

February 1943

TECHNOLOGY REVIEW

Title Reg. in U. S. Pat. Office



CHANGING FROM THIS TO THIS



*Boosted Production 15%
Cut Wheel Costs 50%*

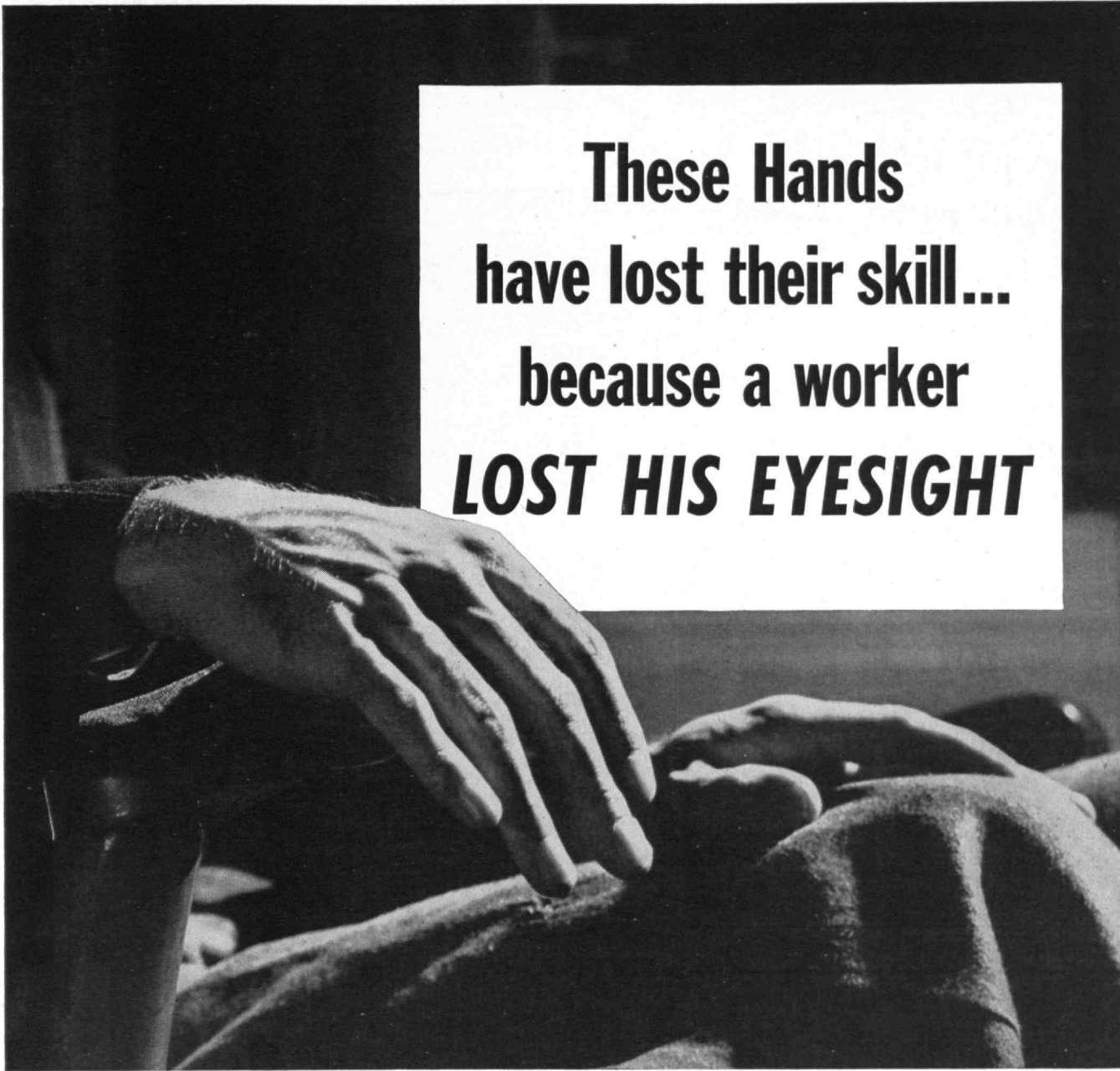


Foreman: "They asked me if the grinding department could possibly turn out more of certain parts with present equipment. I began experimenting. I changed the wheel combination from the old standard and it worked! We cut down grinding wheel costs and got more pieces per hour. So if you can't get more grinding machines, try some wheel experiments. Try telephoning a Norton engineer for a tip."



NORTON ABRASIVES

NORTON COMPANY, WORCESTER, MASS.
BEHR-MANNING DIVISION, TROY, N. Y.



**These Hands
have lost their skill...
because a worker
*LOST HIS EYESIGHT***

protect your workers' eyes with AO Goggles

Without