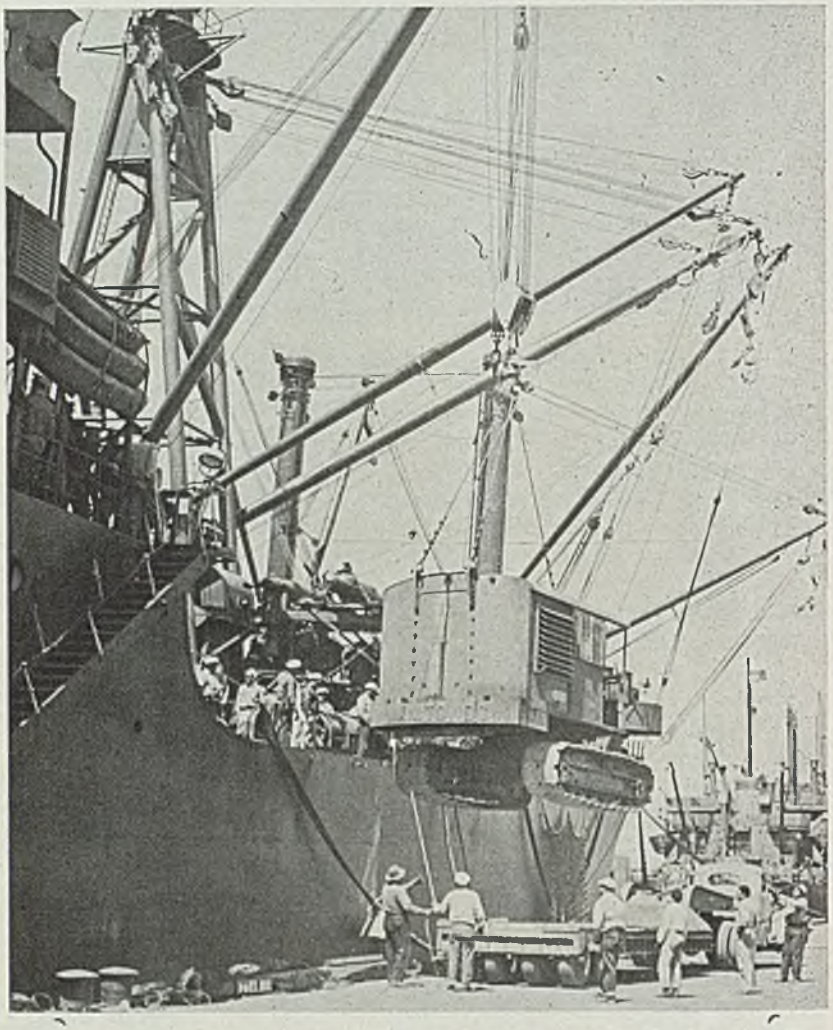
Industrialization program of Orient expected to result in heavy demand for steel and products manufactured in California

SAN FRANCISCO

STEADILY expanding market for iron and steel and products manufactured from steel is foreseen by California producers in China's plans to industrialize. Although that vast country's modernization is expected to take many years, a substantial start toward the goal is indicated as likely in 1946.

Prospects are that the Chinese will turn to the United States for most of the materials, according to William L. Montgomery, president of the San Francisco Foreign Trade Council and managing director of the San Francisco board of the China-America Council of Commerce and Industry. Because California produces many of the products which China needs, and because it is the main shipping point for commerce to the Orient, it is believed that California will share to a large extent in the trade.

Mr. Montgomery points out that China herself is preparing to establish a steel industry, although ultimate capacity is unlikely to fill all the country's needs. In wartime China's iron and steel capacity was only 117,000 tons annually, or about the equivalent of one hour's production in American plants, Mr. Montgomery says. However, the Chinese hope in 1946 to establish a "seed" plant with an annual capacity of 550,000 tons, which in turn would be the beginning of a steel industry with a yearly capacity of about 3 million tons.



WAR SURPLUS RETURNED: A 48-ton crane is lowered onto dock at Port Hueneme, Calif., from the attack transport SOUTHAMPTON which brought back 2000 tons of trucks, tractors and heavy building equipment from the Pacific war zones. NEA photo

Large Quantity of Steel Needed

Meanwhile, according to Mr. Montgomery, China will be in the market for a large quantity of American steel to meet its initial reconstruction program. It is estimated that it will require $3 million of carbon steels, $1 million of pig iron and more than $4½ million of alloy steels. All of these amounts are in American dollars and funds for the purchase of this material will be available during 1946.

In addition, however, China will be in the market for a vastly larger amount of capital goods. Mr. Montgomery reports that during the first three-years of the reconstruction period, China will purchase approximately $2 billion of goods, with about $700 million scheduled for purchase in the first year of the program. A large proportion of these orders will be for iron and steel products, such as transportation equipment, mining machinery, and the materials for erecting power plants, and factories to produce chemicals, electrical goods, consumers goods and the like.

Mr. Montgomery points out that a wide range of American manufacturing companies will share in this trade, many of which are located in California. For example, there will be a great need for diesel engines—96 per cent of all diesels manufactured west of the Mississippi are located in the San Francisco area. China also will need food processing equipment, plant machinery, steam turbines, dredges and small boats.

At the present time, Mr. Montgomery reported, China is in the market for hydraulic suction dredges and auxiliary equipment. This order is expected to amount to about $5 million.

GENEVA BIDS

With approach of May 1, date set by the War Assets Administration for closing bids on the Geneva steel plant in Utah, it is reported that conferences are underway on the West Coast between Henry J. Kaiser and other western interests to determine whether Kaiser will submit a formal bid for the plant.

Although War Assets Administration officials have not stated officially that bids have been submitted for the plant, it is understood here that offers have

been tendered to the government. In addition to Kaiser, Colorado Fuel & Iron Corp. and U. S. Steel Corp. have been mentioned in the past as possible bidders.

KAISER ALUMINUM

The aluminum plants in Spokane, Wash., leased by Henry Kaiser from the government, probably will begin operation in June, according to D. A. Rhoades, general manager of Permanente Metals Corp., a Kaiser corporation.

It is reported from Spokane that four of the six potlines at the Mead works will operate. Each is capable of producing 3 million pounds of aluminum pig annually.

John R. Meek has established headquarters at the Trentwood rolling mill where he will be works manager. Norman L. Krey, of Massena, N. Y., will be works manager of the Mead plant.

OPA DECONTROL EFFECTS

The OPA's order removing price controls from certain types of heavy equipment will have a varied effect on manufacturers in the San Francisco area.

For example, the decontrol order will result in price increases of 10 per cent to 15 per cent on the three larger types of diesel engines manufactured by Atlas Imperial Diesel Engine Co. On the other hand, it will not have an immediate effect on Pelton Water Wheel Co., a Baldwin Locomotive Works subsidiary. Pelton officials pointed out that the company has a year's backlog of orders for hydraulic turbines, most of which have been contracted for at fixed prices. On future business, however, the decontrol order will have the effect of "stiffening prices," the company said.

Joshua Hendy Iron Works said that its prices on diesel engines, steam turbines and electrical machinery will be raised in accordance with competitive conditions.

New Trade Booklet Issued By Department of Commerce

A guide for importers and exporters, "Channels for Trading Abroad," has just been issued by the Office of International Trade, Department of Commerce, setting forth different methods of distributing exports and imports.

The booklet describes the direct method of handling the problems through separate departments or organizations within a company and the indirect methods of using agents and other types of representatives, and it gives a concise summary of special services in the field of distribution offered in the Department of Commerce.

236 Additional Dealers Licensed To Sell Surplus Machine Tools

WAR Assets Administration has licensed 236 more "approved dealers" to negotiate sales of government-owned surplus machine tools and production equipment under the agency-dealer plan for such property. This brings "approved dealers" signed under the program to a total of 1574 as of March 31.

In addition, another 119 dealer appointments have been reported by WAA regional offices, but these approvals have not yet been completed. The field offices had on hand as of March 31, a total of 312 applications in process of screening.

The following have been licensed and are in addition to those listed in previous issues of STEEL (April 1, p. 128; March 18, p. 87; March 11, p. 81; Feb, 25, p. 67; and Feb. 4, p. 101):

Alabama

Trussville: Stuedeman of Trussville.

Birmingham: DoAll Gulf Co. Inc., 531 N. Eighteenth St.; J. L. Praytor, 1505 N. 34th St.; Frank M. Taylor, 415 N. 28th St.; Culpepper Exum & Co.

California

Oakland: Guy D. Reynolds, 464 Vernon St.; Inglewood: Burgan Machinery Co., 9527 Fifth Ave.; Santa Ana: Hockaday & Phillips Inc., 201 Spurgeon St.; Pasadena: Mer-Uhl Co., 97 E. Colorado St.

Los Angeles: Richard H. Priest, 2323 E Eighth St.; Heller Pipe & Machinery Co., 5707 S. Alameda St.; Tornquist Machinery Co., 923 Santa Fe Ave.; Dayton & Bakewell Inc., 1939 Santa Fe Ave.; DoAll Western Co., 1316 S. Santa Fe Ave.; Marshall Tool & Supply Co., 1224 Santa Fe Ave.

San Francisco: Eby Machinery Co. Ltd., 35 Main St.; Western Sales & Engineering, 545 Turk St.; D. & J. Montague & Co., 776 Folsum St.; Surplus Property Purchasing Div., 420 Market St.

Connecticut

Hartford: DoAll Hartford Co., 45 Farmington Ave.; West Hartford: Robert E. Morris Co., 967 Farmington Ave.; New Britain: Goss & Deleeuw; S. Norwalk: Richard S. Davis, 7 Railroad Ave.

Georgia

Dalton: R. G. Miller Co., 222 N. Hamilton St.

Atlanta: J. R. Walraven, 866 Ponce de Leon Ave. N. E.; Jones Machinery Co., 409 Bishop St. N. W.

Illinois

Rockford: J. & R. Supply Co., 804 S. Fifth St.; DoAll Rockford Co., 123 Seventh St.; Storey Tool Sales, 801 Gas-Electric Bldg.

Chicago: Rampart Sales Co., 7939 S. Elizabeth St.; F. S. Knowles, 77 W. Washington St.; MacDell Corp., Room 1208, 53 W. Jackson Blvd.; R. & K. Engineering Co., 715 W. Lake St.; A. L. Richtmytre Industrial Engineers, 664 N. Michigan Ave.; Jet Combustion Inc., 2645 E. 75th St.; DoAll Midwest Co., 1348 W. Washington Blvd.; Walther Sales & Supply Co., 2632 N. Kedzie Ave.; Lavern P. Leinen, 6027 S. Kilpatrick.

Indiana

Hammond: Ilgenfritz & Wagner, 7002 Harrison St.; Jet Combustion Inc., 5305 Hohman Ave.; Conway-Calligan Corp., 464 Fayette St.; Anderson: Anderson Machinery & Supply Division, National Tile & Mfg. Co., 1200 E. 26th St.; Huntington: Model Engineering & Mfg. Co., 237 E. Park Drive; Ft. Wayne: Stockberger-Seastrom Co.

Indianapolis: DoAll Central Co. Inc., 1551 N. Meridian St.; Mid-West Machinery Mart, 2122 E. Washington St.; Stockberger-Seastrom Co., 1409 Madison Ave.; United Engineering, 1934 Madison Ave.

Iowa

Waterloo: Cohn Bros. Inc., 911 Commercial St.; Sioux City: Sioux Machinery & Supply Co., 315 W. Seventh St.

Kansas

Wichita: Fluid Air Engineering Co., 103 S. Waco; Aviation Material & Equipment Co., 130 North Oak; Kansas City: West Side Machine Works Inc., Third & Minnesota Aves.

Maryland

Baltimore: Ace Machinery & Equipment Co., 115 W. Pratt St.; Silver Spring: Lofstrand Co., 959 Selim Rd.

Massachusetts

Brighton: Rivett Lathe & Grinder Inc., 18 Riverview Rd.; Medford: Builders Equipment & Supplies Co., 40 Canal St.; Worcester: Heald Machine Co., 10 New Bond St.

Michigan

Ann Arbor: Russel J. Vial, 831 Brookwood Ave.; F. R. Jorn, 2016 Packard Rd.; F. E. Whitchurch, 1120 Martin Pl.; Birmingham: Bert Carpenter Co., 208 Hanna Bldg.; Flint: Morris H. Schwartz, 1185 E. Stewart Ave.; Hillsdale: A. D. Stock Jr.; Melvindale: Melvindale Machine Products, 2604 Oakwood Blvd.; Muskegon: Muskegon Hardware & Supply Co., 605 W. Western Ave.; Saginaw: Stanley B. Moiles, 401 Court St.

Detroit: Welker Machinery Co. Inc., 413 New Center Bldg.; Friel-Detroit Co., 6503 Grand River Ave.; James W. George Machinery Co., 3146 E. Jefferson Ave.; R. & W. Surplus Sales Co., 3814 35th St.; Walter E. Parker, 3775 Virginia Park; Jay H. Fisher, 1437 Burlingame; Thomas A. Gallagher, 14424 Scripps Ave.; Winterhoff Machinery Co., 8442 Woodward Ave.; Williams Machinery Sales, 2351 W. Fort St.; Stanford P. Bruce, 4016 Kendall; Plant Clearance Co., 1860 National Bank Bldg.; S. J. Garland Co., 1414 Dime Bank Bldg.; Joseph E. Meyer, 12704 Woodrow Wilson; Freeborn Tool & Machinery Sales, 8608 W. Vernor Highway; Heick & Ralph Associates, 600 Michigan Theatre Bldg.; Wolverine Foundry Supply Co., 3211 Bellevue Ave.; June & Co., 719 New Center Bldg.; Thomas C. Leake, 475 E. Grand Blvd.; Bernard J. Mulloy, 7953 Mack Ave.; Don Miller, 13521 Dixie; Government Surplus Service, 226 E. Hancock Ave.; Advance Machine Sales, 6432 Cass Ave.; Maurice J. O' Halloran Jr., 301 Fox Theatre Bldg.; Rae Tool & Manufacturing Co., 11384 Evergreen Rd.

Minnesota

Minneapolis: Consolidated Machine Co., 119 Washington Ave. N.; Universal Machinery Inc., 501 37th St. N.E.; Industrial Products Co., 1120 Metropolitan Life Bldg.; Automotive Supply Co., 122 Washington Ave. N.; National Machine Tool & Supply Co., 13 N. First St.

Missouri

Ferguson: Harold E. MacDonald, 111 S. Elizabeth Ave.

St. Louis: Shea-Brownell Co., 3903 Olive St.; W. C. Hill, 715 Paul Brown Bldg.; St. Louis Sales Co., 1616 Pine St.; John C. Stiles, 4406 McPherson Ave.; Hill Equipment Engineering Co., 4135 Gratiot St.

Kansas City: Machinery & Supplies Co. Inc., 2000 Walnut; American Supply Co., 329 W. Fifth St.; General Machinery & Equipment Co. Inc., 801 Woodland Ave.; General Heating & Cooling Co., 1407 Grand Ave.; Hugh W. Roll, 3526 Bellefontaine; Union Steel & Wrecking Co., 1726 Locust St.; DoAll Kansas City Co., 212 Admiral Blvd.; Industrial Services Co., 213 Reliance Bldg.

MEN of industry

David Adams, assistant treasurer since July, 1945, Tennessee Coal, Iron & Railroad Co., Birmingham, has been appointed assistant secretary and assistant treasurer of the company.

—o—

Arne Hedstrom has been named by Vanadium-Alloys Steel Co., Latrobe, Pa., to head its new Indianapolis office. Prior to service with the Army, Mr. Hedstrom had been associated with the company's Chicago office.

—o—

R. W. Eichenberger, vice president, Robins Conveyors Inc., Passaic, N. J., a division of Hewitt Rubber Corp., has moved to the Chicago office to supervise sales in the Western Division. He succeeds **J. F. Meissner,** resigned.

—o—

Torsten F. A. Edvar has been appointed to the engineering staff, Ajax Electric Co. Inc., Philadelphia. Formerly, he was chief engineer, Harold E. Trent Co., Philadelphia.

—o—

Donald G. Dunn has been appointed assistant sales manager, Aluminum Sales Division, Reynolds Metals Co., and will have headquarters in Louisville. Previously he had headed direct mail advertising, sales promotion and advertising, as well as holding other posts in the company's advertising and public relations department.

—o—

George W. Frick has been appointed executive vice president, Carbide Die & Mold Co., Pittsburgh. Mr. Frick also will direct the company's sales. He resigned as general manager of sales, Firth-Sterling Steel Co., McKeesport, Pa., to accept his present position.

—o—

Dan K. Heiple has rejoined R. G. LeTourneau Inc., Peoria, Ill., as a field engineer in the installation department. Since early in 1942, Mr. Heiple has served as an officer in charge of service and maintenance of aircraft with the Navy.

—o—

George R. King has been named manager of chain link fence sales, Pittsburgh Steel Co., Pittsburgh. Prior to service with the armed forces, Mr. King had been in charge of sales in the New York office of the Cyclone Fence Co.,

—o—

J. Paul Scheetz has joined the Rust Engineering Co., Pittsburgh, in an executive capacity, following service as a commander with the Navy.

—o—

J. E. Eckel, formerly with Eckels-Nye Steel Co., Syracuse, N. Y., now is president, Jersey Shore Steel Co. Inc., Jersey Shore, Pa.

—o—

Carl J. Recker, who has been steel buyer for the Acklin Stamping Co., Toledo, O., for the past five years, recently was named purchasing agent. **George J. Bleim,** vice president in charge of purchasing, resigned recently.

—o—

Philip S. Mumford has been appointed general manager of the East Moline, Ill., plant, American Machine & Metals Inc., and will have charge of manufacturing operations of the company's Troy Laundry Machinery, Tolhurst Centrifugals, Riehle Testing Machines and DeBothezat Fans Divisions. Mr. Mumford, who joined the company in 1934, has returned from three years' active duty with the Navy.

—o—

Robert Ten Broek Stevens has been elected a director, Yale & Towne Mfg. Co., Stamford, Conn.

—o—

Henry F. Schroeder has been elected president, Milwaukee Die Casting Co., Milwaukee, succeeding the late **Frederick J. Schroeder Sr.** Mr. Schroeder formerly was vice president and manager. **Frederick J. Schroeder Jr.,** treasurer, also was elected vice president, and **Lillian M. Wood** was re-elected secretary.

—o—

David B. Acker has been appointed director of manufacturing, and **Robert A. Lawson,** assistant general manager, Menasco Mfg. Co., Burbank, Calif. Mr. Acker, who succeeds **Harold F. Schwedes,** resigned, formerly was with Fisher Body Division, General Motors Corp., Detroit. Mr. Lawson previously served as works manager, Consolidated-Vultee Aircraft Corp. at Downey, Calif.

—o—

New Britain-Gridley Machine Division, New Britain Machine Co., New Britain, Conn., announces the appointment of the following sales engineers: **Frank H. Hastings** with headquarters in Dayton, O., whose territory includes western Ohio, Indiana, and northern Kentucky; **Charles W. Coffin,** and **William H. Nettle,** with headquarters in Detroit, whose territory is Michigan.

—o—

B. E. Bassett has been named a director, Olin Industries Inc., East Alton, Ill. Mr. Bassett formerly was general manager, United States Cartridge Co., an Olin subsidiary, which operated the St. Louis ordnance plant. **Russell R. Casteel,** secretary and counsel of Olin Industries and affiliated corporations, also was named a director.

—o—

Sydney T. Maunder has been appointed manager of sales, power transformer section, Pittsfield, Mass., General Electric Co. He succeeds **Temple O. Eaton** who has resigned to become manager, John Bean Mfg. Division, Food Machinery Corp., Lansing, Mich.

—o—

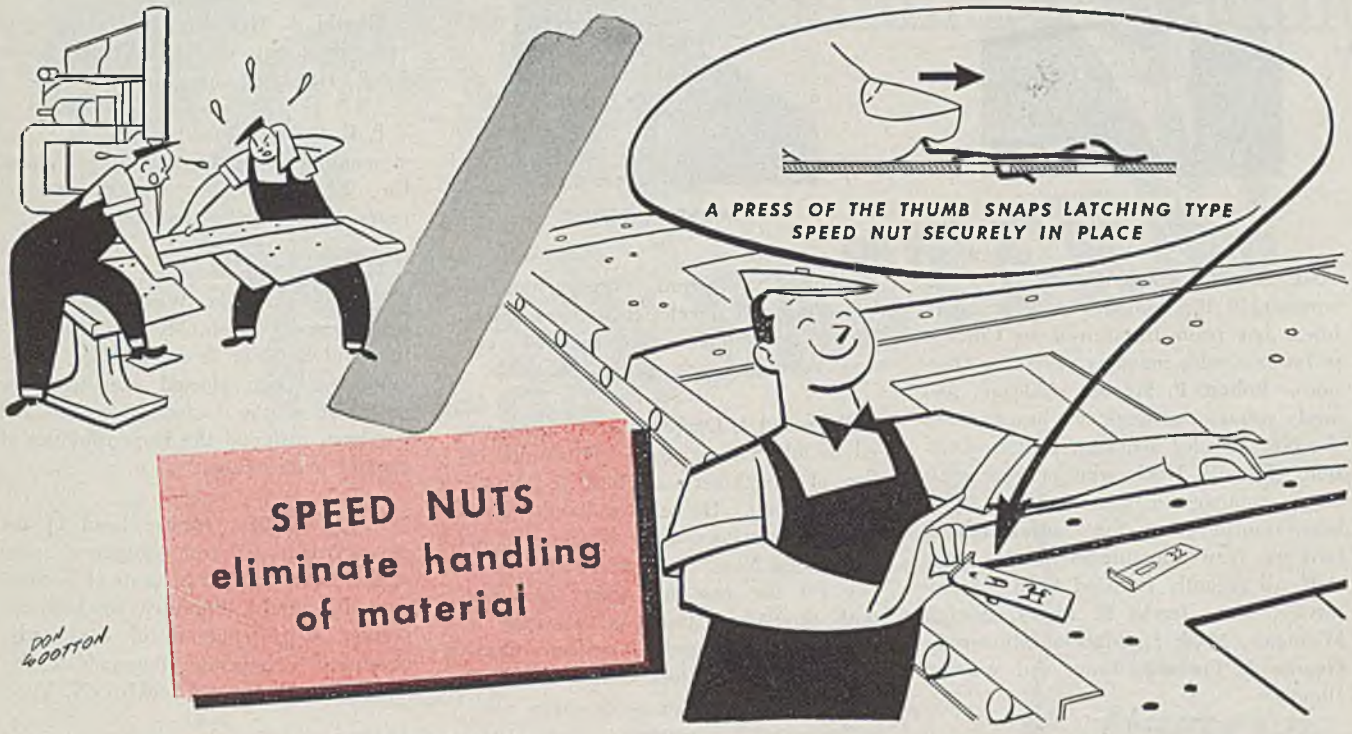
Charles S. Reed Jr. has been elected president and general sales manager, Chicago Retort & Fire Brick Co., Chicago. He formerly was secretary, which position has been assumed by **E. W. Reynolds.** As general sales manager, Mr. Reed succeeds **Henry Tanner,** re-

GEORGE W. FRICK

PHILIP S. MUMFORD

Why clinch, stake or weld ?

Just snap in a latching SPEED NUT



A SPEED NUT CASE HISTORY

A motor truck manufacturer used a battery of machines to clinch nuts in place for assembly of dash to cowl and attachment of instruments and equipment to dash. Two men were required to operate each machine . . . to handle the large stampings and position them for attachment of the fasteners. This extra handling meant frequent damage to stampings, and then after painting, nut threads had to be re-tapped.

30 self-retaining Speed Nuts are now snapped in place by hand on each stamping as it moves from the press department on conveyers. The entire assembly is completed in much less time, machines eliminated and costs substantially reduced.

Sure, there are a lot of ways to attach nuts to mid-sections of panels for blind location assembly, *but* they require expensive equipment, valuable floor space and skilled operators. Panels must be taken off conveyer, carried to press or welder and carefully positioned to attach the fasteners.

Now with Latching type Speed Nuts, panels stay right on the conveyer, and the assembler merely snaps the Speed Nuts in place by hand. These Speed Nuts are *self-retaining*, holding themselves firmly in place until the screw is driven from opposite side. Moreover, Speed Nuts provide a spring tension lock that holds tight under the most severe vibration.

We've developed many types of self-retaining Speed Nuts to simplify and reduce the cost of blind location fastening. We'll be glad to show you how they can improve the assembly of your product. Send in your details today!

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In Canada: Wallace Barnes Co., Ltd., Hamilton, Ontario
In England: Simmonds Aerocessories, Ltd., London
In France: Aerocessoires Simmonds, S.A., Paris
In Australia: Simmonds Aerocessories, Pty. Ltd., Melbourne

Speed Nuts* PATENTED

MORE THAN 3000 SHAPES AND SIZES

* Trade Mark Reg. U S Pat Off

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

WILLIAM G. HALL

RAYMOND J. DERVEY

tired. **Carl E. Von Luhrte**, who has represented the company in Davenport, Iowa, has been transferred to Chicago to become sales manager, Western Division. **Robert P. Stevens**, Chicago, formerly refractories engineer, has assumed the post of sales manager, Eastern Division. **John H. Hock**, who has represented the company in northern Indiana, has been transferred to the central Indiana territory. New appointments to the sales staff, all recently released from military service, are: **Jerald E. Pixley**, eastern Michigan; **Mark L. Marino**, Minnesota; **George J. Friesner**, Iowa and western Illinois.

—o—

William G. Hall, who has been in charge of renewal parts and repairs, Reliance Electric & Engineering Co., Cleveland, during the war, has been named manager of a combined Renewal Parts and Service Division. Mr. Hall succeeds **Arthur W. Ray**, who has retired after completing 40 years with the company, the past 21 as service manager. Mr. Hall joined the engineering department of the company in 1937 and four years later transferred to its service department.

—o—

L. R. Brown, for 23 years manager, Transformer Division, Pittsfield, Mass., General Electric Co., has been named manager of the newly organized Transformer Divisions which include the Transformer Division with **Harry F. McRell** as division manager and the Specialty Transformer Division with **Paul M. Staehle** as division manager.

—o—

Charles E. Heintz, who has been general sales manager, Elastic Stop Nut Corp. of America, Union, N. J., for the past two years, has been elected vice president in charge of sales.

—o—

A. J. Wettlaufer recently was appointed sales manager, Detroit Sales Engineering Co., Detroit, experimental engineering and development organization. Mr. Wettlaufer for more than 25 years was sales manager, Briggs Mfg. Co.

—o—

Raymond J. Dervey has been appointed to take charge of the Pittsburgh office of the American Hoist & Derrick Co., St. Paul. He relieves **Ralph Thomson** who has been made manager of the company's New York office. Mr. Dervey for the past five years has been with the Army, previous to which he served with Amerada Petroleum Corp., Carnegie-Illinois Steel Corp., and J. T. Ryerson & Son Inc.

—o—

D. A. Sutch has been appointed general superintendent of the Clinton plant, Wickwire Spencer Steel Division, Colorado Fuel & Iron Corp. Mr. Sutch has been works manager of the Wickwire Spencer Aviation Corp., Newark, N. J., and he succeeds **G. G. Lloyd**, who was transferred recently to the Buffalo plant as general superintendent.

—o—

Douglas F. G. Eliot, general purchasing agent in charge of purchasing and traffic, Western Electric Co. Inc. New York, recently was elected a vice president of the company.

—o—

Erwin Loewy, president, Hydropress Inc., New York, recently returned from a special 9-month government mission in Germany.

—o—

John W. Weigt succeeds **D. P. Orcutt** as manager of the New York branch, Electric Storage Battery Co., Philadelphia. Mr. Orcutt retires after 36 years with the company.

—o—

Harry M. Bouchard, formerly vice president, Great Lakes Transit Corp., Buffalo, has been named marine superintendent of Northern Shipping Inc., a new lake package freight and automobile carrying company being formed by Great Lakes Transit Corp. and the Overland Freight Corp., Detroit.

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Merrill E. Skinner has resigned as vice president of the Buffalo Niagara Electric Corp., Buffalo, to become director of sales of the Union Electric Co. of Missouri, St. Louis.

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Harold A. Neff has been elevated to vice president of Holo-Krome Screw Corp., Hartford, Conn.

—o—

P. E. Stringer, vice president in charge of manufacturing, Elgin National Watch Co., Elgin, Ill., has retired after 53 years service with the company.

—o—

Henry A. Stix, treasurer, Federal Machine & Welder Co., Warren, O., and its subsidiaries, Warren City Mfg. Co., Warren, and Sommer & Adams Co., Cleveland, has been elected executive vice president of the Federal operation and has been assigned the responsibilities of general management.

—o—

F. J. Gaffney, former head of the measurement and test equipment group of the Massachusetts Institute of Technology Radiation Laboratory, has been appointed chief engineer of the newly-organized Polytechnic Research & Development Co. Inc., Brooklyn, N. Y.

—o—

H. Mandel has resigned as president of the Wickman Corp., Detroit, to take a special assignment for the parent company, A. C. Wickman Ltd., Coventry, England, and **Axel C. Wickman**, chairman and managing director of the parent company, has been elected president of the Wickman Corp. **William T. Muirhead**, managing director of A. C. Wickman (Canada) Ltd., Toronto, Ont., has been elected executive vice president of Wickman Corp. and will have full responsibility of operations of the corporation.

—o—

Lester S. Kauffman, quality control director, American Stove Co., St. Louis, has been elected president of the newly-formed St. Louis Society for Quality Control.

—o—

Paul Warburg and **Bernard Steiert** have been named representatives for Walsh Holyoke Boiler Works Inc., Holyoke, Mass., and Alloy Fabricators, Perth Amboy, N. J., at new headquarters at 345 Madison Avenue, New York.

—o—

William P. Loyzelle has been appointed traffic manager for all of American Locomotive Co.'s divisions, except the Railway Steel Spring Division. Mr.

For Answers on Stainless Welding

-ask EASTERN!

Atomic Hydrogen? Does atomic hydrogen welding of E-S 18-12 Mo (Type 316) produce welds as corrosion resistant as those made by a metallic arc?

Gas-Welding 18-8? What other compositions of chrome-nickel Stainless, besides E-S 18-8 (Type 302) can be oxyacetylene welded?

Tank Annealing? Is it necessary to anneal and pickle small outdoor storage tanks of E-S 18-8 LC (Type 304) after metallic-arc welding?

Weld Vibration? Do spot welds in light gages of E-S 18-8 sheet (Type 302) stand up under rapid vibration over long periods of time?

Bonding to Steel? What is the best way to join E-S 18-8 Stainless sheet (Type 302) to low-alloy steel hangers without a noticeable joint?

Eastern welcomes your questions about joining stainless steels. Whether they concern arc or gas welding, atomic hydrogen, or heliarc welding of light-gage sheet . . . Eastern Stainless' technical men have answers based on experience. "Eastern Stainless Steel Sheets", a modern book about a modern metal, gives you much data on joining. Send for your copy, and if you need further help, get in touch with any of our 18 offices or distributors.

JM Leo E-D1

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EASTERN STAINLESS
STEEL CORPORATION
BALTIMORE 3, MARYLAND • Distributors' stock available in most areas
CHICAGO • CLEVELAND • DALLAS • DETROIT • LOS ANGELES • NEWARK • PHILADELPHIA

ES

Loyzelle, whose headquarters will be in Schenectady, N. Y., succeeds **W. J. Hall,** retired. **Benjamin Davis** will continue as traffic manager of the Railway Steel Spring Division with headquarters in New York.

—o—

Richard S. Sawyer has been named assistant general manager of purchasing and traffic, Rheem Mfg. Co., and will make his headquarters in the New York office. He has been with the company since January, 1941.

—o—

Dr. F. Dudley Chittenden and **George R. Vila** have been appointed assistant development managers, Naugatuck Chemical Division, United States Rubber Co., at Naugatuck, Conn. Both men previously were associated with the company as technical co-ordinators, pioneering in the development and production of synthetic rubber.

—o—

Harley E. Huddle has been appointed secretary and sales manager, Howard Engineering & Mfg. Co., Cincinnati, manufacturer of cleaning and finishing machinery for the metal and food processing industries. Mr. Huddle, associated with the company for the past seven years, has been chief engineer.

—o—

Alfred D. Nutter Jr. has been appointed purchasing agent for the Glass Division, Pittsburgh Plate Glass Co. Mr. Nutter has been associated with the company 12 years and for the past five years has been assistant to the division's purchasing agent. He succeeds **Homer M. Hoffman,** retired.

—o—

R. F. Hatto, sales director, S. Wolf & Co. Ltd., London, England, manufacturers of portable electric tools, is now visiting Canada.

—o—

Robert S. Herwig has joined the Bogue Electric Co., Paterson, N. J., to head its expanded plating equipment department. Mr. Herwig previously was a supervisor of chemical research, Eclipse Pioneer Division at Teterboro, N. J., Bendix Aviation Corp.

—o—

Daniel R. Seagrave has been appointed superintendent of service and erection in the Seattle district, Allis-Chalmers Mfg. Co., Milwaukee, succeeding the late **R. C. Norman.**

—o—

E. H. H. Graf, associated with the Oilgear Co., Milwaukee, as Detroit district manager for the past 13 years, has been appointed sales manager, U. S. Broach Co., Detroit.

—o—

H. E. Widdell, who has been a vice president and a director of Arthur G. McKee & Co., Cleveland, for many years, has been elected president of the company, succeeding **Arthur G. McKee.** Mr. McKee will continue to participate in the affairs of the company as chairman of the advisory committee of the company's board of directors. Other members of the committee are Mr. Widdell and **Robert E. Baker,** secretary and treasurer, and one of the original partners of the McKee organization. Mr. McKee served as president of the company since it was incorporated first as a Pennsylvania corporation in 1915, and later in 1920, as a Delaware corporation. He first opened an office in Cleveland to serve the iron and steel industry as a consulting and contracting engineer in 1905, and since that time the company has grown to embrace the complete design and construction of all kinds of iron, steel and petroleum refining plants, in this country and throughout the world.

—o—

Everett C. Gosnell, formerly manager, Chemical Division, Lukens Steel Co. and subsidiaries, Coatesville, Pa., has joined the Colonial Iron Works Co., Cleveland, as manager of its Chemical & Process Equipment Division. Mr. Gosnell has been associated successively with Indiana Coke & Gas Co., Terre Haute, Ind.; Koppers Co., Pittsburgh; Technical Service Division, International Nickel Co., New York, and for the past nine years has been with the Lukens company.

—o—

R. E. Craig, treasurer and formerly assistant secretary, Phoenix Iron Co., Phoenixville, Pa., is now treasurer and secretary of the company, having succeeded **William O. Lange** as secretary. **William A. Cook** has been named manager of sales, succeeding Mr. Lange in that capacity. Mr. Cook resumed his affiliation with the company Apr. 1 upon his release from military service. Prior to entering the service, Mr. Cook had been assistant to the company's vice president. Mr. Lange, as noted in the Apr. 15 issue of STEEL, resigned recently to become affiliated with the Dreifus Steel Co., Philadelphia, newly organized to do a warehousing business in new steel.

—o—

Bullard Co., machine tool manufacturer, is located in Bridgeport, Conn., rather than Bridgeport, Pa., as reported in the Apr. 8 issue of STEEL, p. 88, in the caption identifying Messrs. E. C. and E. P. Bullard, president and chairman, respectively, of the company.

—o—

L. C. Kroes has been appointed manager of central regional sales, Detrex Corp., Detroit. Mr. Kroes has been associated with the corporation since 1937 and since 1942 has been manager of the Michigan Division.

—o—

Sawhill Mfg. Co., Sharon, Pa., has appointed the following as representatives: **James W. Roy,** Boston, New England territory; **C. C. Abbott,** Cincinnati, southern Ohio territory.

—o—

James W. Chapman has been appointed supervisor of training, Ansco Division, General Aniline & Film Corp., Binghamton, N. Y. He formerly was supervisor of the product inspection department at Remington Arms ordnance plant in Denver, Colo. **Robert M. Dunn** has returned from two years in the Navy to his post as advertising manager of the Ansco Division.

—o—

Robert Shone has been appointed secretary, British Iron & Steel Federation, and he will combine this work with directorship of economic work of the

ROBERT S. HERWIG

EVERETT C. GOSNELL

DR. F. R. HENSEL

Who has been elected vice president in charge of engineering, P. R. Mallory & Co. Inc., Indianapolis, noted in STEEL, Apr. 15 issue, p. 90.

RAYMOND W. KELLY

Who has been appointed assistant general traffic manager, American Rolling Mill Co., Middletown, O., noted in STEEL, Apr. 15 issue, p. 93.

CAPT. NELSON W. PICKERING

Who recently was named executive vice president, Republic Industries Inc., New York, noted in STEEL, Apr. 15 issue, p. 88.

federation, London, England. During the war Mr. Shone was general director, statistics, costs and prices of the Iron & Steel Control.

—o—

George W. Stamm has been appointed assistant branch manager at Cleveland, Crucible Steel Co. of America, New York. Previously Mr. Stamm was a service engineer of the Tool Steel Division operating from the company's tool and specialty steel mills at Syracuse, N. Y.

—o—

F. M. Carlson, American Galvanizing & Tinning Co., Erie, Pa., was elected president of the American Hot Dip Galvanizers Association at a recent meeting of the organization's board of directors. **George I. Gregory,** Thomas Gregory Galvanizing Works, Maspeth, N. Y., was elected first vice president; **F. W. Miller,** Lehigh Structural Steel Co., Allentown, Pa., second vice president; and **S. J. Swensson,** secretary and treasurer.

Douglas C. Ogilvie has been appointed eastern division manager, with headquarters in Newark, N. J., for the Gasflux Co., Mansfield, O. Mr. Ogilvie formerly was welding consultant with Charles W. Krieg Co., Newark, distributor for the Gasflux company in New Jersey and New England.

—o—

Daniel J. Killfoile, following three years service with the Army, has been appointed to the sales staff, Alloy Steel Products Co., Linden, N. J.

—o—

Frank C. Cline recently was named manager of the southwestern district of the Lamp Division, Westinghouse Electric Corp., Pittsburgh. Mr. Cline has been acting manager of the district since July, 1945, and will have headquarters in St. Louis.

—o—

William A. Hoschler has been appointed manager of district stores in the west central district, Westinghouse Electric Supply Co., and he will have headquarters in Columbus, O. **Robert B. Burwell** has been named purchasing agent for the district. **Roy L. Brown** has been appointed manager of the supply company's eastern district and will have headquarters in New York City.

—o—

Jerome S. Selig, vice president in charge of Tank Storage Terminal Division, and **Donald H. Smith,** vice president, General American Transportation Corp., Chicago, have been elected members of the board of directors. **Max Epstein,** chairman; **Lester N. Selig,** vice chairman, and **Sam Laud,** president, were re-elected.

—o—

C. C. Hermann, recently appointed special representative, Whiting Corp., Harvey, Ill., for the sale of its Hydro-Clone dust collector and spark suppressor equipment, has for his territory Indiana, Michigan, Ohio, western New York and western Pennsylvania.

OBITUARIES . . .

Herbert C. Ryding, 82, retired president, Tennessee Coal, Iron & Railroad Co., Birmingham, died Apr. 12 at his home in that city following a 3-month illness. Mr. Ryding was born in England and came to the United States in 1885 to take a position in a steel plant at Louisville. He became vice president of the Tennessee company, a subsidiary of U. S. Steel Corp., in 1917, was elected president in 1930 and retired in 1933.

—o—

Storm W. Archer, 48, a consulting engineer for Ampco Metal Inc., Milwaukee, died Apr. 9 in that city. Mr. Archer prior to joining the Ampco company a year ago had served as consulting engineer for the Consolidated-Vultee Aircraft Corp. at New Orleans.

—o—

William F. Tannhauser, 72, retired vice president, Kendall Corp., Milwaukee, died Apr. 8 in that city.

—o—

Harry A. Guess, 70, vice president in charge of mining operations and explorations, American Smelting & Refining Co., New York, died recently at his home in Queens, New York. Mr. Guess had been associated with the company since 1901, and he became vice president in 1917. He also was a director of Revere Copper & Brass Inc., Federal Mining & Smelting Co., and General Cable Corp., all of New York.

—o—

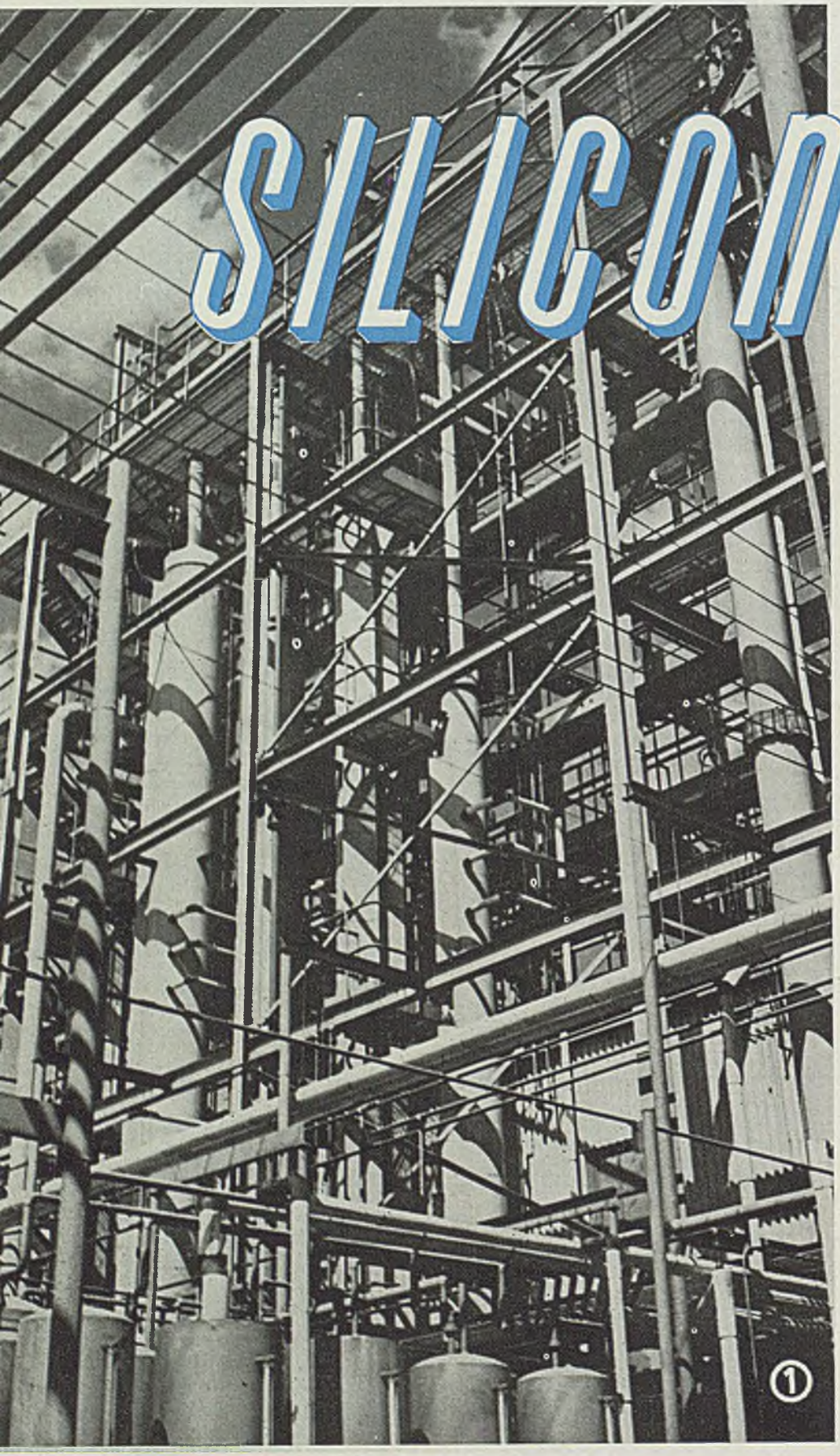
Louis Meyer Diether, 58, president of Electro-Weld Metal Products Ltd., Patterson Boiler Works Ltd., and Patterson Iron Foundry Ltd., Vancouver, B. C., Canada, died Apr. 10.

—o—

William A. Rice, 83, retired purchasing agent, Sargeant Co., New Haven, Conn., died in that city Apr. 15.

—o—

Thomas C. Eayrs, 62, budget director, Buflovak Equipment Division, Buffalo, Blaw-Knox Co., died Apr. 13.



SILICONES...

Truly New Materials for Industry

High-temperature electrical insulation, water-resistant surface treatment, low-temperature lubrication, fluid for diffusion pumps and heat-stable rubber applications are among uses for versatile materials

Fig. 1—Distillation towers dominate the modern silicone plant. Dow Corning photo

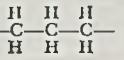
SILICONES have become the basis for a whole new branch of the chemical industry. While this is news of immense importance to the chemist, the engineer is more particularly interested in the question of the forms in which these new materials will be made available to him, and what new properties they will possess.

The primary raw material in silicones is sand, modified by chemicals made from brine, coal, and petroleum. The complex chemical steps are performed silently and unseen in a maze of stills, pressure tanks, cookers, and piping characteristic of synthetic chemical plants. Such plants resemble an oil refinery (See Fig. 1). Silicon and oxygen are the two most abundant elements at our disposal, together constituting about 76 per cent of the earth's crust. In the form of silica and the silicate minerals, they are well known as the major constituents of rocks and sand. Since the earliest civilization, these durable refractory materials have been used in the ceramic and building arts, and since the beginnings of chemical science, they have dominated the chemistry of silicon.

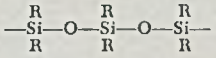
In the past few years research has brought to light many new compounds of silicon of an entirely different character, compounds which do not occur in nature. From this research not one but scores of new useful products—all members of the silicone group—have appeared. In constructing silicone molecules, the possible combinations of the several variables are virtually infinite. Several thousand silicones have already been made and studied to various degrees.

The chemist has worked for a long time with compounds of the element carbon. Starting with a simple carbon-hydrogen compound, a second carbon atom can be joined to the first, a third to the second, and so continue until several hundred thousand compounds can be built. There is no theoretical limit. In the silicones, organic groups have for the first time been attached chemically to the inorganic skeleton found in glass and mineral silicates to create a similarly unlimited chemistry built upon silicon-oxygen linkages.

These large silicone molecular structures have an approximate analogue among the hydrocarbons. But there is an important and essential difference. In the hydrocarbons each carbon atom is linked to an adjoining carbon atom, thus:



In the silicones, however, each silicone atom is linked to an adjoining oxygen atom in this fashion:

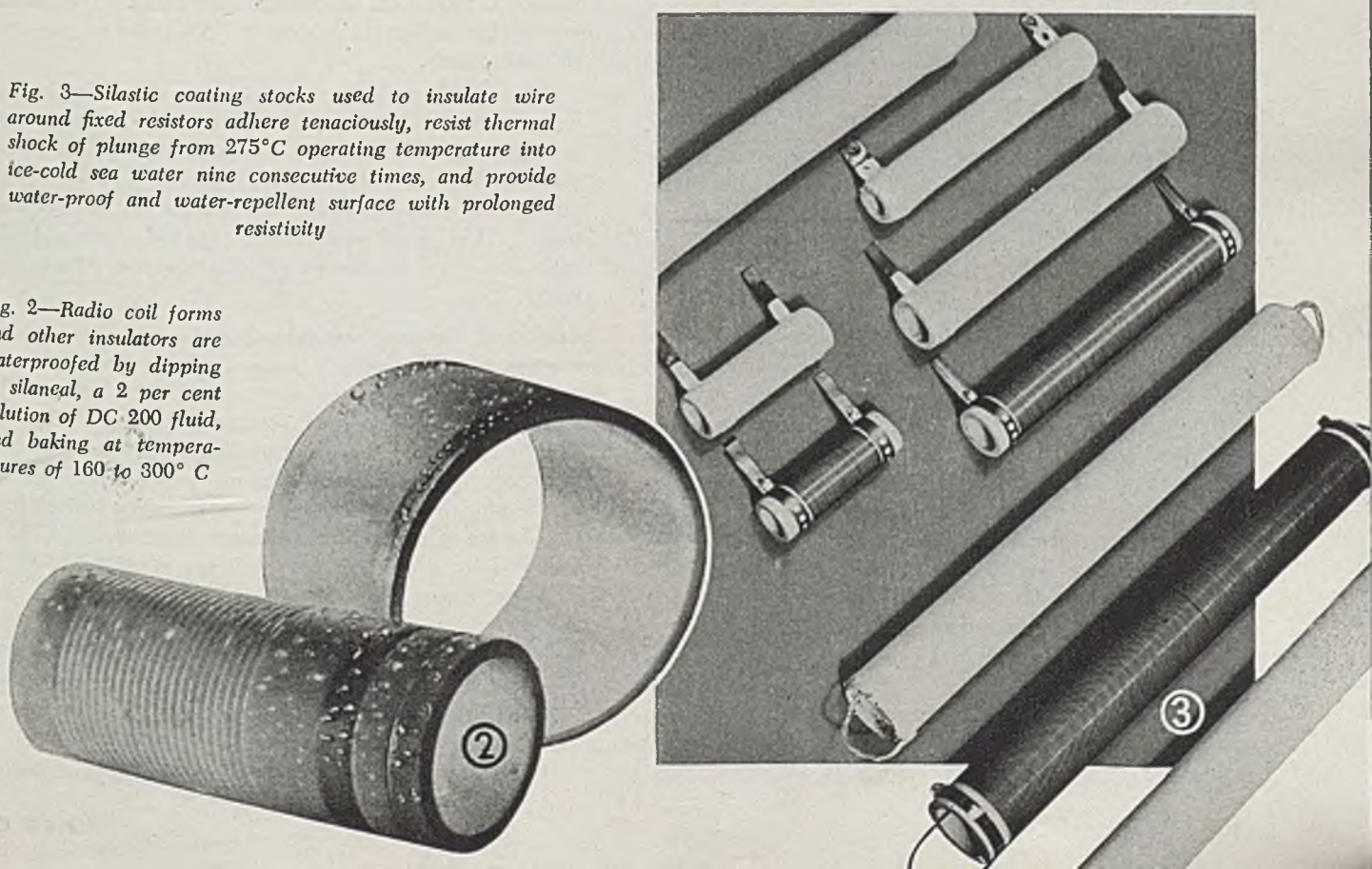


It is this silicon-to-oxygen bond that gives the silicones some of their most valuable properties. The hydrocarbon radical is the only organic component and is bonded directly to the silicon atoms. The resulting silicone is then, clearly, neither organic nor wholly inorganic. It lies midway between the two conventional fields of chemistry and may be termed a semiorganic compound. There are many possible hydrocarbon radicals, but CH_3 (methyl), C_2H_5 (ethyl), and C_6H_5 (phenyl) are the most common ones. Thus the choice of a given hydrocarbon unit from among many is one of the several variables available to the silicone molecular engineer.

Another variable in the design of a silicone is the length of the chain. This chain may be only a few silicon-oxygen-silicon links long or thousands of the organo-silicon oxide units may be linked together. Eventually, each molecule (See Fig. 5) must be terminated by a blocking unit, which can be an *R* unit in place of an oxygen atom. The chemist can allow the molecule to grow to almost

Fig. 3—Silastic coating stocks used to insulate wire around fixed resistors adhere tenaciously, resist thermal shock of plunge from 275°C operating temperature into ice-cold sea water nine consecutive times, and provide water-proof and water-repellent surface with prolonged resistivity

Fig. 2—Radio coil forms and other insulators are waterproofed by dipping in silaneal, a 2 per cent solution of DC 200 fluid, and baking at temperatures of 160 to 300° C



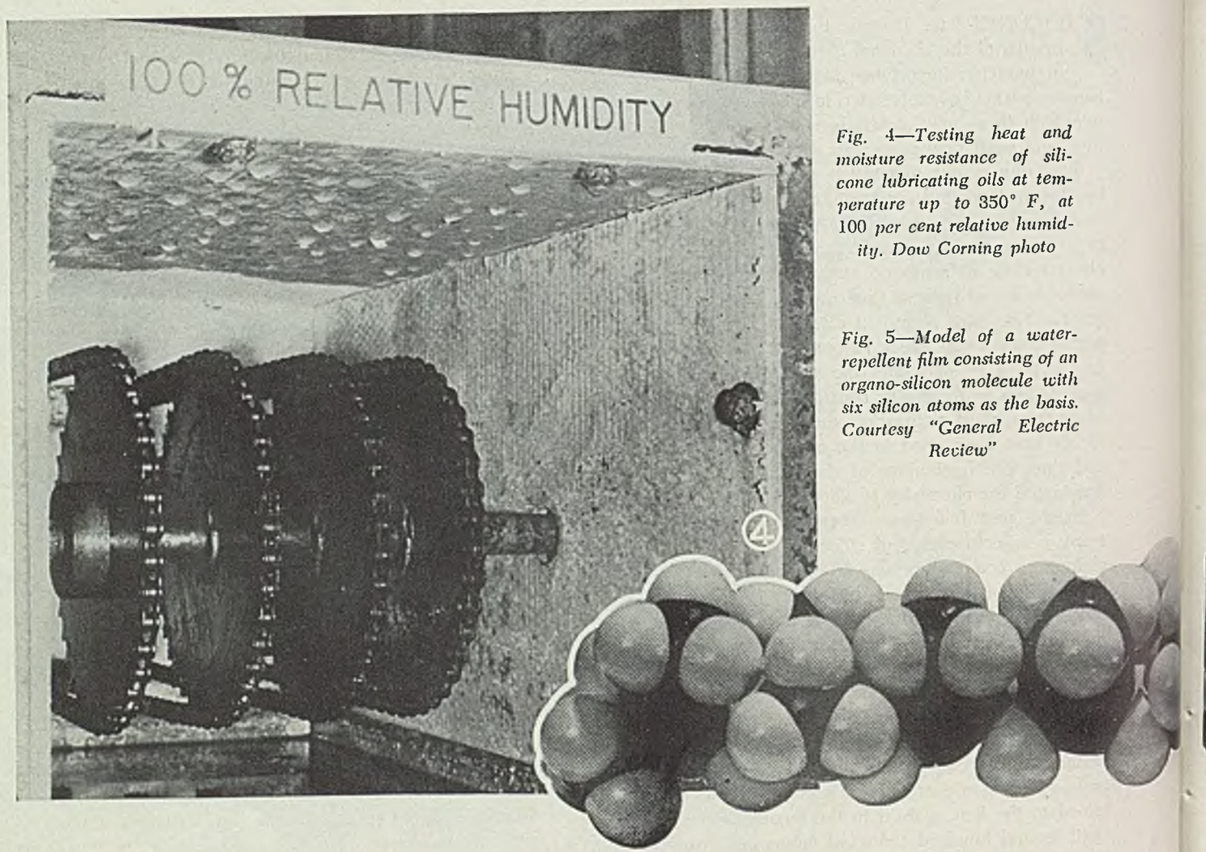
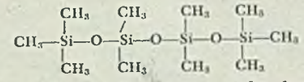


Fig. 4—Testing heat and moisture resistance of silicone lubricating oils at temperature up to 350° F, at 100 per cent relative humidity. Dow Corning photo

Fig. 5—Model of a water-repellent film consisting of an organo-silicon molecule with six silicon atoms as the basis. Courtesy "General Electric Review"

any desired length, and stop further growth by adding a blocking unit. Thus:



In this example we have a straight-chain molecule. However, one chain can be linked to the adjoining molecule by cross-links to form a three-dimensional structure. This is still another variable useful to the architect of silicone molecules.

Three Broad Divisions of Silicones

In general, there are three interrelated types of silicone products—resins, liquids, and rubber. Since the engineer is usually concerned with the selection of a material to meet a given condition, or set of conditions, the silicones might be grouped according to their outstanding properties. Two basic properties are common to them all. One is great temperature stability. The other is water resistance.

Not only are silicones useful over a wide range in temperature but they have the very special ability to resist high temperatures. They withstand heat well above that which destroys organic compounds. The reason for the stability of silicones under heat can be predicted on a theoretical basis. The silicon-to-oxygen bond in the silicone chain is very strong, which means that a relatively large amount of energy (heat) must be applied before the bond is broken. This amount of energy is a known, fixed amount. The amount of energy bonding the silicon to oxygen is 89.3 units (kilocalories per mol.). The bonding energy for carbon to carbon is 58.6 units or only two-thirds as much.

The second quality common in general to all silicones is water resistance. Some idea of why the silicones resist water can also be had from a consideration of the silicone molecule (Fig. 5). It can be thought of as a silicon-oxygen-silicon chain linkage, surrounded by hydrocarbon units. Thus, a silicone presents toward water a hydrocarbon surface similar to paraffin and oil which resist water.

Silicone Resins: The silicone resins were brought into existence largely through the need of the electrical industry for an impregnating resin capable of withstanding higher temperatures than organic varnishes. That the silicone resins have been outstanding in this field has been reported[1]. The silicone resins are produced as varnish-like liquids, but polymerize to a solid when heated for 1 to 3 hours at temperatures of between 220 and 275° F. followed by a cure of several hours at 450 to 500° F. The heat causes the resin molecules—already long chain-like structures—to form many side bonds to adjoining molecules, in all three dimensions. The tangle of bonds between molecules becomes so great that the substance becomes either a brittle or a flexible solid depending on the constitution of the molecules.

A limiting service condition for electrical motors is

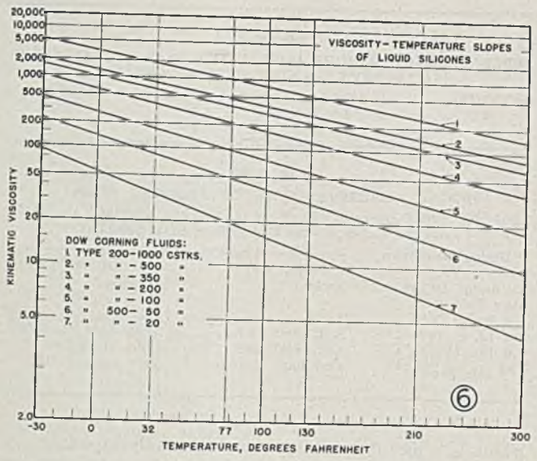


Fig. 6—Graph shows relatively slight changes in viscosity of silicone fluids over wide temperature range

the temperature at which the insulation starts to break down rapidly. Lamme and Steinmetz, in a paper before the institute of electrical engineers said, "The problem of permissible temperature limits in electrical apparatus is largely that of durability of the insulation." Since the problem of horsepower rating is largely that of temperature limits, the advantages to be gained by insulations with higher service temperatures is obvious.

The use of glass fibers for insulating motor conductors offered the possibility of higher temperature service conditions, but the varnish necessary to exclude moisture for the windings was still organic in chemical nature and consequently limited in thermal endurance. Mica and asbestos materials were likewise limited by the lack of heat resistance of the varnish. Silicone resins possess the prop-

TABLE I
VISCOSITY CHANGES OF SILICONE OILS

Temperature Degrees F	Viscosity Ratio η_T/η_{100} Silicone Oil
210	0.4
100	1
0	3.5
—35	6.6
—70	15.6

TABLE II
BEHAVIOR OF SILICONE OILS ON A SMALL GEAR PUMP, MODEL DBD-1050 MANUFACTURED BY THE HYDRAULIC EQUIPMENT CO., CLEVELAND

Run No.	1	2	3
Oil charged	Silicone 9981-LT-25	Silicone 9981-LT-25	Silicone 9981-LT-25
Initial Oil Viscosity:			
Centistokes at 100° F	24.5	24.5	24.8
SSU at 100° F	116	116	117
% Change in Viscosity	+13	+15	+13
Duration of Run (Hours)	144	191	144
Pressure, psi	600	700	700
No. of cycles through pump	50,000	70,000	50,000
Wt. Loss of driven gear, milligram per day	0.5	0.05	0

TABLE III
TEST RUNS IN PESCO IP-320H PUMP

Run No.	5	6	7	8	9
Oil charged	Silicone 9981-LT-27	Silicone From Run 5	Silicone 9981-LT-54-NV	Silicone 9981-LT-37°	Silicone 9981-LT-35
Initial Oil Viscosity:					
Centistokes at 100° F	26.6	31.1	53.7	36.5	35.0
SSU at 100° F	126	146	248	170	163
% Change in Viscosity	+19.5	+1.3	—9.1	—1.4	+2.0
Duration of Run (Hours)	188	441	558	808	504
Pressure, psi	840	1,075	1,100	2,000	1,770
No. of cycles through pump	36,000	85,000	109,000	155,000	97,000
Wt. loss of gears and bushings, milligram per day	4.0	1.4	0.0	0.4	0.5
% Change in Flow Rate	—2.1	0	+3.6	+3.6	.....

°This oil was used in a previous test run which accounts for the negative viscosity change. (Compare viscosity change in runs 5 and 6.)

TABLE IV
PROPERTIES OF FOUR G-E SILICONE OILS

	9981-LT-10	9981-LT-25	9981-LT-50	9981-LT-125
Viscosity at 100° F, centistokes	10	25	50	125
Viscosity at 100° F, SSU	59	119	231	577
Viscosity at 210° F, centistokes	4.3	10.1	20.1	49.5
Viscosity at 210° F, SSU	40	60	99	231
Viscosity Index	275	187	166	145
Viscosity index of a "perfect"† oil with the same viscosity at 210° F	350	207	176	149
"ASTM Slope"	0.437	0.344	0.282	0.235
Viscosity Temperature Coeff. $1-\frac{\eta_{210}}{\eta_{100}}$	0.570	0.596	0.599	0.604
Weight Loss, % (Reduction to constant weight at 160° F)	13.7	9 7	8.2	7.8
Per cent increase in 100° F viscosity during evaporation at 160° F to constant weight	+44	+30	+27	+32
Weight Loss, % (1 week at 150° C (302° F), thin film)	40	26	19	15
Specific Gravity at 20° C	.942	.962	.970	.977

†A perfect oil is defined as one which exhibits no viscosity change with temperature.

erties sought for high temperature insulation. They can be applied as liquid to a fabric of fiberglass or asbestos, filling the interstices. Upon baking, they form a permanent impregnant that repels water and resists heat far better than organic varnishes. Silicone resins have been developed for use as binders or impregnating agents with inorganic insulators and have been successful in raising service temperatures 100° F and more. Other silicone resins have been developed for enameling magnet wire, for bonding fiber board, for bonding mica, and for making other useful forms of electrical insulation.

Thermosetting silicone resins have other properties of interest to the electrical engineer. The dielectric strength is good, of the order of 1500 to 2000 v per mil on thin sections. Likewise on flashover, silicone-bonded inorganic insulation does not track or carbonize. Carbon tracking, common to most inorganic resins, results in greatly impaired dielectric strength. The dielectric constant of 4-mil glass cloth coated with a silicone resin (DC-993) and tested at 25° C and 50 per cent relative humidity is 3.5 at 1000 cycles. Its power factor at 1000 cycles is 0.7 per cent and its dielectric strength in volts per mil is between 1500 to 2000.

It is not necessarily true that all electrical equipment to be satisfactory must be insulated with silicone products. However, the advent of these insulating materials will establish new design limits for many types of electrical apparatus and machines. Because silicone resins withstand higher temperatures than organic insulating resins and because they are excellent for excluding moisture, even after prolonged exposure to temperatures in the range of 150° to 200° C (See Figs. 2 and 3), electrical engineers expect to use them to do one or more of the following things:

1. To provide much greater protection against overload temperatures—
2. To permit higher operating temperatures in electrical windings, even under severe humidity conditions—
3. To provide greatly increased service life of electrical insulation—
4. To reduce or eliminate the fire hazard that is encountered frequently due to failure of conventional electrical insulation—
5. To permit the use of electrical operating devices under high-temperature conditions such as those encountered in the proximity of ovens, furnaces, and the like—
6. To permit designers of electrical equipment to reduce the size and weight, where operating temperatures may be increased.

Silicone Fluids: Long-chain silicone molecules without cross-links to adjoining molecules form clear water-white fluids having unusual properties. Crosslinkages are controlled by the kind and number of hydrocarbon units allowed to combine with the silicon atoms. Control of the length of the molecule gives control of the viscosity over an enormous range. Silicone fluids made up of short-chain molecules are thin and extremely fluid, about like water. On the other hand, if the molecules are allowed to grow to great length involving several thousand silicon-oxygen-silicon units before the blocking units are applied, the product becomes extremely viscous. Almost every degree of viscosity in between these extremes is available,

TABLE V

PERCENTAGE OF WEIGHT LOST AFTER 40 HOURS AT 175° C (347° F) DOW CORNING SILICONE GREASES

DC 31	DC 33	DC 41	DC 44
5.2	4.6	4.2	3.3

TABLE VI

DRYING CHARACTERISTICS OF SILICONE RESINS

(801 and 803 Pigmented with 2 lb of No. 205 Standard Aluminum Paste Per Gal of 60 Per Cent Silicon Resin Solution)

Drying Conditions	Character of Resin Film	
	DC 801	DC 803
Air drying 16 hrs.	Tacky	Tack-free
After Baking		
1 hr. at 70° C.	Tacky	Tack-free
1 hr. at 140° C.	Soft, slight tack	Med. hard, Tack-free
4 hrs. at 140° C.	Soft, Tack-free	Hard, Tack-free
16 hrs. at 250° C.	Very hard, flexible	Very hard, brittle

which is a useful possibility, yet to be fully exploited.

Like other basic types of silicones, the fluids are uncommonly temperature stable. The freezing and boiling points vary with the viscosity. One such fluid with a viscosity almost equal to that of water freezes at about 125° F below zero, at atmospheric pressure, yet boils at 300° F.

Furthermore, the logarithm of the viscosity of silicone fluids varies linearly with temperature and at a very slow rate. The viscosity of most silicone fluids changes much less over a wider temperature range than do the best grades of hydraulic oil.

Silicone Oils in Hydraulic Uses

The properties outlined indicate versatility of the silicone fluids for many uses. Because fluidity is retained at low temperatures, they are of value as hydraulic fluids or lubricants that must operate in extreme cold or at high altitudes. The qualities of silicones as lubricants are still undergoing examination but it appears that they are most suitable for fluid film lubrication where bearing loads are light, as in instruments and other light machines. Avail-

(*Please turn to Page* 118)

TABLE VII

SPECIFICATIONS FOR DOW CORNING SILICONE GREASES

	Low Temperature Greases		High Temperature Greases	
	DC 31	DC 33	DC 41	DC 44
WORKED PENETROMETER (ASTM-D 217-44T)	300–310	280–330	295–305	200–250
FLASH POINT (ASTM-D 92-33) degrees Fahr.	505	528	537	550
DROPPING POINT (ASTM-D 566-42) °F	302	392	392	392
not less than °C	150	200	200	200
BLEEDING (ANG-34 Specification) 16 hrs. at 110° C—less than, %	6	2	4	2
TEMPERATURE RANGE at less than 4000 rpm				
Degrees Centigrade	—70 to 150		—20 to 250°	
Degrees Fahrenheit	—94 to 300		— 4 to 482°	
up to 10,000 rpm				
Degrees Centigrade		—70 to 150		—20 to 175
Degrees Fahrenheit		—94 to 300		— 4 to 347

°Efficient operation of bearings at temperatures above 175° C (347° F) may require frequent relubrication.

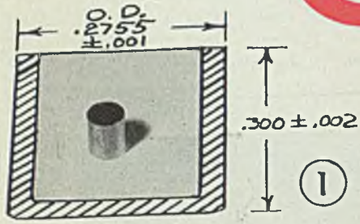
Fig. 7—Made in General Electric's Resin and Insulation Materials Division, these silicone rubber gaskets are squeezed through die in press like toothpaste from a tube. Gaskets then are cured by heating

Fig. 8—Engineer in electrically heated flying suit holds gasket for large searchlight lens to demonstrate its flexibility in laboratory chamber at 60° below zero. Silicone gasket will also withstand temperature of 575° above zero before melting

Fig. 9—Silicone gasket used in turbosupercharger for a B-29 is indicated by Dr. James Marsden of G-E Research Laboratory

Call on Powdered Metal Process for

MILLIONS



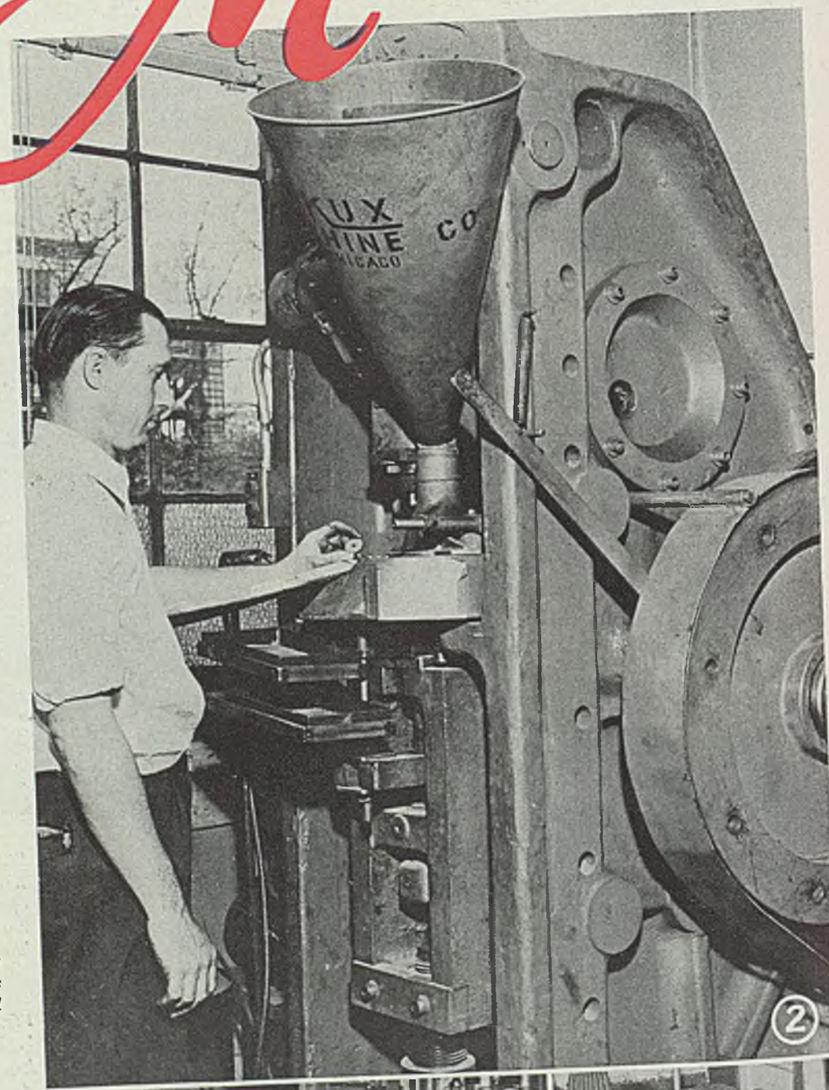


Fig. 1—Cup-shaped nickel filter used in V-T fuse

Fig. 2—Pressing the powdered metal into compacts preparatory to sintering

Fig. 3—Feed end of continuous-type electric furnace for sintering parts

Fig. 4—"Green" compacts ready for sintering. In this case, compacts are intended for valve production

OF NICKEL FILTERS

Airflow and porosity tests on new machine insure uniformity in cup-shaped powdered metal filter for switch of V-T fuse. Superfinished dies afford dimensional control

THE powder metallurgy process lends itself not only to bearing and machine parts such as gears, cams, valves, rings, nozzles, etc., but also to specialties, the nature of which requires super precision and certain extra physical properties.

A case in point is that of a small nickel cup-shaped filter, millions of which were produced in part by Powdered Metal Products Corp., subsidiary of Midland Die & Engraving Co., Chicago, for the mercury safety switch of the V-T (variable time) fuse, one of the scientific wonders of World War II. Filter is shown in Fig. 1.

The sequence of operations on the cup, which shows how exact the manufacturing control on this process can be, is as follows:

Powder Preparation: The nickel powder, which is 99 per cent chemically pure, is checked for screen size and blend which has been specified by Powdered Metal Products Corp. It is necessary to control these two factors in their smallest detail to obtain the desired porosity in the finished cup. The correct screen and blend are arrived at by experiments in the laboratory of PMP.

The powder is annealed in small batches in a hydrogen atmosphere for uniform hardness, a factor which is of utmost importance in molding, to insure uniform porosity required in the finished article. It is necessary to sample all powder used and check it for chemical purity, hardness and apparent density prior to lubricating and feeding it into the machines.

After checking and lubricating, the powder is stored in glass jars along with a dessicant to keep out moisture and harmful oxides.

Production of Compacts: The dies for molding are given a super finish to secure the highest possible dimension control of the cup. At the rate of 800 pieces per hour per press, a battery of presses of the type appearing in Fig. 2 produces cups 24 hr per day.

It is necessary for the press operator to subject every twentieth green compact to an airflow and porosity check to make sure of uniformity. The airflow machine, a development of PMP, permits calibration of density with the same parts after sintering and with those in actual use

(*Please turn to Page* 132)

AVERAGE PHYSICAL PROPERTIES OF FIVE POWDERED METAL PARTS

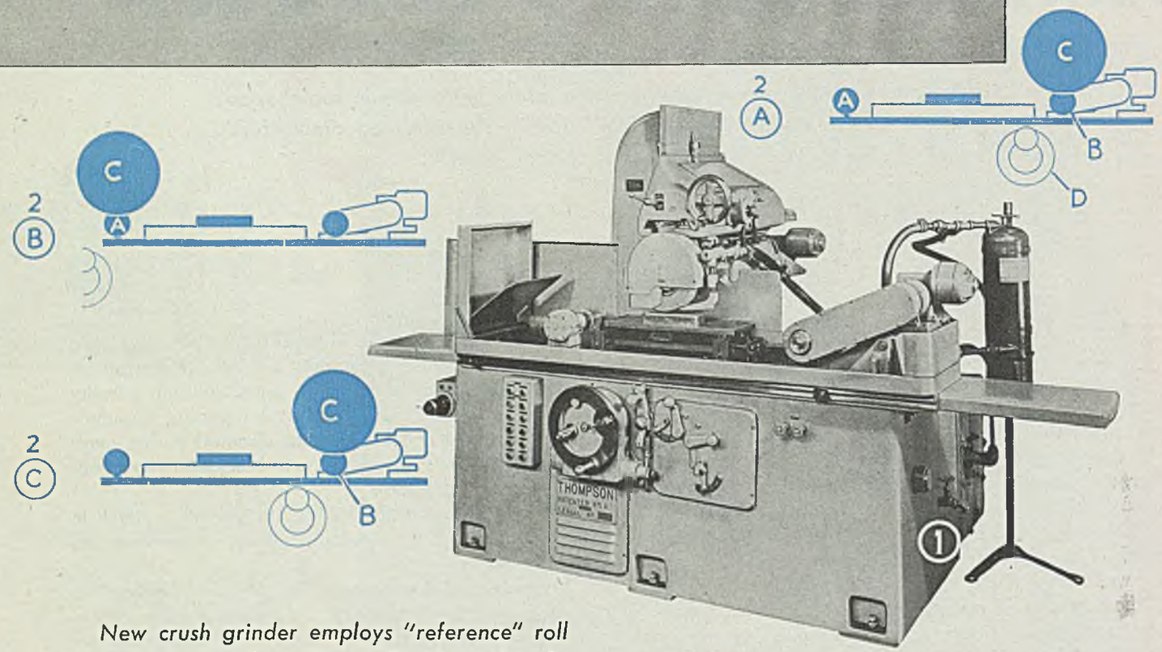
TABLE I: BEARING MATERIAL

	Approximate Chemical Composition	Density	Oil Content % by Volume	Hardness Rockwell	Modulus of Rupture, psi	Tensile Strength, psi
PMP BRONZE B-50	% Cu 90 % Sn 10	6.3	28	H-50	29,000	12,000
PMP IRON B-27	% Fe 90 % Cu 10	5.5	30	B-53	65,000	35,000

TABLE II: MACHINE PARTS MATERIAL

PMP BRONZE W-55	% Cu 90 % Sn 10	7.4	15	B-25	54,000	25,000
PMP IRON W-30	% Fe 90 % Cu 10	5.8	27	C-24	87,000	40,000
PMP STEEL Z-10	% Fe 99 % C 1	6.0	24	C-39	129,000	50,000

flat form contours



New crush grinder employs "reference" roll to true up work crushing roll without disturbing wheel, work or rolls. All equipment is table mounted for absolute alignment in producing flat form contours

Fig. 1—Recently perfected Thompson Truform grinder is equipped with two crushing rolls for increased continuous production

Fig. 2—Diagrammatic representations showing three functions of crushing rolls in production grinding and roll reprocessing sequences

CONSIDERABLE interest has been shown for a number of years in the possibilities of crush grinding, but machines and methods only recently have been developed to bring about great advancements in technique.

Among those who have worked on the development of crush grinding is Thompson Grinder Co. Inc., Springfield, O. Company's engineers have evolved a method to produce flat form contours in a single co-ordinated machining process which utilizes two crushing rolls.

It has been found that in crushing a wheel initially from a straight face to the desired contour, the master crushing roll will lose some of its form due to the amount of crushing that is involved in this initial truing operation. To overcome this difficulty, the Thompson Truforming process uses two master crushing rolls, lined up with respect to the grinding wheel and the work piece, so that any time the work roll shows a tendency to be out of tolerance with the dimensions required, the roll can be readily reprocessed.

The two crushing rolls are mounted on the table. Initial crushing and truing of the wheel is done by means of the work roll; the second roll, called the "reference" roll —spindle mounted on the opposite end of the table—is used for touching up the wheel and correcting form loss. After the grinding wheel has been touched up on the reference roll it can be run at full grinding speed against the work roll to bring it back to true form. Reprocessing is thus done on the machine without removing or disturbing wheel, work or rolls.

The grinding wheel is crushed from the table so that the direction of contact-pressure between grinding wheel and crushing roll is the same as it is between grinding wheel and work. Thus, the wheel is crushed under the same conditions and from the same reference plane (the table) as the work is ground. Displacement of the natural bearing clearances and variation in oil film may occur and cause inaccurate work when crushing apparatus is not mounted on the table.

It is possible for the operator to compensate for retruing of the grinding wheel with respect to the finished height of the work piece by a single setting of the down-feed hand-

(*Please turn to Page* 134)

"Flying Mike"

Continuous gage for rolled strip has throat depth of 10 in., making it possible to measure to center of material 19 or 20 in. wide

CONTINUOUS "flying mike" which will reach in farther on rolled strip material than standard gages has a throat depth of 10 in. which makes it possible to measure to the center of strip material up to 19 or 20 in. wide. With narrower strip material, gage shown in Fig. 1 will allow full width of strip material to be measured.

Casting of the gage head is made of Invar which has the lowest coefficient of expansion of all metals. Therefore, stability of the gage under the most adverse conditions is assured.

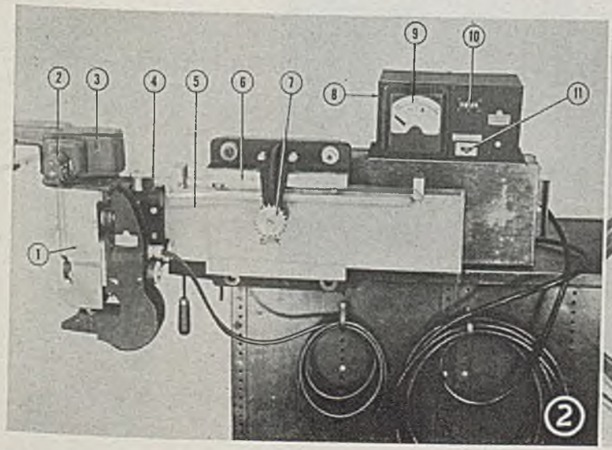
Deep throat casting can be assembled by the manufacturer, Pratt & Whitney, Division Niles-Bement-Pond Co., West Hartford, Conn., to any standard Model D gage. This unit then can be assembled to the present designed mill mountings where the rail is mounted vertically.

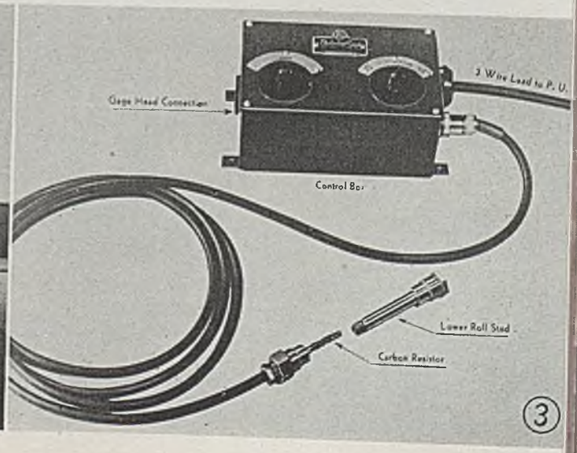
Model D-10 differs from company's Model D only in depth of throat and main casting. All other parts are interchangable.

A remote control unit, shown in Fig. 2, is available for use with the continuous electrolimit gage. Frequently, it becomes desirable and necessary to set the continuous gage from some other location remote from the gage. The remote control unit, when combined with the continuous electrolimit gage, will allow such a setup.

Handwheel setting knob on the gage head is replaced by a reversing Selsyn motor and worm gear drive. The counter, which indicates gage setting on the head, re-

(*Please turn to Page* 135)





By S. C. AVALLONE
Sales Manager and Chief Metallurgist
Spencer Wire Co.
West Brookfield, Mass.

Fine Steel Wire

SOME PROBLEMS IN HIGH-SPEED DRAWING

Thorough cleaning of all foreign matter from surface of wire is essential to avoid abnormal die life and to obtain peak production. Coating product at cleaning crane prevents discoloration and rust. Concentration and temperature of lubricant have important bearing on efficient drawing

DEMANDS for fine steel wire drawing in the emergency were so great as to require an intensive study of the following operating features which have been persistent sources of trouble in the efficient production of fine wire.

Cleaning and Coating: Cleaning of precision wire for fine drawing presents a problem because of the small sizes involved. Moreover, the effects of faulty cleaning are pronounced because of the nature of the operation—wet drawing at high speeds of 1800 to 2500 fpm. Therefore peak performance in the drawing operation cannot be attained unless the wire is thoroughly cleaned—free from all foreign matter, such as smut, lime, drawing, lubricant and oxides.

Dangers in cleaning are undercleaning and overcleaning. Undercleaning is the incomplete removal of material which would interfere with subsequent drawing. Overcleaning results from excessive acid attack producing an open and rough surface. Either condition will cause abnormal die wear which of course means high die replacement and consequently low production.

To safeguard against undercleaning some mills have resorted to what is called a double cleaning or rust-blueing operation, that is to say, the material is cleaned for the first time, allowed to rust, and then re-claimed. However this is a costly procedure and should not be indicated unless absolutely necessary.

The following sequence for cleaning is recommended:

1. Immersion in 18 per cent cold hydrochloric acid, rinse.
2. Immersion in hot 6 to 8 per cent sulphuric acid, rinse.
3. Immersion in 25 per cent cold sulphuric acid, without inhibitor, rinse.

A new development designed to eliminate cleaning, coating, and extra handling has been the bright annealing (protective atmosphere) of the process wire. In the case of certain grades of coated wire, liquor coating is placed on the rod and drawn down to final annealing size, annealed under gas, removed from pots, and taken directly to the wet drawing room. This has not only proved successful but economical and has in recent years had extensive application.

Various coatings are used as a lubricant for a fine drawing namely, lime, liquor coating, (copper-tin) or copper. For best results in drawing the coatings should be adherent, fine grain, and uniform. Where a lime coating is desired hot, light lime should be used and the coating thickness developed by several dips allowing for partial drying before each dip in lime. The fine grained character of the liquor coating is, of course, controlled by time, temperature, and concentration of the relative proportions of copper and tin.

Another development in the coating operation is the coating of wire at the cleaning crane and immersion in a hot alkaline protective coating to prevent discoloration and rust. Wire coated in this manner is sent to the fine wire drawing room and drawn from a dry reel. This arrangement has the advantage of uniformity of coating and the elimination of wet tubs.

Proper Pay-off: As a result of accent on drawing speeds, studies on time losses in the operation of the drawing machine have revealed that 30 per cent of the downtime is due to improper pay-off of wire because of snarls and breaks on the reel. A great deal of the trouble can be minimized by drawing the process wire in 24 or 27 in. inside diameter coils, thereby reducing the speed of revolution of pay-off reel and allowing more time for strand orientation. Wherever possible the ideal arrangement would be to pay off wire from spools.

Machine Design: Economical mill practice in fine wire drawing emphasizes machine design which will carry a heavier load faster. This means that the setting, weight, and construction of the machine should be so engineered as to minimize vibration. This also means that the die-stands should have accurately machined die pockets. Vibration reduces the wear and efficiency of working parts.

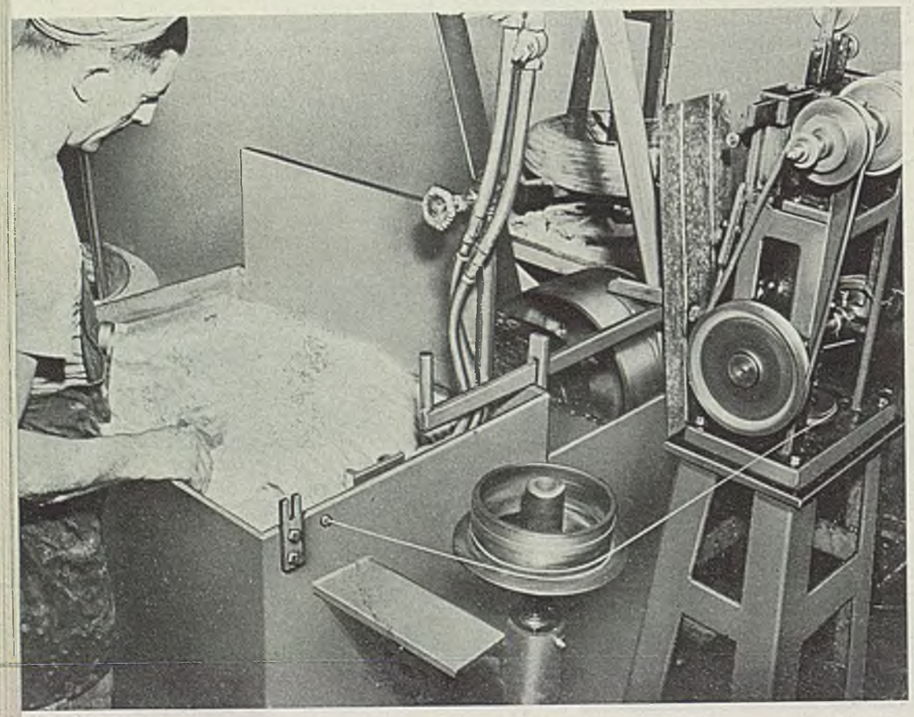


Fig. 1—High-speed equipment for the wet drawing of wire

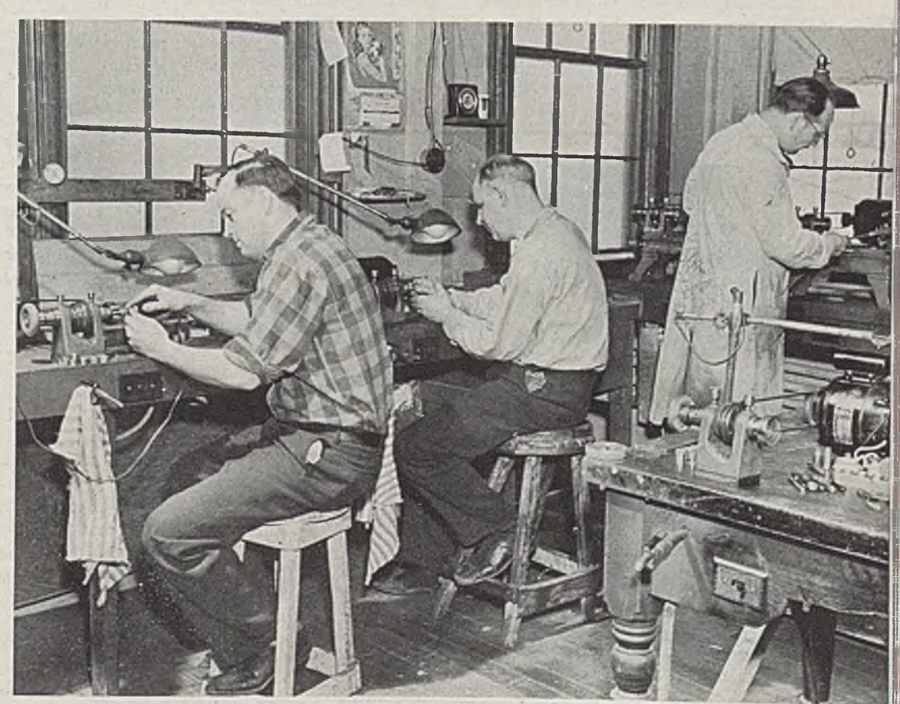


Fig. 2—Die room where dies long in the die block are serviced for further work

As regards the design of the actual drawing mechanism it is an established fact that slippage in the successive steps of drawing is one of the major causes for breakage in the machine. The uneven tension on wires because of slippage places varying loads on the dies with the result that the requirement for each draft as set up is changed beyond the ability of the machine to handle such alterations. The end result is breakage.

To eliminate this factor the steps of the drawing cone should be designed to receive the lineal increase in wire as a result of successive drawing. This arrangement insures a smooth and efficient drawing operation as regards production and die life.

It has been found that 14 per cent reduction in area per draft on all dies except the finish die (10 per cent reduction of area on the finish) is satisfactory on ferrous materials.

Dies: The wire drawing die is the "heart" of the wire drawing operation. Therefore it is imperative that the design as regards approach, bearing length, and polish be suitable for the type of wire being drawn. In the making of a die one should be guided by the objective of making a die as "free drawing" as possible.

Past experiences in drawing types of wire prompt the following general statements. For drawing low-carbon and soft-coated (zinc and tin) wires short bearings should be used. In drawing high-carbon wire, alloys, or materials whose analyses possess rapid work-hardening properties long bearing dies are indicated.

Lubrication: In recent years studies on wet drawing lubricants have demonstrated that metallic soaps such as calcium and aluminum stearated have specific application in high-speed drawing of wire.

Lubricants used in high-speed machines should have a high E.P. (extreme pressure) value and stability. It has been observed that a lubricant of improper concentration or high instability at moderate temperature (90 to 100°F) can cause no end of trouble in the drawing machine.

Importance of Lubricants

Lean lubricant means excess die pull and cutting out of dies. Rich lubricant produces a shoved-up (drawing small) condition. From this should be evident that the determination and control as regards concentration and temperature of a lubricant are of utmost importance in efficient drawing.

Take-Up: A substantial percentage of fine steel wire is being required on spools. For economical and efficient working the take-up should be sufficiently flexible to permit the production of coiled or spooled wire. This arrangement if properly designed eliminates the necessity for re-spooling, which on fine sizes is a costly procedure.

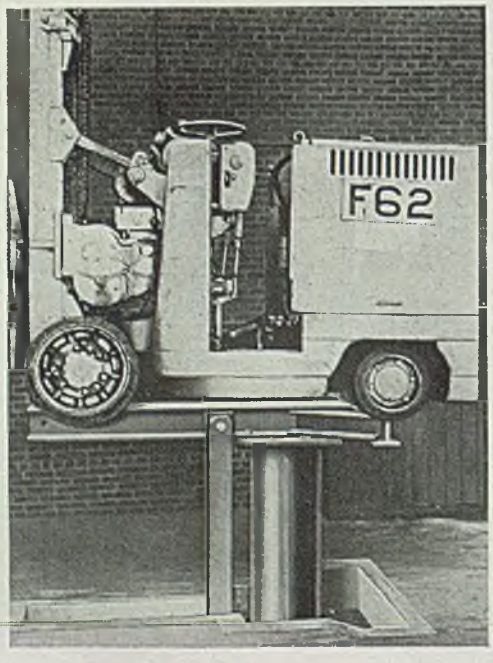
Trends In Fine Wire Markets: Prior to the war, substantial quantities of quality precision fine wire were imported from the continent since few American wire companies were equipped to produce economically, fine steel and alloy wires in the quantities and quality required. With the outbreak of the war, American ingenuity and resourcefulness, was of necessity, put to work to produce in large quantities, wires which heretofor had been imported. This meant an intensive study on the preparation of special alloys, knowledge of heat treatment and workability of these materials and the construction of drawing equipment specially designed to manufacture these materials in quantities demanded by the war effort. This technological advance has tremendously expanded the fine wire market, and has particularly affected the electrical, electronics, rubber and brush fields.

Electrical: Production of household electrical appliances during the war were reduced to nil. The postwar demands for these products will be unprecedented. This means the marketing of various types of fine resistance wires which will reach new peaks. Moreover, there will be an increasing demand for a variety of new low-cost alloy wires, which as a result of metallurgical research, have been tailored for longer life and greater efficiency. The increased operating speed in the manufacture of resisting elements will necessitate wire with flawless unwinding and uniform physical properties from the wire manufacturers. These wire characteristics will be basic features in determining the competitive position of wire manufacturers.

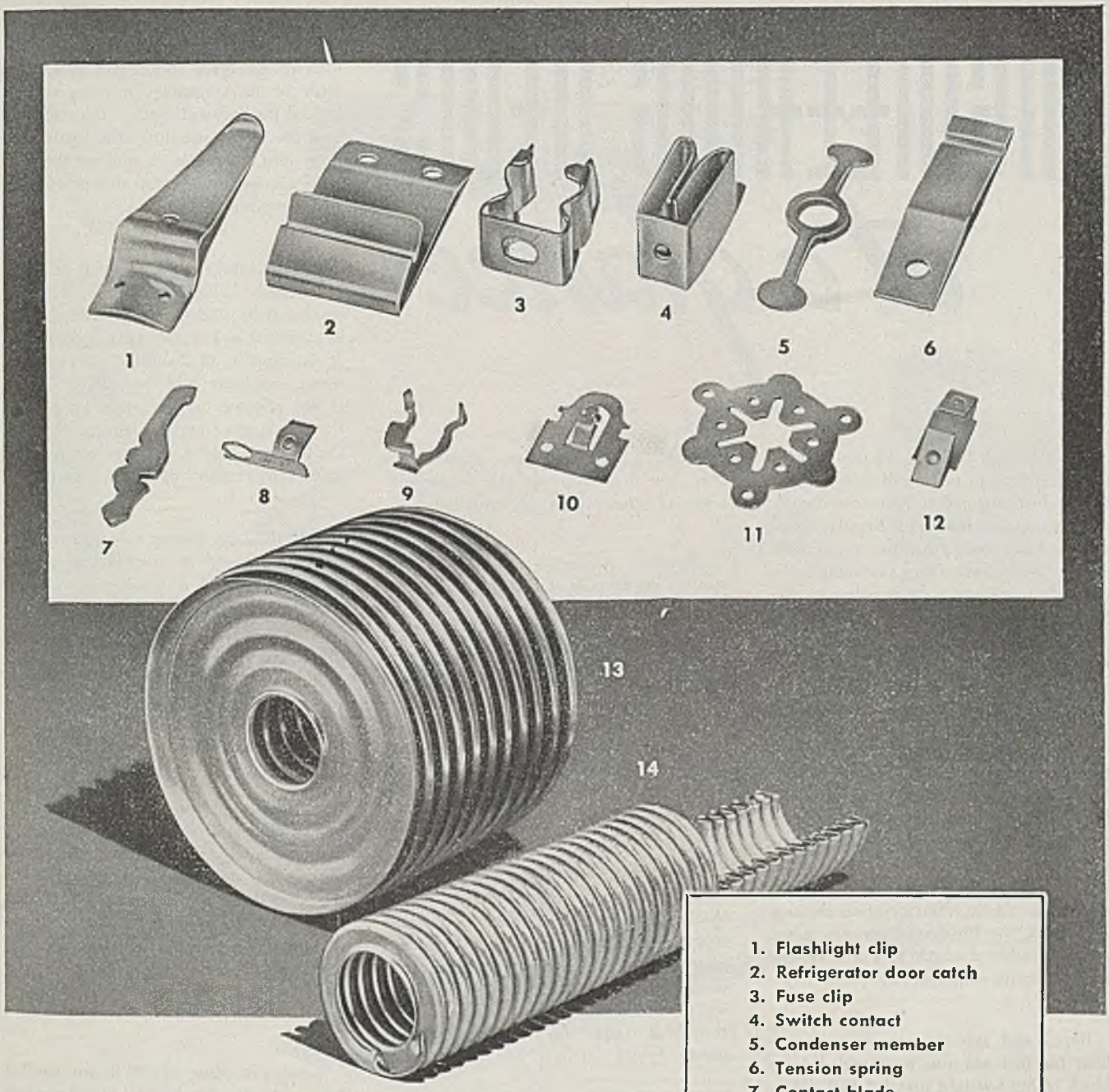
Electronics: Under the impetus of the emergency, this field has sky-rocketed into a major position in industry. Fine wire which is the "working medium" of this industry will have considerable demands. The applications of electronics will be primarily in the realm of control and recording mechanisms for new and various manufacturing operations, and as such, will unquestionably have extensive use in the postwar world. Most of the fine wire used in electronic work will require exact size and shape, special finishes and high sensitivity to changes in electrical energy. In short, precision wire will be a "must". The use of recording wire is one of the hundred uses which fine wire will have in this field of electronics.

Rubber: For the past few years the rubber industry has been working on a development to prolong the life of automobile tires by re-enforcing the fabric with fine high-tensile wires. The requirements of this development which may be a single wire interwoven with cotton fabrics, or interlaced cable cords, will be high strength, flexibility and high elasticity. The volume of fine wire for this purpose may assume primary significance in fine wire production.

Brushes: Alloy steel fine wire in brush manufacturing has had, in recent years, considerable usage. The use of beryllium copper, stainless steel, both heat treatable and non-heat treatable have had special applications in special-purpose brushes.



SERVICING FACTORY TRUCKS: Industrial power trucks at the Massena, N. Y. plant of Aluminum Co. of America are serviced by this hydraulic elevator developed by Revolvator Co., North Bergen, N. J. Platform, consisting of one longitudinal and one transverse H-beam lies flush with floor when in lowered position. In raised position, axle blocks under both axles hold truck securely with wheels turning free. Safety guard drops into vertical position when elevator is raised



1. Flashlight clip
2. Refrigerator door catch
3. Fuse clip
4. Switch contact
5. Condenser member
6. Tension spring
7. Contact blade
8. Sliding contact
9. Guide fork spring
10. Switch tension spring
11. Spring pressure plate
12. 3-way plug contact
13. Tin-coated bellows
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ENGINEERING NEWS *at a glance*

From Philadelphia, L. Morton Morley, vice president in charge of sales, reports Brown Instrument Co., industrial division of Minneapolis-Honeywell Regulator Co., soon will introduce a number of electronic devices which will affect favorably many diversified industries. According to Mr. Morley, the developments will extend uses of electronic instrumentation, particularly in obtaining higher quality control. . . .

Life of refractory linings incorporated on a water-cooled door for open hearths ranged from 150 to 200 heats under actual operating conditions in a large, 11-furnace open hearth shop in West Virginia, it was revealed recently. The door, development of William M. Bailey Co., is designed with water-cooled ribs which divide the plastic refractory into sections. The latter, the Pittsburgh concern states, not only adds strength to the door, but also eliminates warpage. . . .

Rapid and safe emergency source of heat for first aid use is provided by a block of light-weight metal developed by Mines Safety Appliances Co., Pittsburgh. Wrapped in a towel or blanket, the heat block is said to maintain its temperature for about an hour in treating shock victims. A newly developed chemical compound, sealed in the metal block in form of a charge, supplies the heat, the company states. . . .

Corrosion to some extent is inevitable in all but the "noble" metals. Prevention of undue corrosion of steels in service is said to be not a single problem, but many problems, depending on types of environment and atmosphere, Dr. John Johnston, director of the research lab for U. S. Steel Corp. at Delaware, reports in "Corrosion of Steels," a booklet just published by U. S. Steel Corp. Subsidiaries, Chicago. Roughly, a copper steel containing 0.20 per cent copper is said to be twice as resistant to atmosphere as a plain carbon steel, but this advantage also varies with types of atmospheres, he stated. . . .

Thermal properties of instrument springs are usually of the utmost importance, and where a spring unit is made of several parts such as a bellows and helical spring, the parts must be accurately tested to determine the effect of temperature on their resiliency. When this has been determined, they must be perfectly matched to give desired thermal properties, a booklet now being distributed to instrument makers by All-Weather Springs of New York, reveals . . .

Tornos Swiss automatics are now being sold and serviced in the United States by Wickman Corp., the concern revealed recently. In addition, the Detroit concern plans to maintain a comprehensive stock of the machines plus equipment and service parts. The automatics are used to turn out parts for precision instruments. . . .

An alloy steel, electrostatically-coated roofing and siding material reported by Reliance Steel Products Co., McKeesport, Pa., is now being produced in colors. The new material is said to have a tough copolymer resin coating which makes it immune to atmospheric corrosion or chemical attack, besides being highly fire resistant. . . .

Age-old problem of getting a line across a river during the preliminary work of constructing a bridge, or pulling barges across, was solved by the Army by use of a double-motor harpoon rocket, according to "U. S. Rocket Ordnance." Device consisted of two 4.5 in. rocket motors connected in tandem and fitted with a pointed head equipped with four folding spades. A wire cable was attached to the rear nozzle plate. On firing the harpoon rocket, rear motor was ignited. This drove the rocket upward, trailing the wire cable behind it. After the rocket had passed the peak of its trajectory, a delayed fuze ignited the forward motor. This accelerated the rocket and drove the spade head deep into the earth. A pull on the wire rope opened the spades and provided a solid anchorage. . . .

Ready visibility of solutions is provided by flexible, elastic tubing now being produced by Boder Scientific Co. for use in chemical and experimental laboratories. It is capable of handling concentrated nitric, sulphuric and hydrofluoric acids, is not affected by oxidation or greases, the Pittsburgh company reports. Name of the tubing is Tygon, and it is said to withstand temperatures of 50 to 225° F. . . .

In Baltimore, Pemco Corp. revealed it recently released its porcelain enameling reference manual which has been in research and development stages for the past 4 years. A company spokesman stated the manual correlates, for ready reference, essential knowledge of porcelain enameling plant control in relationship to importance of cost reduction, and it tries to correct enameling shop problems. . . .

A gage so calibrated that when it is placed against a piece of pipe or conduit, it immediately registers the exact size designation understood by the trade, is the latest development reported by Three-Point Gage Co., Chicago. It is said to measure all pipe or conduit from ⅛ to 12 in. inclusive. Weighing only 2 oz, the gage easily fits into a man's shirt pocket when closed. . . .

Loads exceeding 25,000 lb are handled by a hook developed by American Chain Ladder Co., and now released for civilian applications. Originally designed for Navy use in transferring supplies and ammunition while ships were underway, the hook has a grab opening of 3 7/16 in. and bail opening diameter of 4 1/6 in, the New York concern reports. . . .

Added rust resistance is provided on iron and steel surfaces by a chemical immersion process which imparts colors to metals when used in connection with its Parkerizing system, Parker Rust Proof Co., reported recently in Detroit. Termed color Parkerizing, the process is said to be of great value in using colors for the identification of parts, such as springs and screws. According Van M. Darsey, Parker president, after Parkerizing and rinsing, metal articles are carried directly to the

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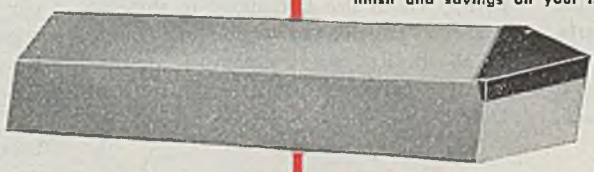

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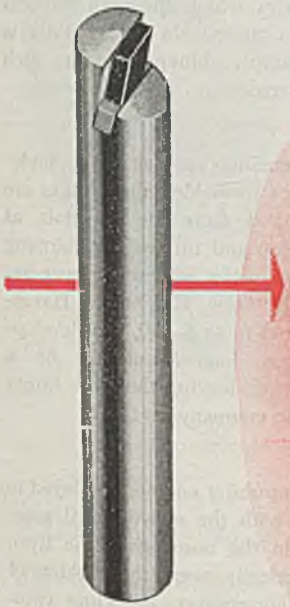

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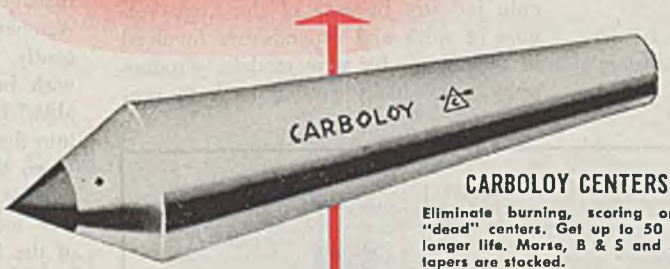

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aqueous color bath without drying, immersed 2 to 6 min, rinsed and dried. The phosphate coating is insoluble in water and does not cause any appreciable build up on threaded or assembly parts, it is said. It was developed by Mr. and Mrs. James N. Tuttle of Rust-Proofing & Metal Finishing Corp., Cambridge, Mass., jobbing plant operators for Parker. . . .

R. W. Goodwin, Goodwin Mfg. Co., Cuyahoga Falls, O., reports his company is now going into production of a 1 and 2 in. capacity, quick-acting collet chuck which was developed nearly a year ago, but kept off the market due to war work. The development, through cantilever action of its hardened steel fingers, provides sure, powerful gripping action when used in chucking operations on a variety of machine tools. It is controlled by a short lever requiring only fingertip force to open or close the collet, and its threaded nose cap is easily removed for changing collets or turned to adjust gripping pressure, he states . . . .

Electrical contacts of Carboloy cemented carbide are reported to be giving increasingly better service in modern high speed, low-amperage telegraph transmission units. Higher speeds at which modern apparatus functions creates a tendency for metal contacts to fuse and oxidize, necessitating daily cleaning or burnishing to prevent eventual freeing of contacts and subsequent interruption of circuit operation.

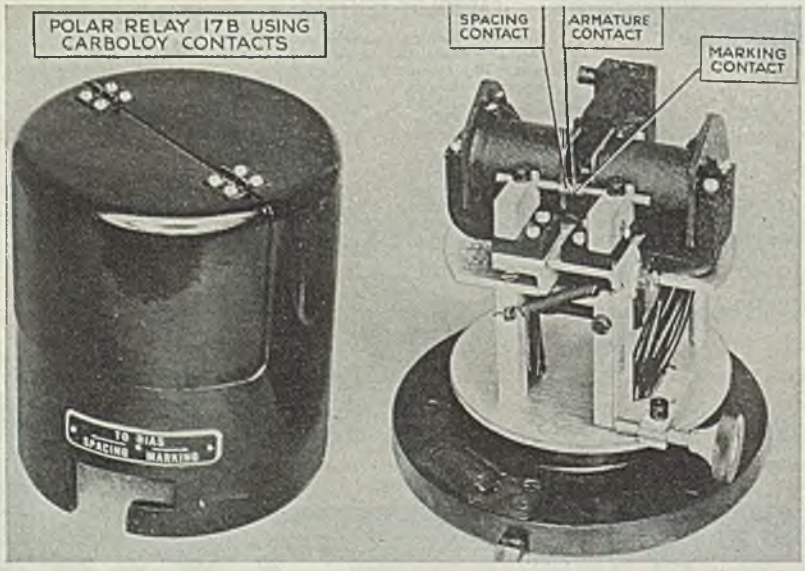
In the cemented carbide contacts, material which becomes loosened through arcing drops away from the carbide instead of fusing to the opposite contact.

To manufacture the contacts, tungsten ores are carefully selected for purity. Grain size is reduced to smallest particles possible to obtain a carbide suited ideally to the electrical requirements, according to Carboloy Co. Inc. of Detroit. . . .

Experimental work at Watson-Stillman Co., N. J., is being done on a 1-oz injection molding machine to relieve larger equipment, it is reported. The new machine, a self-contained fully hydraulic unit, is powered with a vane type pump, and is capable of supplying controlled pressure up to 1200 lb, it is said. . . .

In an interview in Cleveland, George T. Christopher, president and general manager, Packard Motor Co., said his company has gone back entirely to SAE steels in its three lines of 1946 automobiles, preferring not to take a chance on NE steels developed during the war. One of these days, however, a switch will be made to nitrided gears and bearings.

Like the other companies, Packard is finding it difficult to supply body and other sheet metal parts for models earlier than 1942 since dies were scrapped as a war measure. Packard already has spent over half million dollars in replacing these dies. Mr. Christopher expects the next 15 to 18 months will be the most critical in the history of the auto industry because of the huge volume of work and expenditures involved in tooling up for new models. Productivity is gradually getting back to pre-war levels. Before the war, for example, crankshaft grinders were turning out 13 per hour. Output now is back to 11½ per hour. During the war, workmen were accustomed to working on Rolls Royce crankshafts which required more time individually. A number of smaller companies which started up in the last four or five years to do sub-contract war work from blueprints supplied by contractors are trying to get into the automobile accessories business. If these companies expect to stay in business, he said, they must design and engineer parts and accessories which the auto builders can buy at a price. No auto builder is going to supply blueprints for such parts, he stated . . .



Carboloy cemented carbide contacts, which have been brazed to the marking and spacing contacts, and armature in this Western Union relay, are self cleaning

Synthetic enamels such as alkyds, melamine and urea formaldehyde coatings are readily stripped from such metals as aluminum, zinc and tin without harming the metal by using a new stripper reported by Enthone Co., New Haven, Conn. Referred to as S-300, the development removes enamels cleanly by a wrinkling action, leaving the work bright and clean, the company says. . . .

The jet propulsion engine, employed in combination with the conventional gasoline engine in the nose, gives the Ryan Fireball superiority over other fighters of comparable horsepower, including twin-engined craft, Al Conover, flight research manager and chief test pilot for Ryan Aeronautical Co., San Diego, stated recently. "The performance of the fighter with both engines operating is remarkable," he said. "In a climb it fairly shoots into the air, and the jet engine takes over when the conventional engine begins to wheeze for sea-level air." In speaking before members of the San Diego section of the Institute of Aeronautical Sciences, the other day, Ben Salmon, chief engineer for the same company, stated the plane which is designed around a composite power plant, jet and propeller, will excell in overall performance. He said in the Navy fighter, the Fireball, all good characteristics of both propeller drive power plant and of turbo-jet were combined and found to compliment each other to overcome deficiencies of both. . . .

Alundum abrasive when used in wet tumbling processes in a special form developed by Norton Co., Worcester, Mass., is said to easily maintain or improve microinch finish on metals. The aluminum oxide product also is excellent for cleaning and deburring, providing continuous fast-cutting action without glazing, according to the company. Normally it is used with water and a cleaner. . . .

QUALITY CONTROL

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Sky-Hook Bridge

Has Narrow Escape

Failure of lifting mechanism to function leaves aerial lift bridge in partially elevated position with large ore freighter headed for structure. Quick action on part of bridge tender averts serious accident. Interesting details of this Duluth bridge and its operation are presented in the accompanying article

WHEN the alarm whistle sounded, Ernie Gustafson glanced out of his Canal Park office window and froze with apprehension. As operations officer for the army engineers in Duluth, it was part of his business to judge the weight of ships, wind drift or the imminence of collision. What he saw now caused him to start from his chair and roar orders to clear clerks and draftsmen out of the building.

An ore freighter—one of the big babies that haul up to 16,000 tons each trip—was halfway through the Duluth ship canal headed straight for the aerial lift bridge. But something was wrong. The bridge was only halfway up! Always, at this stage of passage the 900-ton span should have been in the clear of the tallest mast, but now it hesitated and wavered dead ahead of the big freighter.

While the people in Ernie's office disregarded his orders and watched in horrified silence, the span started lifting. Seconds later, when it seemed as if surely the freighter must crash head on, the span barely cleared the top of the mast 135 ft above the water just as the ship sailed safely underneath the bridge.

What happened was the only possible mechanical condition which might cause world-famous aerial lift span at Duluth, Minn. to fail to open, and that had to be coupled with the human equation before a crash was possible. The bridge, which normally operates from 153 big storage batteries in a concrete vault beneath one of the abutments, has two power sources for charging them. The source of current can never fail, but the 900-ton bridge span is so delicately balanced that mechanical brakes must sometimes be used to halt the upward travel of the big bridge deck. The brakes worked too well that summer day in 1935.

They went on automatically when the operator began raising the span too fast. Excited because he could see the big freighter bearing down upon him, the

By RAY DAY

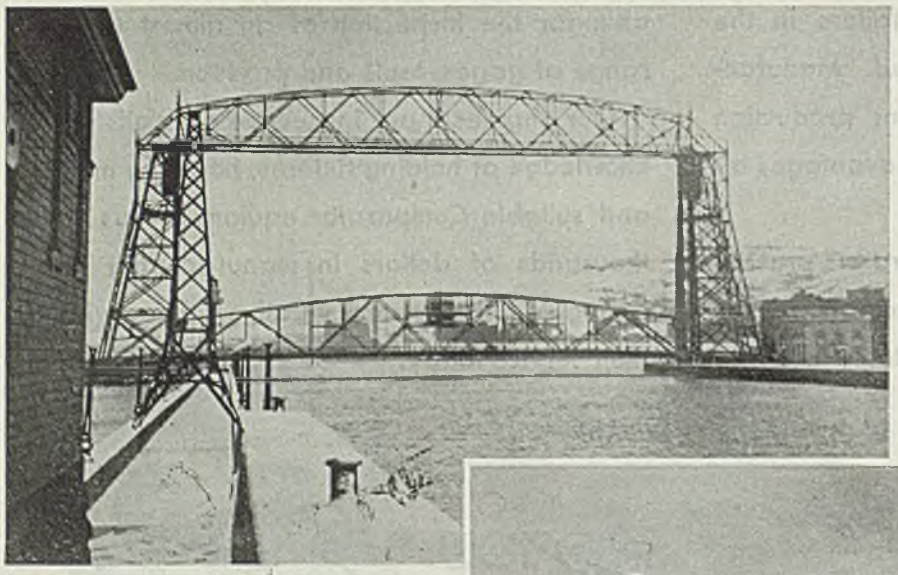

Fig. 1 (above)—Lower level span which carries traffic from Duluth to Park Point, Minn., is one of the first aerial bridges of its time

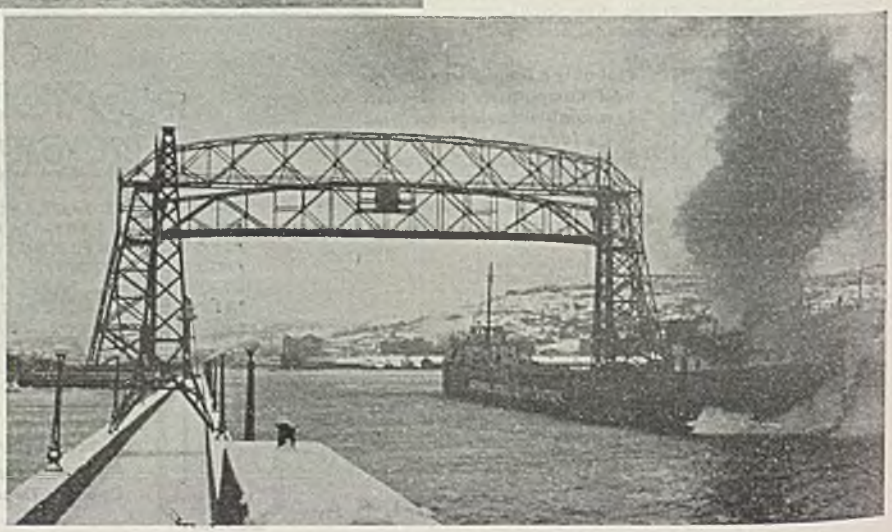

Fig. 2 (right)—Span in elevated position has a bridge deck clearance of 135 ft

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operator took several precious minutes trying desperately to release this brake with his usual controls. They wouldn't work. When he applied power with the brake on, the big automatic circuit breakers kicked out like a fuse in the switch box at home. Finally he collected his wits well enough to remember that he could release the brake by hand, which he did barely in time to avert a serious accident. It could have wrecked a ship, the bridge, and some of the buildings which stand along the canal.

Nowadays the city of Duluth keeps two operators on duty in the control house of the bridge at all times as a safety measure to prevent just this kind of contingency. About the only thing that could happen now would be for both operators to be striken simultaneously by a heart attack.

Last season the Duluth bridge was raised more than 6000 times to pass 7010 treasure ships—long ore boats which carried more than 60,000,000 tons of iron ore from the Mesabi range cities of Hibbing, Eveleth and Virginia. In one day 86 ships sailed into Duluth harbor under the aerial lift bridge. An accident here during the war years could have slowed down steel production seriously at South Chicago, Gary, Cleveland, Buffalo and other points far down the lakes. But the men who man the bridge came through with flying colors, and ever since that day in 1935 nothing has ever happened that resembles an accident.

Present Span Built in 1929

The present span, which was built in 1929 to replace the ancient "cable car" ferry, carries pedestrian and automobile traffic from Duluth to the residential district on Park Point. Park Point is a 4-mile long sand spit which stretches down Lake Superior several thousand feet off-shore from the beach. It makes the harbor at Duluth the finest natural one on the lakes. All the ships entering this great port pass under the bridge and leave, loaded with iron ore through the channel at Superior, Wis. So narrow are both channels that one way traffic is restricted in each.

In the old days before automobiles became so plentiful, a small cable car suspended by old style wire rope from a tower, shuttled passengers, horse drawn vehicles and a few early automobiles across the water. When the car was on either side it was out of the way of passing ships. By the late 1920's the waiting line at the cable car grew too big, and public pressure forced the construction of the present bridge. It was one of the first aerial lift structures of its time, and has since become the pattern for many other similar bridges across the Welland Canal and tributary streams of the Great Lakes farther east.

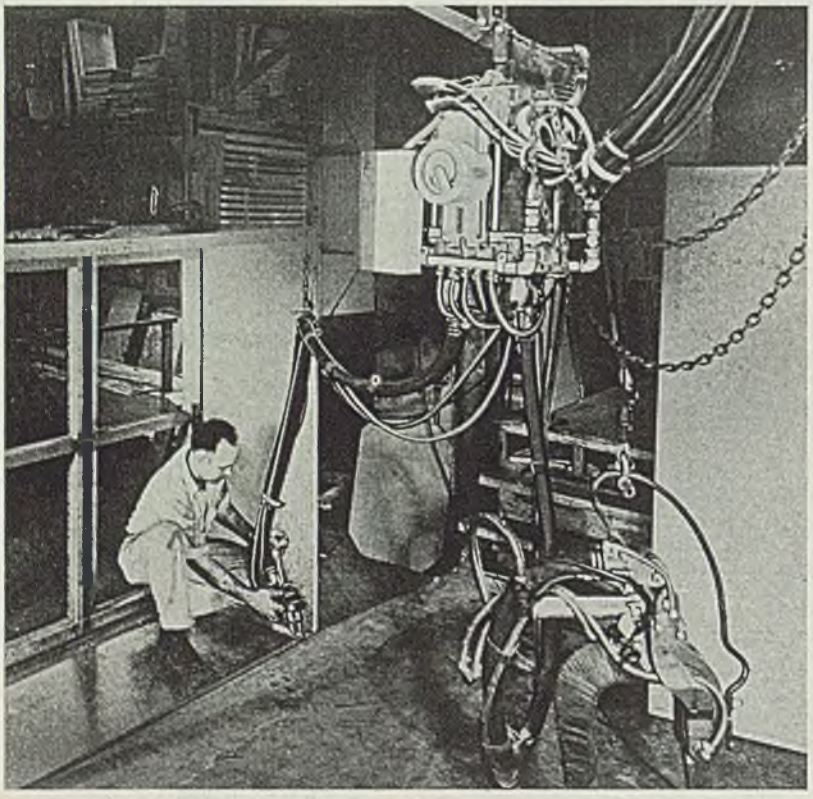
The old towers and the upper framework were strengthened by the Kansas City Bridge Co., contractors who also built and installed the 900-ton span. The bridge towers rise 250 ft above the water, allowing a bridge deck clearance of 135 ft; enough to clear ore boat masts. Two concrete counterweights, weighing 450 tons each, are hooked one to each end of the span, and lead over sheaves 10 ft in diameter. They keep the deck in a constant state of balance, and so delicately, that small counterweights are also added or taken off to balance the weight of snow or sleet as it falls on or melts off the bridge. The electric motor which raises this ponderous weight actually exerts less horsepower in doing its work than the engine in your automobile!

The motors drive the bridge deck up and down by preformed wire rope. Preformed rope is as much an improvement over the old style wire rope as the present bridge is over the cable car. The preformed wire cables which drive the 900-ton deck span are ¾-in. diameter.

Preformed wire rope is now made by all leading cable manufacturers in the United States, by an improved process which pre-shapes each wire into the spiral shape it assumes in service. The process relieves each wire of the stress it would have if it were forced in place. Thus, when a preformed rope passes over sheaves as it must in the Duluth bridge rigging, it lasts much longer than non-preformed because it has none of the latter's inherent inner stresses. Although cables are inspected frequently and a high factor of safety used, preformed cables last from two to three seasons, or long enough to make from 11,000 to 18,000 lifts, depending upon traffic.

Ice is the bridge tender's nemesis. Mark Twain once said "The coldest winter I ever spent was one summer in Duluth." Before the final freezeup occurs to make winter shipping impossible, there are many days when sleet and ice coat the bridge. Often in October and November rain falls on the cold bridge steel and freezes. When this happens, the bridge tenders get out their blow torches and begin swearing.

The worst trouble spot is on the heavy vertical copper wires at the south pier, where rolling trolleys take power for the



PORTABLE SPOT WELDER: Two welding guns, operating from a single transformer with a single timer and air-hydraulic booster, are used at Vering Mfg. Co., Los Angeles, in production of refrigeration units. Guns, made by Progressive Welder Co., Detroit, can be operated in either vertical or horizontal position. Entire assembly is mounted on chain hoist traveling on overhead trolley. One gun has short throat, the other a deep throat to reach all joints. Operator is shown welding a joint between bottom subassembly and frame of walk-in cooler made of 22-gage stock

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The inherent strength of Otiscoloy is obtained without mechanical working or heat treating, which gives it exceptional weldability and formability for a high-tensile steel. It is being used successfully to reduce dead-weight and increase pay load in railroad freight cars, in trucks, buses, mine cars and other equipment. Otiscoloy is also resistant to abrasion and corrosion. Our metallurgical engineers will be glad to discuss the application of Otiscoloy to your production problems. Write for further information.

JONES & LAUGHLIN STEEL CORPORATION

PITTSBURGH 30, PA.

electric motors. When ice forms on these wires, electrical contacts are made and broken, causing the span to lift jerkily. All this ice has to be melted off by blow torches, sometimes in a blizzard or zero weather.

The bridge tenders, with years of experience behind them, soon get so they can identify a ship as soon as her stack clears the horizon. They can also estimate accurately just how far out she is and how long it will take her to enter the canal. They no longer take chances on raising the bridge at the last minute, but start as soon as the vessel blows her passing whistle. It takes 42 sec to raise the span, and about 7 min for the total cycle. On a busy summer day automobiles accumulate on each side and tempers fray a little, but for the most part both land and water traffic is handled adequately.

On a warm, still day the bridge will coast up to the top of the towers after power has pulled it up only about halfway. But on days when ice bedevils the tenders, or when a good stiff wind is lashing in across the lake from the Canadian side, friction is great enough for the deck to require electric motor power all the way.

This season the tenders even had black bears on their hands! One 365-lb bruin crossed the bridge and trapped himself on a concrete parapet wall on the south side of the canal. When the bridge tenders and a lighthouse keeper at the end of the canal spread the alarm, police came and shot the bear.

All of which proves that anything can happen at the world-famous bridge, and frequently does.

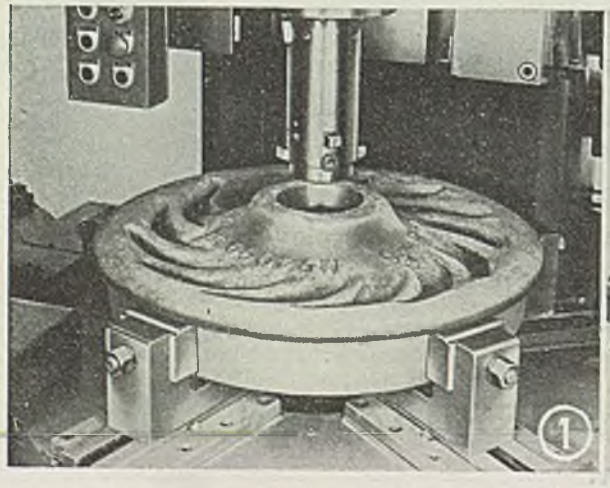
Automatic-Cycle Rough and Finish Boring of

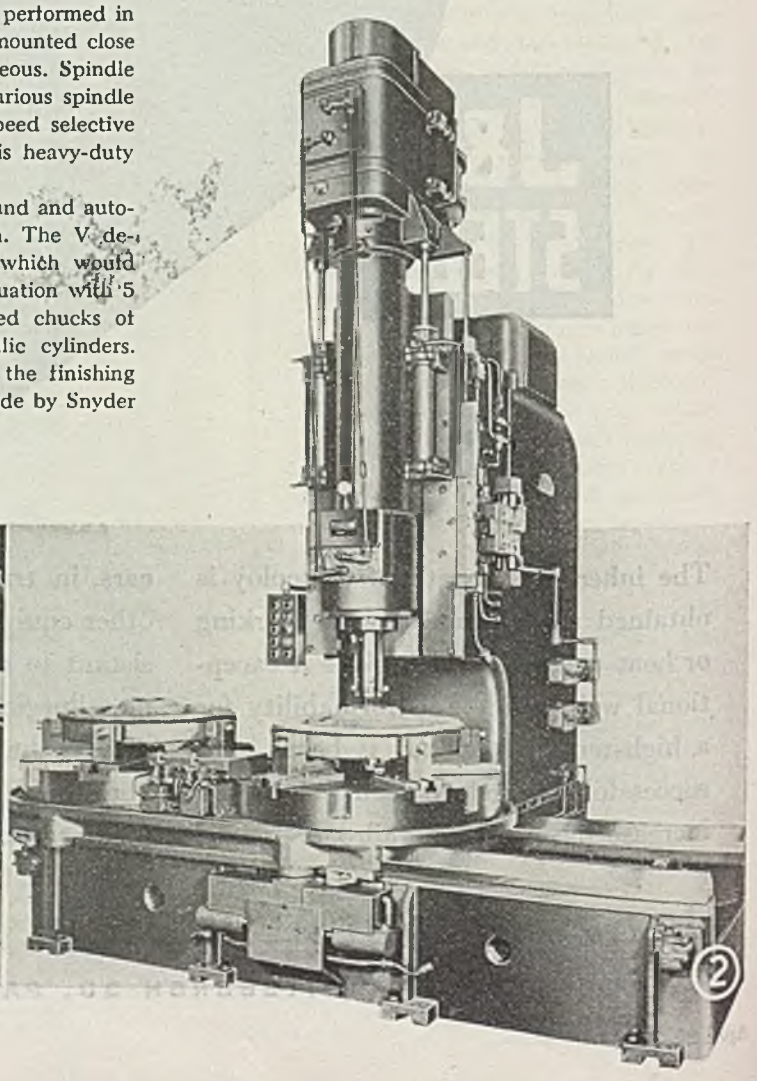
RAILROAD CAR WHEELS

SPECIAL-PURPOSE, automatic-cycle machine for rough and finish boring wheels for railroad cars, shown in Fig. 2, combines improved accuracy with increased production rate and is engineered to maintain its efficiency over an estimated lifetime of 20 yr. On steel wheels, the cutting time for boring 1/8 in. stock per side is 1 min 20 sec for a hole 7 in. long and 7 in. in diameter. Same amount of stock is removed from cast iron wheels in 50 sec. Cutting tools are tungsten carbide tipped.

Chamfering and facing a 1½ in. flange may be performed simultaneously with the boring operation. A 19-in. stroke is provided so that rough and finish boring may be performed in succession. In Fig. 1, rough and finish tools are mounted close together so that operations are, in part, simultaneous. Spindle feeds are from 2 in. to 24 in. per minute and various spindle speeds are provided through the use of a four-speed selective transmission or a variable speed motor. Spindle is heavy-duty with taper roller bearing mounting.

Table travels upon V-ways, case-hardened, ground and automatically lubricated to provide smooth operation. The V design allows for normal wear without side-play which would impair accuracy. Table travel is by hydraulic actuation with 5 sec time interval. Work is held by two 5-jawed chucks of 42 in. capacity, operated by individual hydraulic cylinders. Work-cycle is automatic. Capacity is 20 hp for the finishing machine and 30 hp for the roughing machine, made by Snyder Tool & Engineering Co., Detroit.





Looking for a better Source for **FORGINGS?**

IF you feel somewhat "up against it," trying to line up a reliable mass-production source for quality forgings, here is a suggestion which may prove helpful:

Talk it over with a TUBE TURNS representative.

TUBE TURNS is organized for *service* with a complete die design department, a major tool and die shop, laboratory and heat treating facilities centered around mechanical and upset presses ranging up to 9-inch sizes.

Together with proved ability at developing tailor-made procedures for specific jobs, TUBE TURNS' set-up in many cases makes it possible to produce forgings of better grain flow, better density, and closer tolerances. Minimum wear on dies used in mechanical press forging makes them longer lasting and assures more perfect production over a longer period of time.

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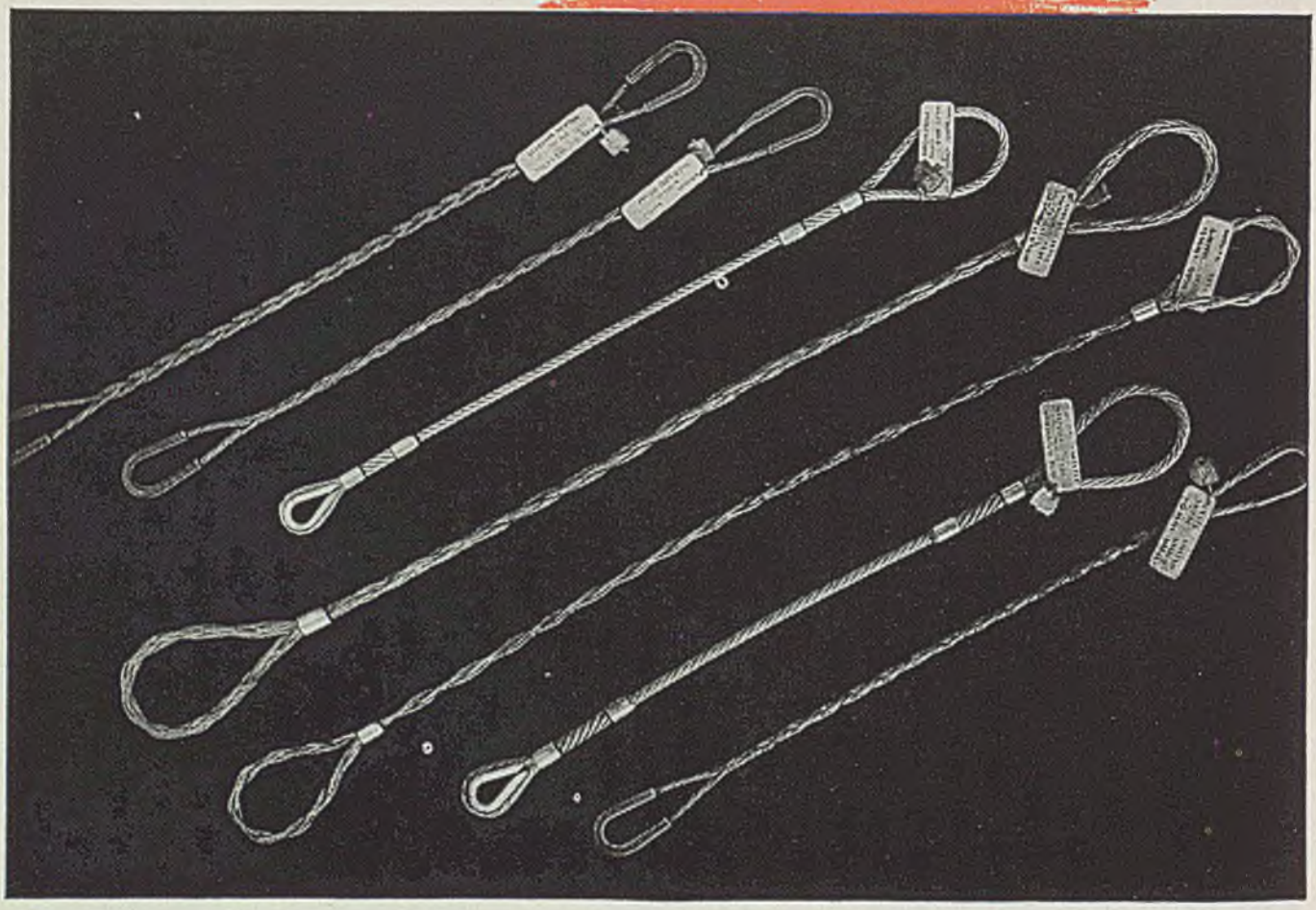

You get more than a sling when you order American Cable ACCO-REGISTERED. You get a sling that has been load-tested to twice its rated capacity before it leaves the mill. That assures you of mechanical reliability; gives you confidence in known strength and safety....You get a Certificate of Test and Registry which gives your sling a Serial number, states its type, certifies to the proof-testing and its established load capacity....You get a sling that is tagged with a metal plate on which has been stamped the sling's number, type, size and load rating in pounds. This tag is in front of your workmen at all times, still further assuring maximum safety.

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TRADE MARK

In Business for Your Safety

Tin Undercoat....

greatly improves corrosion resistance of painted steel. Deposition of 0.00003-in. coat of tin from the sodium stannate bath, followed by application of anti-rusting oxide film found best protection system according to this report, also presented to Iron & Steel Institute

By E. S. HEDGES and Staff
Tin Reserach Institute
Greenford, England

and

L. A. JORDAN and Staff
Paint Research Station
Teddington, England

IN the course of investigations on the electrodeposition of tin on steel undertaken by the Tin Research Institute, it was noticed that tin coatings as thin as 0.000008-in. were remarkably effective in preventing the rusting of steel sheet in the indoor atmosphere and had a considerable retarding influence on rusting out of doors. Such coatings are only one-tenth of the thickness of tin ordinarily applied to tinplate of canning quality and less than one-hundredth of that applied to hot-tinned steel articles such as dairy equipment. It did not seem reasonable, therefore, to expect useful service from such thin tin coatings alone, but it appeared worthwhile to examine the extent to which they influence the protection afforded by the subsequent application of coatings such as paint.

There were reasons for believing that this influence would be beneficial. For example, owing to the war-time scarcity of tin, it was necessary in the United States to substitute a lacquered electrolytic tinplate for much of the hot-tinned tinplate formerly used. The new material carries only about one-third of the tin coating applied to the older tinplate and its successful performance under mild conditions depends on the coating of lacquer; but it may also be said that the satisfactory performance of the lacquered sheet depends on the thin tin coating below the lacquer, as it has not been possible to make a directly lacquered steel container which is entirely satisfactory for wet packs.

Lacquered steel products are greatly improved if the surface of the steel is phosphated before lacquering. In this process the surface layer of the steel (about 0.0002-in. deep) is converted into a relatively thick layer (about 0.0003-in.) of phosphates of iron and other metals, and the product has been used during the tin shortage as a substitute for tinplate in packing non-corrosive substances. It is, however, generally agreed that lacquered phosphated steel is inferior to lacquered thinly electrotinned steel as a packaging material.

Information on the protective effect of thin tin coatings is given by Kronsbein[1] who has reported the results of corrosion tests on painted steel specimens pickled by the Bullard-Dunn process[2]. In this process the steel article is treated cathodically in hot sulphuric acid containing stannous sulphate. Hydrogen is liberated in copious amounts and assists in blasting off the scale, while a thin film of tin is simultaneously deposited on the cleaned areas. When pickling is complete, the whole surface of the article is thinly coated with tin; this process of coating is described in complete detail by Fink and Wilber[3].

Kronsbein reports that in accelerated corrosion and ordinary atmospheric-exposure tests of steel specimens coated with a variety of paints after different preliminary treatments, the specimens cleaned by the Bullard-Dunn process with the tin deposit not removed were, on the average, corroded about a quarter as much as the uncleaned specimens and about half as much as the shot-blasted, phosphated specimens.

Experimental Methods: The plan of work provided for the corrosion testing

TABLE I
TREATMENTS OF TEST PANELS BEFORE PAINTING

Code Mark	Steel	Treatment
CS	Cold-reduced	Degreased
PS	Pack-rolled	Degreased
CB	Cold-reduced	Phosphated
PB	Pack-rolled	Phosphated
CA2	Cold-reduced	Acid tin bath, 2 oz. per basis box
CA8	Cold-reduced	Acid tin bath, 8 oz. per basis box
PA2	Pack-rolled	Acid tin bath, 2 oz. per basis box
PA8	Pack-rolled	Acid tin bath, 8 oz. per basis box
CK2	Cold-reduced	Alkaline tin bath, 2 oz. per basis box
CK8	Cold-reduced	Alkaline tin bath, 8 oz. per basis box
PK2	Pack-rolled	Alkaline tin bath, 2 oz. per basis box
PK8	Pack-rolled	Alkaline tin bath, 8 oz. per basis box
CF2	Cold-reduced	Alkaline tin bath, 2 oz. per basis box with T.R.I. film
CF8	Cold-reduced	Alkaline tin bath, 8 oz. per basis box with T.R.I. film
PF2	Pack-rolled	Alkaline tin bath, 2 oz. per basis box with T.R.I. film
PF8	Pack-rolled	Alkaline tin bath, 8 oz. per basis box with T.R.I. film
CFF2	Cold-reduced	Alkaline tin bath, 2 oz. per basis box. Acid film
CAM8	Cold-reduced	Acid tin bath, 8 oz. per basis box. Flash-melted
CKM8	Cold-reduced	Alkaline tin bath, 8 oz. per basis box. Flash-melted
H20	Tinplate	Hot-dipped, 20 oz. per basis box

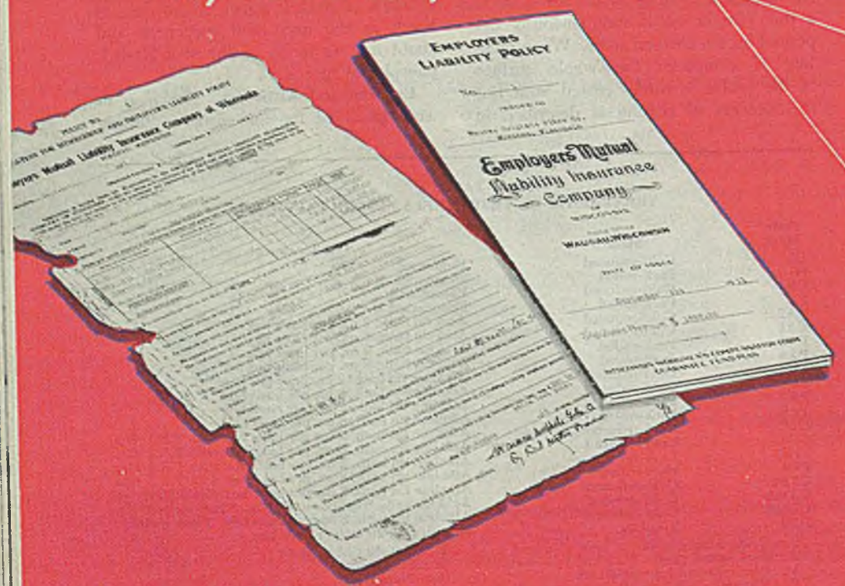
C = Cold-reduced steel
P = Pack-rolled steel
A = Electrotinned from acid bath
K = Electrotinned from alkaline bath
F = Oxide-filmed (T.R.I.)
FF = Oxide filmed (Phosphoric acid)

H = Hot-dipped tinplate
B = Phosphated
S = Plain steel
2 = 2 oz. tin coating per basis box
8 = 8 oz. tin coating per basis box
M = Flash-melted

Who are EMPLOYERS MUTUALS OF WAUSAU ?

What they can do for you

This...the first policy ever written by Employers Mutuals of Wausau... is still in force because of these principles



Mosinee Paper Mills Company (formerly Wausau Sulphate Fibre Company), the proud holder of the first policy ever issued by Employers Mutual Liability Insurance Company of Wisconsin, was one of the organizers of Employers Mutuals.

Policy No. 1 was issued on September 1, 1911, to this company which had elected to operate under the new Wisconsin Workmen's Compensation law. The original application form is carefully preserved in Employers Mutuals archives.

Protection lies in the sound financial condition and conservative management of the company; in the care taken in writing its policies to assure proper coverage for the policyholder. Protection is inherent in this well managed company, organized and owned by policyholders and operated for their benefit.

Service extends through many fields, from the prompt payment of claims in a manner to assure greatest benefit to the policyholder, all the way to the nationwide engineering and nursing services which aid policyholders in reducing hazards, preventing accidents and occupational disease, and thus reducing their loss ratio.

Savings arise from the protection and service which prevent disastrous losses, reduce accident rates and lower the premiums, save man hours and keep valuable employees on the job. In addition, all profits above those retained to assure strong reserves and adequate surplus are returned to policyholders in the form of dividends.

Because of these principles, Policy No. 1 still protects Mosinee Paper Mills Company. Because of these principles, thousands of companies throughout the country have selected Employers Mutuals to protect them from losses. And these same principles have protected the savings and investments of hundreds of thousands of individuals who have insured their health, their homes, their automobiles, and other personal property with Employers Mutuals.

EMPLOYERS MUTUALS of Wausau are mutual insurance companies, wholly owned by policyholders and operated solely in their interests. They write practically every type of insurance, except life

Employers Mutual Liability Insurance Company of Wisconsin began operating September 1, 1911, the same day the Wisconsin Compensation Law became effective. It is now one of the largest writers of Workmen's Compensation in the country.

The Wisconsin law, which was not compulsory, was the first constitutional Workmen's Compensation law in the United States. A group of employers, who elected to operate under it, recognized the danger of operating without insurance. Yet the cost of available insurance appeared very high. Therefore it was decided by these businessmen to organize a mutual company.

Employers Mutual Fire Insurance Company, organized in 1935 under the same management, is operated on the same sound, conservative principles that have guided the Liability Company through all these years.

Policies written by Employers Mutuals are models in protection. Their safety engineering service is noted throughout the United States for achievements in accident prevention and reduced premium costs through improved experience ratings.

Policyholders have saved over forty-seven million dollars in dividends alone since the company was organized, in addition to their savings by rate reductions earned through reduced losses. At the same time they have safeguarded their earnings and capital by pooling their reserves to replace losses and pay for damage.

What Employers Mutuals of Wausau Can Do For You

Representatives: Employers Mutuals representatives are trained to make your insurance understandable, not merely to promote sales. Call upon them for counsel and, if you wish, a complete analysis of your present coverage. Such an analysis often reveals important risks that are not covered, while in many cases it discloses duplicate coverage that entails needless expense.

Employers Mutuals of Wausau operate nationally, with branch offices located in principal cities throughout the country. They write Public Liability ... Automobile ... Plate Glass ... Burglary ... Workmen's Compensation ... Fidelity and Surety Bonds ... Group Health, Accident, Hospitalization ... and other casualty insurance ... Fire ... Tornado ... Extended Coverage ... Inland Marine ... and allied lines of insurance.

Information Bureau: Write for information on your insurance problems, analysis of coverage, or explanation of insurance terms. Address: **Insurance Information Bureau, Employers Mutuals of Wausau, Wausau, Wisconsin.**

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of panels of mild-steel sheet coated with tin as described below and subsequently painted with representative paint compositions. For purposes of comparison a number of cleaned steel panels were painted directly, omitting the tin undercoat, and a further series was phosphated before painting. The electrotinned panels were prepared at the Tin Research Institute and the phosphated panels were prepared by a firm specializing in that treatment. There was as little delay as possible between the phosphating treatment and the painting.

All the panels were painted at the Paint Research Station and were subjected to their standardized accelerated weathering test, to their accelerated corrosion test and to outdoor weathering. At suitable intervals the panels were examined jointly by representatives of both research organizations.

The Steel Base: Two types of mild-steel sheet were used. The first, referred to as "cold-reduced steel", was Ebbw Vale "white-to-edge" plate, 0.011-in. thick; the second, referred to as "pack-rolled steel", was of South Wales origin, 0.011-in. thick. Their analyses were as follows:

	Cold-Reduced Steel	Pack-Rolled Steel
Carbon, per cent	0.08	0.10
Manganese, per cent	0.34	0.40
Silicon, per cent	0.001	0.005
Phosphorus, per cent	0.0015	0.0015
Sulphur, per cent	0.026	0.075
Copper, per cent	0.018	0.110
Nickel, per cent	0.046	0.165
Chromium, per cent	0.017	0.050

The size of panel was 6 x 3 in. for accelerated weathering and corrosion tests and 8 x 6 in. for outdoor weathering tests.

Tin Coatings: Two types of electrotinned coatings were applied: (1) From the acid bath (stannous sulphate plus sulphuric acid), and (2) from the alkaline bath (sodium stannate plus sodium hydroxide). The current densities used were 10 and 15 amp per square foot for the acid and alkaline bath respectively; the other conditions of electrodeposition are as described by Baier[4].

Two thicknesses of tin coating were applied, namely 0.000008 and 0.00003-in. (2 and 8 oz per basis box.)

In addition to the as-deposited tin surfaces, other surface treatments of tin were included in the tests as follows: (a) In sets of panels coated with 0.00003-in. of tin from both the acid and the alkaline bath, the tin coating was flash-melted by immersing momentarily in palm oil at a temperature slightly above the melting point of tin. (b) Sets of panels carrying 0.000008 and 0.00003-in. of tin from the alkaline bath were treated with the Tin Research Institute anti-rusting oxide film[5]. (c) One set of panels coated with 0.000008-in. of tin from the alkaline bath was treated with an oxide film by immersing in a phosphoric-acid-chromic-acid mixture.

A set of panels of commercial hot-tinned tinpate was also included. These had a base of pack-rolled steel and a tin coating thickness of 0.000076-in. (20 oz per basis box).

List of Panels and Coding: In all 420 panels were included in the tests. All the treatments before painting are listed in Table I, to which is attached a key to the code marks.

Types of Paint: Two-coat paint systems —a priming coat and a finishing coat— were applied throughout. The paints used were chosen as being representative of various decorative and industrial types. They comprised:

(a) Linseed-oil-base paints as used in structural painting practice.

(b) Air-drying japan-type paints as used for industrial finishing of many small metal articles.

(c) Stoving paints as used for in-

TABLE II
AVERAGE GRADINGS OF PANELS

Code Mark	Sets 1	2	3	4	5	6	7	9	10	11	13	14	Grand Average
CA8	1.0	1.2	1.0	1.2	1.5	2.2	1.6	2.2	1.9	2.6	2.7	2.8	1.8
CK8	1.0	1.0	1.0	1.6	1.3	1.9	1.3	1.5	2.5	2.3	2.8	1.9	1.7
CF8	1.0	1.0	1.0	1.9	2.1	2.4	1.7	1.1	2.7	2.3	2.4	2.2	1.8
CAM8	1.0	1.6	1.2	1.7	2.1	..	3.6	..	2.8	2.5	2.6	2.4	2.2
CKM8	1.0	1.0	1.2	1.4	1.6	..	3.3	2.8	2.5	1.7	3.0	2.3	2.9
CA2	1.2	1.6	1.4	1.8	2.8	2.3	3.0	3.9	3.7	1.8	3.4	2.5	2.5
CK2	1.0	1.0	1.2	2.9	2.5	2.2	3.0	3.9	3.7	2.7	3.9	2.4	2.5
CF2	1.8	1.8	1.4	2.1	1.8	1.9	1.2	3.9	3.6	1.8	1.3	1.2	2.0
CFF2	2.0	2.1	1.4	2.1	2.0	2.2	2.2	1.2	3.6	2.6	2.1	3.9	2.3
CB	1.8	1.9	2.2	2.0	1.7	1.9	2.5	1.8	3.3	2.3	2.2	1.3	2.1
CS	4.0	4.0	4.0	4.0	4.0	4.0	3.2	4.0	4.0	4.0	3.7	4.0	3.9
PA8	1.2	1.0	1.0	1.2	1.4	1.0	1.1	2.1	2.5	1.8	2.7	1.9	1.6
PK8	1.8	1.0	1.0	1.3	1.3	1.6	2.1	1.6	1.9	1.9	2.1	2.3	1.7
PF8	1.0	1.0	1.2	1.6	1.0	1.3	1.7	1.3	1.3	1.1	1.0	2.5	1.3
PA2	1.6	1.9	1.0	2.0	2.2	1.7	2.7	3.2	3.6	2.1	2.8	3.3	2.2
PK2	1.6	1.2	1.5	2.1	2.2	2.6	3.0	3.9	3.6	1.8	2.6	2.7	2.5
PF2	1.4	1.2	1.0	1.4	1.2	1.9	1.7	1.3	3.6	1.4	1.1	2.1	1.6
PB	1.6	1.8	2.0	2.5	2.4	2.1	2.5	1.6	2.4	1.7	2.0	1.8	2.0
PS	1.4	2.4	2.0	2.8	3.6	4.0	3.4	3.0	4.0	3.8	3.4	3.2	3.1
H2O	1.0	1.0	1.0	1.6	1.9	1.6	2.3	1.9	1.5	2.0	2.3	1.4	1.6

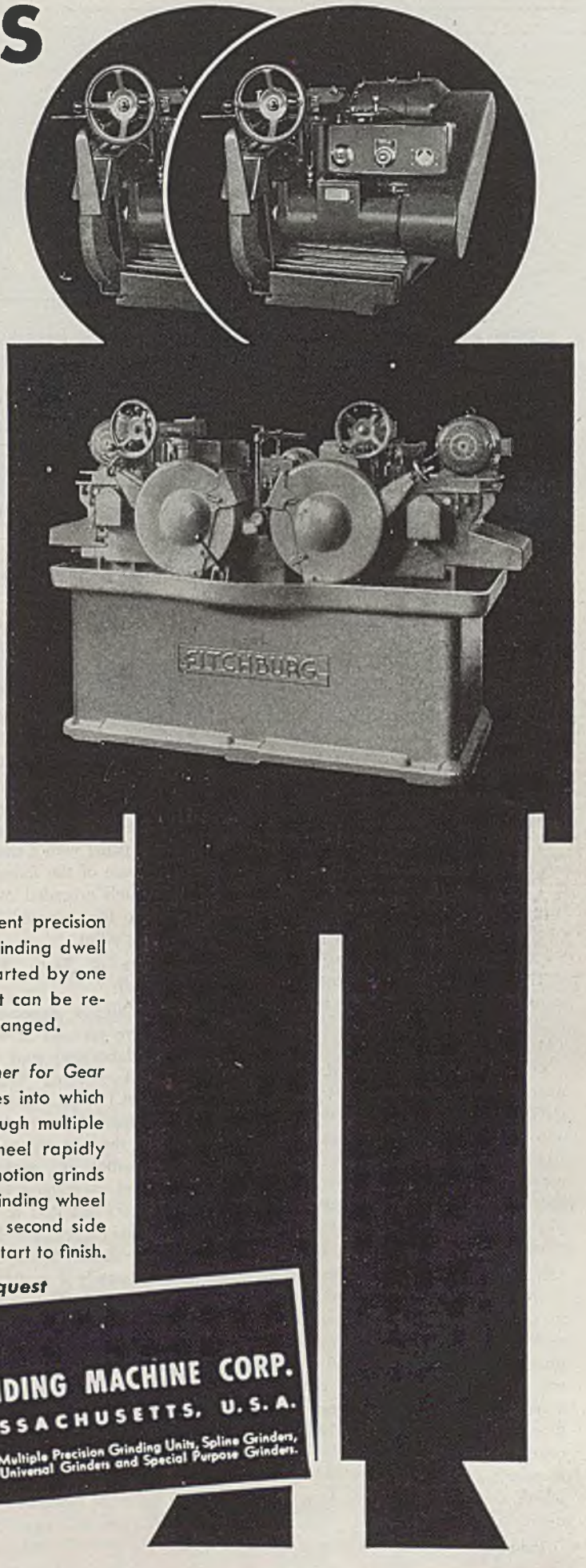
Key To Codes

Code Mark	Steel	Treatment		
CA8	Cold-reduced	Acid tin bath	0.00003-in.	
CK8	Cold-reduced	Alkaline tin bath	0.00003-in.	
CF8	Cold-reduced	Alkaline tin bath	0.00003-in.	with T.R.I. film
CAM8	Cold-reduced	Acid tin bath	0.00003-in.	Flash-melted
CKM8	Cold-reduced	Alkaline tin bath	0.00003-in.	Flash-melted
CA2	Cold-reduced	Acid tin bath	0.000008-in.	
CK2	Cold-reduced	Alkaline tin bath	0.000008-in.	
CF2	Cold-reduced	Alkaline tin bath	0.000008-in.	with T.R.I. film
CFF2	Cold-reduced	Alkaline tin bath	0.000008-in.	with acid film
CB	Cold-reduced	Phosphated		
CS	Cold-reduced	Degreased		
PA8	Pack-rolled	Acid tin bath	0.00003-in.	
PK8	Pack-rolled	Alkaline tin bath	0.00003-in.	
PF8	Pack-rolled	Alkaline tin bath	0.00003-in.	with T.R.I. film
PA2	Pack-rolled	Acid tin bath	0.000008-in.	
PK2	Pack-rolled	Alkaline tin bath	0.000008-in.	
PF2	Pack-rolled	Alkaline tin bath	0.000008-in.	with T.R.I. film
PB	Pack-rolled	Phosphated		
PS	Pack-rolled	Degreased		
H2O	Tinplate	Hot-dipped	0.000076-in.	

Key to Sets

Set No.	Paint	Treatment
1	Linseed-oil-base paint containing 40% of red lead	1000-hr accelerated weathering followed by 750-hr accelerated corrosion test
2	Linseed-oil-base paint containing 5% of red lead	1000-hr accelerated weathering followed by 750-hr accelerated corrosion test
3	Linseed-oil-base paint containing no red lead	1000-hr accelerated weathering followed by 750-hr accelerated corrosion test
4	Linseed-oil-base paint containing 40% of red lead	1750-hr accelerated corrosion test
5	Linseed-oil-base paint containing 5% of red lead	1000-hr accelerated corrosion test
6	Linseed-oil-base paint containing no red lead	1000-hr accelerated corrosion test
7	Nitrocellulose lacquer	1000-hr accelerated weathering followed by 500-hr accelerated corrosion test
9	Stoving paint	1000-hr accelerated weathering followed by 750-hr accelerated corrosion test
10	Stoving paint	1500-hr accelerated corrosion test
11	Air-drying japan containing 5% of zinc chrome	1000-hr accelerated weathering followed by 500-hr accelerated corrosion test
13	Air-drying japan containing 5% of zinc chrome	1500-hr accelerated corrosion test
14	Air-drying japan containing no zinc chrome	1500-hr accelerated corrosion test

TWO HEADS
ARE BETTER THAN ONE IN MULTIPLE PRECISION GRINDING



When Fitchburg engineers put their heads to the "grindstone" to develop a method that would cut costs on precision grinding as multiple tooling has on machined work, they emerged with a revolutionary idea. This new design not only makes other equipment obsolete — it also prevents its own obsolescence by its unique engineering feature!

The basis of this Fitchburg method is an independent standard interchangeable grinding head which may be mounted singly or in multiples on standard or special equipment, and may be regrouped and remounted on standard machines or on new special bases, for operations other than the one originally specified. Mounted singly, it can perform more jobs than was thought previously possible — straight or bevel gears, internal or external gears, etc. — due to its independent positioning and its ability to be set at any angle the work requires. Mounted in multiples, its production uses are even greater.

THE HEAD. *The Bowgage Head* is a completely independent precision grinding unit. It has rapid traverse, slow grinding feed, grinding dwell or spark out, and rapid return to starting position — all started by one push button. It is precise to .0002", minimizing spoilage. It can be removed and remounted for other work, if operations are changed.

THE BODY. *This Fitchburg Double-Head Grinder and Polisher for Gear Shift Grooves* is typical of many special Fitchburg machines into which independent Fitchburg heads can be built to cut costs through multiple automatic grinding on mass production. One grinding wheel rapidly traverses into the slot and then an automatic side wheel motion grinds one side of the slot, then the other. Meanwhile, the other grinding wheel comes in and finish-polishes the first side ground, then the second side which has just been ground. This is an automatic cycle from start to finish.

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FITCHBURG GRINDING MACHINE CORP.
FITCHBURG, MASSACHUSETTS, U.S.A.
Manufacturers of—Bowgage Wheelhead Units. Multiple Precision Grinding Units, Spline Grinders, Cylindrical Grinders, Gear Grinders, Both Full Universal Grinders and Special Purpose Grinders.

TABLE III—Order of Merit

Code Mark	Treatment	Average Grading	
F8	Alkaline tin bath 0.00003 in. with T.R.I. film	1.6	
H2O	Hot-dipped tinplate 0.000076 in.	1.6	
A8	Acid tin bath 0.00003 in.	1.7	(a)
K8	Alkaline tin bath 0.00003 in.	1.7	
F2	Alkaline tin bath 0.000008 in. with T.R.I. film	1.8	
KM8	Alkaline tin bath 0.00003 in. Flash-melted	2.0	
B	Phosphated	2.1	
AM8	Acid tin bath 0.00003 in. Flash-melted	2.2	(b)
A2	Acid tin bath 0.000008 in.	2.4	
K2	Alkaline tin bath 0.000008 in.	2.5	
S	Degreased	3.5	(c)

dustrial finishing of mass-produced articles.

(d) Nitrocellulose lacquer, used as an alternative to (b) and (c).

(*a*) *Linseed-Oil-Base Paints*:

Three types of primers were used, with the same finishing coat. The primers were:

(1) Paint containing 40 per cent of red lead (calculated on the total pigment).

(2) Paint containing 5 per cent of red lead (calculated on the total pigment), corresponding to British Standard Specification No. 1033.

(3) Paint similar to (2), but containing no red lead or other corrosion-inhibitive pigment.

The finishing coat consisted of red iron oxide, ground into linseed stand oil.

(*b*) *Air-Drying Japan-Type Paints*:

Two types of primers were used:

(1) Air-drying synthetic-resin-base paint containing 5 per cent of zinc chrome (calculated on the total paint), or 10 per cent calculated on the pigment.

(2) Paint similar to (1), but containing no zinc chrome or other corrosion-inhibitive pigment.

The finishing coat consisted of the same medium, pigmented to a glossy finish with carbon black.

(*c*) *Stoving Paints*:

Only one primer was used, containing no corrosion-inhibitive pigment and consisting of black iron oxide, carbon black and extenders ground into varnish made from linseed stand oil/tung oil/Congo copal (3 : 1 : 2). The finishing coat consisted of rosin/gilsonite/linseed stand oil/tung oil varnish pigmented to a glossy finish with carbon black.

(*d*) *Nitrocellulose Lacquers*:

Only one primer was used, containing no corrosion-inhibiting pigment and consisting of black oxide and carbon black ground into a clear nitrocellulose medium. The finishing lacquer consisted of a nitrocellulose medium pigmented to a glossy finish with carbon black. This coating system is intentionally below the standard used in industrial practice, where corrosion resistance is a requirement.

Painting Procedure: The panels were painted in the laboratories of the Paint Research Station and the utmost care was taken to prevent any soiling before painting. The panels were wrapped separately in tissue paper and not touched by hand at any time. Care was also taken to apply a uniform thickness of coating. This was done both with brushed and sprayed coatings by dealing with the panels in sets and not as single items. All the linseed-oil-base paints were applied by brush and the remainder by spray. In each case at least 24 hr were allowed for the primer to dry before application of the finishing paint. The panels were painted on both sides.

In the case of the linseed-oil-base paints only two-thirds of the primer surface was covered with finishing paint, the remaining one-third of the primer at the bottom of the panel being left exposed. A diagonal scratch, 2 in. long and penetrating to the steel, was made on the face of each panel with a sharp-pointed knife. In the case of the linseed-oil-base paints the scratch extended over the boundary between the exposed primer and the finishing paint.

Nature of Tests: Three tests were employed:

(1) *Outdoor Exposure*—Panels (8 x 6 in.) were exposed at 45°, facing south, on the laboratory roof at Teddington.

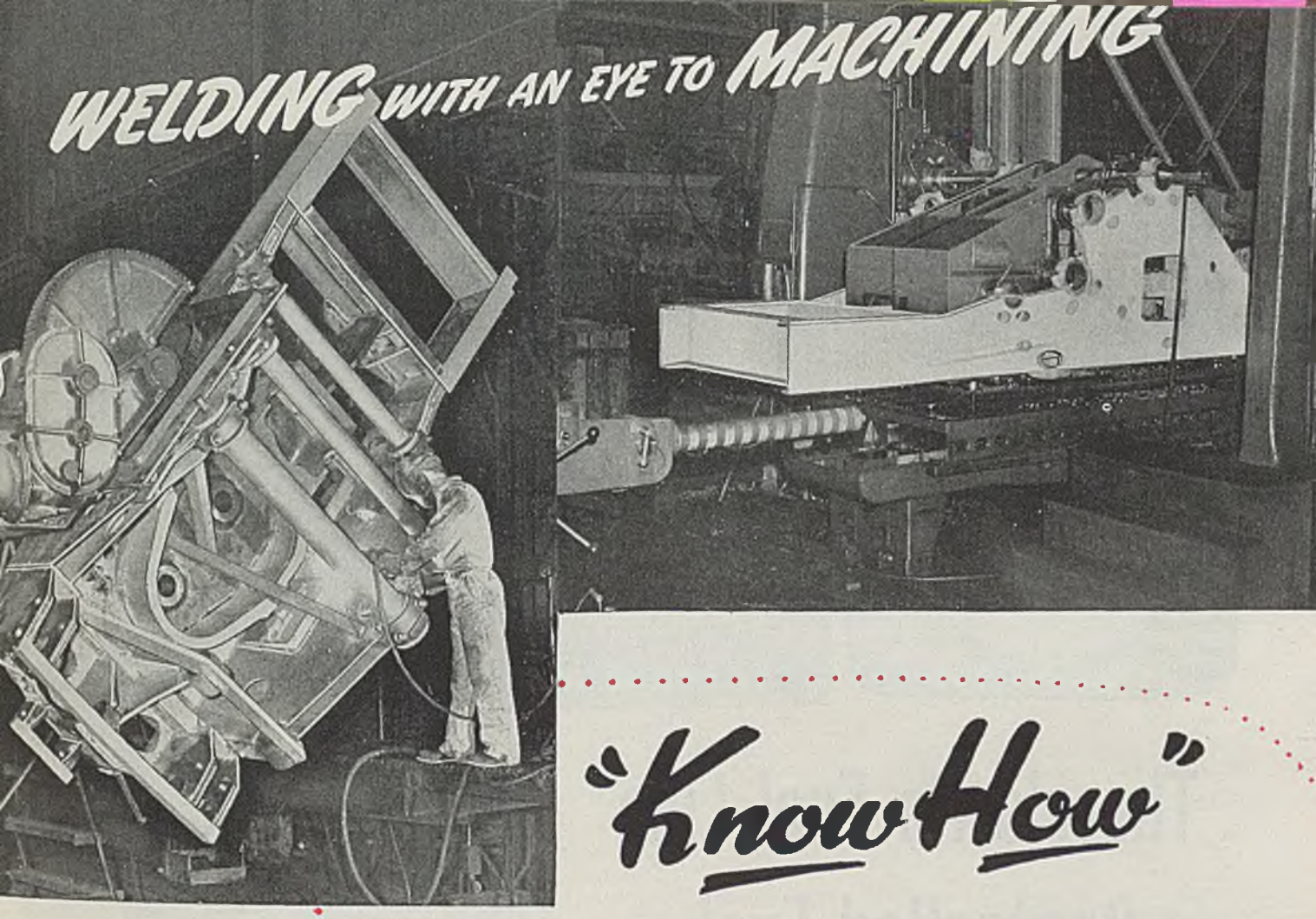
(2) *Accelerated Weathering*—Panels (6 x 3 in.) were exposed for 1000 hr in an accelerated weathering apparatus. Details of the test are as follows: An uncored carbon arc, enclosed in resistance glass and consuming across the arc between 800 and 950 w, is suspended eccentrically (approximately 6-10 in. distant from the center) in a cylindrical container (approximately 4 ft diameter) with vertical sides to which the panels are attached. The container is revolved slowly (approximately 3 rpm), an arrangement which ensures even exposure of the panels to the radiation of the arc and regular wetting by means of a fine spray of rain-water suitably disposed in the container so as to impinge on the panels one-quarter of a revolution before reaching the point nearest to the arc. After the 1000-hr test individual panels in many of the sets showed little or no change; they were, therefore, subjected to a further accelerated corrosion test, details of which are given under (3).

(3) *Accelerated Corrosion* — Panels (6 x 3 in.) were exposed to an accelerated corrosion test involving a 24-hr cycle consisting of (a) a 16-hr exposure in the accelerated weathering apparatus described above, followed by (b) an 8-hr exposure in an atomized mist composed of 270 g. of Tidman's sea salt, 37.5 ml of concentrated sulphuric acid (sp. gr. 1.84), and 10 litres of water. The cycle was repeated until at least some of the panels in each series showed appreciable corrosion.

Evaluation of Results: The exposed panels were examined at intervals during the test for the onset and development of rust, special attention being paid to the behavior at the scratch mark. On the whole, there was no appreciable breakdown of the paint coatings, but rusting occurred underneath the paint; in some cases patches of paint were blistered. In spite of the long duration of the tests there was (with few exceptions) not much rust to be seen at the painted surface. On some panels there was appreciable spread of rust from the scratch, but on others, where there was an equal spread, it was not noticeable, as the paint coating was not much disturbed thereby. These facts made the fair assessment of the relative degree of corrosion of the painted specimens somewhat difficult. Photographic representation of the results was also marred to some extent by the color of the paints which, being either red or black, provided very little photographic contrast with rust.

In view of these difficulties, it was considered desirable, while photographing certain suitable sets of painted panels, to remove the paint from one side of all the panels (by means of a commercial paint remover) and grade the panels by an arbitrary scale according to the degree of rusting of the metal surface. This was done independently by five experienced observers, allocating the value 4 to the most rusted and the value 1 to the least rusted panel in each set. The individual results thus obtained were satisfactorily consistent and from them a mean grading for each panel was calculated (see Table II). The depainting procedure was also admirably adapted to the photographic representation of the rust on all panels, but the comparison is unfair to the phosphated panels, owing to the dark color of the phosphate coating. This difficulty was overcome by afterwards removing the phosphated coating by dipping the panel in cold 5 per cent hydrochloric acid for 30 sec (a treatment which was too mild appreciably to affect the rust spots), and then comparing the panel with the corresponding panels

WELDING WITH AN EYE TO MACHINING



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● Sub-assembly construction makes for ease in welding and handling the smaller units. Push-button control on positioner and platform combination (*shown above*) insures faster down-hand welding at all points on the structure.

On the horizontal boring mill (*right*) the same part is nearing completion. Twenty-four holes bored—twelve holes spotfaced and backfaced—from the same side, using a bar-holding fixture, obviates reversing the job or changing setup.

Danly facilities combined with Danly "know how" gained in over fourteen years of heavy weldment production make the hard jobs look easy—produce accuracy in the weldments that leads to faster machining—complete the job at lower final cost.

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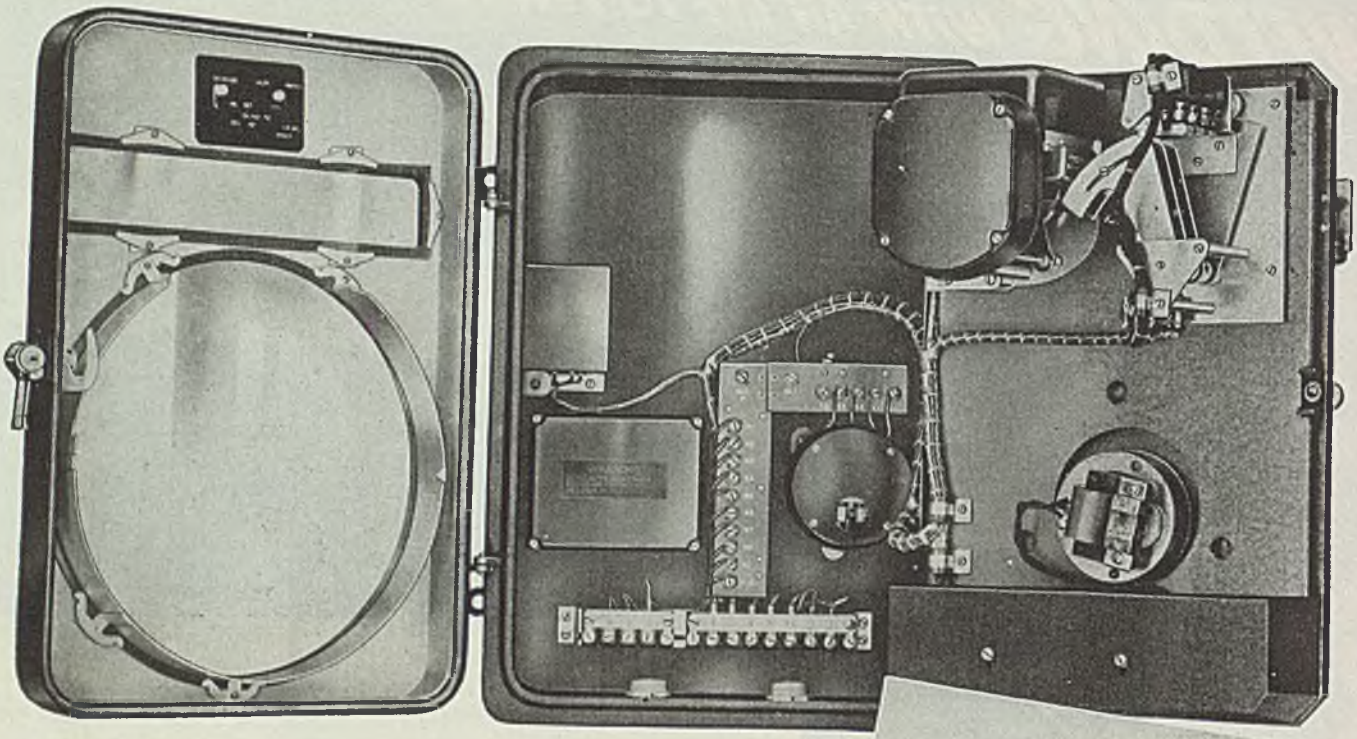

Bristol MICROACT Controller Model 431, Type 30. Note that all parts are accessible even when operating. No lubrication needed. Cold-junction compensator is fully automatic. No mechanical connection between galvanometer and other units, so galvanometer can be protected from dust and air currents when door is open.

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Bristol Pyromaster Controllers — instant response, unaffected by vibration, no mechanical motion except when temperature changes — are offered in models for use with electrically-operated fuel control apparatus...also magnetic switches for electrically-heated equipment.

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AUTOMATIC CONTROLLING AND RECORDING INSTRUMENTS

BRISTOL

...Gives YOU the Most from Heat

of de-painted plain steel and of the best tin-treated steel.

Experimental Results, Outdoor Exposure Tests: After exposure to natural weathering for 2 years, the majority of the panels showed little rusting. Detailed presentation of the results will be withheld, therefore, until a later stage.

Accelerated Weathering and Corrosion Tests: All the experimental evidence has been recorded photographically after removal of the paint film so as to reveal the amount of corrosion that had occured. As it is not practicable to reproduce all the photographs here, the experimental evidence is presented by recording the average grading of the panels as described above. These results are shown in Table II.

With every painting system the corrosion of the plain-steel panel was much greater than that of any of the treated panels. It was also noticed that on the whole the results were more favorable to the pack-rolled than to the cold-reduced steel — an unexpected result, which may be due to the somewhat rougher surface of the former. Comparison of the electrotinned panels reveals no appreciable difference between the coatings from the acid bath and those from the alkaline bath (cf CA8 with CK8, PA8 with PK8, PA2 with PK2, and CA2 with CK2). The 0.00003-in. tin coating is more effective than the 0.000008-in. tin coating (cf the 8 series with the 2 series), but the 0.000008-in. coating is remarkably effective when compared with plain steel.

A notable exception is in sets 9 and 10 (stoving paints), where the thinnest tin coating has given little effective protection, possibly owing to diffusion of the tin into the steel during the stoving treatment (at 150° C), with formation of a surface layer of the compound $FeSn_2$. The as-deposited tin coatings are in general better than those that have been melted (cf CA8 and CK8 with CAM8 and CKM8), a fact which may again be connected with the rougher surface. On the whole, the relatively thick (0.000076-in.), commercial hot-tinned coating (H20) is quite effective, but adhesion of the paint does not appear to be so good as with the electrotinned coatings.

In many cases, panels of hot-tinned tinplate are remarkably free from isolated rust spots, but rust has spread from the edges and from the scratch mark. Treatment of the tinned surface with an oxide film gives an improvement in rust resistance in three cases out of four (cf PF2 with PK2, PF8 with PK8, CF2 with CK2, and CF8 with CK8) and appears to improve the adhesion of the paint. The phosphate treatment occupies an intermediate position among the tin treatments.

The treatments can be arranged in order of merit by taking the average gradings for both steel bases and all the paints. The order is given in Table III, from which it will be seen that the treatments can be classified roughly into three groups: (a) Treatment with 8 oz per basis box or more of tin, or with 2 oz of tin followed by the anti-rust oxide film; (b) 8 oz melted tin coatings, phosphate coating, 2 oz electrotinned coatings; (c) plain steel.

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[3] C. G. Fink and T. H. Wilber: Transactions of the Electrochemical Society, 1934, vol. 66, p. 381.

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[5] R. Kerr: Journal of the Society of Chemical Industry, 1940, vol. 59, Dec., p. 259.

Anti-Friction Die Sets

Overcome friction at high speeds

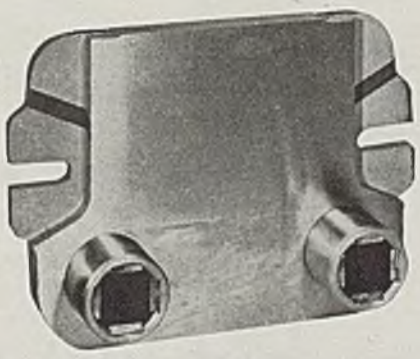
TO overcome friction at high speeds, Lempco Products Inc., Bedford, O., has developed a revolutionary die set for its own high-speed punch press. Considerable precision machine work is necessary to produce them which, according to the company, makes them good companion pieces for expensive die equipment.

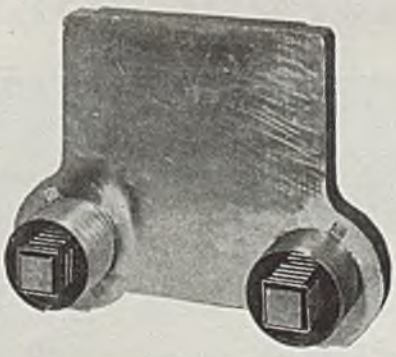
To get parallel flat surfaces, all faces are ground to a very fine finish on surface grinders. The punch holder and die holder are matched, clamped and bored with jig boring precision in the same operation. The guide pins are produced from wear-resisting alloy steel, hardened and ground to size.

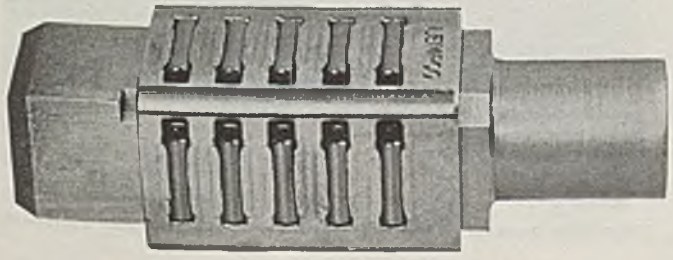
A preload of 0.0015-in. is set up in both types manufactured, the round pin (ball bearing) and the square pin (roller bearing) sets. In actual operation, a run of 18 million strokes reportedly failed to destroy the preload on one die set, careful inspection showing a remaining preload of 0.0005-in. The company states that this is definite insurance against "play" between the guide post and bushing, resulting in longer die life.

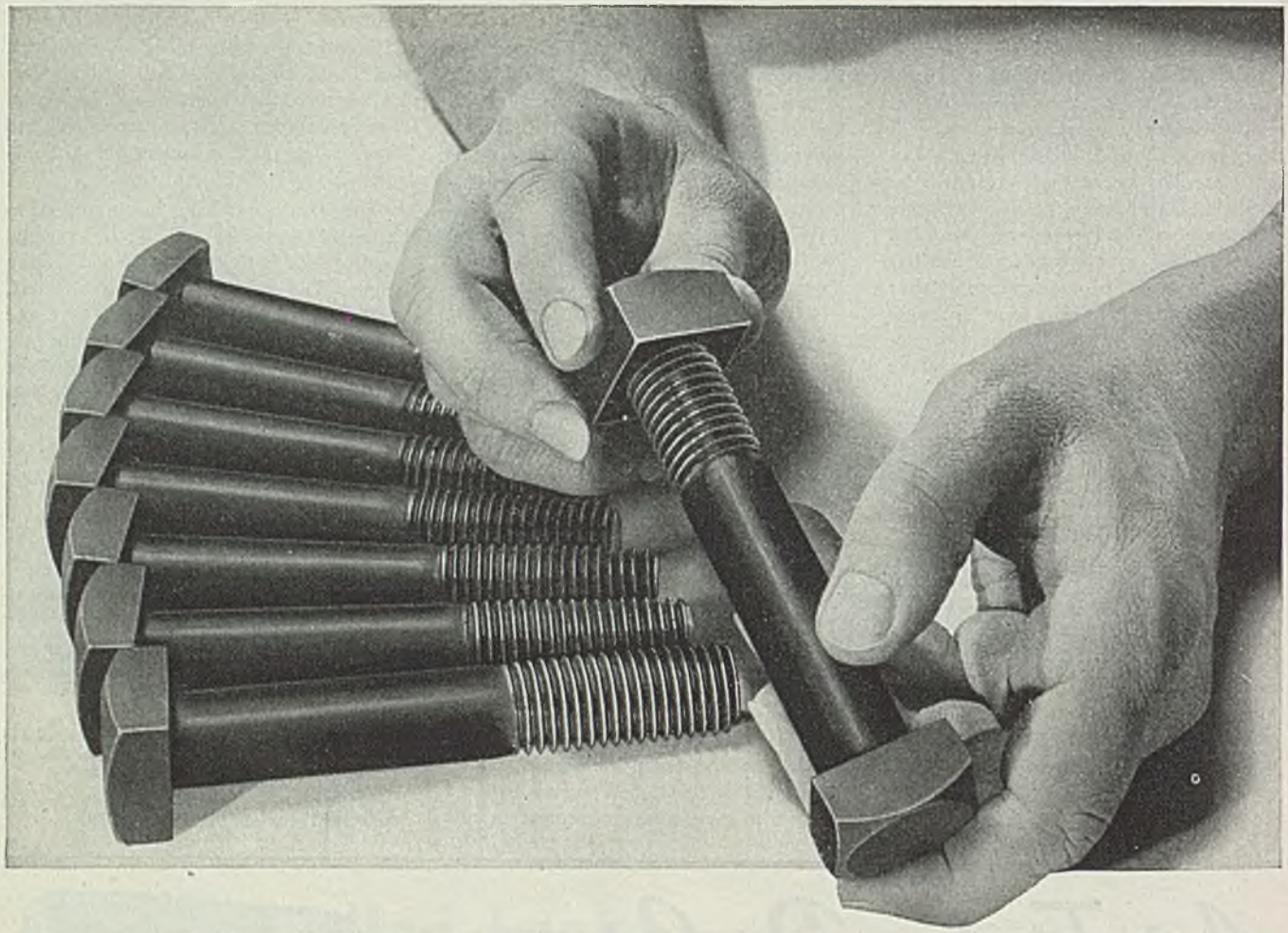
The die sets are said to open and close freely by hand, no jacks, pry bars, or similar tools being necessary.

Illustration at lower left shows the Lempco anti-friction die set's square guide post and roller bearing assembly; at lower right is shown the round guide posts and ball bearing assembly. Photo at right shows the whole die set.









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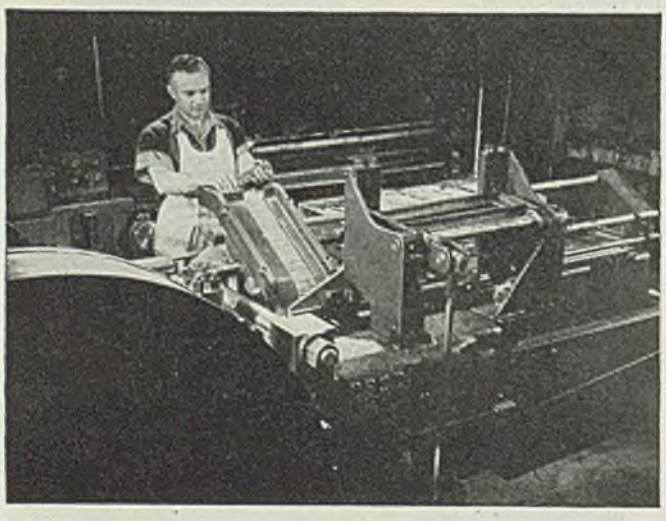
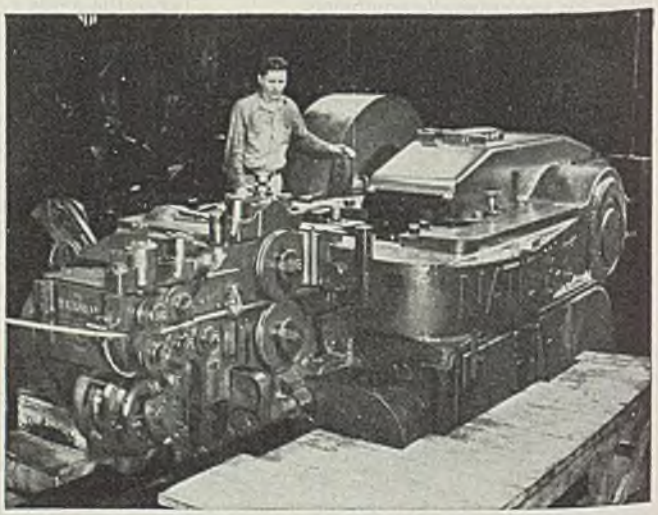
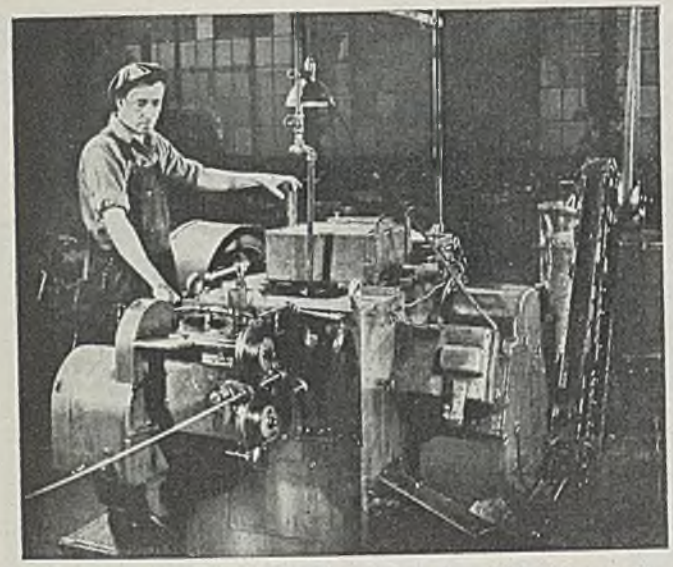


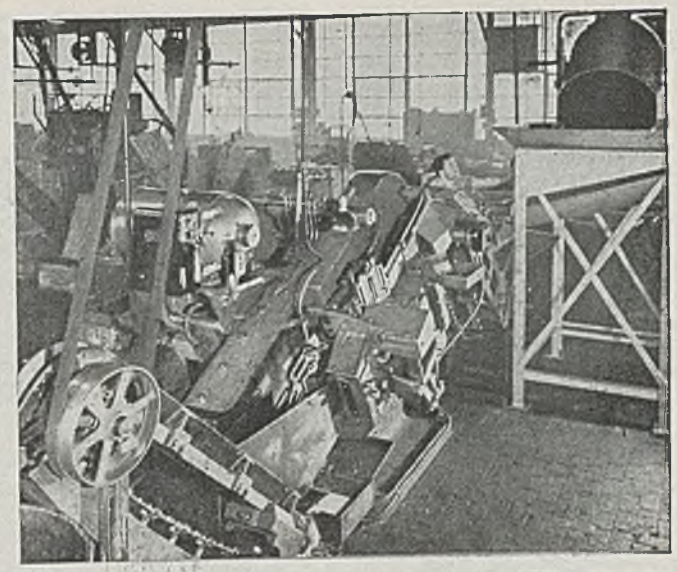
ANY LENGTHS — With the development of the Rod Header, RB&W cold heads the smaller diameters of machine bolts in the longest lengths.



SOLID DIE — This big machine which cold heads in solid dies — insuring maximum accuracy and soundness — indicates scope of RB&W equipment.



HIGH SPEED HEADING — 11,220 pieces an hour is the rate of this ¾" header.



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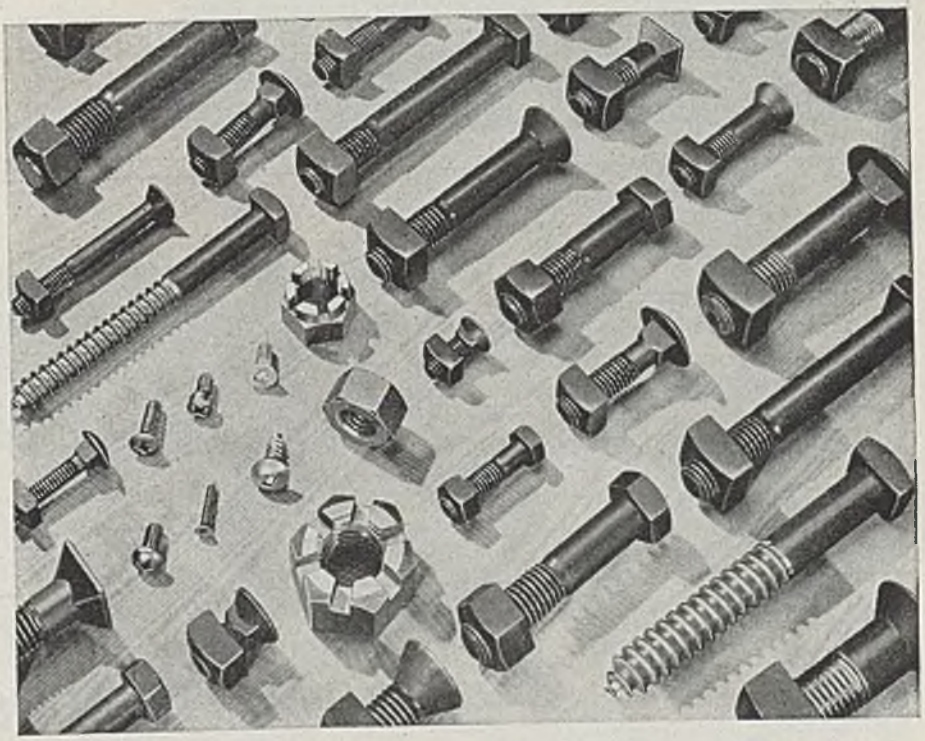

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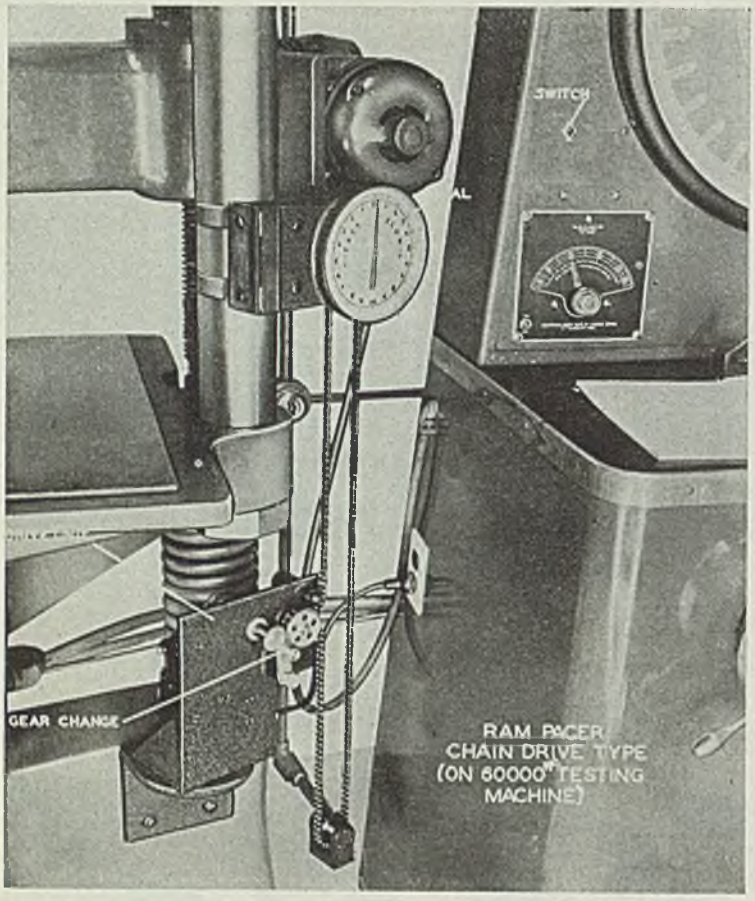
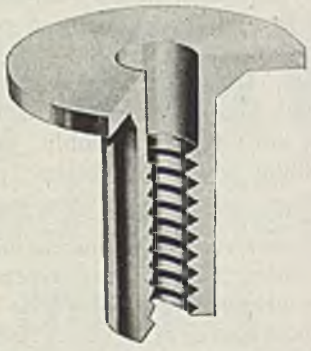


"Pace Setter"

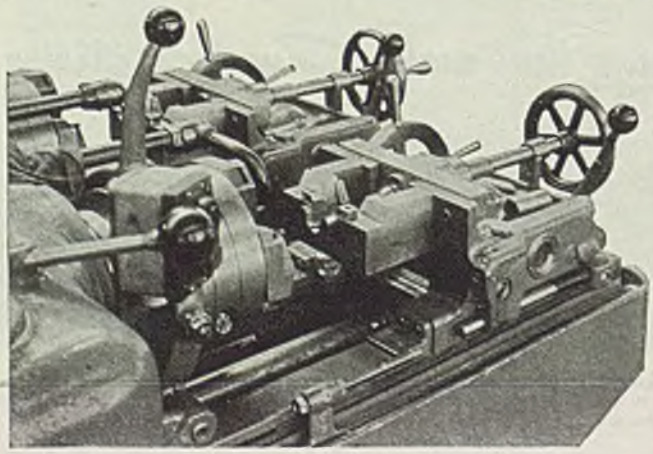
This odd-looking device, called the ram pacer, developed by Southwark Division, Baldwin Locomotive Works, Philadelphia, controls the crosshead movement of any standard hydraulic testing machine at eight preset speeds while testing materials. It is attached to fixed frame of machine, while its dial portion is attached to the moving crosshead. Pointer sprocket wheel, and sprocket wheel on drive unit are connected by an endless weighted chain. With gear selected for a certain speed, hydraulic valve of the testing machine is opened until the loadhead rises to a point where the dial pointer stands still. The pacing device also can be used as a deflectometer. Dial, divided into two hundred graduations of 0.0001 in. each, will indicate deflection of a specimen under test if synchronous motor is not turned on

---

WASHER-HEAD FASTENER: Developed for fastening plywood interior walls to steel sections in tractor, truck and house trailers, this one-piece Rivnut made by B. F. Goodrich Co., Akron, will not vibrate loose, serves as a nut plate for fastening trim and will not pull through because of large diameter head. It is internally threaded and counterbored, and can be upset or headed from one side. Fastener is of cadmium-plated steel and is furnished only in No. 6-32 thread



Work Holding Fixture



Thread concentricity is assured by this fixture developed by Landis Machine Co., Waynesboro, Pa., for use with its threading machine. It comprises a traveling center, located within bore of head and machine spindle, combined with a splined bushing to drive work piece, and a manually-operated work center on the machine carriage combined with cradle support to align piece with work center. Work is placed on supporting bracket and piece advanced with carriage until splined end of shaft engages splined sliding bushing and center within bore of head. Hand wheel is employed to advance rear center to engage gear end of work. Supporting cradle is detachable from machine carriage front and can be interchanged with similar brackets to accommodate odd-shaped work

"Put it on the Blanchard"

Here is another example of how the BLANCHARD increases the production of these sprocket shaft supports over the former method.

These steel forged sprocket shaft supports are ground on a No. 18 Blanchard Surface Grinder equipped with a 36" chuck. Four pieces are placed on the chuck at one time and 1/8" to 3/16" of metal is removed from each surface.

They are ground at the rate of 10 per hour, whereas only 2½ pieces were produced per hour by the former method of production.

When surfaces must be flat and parallel, "put it on the Blanchard" and increase production.

GET THESE ADVANTAGES

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- **Adaptability** ✓
- **Fixture Saving**
- **Operation Saving**
- **Material Saving**
- **Close Limits**
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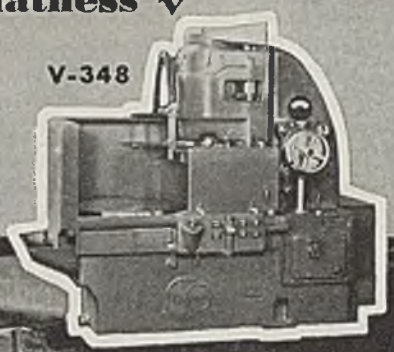
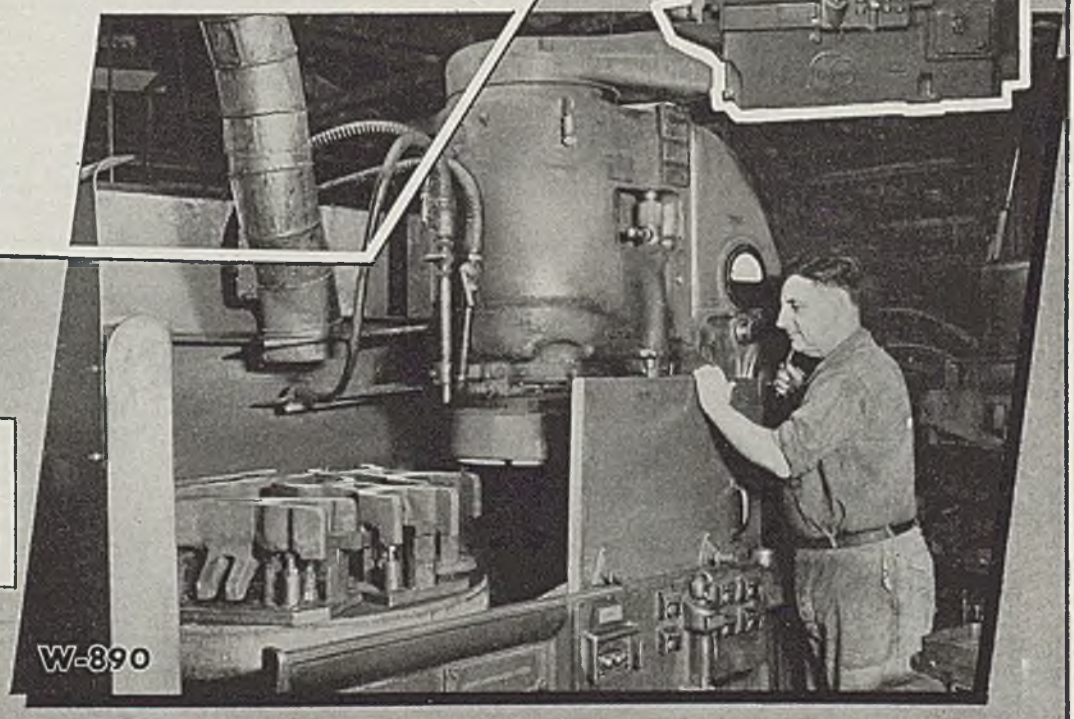
- **Flatness** ✓



Send for your free copy of "Work Done on the Blanchard", third edition. This new book shows over 100 actual jobs where the Blanchard Principle is earning profits for Blanchard owners.



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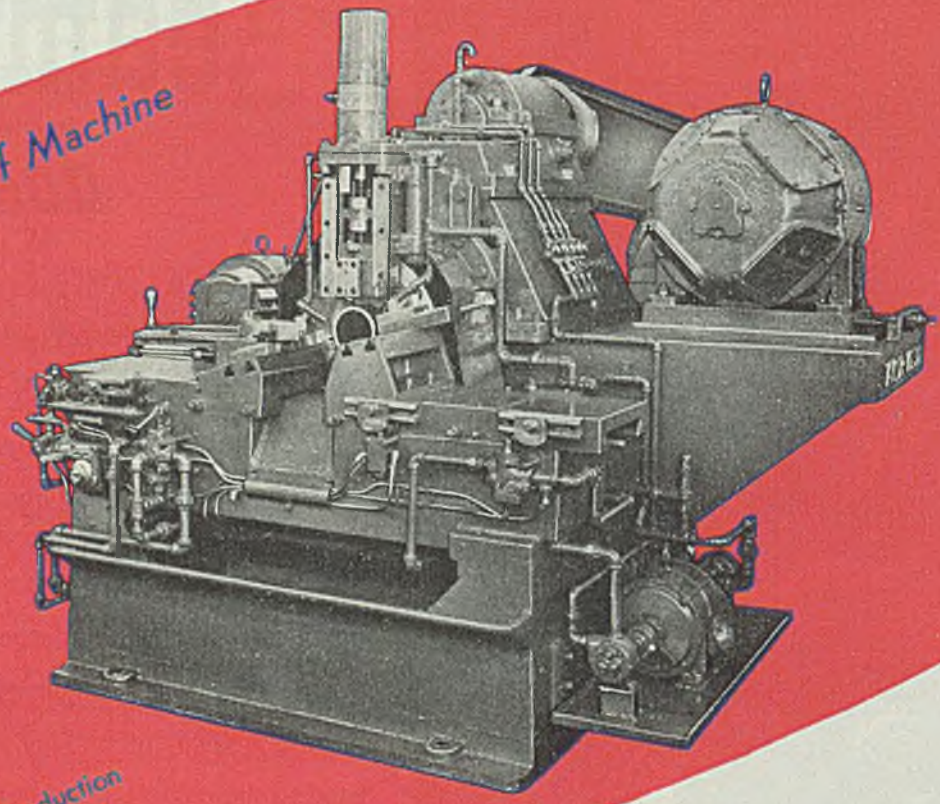

Assures More Production month after month with lower Operating Cost.

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Tube Testing Machines
Test Benches
Complete line of equipment for finishing of pipe

This Tube Cutting Off Machine may be depended upon to deliver high continuous production month after month, year in and year out. Immune to shop fatigue the operation is smooth, vibrationless and economical. Tools may be set quickly.

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Engineers and Builders of Rolling Mill Machinery

water repellent and chemically resistant, protect metal dies during molding operations or while standing. In injection and compression molding, a cloth treated with a very small quantity of 100 per cent silicone fluid may be used to wipe the die or mold. Only a very thin film over the metal surface should be applied to secure effective release.

For more complicated molds and dies a brush may be preferable for application. A sufficient quantity of the fluid will be transferred to the brush by allowing the bristles to lie on a piece of felt saturated with a typical DC mold-release fluid. An excessive amount of the silicone fluid will cause poor welding of the plastic. To minimize this danger, a dilute solution of the fluid in an organic solvent or an emulsion may be freely brushed over the surface of hot molds. An emulsion has been used with excellent results in the molding of natural and synthetic rubber. For molds and dies having deep cavities and undercut surfaces, a paint gun adjusted to expel an almost invisible mist of fluid can be used.

The number of moldings which can be made before it becomes necessary to retreat the die depends upon the speed of the cycle, the nature of the plastic material used, and the contour of the die. On a fast cycle of 30 to 45 sec, it may be necessary to retreat the die every 10 to 15 min. Threaded dies from which release is difficult, may require retreating after four or five injections.

Silicone mold release fluids have been especially effective in the injection molding of a wide variety of plastic materials including ethylcellulose, polystyrene, cellulose acetate, cellulose acetobutyrate, and synthetic rubbers. The material has been equally effective in securing the release of large sheets in press polishing operations and in preventing the warping, on removal from the die, of large compression molded thermoplastics.

Spatter Release Materials in Welding: A recent development of particular interest to the metalworking industry, is the use of silicone liquids as spatter release agents in welding. When highly polished surfaces of aluminum, stainless steel, nickel, and monel metal must be welded, a coating of silicone liquid will prevent spalls from the operation marring the finish.

Silicone Greases

An offshoot of the silicone fluid family is the group of silicone greases and pastes. The grease maintains its consistency throughout the range of temperature from 40° F below zero to 400° F above. Silicone grease is, furthermore, resistant to oxidation, acids, and alkalies. These qualities have led to its use as a lubricant for stop cocks and pressure-lubricated valves. To supply the need for high and low temperature lubrication, Dow Corning Corp. has developed four silicone greases. These silicone greases, designed for the lubrication of ball bearings operating at abnormally high and low temperatures are characterized by a high order of heat stability, low volatility, relatively slight changes in consistency over a wide temperature range, and low freezing points. An indication of the low volatility of the silicone greases is given in Table V. Typical specifications for these greases are presented in Table V.

OPTICAL MICROMETER: Large or curved plastic sheet is easily measured with this micrometer made by Aireon Mfg. Corp., Burbank, Calif. Tube containing lens system is screwed up or down in outer tube. Plastic nosepiece at lower end of instrument has inserts of soft neoprene that sink level with base, preventing lateral motion that might cause scratching. Transparent sheet is marked with crayon on side away from instrument and mark focused in eyepiece. Reading of barrel and thimble gives thickness of sheet

Compounds: A silicone compound of the grease type proved invaluable in solving some of the most pressing war problems by providing heat-stable, waterproof insulating materials for sealing aircraft ignition systems and radio, radar, and oxygen equipment. Early in World War II, engine failures occurred at a distressing rate because of breakdown of the ignition systems. In the reduced air pressure of high altitudes, corona caused arc-over in the air spaces around the high-voltage ignition cables where they entered the sparkplug well. Some filling material was needed that would displace the air around these enclosed cables, and that would have a high dielectric strength, and would not be decomposed by temperatures up to 400° F. A silicone compound was developed specifically for this purpose.

Vehicles for Protective Coatings

To meet the need for durable protective coatings on all kinds of equipment and surfaces exposed to elevated temperatures and high humidities, silicone resins have been developed for use in formulating heat resistant vehicles for enamels or paints. Two of these resins are designated as DC 801 and DC 803. Typical uses are as heat resistant paints for exhaust stacks, flues, hot-air ducts, and ovens.

Special care must be exercised in the selection of pigments for silicone enamels because of the poor thermal stability of some pigments. The following pigments have been tested for stability at 200-250° C and are recommended by Dow Corning Corp. for use in silicone enamels:

Carbon Black
Cadmium Sulphide
Metallic Aluminum
Monastral Blue
Monastral Green
Titanium Dioxide
Red Iron Oxides
Magnesium Silicate
Diatomaceous Earths
Talc

The drying characteristics of the silicone resins used in vehicles for protective coatings, as shown in Table VI, were prepared by Dow Corning.

Silicone Rubber

The third group of silicones looks and behaves like rubber. It has the softness and resiliency of natural rubber, and in addition is equally unaffected by high or low temperatures. Silicone rubbers retain indefinitely their elasticity and resiliency at temperatures of 300° F, and can be used in some places where temperatures reach 500° F.

Because no suitable gasket material has been available, high-power marine searchlights have had to depend on the metal-to-metal fitting of covers. Under the severe conditions of service at sea, these fits do not keep out water, necessitating the carrying of spare dry carbons. These searchlights experience temperatures when not in operation of well below zero. When in service they are heated by the arc which, at the joints, reaches 570° F. Gaskets of sili-

cone rubber (Figs. 8 and 9) were found to meet these rigorous conditions successfully.

Silicone rubber, applied as a coating to wire-wound resistors and glass-fiber tape, provides a heat-resistant surface not wetted by water and having good electrical properties. It makes a superior, flexible, insulating sleeving for wires and cables. Where temperatures are high or low or both it serves well as vibration mountings. Because of this temperature stability and because it does not swell in oil, gasoline, or other hydrocarbons, silicone rubber someday may make superior printing press inking rolls. It has been used as a protective coating for glass cloth, glass and enameled objects, ceramics, iron, steel, and aluminum.

Silicone rubber is not a general substitute for natural or synthetic rubber. It is deficient in tension, shear, and abrasion. However, silicone rubber does offer the solution to many problems in which a material is required which retains its resiliency and flexibility over a wide temperature range and which resists moisture and oil.

While possessing many of the physical properties of other elastomers, both natural and synthetic, silicone rubber is entirely different in its chemical nature. In order to prevent flow under heat, pressure or both, all rubbers are vulcanized, that is, in chemical terminology, cross-linked. Unlike other rubbers, a methylsilicone polymer has no chemical unsaturation and so the conventional methods of vulcanizing with sulphur have not been possible; however, other methods have been found.

The polymeric silicone gum may be compounded with most fillers used in the rubber industry. Silicone rubber is processed on standard rubber equipment. It may be extruded in a standard continuous extrusion machine (Fig. 7), and molded and vulcanized in a steam-heated press. When metal inserts are molded in a silicone rubber article, relatively little sticking of the rubber to the metal occurs. The rubber in contact with metals has no corrosive action because of its chemical inertness and because it contains no added ingredients, such as sulphur-containing vulcanizing agents, which cause corrosion.

Thus the development of the silicones suggests that many other discoveries in the field of materials of use to metalworking plants may emerge from the young science of molecule engineering.

REFERENCES

[1] Kauppi, T. A., and Moses, G. L., Am. Inst. Elect. Engrs., Tech. Paper, 45-30.

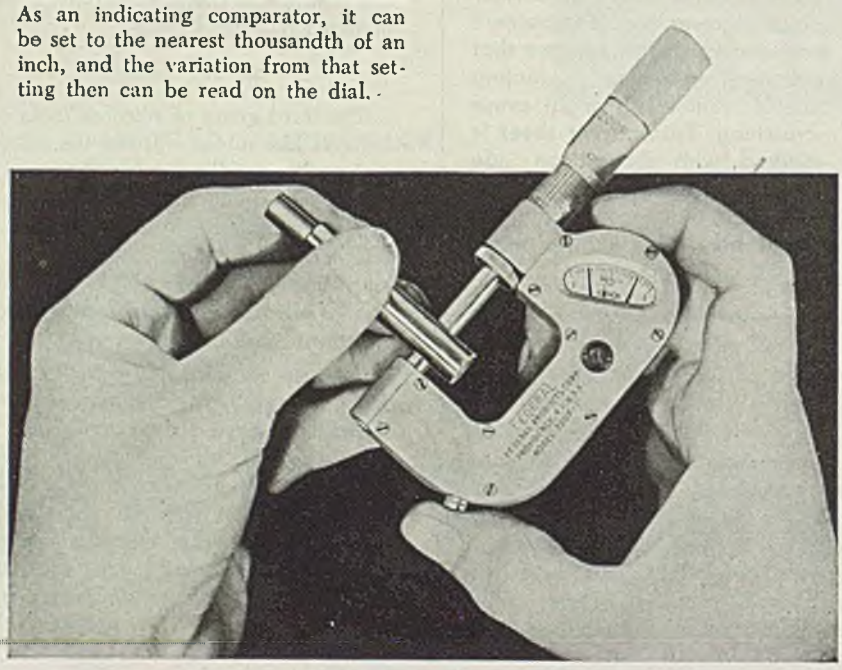
[2] "Dri-Film" is the trademark of General Electric Co.'s water-repellent compounds.

Micrometer with Dial Indicator

. . . obviates necessity of setting to a master for measuring and serves as indicating comparator

MICROMETER in accompanying illustration, incorporating a dial indicator, also can be used as a dial indicator comparator without the necessity of setting to a master as the micrometer furnishes its own precision setting. As a micrometer, the spindle can be brought in contact with the work until the indicator hand indicates "0" and the measurement is then read in the barrel and thimble. As an indicating comparator, it can be set to the nearest thousandth of an inch, and the variation from that setting then can be read on the dial.

In both cases anvil pressure is constant and, therefore, the real accuracy of the instrument can be realized, independent of "feel". Use of the micrometer as a comparator makes it highly advantageous for short runs and equally valuable as a direct reading instrument where frequent changes occur in dimensions and tolerances. A single micrometer, made by Federal Products Corp., 1144 Eddy street, Providence, R. I., can replace a complete series of standard go and no-go gages.

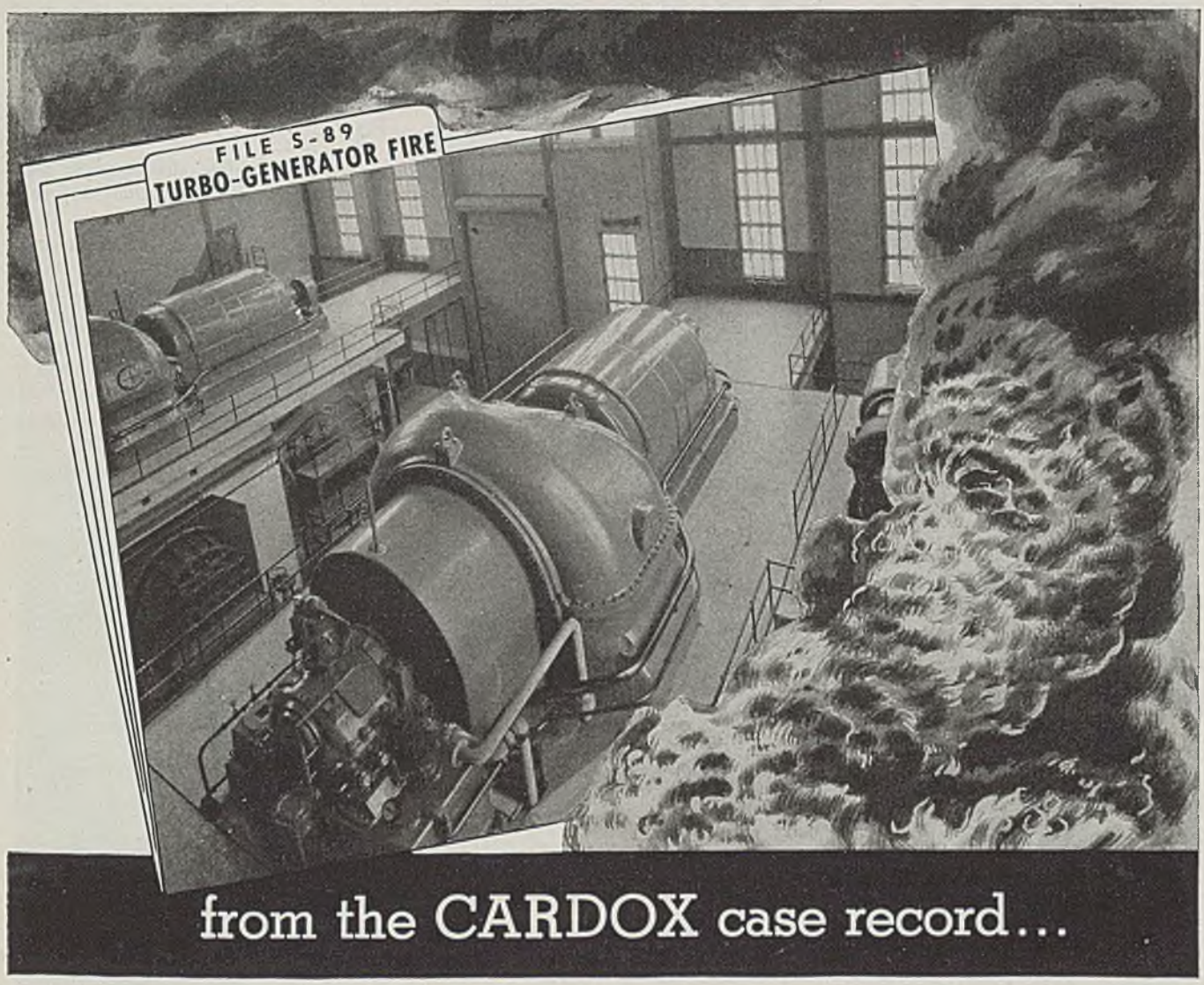


Instrument is light, easy to handle and easy to read. Indicating dial is integral with frame and is provided with tolerance hands which can be easily set with a wrench furnished with the gage. Micrometer scale and the indicating dial are graduated in 0.0001-in. and the measuring capacity is 0.1-in.

When used as a comparator, measuring spindle is locked positively in desired position by a new type of thumb clamp which grips evenly, and does not throw the spindle to one side or considerably out of line.

The opposite anvil is retracted by pressure on the finger or thumb button. This enables the workpiece to be inserted with less chance of the anvils scratching the work. It also prevents excessive wear on the anvils. Both contact faces are tungsten carbide tipped, and are lapped parallel.

Retracting mechanism operates separately from the movement and cannot influence the reading. Micrometer 200P-1 is finished in dull chrome which adds to ease of reading the dial, and also protects the instrument from rust.



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File No. S-89, recording a report on Cardox speedy extinguishment of a 15,000 K.W. Turbo-Generator fire, offers an interesting example of Cardox performance on one of many types of hazards most effectively protected by fast-acting, non-damaging Cardox CO_2.

"Turbine had been shut down for clean-up of exciter and periodical tune up. In putting generator on the line, a direct internal short and resultant fire occurred.

"The Cardox System was actuated automatically by differential relay and operated perfectly on timed discharge. While insulation on coil end loops is burned off in some areas, fire did not reach into that part of the coils in the stator slots. Furthermore, inspection shows the rotor to be entirely undamaged. Plant Fire Chief is especially well pleased by the speed of extinguishment since such a fire normally results in very severe and costly damage to the generator. In this case, only a minimum of repair time and expense will be involved."

The danger spots in your plant may not be similar to the one described here. But if they involve electrical equipment, flammable liquids or any of a multitude of hazardous operations, a Cardox System offers a new high standard of swift, efficient protection. Through the distinctive Cardox method of control and engineered application, fast-acting, non-damaging carbon dioxide is made available in *tons* for large fires . . . in *pounds* for small ones, with ample reserve for new emergencies.

An analysis of your fire hazards by Cardox Research Division and Engineering Staff puts you under no obligation. Write for Bulletin 846, explaining why and how Cardox has given carbon dioxide a scope of usefulness and fire extinguishing performance far beyond its generally recognized scope.

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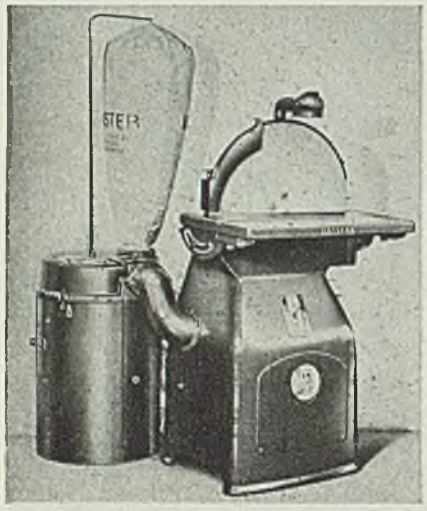
INDUSTRIAL EQUIPMENT

Disk Grinder

A 24-inch disk grinder adaptable to all kinds of grinding on metal, wood or plastics, now is available for delivery from the Kindt-Collins Co., 12651 Elmwood avenue, Cleveland.

Special features of the machine include a heavily ribbed, normalized and machined table which can be tilted 45° down and 25° up by a worm and gear drive; use of both faces of the grinding



disk and circular and core print fixture which has a capacity of 22 in. in diameter and is wedge-shaped with a 10° angle. Both flexible back cloth and paper back abrasives may be used on the disk.

Two models of the grinder are available: Model A, furnished with its own dust collection system; and model B, equipped with a 4 in. exhaust tube to be attached to the plant dust-collecting system.

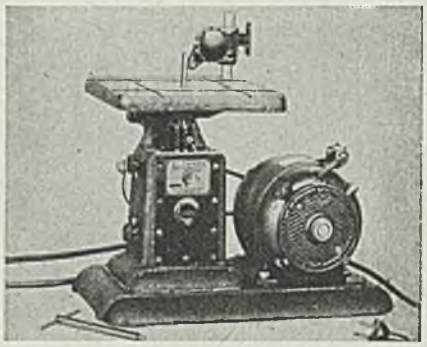
Steel 4/22/46; *Item No.* 9201

Die Filing Machine

A die filing machine which insures complete accuracy in filing, honing and sawing is announced by All American Tool & Mfg. Co., 1014 West Fullerton avenue, Chicago. A universal joint clamp assures a 100 per cent vertical file position despite warped or twisted shanks.

An overarm is provided to hold the file against the work. The tilting table measures 8¼ x 8¼ in. The file is actuated by a scotch yoke mechanism running in an oil bath. Vertical shaft bearings are adjusted by locking thumb screws on the outside.

A neoprene bellows seals off the housing against seepage of oil or entrance of chips. The power is furnished by

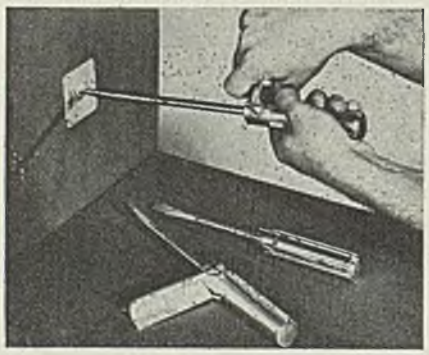


a 1/6 hp, 110 v ac motor of 1725 rpm, which gives the file a speed of 425 strokes per min with a ¾ in. movement. The file clamp has a capacity of ⅛ to ¼-in. shanks.

Steel 4/22/46; *Item No.* 9204

Screw Driver

Designated as Tuffy, a new triple-purpose screw driver tool with a power-arm arrangement that gives extra power that unlocks rusted screws, is offered by Swallow Airplane Co. Inc., Wichita,



Kans. In reverse, it makes possible the last quarter-turn pressure needed to tighten screws and makes them stay put. With the power-arm folded back into the handle, it becomes a standard type screw driver.

This device's aluminum power-arm is constructed so that when in use it affords a solid horizontal hand support that allows full hand and body pressure to prevent slipping or gashing of screw head. Tool has aluminum handle; blade is drop-forged steel and plated. It is made in 5 x ¼-in., 6 x ⅛-in., 8 x ⅜-in. length blades.

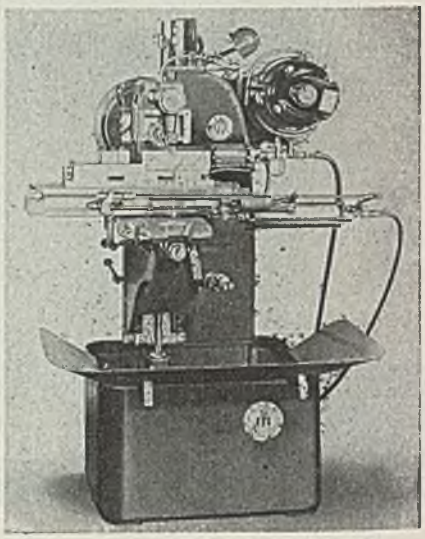
Steel 4/22/24; *Item No.* 9336

Power Feed Attachment

A power table feed attachment for the miller made by W. H. Nichols & Sons, Waltham, Mass., is now available. This attachment can be added at the factory, or by any mechanic in the field, using a kit supplied by the company.

This attachment offers rapid approach, maximum proper cutting feed, fast table return and shut-off, thus requiring operator to only load and unload the work and often run more than one machine on production work.

Basically, this attachment is a Bellows air feed unit used in conjunction with a



Hydro-Check, both the air and hydraulic units being infinitely variable to suit the work being produced.

A 9 in. maximum cutting stroke is attained with the attachment. It can be operated from any shop air system carrying 75 to 175 lb of air.

Steel 4/22/46; *Item No.* 9209

Cold Chamber Machine

New HDO series automatic hydraulic cold chamber machines have been developed for high pressure casting of aluminum, magnesium and zinc alloys by H. L. Harvill Mfg. Co., Vernon, Calif.

Three models of the same basic design are available, ranging in sizes from a normal vertical die dimension of 13 in. to 21 in. Normal horizontal die dimension varies from 20 in. to 31 in. Horizontal die dimension may be greater by having the dies extend beyond the machine platen, providing layout of cavities in die will permit correct metal flow. Die thickness varies from 18½ in. to 28½ in. with a dimension

(All claims are those of respective manufacturers; for additional information fill in and return the coupon on page 130.)

Tandem Chamber Heat Treating and Aging Furnace

for

ALUMINUM ALLOY AIRCRAFT PARTS

- FORCED CONVECTION
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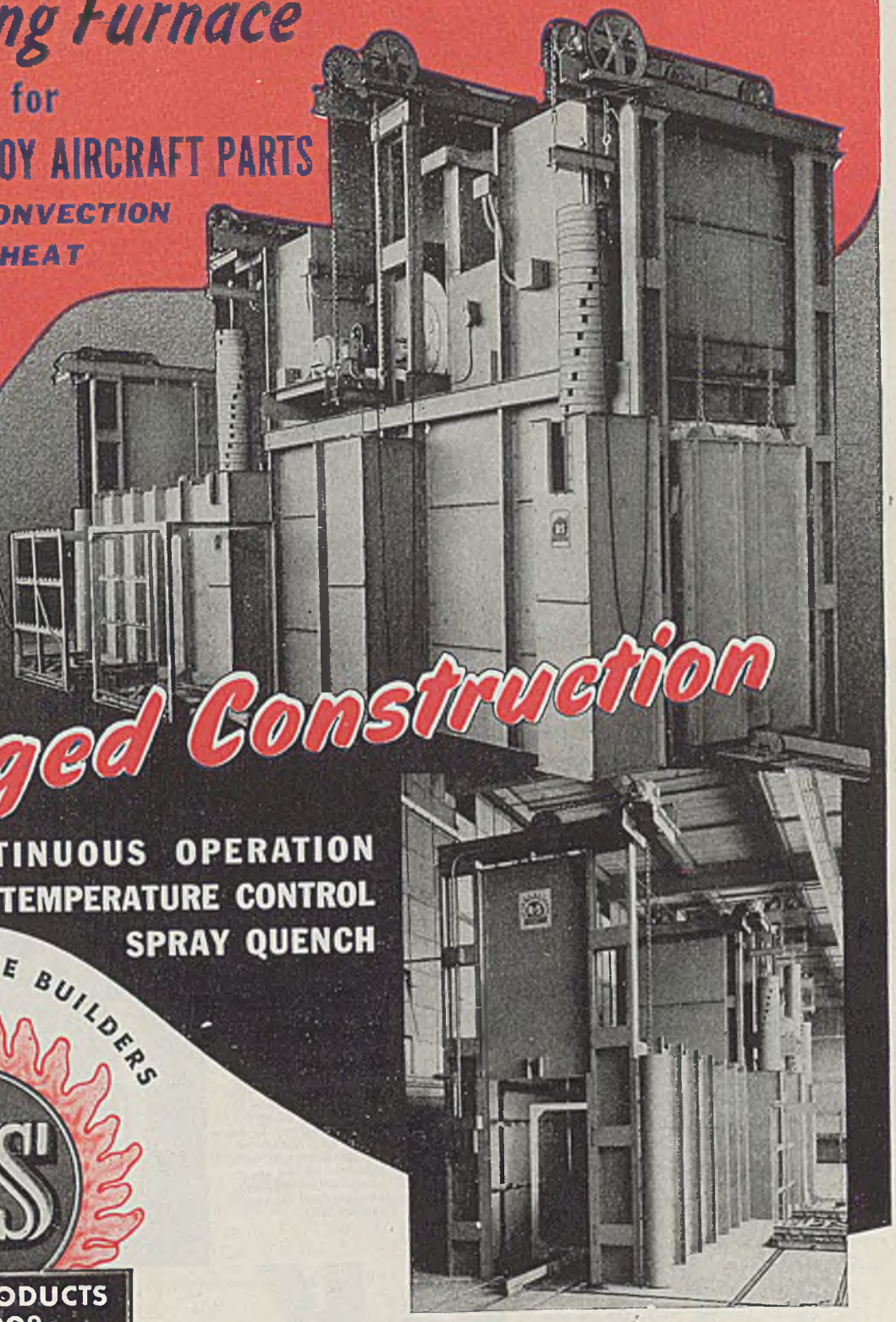

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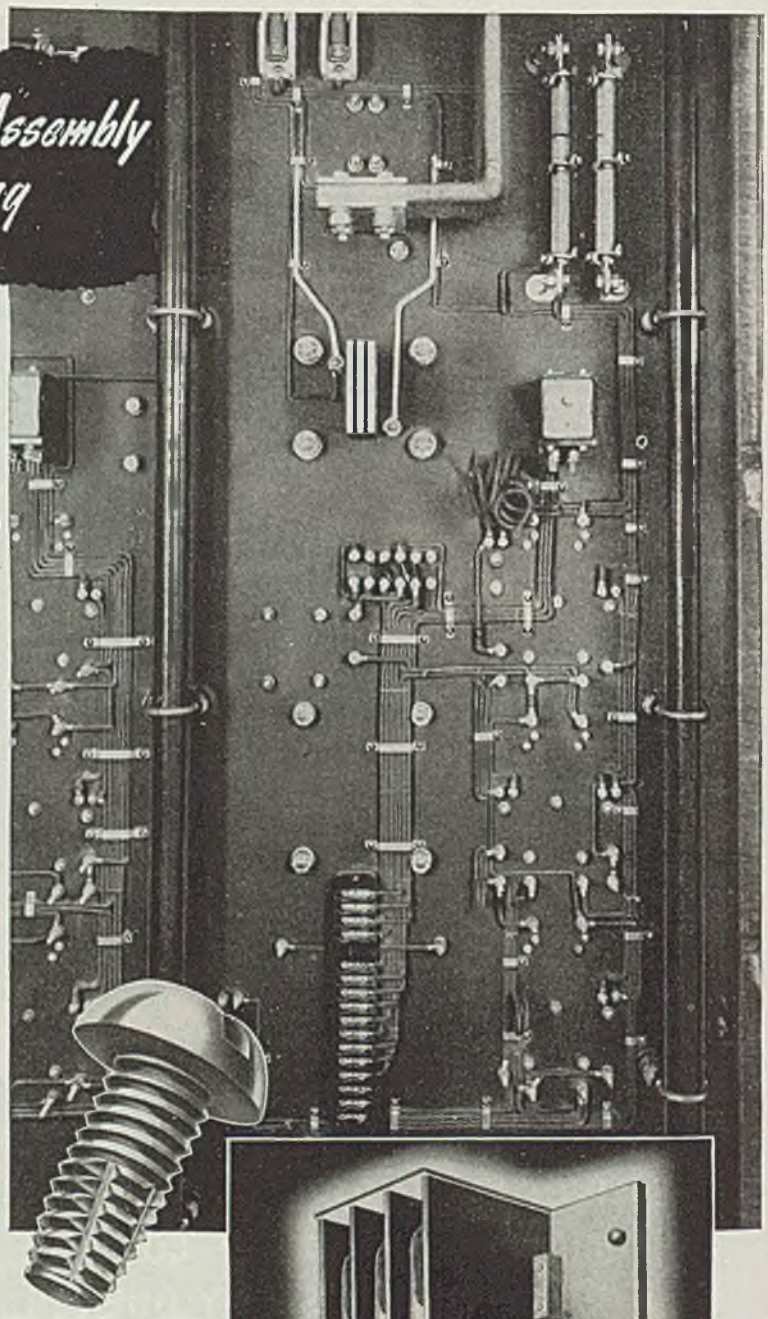

IT'S CERTAINLY sound common sense to save any assembly time which does not add to your product or your profits. The way the I. T. E. Circuit Breaker Company of Philadelphia saved it . . . in assembling switchboards and circuit breakers. They used P-K Self-tapping Screws everywhere possible, in many kinds of materials. The minutes saved by eliminating individual tapping operations are multiplied many thousands of times in assembling this kind of apparatus. That rates as *common sense assembly engineering!*

You don't know . . . we don't know . . . whether or not P-K Screws would save you money on *your* assembly job. But we do know that in *7 out of 10* jobs submitted to us, P-K Screws do the job better, for less. Why not find out if your job is one of the lucky seven?

Let a P-K Assembly Engineer prove it

The way one manufacturer makes fastenings with P-K Self-tapping Screws illustrates only a small part of the advantages of these unique fastenings. Maybe your product needs some of the many other advantages of P-K Screws. With the help of a P-K Assembly Engineer you can find out . . . either by his calling on you, or your mailing in assembly details . . . both without obligation. Parker-Kalon Corp., 208 Varick St., New York 14, N. Y.

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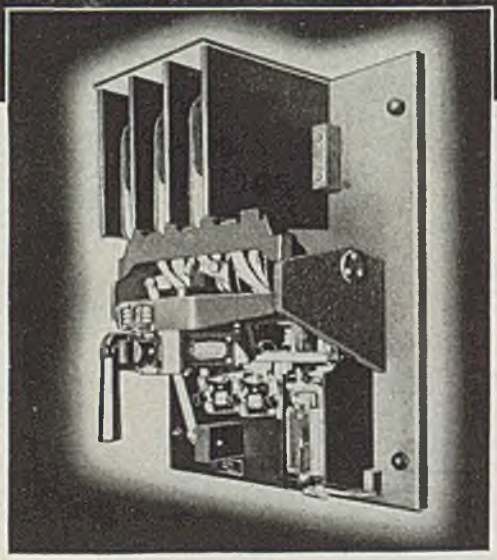
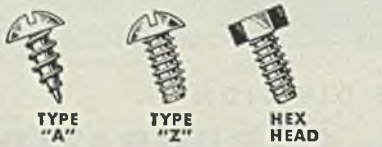


The P-K Type "F" Self-tapping Screw is used for a multitude of fastenings . . . for wire cleats, insulation, switch covers, name and calibration plates, and even functions as terminals in these I. T. E. switchboards and circuit breakers. It cuts a clean, snug fitting thread as it is driven, and makes secure fastenings in such materials as the slate, ebony asbestos, and bakelite used in these switchboards.



PARKER-KALON

P-K

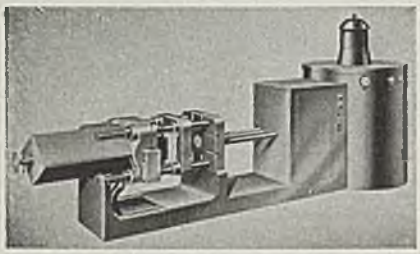
SELF-TAPPING SCREWS

A FASTENING FOR EVERY METAL AND PLASTIC ASSEMBLY

between die faces in the open position ranging from 10 in. to 11½ in.

These machines are equipped with electric timers and limit switches for fully automatic control, or, at option of operator, may be operated semiautomatic or controlled manually. Special water hydraulic system has pressure variation from 200 to 1000 lb.

Hydraulic opening and closing cylinder provides motion for opening and closing of dies, but does not take the shock of metal injection. A mechanical method of



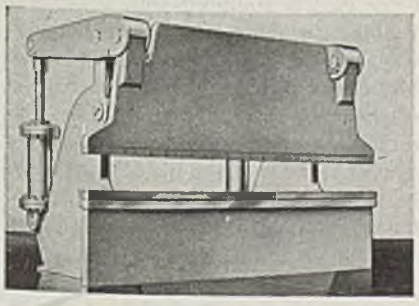
locking the dies results in a transmission of this shock load to the structural members of the machine. Die locking is, therefore, positive and not subject to spring between the die faces because of the compressible characteristics of fluids.

An automatic continuous metal feeding device has been developed to convert equipment to automatic zinc and aluminum operation. This equipment attaches to machine beneath cold chamber injection assembly.

Steel 4/22/46; *Item No.* 9036

Hydraulic Press

A new hydraulic press for bending, braking, shearing, multiple punching and similar operations has been announced by Pacific Industrial Mfg. Co., Oakland, Calif. This model 325 press



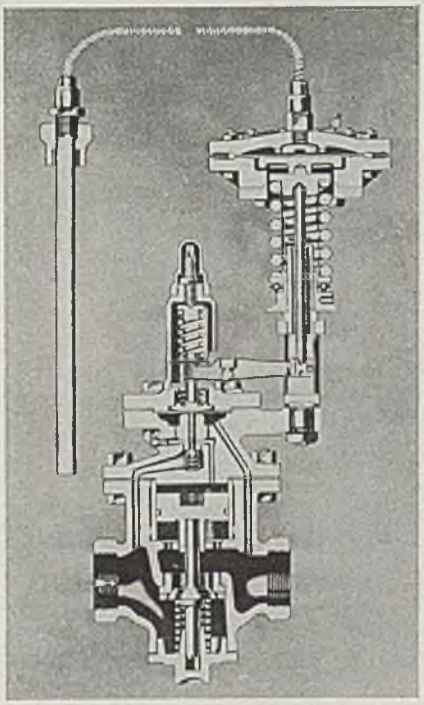
has a working pressure of 325 tons and is equipped with unique electrical controls which balance pressures on the two pistons so accurately that the 12-ft ram will maintain the desired pre-set tilt within plus or minus 0.005-in. whether the work is done at either end or in the center.

A micrometer stroke adjustment, excellent work clearance overhead in front and back of the ram; and few working parts to reduce maintenance and repair expense are advantages. Full-circle bends over 4 ft in diameter and may be made on plates up to 8 ft 6 in. wide. Eighteen inch horns are provided at either end of the ram.

Steel 4/22/46; *Item No.* 9202

Temperature Regulator

A self-contained, spring loaded, internal pilot, piston operated temperature regulator for steam service is introduced by Leslie Co., 152 Delafield avenue, Lyndhurst, N. J. Feature of the new



regulator is duo-matic control, whereby temperature regulation and pressure control are obtained simultaneously with a single regulator, thus simplifying piping and reducing installation costs.

Regulator has a wide range, rugged thermostatic element with 100° F adjustable temperature range, is single-seated for positive dead-end control, and is equipped with metal diaphragms. It has no bellows or packing glands. All wearing parts are renewable, interchangeability allows overhaul without removal from the pipe line. Corrosion and wear resistance is obtained with the use of stainless steel hardened wearing parts. Vital parts are hardened to at least 500 brinell.

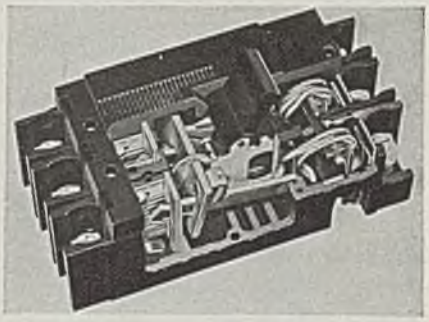
A temperature drop of 1° F at bulb reduces vapor pressure, allowing limit spring to open controlling valve and deliver an increased steam pressure to heat exchanger. Outlet steam pressure is always directly proportional to the change in temperature at bulb and this pressure is automatically maintained regardless of the volume of steam used by heater or variations in supply pressure.

Steel 4/22/46; *Item No.* 9984

Circuit Breaker

A circuit breaker rated at 15 to 100 amp at 600 v ac, 50 to 100 amp at 250 v ac-dc, 2 and 3-pole, is announced by Switch & Panel division, Square D Co., 6060 Rivard street, Detroit.

Dust resisting sheet steel enclosures with front operated handle are available



for 3 and 4-wire solid neutral applications in addition to 2 and 3-pole devices. Weatherproof, dust-tight and explosion-resisting enclosures are also available for Class 1, Group D and Class 11, Group G hazardous location applications. The breaker is also manufactured for panelboards.

Steel 4/22/46; *Item No.* 9180

Welding Machine Carriage

A heavy-duty, straight-line unit, the Oxweld-Unionmelt CM-37 machine carriage, is offered by The Linde Air Products Co., unit of Union Carbide & Carbon Co., 30 East 42nd street, New York. It can be used for carrying electric welding equipment and with acces-

sory equipment it can be adapted for use in plate edge preparation, flame hardening and heavy cutting.

Aluminum alloys are used in the construction of the machine, its weight being 87 lb, without equipment, enabling it to be moved easily from job to job. Equipped with a 110 v as unidirectional motor of ¼ hp, reversing is accomplished mechanically through gears.

The machine has a speed range of 2

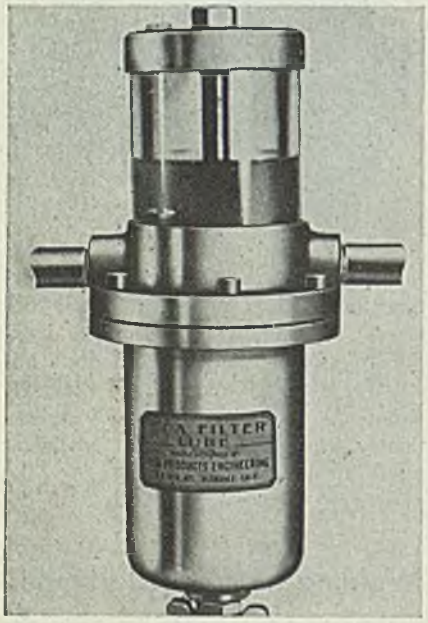
(All claims are those of respective manufacturers; for additional information fill in and return the coupon on page 130.)

to 50 ipm for general industrial use, and 7 to 210 ipm for use with welding processes. It will operate on a track, on a standard 10 in., 24.5 lb I-beam, or directly on a steel plate or other flat work piece.

Steel 4/22/46; *Item No.* 9185

Pneumatic Filtering Unit

Filter-Lube, a compact pneumatic filtering unit combined with a lubricator which prevents freezing of air-operated devices, and deters corrosion, is announced by CCA Products Engineering, P. O. Box 671, Glendale, Calif. Its pri-



mary use is for air cylinders, vises, chucks or any reciprocating or rotary air tools.

Featuring a full view, transparent plastic lubricator oil reservoir, and a needle valve oil regulator, it permits correct amount of oil to mix with filtered operating air.

Lower element of this automatic filter is composed of a sludge basin and an interchangeable all-wool felt filter media.

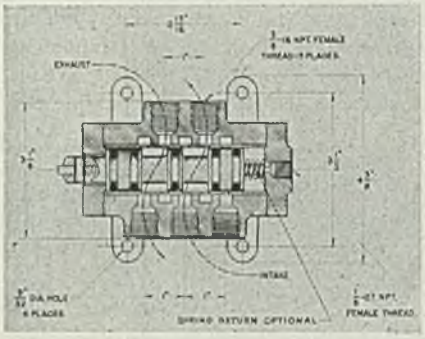
Steel 4/22/46; *Item No.* 9183

Control Valve

The Modernair 4-way control valve for control of air and low pressure hydraulic systems and adaptable to hand, foot or pilot operation is announced by Modern Products Ltd., 952 South Grand avenue, Los Angeles.

The valves are fully balanced, free of metal-to-metal contact between wearing parts. The design permits transmission of full line volume and pressure through valve, without operation being affected by variation of line pressure.

The valve can be used normally on or off in three positions, with center position being "neutral". In neutral position, when valve is used for cylinder control, unit may be arranged to permit positioning of piston with pressure balanced on both sides of the piston, or with pressure relieved at both piston ends. Hand, foot or pilot operated valves can be used as single 3-way valve by plugging one



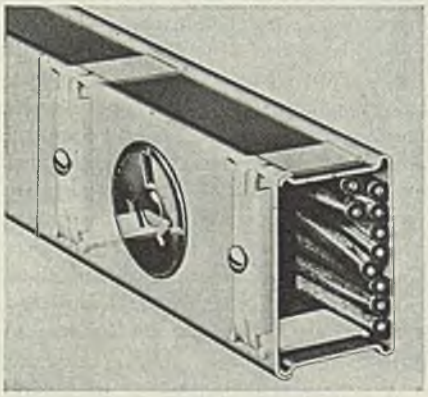
outlet port or as two 3-way valves in series. When the unit is installed as two 3-way valves in series, one valve will have the pressure on, while the other will have the pressure off.

Changes from one operation to another may be made without breaking the line connections and using identical housings.

Steel 4/22/46; *Item No.* 9194

Surface Duct

Designed primarily to facilitate use of wiring for flexible power tools and machines, the surface raceway, called Surfaceduct No. 1700, introduced by National Electric Products Corp., Pittsburgh, also can be used in any electrical application in connection with lighting and heating devices. A two-



piece unit, base and capping, measuring 1⅝ x 2⅛ in., it is capable of meeting requirements up to 60 amp loads.

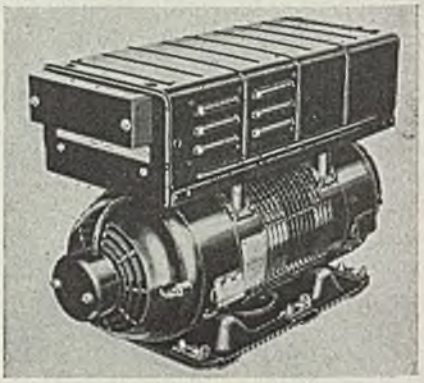
An arch-type bridge within the raceway, four of which are furnished in each 10 ft length, allows maximum wire capacity, retains wires during installation and locks the snap-on cover.

A combination T and offset service fitting in the unit makes possible installation of devices in an offset position from the raceway, eliminating obstructions for maximum wire fills. The duct has ½ and ¾-in. knockouts. Mounting holes are located every 12 in. along the base, suspension installations being made by use of hangers.

Steel 4/22/46; *Item No.* 9186

Inverter

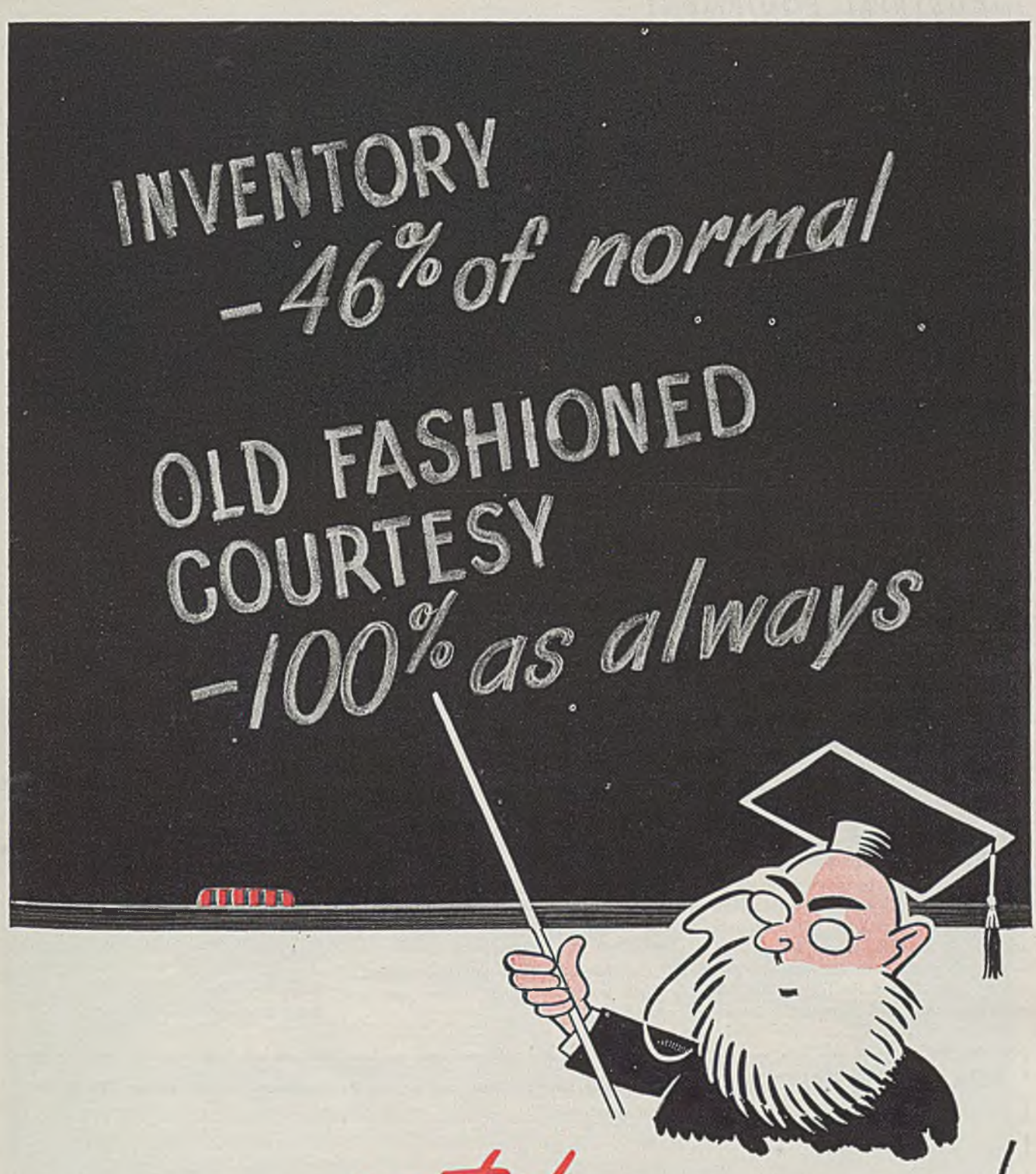
Jack & Heintz Precision Industries Inc., Cleveland 1, introduces the first of a series of direct current and alternating current inverters. The 2500 V. A. inverter provides a continuous and dependable source of 400 cycle, 115 v power for use in aircraft applications, with particular reference to radar. This unit is of the motor-generator, two bearing type, complete with control box. Motor is a 4 pole, shunt machine, with a series field for quick starting at low current, and has two inter-



pole windings which give sparkless commutation throughout range of loads inherent to aircraft service. Six pole alternator field is equipped with amortisseur windings, which aid in maintaining good wave shape required for radar loads. Mixed-flow fans are mounted on each end of the rotor shaft, and the airflow from each fan cools the direct and alternating current sections of the machine separately, with a partial diversion of air to cool the control box. This self-ventilation is effective up to 35,000 ft altitude. Inherently stable speed characteristic of the motor is closely controlled by a carbon pile speed governor, mounted on the motor end of the machine and readily accessible for adjustment.

A ribbed aluminum control box is mounted on the top of the machine by brackets which also house and shield the conductors from the machine. Relays are provided for starting and running; the starting operation is entirely automatic and the series field is shunted out when the operational speed is attained. A car-

(All claims are those of respective manufacturers; for additional information fill in and return the coupon on page 130.)



LESSON IN *metal* ARITHMETIC!

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Structural Shapes • Plates • Checker Plates • Sheets • Strip • Hot Rolled and Cold Finished Bars
Reinforcing Bars . . . *also* APS Plasteel Roofing • Bates Open Steel Flooring • Thorn Steel Windows

bon pile voltage regulator on a quick detachable shock mounting is located in the control box, providing close control of the output voltage over the load range.

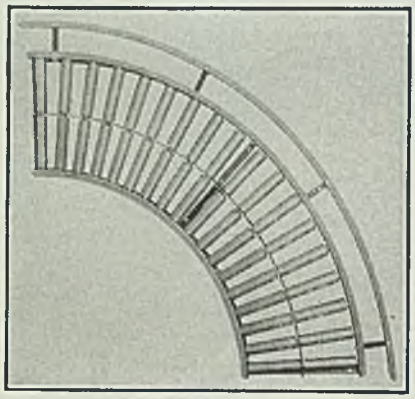
Suitable filters are installed in the control box, which keep the conducted and radiated radio interference at a low value, as well as minimizing the alternating current ripple at the input terminals.

Steel 4/22/46; *Item No.* 9086

Gravity Roller Conveyor

A packaged line of gravity roller conveyors for a large number of industrial uses in handling and transportation is being marketed by Lyon Metal Products Inc., Aurora, Ill.

Available in three straight sections, all 10 ft long and 12, 18, and 24 in. wide,



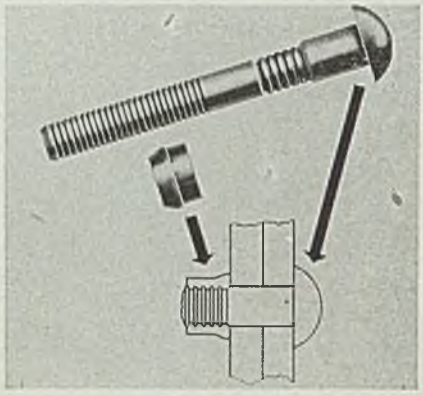
three 90° curved sections of the same widths, and two trestles 18 and 24 in. wide, each item is a complete unit.

Transportation is by gravity, the rollers not being driven by power. Combinations of units can be made to follow straight and curved lines. Rollers are mounted on full-length shafts, reducing wear and preventing spreading of the frame. The rollers are mounted on 4 in. centers, allowing sufficient support for items up to 200 lb.

Steel 4/22/46; *Item No.* 9132

Locking Fastener

A new type steel or aluminum alloy fastener, the Huck Lockbolt, which draws work tightly together and then locks it permanently in place with uniform tightness is announced by Huck Mfg. Co., Detroit. It consists of two parts: (1) A pin which has a head of any desired type, locking grooves, a



breakneck groove, and pull grooves which fit the jaws of a hand-operated or pneumatic-driving gun; (2) a locking collar.

To operate, the pin is inserted in work, collar is slipped on and gun applied, thus pulling pin and drawing work together tightly. The pull then is increased until the anvil in the nose of the gun is forced over the collar, squeezing collar into locking grooves of the pin to form a rigid, permanent lock. At this point, pin is automatically broken off at the breakneck groove.

The fasteners are quickly installed, require no lock washers, cotter pins or special nuts.

They now can be furnished in 3/16-in. diameter with grip lengths ranging from 1/32 to 21/32-in. Diameters of ¼ and 5/16-in. soon will be available.

Steel 4/22/46; *Item No.* 9177

Tubular Drawing Board

A light-weight drawing board with an all-steel, tubular, welded frame reinforced with angle pieces, is announced by Binkins Tool & Mfg. Co., 1513 Springwells avenue, Detroit. Construction is unaffected by moisture or varying weather conditions and holds the board true and flat. The board is adjustable to a maximum tilt-angle of 60

degrees and a maximum up-and-down movement of 6 in.

Optional equipment available includes a tray-shelf that is installed under the board for drafting tools, reference books, blueprints and manuals, and an adjustable light bracket assembly for 48 in. fluorescent lamps.

Steel 4/22/46; *Item No.* 9178

FOR MORE INFORMATION on the new products and equipment mentioned in this section, fill in this form and return to us. It will receive prompt attention.

Circle numbers below corresponding to those of items in which you are interested:

9201	9984	9186
9204	9180	9086
9336	9185	9132
9209	9183	9177
9036	9194	9178
9202		

4-22-46

NAME ..... TITLE .....

COMPANY .....

PRODUCTS MADE .....

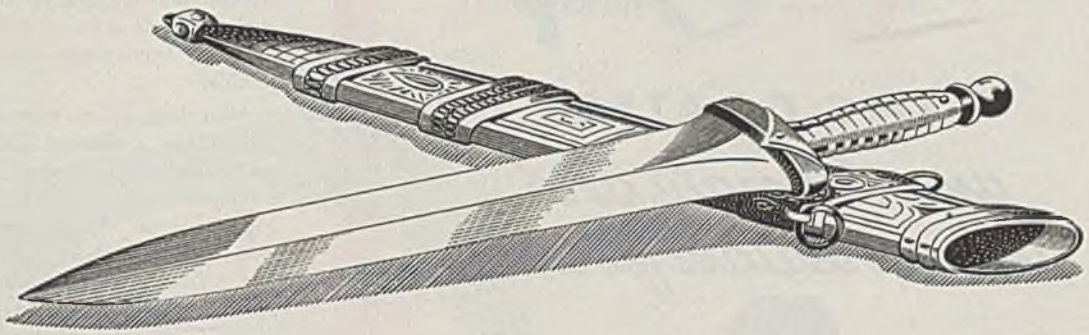
STREET .....

CITY and ZONE ..... STATE .....

Mail to: STEEL, Engineering Dept.—1213 West Third St., Cleveland 13, Ohio

(All claims are those of respective manufacturers; for additional information fill in and return the coupon on this page.)

WHAT Damascus MEANT TO ANCIENT WARRIORS . . .



When the Roman legions went into battle, the most prized weapons were those from the forges of Damascus . . . and the Legionaries called for these fine quality swords by name . . . *Damascus.*

Granite City MEANS TO MODERN STEEL

Since 1878, the facilities of Granite City—large enough to permit the use of the most modern methods and small enough to insure finest quality—have made *quality* steel a product to be called for by name—*Granite City.*

Granite City Steel Co.

GRANITE CITY, ILLINOIS

Chicago • Cleveland • Houston
Indianapolis • Kansas City
Los Angeles

SINCE 1878 GRANITE CITY STEEL

Milwaukee • Memphis • Minneapolis • Moline • New York
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HOT ROLLED SHEETS • COLD ROLLED SHEETS • STRIPLATES • STAINLESS-CLAD • TIN PLATE • TERNE PLATE • ELECTRICAL SHEETS • TIN MILL PRODUCTS • PORCELAIN ENAMELING SHEETS

ThomaStrip

COLD ROLLED STRIP STEEL

ZINC COATED

an ultimate and intermediate finish

DULL ZINC COATED | ZINC COATED LACQUERED | ZINC COATED POLISHED

When you select materials for your new product, consider the advantages of zinc coated ThomaStrip.

This coating is applied by the electrolytic process, and is available in a variety of finishes—dull, bright, polished, and lacquer coated.

Zinc coating lubricates dies, increases production, affords maximum rust resistance, and provides an inexpensive finish with complete coverage inside and outside of formed and drawn parts.

Our engineers will be glad to discuss the possibilities of ThomaStrip as applied to your products.

ELECTRO-COATED ZINC, COPPER, NICKEL AND BRASS . . HOT DIPPED TIN AND SOLDER . . LACQUER COATED IN COLORS . . UNCOATED PRECISION STRIP, CARBON AND ALLOY SPECIALTIES

THE THOMAS STEEL CO.

WARREN • OHIO

COLD ROLLED STRIP STEEL SPECIALISTS

Nickel Filters

(*Concluded from Page 85*)

on the VT fuse. In practice, mercury passes through the base of the cup in several hundredths of a second. Density of the cups varies less than 1 per cent over a production run amounting to millions.

The parts during manufacture are segregated into batches of 800 pieces, and each batch is given a code number for handling from press room to fuse assembly.

After loading on trays, the cups are sintered in a General Electric furnace, under atmosphere control, for 45 min at a temperature of 2050° F. The furnace, Fig. 3, is an electric continuous type, with special preheat oven at the feed end. The sintering is done to bond the particles together by atomic forces. The heat creates greatly increased surface contact of the metallic particles.

After removal from the sintering furnace, the cups are inspected for dimensional change and subjected to a deformation test. Representative samples are given a further porosity test, which consists of passing mercury through the end of the cup. The cups are inserted in an electronic unit which records the rate of flow in hundredths of a second. The tested cups are discarded and the finished cups packed with dessicant in glass jars and shipped to the rear fitting assembler where they are further sampled and tested before being accepted. The cups were also analyzed chemically at the place of assembly.

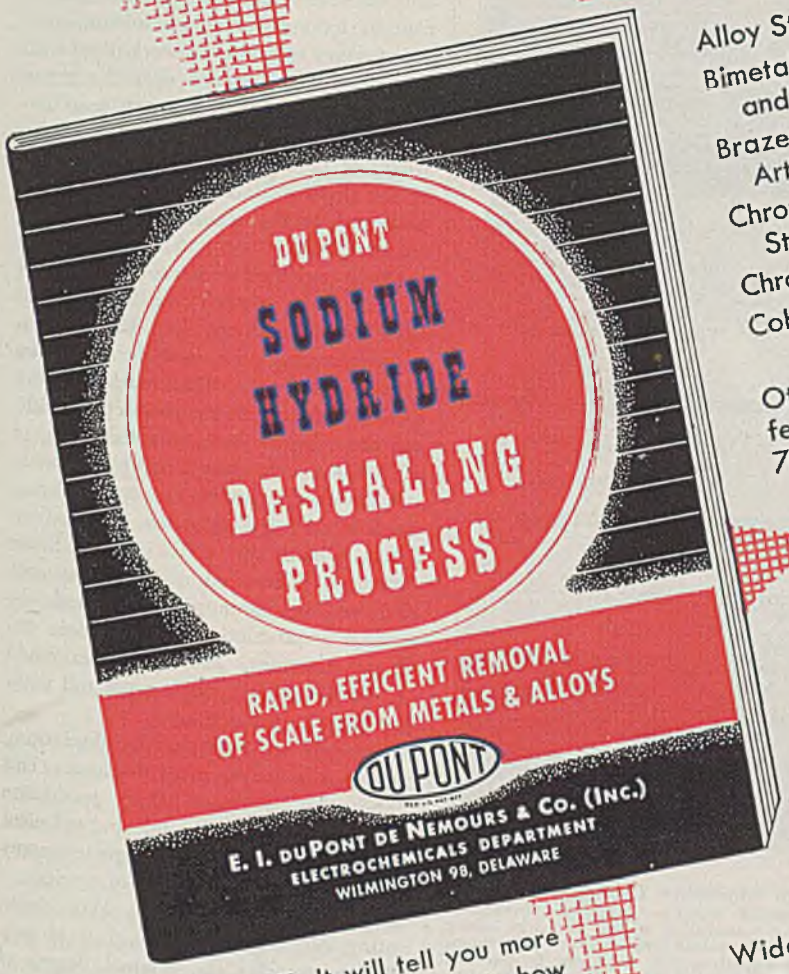
The usual range of bearing material and machine part products of course do not require such rigid control of physicals during manufacture. The production routine on the cup, however, shows that any degree of control can be applied to powdered metal products during manufacture.

Recognizing the need for standardization of materials available for the powder metallurgy process, Powdered Metal Products has developed five standard classifications for bronze, iron and steel types. Divided into two major categories, these materials have the varying average physical properties shown in accompanying table.

—o—

A new vinyl-resin industrial coat which reportedly cannot be stained by oil or grease and a synthetic Ameripol rubber coated apron, said to be acid and solvent proof are additions to line of industrial protective clothing of B. F. Goodrich Co., Akron, O. These and others items are described and illustrated in a new 10-page catalog.

FOR POSITIVE DESCALING OF



- Alloy Steels
- Bimetallic Sheet and Strip
- Brazed and Welded Articles
- Chrome-Nickel Steels
- Chrome Steel
- Cobalt-Nickel Steels
- Composite Sheet
- High Speed Tool Steels
- Copper
- Inconel
- Nickel
- Nichrome
- Monel

Other metals which are not affected by fused caustic at 700°F.

HERE ARE SOME OF THE OPERATING FEATURES

- Wide Application
- Uniform Treatment
- No Loss of Metal
- No Pitting
- No Hydrogen Embrittlement
- Safe Operating Temperatures
- Inexpensive Equipment
- Speedy, Efficient Descaling
- Economy

SEND FOR THIS BOOK. It will tell you more about this new Du Pont development, how easily it can be installed and used, how economical it is for the production of clean, bright surfaces, free of scale and smut. Just clip the coupon to your letterhead and mail to E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Department, Wilmington 98, Delaware.

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DU PONT — BETTER THINGS FOR BETTER LIVING ... THROUGH CHEMISTRY

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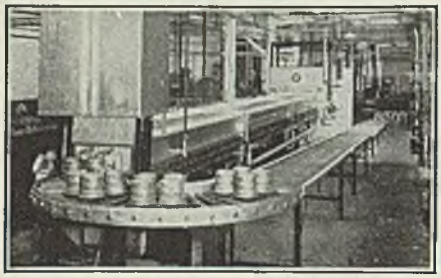
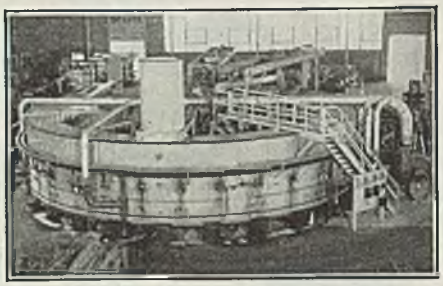
We Specialize on Building Production Furnaces



Copper Brazing Heavy Assemblies. An EF roller hearth furnace copper brazing heavy steel assemblies. Other types are handling aluminum, brass, and steel assemblies ranging from small radio tube parts up to large automotive and aircraft units. Information on furnaces and brazing process available on request.



Heats 35,000 lbs. Billets Per Hr. Billets up to 10" x 32" are uniformly heated in this large EF oil fired rotary hearth furnace. Has hydraulically operated charging and discharge mechanism. Other EF rotaries available for various processes; in sizes ranging from 250 lbs. per hr. up. Write us regarding your requirements.

We Build the Furnace to Fit the Job

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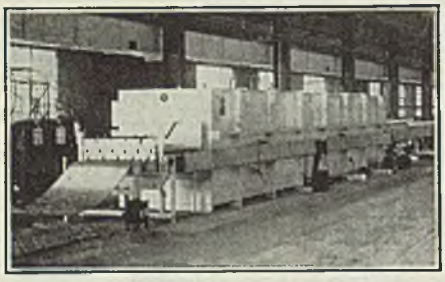
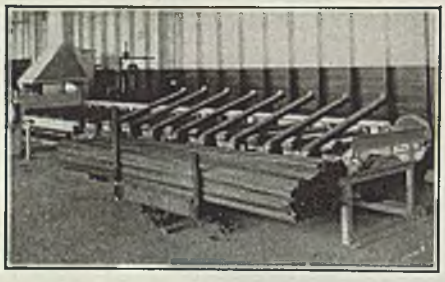
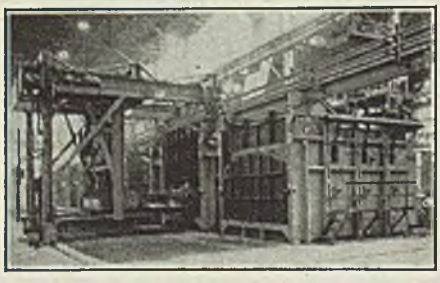
No Job is Too Large or Too Unusual



Bright Annealing Strip — Continuously. This EF furnace handles single or parallel strands up to 36" wide. Advantages include uniform finish and anneal; quick deliveries; short annealing time; less material in process. Available for annealing hot or cold rolled; high or low carbon; stainless and non-ferrous.



For Bright Annealing Tubing. Discharge end of an EF continuous special atmosphere furnace bright annealing 40,000 lbs. steel tubing per day. We build other sizes and types; electrically heated or fuel fired; for ferrous and non-ferrous tubing. Additional information furnished on request.



For Heat Treating Large Castings. Railroad castings, heavy tank castings and other large parts and products are annealed, or heated and quenched in EF units similar to the above. Other types include roller hearth, roller rail, pit, car, and other designs; electric or fuel fired.

For Scale Free Hardening Small Parts. 175 to 2000 lbs. of small and medium size parts and products, per hour, are scale-free hardened in EF continuous chain belt furnaces such as shown above. We build them either electrically heated or fuel fired. Send for data on sizes to handle your products and production.

We solicit your inquiries covering production furnaces for handling products in any size or shape

The Electric Furnace Co., Salem, Ohio

Gas Fired, Oil Fired and Electric Furnaces---For Any Process, Product or Production

Flat Form Contours

(*Concluded from Page 86*)

wheel stop. This permits accurate holding of pitch-line dimensions on thread forms, the amount dressed from the wheel is automatically compensated as the backup stop on the elevation handwheel is set to finished work height.

On very precise, intricate contours such as thread forms, serrations, lamination die segments, and any other precise contour having very close tolerances, it is important to grind the work piece with one pass of the wheel over the entire contour. This eliminates any inaccuracies due to the work approaching the wheel at high speed and removing part of the precise contour that has been reproduced in the wheel from the faster crushing roll.

On a modified buttress thread form which had an 8-pitch form, it was possible to obtain more than 15,000 dressings from the work crushing roll before it was worn out. This represented an increase of continuous production, without changing or disturbing the setup, of 12,500 per cent over a more commonly used method. Similar economies in production cost and time are obtained on forms where the rolls provide fewer dressings. Thus, on a simple flat contour working four pieces up and obtaining a production of 56 pieces between dressings, 250,000 pieces could be finished from a single work roll without disturbing the setup.

Grinders are equipped for duplicating master rolls in the same machine. This duplication is done before production grinding is started and in sufficient numbers to assure an adequate supply of rolls for the completion of production of the given contour work. With duplicating (as with re-crushing) it is possible to transfer the original degree of accuracy from a master reference roll into a work roll and no modification is necessary with the process.

Feeds and speeds are adjustable for each particular type of contour. All measurements, starting position of the wheel and down-feed limits (for crushing, grinding, truing and touching-up) are figured from the same "check" which is the work height. Size compensation is automatic as are the crushing and truing limits, grinding and interlocked grinding, and truing cycles.

—o—

A time and motion study slide rule is offered by Better Methods Co., 1172 Raymond boulevard, Newark, N. J. Designed to provide handy ready reference, the rule incorporates cut-outs for process charts, 40 principles of motion economy body members and time standards for each manual motion.

"Flying Mike"

(*Concluded from Page 87*)

mains undisturbed in the original position.

The remote control setting cabinet contains a Selsyn motor, counter, plus and minus toggle switch and an indicating meter. Unit is sturdily built to withstand rough treatment.

Components are as follows: (1) Model D continuous gage head; (2) gage head counter; (3) gage head Selsyn motor; (4) cross head; (5) cross slide; (6) rail; (7) sprocket for overhead slide control; (8) remote control cabinet; (9) indicating meter; (10) cabinet counter; (11) plus and minus toggle switch.

Temperature Compensator Available

To assure accurate gaging of strip material, a temperature compensator also is available to maintain zero setting for all conditions of temperature. Under conditions of constant temperature electrolimit continuous gage is accurate to 0.000025-in. but as temperature changes such as it does in rolling, gage reading varies from its original setting and this variation is actually a shift of the zero setting. Temperature compensator maintains a zero setting, namely; counter on zero and meter on zero—for all conditions of temperature, and this then makes the gage indication accurate for any setting thickness, whether the gage is cold or warm.

Temperature compensator, shown in Fig. 3, can be readily applied to any electrolimit continuous gage and installed in about 10 min. Only mechanical change on gage is to replace existing lower roll stud with temperature compensator roll stud. Temperature compensator eliminates necessity of constantly checking the continuous gage with feeler gages during rolling, and provides an automatic means of indicating gage thickness accurately under varying temperature conditions.

New Calibrator Tests Electronic Equipment

To provide calibration marks for use in calibrating the sweep speed of a synchroscope or triggered sweep oscilloscope, a calibrator, model No. 8127, for commercial use in radar and television test work is being produced by United Cinephone Corp., Torrington, Conn.

Marks on the unit consist of short video pulses, said to be of less than ½ microsecond duration, spaced apart by a known number of microseconds selected by a switch from four different time intervals between calibration markers.

the BUSINESS TREND

FURTHER reduction in steel ingot output as a result of shrinking supplies of fuel lowered STEEL's industrial production index to 121 per cent (preliminary) in the week ended Apr. 13, compared with 123 per cent in the previous week, and a postwar high of 132 recorded in the week ended Mar. 30.

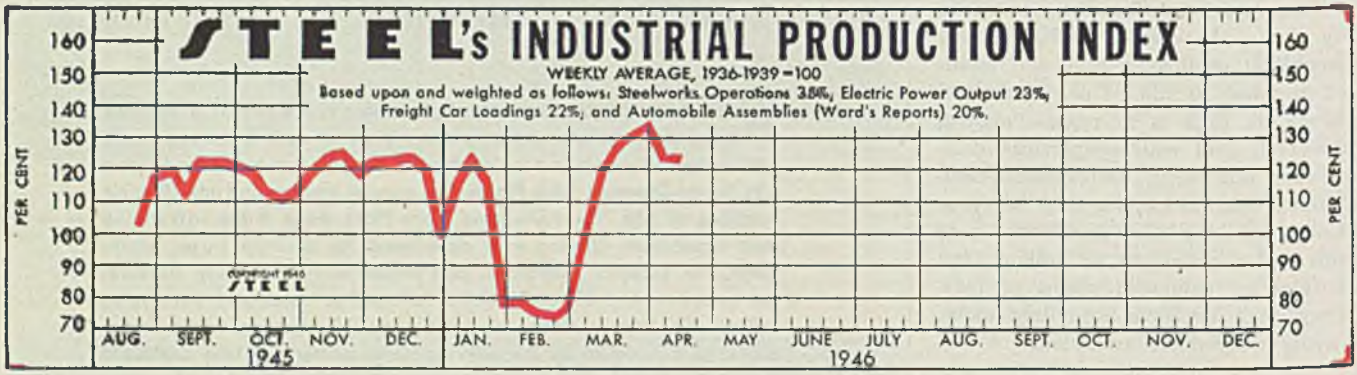
The bituminous coal miners' strike, responsible for the tapering off of steel ingot production, continued to hold down railroad car loadings in the week ended Apr. 13, and threatens a severe fuel shortage that would seriously curtail all industrial production.

AUTOS—Although production of automobiles, trucks and buses in the week ended Apr. 13 reached 49,425, the highest mark recorded since January, 1942, the increase over the previous week was an insignificant 1690 units. The coal strike, already having reduced steel operations, poses a real threat to vehicle manufacturing, for fuel supplies are none too plentiful for contemplated auto production schedules.

COKE—Just now appearing statistically is another effect of the recent steel strike. A Bureau of Mines report shows that cumulative production of by-product coke through February was 40 per cent lower than for the corresponding period in 1945 principally because of curtailed operations at plants affiliated with the iron and steel industry, or "furnace plants." This group of plants operated at but 54.4 per cent of productive capacity in January and 36 per cent in February, whereas nonfurnace, or "merchant plants," operated at 90.1 per cent in January and 90.8 per cent in February. Total coke production in February was 3,006.832 tons, lowest monthly output since May, 1939.

CASTINGS—Another effect of the steel strike was a reduction of steel castings shipments in February to 55,923 tons, 40 per cent under January. Unfilled orders for sale to the trade totaled 379,391 tons at the end of February, 10 per cent greater than the backlog at the end of January. Shipments of malleable iron castings during February totaled 40,156 tons, off sharply from the 53,685 tons shipped in January, and down almost to the 1935-1939 monthly average. New orders booked, less cancellations, for outside trades during February were 31,104 tons, 34 per cent lower than in January.

RAILROADS—Class 1 railroads in the U. S. expended $1,572,404,000 in 1945 for fuels and materials and supplies, a decrease of $88,125,000 from 1944. Expenditures for iron and steel products of all kinds amounted to $520,876,000 in 1945, compared with $526,608,000 in 1944. Capital expenditures for equipment and improvements to railway property in 1945 totaled $562,980,000, greatest for any year since 1930. The 1945 expenditures were $2,868,000 above those of 1944.



The Index (see chart above): Latest Week (preliminary) 121 Previous Week 123 Month Ago 126

FIGURES THIS WEEK

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	75.5	81.5	84.5	94.5
Electric Power Distributed (million kilowatt hours)	4,015	3,988	3,988	4,332
Bituminous Coal Production (daily av.—1000 tons)	141	2,211	2,167	1,286
Petroleum Production (daily av.—1000 bbls.)	4,691	4,446	4,415	4,811
Construction Volume (ENR—Unit $1,000,000)	$118.9	$131.0	$74.8	$52.2
Automobile and Truck Output (Ward's—number units)	49,425	47,735	35,020	20,470

*Dates on request. †1946 weekly capacity is 1,762,381 net tons. 1945 weekly capacity was 1,831,636 net tons.

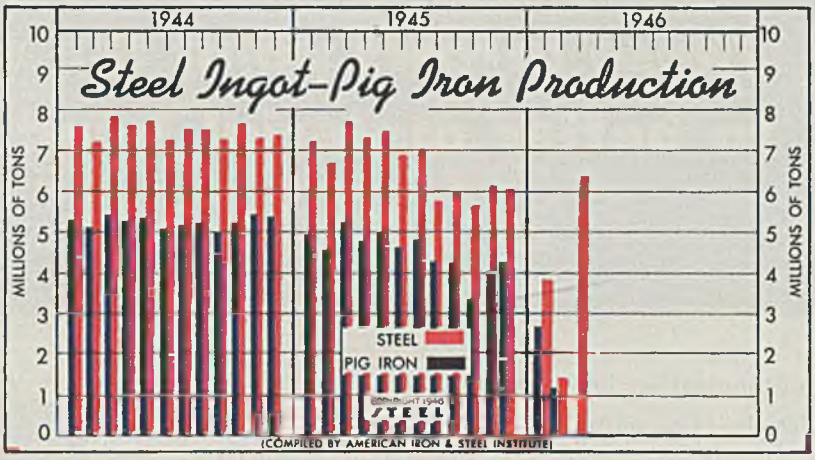
TRADE				
Freight Carloadings (unit—1000 cars)	644†	645	800	846
Business Failures (Dun & Bradstreet, number)	24	19	17	17
Money in Circulation (in millions of dollars)‡	$27,955	$27,912	$27,946	$25,939
Department Store Sales (change from like week a year ago)‡	+50%	+12%	+14%	−13%

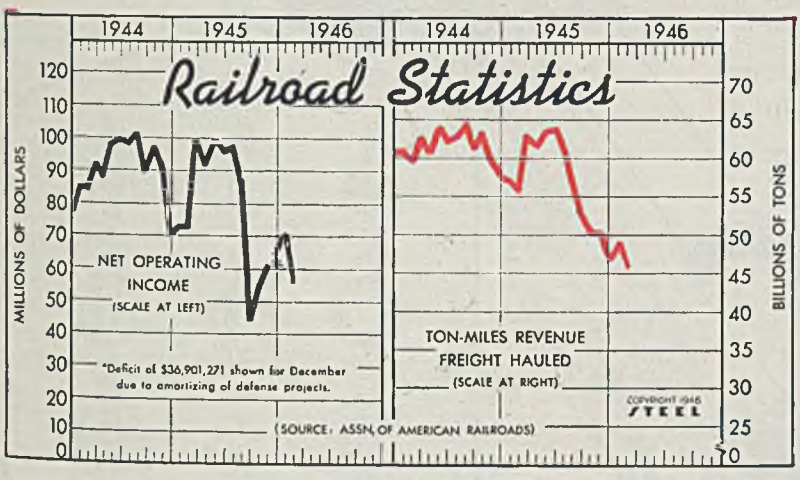
†Preliminary. ‡Federal Reserve Board.

Iron, Steel Production

(Net Tons—000 omitted)

	Steel Ingots			Pig Iron	
	1946	1945	1944	1946	1945
Jan.	3,872	7,206	7,593	2,645	4,945
Feb.	1,393	6,655	7,194	1,148	4,563
Mar.	6,535	7,708	7,826	.....	5,228
April	.....	7,292	7,594	.....	4,786
May	.....	7,452	7,703	.....	5,016
June	.....	6,842	7,234	.....	4,605
July	.....	6,987	7,498	.....	4,812
Aug.	.....	5,736	7,499	.....	4,249
Sept.	.....	5,983	7,235	.....	4,227
Oct.	.....	5,598	7,621	.....	3,388
Nov.	.....	6,201	7,279	.....	4,026
Dec.	.....	6,039	7,366	.....	4,323
Total	.....	79,719	89,642	.....	54,167





Statistics of Class I Railroads

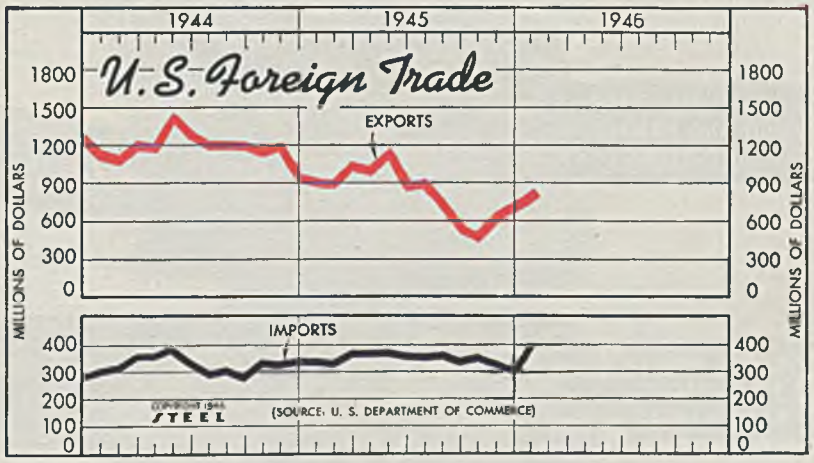
	Net Operating Income			Ton-Miles Revenue Freight		
	millions			billions		
	1946	1945	1944	1946	1945	1944
Jan.	$70.8	$73.0	$84.9	49.0	56.8	60.5
Feb.	57.8	73.2	84.5	46.0	55.3	59.3
Mar.	....	99.9	92.5	....	62.9	62.7
Apr.	....	91.9	87.7	....	61.6	60.4
May	....	99.9	98.5	....	63.4	64.0
June	....	96.1	99.8	....	63.6	62.0
July	....	97.1	98.6	....	60.5	62.8
Aug.	....	86.7	101.4	....	56.4	64.5
Sept.	....	44.0	89.1	....	52.2	61.0
Oct.	....	54.4	97.3	....	50.0	63.5
Nov.	....	61.3	91.6	....	50.0	59.4
Dec.	....	†36.9	69.8	....	46.5	57.3
Ave.	....	$70.0	$91.3	....	56.5	61.5

† Deficit of $36,901,271 shown for December, 1945, due to amortizing of defense projects.

Foreign Trade
Bureau of Foreign and Domestic Commerce

(Unit Value—$1,000,000)

	Exports			Imports		
	1946	1945	1944	1946	1945	1944
Jan.	800	901	1,124	398	334	300
Feb.	...	882	1,086	...	324	313
Mar.	...	1,030	1,197	...	365	359
Apr.	...	1,002	1,182	...	366	359
May	...	1,133	1,419	...	372	386
June	...	866	1,271	...	360	330
July	...	893	1,198	...	356	293
Aug.	...	737	1,207	...	360	302
Sept.	...	515	1,199	...	335	280
Oct.	...	455	1,140	...	344	327
Nov.	...	639	1,184	...	322	322
Dec.	...	736	934	...	297	336
Total	...	9,789	14,141	...	4,135	3,907



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$11,826	$13,004	$11,135	$10,245
Federal Gross Debt (billions)	$273.8	$274.5	$278.6	$235.2
Bond Volume, NYSE (millions)	$30.8	$25.0	$23.8	$39.8
Stocks Sales, NYSE (thousands)	7,591	8,127	5,923	5,241
Loans and Investments (billions)†	$65.2	$66.0	$67.7	$57.3
United States Gov't. Obligations Held (millions)†	$46,538	$46,818	$49,231	$43,286

†Member banks, Federal Reserve System.

PRICES

STEEL's composite finished steel price average	$63.54	$63.54	$63.54	$57.55
All Commodities†	109.1	108.7	108.2	105.1
Industrial Raw Materials†	122.2	121.1	121.4	116.1
Manufactured Products†	104.6	104.5	103.8	101.9

†Bureau of Labor Statistics Index, 1926 = 100.

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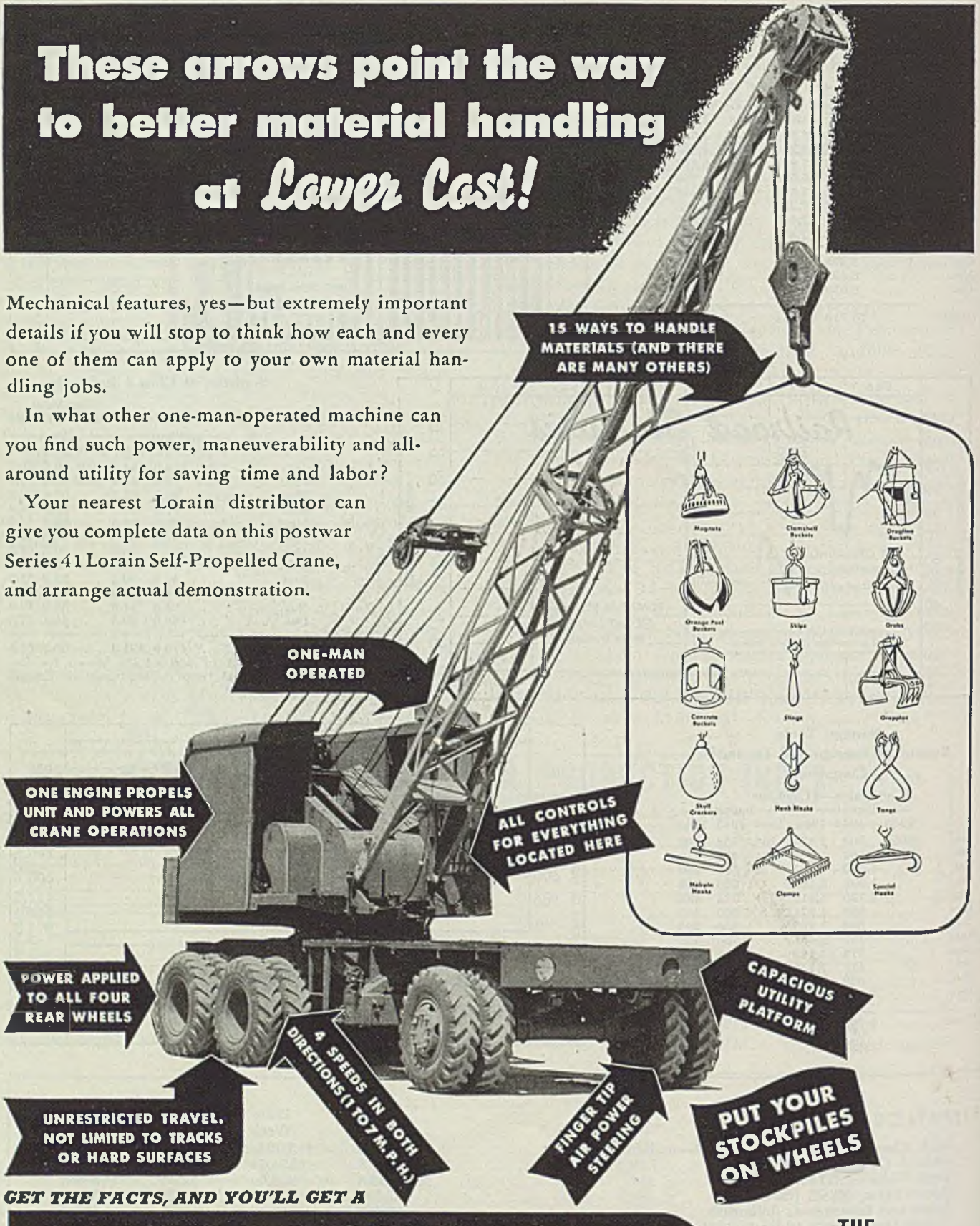
Your nearest Lorain distributor can give you complete data on this postwar Series 41 Lorain Self-Propelled Crane, and arrange actual demonstration.



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21. Valve Trim Alloy

Lebanon Steel Foundry—2-page illustrated data sheet No. 669.1 gives application and physical property data on Circle-L valve trim alloys. Analysis, nominal physical properties and heat treatment are tabulated. Typical parts are shown.

22. Stock Control

Systems Div., Remington Rand Inc.—26-page illustrated loose-leaf Management Controller No. 708 describes system of stock control with Graph-A-Matic computing chart and budget control. Procedure, typical system, use of Kardex forms and other phases are discussed. It is available on loan basis only.

23. Boron Carbide

Norton Co.—10-page illustrated bulletin form 378 presents information about manufacture, characteristics and uses of Norbide boron carbide material. This extremely hard material is suitable for gages, pressure blast nozzles and other molded products, and as abrasive.

24. Cast Iron Cutting

National Cylinder Gas Co.—12-page illustrated technical bulletin form No. N606 is entitled "How to Cut Cast Iron". Principles and procedure of cutting with oxyacetylene flame are discussed. Simplified methods and techniques are stressed.

25. Power Saw & File

Mid-States Equipment Corp.—4-page illustrated folder describes Saw Gun portable power saw and file for use with metals, wood, plastics and other materials. Unit is for attachment to electric or air drills or flexible shaft machines. Applications are covered and prices listed.

26. Electrical Equipment

Motor Generator Corp.—4-page illustrated brochure is preview of postwar products. Equipment shown includes high voltage motor-generator sets; battery charging equipment, and equipment for testing, waste recovery, metal plating, materials handling, railway service, buffing and grinding, aviation, automotive use and magnets.

27. Locomotive Diesel Engine

Cooper-Bessemer Corp.—Illlustrated broadside presents sectional view of type FWL-6T locomotive diesel engine which is rated 660 horsepower at 1000 revolutions per minute. Engine and generator are mounted together on rigid sub-base as complete power plant unit. Engine is built in 6 and 8-cylinder in-line types and in 12 and 16-cylinder V-types.

28. Induction Heating Units

Lepel High Frequency Laboratories Inc.—36-page illustrated bulletin "Lepel High Frequency Induction Heating Units" offers basic information on principles of this heating method, discusses practical applications and describes available equipment. Units are available for brazing, hardening, annealing, stress relieving, soldering and melting.

29. Focal Lighting

Fostoria Pressed Steel Corp.—8-page illustrated bulletin "Better Lighting on the Job" shows how Localites speed production, improve efficiency, minimize rejects, lower operating costs and raise employee morale on precision operations. Typical uses of these units for obtaining high lighting intensities on work are shown.

30. Straddle Truck

Hyster Co.—8-page illustrated bulletin No. 695 presents details of Hyster Yardmaster series M straddle truck which has ample power to lift and carry loads of up to 12,000 pounds. Speeds of up to 33 miles per hour forward or reverse can be attained. Ample traction is afforded by pneumatic tires. Full visibility is assured for picking up and spotting loads.

31. Case Hardening

Nitralloy Corp.—40-page illustrated technical bulletin entitled "Nitralloy and the Nitriding Process" describes case hardening of alloy steels by means of nitrogenous medium. Procedure, manipulation and machining of steels so treated are covered. List of applications is included.

32. Fastening Devices

Manufacturers Screw Products—136-page illustrated catalog and reference book No. 15 describes and gives net prices on complete line of screws, nuts, bolts, washers, rivets, Phillips heads and specials. Handily indexed, catalog provides ready reference data for all types of fastening problems.

33. Plastic Coating

Nukem Products Corp.—12-page illustrated bulletin entitled "Nukemite Acid and Alkali Proof Plastic Coating" presents data and information about material for use where corrosion and contamination are present. Recommended applications include use in steel, petroleum, chemical, transportation, structural, automotive, dairy and food processing industries.

34. Alloy Castings

National Alloy Steel Div., Blaw-Knox Co.—24-page illustrated wirebound catalog No. 2041 presents information on National Alloy heat and corrosion resisting castings. Laboratory control and production by Rotocasting are discussed. Typical castings produced for various industries are shown. Engineering data are given.

35. Work Holding Clamps

McFerron-Myers Products Co.—4-page illustrated bulletin on Duo-Square work holding clamps describes adjustable, 90-degree and straight models of work holding clamps which facilitate welding and fabrication of all types of products. Various sizes are available to accommodate wide range of work.

36. Processing Equipment

Marco Co.—20-page illustrated catalog No. 10 describes Flow-Master line of processing equipment which includes homogenizers, Kombi-nators and pumps for chemical, drug, pharmaceutical, petroleum, textile and food industries.

37. Roller Bearings

McGill Mfg. Co.—16-page illustrated bulletin No. SM-42 presents data on McGill Solidend Multirol bearings. Design and construction features are discussed. Size combination and dimension table gives complete information on sizes and combinations available. Engineering data is included.

38. Carbide Tools

Metro Tool & Gage Co.—6-page illustrated condensed catalog presents description of Metro standard carbide tools and masonry drills. Specifications and prices are given.

39. Die Casting Machines

Hydraulic Press Mfg. Co.—8-page illustrated bulletin No. 4402 describes hydraulic high pressure die casting machines for magnesium, aluminum, copper and zinc alloys. Specifications are given and advantages outlined. Size and capacity data on two sizes are given.

40. Hydraulic Equipment

Hydraulic Machinery, Inc.—8-page illustrated brochure outlines expanded engineering, laboratory and production facilities of company for producing special and hydraulic machinery and test equipment to order. Hydraulic power units are also described. Typical machines are illustrated.

41. Safety Shoes

Lehigh Safety Shoe Co.—8-page illustrated bulletin No. 12 describes several models of industrial safety shoes for both men and women workers. High and low shoes can be furnished with seven different types of soles which are designed for specific kinds of industrial floors or conditions.

42. Locomotive Cranes

Orton Crane & Shovel Co.—16-page illustrated catalog No. 77 describes standard and broad gage diesel and gasoline locomotives. Construction and engineering details are covered. Charts present data on clearance dimensions of standard models, weights or rehandling and excavating clamshell buckets, and normal lifting capacities at operating radius of 10 to 120 feet.

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HELPFUL LITERATURE

1. Cast Steels

Jessop Steel Co.—16-page illustrated bulletin on Jessop Cast-to-Shape steels gives properties and suggests applications of this material for dies, forming tools, gages, hobs, rolls and numerous other products. Typical parts produced, available alloys and other data are presented.

2. Welding Instruction

Lincoln Electric Co.—8-page illustrated folder gives facts about 16-millimeter sound color motion picture entitled "The Prevention and Control of Distortion in Arc Welding" which is available for presentation before industrial and trade groups. Animated with color and sound by Walt Disney Productions, this film presents useful facts in interesting manner to students and users of arc welding.

3. Air Cylinders

Logansport Machine Co.—16-page illustrated catalog No. 471 is descriptive of Air-Draulic cylinders which combine major advantages of both air and hydraulic cylinders. Powered by compressed air, they are oil regulated. Types of power movements which can be obtained are outlined and typical circuits employing different types of control are described.

4. Automatic Lathe

Lodge & Shipley Machine Tool Co.—2-page illustrated publication No. 620 lists specifications of No. 2A Duomatic automatic lathe which is adaptable for wide range of work. Dual tool slides and carriages permit any combination of turning and facing cycles. No cams are used to change cycles. Easy adjustments permit fast, accurate handling of large and small runs.

5. Special Iron

Meehanite Metal Corp.—4-page illustrated folder, form DM-145, describes typical application case histories of Meehanite for thread gages, upsetting dies and precision machinery. Other industrial bulletins available are shown.

6. Cutting & Welding

Metal & Thermit Corp.—10-page illustrated booklet deals with underwater cutting and welding with Murex electrodes. Arc-oxygen process for underwater work and for cutting cast iron and high alloy steels in open air is discussed. Working data, procedure information and instructions for use are given.

7. Industrial Dryers

C. M. Kemp Mfg. Co.—44-page illustrated catalog No. 25-D describes line of Kemp Dynamic dryers for drying air, gases and liquids. Materials which can be dried with equipment are tabulated. Typical equipment, processing plant layouts, specifications and other data are included.

8. Torque Tools

JO Mfg. Co.—12-page illustrated catalog on JO Line torque tools lists specifications of tools for production, inspection and servicing operations on both plastics and metals. Suggested torque values are given for many types of work. Details are given on wrenches for automotive, aircraft, industrial and electrical work.

9. Oil Reclaimers

Honan-Crane Corp.—8-page illustrated bulletin "Clean Oil, Vol. 2 No. 1" contains brief descriptions of sump cleaner, oil transfer truck and sump cleaner, Centri-Power coolant filter and mobile coolant filter. Applications of oil filtering equipment in industrial plants are shown.

10. Brazing Furnaces

Lindberg Engineering Co.—8-page illustrated bulletin No. 210 presents details on line of continuous production brazing furnaces with operating temperatures from 1300 F to 2100 F for low temperature silver brazing, high temperature copper brazing, sintering of powder metals and bright annealing. Mesh belt conveyors and roller hearth furnaces are described.

11. General Service Pump

Ingersoll-Rand Co.—20-page illustrated bulletin No. 7057 covers design, construction and engineering details of line of Cameron single-stage general service pumps for capacities up to 25,000 gallons per minute against heads up to 300 feet. Several combinations of metals are available for wide variety of liquids.

12. Furnace Electrodes

International Graphite & Electrode Corp.—8-page illustrated technical treatise "Handling and Proper Use of Electrodes" contains helpful data on handling and applications of carbon electrodes for electric arc furnaces. Recommended practices are shown.

13. Air Operated Devices

Mead Specialties Co.—40-page illustrated catalog entitled "Mead Industrial Air Power" describes air actuated presses, vises, collet fixtures, work holders and feeders, as well as air filter and pressure regulators, hand control valves, foot control valves and manifold for distributing air.

14. Low Temperature Brazing

Handy & Harman—20-page illustrated bulletin No. 12-A discusses low temperature brazing of metals with Sil-Fos and Easy-Flo silver alloys. Composition, brazed properties, applications and recommended procedures are outlined. Typical parts fabricated through use of low temperature brazing are shown. Design considerations for brazing are covered.

15. Involute Splines

National Broach & Machine Co.—12-page illustrated bulletin No. SP45-11 describes Red Wing involute splines and covers advantages and uses. Dimensional and specification data are given in table form. Typical set-ups are shown.

16. Air Regulating Valve

Hannifin Mfg. Co.—4-page illustrated bulletin No. 56 shows design and construction of piston type air pressure regulating valves for accurate control of pneumatic equipment. Features are described and specifications tabulated.

17. Heat Treating Equipment

International Nickel Co.—8-page illustrated bulletin is entitled "Inco Nickel Alloys for Long Life in Heat Treating Equipment." Advantages which recommend use of nickel alloys for construction of baskets, furnace tubes, retorts, nitriding equipment, roller hearth tubing, carburizing containers, thermocouple tubes, etc. are covered. Technical data are given on Inconel under high temperature conditions.

18. Steel Plate Shapes

By-Products Steel Corp.—12-page illustrated bulletin, form No. 270, gives information on flame cut, sheared, pressed, bent, blanked and welded steel plate shapes made to specification. Typical parts are shown. List of sales offices and representatives is provided.

19. Welding Accessories

Hobart Brothers Co.—Illustrated broadside shows and gives essential data on complete line of arc welding accessories. Details of welder's overalls, coats, gloves, sleeves, aprons, leggings, electrode holders, cable, hammers, curtains, brushes, cable connectors and other accessories are given.

20. Index System

LeFebure Corp.—36-page demonstration booklet contains samples of entry book index system for public and industrial records. System provides chronological order, unlimited expansibility and speed in use. Details are given on expansion type binders and accounting equipment.

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MARKET SUMMARY

Fuel Shortage May Bring Sharp Steel Reduction Soon

Mills holding line well under handicaps . . . More scrap needed as pig iron supply shrinks . . . No advance in scrap price ceilings

WITH the soft coal strike now entering its fourth week and few signs of immediate settlement, indications point to loss of about a million tons of steel this month, and should the strike continue into May the reduction in output will be much more drastic.

Various large producers who have been able to maintain fair production so far are on the point of sharply curtailing and those already seriously affected will make further reduction within a week or so. The sharper the decline in general the longer it will take mills to regain normal stride after the coal dispute has been settled.

Meanwhile, steel and iron consumers are being increasingly affected. Various foundries report that coke is becoming more of a factor than pig iron and some nonintegrated producers are confronted by greater scarcity of fuel than of iron. However, there is little easing of pressure in any quarter.

In finished steel, production of sheets and strip is being affected after having held up better than most other major lines. Producers operating on a quarterly basis again have postponed setting up quotas for third quarter, with little likelihood that action will be taken before some time in May.

The situation in bars is increasingly tighter, in both hot-rolled and cold-drawn. Only in large rounds and flats can tonnage be had before fourth quarter and in smaller sizes most sellers are out of the market for the entire year.

Steelmakers are holding production surprisingly well in face of fuel shortage and the estimated national rate for last week declined only 1 point, to 74½ per cent of capacity. Buffalo rose 1½ point to 93 per cent, Wheeling 4½ points to 90½, Chicago ½-point to 75 and Cleveland 1½ points to 97. Pittsburgh declined 1½ points to 67½, Youngstown 10 points to 60 and eastern Pennsylvania 3 points to 81. New England was unchanged at 88, Detroit unchanged from the revised rate of the prior week at 88; St. Louis 54, Cincinnati 79 and Birmingham 85. West Coast production averaged 81½ per cent, up 2 points.

Office of Price Administration has granted Central Iron & Steel Co., Harrisburg, Pa., an increase of $8 per ton on plain carbon plates and two other eastern mills asking an increase may get similar aid.

Tin plate producers are feeling the effect of steel shortage but are pressing for all the tonnage they can produce, to provide material for cans for the seasonal food packs. It seems likely the tonnage earmarked for export during second quarter will be pushed into third quarter.

Not much effect has been felt up to this time from the building limitation order of Civilian Production Administration. Many new projects are being placed with fabricators, subject to approval or otherwise and shape mills are well filled for most of the year. Approval is being given many projects, including a 26-story office building at Boston.

Tightness in pig iron is increasing as supply of coke for blast furnaces becomes more problematical. Every effort is being made to distribute production to best advantage and foundries have not suffered so far, but inventories are being depleted and castings production must inevitably be curtailed if coal mining is not resumed soon. A steel mill strike in the St. Louis district is diverting merchant iron supply from the mill to foundry consumers, affording some relief. A furnace in the Cleveland district has been relighted after relining and one in the Buffalo district is held idle after repair, because of fuel shortage.

Scrap scarcity continues as great as ever and demand is unabated. Steel mills, though not producing as much steel as usual nevertheless require more scrap to eke out shortened pig iron supply for open hearths. Consumers of cast scrap are paying as much as $12 per ton freight to move material from remote areas, so great is need.

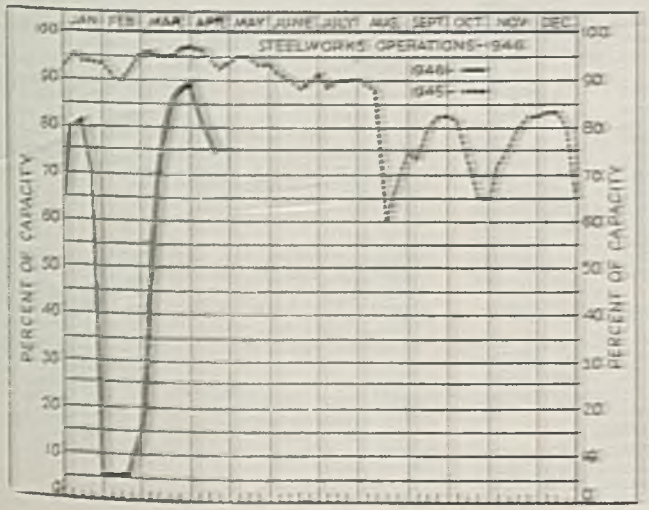
Office of Price Administration disclaims intention of advancing ceiling prices of steel and iron scrap, acting on recommendation of the Iron and Steel Scrap Industry Advisory Committee that no advance is wanted or justified.

DISTRICT STEEL RATES

(Percentage of Ingot Capacity Engaged in Leading Districts)

	Week Ended Apr. 20	Change	Same Week 1945	Same Week 1944
Pittsburgh	67.5	—1.5	89.5	98.5
Chicago	75	+0.5	98.5	101.5
Eastern Pa.	81	—3	91	95
Youngstown	60	—10	91	94
Wheeling	90.5	+4.5	92.5	98
Cleveland	97	+1.5	94.5	90
Buffalo	93	+1.5	90.5	90.5
Birmingham	85	None	50	95
New England	88	None	92	89
Cincinnati	79	None	92	81
St. Louis	54	None	30	77
Detroit	88	None	96	88
Estimated national rate	74.5	—1	92	98.5

*Based on steelmaking capacities as of these dates.



COMPOSITE MARKET AVERAGES

	Apr. 20	Apr. 13	Apr. 6	One Month Ago Mar., 1946	Three Months Ago Jan., 1946	One Year Ago Apr., 1945	Five Years Ago Apr., 1941
Finished Steel	$63.54	$63.54	$63.54	$63.54	$58.27	$57.55	$56.73
Semifinished Steel	40.60	40.60	40.60	40.60	37.80	36.00	36.00
Steelmaking Pig Iron	25.50	25.50	25.50	25.125	24.75	24.00	23.00
Steelmaking Scrap	19.17	19.17	19.17	19.17	19.17	19.17	19.17

Finished Steel Composite:—Average of industry-wide prices on sheets, strips, bars, plates, shapes, wire, nails, tin plate, standard and line pipe. Semifinished Steel Composite:—Average of industry-wide prices on billets, slabs, sheet bars, skelp and wire rods. Steelmaking Pig Iron Composite:—Average of basic pig iron prices at Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Neville Island, Granite City and Youngstown. Steelworks Scrap Composite:—Average of No. 1 heavy melting steel prices at Pittsburgh, Chicago and eastern Pennsylvania. Finished steel, net tons; others, gross tons.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for last Month, Three Months and One Year Ago

Finished Material, cents per lb.; coke, dollars per net ton; others dollars per gross ton.

Finished Material

	Apr. 20, 1946	Mar., 1946	Jan., 1946	Apr., 1945
Steel bars, Pittsburgh	2.50c	2.50c	2.25c	2.15c
Steel bars, Philadelphia	2.82	2.82	2.57	2.47
Steel bars, Chicago	2.50	2.50	2.25	2.15
Shapes, Pittsburgh	2.35	2.35	2.10	2.10
Shapes, Philadelphia	2.465	2.465	2.215	2.215
Shapes, Chicago	2.35	2.35	2.10	2.10
Plates, Pittsburgh	2.50	2.50	2.25	2.20
Plates, Philadelphia	2.55	2.55	2.80	2.25
Plates, Chicago	2.50	2.50	2.25	2.20
Sheets, hot-rolled, Pittsburgh	2.425	2.425	2.20	2.20
Sheets, cold-rolled, Pittsburgh	3.275	3.275	3.05	3.05
Sheets, No. 24 galv., Pittsburgh	4.05	4.05	3.70	3.65
Sheets, hot-rolled, Gary	2.425	2.425	2.20	2.20
Sheets, cold-rolled, Gary	3.275	3.275	3.05	3.05
Sheets, No. 24 galv., Gary	4.05	4.05	3.70	3.65
Hot-rolled strip, over 6 to 12-in., Pitts.	2.35	2.35	2.10	2.10
Cold-rolled strip, Pittsburgh	3.05	3.05	2.80	2.80
Bright bess., basic wire, Pittsburgh	3.05	3.05	2.75	2.60
Wire nails, Pittsburgh	3.25	3.25	2.90	2.80
Tin plate, per base box, Pittsburgh	$5.25	$5.25	$5.00	$5.00

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$38.00	$38.00	$36.00	$34.00
Slabs, Pittsburgh, Chicago	39.00	39.00	36.00	34.00
Rerolling billets, Pittsburgh	39.00	39.00	36.00	34.00
Wire rods, No. 5 to ⅜-inch, Pitts.	2.30c	2.30c	2.15c	2.00c

Pig Iron

	Apr. 20, 1946	Mar., 1946	Jan., 1946	Apr., 1945
Bessemer, del. Pittsburgh	$27.69	$27.315	$26.94	$26.19
Basic, Valley	26.00	25.625	25.25	24.50
Basic, eastern del. Philadelphia	27.84	27.465	27.09	26.34
No. 2 fdry., del. Pgh. N. & S. sides	27.19	26.815	26.44	25.69
No. 2 foundry, Chicago	26.50	26.125	25.75	25.00
Southern No. 2, Birmingham	22.88	22.505	22.13	21.38
Southern No. 2, del. Cincinnati	26.94	26.565	26.19	25.44
No. 2 fdry., del. Philadelphia	28.34	27.965	27.59	26.84
Malleable, Valley	26.50	26.125	25.75	25.00
Malleable, Chicago	26.50	26.125	25.75	25.00
Lake Sup., charcoal del. Chicago	37.34	37.340	37.34	37.84
Gray forge, del. Pittsburgh	26.69	26.315	25.94	25.19
Ferromanganese, del. Pittsburgh	140.00	140.000	140.00	140.38

Scrap

Heavy melting steel, No. 1, Pittsburgh	$20.00	$20.00	$20.00	$20.00
Heavy melt. steel, No. 2, E. Pa.	18.75	18.75	18.75	18.75
Heavy melting steel, Chicago	18.75	18.75	18.75	18.75
Rails for rolling, Chicago	22.25	22.25	22.25	22.25
No. 1 cast, Chicago	20.00	20.00	20.00	20.00

Coke

Connellsville, furnace ovens	$7.50	$7.50	$7.50	$7.00
Connellsville, foundry ovens	8.25	8.25	8.25	7.75
Chicago, by-product fdry., del.	13.75	13.75	13.75	13.35

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Following are maximum prices established by OPA schedules, except those for stainless steels which are now exempt from price control. Price schedule No. 6 covers semifinished and finished iron and steel products; by-product foundry coke, No. 29; relaying rails, No. 46; beehive oven coke, No. 77; bolts, nuts and rivets, No. 147; coke by-products, GMPR, except sulphate of ammonia, No. 205. Finished steel quoted in cents per pound and semifinished steel in dollars per gross ton, except as otherwise noted. Pricing on rails was changed to net ton basis as of Feb. 15, 1946.

Semifinished Steel

Carbon Steel Ingots: Fob mill base, rerolling quality, standard analysis, $33.

Alloy Steel Ingots: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon; uncrop, $46.80.

Rerolling, Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Sparrows Point, Birmingham, Youngstown, $39; Detroit, del., $41; Duluth (billets), $41; Pac. ports (billets), $51. (Andrews Steel Co., carbon slabs, $41; Northwestern Steel & Wire Co., $41, Sterling, Ill.; Granite City Steel Co. $47.50 gross ton slabs from D.P.C. mill. Geneva Steel Co. $58.64, Pac. ports.)

Forging Quality Blooms, Slabs, Billets: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, $47; Detroit, del., $49; Duluth, billets, $49; forging billets fob Pac. ports, $59.

(Andrews Steel Co. may quote carbon forging billets $50 gross ton at established basing points; Follansbee Steel Corp., $49.50 fob Toronto, O. Geneva Steel Co. $64.64, Pacific ports.)

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $56.16, del. Detroit $58.16, eastern Mich. $59.16.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Point, Youngstown, $38. (Empire Sheet & Tin Plate Co., Mansfield, O., carbon sheet bars, $39, fob mill.)

Skelp: Pittsburgh, Chicago, Sparrows Point, Youngstown, Coatesville, lb, 2.05c.

Wire Rods: Pittsburgh, Chicago, Cleveland, Birmingham, No. 5—⅜ in. inclusive, per 100 lb, $2.30. Do., over ⅜—$\frac{47}{64}$-in., incl., $2.45; Galveston, base, $2.40 and $2.55, respectively. Worcester add $0.10; Pacific ports $0.50.

Bars

Hot-Rolled Carbon Bars and Bar-Size Shapes under 3: Pittsburgh, Youngstown, Chicago, Gary, Cleveland, Buffalo, Birmingham base, 20 tons one size, 2.50c; Duluth, base, 2.60c; Detroit, del., 2.60c; eastern Mich., 2.65c; New York, del., 2.84c; Phila., del., 2.82c; Gulf ports, dock, 2.85c; Pac. ports, dock, 3.15. (Sheffield Steel Corp., 2.75c, fob St. Louis; Joslyn Mfg. & Supply Co., may quote 2.55c, fob Chicago.)

Rail Steel Bars: Same prices as for hot-rolled carbon bars except base is 5 tons.

Hot-Rolled Alloy Bars: Pittsburgh, Youngstown, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 2.81c; Detroit, del., 2.91c. (Texas Steel Co. may use Chicago base price as maximum fob Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

AISI Series	(*Basic O-H)	AISI Series	(*Basic O-H)
1300	$0.104	4300	$1.768
2300	1.768	4600	1.248
2500	2.652	4800	2.236
3000	0.52	5100	0.364
3100	0.884	5130 or 5152	0.468
3200	1.404	6120 or 6152	0.988
3400	3.328	6145 or 6150	1.248
4000	0.468	8612	0.676
4100 (.15-.25 Mo)	0.728	8720	0.728
(.20-.30 Mo)	0.78	9830	1.352

*Add 0.25 for acid open-hearth; 0.50 electric.

Cold-Finished Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base, 20,000-39,999 lb, 3.10c; Detroit, 3.15c; Toledo, 3.25c.

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base, 3.48c; Detroit, del., 3.58c; eastern Mich., 3.63c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base, 2.35c; Detroit, del., 2.45c; eastern Mich. and Toledo, 2.50c; Gulf ports, dock, 2.70c; Pacific ports, dock, 2.75c.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Buffalo, base, 2.35c; Detroit, del., 2.45c; eastern Mich. and Toledo, 2.50c; Gulf ports, dock, 2.70c.

Iron Bars: Single refined, Pitts., 4.76c; double refined, 5.84c; Pittsburgh, staybolt, 6.22c; Terre Haute, single ref., 5.42c; double ref., 6.76c.

Sheets, Strip

Hot-Rolled Sheets: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Pt., Middletown, base, 2.425c; Granite City, base, 2.525c; Detroit, del., 2.525c; eastern Mich., 2.575c; Phila., del., 2.595c; New York, del., 2.665c; Pacific ports, 2.975c.

(Andrews Steel Co. may quote hot-rolled sheets for shipment to Detroit and the Detroit area on the Middletown, O., base; Alan Wood Steel Co., Conshohocken, Pa., may quote 2.60c on hot carbon sheets, nearest eastern basing point.)

Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.275c; Granite City, base, 3.375c; Detroit, del., 3.375c; eastern Mich., 3.425c; New York, del., 3.615c; Phila., del., 3.595c; Pacific ports, 3.925c.

Galvanized Sheets, No. 24: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base, 4.05c; Granite City, base, 4.15c; New York, del., 4.29c; Phila., del., 4.22c; Pacific ports, 4.60c.

Corrugated Galv. Sheets: Pittsburgh, Chicago, Gary, Birmingham, 29-gage, per square, 3.73c.

Culvert Sheets: Pittsburgh, Chicago, Gary, Birmingham, 16-gage not corrugated, copper alloy, 4.15c; Granite City, 4.25c; Pacific ports, 4.60c; copper iron, 4.50c; pure iron, 4.50c; zinc-coated, hot-dipped, heat-treated, No. 24, Pittsburgh, 4.60c.

Aluminized Sheets, 20 gage: Pittsburgh, hot-dipped, coils or cut to lengths, 9.00c.

Enameling Sheets: 10-gage: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base 3.20c; Granite City, base 3.30c; Detroit, del., 3.30c; eastern Mich., 3.35c; Pacific ports, 3.85c; 20-gage: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base, 3.80c; Detroit, del., 3.90c; eastern Mich., 3.95c; Pacific ports, 4.45c.

Electrical Sheets No. 24:

	Pittsburgh Base	Pacific Ports	Granite City
Field grade	3.90c	4.65c	4.00c
Armature	4.25c	5.00c	4.35c
Electrical	4.75c	5.50c	4.85c
Motor	5.425c	6.175c	5.525c
Dynamo	6.125c	6.875c	6.225c
Transformer			
72	6.625c	7.375c	.....
65	7.625c	8.375c	.....
58	8.125c	8.875c	.....
52	8.925c	9.675c	.....

Hot-Rolled Strip: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Middletown base, 6-inch and narrower, 2.45c; Detroit, del., 2.55c; eastern Mich., 2.60c; Pacific ports, 3.10c; over 6-inch, base, 2.35c; Detroit, del., 2.45c; eastern Mich., 2.50c; Pacific ports, 3.00c.

Cold-Rolled Strip: Pittsburgh, Cleveland, Youngstown, 0.25 carbon and less, 3.05c; Chicago, base, 3.15c; Detroit, del., 3.15c; eastern Mich., 3.20c; Worcester, base, 3.25c.

Cold-Finished Spring Steel: Pittsburgh, Cleveland, base, 0.26-0.50 carbon, 3.05c. Add 0.20c for Worcester.

Tin, Terne Plate

(OPA ceiling prices announced March 1, 1946.)

Tin Plate: Pittsburgh, Chicago, Gary, 100-lb base box, $5.25; Granite City, Birmingham, Sparrows Point, $5.35.

Electrolytic Tin Plate: Pittsburgh, Gary, 100-lb base box, 0.25 lb tin, $4.60; 0.50 lb tin, $4.75; 0.75 lb tin, $4.90; Granite City, Birmingham, Sparrows Point, $4.70, $4.85, $5.00, respectively.

Tin Mill Black Plate: Pittsburgh, Chicago, Gary, base 29-gage and lighter, 3.30c; Granite City, Birmingham, Sparrows Point, 3.40c; Pacific ports, boxed, 4.30c.

Long Ternes: Pittsburgh, Chicago, Gary, No. 24 unassorted, 4.05c; Pacific ports, 4.80c.

Manufacturing Ternes (Special Coated): Pittsburgh, Chicago, Gary, 100-base box, $4.55; Granite City, Birmingham, Sparrows Point, $4.65.

Roofing Ternes: Pittsburgh base per package 112 sheets; 20 x 28 in., coating I. C. 8-lb $12.50; 20-lb $15.50 (nom.); 40-lb $20.00 (nom.).

Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, Coatesville, Claymont, 2.50c; New York, del., 2.69c; Phila., del., 2.55c; St. Louis, 2.74c; Boston, del., 2.82-3.07c; Pacific ports, 3.05c; Gulf ports, 2.85c.

(Granite City Steel Co. may quote carbon plates 2.65c fob D.P.C. mill; Geneva Steel Co., Provo, Utah, 3.20c fob Pac. ports; Central Iron & Steel Co., Harrisburg, Pa., 2.80c, basing points.)

Floor Plates: Pittsburgh, Chicago, 3.75c; Pacific ports, 4.40c; Gulf ports, 4.10c.

Open-Hearth Alloy Plates: Pittsburgh, Chicago, Coatesville, 3.75c; Gulf ports, 4.20c; Pacific ports, 4.40c.

Clad Steel Plates: Coatesville, 10% cladding; nickel-clad, 18.72c; inconel-clad, 26.00c; monel-clad, 24.96c.

Shapes

Structural Shapes: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.35c; New York, del., 2.52c; Phila., del., 2.465c; Pacific ports, 3.00c; Gulf ports, 2.70c.

(Phoenix Iron Co., Phoenixville, Pa., may quote the equivalent of 2.45c, Bethlehem, Pa., on the general range and 2.55c on beams and channels from 4 to 10 inches.)

Steel Piling: Pittsburgh, Chicago, Buffalo, 2.65c; Pacific ports, 3.20c.

Wire and Wire Products

(Fob Pittsburgh, Chicago, Cleveland and Birmingham, per 100 pounds)

Wire to Manufacturers in carloads

Bright basic or bessemer	•$3.05
Spring (except Birmingham)	•$3.65

Wire Products to Trade

Nails and staples

Standard and cement-coated	†$3.25
Galvanized	††$2.50
Wire, Merchant Quality	
Annealed	§$3.50
Galvanized	§$3.85

(Fob Pittsburgh, Chicago, Cleveland, Birmingham, per base column)

Woven fence, 15½ gage and heavier	72
Barbed wire, 80-rod spool	79
Barbless wire, twisted	79
Fence posts	74
Bale ties, single loop	72½

•Add $0.10 for Worcester, $0.05 for Duluth and $0.50 for Pacific ports.

†Add $0.30 for Worcester, $0.50 for Pacific ports.

††Add $0.50 for Pacific ports.

§Add $0.10 for Worcester, $0.70 for Pacific ports.

Tubular Goods

Welded Pipe: Base price in carloads, threaded and coupled to consumers about $200 per net ton. Base discounts on steel pipe Pittsburgh and Lorain, O.; Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Pittsburgh base only on wrought iron pipe.

Butt Weld

	Steel			Iron	
In.	Blk.	Galv.	In.	Blk.	Galv.
⅛	53	30	½	21	0½
¼ & ⅜	56	37½	⅝	27	7
½	60½	48	1-1¼	31	13
¾	63½	52	1½	35	15½
1-3	65½	54½	2	34½	15

Lap Weld

	Steel			Iron	
In.	Blk.	Galv.	In.	Blk.	Galv.
2	58	46½	1¼	20	0½
2½-3	61	49½	1½	25½	7
3½-6	63	51½	2	27½	9
7-8	62	49½	2½-3½	28½	11½
9-10	61½	49	4	30½	15
11-12	60½	48	4½-8	29½	14
			9-12	25½	9

Boiler Tubes: Net base prices per 100 feet fob Pittsburgh in carload lots, minimum wall, cut lengths 4 to 24 feet, inclusive.

O.D.		—Seamless— Hot	Cold	—Elec. Weld— Hot	Cold
sizes	B.W.G.	Rolled	Drawn	Rolled	Rolled
1"	13	.....	$9.90	$9.36	$9.65
1¼"	13	.....	11.73	9.63	11.43
1½"	13	$10.91	12.96	10.63	12.64
1¾"	13	12.41	14.75	12.10	14.37
2"	13	13.90	16.52	13.53	16.19
2¼"	13	15.50	18.42	15.06	18.03
2½"	12	17.07	20.28	16.57	19.83
2½"	12	18.70	22.21	18.11	21.68
2¾"	12	19.82	23.54	19.17	22.95
3"	12	20.79	24.71	20.05	24.02
3½"	11	26.24	31.18	25.30	30.29
4"	10	32.56	38.68	31.32	37.52
4½"	9	43.16	51.29	.....	.....
5"	9	49.96	59.36	.....	.....
6"	7	76.71	91.14	.....	.....

Rails, Supplies

Standard rails, over 60-lb, fob mill, net ton, $43.40. Light rails (billet), Pittsburgh, Chicago, Birmingham, net ton, $49.18.

•Relaying rails, 35 lb and over, fob railroad and basing points, $31-$33.

Supplies: Track bolts, 4.75c; heat treated, 5.00c. Tie plates $51 net ton, base. Standard spikes, 3.65c.

•Fixed by OPA Schedule No. 46, Dec. 15, 1941.

Tool Steels

Tool Steels: Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per lb: Reg. carbon 15.15c; extra carbon 19.48c; special carbon 23.80c; oil-hardening 25.97c; high carbon-chromium 46.53c.

W	Cr	V	Mo	Base, per lb.
18.00	4	1	..	72.49c
1.5	4	1	8.5	58.43c
.....	4	2	3	58.43c
6.40	4.15	1.90	5	62.22c
5.50	4.50	4	4.50	75.74c

Rivets

Fob Pittsburgh, Cleveland, Chicago, Birmingham

Structural	3.75c
⅛-inch and under	65-5 off

Washers, Wrought

Fob Pittsburgh, Chicago, Philadelphia, to jobbers and large nut and bolt manufacturers, lcl ..... $2.75-$3.00 off

Bolts, Nuts

Fob Pittsburgh, Cleveland, Birmingham, Chicago. Additional discounts: 5 for carloads; 10 for full containers, except tire, step and plow bolts.

(Ceiling prices advanced 7 per cent, effective Apr. 1, 1946; discounts remain unchanged.)

Carriage and Machine

½ x 6 and smaller	65½ off
Do., ⅝ and ⅝ x 6-in. and shorter	63½ off
Do., ¾ to 1 x 6-in. and shorter	61 off
1⅛ and larger, all lengths	59 off
All diameters, over 6-in. long	59 off
Tire bolts	50 off
Step bolts	56 off
Plow bolts	65 off

Stove Bolts

In packages, nuts separate, 71-10 off, nuts attached, 71 off; bulk, 80 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

Semifinished hex	U.S.S.	S.A.E.
⅞-in. and smaller	..	64
1-in. and smaller	62	..
1⅛-in.-1-in.	..	60
1⅛-in.-1-in.	59	..
1⅛-in.-1½-in.	57	58
1⅝-in. and larger	56	..

Additional discount of 10 for full kegs.

Hexagon Cap Screws

Upset 1-in., smaller	64 off
Milled 1-in., smaller	60 off

Square Head Set Screws

Upset 1-in. and smaller	71 off
Headless, ¼-in. and larger	60 off
No. 10 and smaller	70 off

Stainless Steels

(Open market prices. OPA price control suspended Oct. 11, 1945.)

Base, Cents per lb

CHROMIUM NICKEL STEELS

	Bars	Plates	Sheets	H. R. Strip	C. R. Strip
302	25.96c	29.21c	36.79c	23.93c	30.30c
303	28.13	31.38	38.95	28.21	35.71
304	27.05	31.38	38.95	25.45	32.46
308	31.38	36.79	44.36	30.84	37.87
309	38.95	43.28	50.85	40.03	50.85
310	53.02	56.26	57.35	52.74	60.59
212	38.95	43.28	53.02	.....	...
•316	43.28	47.61	51.94	43.28	51.94
†321	31.38	36.79	44.36	31.65	41.12
†347	35.71	41.12	48.69	35.71	45.44
431	20.56	23.80	31.38	18.94	24.35

STRAIGHT CHROMIUM STEEL

403	23.93	26.51	31.92	22.99	29.21
••410	20.02	23.93	28.67	18.39	23.80
416	20.56	23.80	29.21	19.75	25.45
††420	25.96	30.84	36.25	25.70	39.49
430	20.56	23.80	31.38	18.94	24.35
††430F	21.10	24.35	31.92	20.29	26.51
440A	25.96	30.84	36.25	25.70	39.49
442	24.35	27.59	35.17	25.96	34.62
443	24.35	27.59	35.17	25.96	34.62
446	29.76	33.00	39.49	37.87	56.26
501	8.66	12.98	17.04	12.98	18.39
502	9.74	14.07	18.12	14.07	19.48

STAINLESS CLAD STEEL (20%)

(Fob Pittsburgh and Washington, Pa., plate prices include annealing and pickling.)

304	....	19.48	20.56	....	....
410	....	17.31	18.39	....	....
430	....	17.85	18.94	....	....
446	....	19.48	20.56	....	....

• With 2-3% molybdenum. § With titanium. † With columbium. •• Plus machining agent. †† High carbon. ‡‡ Free machining.

Metallurgical Coke

Price Per Net Ton

Beehive Ovens

Connellsville, furnace	•7.50
Connellsville, foundry	8.00- 8.50
New River, foundry	9.00- 9.25
Wise county, foundry	7.75- 8.25
Wise county, furnace	7.25- 7.75

By-Product Foundry

Kearney, N. J., ovens	13.05
Chicago, outside delivered	13.00
Chicago, delivered	13.75
Terre Haute, delivered	13.50
Milwaukee, ovens	13.75
New England, delivered	14.65
St. Louis, delivered	†13.75
Birmingham, delivered	10.90
Indianapolis, delivered	13.50
Cincinnati, delivered	13.25
Cleveland, delivered	13.20
Buffalo, delivered	13.40
Detroit, delivered	13.75
Philadelphia, delivered	13.28

•Operators of hand-drawn ovens using trucked coal may charge $8.00; effective May 26, 1945. †14.25 from other than Ala., Mo., Tenn.

Coke By-Products

Spot, gal, freight allowed east of Omaha

Pure and 90% benzol	15.00c
Toluol, two degree	27.00c
Solvent naphtha	26.00c
Industrial xylol	26.00c
Per pound fob works	
Phenol (car lots, returnable drums)	10.50c
Do., less than carlots	11.25c
Do., tank cars	9.50c
Eastern plants, per pound	
Naphthalene flakes, balls, bbl, to jobbers	8.00c
Per ton, bulk, fob port	
Sulphate of ammonia	$29.20

WAREHOUSE STEEL PRICES

Base delivered price, cents per pound, for delivery within switching limits, subject to established extras. Quotations based on OPA mill prices announced March 1, 1946.

	Hot-rolled bars	Structural shapes	Plates	Floor plates	Hot-rolled sheets (10-gage base)	Hot-rolled strip (14-gage and lighter, 6-in and narrower)	Hot-rolled strip (12-gage and heavier wider than 6-inch)	Galvanized flat sheets (24-gage base)	Cold-rolled sheets (17-gage base)	Cold finished bars	Cold-rolled strip
Boston	4.294[1]	4.162[1]	4.162[1]	5.977[1]	3.999[1]	5.456[1]	4.350[1]	5.674[14]	4.969[14]	4.594[11]	4.965
New York	4.103[1]	4.008[1]	4.018[1]	5.824[1]	3.815[1]	4.324[1]	4.224[1]	5.460[12]	4.838[14]	4.553[21]	5.024
Jersey City	4.103[1]	3.997[1]	4.018[1]	5.824[1]	3.815[1]	4.324[1]	4.224[1]	5.460[12]	4.838[14]	4.553[21]	5.024
Philadelphia	4.072[1]	3.916[1]	3.855[1]	3.768[1]	3.743[1]	4.622[1]	4.172[1]	5.468[15]	5.097[25]	4.022[21]	5.022
Baltimore	4.052[1]	4.009[1]	3.844[1]	5.502[1]	3.619[1]	4.602[1]	4.152[1]	5.344[1]	5.077[25]	4.502[21]	.....
Washington	4.191[1]	4.180[1]	4.046[1]	5.591[1]	3.821[1]	4.741[1]	4.291[1]	5.646[17]	5.068[20]	4.491[21]	.....
Norfolk, Va.	4.315[1]	4.252[1]	4.221[1]	5.715[1]	3.996[1]	4.865[1]	4.415[1]	5.821[17]	4.490[24]	4.615[21]	.....
Bethlehem, Pa.*	.....	3.70[1]	.....	.....	.....	.....	.....	.....	.....	.....	.....
Claymont, Del.*	.....	.....	3.70[1]	.....	.....	.....	.....	.....	.....	.....	.....
Coatesville, Pa.*	.....	.....	3.70[1]	.....	.....	.....	.....	.....	.....	.....	.....
Buffalo (city)	3.60[1]	3.65[1]	3.88[1]	5.51[1]	3.575[1]	4.169[1]	4.069[1]	5.20[15]	4.625[16]	4.20[21]	4.919
Buffalo (country)	3.50[1]	3.55[1]	3.55[1]	5.15[1]	3.475[1]	3.85[1]	4.060[1]	5.10[15]	4.525[16]	4.10[21]	4.60
Pittsburgh (city)	3.60[1]	3.65[1]	3.65[1]	5.25[1]	3.575[1]	3.95[1]	3.850[1]	5.20[13]	4.625[24]	4.20[21]	4.70
Pittsburgh (country)	3.50[1]	3.55[1]	3.55[1]	5.15[1]	3.475[1]	3.85[1]	3.750[1]	5.10[13]	4.525[24]	4.10[21]	4.60
Cleveland (city)	3.60[1]	3.838[1]	3.65[1]	5.438[1]	3.575[1]	3.95[1]	3.850[1]	5.327[23]	4.625[24]	4.20[21]	4.70
Cleveland (country)	3.50[1]	.....	3.55[1]	.....	3.475[1]	3.85[1]	3.750[1]	.....	4.525[24]	4.10[21]	4.60
Detroit	3.70[1]	3.911[1]	3.859[1]	5.531[1]	3.675[1]	4.050[1]	3.950[1]	5.450[13]	4.725[24]	4.25[13]	4.909
Omaha (city, del.)	4.293[1]	4.343[1]	4.343[1]	5.943[1]	4.018[1]	4.498[1]	4.393[1]	5.965[13]	5.668[24]	4.893[21]	.....
Omaha (country)	4.193[1]	4.243[1]	4.243[1]	5.843[1]	3.918[1]	4.393[1]	4.293[1]	5.865[13]	.....	.....	.....
Cincinnati	3.861[1]	3.941[1]	3.911[1]	5.541[1]	3.650[1]	4.025[1]	3.925[1]	5.275[13]	4.700[24]	4.461[21]	4.961
Youngstown*	.....	.....	.....	.....	.....	.....	.....	4.85[13]	.....	.....	.....
Middletown, O.*	.....	.....	.....	.....	3.475[1]	3.85[1]	3.750[1]	5.10[15]	.....	.....	.....
Chicago (city)	3.75[1]	3.80[1]	3.80[1]	5.40[1]	3.475[1]	3.95[1]	3.850[1]	5.681[15]	4.425[24]	4.20[21]	4.90
Milwaukee	3.887[1]	3.937[1]	3.937[1]	5.537[1]	3.612[1]	4.087[1]	3.987[1]	5.722[15]	4.562[24]	4.337[21]	5.037
Indianapolis	3.83[1]	3.88[1]	3.88[1]	5.48[1]	3.743[1]	4.118[1]	4.018[1]	5.368[15]	4.793[24]	4.43[21]	5.030
St. Paul	4.01[3]	4.06[3]	4.06[3]	5.66[3]	3.735[3]	4.21[3]	4.110[3]	5.707[15]	4.685[24]	4.811[21]	5.352
St. Louis	3.897[1]	3.947[1]	3.947[1]	5.547[1]	3.622[1]	4.097[11]	3.997[1]	5.622[15]	4.572[24]	4.481[21]	5.181
Memphis, Tenn.	4.265[1]	4.315[1]	4.315[1]	6.03[1]	4.190[1]	4.565[1]	4.465[1]	5.715[15]	5.005[24]	4.78[21]	.....
Birmingham	3.65[1]	3.80[1]	3.80[1]	6.153[1]	3.675[1]	4.05[1]	3.950[1]	5.20[15]	5.077[24]	4.99[21]	5.465
New Orleans (city)	4.35[4]	4.15[4]	4.15[4]	6.10[4]	4.283[4]	4.55[4]	4.450[4]	5.70[20]	5.304[10]	5.05[21]	5.679
Houston, Tex.	4.00[3]	4.50[3]	4.50[3]	5.75[3]	3.988[3]	4.663[3]	4.563[4]	5.763[20]	5.819[10]	4.10[22]	.....
Los Angeles	4.65[4]	4.90[4]	5.20[4]	7.45[4]	5.225[4]	7.10[4]	5.200[4]	6.45[12]	7.425[4]	6.033[23]	5.863
San Francisco	4.40[7]	4.60[7]	4.90[7]	6.60[7]	4.775[7]	6.10[7]	4.750[7]	6.80[15]	7.525[13]	5.783[21]	7.583
Portland, Oreg.	4.70[27]	4.70[27]	5.00[27]	6.75[27]	4.875[27]	6.65[27]	5.000[27]	6.20[15]	6.825[15]	5.983[15]	.....
Tacoma, Wash.	4.60[8]	4.70[8]	5.00[8]	6.75[8]	4.875[8]	5.80[8]	4.500[8]	6.40[15]	7.825[15]	6.233[21]	.....
Seattle	4.70[8]	4.70[8]	5.00[8]	6.75[8]	4.875[8]	5.80[8]	4.500[8]	6.40[15]	7.275[15]	6.233[21]	.....

*Basing point cities with quotations representing mill prices, plus warehouse spread.
NOTE—All prices fixed by Office of Price Administration in Revised Price Schedule No. 49, as amended. Deliveries outside above cities computed in accordance with regulations.

BASE QUANTITIES

[1]—400 to 1999 pounds; [2]—400 to 14,999 pounds; [3]—any quantity; [4]—300 to 1999 pounds; [5]—400 to 8999 pounds; [6]—300 to 9999 pounds; [7]—400 to 39,999 pounds; [8]—under 2000 pounds; [9]—under 4000 pounds; [10]—500 to 1499 pounds; [11]—one bundle to 39,999 pounds; [12]—150 to 2249 pounds; [13]—150 to 1499 pounds; [14]—three to 24 bundles; [15]—450 to 1499 pounds; [16]—one bundle to 1499 pounds; [17]—one to nine bundles; [18]—one to six bundles; [19]—100 to 749 pounds; [20]—300 to 1999 pounds; [21]—1500 to 39,999 pounds; [22]—1500 to 1999 pounds; [23]—1000 to 39,999 pounds; [24]—400 to 1499 pounds; [25]—1000 to 1999 pounds; [26]—under 25 bundles. Cold-rolled strip, 2000 to 39,999 pounds, base; [27]—300 to 4999 pounds.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (Natural) Lower Lake Ports

Old range bessemer	$4.95
Mesabi nonbessemer	4.55
High phosphorus	4.55
Mesabi bessemer	4.70
Old range nonbessemer	4.80

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56-63% contract	18.00

Foreign Ore

Cents per unit, cif Atlantic ports

Manganiferous ore, 45-55% Fe., 6-10% mg.	Nom.
N. African low phos.	Nom.
Swedish basic, 60 to 68%	Nom.
Spanish, N. African basic, 50 to 60%	Nom.
Brazil iron ore, 68-69% fob Rio de Janeiro	7.50-8.00

Tungsten Ore

Chinese Wolframite, per short ton unit, duty paid	$24.00

Chrome Ore

(Equivalent OPA schedules):

Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S. C., Portland, Oreg., or Tacoma, Wash.
(S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African

48% 2.8:1	$39.75
48% 3:1	41.00
48% no ratio	31.00

South African (Transvaal)

44% no ratio	$27.40
45% no ratio	28.30
48% no ratio	31.00
50% no ratio	32.80

Brazilian—nominal

44% 2.5:1 lump	$33.65
48% 3:1 lump	43.50

Rhodesian

45% no ratio	$28.30
48% no ratio	31.00
48% 3:1 lump	41.00

Domestic (seller's nearest rail)

48% 3:1	$43.50

less $7 freight allowance.

Manganese Ore

Sales prices of Office of Metals Reserve, cents per gross ton unit, dry, 48%, at New York, Philadelphia, Baltimore, Norfolk, Mobile and New Orleans, 85c; Fontana, Calif., Provo, Utah, and Pueblo, Colo., 91c; prices include duty on imported ore and are subject to premiums, penalties and other provisions of amended M.P.R. No. 248, effective May 15, 1944. Price at basing points which are also points of discharge of imported manganese ore is fob cars, shipside, at dock most favorable to the buyer. Outside shipments direct to consumers at 10c per unit less than Metal Reserve prices.

Molybdenum

Sulphide conc., lb, Mo cont., mines	$0.75

NATIONAL EMERGENCY STEELS (Hot Rolled)

(Extras for alloy content)

Basic open-hearth Electric furnace

Designation	Carbon	Mn.	Si.	Cr.	Ni.	Mo.	Bars per 100 lb.	Billets per GT	Bars per 100 lb.	Billets per GT
	Chemical Composition Limits, Per Cent									
NE 9415	.13-.18	.80-1.10	.20-.35	.30-.50	.30-.60	.08-.15	$0.780	$15.60	$1.300	$26.00
NE 9425	.23-.28	.80-1.20	.20-.35	.30-.50	.30-.60	.08-.15	.780	15.60	1.300	26.00
NE 9442	.40-.45	1.00-1.30	.20-.35	.30-.50	.30-.60	.08-.15	.832	16.64	1.352	27.04
NE 9722	.20-.25	.50-.80	.20-.35	.10-.25	.40-.70	.15-.25	.676	13.52	1.196	23.92
NE 9912	.10-.15	.50-.70	.20-.35	.40-.60	1.00-1.30	.20-.30	1.248	24.96	1.612	32.24
NE 9920	.18-.23	.50-.70	.20-.35	.40-.60	1.00-1.30	.20-.30	1.248	24.96	1.612	32.24

Extras are in addition to a base price of 2.808c, per pound on finished products and $56.16 per gross ton on semifinished steel major basing points and are in cents per pound and dollars per gross ton. No prices quoted on vanadium alloy.

Pig Iron

Prices (in gross tons) are maximum fixed by OPA Price Schedule No. 10, effective June 10, 1941, amended Feb. 14, Oct. 23, 1945, and March 15, 1946. Exceptions indicated in footnotes. Base prices bold face, delivered light face. Federal tax on freight charges, effective Dec. 1, 1942, not included.

	No. 2 Foundry	Basic	Bessemer	Malleable
Bethlehem, Pa., base	$27.50	$27.00	$28.50	$28.00
Newark, N. J., del.	29.03	28.53	30.03	29.53
Brooklyn, N. Y., del.	30.00	.....	.....	30.50
Birdsboro, Pa., base	27.50	27.00	28.50	28.00
Birmingham, base	22.88	21.50	27.50	.....
Baltimore, del.	28.11	.....	.....	.....
Boston, del.	27.64	.....	.....	.....
Chicago, del.	26.72	.....	.....	.....
Cincinnati, del.	26.94	26.06	.....	.....
Cleveland, del.	26.62	25.74	.....	.....
Newark, N. J.	28.64	.....	.....	.....
Philadelphia, del.	27.96	27.46	.....	.....
St. Louis, del.	26.62	27.54	.....	.....
Buffalo, base	26.50	25.50	27.50	27.00
Boston, del.	28.00	27.00	29.00	28.50
Rochester, del.	28.03	.....	29.03	28.53
Syracuse, del.	28.58	.....	29.58	29.08
Chicago, base	26.50	26.00	27.00	26.50
Milwaukee, del.	27.60	27.10	28.10	27.60
Muskegon, Mich., del.	27.69	.....	.....	27.69
Cleveland, base	26.50	26.00	27.00	26.50
Akron, Canton, del.	27.89	27.39	28.39	27.89
Detroit, base	26 50	26.00	27.00	26.50
Saginaw, Mich., del.	28.81	28.31	29.31	28.81
Duluth, base	27.00	26.50	27.50	27.00
St. Paul, del.	29.13	28 63	29.63	29.13
Erie, Pa., base	26.50	26.00	27.50	27.00
Everett, Mass., base	27.50	27.00	28.50	28.00
Boston, del.	28.00	27.50	29.00	28.50
Granite City, Ill., base	26.50	26.00	27.00	26.50
St. Louis, del.	27.00	26.50	.....	27.00
Hamilton, O., base	26.50	26.00	.....	26.50
Cincinnati, del.	27.61	27.11	.....	27.61
Neville Island, Pa., base	26 50	26.00	27.00	26.50
°Pittsburgh, del. N. & S. sides	27.19	26.69	27.69	27.19
Provo, Utah, base	24.50	24.00	.....	.....
Sharpsville, Pa., base	26.50	26.00	27.00	26.50
Sparrows Point, base	27.50	27.00	.....	.....
Baltimore, del.	28.49	.....	.....	.....
Steelton, Pa., base	.....	27.00	.....	.....
Swedeland, Pa., base	27.50	27.00	28.50	28.00
Philadelphia, del.	28.34	27.84	.....	28.04
Toledo, O., base	26.50	26.00	27.00	26.50
Youngstown, O., base	26.50	26.00	27.00	26.50
Mansfield, O., del.	28.44	27.94	28.94	28.44

°To Neville Island base add: 55 cents for McKees Rocks, Pa.; 84 cents, Lawrenceville, Homestead, McKeesport, Ambridge, Monaco, Aliquippa; 97 cents (water), Monongahela; $1.11, Oakmont, Verona; $1.24, Brackenridge.

Exception to Ceiling Prices: Struthers Iron & Steel Co., Struthers, O., may charge 50 cents a ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable pig iron.

Ceiling Prices are aggregate of (1) governing basing point, (2) differentials, and (3) transportation charges from governing basing point to point of delivery as customarily computed. Governing basing point is the one resulting in lowest delivered price for the consumer.

High-Silicon, Silvery

6.00-6.50 per cent	(base)	$32.00
6.51-7.00	33.00	9.01- 9.50. 38.00
7.01-7.50	34.00	9.51-10.00. 39.00
7.51-8.00	35.00	10.01-10.50. 40.00
8.01-8.50	36.00	10.51-11.00. 41.00
8.51-9.00	37.00	11.01-11.50. 42.00

Fob Jackson county, O., per gross ton. Buffalo base $1.25 higher, whichever is most favorable to buyer.

Electric Furnace Ferrosilicon: Si 14.01 to 14.50%, $45.50 Jackson co.; each additional 0.50% silicon up to and including 18% add $1; low impurities not exceeding 0.005 P, 0.40 Si, 1.0% C, add $1.

Bessemer Ferrosilicon

Prices same as for high silicon silvery iron, plus $1 per gross ton.

Charcoal Pig Iron

Northern

Lake Superior Furn. $34.00
Chicago, del. 37.34

Southern

Semi-cold blast, low phosphorus.
Fob furnace, Lyles, Tenn. $33.00 (For higher silicon irons a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Gray Forge

Neville Island, Pa. $26.00
Valley base 26.00

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Buffalo, N. Y., $32.00 base; $33.24, del. Philadelphia. Intermediate phosphorus, Central Furnace, Cleveland, $29.00.

Differentials

Basing point prices are subject to following differentials:
Silicon: An additional charge not to exceed 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).
Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.
Manganese: An additional charge not to exceed 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.
Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

Refractories

Per 1000 pieces, fob shipping point.

Net prices

Fire Clay Brick

Super Duty

Pa., Mo., Ky. $76.05

High Heat Duty

Pa., Ill., O., Md., Mo., Ky. 60.40
Ala., Ga. 60.40
N. J. 65.90

Intermediate Heat Duty

Ohio 50.60
Pa., Ill., Md., Mo., Ky. 54.80
Ala., Ga. 49.15
N. J. 54.80

Low Heat Duty

Pa., Md., Ohio 42.35

Malleable Bung Brick

All bases 70.45

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry Press 36.45
Wire Cut 34.15

Silica Brick

Pennsylvania 60.40
Joliet, E. Chicago 69.30
Birmingham, Ala. 60.40

Magnesite

Domestic dead-burned grains, net ton fob Chewelah, Wash., net ton, bulk 22.00
net ton, bags 26.00

Basic Brick

Net ton, fob Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick 54.00
Chem. bonded chrome 54.00
Magnesite brick 76.00
Chem. bonded magnesite 65.00

Fluorspar

Metallurgical grade, fob Ill., Ky., net tons, carloads, CaF_2 content, 70% or more, $33; 65 but less than 70%, $32; 60 but less than 65% $31; less than 60%, $30. After Aug. 29, 1944, base price any grade $30.00.

Ferroalloy Prices

Ferromanganese, standard: 78-82% c.l. gross ton, duty paid, $135 fob cars, Baltimore, Philadelphia or New York, whichever is most favorable to buyer, Rockdale or Rockwood, Tenn. (where Tennessee Products Co. is producer), Birmingham, Ala. (where Sloss-Sheffield Steel & Iron Co. is producer); $140 fob cars, Pittsburgh (where Carnegie-Illinois Steel Corp. is producer); add $6 for packed c.l., $10 for ton, $13.50 for less ton; $1.70 for each 1%, or fraction contained manganese over 82% or under 78%.

Ferromanganese, low carbon: Eastern zone: Special, 21c; regular, 20.50c; medium, 14.50c; central zone: Special, 21.30c; regular, 20.80c; medium, 14.80c; western zone: Special, 21.55c; regular, 21.05c; medium, 15.75c. Prices are per pound contained Mn, bulk carlot shipments, fob shipping point, freight allowed. Special low-carbon has content of 90% Mn, 0.10% C, and 0.06% P.

Spiegeleisen: 19-21% carlot per gross ton, Palmerton, Pa., $36; Pittsburgh, $40.50; Chicago, $40.60.

Electrolytic Manganese: 99.9% plus, less ton lots, per lb 37.6c.

Chromium Metal: 97% min. chromium, max. 0.50% carbon, eastern zone, per lb contained chromium bulk, c.l., 79.50c, 2000 lb to c.l. 80c; central 81c and 82.50c; western 82.25c and 84.75c; fob shipping point, freight allowed.

Ferrocolumbium: 50-60% per lb contained columbium in gross ton lots, contract basis, R. R. freight allowed, eastern zone, $2.25; less-ton lots $2.30. Spot prices 10 cents per lb higher.

Ferrochrome: High carbon, eastern zone, bulk, c.l., 13c, 2000 lb. to c.l. 13.90c; central, add .40c and .65c; western, add 1c and 1.85c—high nitrogen, high carbon ferrochrome; Add 5c to all high carbon ferrochrome prices; all zones; low carbon eastern, bulk, c.l. max. 0.06% carbon, 23c, 0.10% 22.50c, 0.15% 22c, 0.20% 21.50c, 0.50% 21c, 1.00% 20.50c, 2.00% 19.50c; 2000 lb to c.l., 0.06% 24c, 0.10% 23.50c, 0.15% 23c, 2.00% 22.50c, 0.50% 22c, 1.00% 21.50c, 2.00% 20.50c; central, add 0.4c for bulk, c.l. and 0.65 for 2000 lb to c.l.; western, add 1c for bulk, c.l. and 1.85c for 2000 lb c.l.; carload packed differential 0.45c; fob shipping point, freight allowed. Prices per lb contained Cr, high nitrogen, low carbon ferrochrome: Add 2c to low carbon ferrochrome prices; all zones. For higher nitrogen carbon add 2c for each 0.25% of nitrogen over 0.75%.

Special Foundry Ferrochrome: (Cr 62-66%; C approx. 5-7%.) Contract, carload bulk 13.50c, packed 13.95c, ton lots 14.40c, less 14.90c, eastern, freight allowed, per pound contained chromium; 13.90c, 14.35c, 15.05c and 15.55c central; 14.50c, 14.95c, 16.25c and 16.75c, western; spot up .25c.

S.M. Ferrochrome, high carbon: (Cr 60-65%, Si 4-6%, Mn 4-6% and C 4-6%.) Contract, carlot, bulk, 14.00c, packed 14.45c, ton lots 14.90c, less 15.40c, eastern, freight allowed; 14.40c, 14.85c, 15.55c and 16.05c, central; 15.00c, 15.45c, 16.75c and 17.25c, western; spot up .25c; per pound contained chromium.

S.M. Ferrochrome, low carbon: (Cr 62-66%, Si 4-6%, Mn 4-6% and C 1.25% max.) Contract, carlot, bulk, 20.00c, packed 20.45c, ton lots 21.00c, less ton lots 22.00c, eastern, freight allowed, per pound contained chromium; 20.40c, 20.85c, 21.65c and 22.65c, central; 21.00c, 21.45c, 22.85c and 23.85c, western; spot up .25c.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7% and Fe approx. 20%) per lb of alloy contract carlots 11.50c, ton lots 12.00c, less 12.50c, eastern zone, freight allowed; 12.00c, 12.85c and 13.35c central zone; 14.05c, 14.60c and 15.10c, western; spot up .25c.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 5-7%, Zr 5-7%, Ti 9-11% and B 0.55-0.75%), per lb of alloy contract, carlots 25.00c, ton lots 26.00c, less ton lots 27.00c, eastern, freight allowed, 25 50c, 26.75c and 27.75c, central; 27.50c, 28.90c and 29.90c, western; spot up .25c.

Silvaz Alloy: (Si 35-40%, Va 9-11%, Al 5-7%, Zr 5-7%, Ti 9-11% and B 0.55-0.75%) per lb of alloy. Contract, carlots 58.00c, ton lots 59.00c, less 60.00c, eastern freight allowed; 58.50c, 59.75c and 60.75c, central; 60.50c, 61.90c and 62.90c, western; spot up ¼c.

CMSZ Alloy 4: (Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75% and C 3.00-4.50%). Contract carlots, bulk, 11.00c and packed 11.50c; ton lots 12.00c; less 12.50c, eastern, freight allowed; 11.50c and 12.00c, 12.75c, 13.25c, central; 13.50c and 14.00c, 14.75c, 15.25c, western; spot up .25c.

CMSZ Alloy 5: (Cr 50-56%, Mn 4-6%, Si 13.50-16.00%, Zr 0.75-1.25%, C 3.50-5.00%) per lb of alloy. Contract, carlots, bulk, 10.75c, packed 11.25c, ton lots 11.75c, less 12.25c, eastern, freight allowed; 11.25c, 11.75c, 12.50c, 13.00c central; 13.25c, 13.75c, 14.50c and 15.00c, western; spot up 0.25c.

Ferro-Boron: (B 17.50% min., Si 1.50% max., Al 0.50% max. and C 0.50% max.) per lb of alloy contract ton lots $1.20, less ton lots $1.30, eastern, freight allowed; $1.2075 and $1.3075 central; $1.229 and $1.329, western; spot add 5c.

Manganese-Boron: (Mn 75% approx., B 15-20%, Fe 5% max., Si 1.50% max. and C 3% max.) per lb of alloy. Contract ton lots, $1.89, less $2.01, eastern; freight allowed; $1.903 and $2.023, central; $1.935 and $2.055 western; spot up 5c.

Nickel-Boron: (B 15-18%, Al 1% max., Si 1.50% max., C 0.50% max., Fe 3% max., Ni, balance), per lb of alloy. Contract, 5 tons or more $1.90, 1 ton to 5 tons, $2.00, less than ton $2.10, eastern, freight allowed; $1.9125, $2.0125 and $2.1125, central; $1.9445, $2.0445 and $2.1445, western; spot same as contract.

Chromium-Copper: (Cr 8-11%, Cu 88-90%, Fe 1% max., Si 0.50% max.) contract, any quantity, 45c, eastern, Niagara Falls, N. Y., basis, freight allowed to destination, except to points taking rate in excess of St. Louis rate to which equivalent of St. Louis rate will be allowed; spot up 2c.

Vanadium Oxide: (Fused: Vanadium oxide 85-88%, sodium oxide approx. 10% and calcium oxide approx. 2%, or Red Cake; Vanadium oxide 85% approx., sodium oxide, approx. 9% and water approx.

2.5%) Contract, any quantity, $1.10 eastern, freight allowed per pound vanadium oxide contained; contract carlots, $1.105, less carlots, $1.108, central; $1.118 and $1.133, western; spot add 5c to contracts in all cases.

Calcium metal; cast: Contract ton lots or more $1.35, less, $1.60, pound of metal; $1.36 and $1.61 central, $1.40 and $1.65, western; spot up 5c.

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%), per lb of alloy. Contract, carlots, 15.50c, ton lots 16.50c and less 17.00c, eastern, freight allowed; 16.00c, 17.35c, and 17.85c, central; 18.05c, 19.10c and 19.60c western; spot up 0.25c.

Calcium-Silicon: Ca 30-35%, Si 60-65% and Fe 3.00% max.), per lb of alloy. Contract, carlot, lump 18.00c, ton lots 14.50c, less 15.50c, eastern, freight allowed; 13.50c, 15.25c and 16.25c central; 15.55c, 17.40c and 18.40c, western; spot up 0.25c.

Briquets, Ferromanganese: (Weight approx. 3 lb and containing exactly 2 lb Mn) per lb of briquets. Contract, carlots, bulk 0.0605c, packed 0.063c, tons 0.0655c, less 0.068c eastern freight allowed; 0.063c, 0.655c, 0.0755c and 0.078c, central; 0.066c, 0.0685c, 0.0855c and 0.088c, western; spot up 0.25c.

Briquets, Ferrochrome: Containing exactly 2 lb Cr, eastern zone, bulk, c.l., 8.25c per lb of briquets, 2000 lb to c.l., 8.75c; central, add 0.3c for c.l. and 0.5c for 2000 lb to c.l.; western add 0.70c for c.l., and 0.2c for 2000 lb to c.l.; **silicomanganese,** eastern, containing exactly 2 lb Mn and approx. ½ lb Si, bulk, c.l., 5.80c, 2000 lb to c.l., 6.30c.; central add 0.25c for c.l. and 1c for 2000 lb to c.l.; western, add 0.5c for c.l., and 2c for 2000 lb to c.l.; **ferrosilicon,** eastern, approx. 5 lb, containing exactly 2 lb Si, or weighing approx. 2½ lb and containing exactly 1 lb of Si, bulk, c.l. 3.35c, 2000 lb to c.l., 3.80c; central, add 1.50c for c.l., and 0.40c for 2000 lb to c.l.; western, add 3c for c.l. and 0.45c for 2000 to c.l.; fob shipping point, freight allowed.

Ferromolybdenum: 55-75% per lb contained Mo, fob Langeloth and Washington, Pa., furnace, any quantity 95.00c.

Ferrophosphorus: 17-19%, based on 18% P content, with unitage of $3 for each 1% of P above or below the base; gross tons per carload fob sellers' works, with freight equalized with Rockdale, Tenn.; contract price $58.50, spot $62.25.

Ferrosilicon: Eastern zone, 90-95%, blk, c.l., 11.05c, 2000 lb to c.l., 12.30c; 80-90%, bulk c.l., 8.90c, 2000 lb to c.l., 9.95c; 75%, bulk, c.l., 8.05c, 2000 lb to c.l., 9.05c; 50%, bulk c.l., 6.65c and 2000 lb to c.l., 7.85c; central 90-95%, bulk, c.l., 11.20c, 2000 lb to c.l., 12.80c; 80-90%, bulk, c.l., 9.05c, 2000 to c.l., 10.45c; 75%, bulk, c.l., 8.20c, 2000 lb to c.l., 9.65c; 50% bulk, c.l., 7.10c, 2000 lb to c.l., 9.70c; western, 90-95%, bulk, c.l., 11.65c, 2000 lb to c.l., 15.60c; 80-90%, bulk, c.l., 9.55c, 2000 lb to c.l., 13.50c; 75%, bulk, c.l., 8.75c, 2000 lb to c.l., 13.10c; 50%, bulk, c.l., 7.25c, 2000 lb to c.l., 8.75c; fob shipping point, freight allowed. Prices per lb contained Si.

Grainal: Vanadium Grainal No. 1 87.5c; No. 6, 60c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

Silicon Metal: Min. 97% Si and max. 1% Fe, eastern zone, bulk, c.l., 12.90c; 2000 lb to c.l., 13.45c; central, 13.20c and 13.90c; western, 13.85c and 16.80c; min. 96% Si and max. 2% Fe, eastern, bulk, c.l., 12.50c, 2000 lb to c.l., 13.10c; central, 12.80c and 13.55c; western, 13.45c and 16.50c fob shipping point, freight allowed. Price per lb contained Si.

Manganese Metal: (96% min. Mn, max. 2% Fe), per lb of metal, eastern zone, bulk, c.l., 30c, 2000 lb to c.l., 32c, central, 30.25c, and 33c; western, 30.55c and 35.05c.

Ferrotungsten: Spot, 10,000 lb or more, per lb contained W, $1.90; contract, $1.88; freight allowed as far west as St. Louis.

Tungsten Metal Powder: Spot, not less than 97%, $2.50-$2.60; freight allowed as far west as St. Louis.

Ferrotitanium: 40-45%, R.R. freight allowed, per lb contained Ti; ton lots $1.23; less-ton lots $1.25; eastern. Spot up 5c per lb.

Ferrotitanium: 20-25%, 0.10 maximum carbon; per lb contained Ti; ton lots $1.35; less-ton lots $1.40 eastern. Spot up 5c per lb.

High-Carbon Ferrotitanium: 15-20% contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C $142.50; 3-5% C $157.50.

Carbortam: B 0.90 to 1.15% net ton to carload, 8c per lb fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

Borium: B 1.5-1.9%, ton lots, 45c lb; less-ton lots, 50c lb.

Ferrovanadium: Va 35-55%, contract basis, per lb contained Va, fob producers plant with usual freight allowances; open-hearth grade $2.70; special grade $2.80; highly-special grade $2.90.

Zirconium Alloys: Zr 12-15%, per lb of alloy, eastern contract, carlots, bulk, 4.60c, packed 4.80c, ton lots 4.80c, less tons 5c, carloads, bulk, per gross ton $102.50; packed $107.50; ton lots $108; less-ton lots $112.50. Spot up ¼c per ton.

Zirconium Alloy: Zr 35-40%, eastern, contract basis, carloads in bulk or package, per lb of alloy 14.00c; gross ton lots 15.00c; less-ton lots 16.00c. Spot up ¼c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) contract basis fob Niagara Falls, N. Y., per lb 5.50c; ton lots 6.00c. Spot up ½c.

Siminal: (Approx. 20% each Si, Mn, Al) Contract, freight not exceeding St. Louis rate allowed, per lb alloy; carlots 8c; ton lots 8.75c; less-ton lots 9.25c.

Borosil: 3 to 4% B, 40 to 45% Si, $6.25 lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Following prices are quotations developed by editors of STEEL in the various centers. For complete OPA ceiling price schedule refer to maximum price regulation No. 4 Quotations are on gross tons.

PHILADELPHIA:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$18.75
No. 2 Heavy Melt. Steel	18.75
No. 2 Bundles	18.75
No. 3 Bundles	16.75
Mixed Borings, Turnings	13.75
Machine Shop Turnings	13.75
Billet, Forge Crops	23.75
Bar Crops, Plate Scrap	21.25
Cast Steel	21.25
Punchings	21.25
Elec. Furnace Bundles	19.75
Heavy Turnings	18.25

Cast Grades

(Fob Shipping Point)

Heavy Breakable Cast	16.50
Charging Box Cast	19.00
Cupola Cast	20.00
Unstripped Motor Blocks	17.50
Malleable	22.00
Chemical Borings	16.51

NEW YORK:

(Dealers' buying prices)

No. 1 Heavy Melt. Steel	$15.33
No. 2 Heavy Melt. Steel	15.33
No. 2 Hyd. Bundles	15.33
No. 3 Hyd. Bundles	13.33
Chemical Borings	14.33
Machine Turnings	10.33
Mixed Borings, Turnings	10.33
No. 1 Cupola	20.00
Charging Box	19.00
Heavy Breakable	16.50
Unstrip Motor Blocks	17.50
Stove Plate	19.00

BOSTON:

(Fob shipping points. Boston differential 99c higher, steelmaking grades; Providence, $1.09 higher)

No. 1 Heavy Melt. Steel	$14.06
No. 2 Heavy Melt. Steel	14.06
No. 1 Bundles	14.06
No. 2 Bundles	14.06
No. 1 Busheling	14.06
Machine Shop Turnings	9.06
Mixed Borings, Turnings	9.06
Short Shovel Turnings	11.06
Chemical Borings	13.31
Low Phos. Clippings	16.56
No. 1 Cast	20.00
Clean Auto Cast	20.00
Stove Plate	19.00
Heavy Breakable Cast	16.50

CLEVELAND:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$19.50
No. 2 Heavy Melt. Steel	19.50
No. 1 Comp. Bundles	19.50
No. 2 Comp. Bundles	19.50
No. 1 Busheling	19.50
Mach. Shop Turnings	14.50
Short Shovel Turnings	16.50
Mixed Borings, Turnings	14.50
No. 1 Cupola Cast	20.00
Heavy Breakable Cast	16.50
Cast Iron Borings	13.50-14.00
Billet, Bloom Crops	24.50
Sheet Bar Crops	22.00
Plate Scrap, Punchings	22.00
Elec. Furnace Bundles	20.50

PITTSBURGH:

(Delivered consumer's plant)

Railroad Heavy Melting	$21.00
No. 1 Heavy Melt Steel	20.00
No. 2 Heavy Melt Steel	20.00
No. 1 Comp. Bundles	20.00
No. 2 Comp. Bundles	20.00
Short Shovel Turnings	17.00
Mach. Shop Turnings	15.00
Mixed Borings, Turnings	15.00
No. 1 Cupola Cast	*20.00
Heavy Breakable Cast	*16.50
Cast Iron Borings	16.00
Billet, Bloom Crops	25.00
Sheet Bar Crops	22.50
Plate Scrap, Punchings	22.50
Railroad Specialties	24.50
Scrap Rail	21.50
Axles	26.00
Rail 3 ft. and under	23.50
Railroad Malleable	22.00

*Shipping point.

VALLEY:

(Delivered consumer's plant)

No. 1 R.R. Heavy Melt.	$21.00
No. 1 Heavy Melt Steel	20.00
No. 1 Comp. Bundles	20.00
Short Shovel Turnings	17.00
Cast Iron Borings	16.00
Machine Shop Turnings	15.00
Low Phos. Plate	22.50

MANSFIELD, O.:

(Delivered consumer's plant)

Machine Shop Turnings	$15.00

BIRMINGHAM:

(Delivered consumer's plant)

Billet Forge Crops	$22.00
Structural, Plate Scrap	19.00
Scrap Rails Random	18.50
Rerolling Rails	20.50
Angle Splice Bars	20.50
Solid Steel Axles	24.00
Cupola Cast	20.00
Stove Plate	19.00
Long Turnings	8.50- 9.00
Cast Iron Borings	8.50- 9.00
Iron Car Wheels	16.50-17.00

CHICAGO:

(Delivered consumer's plant; cast grades fob shipping point, railroad grades fob tracks)

No. 1 R.R. Heavy Melt.	$19.75
No. 1 Heavy Melt. Steel	18.75
No. 2 Heavy Melt. Steel	18.75
No 1 Ind. Bundles	18.75
No. 2 Dlr. Bundles	18.75
Baled Mach. Shop Turn.	18.75
No. 3 Galv. Bundles	16.75
Machine Turnings	13.75
Mix. Borings, Sht. Turn.	13.75
Short Shovel Turnings	15.75
Cast Iron Borings	14.75
Scrap Rails	20.25
Cut Rails, 3 feet	22.25
Cut Rails, 18-inch	23.50
Rerolling rails	22.25
Angles, Splice Bars	22.25
Plate Scrap, Punchings	21.25
Railroad Specialties	22.75
No. 1 Cast	20.00
R.R. Malleable	22.00

BUFFALO:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$19.25
No. 2 Heavy Melt. Steel	19.25
No. 1 Bundles	19.25
No. 2 Bundles	19.25
No. 1 Busheling	19.25
Machine Turnings	14.25
Short Shovel Turnings	16.25
Mixed Borings, Turn.	14.25
Cast Iron Borings	15.25
Low Phos.	21.75

DETROIT:

(Delivered consumer's plant)

Heavy Melting Steel	$17.32
No. 1 Busheling	17.32
Hydraulic Bundles	17.32
Flashings	17.32
Machine Turnings	12.32
Short Shovel. Turnings	14.32
Cast Iron Borings	13.32
Low Phos. Plate	19.82
No. 1 Cast	20.00
Heavy Breakable Cast	16.50

ST. LOUIS:

(Delivered consumer's plant; cast grades fob shipping point)

Heavy Melting	17.50
No. 1 Locomotive Tires	21.00
Misc. Rails	19.00
Railroad Springs	22.00
Bundled Sheets	17.50
Axle Turnings	17.00
Machine Turnings	10.50
Shoveling Turnings	12.50
Rerolling Rails	21.00
Street Car Axles	24.50
Steel Rails, 3 ft.	21.50
Steel Angle Bars	21.00
Cast Iron Wheels	20.00
No. 1 Machinery Cast	20.00
Railroad Malleable	22.00
Breakable Cast	16.50
Stove Plate	19.00
Grate Bars	15.25
Brake Shoes	15.25

CINCINNATI:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$19.50
No. 2 Heavy Melt. Steel	19.50
No. 1 Comp. Bundles	19.50
No. 2 Comp. Bundles	19.50
Machine Turnings	10.50-11.00
Shoveling Turnings	12.50-13.00
Cast Iron Borings	11.50-12.00
Mixed Borings, Turnings	10.50-11.00
No. 1 Cupola Cast	20.00
Breakable Cast	16.50
Low Phosphorus	21.00-22.00
Scrap Rails	20.50-21.00
Stove Plate	18.50-19.00

LOS ANGELES:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$14.00
No. 2 Heavy Melt. Steel	13.00
No. 1, 2 Deal Bundles	12.00
Machine Turnings	5.50
Mixed Borings, Turnings	5.50
No. 1 Cast	20.00

SAN FRANCISCO:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$15.00
No. 2 Heavy Melt. Steel	14.00
No. 1 Busheling	15.50
No. 1, No. 2 Bundles	13.00
No. 3 Bundles	8.50
Machine Turnings	7.00
Billet, Forge Crops	15.50
Bar Crops, Plate	15.50
Cast Steel	15.50
Cut, Structural, Plate, 1", under	18.00
Alloy-free Turnings	7.00
Tin Can Bundles	14.50
No. 2 Steel Wheels	15.50
Iron, Steel Axles	23.00
No. 2 Cast Steel	15.50
Uncut Frogs, Switches	15.50
Scrap Rails	15.00
Locomotive Tires	15.50

SEATTLE:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$12.50
No. 2 Heavy Melt. Steel	12.50
Heavy Railroad Scrap	14.50
(Fob shipping point)	
No. 1 Cupola Cast	20.00

NONFERROUS METAL PRICES

Copper: Electrolytic or Lake from producers in carlots 12.00c, Del. Conn., less carlots 12.12½c, refinery; dealers may add ¾c for 5000 lbs. to carload; 1000-4999 lbs. 1c; 500-999 1½c; 0-499 2c. Casting, 11.75c, refinery for 20,000 lbs., or more; 12.00c less than 20,000 lbs.

Brass Ingot: Carlot prices, including 25 cents per hundred freight allowance; add ¼c for less than 20 tons; 85-5-5-5 (No. 115) 13.00c; 88-10-2 (No. 215) 16.50c; 80-10-10 (No. 305) 15.75c; No. 1 yellow (No. 405) 10.00c.

Zinc: Prime western 8.25c, select 8.35c, brass special 8.50c, intermediate 8.75c, E. St. Louis, for carlots. For 20,000 lbs. to carlots add 0.15c; 10,000-20,000 0.25c; 2000-10,000 0.40c; under 2000 0.50c.

Lead: Common 6.35c, chemical, 6.45c, corroding, 6.45, E. St. Louis for carloads; add 5 points for Chicago, Minneapolis-St. Paul, Milwaukee-Kenosha districts; add 15 points for Cleveland-Akron-Detroit area, New Jersey, New York state, Texas, Pacific Coast, Richmond, Indianapolis-Kokomo; add 20 points for Birmingham, Connecticut, Boston-Worcester, Springfield, New Hampshire, Rhode Island.

Primary Aluminum: 99% plus, ingots 15.00c del., pigs 14.00c del.; metallurgical 94% min. 13.50c del. Base 10,000 lb and over; add ½c 2000-9999 lb; 1c less through 2000 lb.

Secondary Aluminum: Piston alloy (No. 122 type) 10.50-11.00c; No. 12 foundry alloy (No. 2 grade) 10.50-10.75c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1 (95-97½%) 11.75-12.00c; grade 2 (92-95%) 10.25-10.75c; grade 3 (90-92%) 8.50-9.00c; grade 4 (85-90%) 8.25-8.50c. Above prices for 30,000 lb or more; add ¼c 10,000-30,000 lb; ½c 1000-10,000 lb; 1c less than 1000 lb. Prices include freight at carload rate up to 75c per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots (4-notch, 17 lb) 20.50c per lb, carlots; 22.50c 100 lb to c.l. Extruded 12-in. sticks 27.50c, carlots; 29.50c 100 lb to c.l.

Tin: Prices ex-dock, New York in 5-ton lots. Add 1 cent for 2240-11,199 lbs., 1½c 1000-2239. 2½c 500-999, 3c under 500. Grade A, 99.8% or higher (includes Straits), 52.00c; Grade B, 99.8% or higher, not meeting specifications for Grade A, with 0.03 per cent maximum arsenic, 51.87½c; Grade C, 99.65-99.79% incl. 51.62½c; Grade D, 99.50-99.64% incl., 51.50c; Grade E, 99-99.49% incl. 51.12½c; Grade F, below 99% (for tin content), 51.00c.

Antimony: American bulk carlots fob Laredo, Tex., 99.0% to 99.8% and 99.8% and over but not meeting specifications below, 14.50c; 99.8% and over (arsenic, 0.05%, max. and other impurities, 0.1%, max.) 15.00c. On producers' sales add ¼c for less than carload to 10,000 lb.; ½c for 9999-224 lb.; and 2c for 223 lb. and less; on sales by dealers, distributors and jobbers add ½c, 1c, and 3c, respectively.

Nickel: Electrolytic cathodes, 99.5%, fob refinery 35.00c lb.; pig and shot produced from electrolytic cathodes 36.00c; "F" nickel shot or ingot for additions to cast iron, 34.00c.

Mercury: Open market, spot, New York, $103-$107 per 76-lb flask.

Arsenic: Prime, white, 99%, carlots, 4.00c lb.

Beryllium-Copper: 3.75-4.25% Be., $14.75 lb contained Be.

Cadmium: Bars, ingots, pencils, pigs, plates, rods, slabs, sticks, and all other "regular" straight or flat forms 90.00c lb., del.; anodes, balls, discs and all other special or patented shapes 95.00c lb. del.

Cobalt: 97-99%, $1.50 lb., for 550 lb. (bbl.); $1.52 lb. for 100 lb. (case); $1.57 lb. under 100 lb.

Indium: 99.9%, $2.25 per troy ounce.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, N. Y. 70.625c per ounce.

Platinum: $35 per ounce.

Palladium: $24 per troy ounce.

Iridium: $165 per troy ounce.

Rolled, Drawn, Extruded Products

(Copper and brass product prices based on 12.00c, Conn., for copper. Freight prepaid on 100 lb or more.)

Sheet: Copper 22.08c; yellow brass 20.81c; commercial bronze, 90% 22.40c, 95% 22.61c; red brass, 80% 21.48c, 85% 21.69c; phosphor bronze, grades A and B 5%, 38.77c; Everdur, Herculoy, Duronze or equiv., 27.33c; naval brass 25.83c; manganese bronze 29.33c; muntz metal 24.08c; nickel silver 5% 28.62c.

Rods: Copper, hot-rolled 18.60c, cold-drawn 19.60c; yellow brass 16.04c; commercial bronze 90% 22.35c, 95% 22.56c; red brass 80% 21.43c, 85% 21.64c; phosphor bronze grades A and B 5% 39.02c; Everdur, Herculoy, Duronze or equiv., 26.53c; naval brass 20.15c; manganese bronze 23.53c; muntz metal 19.90c; nickel silver 5% 30.87c.

Seamless Tubing: Copper 22.42c; yellow brass 23.55c; commercial bronze 90% 24.79c; red brass 80% 24.12c, 85% 24.33c.

Extruded Shapes: Copper 22.10c; architectural bronze 20.15c; manganese bronze 25.03c; muntz metal 21.15c; naval brass 21.40c.

Angles and Channels: Yellow brass 29.31c; commercial bronze 90% 30.90c, 95% 31.11c; red brass 80% 29.98c, 85% 30.19c.

Copper Wire: Soft, fob eastern mills, carlots 15.37½c, less-carlots 15.87½c; weatherproof, fob eastern mills, carlots 17.00c, less-carlots 17.50c; magnet, delivered carlots 17.50c, 15,000 lb or more 17.75c, less carlots 18.25c.

Aluminum Sheets and Circles: 2s and 3s flat mill finish, base 30,000 lbs. or more; del.; sheet widths as indicated; circle diameter 9" and larger:

Gage	Width	Sheets	Circles
.249"-7	12"-48"	22.70c	25.20c
8-10	12"-48"	23.20c	25.70c
11-12	26"-48"	24.20c	27.00c
13-14	26"-48"	25.20c	28.50c
15-16	26"-48	26.40c	30.40c
17-18	26"-48"	27.90c	32.90c
19-20	24"-42"	29.80c	35.80c
21-22	24"-42"	31.70c	37.20c
23-24	3"-24"	25.60c	29.20c

Lead Products: Prices to jobbers; full sheets 9.50c; cut sheets 9.75c; pipe 8.15c, New York; 8.25c, Philadelphia, Baltimore, Rochester and Buffalo; 8.75c, Chicago, Cleveland, Worcester, Boston.

Zinc Products: Sheet fob mill, 13.15c; 36,000 lbs. and over deduct 7%; Ribbon and strip 12.25c, 3000-lb. lots deduct 1%, 6000 lbs. 2%, 9000 lbs. 3%, 18,000 lbs. 4%, carloads and over 7%. Boiler plate (not over 12") 3 tons and over 11.00c; 1-3 tons 12.00c; 500-2000 lbs. 12.50c; 100-500 lbs. 13.00c; under 100 lbs. 14.00c. Hull plate (over 12") add 1c to boiler plate prices.

PLATING MATERIALS

Chromic Acid: 99.75%, flake, del., carloads 16.25c; 5 tons and over 16.75c; 1-5 tons 17.25c; 400 lbs. to 1 ton 17.75c; under 400 lbs. 18.25c.

Copper Anodes: Base 2000-5000 lbs., del.; oval 17.62c; untrimmed 18.12c; electro-deposited 17.37c.

Copper Carbonate: 52-54% metallic cu, 250 lb. barrels 20.50c.

Copper Cyanide: 70-71% cu, 100-lb. kegs or bbls. 34.00c fob Niagara Falls.

Sodium Cyanide: 96%, 200-lb. drums 15.00c; 10,000-lb. lots 13.00c fob Niagara Falls.

Nickel Anodes: 500-2999 lb. lots; cast and rolled carbonized 47.00c; rolled depolarized 48.00c.

Nickel Chloride: 100-lb. kegs or 275-lb. bbls. 18.00c lb., del.

Tin Anodes: 1000 lbs. and over 58.50c del.; 500-999 59.00c; 200-499 59.50c; 100-199 61.00c.

Tin Crystals: 400 lb. bbls. 39.00c fob Grasselli, N. J.; 100-lb. kegs 39.50c.

Sodium Stannate: 100 or 300-lb. drums 36.50c, del.; ton lots 35.50c.

Zinc Cyanide: 100-lb. kegs or bbls. 33.00c fob Niagara Falls.

Scrap Metals

Brass Mill Allowances: Prices for less than 15,000 lbs. fob shipping point. Add ⅝c for 15,000-40,000 lbs.; 1c for 40,000 or more.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	10.250	10.250	9.500
Tinned Copper	9.625	9.625	9.375
Yellow Brass	8.625	8.375	7.785
Commercial bronze			
90%	9.375	9.125	8.625
95%	9.500	9.250	8.750
Red Brass, 85%	9.125	8.875	8.375
Red Brass, 80%	9.125	8.875	8.375
Muntz Metal	8.000	7.750	7.250
Nickel Sil, 5%	9.250	9.000	4.625
Phos. br., A, B, 5%	11.000	10.750	9.750
Naval brass	8.250	8.000	7.500
Mang. bronze	8.250	8.000	7.500

Other than Brass Mill Scrap: Prices apply on material not meeting brass mill specifications and are fob shipping point; add ¾c for shipment of 60,000 lbs. of one group and ½c for 20,000 lbs. of second group shipped in same car. Typical prices follow:

(Group 1) No. 1 heavy copper and wire, No. 1 tinned copper, copper borings 9.75c; No. 2 copper wire and mixed heavy copper, copper tuyeres 8.75c.

(Group 2) Soft red brass and borings, aluminum bronze 9.00c; copper-nickel and borings 9.25c; car boxes, cocks and faucets 7.75c; bell metal 15.50c; babbit-lined brass bushings 13.00c.

(Group 3) Admiralty condenser tubes, brass pipe, 7.25c; muntz metal condenser tubes 6.75c; old rolled brass 6.75c; manganese bronze solids: (lead 0.00%-0.40%) 5.50c; (lead 0.41%-1%) 4.50c; manganese bronze borings: (lead 0.00-0.40%) 4.00c; (lead 0.41%-1%) 5.00c.

Aluminum Scrap: Price fob point of shipment, truckloads of 5000 pounds or over; Segregated solids, 2S, 3S, 5c lb., 11, 14, etc., 3 to 3.50c lb. All other high grade alloys 5c lb. Segregated borings and turnings, wrought alloys, 2, 2.50c lb. Other high-grade alloys 3.50, 4.00c lb. Mixed plant scrap, all solids, 2, 2.50c lb. borings and turnings one cent less than segregated.

Lead Scrap: Prices fob point of shipment. For soft and hard lead, including cable lead, deduct 0.55c from basing point prices for refined metal.

Zinc Scrap: New clippings 6.50c, old zinc 4.75c, fob point of shipment, add ½c for 10,000 lb or more. New die cast scrap 4.45c, radiator grilles 3.50c, add ½c for 20,000 lb or more. Unsweated zinc dross, die cast slab 5.30c, any quantity.

Nickel, Monel Scrap: Prices fob point of shipment; add ½c for 2000 lbs. or more of nickel or cupro-nickel shipped at one time and 20,000 lbs. or more of Monel. Converters (dealers) allowed 2c premium.

Nickel: 98% or more nickel and not over ½% copper 23.00c; 90-98% nickel, 23.00c per lb nickel contained.

Cupro-nickel: 90% or more combined nickel and copper 26.00c per lb. contained nickel, plus 8.00c per lb. contained copper; less than 90% combined nickel and copper 26.00c for contained nickel only.

Monel: No. 1 castings, turnings 15.00c; new clipping 20.00c; soldered sheet 18.00c.

Sheets, Strip . . .

Sheet & Strip Prices, Page 142

Sheet schedules are filled through the year in most cases and while some possibility exists of an order being placed for delivery in fourth quarter, probably only regular customers of the producer could obtain this. Considerable shopping is being done by consumers unable to obtain sufficient from regular supplhers, but with small success. A strike at Granite City, Ill., has stopped sheet production there. Demand continues heavy in spite of inability to place orders.

New York — Sheet buyers continue to canvass the market for practically all grades. Notwithstanding the sold-up condition of sellers for the remainder of the year, consumers keep trying to place tonnage and apparently with just enough success or encouragement to cause them to continue. However, consumers generally realize that they will have to get along with much less sheet tonnage than they would like to place.

At present there does not appear to be a grade in which producers are not well booked ahead. Some stainless steel is available before the end of this year, but only a relatively small amount, and possibly a little hot-rolled sheet tonnage, but even in these lines it would be difficult for other than regular customers to obtain tonnage this year.

Some producers are making a point of considering all inquiries before possible rejection; still others do not go even that far, especially where inquiries are from other than regular customers. Mills operating on a quarterly quota basis have not yet set up allocations for third quarter and in these cases some buyers might get more and others less than they are receiving in the current quarter. Nevertheless there appears little chance of any buyers being allocated tonnages if they are not regular customers.

Cincinnati — Sheet mills have continued production without effect from the coal strike, but curtailment due to coal shortage is approaching rapidly. Any loss of tonnage will add problems to the mill quota plans as fabricators daily press for more tonnage. One district mill is holding steel output to rolling needs, abandoning previous policy of selling semifinished.

St. Louis — Granite City Steel Co. continues shut down by a strike of machinists, halting all production of sheets and plates in this district. The strike is in its third week. The mill was in operation only one week after settlement of the general steel strike. Sheet schedules before the shutdown were filled through 1946.

Birmingham—No easing is apparent in demand for sheets, but warmer weather has materially accentuated the need for roofing sheets which are not obtainable even in approximately needed volume. Considerable cotton ties are being produced in preparation for the next baling season.

Boston — Curtailment in narrow cold strip production has followed further interruption in hot strip deliveries, with more revisions in schedules. Meanwhile, consumers are pressing for strip and getting only part of the volume previously specified. Assigned quotas and volume booked for definite scheduling fill capacity on practically all flat-rolled products this year. Demand and pressure for polished stainless and electrical sheets is intense. Hot-rolled carbon sheets are in similar situation. Several mills normally taking carbon tonnage in this district are out of the market; one is not rolling straight carbon and another is holding to clad steel and stainless. Orders booked weeks ago on a no-delivery promise basis are still out of schedule and some fabricators are running short of steel, with replacements less certain than ever. Some inquiries from the Springfield armory bring out no bidders and substantial tonnages of sheets and strip are wanted for casing of ordnance in storage. One lot of 600 tons of cold-rolled sheets, 16 and 18-gage, placed several weeks ago on an MM rating has not been delivered, this rating having been suspended during the steel strike and not reinstated.

Pittsburgh — Prospect of sustained near capacity output of sheets and strip is not bright, most mills expecting to start tapering production this week. One interest here already has been forced to shut down a large plant producing galvanized and electrical sheets and is scheduling further reduction in operations by close of this week. Should the coal strike continue past the first of the month many civilian goods production programs will be hard hit as consumers have been unable to build inventories under present rationing policy. Some sellers do not expect that a balance between supply and demand will be reached until well into 1947.

Steel Bars . . .

Bar Prices, Page 142

Carbon bar producers in general are sold for the year in smaller sizes and have little capacity open for larger diameters. Most producers have orders on books for early 1947 but have not opened books for that delivery. Cold-drawn deliveries have advanced materially and are almost as extended as for hot-rolled. Limitation on steel production because of the coal strike is tending to push deliveries further into the future.

New York — Cold-drawn carbon bar deliveries have tightened to an extent that there is now comparatively little point in shifting specifications from hot-rolled carbon bars to cold-drawn, as has been the case in various instances over recent weeks. Practically all cold drawers are now out of the market for this year on smaller sizes, ⅝-inch and smaller, and, in fact, have relatively little tonnage available in larger sizes for fourth quarter. This compares with the sold-up condition in hot carbon bars, on which most sellers are covered for the remainder of the year on sizes ranging up to and including 1½ inches and have little tonnage available on larger sizes, both rounds and flats. Hot alloy bars, on the other hand, can still be had in certain quarters for shipment within five to six weeks, although the average is more extended, with some producers having little to offer before late June or early July.

While some, if not all, sellers have orders which will fall into next year, primarily because of the recent steel strike and now to some degree at least because of the coal strike, they have not opened books for 1947. However, it is believed that when they do it will be on a quota basis, as demand is accumulating rapidly.

St. Louis — Merchant bar production here continues at capacity with pressure of orders maintaining the gradual increase of the last several weeks. Bars ¾-inch and smaller are tightest and schedules are filled through first quarter. Drawers are not yet affected by the coal strike, having a stockpile that is expected to last at least two more weeks. Thereafter some of the capacity can be shifted to gas or oil fuel. Inquiries from customers of mills outside the district which are threatened by earlier coal shutdowns are multiplying.

Cleveland—While practically all sellers of sheet and strip are out of the market for the balance of the year, the rate of shipments varies widely. Some companies have been able to maintain them at the March rate while others report that the April movement will be only about 50 per cent of that for last month. Added to the March carryover, this represents a substantial tonnage that will not be delivered as originally scheduled and will upset shipping schedules for months. Operations at finishing mills in some cases are at a 40 per cent rate, will decline to almost 20 per cent by the end of this week and will be halted around May 1 unless the coal strike is settled. Mills which have maintained a steady rate of production through last week will start to curtail by the end of this week.

Boston — Fabricators have had to scale down estimated postwar production in some instances to the level of steel supply, which in smaller sizes of hot and cold-finished carbon bars is tightening. Several forge shops are in this category and are unable to take on all orders offered by the automotive industry and others. One large district is more active on automotive tonnage, replacing wartime aircraft volume. This has meant a switch from alloy to carbon grades. Forge shops are pressing for steel to take up enlarged capacity in more cases. While hot-rolled alloys are available in May, small sizes in cold-drawn are sold through fourth quarter, including ground stock up to ⅝-inch. Stainless bars are easy, three to four weeks on hot-rolled standard grades to eight and ten weeks on cold-finished nonstandard. Cold drawn carbon bars in small sizes have also extended rapidly through this year as inventories of hot-rolled stock are more depleted.

Pittsburgh — Carbon bar production schedules have held fairly well with exception of one large interest, but there is little prospect that producers can maintain current operations much longer should the coal strike continue. Cold-finishers also will soon have to begin tapering operations as result of curtailed mill deliveries, because they have sufficient stock for only 10 days to 2 weeks balanced operations. Demand remains good for most cold-finished bar sizes, although pressure for early delivery is not as great as predicted earlier this year because many reconversion programs are held back. Sellers are committed through third quarter, but could easily be booked through remainder of year if all tonnage offered was accepted. As in case of primary steel producers, cold finishers are rationing output on basis of prewar customer relationships and are watching distribution

in an effort to avoid excessive freight absorption.

Steel Plates . . .

Plate Prices, Page 143

Plate producers face a probable reduction in output this week as steel ingot production is cut by shortage of fuel. Bookings now run well into third quarter and in some cases into fourth, with some mills unable to offer delivery this year. Most mills are selecting tonnage to give most profitable operation.

Pittsburgh — Further reduction in plate rolling schedules is in prospect this week and if continued for two or three weeks would begin indirectly to retard output of railroad cars and locomotives and restrict miscellaneous tank, ship repair and barge construction. Fabricators' inventories are relatively low despite intensive effort on part of consumers to augment stocks to meet gradually widening demand. In most instances sellers are booked into third quarter, with heaviest demand noted in light gages. One interest is booked into fourth quarter and is not opening books or scheduling tonnage for that period until full effect of the coal strike is determined. No significant tonnage has been canceled or temporarily suspended as result of the new construction order.

Favorable acceptance is expected of a voluntary simplified practice recommendation covering thickness of carbon steel plates recently submitted to producers, distributors and users by the National Bureau of Standards, Washington. Advantages derived from adherence to these recommendations would result in a reduction of the number of thicknesses handled by steel distributors, which would expedite mill deliveries and reduce production costs from producers' point of view, also permit a substantial reduction in number of items handled by distributors. If plate thickness is specified in inches, the recommendations state the thickness will range from ⅛-inch to 2 inches, inclusive; where weight is used the range will be from 7.65 pounds per square foot to 81.60 pounds. Plates over 2 inches and up to 6 inches thick progress in increments of ⅛-inch, those over 6 inches thick advance in ¼-inches.

New York—Central Iron & Steel Co., Harrisburg, Pa., has been granted $6 per ton price relief on plain carbon plates by the Office of Price Administration, being permitted to quote 2.80c per pound at all leading basing points, as compared with 2.50c. Its price on floor plates remains unchanged at the general market of 3.75c, Pittsburgh and Chicago.

Plate sellers generally are well covered for the remainder of the year, although fourth quarter tonnage is still available. However, certain producers are out of the market entirely, refusing to accept tonnage for 1947, and those that are still accepting business are selecting their tonnage carefully, with a view to obtaining the most profitable work possible.

Bethlehem Steel Co. has apparently submitted the low bid on the construction of three 650-foot passenger and cargo liners for the American Export Lines Inc., although the Maritime Commission will reserve action until it has had opportunity of studying all bids submitted. A substantial tonnage of plates will be involved

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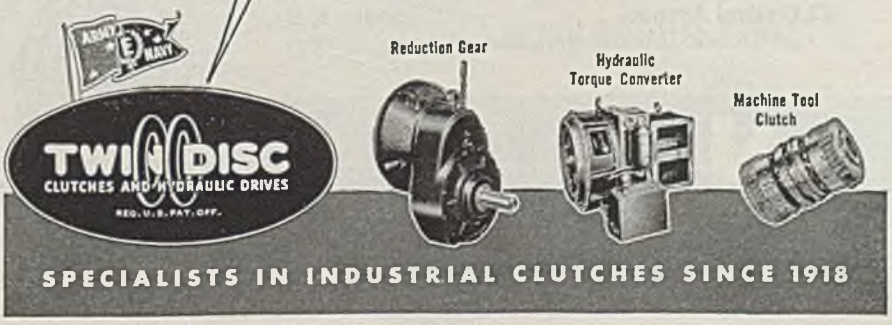

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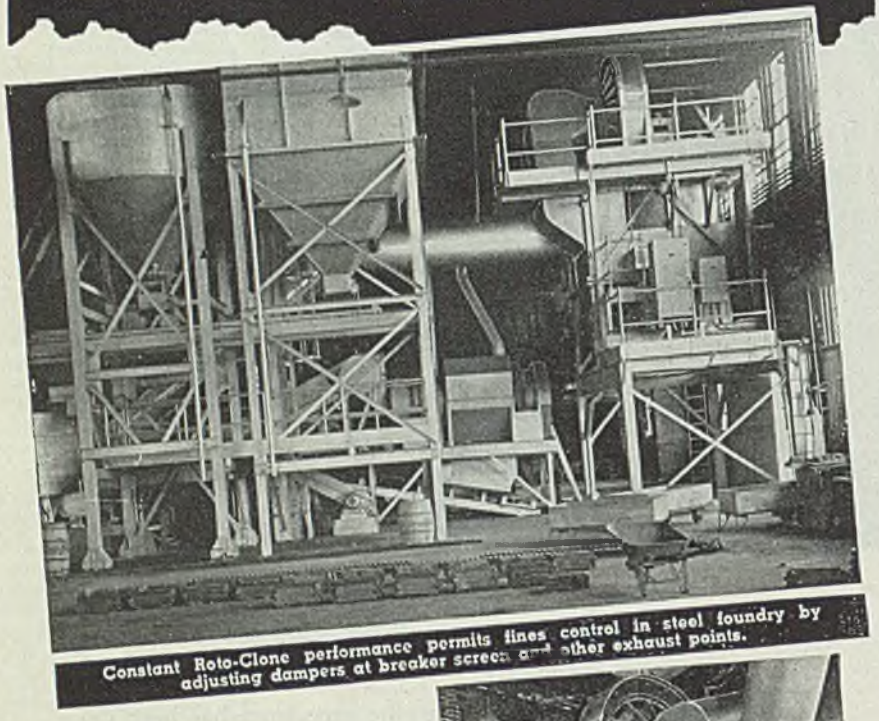

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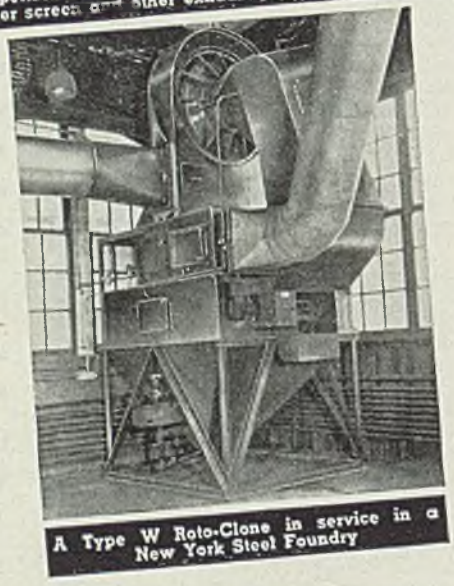

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in the construction, with relatively moderate quantities of shapes and bars.

Boston—Deliveries on welding quality tank steel plates in lighter gages are more extended; some mills are filled for the remainder of this year on that grade in small sizes and are not taking additional tonnage on a firm basis. Schedules on flanged material also have lengthened to 26 or 28 weeks. On the other hand floor plates are on a 30-day basis and some mills can supply from stock. Fabricators with inventories more out of balance are shopping for needed sizes. A Cincinnati shop will fabricate a gas holder for Springfield, Mass., taking about 450 tons. Shipbuilding orders are at a low point but Bethlehem appears to be low on three 650-foot passenger-cargo liners for American Export Lines Inc. If awarded to this builder these craft will be built at the Fore River-Quincy yard.

Philadelphia — Plate specifications continue heavy, with demand for boiler plate a feature. Boilermakers declare enough business is being offered for replacement needs alone to keep them busy for some time. Also there is large demand for household boilers for the veterans' housing program, requiring plates about 5/16-inch. Tank work also is active, especially for uiderground fuel oil storage, which have all but dried up capacity for light plates. While relatively little line pipe work is being placed in the East at present considerable business is developing in other sections, particularly the West.

Ship work is featured by 37,000 tons of plates and 13,000 tons of shapes and bars for three cargo-passenger ships for the American Export Lines Inc. Bethlehem Steel Co. has submitted lowest bid to the Maritime Commission, which will also receive bids Apr. 25 on two merchant ships for another line.

Birmingham — Mills have increased plate production slightly over the past week, but make little or no headway in improving deliveries. Considerable tonnage is being sought by shipbuilders and tank manufacturers.

Los Angeles — Southern Counties Gas Co. of California has placed a 36-inch gas line with Consolidated Steel Corp., Los Angeles, requiring about 60,000 tons of plates.

Wire . . .

Wire Prices, Page 143

Boston — Mill schedules on fine wire specialties in high-carbon grades continue subject to revision, notably among nonintegrated mills depending on uncertain rod supplies. As a result considerable forward tonnage still is unscheduled. Rope is one of the few wire products on which delivery approaches normal. Razor blade steel supply has improved materially and one producer has cut back production in favor of other items. Rod producers are rationing tonnage to this area on a sharply reduced basis and do not always promise delivery tentatively. Specifications frequently are held for 30 days, with aggregate tonnage available, uncertain. Cold-heading stock is in heavy demand, also bessemer screw stock, with deliveries lagging behind original schedules. Users of fine wire are being forced to adjust operations to supply of steel and integral parts, with shortage of fraction-

al motors a factor in buying. Up to 70 weeks is being quoted on delivery of some fractional motors.

Pittsburgh—Coal strike is expected to retard wire production by the end of this week, although every effort currently is being made to sustain operations. Cement-coated nails are in particularly short supply, with the new housing program alone estimated to require about 15,000 tons. Current profit squeeze has forced some sellers to limit new business within areas involving a minimum of freight absorption.

Birmingham — Drawn wire is at a premium despite comparatively heavy mill schedules. Many smaller wire users are operating part time because of scarcity, which has cut supplies in some instances to half current needs. Agricultural interests are begging for wire fencing and nails with but relatively small tonnages available.

Tubular Goods . . .

Tubular Goods Prices, Page 143

Boston — Merchant steel pipe is rationed to distributors and slight progress is being made in overcoming the six to eight weeks production loss in first quarter. While some late fourth quarter tonnage is possible with a few mills schedules in most sizes of both lap and butt-weld are practically filled for this year. Tubing is also tight and boiler tubes, quoted in October three weeks ago by one mill, have jumped through the year. Cast pipe shipments are more extended by most foundries, with demand holding well after the increase in seasonal buying.

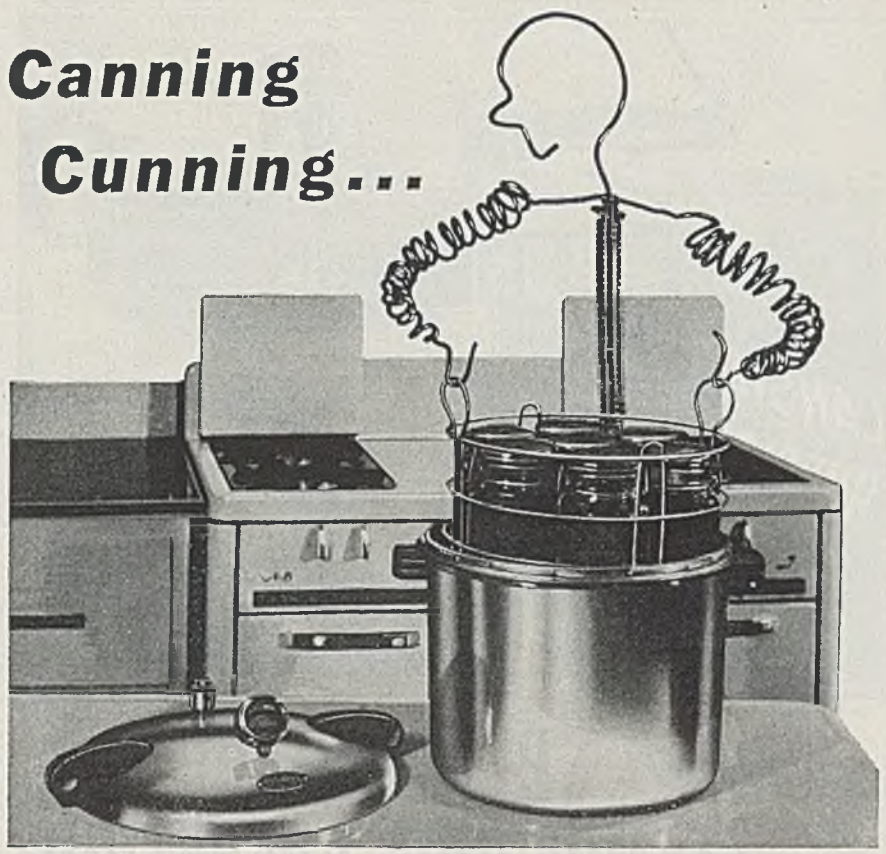
Seattle—Demand for cast iron pipe is strong and steady, large tonnages being involved in proposed improvements in this area. Agencies are handicapped by low production and uncertain deliveries retard calls for bids. Hillsboro, Oreg., has opened bids for a large tonnage of water pipe, which may be changed to steel pipe on account of delivery. Seattle has let 725 tons of 6-inch and larger to H. G. Purcell, Seattle.

Tin Plate . . .

Tin Plate Prices, Page 143

Pittsburgh — Finishing schedules are expected to remain at present practical capacity until April 27, if the coal strike continues. At that time one major interest will be forced to curtail output sharply, while other producers also should be adversely affected by May 1. Tin plate production will be favored as long as consistent with supplies of steel, for producers have much tonnage to make up, due to the steel strike, in meeting essential tin plate needs for seasonal domestic food pack. Although producers have presented additional data covering first half tin plate supply prospects, with further reduction in output likely as result of the coal strike, CPA has not yet taken action on revoking the 152,000 tons scheduled for export. Should the coal strike cut deeply into tin plate output there is good prospect that this export quota will be pushed into third quarter. With exception of roofing ternes and full-finished black plate for use other than containers, most tin mill products are being invoiced at the old prices.

Canning Cunning...



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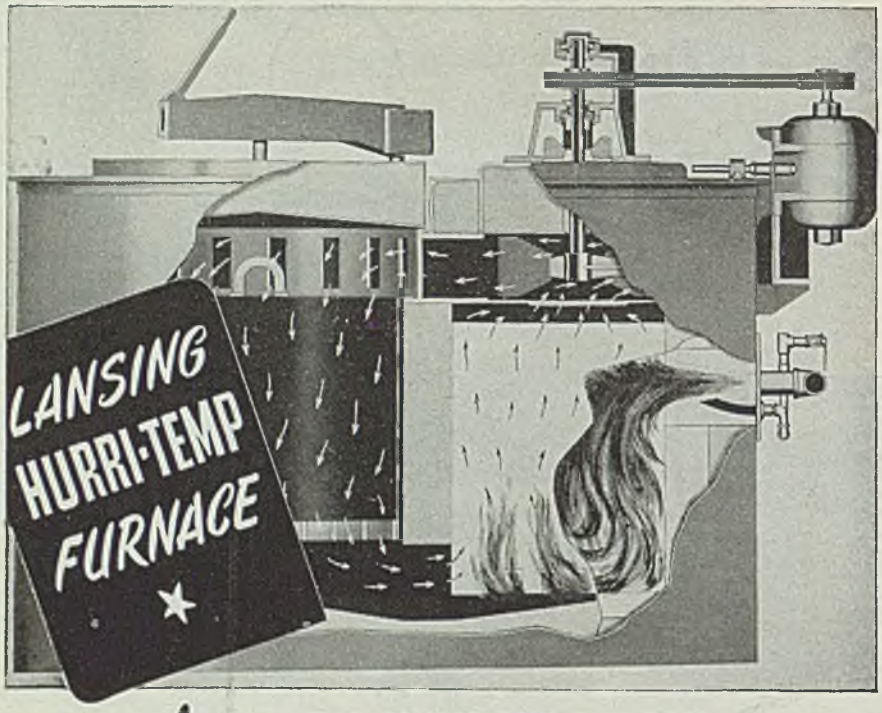

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Rails, Cars . . .

Track Material Prices, Page 143

New York — The largest freight car inquiry to have appeared in some time involves 2100 cars for the Southern Railways. This may be a forerunner of other large lists for only recently, L. M. Betts, Association of American Railroads, reported that the carriers now have on order or in process of being ordered, more than 30,000 box cars and more than 60,000 cars of all types and that this number may be substantially increased. Under recommendations of the A.A.R., he said, consideration is being given to ordering of additional cars which may bring the total under contract to 125,000 to 150,000 cars.

The largest coach order reported recently involves 12 streamlined sleeping cars to be built of high tensile steel for the Chicago & North Western. The order was placed with Pullman-Standard Car Mfg. Co., Chicago, and follows one for 16 passenger cars placed by the Chicago & North Western with American Car & Foundry Co., New York, as noted in the April 15 issue.

Locomotive buying includes six 2-8-2 type switch engines to be built by the Baldwin Locomotive Works, Eddystone, Pa., for the United Fruit Co.

While producers of track accessories have not opened books for next year, one seller is reliably reported to have approached railroads for estimates of their first quarter requirements.

Structural Shapes . . .

Structural Shape Prices, Page 143

Boston—With a flurry in bridge inquiry, approximately 1300 tons, indications are that a 7500-ton superstructure 26-story insurance building here will be authorized. Bids have been taken with deliveries wanted in November to start but indications are that fabricated steel will not be available before the first of the year. Foundations for the Boston University building are also authorized, as are several industrial projects, including one for Simonds Saw & Steel Co. at Fitchburg, Mass. Plain structural material deliveries are more extended by the coal strike, notably in small sizes, for which demand is strongest. Structural mill schedules are in terms of feet rather than in tons and some producers continue on sharply reduced or negligible output. This throws a heavy and unbalanced lead on the Pittsburgh district. Detailing and other engineering programs on considerable tonnage involved in work under construction over a broad area is still retarded by a strike of junior engineering forces at Stone & Webster Engineering Corp. headquarters at Boston.

Pittsburgh — Structural mills continue to fabricate only tonnage on order for projects which had been begun before the March 26 deadline stipulated by CPA. New structural steel contracts for non-housing applications are being accepted, however, in belief the projects will eventually meet CPA approval. Difficulty of setting up a priority program for steel to be directly controlled from mill to housing construction is illustrated by estimate that only 5 per cent of all the rolled steel going into housing units could possibly be traced. Volume of suspension orders resulting from this

order have been relatively small. However, production schedules, extended into December, are in for some extensive revisions unless approval of construction programs by CPA officials is more liberal than indicated.

Philadelphia — While some construction is being held up apparently as a result of the CPA limitation order, at least being temporarily delayed, there is considerable structural activity. Meanwhile, shape mills are scheduled well into fourth quarter, with at least one practically out of the market for the year. Fabricators are scheduled well ahead. OPA ceiling on fabricated material may be lifted shortly, applying to the so-called 1941 pricing formula.

Seattle—Fabricators have a large number of small jobs but steel supply is low and replacements are inadequate. Prior allocations have been far below normal requirements and the coal strike means further delay. Bids will be received by the Bureau of Reclamation, Denver, May 2, for construction of a steel barge 50 x 120 feet for Grand Coulee dam, to carry a 50-ton steam crane, the latter being let to Washington Iron Works, Seattle.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 143

Pittsburgh — Mills are falling behind on reinforcing bar delivery and still further reduction in operations, because of the coal strike, is likely this week. Due to profitless production at present price levels, output of merchant bars was one of the first items curtailed when mills began tapering finished steel production the past two weeks. Industry-wide output of reinforcing bars currently is estimated at about 40 per cent of rate established in fourth quarter last year. In face of declining production, sales for producers east of the Rocky Mountains climbed to about 80,000 net tons in March, compared with 58,000 tons for February, while April total is expected to top March volume. Some reduction in mill backlogs is expected to develop under the new construction regulations, although little tonnage has been suspended. Most mills have sufficient tonnage on books covering construction already under way to sustain present rate of output for 6 to 7 months. Bids went in last week for a Norfolk & Western Railroad coal pier at Norfolk, Va., involving 5000 tons. Heavy demand for reinforcing bars should continue as a large number of heavy construction projects are not affected by new construction regulations.

Seattle — Potential market for reinforcing bars is of large proportions, both for public improvements and private building. This year these promise to absorb all that mills will be able to produce.

Pig Iron . . .

Pig Iron Prices, Page 145

Effects of the coal strike are increasingly felt by pig iron producers, many blast furnaces being banked and others recently repaired are not being returned to blast until fuel supply can be assured. Foundries have been able to continue operations up to this time, but curtailment seems just ahead.

New York — So far this month pig

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Statement of Condition

MARCH 30, 1946

ASSETS

Cash and Due from Banks	$ 96,225,954.57
United States Government Obligations	273,211,979.23
Other Securities	15,141,992.65
Loans and Discounts	106,569,379.30
Investment in Banking Premises	1,575,440.00
Customers' Liability on Acceptances and Letters of Credit	725,222.94
Accrued Interest	1,099,623.22
Other Assets	296,320.36
	$494,845,912.27

LIABILITIES

Capital Stock (625,000 shares)	$10,000,000.00	
Surplus	10,000,000.00	
Undivided Profits	2,336,704.29	$ 22,336,704.29
Reserves		3,138,106.08
Dividend on Capital Stock Payable May 1, 1946.		218,750.00
Acceptances and Letters of Credit		725,222.94
Accrued Interest and Expenses		1,261,714.15
Deferred Credits and Other Liabilities		404,658.55
Corporation, Individual and Bank Deposits	$287,745,744.40	
Savings Deposits	57,223,338.64	
Trust and Public Deposits	21,617,618.05	
U. S. Government War Loan Account	100,174,055.17	466,760,756.26
		$494,845,912.27

Contingent Liability on Unused Loan Commitments $12,862,321.27

NOTE: United States Government obligations carried at $126,792,927.56 are pledged to secure trust and public deposits, U. S. Government War Loan account, and for other purposes as required or permitted by law.

MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

iron shipments have been fairly well sustained, notwithstanding the soft coal strike. As a matter of fact, district foundries have found it more difficult to obtain an adequate supply of coke than of pig iron. However, certain pig iron producers are now scheduled to taper shipments and the movement over the remainder of this month should be down appreciably, in the event that the suspension at the coal mines continues.

While there has been little decline in pig iron shipments into this district so far this month, the movement actually would have been higher if it had not been for the coal strike. This is particularly true in the case of the leading Buffalo producer, who had planned to put an additional furnace into operation at the beginning of this month, but who decided to postpone action until after the coal dispute had been settled. Meanwhile this producer is operating two furnaces.

Pittsburgh — Prospect of higher freight rates and coal and coke prices is of major concern to blast furnace interests for price relief in recent months has been considered inadequate to cover previous advances in raw materials and labor costs.

Steady reduction in pig iron stocks is reported by most foundries here, for iron output of the lone merchant producer and shipments into this area from other districts fail to even closely approach present consumption volume. No foundry yet has been forced to curtail operations due to lack of pig iron or coke, but the coal strike is accentuating the very limited supply of these materials and has prevented many foundries from increasing operations, now that tight manpower problem is easing. It is estimated that nearly 75 per cent of the foundries in this area will have to begin tapering operations early in May should the coal strike continue.

CPA officials met recently with pig iron industry advisory group members to discuss ways and means of increasing production. Problems of coke and iron ore supply, plus matter of premium prices for high cost operating units were considered. No definite decision was reached on the question of returning to some form of government pig iron allocation. It is hoped that the pending price advance on gray iron castings will be adequate enough to stimulate output of these castings. Industry members requested an increase of slightly under 20 per cent.

Buffalo — Instead of increasing operations, as had been hoped with better labor supply, numerous foundries have been forced to curtail because of pig iron and coke shortage. Reduction in pig iron output has disturbed foundry schedules and further tightened the market. The local pig iron rate has slipped to 75 per cent, with further reduction if the coal strike continues. Hanna Furnace Corp. has decided to delay relighting of a repaired blast furnace, pending settlement of the coal strike.

St. Louis — Pig iron continues in short supply, blast furnace repair in the Birmingham area affecting this district somewhat. Local furnaces are running at capacity. Strike shutdown at the Granite City Steel Co., which usually takes about half the local pig iron output, is allowing pig supplies to be spread among other users, easing the general situation a trifle. Iron production here has not been affected by the coal strike. Shipments from outside are fair though many melters are below the 30-day limit on stocks. Short supplies are forecast for six months after the coal strike settlement.

Boston — Production is being cut back in some cases because of shortage of iron, all grades being equally tight. One Buffalo district furnace normally supplying New England tonnage has not been relighted because of fuel shortage. Furnaces are revising ration schedules downward, supplying emergency shipments with increasing difficulty. Melt which would normally be upward with settlement of foundry stoppages tends lower, with most foundries losing ground in efforts to maintain already delayed delivery schedules on finished castings. One large textile equipment manufacturer in attempting to resume is handicapped by an acute shortage of iron. Steelworks are holding operating rates but with inventories under 30 days. Water shipments to one and possibly two will be resumed shortly.

Cincinnati — Shipments of merchant pig iron into this district have been reduced since the coal strike, the decrease more pronounced in northern than in southern. Reserves have helped to prevent curtailment in the melt so far, but a number of foundries will soon be hit by shortage of iron.

Cleveland—Total shipments of pig iron this month have held at about the same rate as in March, although deliveries to

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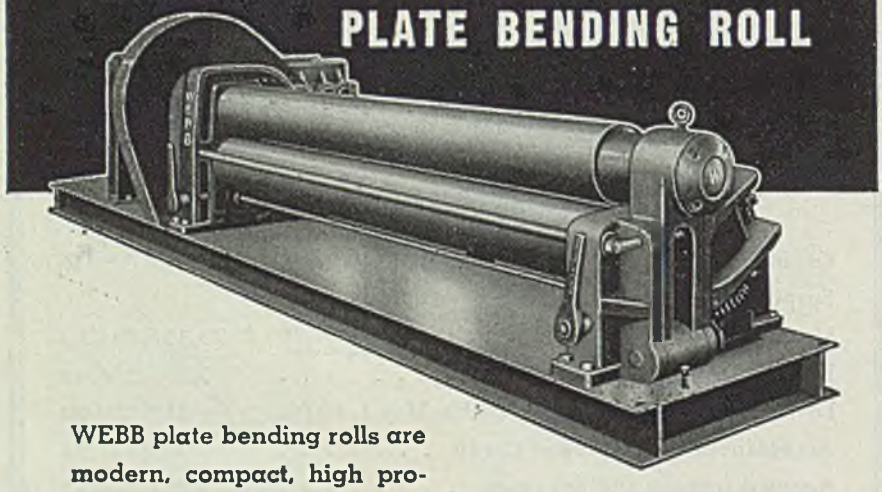

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individual consumers have averaged about 20 tons lighter per order, to give wider distribution. Difficulty in covering coke needs has increased, with reserves now well below the 20-day limit. Shortage of scrap has necessitated an increase in the use of pig iron. Foundry melt has remained steady, despite these shortages of raw materials, but is expected to decline in another week if the coal strike continues. Pig iron producers have maintained steady shipments, since their operations have not yet been seriously hampered by the coal strike, but likely will curtail production sharply by the end of this week.

Chicago — Pig iron, and foundry coke as well, have become extremely critical items, first because of the recent steel strike, and now made worse by the coal strike. Supplies are on a literal hand-to-mouth basis, and in some instances quantities are so short that foundries have had to curtail working hours. No actual shutdowns are known, but it is certain that production of critical castings would be at an appreciably higher level today if iron and coke supply was more adequate. Fact that foundry scrap is in short supply places heavier than wanted burden on pig iron. Currently, 25 blast furnaces in the district are active, compared with 34 before the coal strike, and further reduction is likely in the next few days.

Philadelphia — Consumers still press for pig iron although operations of some are being more seriously threatened by shortage of coal and coke. This applies to at least one district steel mill, as well as to some foundries. Due to shortage of pig iron and need for using a heavier proportion of scrap there has been a sharp spurt in demand for ferroalloys in briquets and other forms for sweetening charges of metal. Washington has asked some pig iron producers to focus as much attention as possible on requirements for soil pipe. Pig iron production in the East has been fairly well sustained so far, despite the coal strike. One furnace scheduled to have been banked last week finds it can carry on a little longer. Meanwhile, it has shifted from foundry iron to basic, not only to meet urgent demand for the latter but to conserve coke.

Birmingham — Pig iron becomes increasingly tight in this district with more time lost by industries dependent upon the product. Aggravating the situation is the fact that Sloss-Sheffield Steel & Iron Co. has placed a North Birmingham furnace on ferromanganese, and demand for iron is coming into the district from sources heretofore not regular customers. Woodward Iron Co. has a furnace down for repairs during the coal shortage.

Seattle — Foundries in this area are busy, mainly on small jobs, though the total keeps operations at capacity. Labor has improved with the return of veterans and more skilled workers are available. One local plant reports higher employment than at the end of the war. The usual spring volume of business from Alaska is being met.

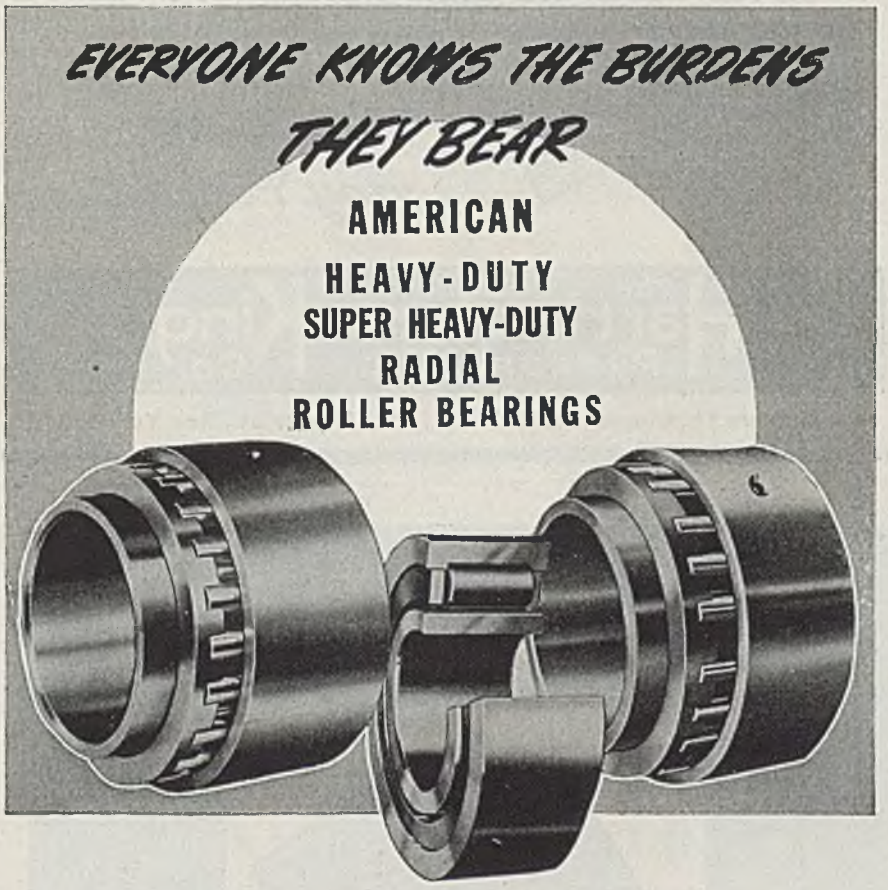
Scrap . . .

Scrap Prices, Page 146

In spite of lowered steel production rate in important centers demand for scrap shows no slackening, consumers seeking as much as possible, to build inventories for the period after the coal strike, when steelmaking is expected to soar to meet heavy demand. Foundries also take all cast scrap available, to make up for shortened pig iron supply.

Washington—Office of Price Administration has ruled that present ceiling prices for steel and iron scrap are adequate and denies emphatically that any increase is contemplated. Warren Huff, executive of the Metals Branch of OPA, states that members of Iron and Steel Scrap Industry Advisory Committee has agreed unanimously that no increase in scrap ceiling prices is wanted or justified.

Pittsburgh — Although scrap inventories are ample for current rate of consumption, and even increased in some instances because of sharply reduced steel poduction, stocks are not building up at pace desired in anticipation of the probable high level of steel and foundry operations when strikes are cleared up. Consumers are accepting all good quality scrap available, paying relatively high freight equalization on much tonnage, and are expected to continue this policy. Scarcity of good open-hearth and cast grades is showing signs of easing, as production at automotive and other metalworking plants gains momentum. However, increased flow of scrap depends upon ability of manufacturers to get into fuller production, which in turn may hinge somewhat on steel supply. Carbon machine shop turnings are being



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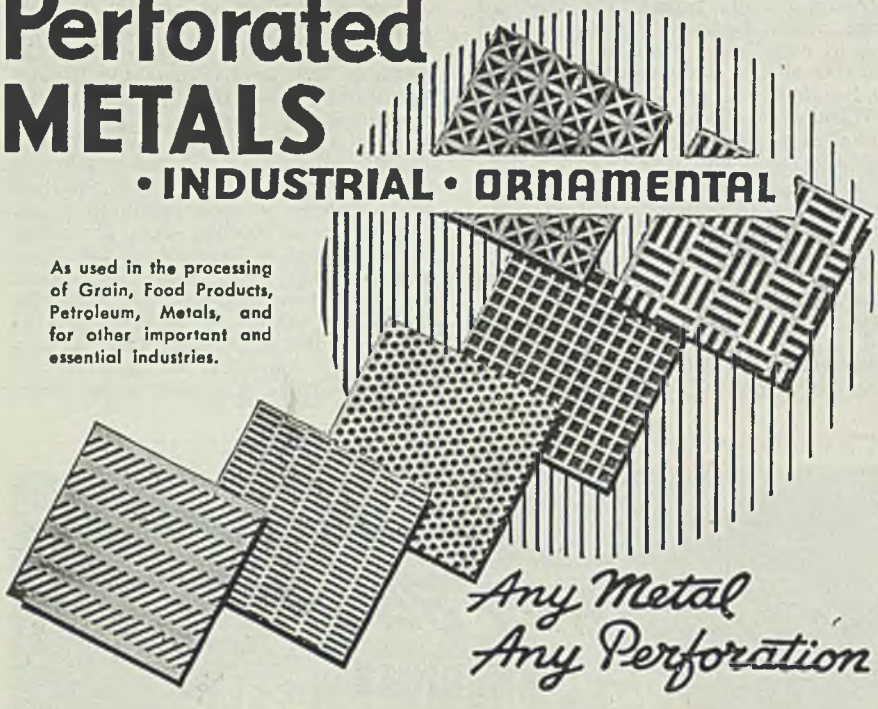

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absorbed locally in the Detroit area. Shortage of pig iron has accentuated the cast scrap shortage, while demand for low phos scrap continues brisk, with supply failing to meet requirements. Small lots of triple alloy scrap have been cleaned up, and there is no heavy volume believed hanging over the market. Scrap tonnage on railroad lists continue meager.

Buffalo — With consumers pressing strongly for scrap, dealers do not expect any suspension of shipments, even if fuel shortage decreases ingot production. Dealers are forced to limit acceptance of new orders because tonnage is not available. Industrial scrap, which had shown an improvement, has dropped back. Termination scrap also is in light supply. Four barges, first of the season, are en route by the canal to a steel mill buyer. The first full load from upper lake ports arrived last week. Early water receipts lag far behind those of a year ago.

St. Louis — Scrap remains scarce but shipments are improving slightly due to better weather. Railroad metal is in heavy demand and short supply, with No. 2 heavy melting steel coming in a bit better. Mill and foundry reserves are up somewhat to around 45 days, largely because the area's largest sheet and plate roller is shut down and unable to store scrap arriving under previous orders. This mill normally takes 50 per cent of this market's open-hearth scrap.

Cincinnati — Pressing demand for iron and steel scrap of all grades will likely not be reduced even if there is curtailment in steelmaking by the coal strike. Brokers and dealers contend there is an actual shortage of scrap and this opinion carried over to melters will maintain buying for stocks. Foundries are avid for cast scrap, willing to pay springboards, as supplies of pig iron dwindle.

Boston—With heavy demand, supply of strictly No. 1 heavy melting steel and cast scrap is light, both prepared and unprepared. Slight improvement in shipyard tonnage from the Boston area centers largely in low phos, on which the differential for that grade is paid, with all prices at ceiling. Production of industrial scrap rises slowly and restricted dismantling automatically holds down offerings of cast. That grade emanating from the textile and shoe industries frequently never reaches the open market, reverting to suppliers of new equipment for replacement. Consumers of low phos note some improvement in grading. Because of the differential yards tend to center on that grade, with competition keen for unprepared.

Cleveland — No relief from scrap scarcity is felt, demand increasing from steelmakers who are short of pig iron because of the fuel shortage and seek to use more scrap in open hearths. Demand also has reappeared for low phos for open-hearth use, but there is not enough of this grade for electric furnaces alone. Foundries are paying as high as $10 and $12 per ton freight on cast scrap, so pressing is need in the pig iron shortage. Criticism is heard of slowness of government agencies in charge of disposal of obsolete machinery, sufficient tonnage of which is said to be ready for scrapping to relieve the situation materially if it were made available.

Philadelphia — A little more scrap continues to move but with demand ac-

tive supply still is tight. Only in unprepared grades of steel scrap does there appear to be any easing in demand and that is scarcely appreciable. Luria Bros., Philadelphia, were high recently on the major portion of 16,000 tons, mainly salvageable material at the Sun Shipbuilding & Dry Dock Co. yard at Chester, Pa., bidding high on nine of 15 items.

Chicago—Demand for scrap far exceeds supply, the coal strike notwithstanding. So far only one steelmaker in this district has reduced its operations and this one is not a large scrap user, producing most of its own. Within the next week, other steel mills may be forced to cut production, but it is not expected to affect demand for scrap. All consumers are reaching out far and paying springboard to obtain material. Volume of termination scrap is somewhat heavier, but production scrap volume is held down because manufacturing plants are restricted in receiving new steel from mills. Foundry scrap is deplorably short. Ceiling prices hold firm on all grades except alloy.

Warehouse . . .

Warehouse Prices, Page 144

Philadelphia — While the soft coal strike is adversely affecting steel production district jobbers have been receiving more steel so far this month and as a result their sales have been heavier on a daily average basis. Through most of March, it is pointed out, mills were still recovering from the steel strike and had not been able to get average shipments to jobbers up to a rate as high as has prevailed this month.

Pittsburgh — Loss of 6 to 10 weeks' production due to the steel strike, and now curtailment from fuel shortage, have forced a marked reduction in mill shipments to steel distributors. Tonnage shipped to warehouses represents only a small proportion of previously scheduled deliveries since the first of the year.

Jobbers of bolts, nuts and rivets are not permitted to pass on the 7 per cent increase granted producers April 1. Steel distributors also are prohibited from passing along the 8.2 per cent increase on galvanized ware or galvanized sheet ware. Until expected amendment to recently published increase on alloys is announced most steel distributors are billing customers for alloy steel items on old price basis with understanding that another invoice covering price advance will follow when amount of increase is definitely known.

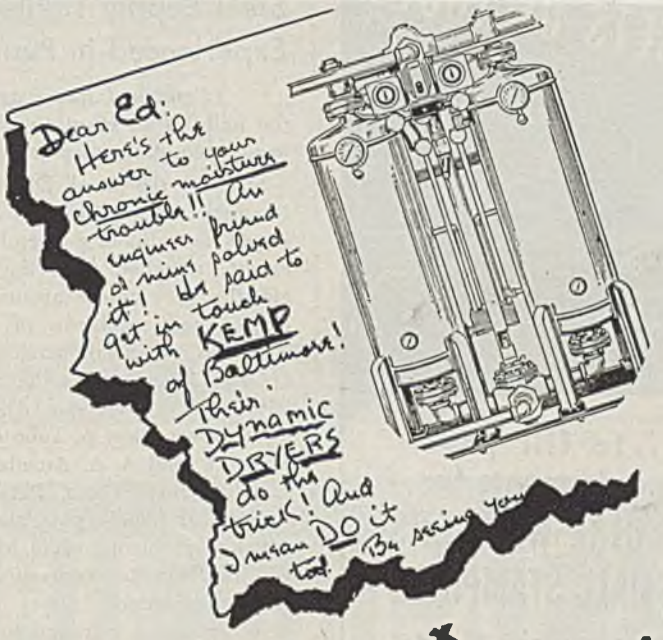
Boston—Demand has slackened slightly, due in part to lack of balance in distributor stocks. While mill replacements are somewhat heavier shipments frequently are in odd sizes and much of the faster moving carbon material goes out promptly on arrival. Shipments are six to eight weeks behind original schedules and in the first 15 days of the month are irregular and uncertain. Jobbers find it difficult to place orders for delivery during the remainder of the year for carbon products.

Cleveland — Incoming shipments of steel products at warehouses are declining steadily as mill operations slow down as a result of the coal strike. Some warehouse receipts are as much as 30 per cent below those for the same period a month ago and probably will not be more than 50 per cent for the full month. At the same time, demand has continued heavy and well in excess of supplies. Stock position has deteriorated further with warehouses completely out in many sizes or gages of bars, sheet, strip, plates and structurals. Based on present indications, stocks will continue badly out of balance through the year.

Canada . . .

Toronto, Ont. — Following the announcements by the Wartime Prices and Trade Board of an increase in all iron and steel prices ranging from $5 to $9 per ton, which went into effect Apr. 1, the prices board now has lifted the ceiling on farm machinery, with the new rates in effect Apr. 13. Under the increased rate farm machinery has been marked up 12½ per cent. The price increase is less than half that requested by implement makers, but board officials stated that the new prices should be competitive with prices for similar products imported from the United States, which have been free of war exchange tax and customs duties since July 1, 1944.

New problems of a serious nature are facing the iron and steel industry. Union leaders at Sault Ste. Marie, Ont., have called for a strike vote by employees of the Algoma Steel Corp. Ltd., and a decision in this respect should be known within the next week. Demands also are being made on the Steel Co. of Canada Ltd., Hamilton, and Dominion Steel & Coal Co., Sydney, N. S., for higher wages. The demands of the unions call



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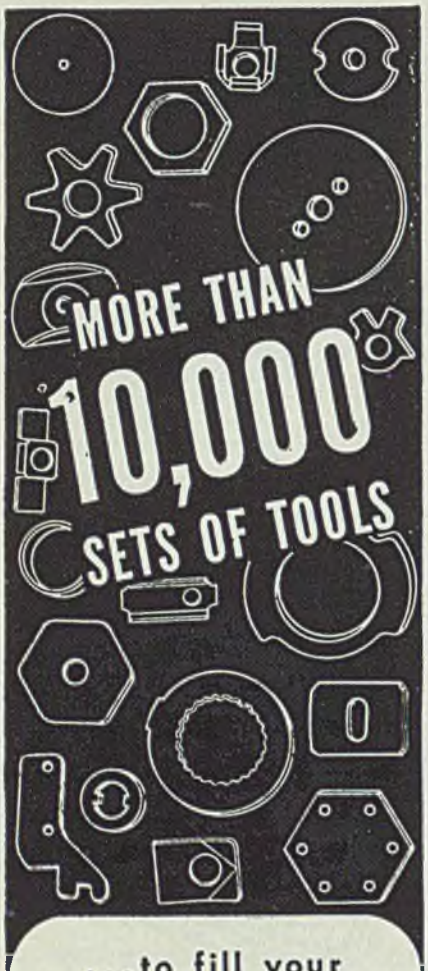

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for a minimum wage of $33.60 a week, a 40 hour week throughout the country and two-week holidays with pay.

In addition to Canada's own labor problems, the coal strike in the United States is causing much uneasiness. H. G. Hilton, president of the Steel Co. of Canada Ltd., stated that production of steel by his company would have to be curtailed in three weeks, if the U. S. coal strike continues.

Central Iron & Steel Co. Given Higher Plate Price

Central Iron & Steel Co., Harrisburg, Pa., has been granted a price increase of $6 per ton on plain carbon plates and three other eastern plate mills may also receive some price relief soon.

Steel Supply Tightest Ever Experienced in Peacetime

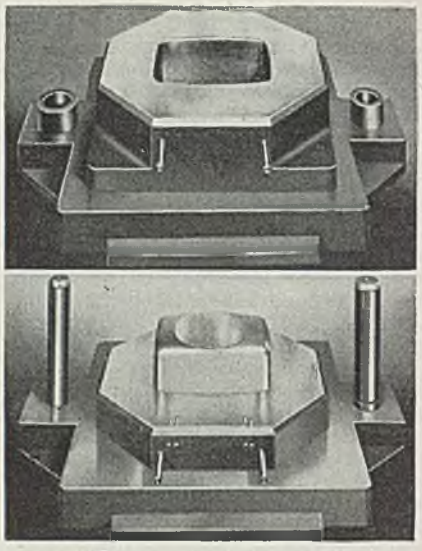
(*Continued from page* 50)

the mills in an effort to distribute tonnage as equitably as possible.

Staff of the Steel Division, Civilian Production Administration, is being enlarged by addition of several steel market experts recruited from the industry to aid the government agency in solving acute supply problems of reconverting industries and small manufacturers. So far two industry men have joined the CPA staff. They are D. F. Lacey, Youngstown Sheet & Tube Co., Youngstown, O., and A. A. Archibald, Jones & Laughlin Steel Corp., Pittsburgh. Mr. Lacey will handle pipe and sheet distribution problems, while Mr. Archibald will handle matters concerning warehouse steel distribution. Other industry experts are being recruited for CPA by a committee composed of Norman Foy, Republic Steel Corp., Cleveland, C. L. Longfield, Youngstown Sheet & Tube Co., Youngstown, J. L. Block, Inland Steel Co., Chicago, and Jesse Honeycutt, Bethlehem Steel Co., Bethlehem, Pa., all of whom served in the Steel Division of the old War Production Board.

No mandatory allocation of steel under government control is contemplated. In fact, it is pointed out that it would be impossible to administer any mandatory allocation in a civilian goods market on anything like an equitable basis since no one can determine fairly which product or which manufacturer merits precedence over another. However, close co-operation of the various industry units with the government production agency, it is believed, will solve most of the acute supply problems now confronted.

Over coming months it is certain that the warehouse arm of the steel industry will be under increasing pressure. Hundreds of thousands of small buyers are dependent upon the warehouses as their source of supply. The steel producers,



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cognizant of the important role of the jobbers in steel distribution, have been shipping steel to the distributors in fair volume. However, warehouse receipts are reported greatly out of balance and in some items stocks are low. Last year the warehouses received in excess of 9,571,000 tons of finished steel from the mills. This represented about 17 per cent of total output. In 1944 the warehouse take amounted to 8,008,076 tons or 13 per cent, while in 1939 it was 5,179,660 tons or 15 per cent. Warehouse take in 1946, it is estimated, will amount to somewhere around 7,500,000 tons or 15 per cent, the drop being due to the scaling down in mill shipments occasioned by the loss of production in the first quarter as a result of the steelworkers' strike.

Some relief from the existing tight market situation in steel may result from the addition of steelmaking facilities over coming months. However, the extent of such relief is not known. The steel companies are planning to spend this year a record-breaking total of $327 million for new equipment and additional facilities. Most of the expenditures scheduled this year are for new and improved rolling mills and finishing facilities. Included are several continuous mills for producing cold-rolled sheet and strip for use in automobiles, refrigerators, ranges, etc.

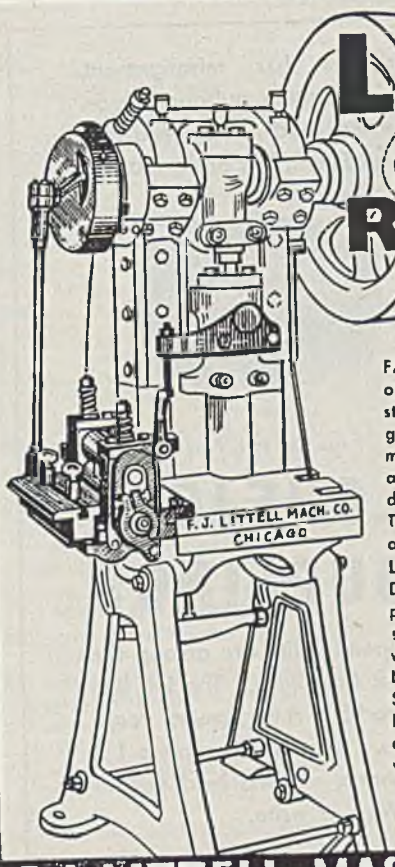
Some of the steel construction program, however, may be held up by the government ban on so-called nonessential construction. Further, it is pointed out, the additional facilities are not spread uniformly throughout the country. And even in those areas where construction is projected the new mills will not be ready for production for many months.

One factor that is emphasized by observers in discussing the tight steel market situation is the fact that steelmakers increasingly are reluctant to ship outside their natural market borders because of high freight rates which they must absorb. Under existing OPA ceiling prices such outside business is unattractive. Hemmed in by high production costs and rigid price ceilings the tendency of the mills is increasingly in the direction of doing business in areas closest to source of production.

For example Spang-Chalfant Division at Pittsburgh of the National Supply Co. last week announced termination of shipments of pipe into the Chicago area. It plans to close shortly the company's Chicago sales office in existence almost 50 years. The Chicago market comprises northern Illinois, Iowa, Nebraska, Wisconsin and Minnesota.

"In view of present ceiling prices on welded pipe and the recent increase in wages, the company finds it unprofitable to sell to the Chicago area and to absorb the freight necessary to sell on the Gary

LITTELL
STYLE "M"
ROLL FEEDS



At left—Standard Style "M" Littell Roll Feed, equipped with a 3-roll Straightener, mounted on left-hand side of an O.B.I. press, feeding left to right. *Below*—same unit, including Littell Automatic Centering Reel.

FASTER production, better quality, lower costs, are assured with LITTELL Style "M" Roll Feeds—sturdy, efficient units that keep plant schedule going. Automatic in operation, they protect workmen's hands and lower insurance rates. Hardened and ground feeding rolls. Positive, silent roller drive for high speed, accuracy and durability. Two-piece driving disc, convenient feed adjustment and calibrated feed.

LITTELL Roll Feeds are made in Single- and Double-Roll types, for stamping, blanking, cupping, drawing operations. Capacities and models for handling stock up to .156" thick by 30" wide. Speeds, 50 to 200 strokes per minute. Length of stock advance per stroke up to 50". Stock usually fed to feeds from Littell Reels or Coil Cradles. Straighteners and Scrap Winders can also be provided.

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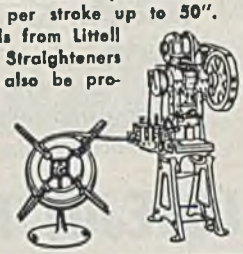

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Corrects for misalignment, shock, vibration, pulsating loads, reversing loads, drag, end-wise displacement, backlash, etc. Extremely quiet.

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800 OUTSIDE ROOMS ALL WITH PRIVATE BATH . . . SINGLE FROM $2.50 . . . DOUBLE FROM $4.00

Charles H. Lott, *General Manager*

base," A. E. Walker, president of National Supply Co. stated.

"As long as present conditions exist, Spang-Chalfant cannot justify continued shipments into the Chicago area. However, in order to minimize the already acute shortage of pipe in the area, Spang-Chalfant will continue shipments through June."

Still another factor figuring in the tight supply, is the fact that producers are placing greatest emphasis on production of those products upon which they are assured a profit under OPA price ceilings.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2600 tons, press girders and framing, Detroit, for Fisher Body Division, General Motors Corp., to American Bridge Co., Pittsburgh.

1300 tons, power plant, Eastman Kodak Co., Rochester, N. Y., to American Bridge Co., Pittsburgh.

995 tons, paper mill, West Carrollton, O., for American Envelope Co., to American Bridge Co., Pittsburgh.

975 tons, utilities buildings, Galesburg, Ill., for Butler Mfg. Co., to American Bridge Co., Pittsburgh.

750 tons, crane shed and warehouse, for John Griffith & Sons Construction Co., Chicago, to American Bridge Co., Pittsburgh.

560 tons, warehouse buildings Nos. 14 and 15, Louisville, for Belknap Hardware & Mfg. Co., to American Bridge Co., Pittsburgh.

500 tons, bulk sugar storage bin, Pepsi Cola Co., Long Island City, N. Y., to American Bridge Co., Pittsburgh.

500 tons, DeSales School of Nursing, for Southeastern Construction Co., Clarksburg, W. Va., to American Bridge Co., Pittsburgh.

400 tons, Mahoning creek bridge, Pittsburgh & Shawmut Railroad, Tidal, Pa., to American Bridge Co., Pittsburgh.

365 tons, two warehouses, Moorhead, Minn., for American Crystal Sugar Co., to John Beam, Denver.

360 tons, power plant extension for Eastern Shore Public Service Co., Vienna, Md., to Dietrich Bros., Baltimore, through United Engineers, Philadelphia.

300 tons, Pennsylvania railroad, addition to St. Clair engine house, Columbus, O., to American Bridge Co., Pittsburgh.

300 tons, warehouse, Walnut Avenue Realty Co., New York, to American Bridge Co., Pittsburgh.

300 tons, addition and alterations, Provident Trust Co., Philadelphia, to Phoenix Bridge Co., Phoenixville, Pa.

250 tons, Weyerhaeuser Timber Co. saw mill plant, Longview, Wash.; to Isaacson Iron Works, Seattle.

250 tons, all-welded building for General Electric Co., Lynn, Mass., to American Bridge Co., Pittsburgh.

225 tons, bridges, No. 4 and 4A, Missouri Pacific Railroad, Centropolis, Mo., to American Bridge Co., Pittsburgh.

225 tons, plant additions, Irwin & Leighton, Philadelphia, to American Bridge Co., Pittsburgh.

180 tons, addition for Carpenter Steel Co., Reading, Pa., to Reading Metal Craft Co., Reading, Pa.

110 tons, bus terminal, Dallas, Tex., for Southwestern Greyhound Lines, to Mosher Steel Co., Houston, Tex.

STRUCTURAL STEEL PENDING

4375 tons, bank building, San Francisco, for Bank of America.

2050 tons, Terminal Island Freeway bridge,

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Los Angeles, for state.

1890 tons, bridges, Los Angeles and Long Beach, Calif., for state.

1110 tons, kiln building, Fulton, Mo., for Harbison-Walker Refractories Co.

600 tons, coaster gates, Grand Coulee dam, Odair, Wash., for U. S. Bureau of Reclamation.

500 tons, manufacturing plant, Joplin, Mo., for Pittsburgh-Corning Glass Corp.

440 tons, manufacturing building, Kankakee, Ill., for Gaines Food Co. Inc.

420 tons, Bancroft street grade separation, Toledo, O., for state.

400 tons, bridge, American river, Tahoe national forest, Placer county, California; bids April 25, Public Roads Administration, San Francisco.

400 tons or more, radial gates, trash racks, etc., for Columbia Basin project; bids to Bureau, May 10 and May 15.

400 tons, three state bridges in Northumberland County, Pennsylvania; bids rejected second time, being higher than on first tenders.

350 tons, highway truss spans, Guymon, Okla., for state highway commission.

335 tons, beam highway bridge, Greenriver, Utah, for state.

335 tons, DPG bridge, Cherokee, Iowa, for Illinois Central railroad; bids April 4.

275 tons, two state bridges in Lackawanna county, Pennsylvania; bids Apr. 29.

250 tons, shore protection, Evanston, Ill., for city; Thor Broten, Evanston, contractor; bids April 14.

250 tons, state pier extension, Portland, Me.

225 tons, beam spans, Marianna, Ark., for state highway commission.

200 tons, warehouse, Associated Grocers of Rhode Island, Providence, R. I.

200 tons, Sacred Heart Hospital, Norristown, Pa.; plans revised and new bids Apr. 24; original plans called for 400 tons.

REINFORCING BARS . . .

REINFORCED BARS PLACED

135 tons, foundations, milling plant, Huron, O., for Eastern Mill Co-operative Association, to Carnegie-Illinois Steel Corp., Chicago; James Stewart Corp., Chicago, contractor.

REINFORCED BARS PENDING

13,350 tons or more, Columbia Basin canals and structures; bids to Reclamation Bureau, Coulee Dam, Wash., May 10 and May 15.

5000 tons, coal pier, Norfolk & Western Railway, Norfolk, Va.; bids in.

5000 tons, Grand Coulee dam, Odair, Wash., for U. S. Bureau of Reclamation.

807 tons, Friant, Wash., for U. S. Bureau of Reclamation.

310 tons, Bureau of Reclamation, inv. A-48,763 A-1; bids in April 18; also 1315 tons, two inquiries, closed April 19.

275 tons, packing plant, Storm Lake, Iowa, for Kingan & Co.

205 tons, Mountain Brook dam, Jaffrey, N. H.; Central Construction Co., Lawrence, Mass. low $489,094.50, bids April 5 to U. S. engineer, Boston.

200 tons, expansion, Hamtramck, Mich., for Bull Dog Electric Products Co.

200 tons, grain elevator, Hillsdale, Mich.

Unstated, lay-up piers for Navy at Puget Sound yard, Tacoma and Tongue Point, Oreg.; negotiations under way.

Unstated, 11,000 capacity stadium, Seattle; Western Construction Co., Seattle, low at $720,623.

PLATES . . .

PLATES PLACED

450 tons, including shapes, 500,000-cubic foot capacity gas holder, Springfield Gas Light

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Co., Springfield, Mass.; to International-Stacey Corp., Cincinnati.

PLATES PENDING

100 tons or more, barge for Coulee dam crane; bids to Bureau of Reclamation, May 15.

Unstated, three steel storage tanks, total 510,000-gallons, bids to Denver May 1.

Unstated, two siphons Columbia Basin project; bids to Bureau of Reclamation, May 15.

Unstated, 11,000 feet or more supply water line, for Hillsboro, Oreg.; bids in.

PIPE . . .

CAST IRON PIPE PLACED

725 tons, 6-inch and up for Seattle projects, to H. G. Purcell, Seattle, for U. S. Pipe & Foundry Co., Burlington, N. J.

410 tons, 4 to 60-inch pit cast cement-lined bell and spigot and 151 tons fittings and castings, for Metropolitan District Commission, Boston, to Warren Pipe Co., Everett, Mass.

150 tons, 6 and 8-inch for Providence, R. I., to R. D. Wood Co., Florence, N. J.

CAST IRON PIPE PENDING

700 tons, 4 to 12-inch for Metropolitan District Commission, Hartford, Conn.

200 tons, 12-inch for Rockland, Mass.

RAILS, CARS . . .

RAILROAD CARS PLACED

Chicago & North Western, 12 high tensile steel streamlined sleeping cars, to Pullman-Standard Car Mfg. Co., Chicago; in addition to 16 streamlined passenger coaches recently noted as placed with American Car & Foundry Co., New York.

United Fruit Co., six 2-8-2 type switch engines, to Baldwin Locomotive Works, Eddystone, Pa.

RAILROAD CARS PENDING

Southern Railways, 2100 freight cars, bids asked; list comprises 1000 fifty-ton box cars, 600 fifty-ton and 100 seventy-ton gondolas, 250 ballast cars and 150 covered hopper cars.

CONSTRUCTION AND ENTERPRISE

CALIFORNIA

LOS ANGELES—Hughes Aircraft Co., Florence Ave. and Teale St., Culver City, Calif., is building a graving dock for large seaplanes at Pier E, Los Angeles harbor, to cost about $130,000.

LOS ANGELES—Asia Motors Corp. has been incorporated with $500,000 capital, represented by Harold J. Goldman, 206 South Spring St.

LOS ANGELES—Coast Valve & Supply Co. has been incorporated with 2500 shares no par value, represented by G. Allen Bisbee, 354 South Spring St.

LOS ANGELES—D.J.D. Screw & Specialty Products Co. has been formed by John G. Meyer and associates and has established operations at 6826 South Avalon Blvd.

LOS ANGELES—Supreme Metal Products Co. has been formed by Irvin and Alvin Schlom and has established operations at 5036 West Jefferson Blvd.

LOS ANGELES—Acme Sash Balance Co. has been incorporated with $150,000 capital and 20,000 shares no par value, represented by James E. Martin, 756 South Broadway.

PASADENA, CALIF.—Barry Moore Industries is building a machine shop at 1363 Wesley Ave., 74 x 96 feet, to cost about $15,000.

PITTSBURG, CALIF.—Columbia Steel Co., Russ Bldg., San Francisco, plans construction of a sheet and tin plate shop.

SAN JOSE, CALIF.—Central California Aircraft has been incorporated with $25,000 capital, represented by Victor A. Chargin, First National Bank Bldg.

VENICE, CALIF.—Airesearch Mfg. Co., 9851 Sepulveda Ave., is erecting two plant buildings, 32 x 62 feet and 42 x 82 feet, to cost about $17,500.

VERNON, CALIF.—John Deere Plow Co. is building a warehouse and display room at 5525 Downey Rd. 60 x 180 feet and 140 x 320 feet, to cost about $145,000.

CONNECTICUT

HARTFORD, CONN.—American Steel & Alloy Corp., 425 Homestead Ave., has let contract to F. H. McGraw Co., 780 Windsor St., for a one-story 145 x 240-foot plant, estimated to cost about $100,000. C. DuBose, 51 East 42nd St., New York, is architect.

MERIDEN, CONN.—Meriden Foundry Co., 200 Carpenter Ave., has let contract to A. Wales Lines Co., 134 State St., for a one-story 105 x 160-foot and 22 x 25-foot plant to cost about $60,000.

GEORGIA

ATLANTA, GA.—Southern Wire & Iron Works, 441 Memorial Dr. SE., has let contract at $13,000 to N. F. Williams, 1807 Sylvan Rd. SW., for a one-story plant addition.

ILLINOIS

AURORA, ILL.—Aurora Equipment Co., 422 Cleveland St., will let contract soon for a one-story 40 x 205-foot plant addition. Schmidt, Garden & Erickson, 104 South Michigan Ave., Chicago, are architects.

CHICAGO—American Name Plate & Mfg. Co., 4254 West Arthington Ave., has let contract to Coath & Goss, 5103 West Lake St., for a one-story plant building 78 x 121 feet, to cost about $40,000. E. G. Halstead, 1 Riverside Dr., Riverside, Ill., is architect.

CHICAGO—Pettibone Mulliken Corp., 4710 West Division St., has let contract to Enger Bros., 4910 West St. Paul St., for a 245 x 265-foot pattern storage building, to cost about $200,000. N. Ronneberg, 3916 North Harlem Ave., is architect.

CHICAGO—National Can Corp., 6000 West 51st St., has let contract to Clearing Industrial District, 6455 South Central Ave., for a one-story 360 x 683-foot plant to cost about $600,000. J. S. Cromelin, 6455 South Central Ave., is architect.

MELROSE PARK, ILL.—Arrow Match Corp., 3001 West Grand Ave., has let contract to Nathan Flyer Construction Co., 59 West Hubbard St., for a one-story 200 x 220-foot plant building. E. H. Nordlie Co., 111 West Washington St., Chicago, is architect.

INDIANA

ELKHART, IND.—American Home Foods Inc., 22 East 40th St., New York, has let contract to Wigton-Abbott Corp., 1225 South Ave., Plainfield, N. J., for design and construction of a power plant to cost about $100,000.

FORT WAYNE, IND.—Fruehauf Trailer Co., 2001 East Pontiac St., G. H. Skidmore, manager, has let contract to Collins Construction Co., Burlington and Twelfth Sts., Kansas City, Mo., for a plant addition to cost about $500,000. J. Gordon Turnbull Co., 2630 Chester Ave., is architect.

HAMMOND, IND.—Lever Bros., Hammond, have let contract to Stone & Webster Engineering Corp., 90 Broad St., New York, for various plant additions, estimated to cost about $300,000.

RICHMOND, IND.—Johns-Manville Co., 814

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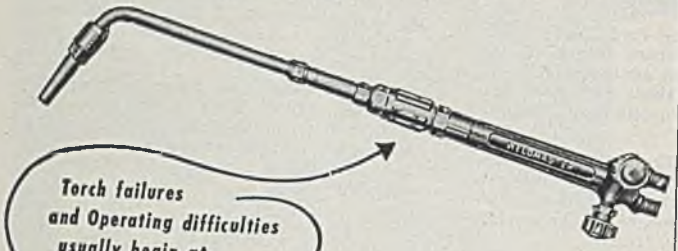

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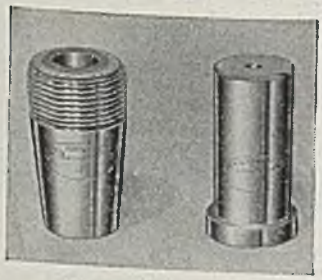

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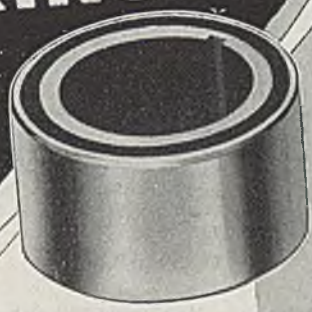

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TORFLEX Bearings are used in gears (see illustration below) to cushion shocks, prevent tooth breakage, reduce chatter, vibration and noise and by allowing torsional wind-up, they reduce starting loads.

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Richmond Ave., has let contract to Ferro-Concrete Construction Co., 203 West Third St., Cincinnati, for a one-story 150 x 230-foot plant addition, estimated to cost about $250,000.

LOUISIANA

LAKE CHARLES, LA.—Southern Alkali Corp. has leased from Reconstruction Finance Corp. the $56 million magnesium plant here and will reconvert under contract let to H. K. Ferguson Co., Cleveland.

MARYLAND

CUMBERLAND, MD.—Western Union Telegraph Co., 60 Hudson St., New York, has let contract to Sordoni Construction Co., Forty Fort, Pa., for a radio relay station, to cost over $25,000. L. Chatelain Jr., 1727 K St., Washington, is engineer. Contracts for similar stations have been let to same contractor for Hagerstown, Thurmont and Westminster, Md.

TOWSON, MD.—Bendix Radio Corp., Joppa Rd., has let contract to Davis Construction Co., 9 West Chase St., for a one-story 48 x 486-foot addition and railroad terminal, to cost about $200,000. V. P. Saxe, 100 West Monument St., Baltimore, is architect.

MASSACHUSETTS

FITCHBURG, MASS.—Simonds Saw & Steel Co., has been authorized to build a plant addition to cost about $364,000 for fabrication of wood-cutting saws and machine knives for woodworking and lumber industries.

FRAMINGHAM, MASS.—General Motors Corp., Framingham, has let contract to Gilbane Building Co. Inc., 90 Calverly St., Providence, R. I., for a boiler plant, to cost about $40,000.

HUDSON, MASS.—Town board of selectmen, Town Hall, is taking bids on a water system, reservoir, standpipe and booster pumping station. Metcalf & Eddy, 1300 Statler Bldg., Boston, are engineers.

TAUNTON, MASS.—Glenwood Range Co., Ware St., plans additions and improvements to plant to cost over $40,000. G. A. Payne, Ware St., is architect.

WEHAM, MASS.—Town board of selectmen, Town Hall, is taking bids for a 500,000-gallon steel water tank and water system. H. E. Bailey, 177 State St., Boston, are engineers.

MICHIGAN

ALBION, MICH.—Ideal Castings Co., 900 Plastics Rd., has been incorporated with $100,000 capital to do foundry and machine shop business, by Lyle M. Johnson, 411 Burr Oak St.

DETROIT—DeLuxe Die Works, 20201 Hoover Rd., has been incorporated with $300,000 capital to manufacture tools, gages, dies and jigs, by Nicholas Timko, same address.

DETROIT—A. L. Moses Co., 723 Fisher Bldg., has been incorporated with $10,000 capital to manufacture tools and machinery, by Alonzo L. Moses, same address.

DETROIT—Canfield Tow-Bar Co., 104 West Canfield Ave., has been incorporated with $27,000 capital to manufacture tow-bars and equipment, by Ercel C. Vandergrift, 4425 Cass Ave., Detroit.

DETROIT—Roger Allen Corp., 3206 Joy Rd., has been incorporated with $1000 capital to manufacture gages and machinery, by Bernard A. Werbe, 18458 Muirland Ave.

DETROIT—Jackson Gas Burner Co., 8781 Quincy Ave., has been incorporated with $1000 capital to manufacture gas burners, by James H. Jackson, same address.

DETROIT—Burroughs Adding Machine Co., 6071 Second Blvd., has let contract to Joseph A. Krausman Co., 4612 Woodward Ave., for a three-story manufacturing plant, estimated to cost $200,000.

JACKSON, MICH.—Frost Gear & Forge Division, Clark Mfg. Co. has let contract to North-Moller Co., Jackson, for a one-story plant addition to cost about $150,000.

MARSHALL, MICH.—Marshall Brass Co. is building a new manufacturing plant.

RIVER ROUGE, MICH.—Ford Motor Co., 3000 Schaefer Rd., Dearborn, Mich., will let contract soon for a plant addition and stripping building, to cost about $350,000. Giffels & Vallet, 1000 Marquette Bldg., Detroit, are engineers.

WYANDOTTE, MICH.—Down River Machine Corp., 1625 Fourth St., has been incorporated to do general machine shop work, with 16,000 shares no par value, by Frank Zavadil, 87 Oak St., River Rouge, Mich.

MINNESOTA

HAWICK, MINN.—Rural Co-Operative Association of Maple Lake, J. Johnson, secretary, Maple Lake, will install two diesel engine-driven generator units in proposed power plant building, total cost about $200,000. United Engineering Service, 600 Kasota Bldg., Minneapolis, is engineer.

MINNEAPOLIS—Foley Mfg. Co., 30 Second St. NE., W. M. Ringer, president, has let contract to E. M. Ganley Co., 2922 Oakland Ave., for a one-story 142 x 382-foot plant building with two-story wing 49 x 140 feet, estimated to cost about $250,000.

MISSISSIPPI

NATCHEZ, MISS.—Johns-Manville Corp., 22 East 40th St., New York, plans an insulating board plant near here, estimated to cost about $5 million.

MISSOURI

KIRKSVILLE, MO.—City has filed application with FWA for advance funds for two complete sewage treatment plants and connecting mains, estimated to cost about $348,000.

ST. LOUIS—New England Lead Burning Co., 901 South Boyle Ave., has let contract to Lecoutour Construction Co., 4903 Delmar Blvd., for a plant building costing about $14,000. J. C. Geselschap, 1704 McCready Ave., is architect.

ST. LOUIS—A. Kilpatrick & Sons will build an addition to machine shop, to cost about $25,000 Henri Rush & Co. are architects.

OHIO

CLEVELAND—General Motors Corp., Detroit, will build two plants here for production of cars by the Chevrolet light car division. Plants will be built in Brookpark, covering 1 million square feet and the other in Parma, covering 1,500,000 square feet. M. E. Coyle, general manager, Detroit, will be in charge.

CLEVELAND—Crucible Steel Castings Co., 8401 Almira Ave., Maxwell H. Tielke, president, plans $200,000 improvement for late summer, including installation of sand conveyor system and necessary structural changes.

CLEVELAND—Reeves Service & Mfg. Co. has been organized by E. H. Hatters, president, and E. C. Hatters, treasurer, and has taken over former Reeves Engineering & Mfg. Co., 1316 East 110th St., to continue operation of a general machine shop.

CLEVELAND—Lucas Machine Tool Co., 523 East 99th St., has let contract to Hunkin-Conkey Construction Co., 1740 East Twelfth St., for a one-story 175 x 330-foot plant and office, to cost about $500,000. J. Gordon Turnbull Inc., 2630 Chester Ave., is engineer.

EUCLID, O.—Euclid Road Machinery Co., 1361 Chardon Rd., has let contract to Albert M. Higley Co., 2036 East 22nd St., for a one-story 140 x 200-foot plant, to cost about $175,000.

LODI, O.—Claude A. Schmidle, 2560 Milford Rd., Cleveland, is negotiating for purchase of part of waterworks site for erection of a foundry.

NILES, O.—Youngstown Steel Car Corp., Hunter Rd., A. E. Wilkoff, secretary, will build a plant addition for production of a new product recently engineered. New plant will cost about $60,000, with equipment.

TOLEDO, O.—American Floor Surfacing Machine Co., 518 St. Clair St., has let contract to J. H. Berkebile & Sons, 998 Whittier St., for a plant addition to cost about $45,000. Bellman, Gillet & Richards, 518 Jefferson St., are architects.

OREGON

PORTLAND, OREG.—Spencer Packing Co., C. B. Spencer, president, has plans for a proposed $500,000 canning plant in Guilds Lake area, 150 x 450 feet. Simms Co., Portland, is engineer.

PORTLAND, OREG.—Wheeler Engineering Co., manufacturer of gas and oil furnaces and frozen food equipment, plans construction of a plant 31 x 95 feet.

PORTLAND, OREG.—Pacific Chain & Mfg. Co., 4200 N.W. Yeon St., will build a chain factory costing about $75,000.

PENNSYLVANIA

WARREN, PA.—Pennsylvania Electric Co., 222 Levergood St., Johnstown, Pa., has let contract to Berkebile Bros., Swank Bldg., Johnstown, for a two-story 156 x 225-foot power plant and substation, estimated to cost about $5 million. Gilbert Associates, 412 Washington St., Reading, Pa., are engineers.

TENNESSEE

CHATTANOOGA, TENN.—American Mfg. Co. plans construction of a plant addition to cost about $22,000.

TEXAS

MT. PLEASANT, TEX.—Ben L. Patrick, mayor, has let contract to Pittsburgh-Des Moines Steel Co., Dallas, Tex., for a 400,000-gallon steel tank on steel tower.

WASHINGTON

BREMERTON, WASH.—City plans replacement of First St. municipal pier, involving steel piling to protect earth fill.

LONGVIEW, WASH.—Longview Rendering Co. plans erection of a rendering plant to cost about $50,000.

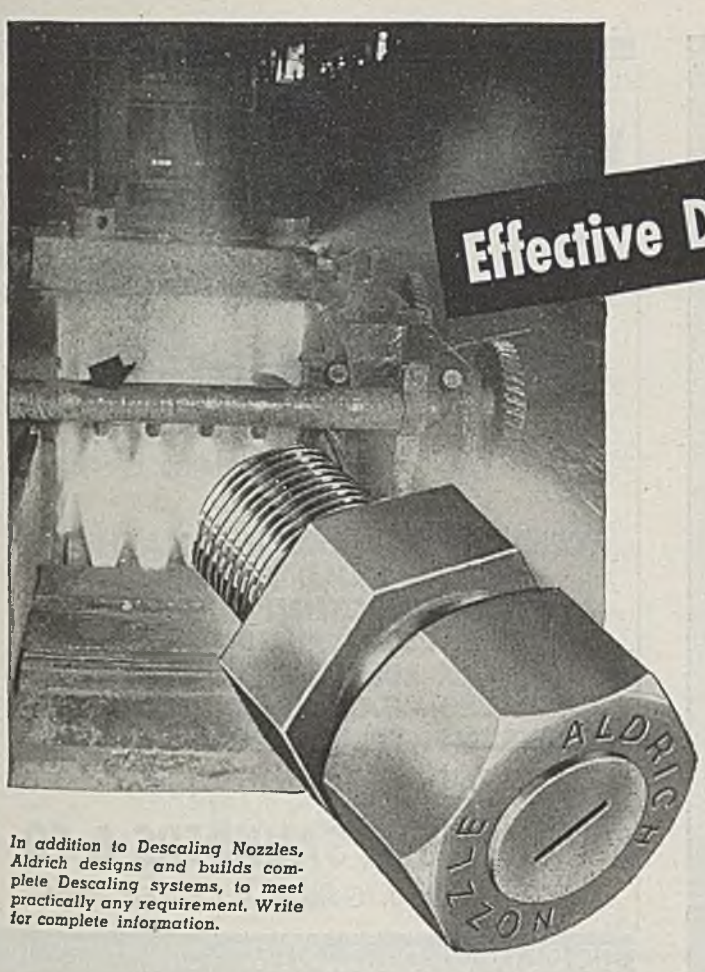
PULLMAN, WASH.—Frank Allen, city clerk, will receive bids May 7 for equipment for sewage treatment plant and turbine water pump and motor.

SPOKANE, WASH.—City plans $3,700,000 sewage disposal plant, project endorsed by Taxpayers' Association.

WENATCHEE, WASH.—Northwest Chemurgy Co-Operative. H. F. Carstensen, president, will ask bids soon to Robert Beck, Seattle, engineer, for proposed plant at The Dalles, Oreg., including 80 x 180-foot concrete building to house four separate manufacturing processes. Cost is estimated at $750,000.

WEST VIRGINIA

WHEELING, W. VA.—Saturn Foundry & Machine Co., Nineteenth St., has let contract to the Byrum Co., 24 Fourteenth St., for a foundry and machine shop, two stories, 115 x 128 feet, estimated to cost about $50,000.



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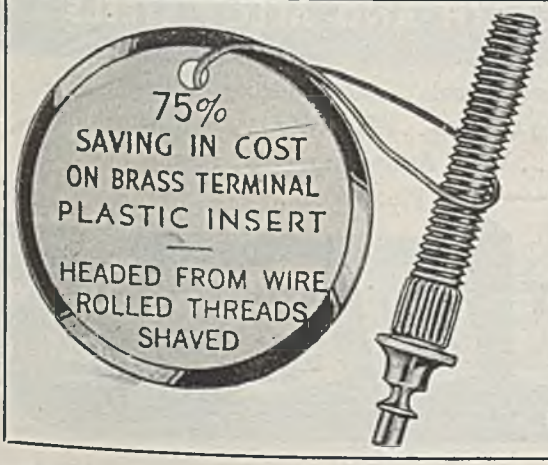

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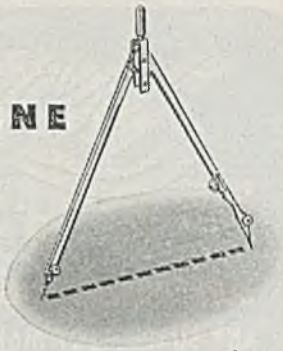

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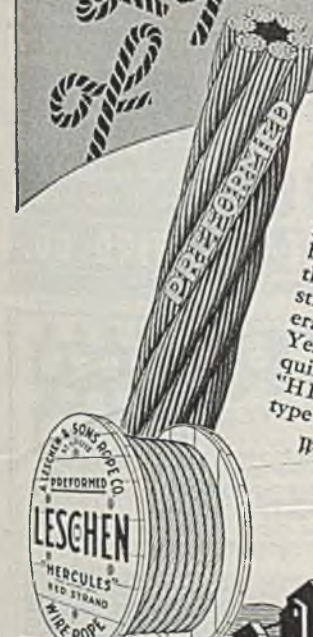

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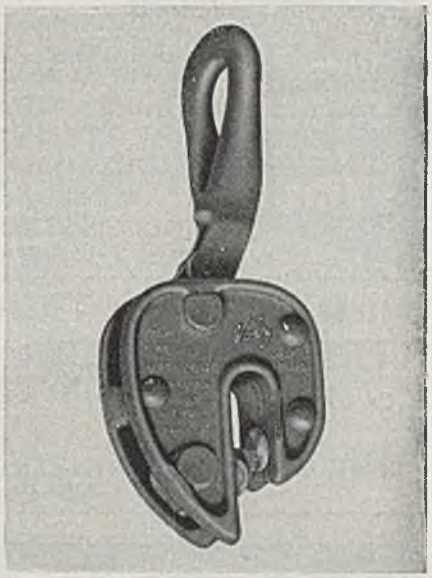

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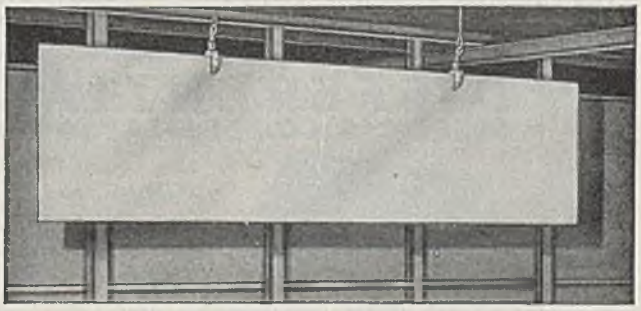

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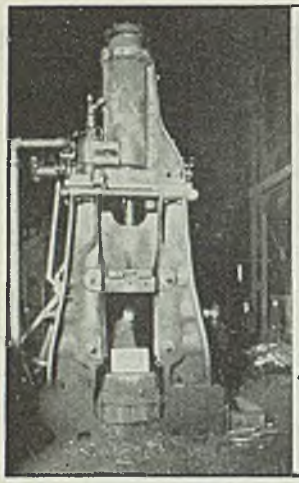

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30-Ton Morgan 30' Span
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25-Ton Bedford 50' Span
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25-Ton P&H 70' Span
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25-Ton Whiting 82' Span
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20-Ton Morgan 77' Span
20-Ton Northern 60' Span
20-Ton P&H 51'4" Span
20-Ton P&H 39'6" Span
20-Ton Shaw 76'4" Span
20-Ton Shepard Niles 49'6" Span
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15-Ton Alliance 35' Span
15-Ton Cleveland 55'6" Span
15-Ton Cleveland 35' Span
15-Ton Morgan 77' Span
15-Ton Niles 32' Span
15-Ton Northern 53' Span
15-Ton Shaw 82' Span
15-Ton Shaw 77' Span
15-Ton Toledo 82' Span
15-Ton Whiting 74'8½" Span
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10-Ton Case 31'9" Span
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10-Ton Cleveland 50' Span
10-Ton Lane 50' Span
10-Ton Morgan 39'5" Span
10-Ton Morgan 77' Span
10-Ton P&H 57' Span
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10-Ton P&H 37'4" Span
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3-Ton Shaw 33' Span
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39—Fully Repaired Box Cars
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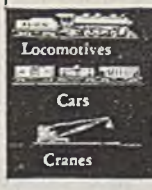

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We can furnish rails, spikes, bolts, angle bars, locomotives, cranes and other railway material.

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WANTED TO BUY
STEEL TUBING
3½" and 4" O.D., lengths 8'0" to 21'0"—Wall Thicknesses .095 to .125 inclusive.
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WANTED
PRESS BRAKE
10' or larger for light sheet metal.
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For
BAR OR SUBWAY TYPE GRATINGS

Established manufacturer entering bar grating production desires established engineering representatives capable of handling complete grating sales. Give details of your organization and territory now covered.

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Also steel detailers and checkers

Write or Wire

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Squad Leader for steel and wire mill machinery. Man with steel mill experience preferable with at least ten years background. Salary.

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SUPERVISING WELDING ENGINEER REQUIRED BY LARGE SOUTHERN SHIPYARD. SHOULD BE THOROUGHLY FAMILIAR WITH STRUCTURAL, SHIP AND PIPE WELDING DESIGN AND PRACTICE. WRITE, FULLY DETAILING QUALIFICATIONS, SALARY REQUIREMENTS, ETC. TO BOX 519, STEEL, PENTON BLDG., CLEVELAND 13, O.

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to the
A. H. NILSON MACHINE COMPANY, BRIDGEPORT, CONN.
designers and builders of wire and ribbon stock forming machines.
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TOOL, DIE, MOLD, STAMPING AND ALL TYPES OF MACHINE WORK.
Send the blueprints.
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Metal Specialties comprised of STAMPINGS, FORMING, WELDING, SPINNING, MACHINING. All Metal or Combined with Non-Metal Materials

Write for Folder

LARGE SCALE PRODUCTION
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ADVERTISING INDEX

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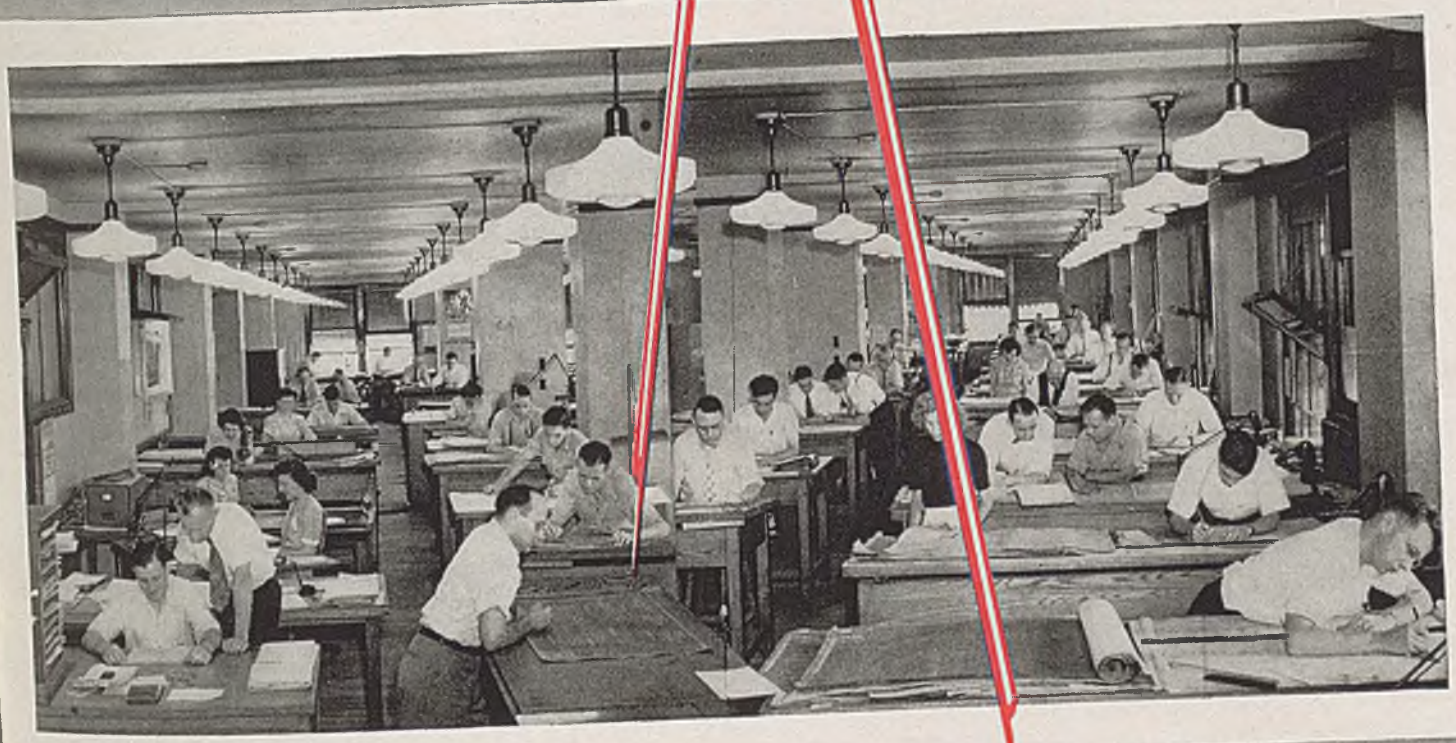
AETNA·STANDARD

Pace-setting *Engineering*



HERE'S THE BLUEPRINT OF PACE-SETTING ENGINEERING

Aetna-Standard engineers for 42 years have been known the world over as designers of seamless tube mills and continuous buttweld pipe mills. In recent years, they have been internationally recognized for many other products, such as levellers, rolling mills, coating equipment, and sizing mills.

Pace-Setting Engineering helps keep you in front.

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ASSOCIATED COMPANIES:
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- World's foremost designers and builders of Seamless Tube Mills and Continuous Buttweld Pipe Mills.
- Pioneers in Coating Equipment, Continuous Galvanizing and Tinning.
- Originators of One-Man Drawbenches.
- New Products . . . recent examples:
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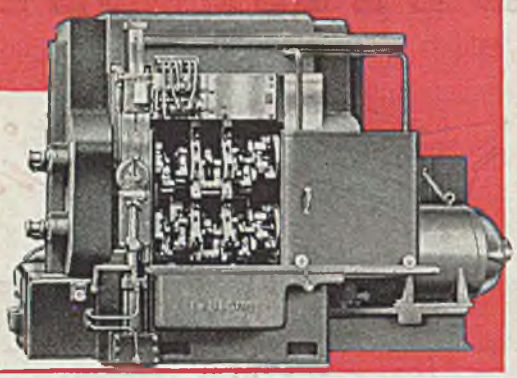
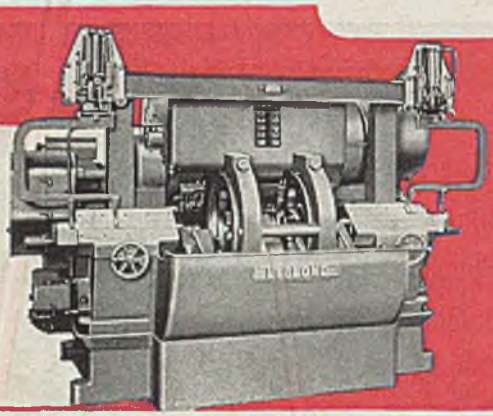
  - Hydraulic Squeeze Pointer
  - Automatic Tube Cut-Off
  - Combination Plate Bending and Straightening Machine
  - Bar Turning Pointer.

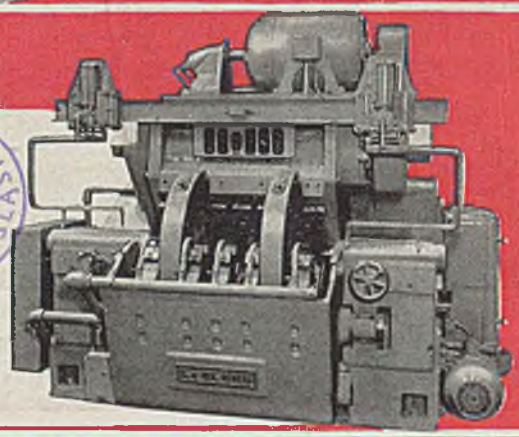
Le BLOND
AUTOMATIC CRANKSHAFT LATHES



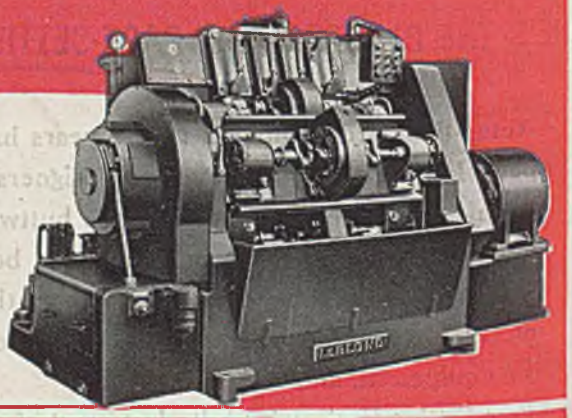
6AC 2 spindle, rough turns pin bearings on both spindles, or rough on one spindle, finish on the other.



7ACL Rough turns simultaneously on a single spindle all line bearings in one operation.



1LB Rough and finish turn line bearings at same chucking. Finish tools on separate cradle follow roughers immediately to reduce floor-to-floor time.



DM 4 Station index machine for finish turning all line bearings. Eliminates completely all rough grinding operations. Equipped with red and green control light system.

This new and improved line of LeBlond Automatic Crankshaft Lathes is in big demand wherever production requirements are high. Now more automatic and much faster, these truly remarkable lathes average 15 to 50 cranks per hour. See the complete line either under construction or in actual operation at our plant now.

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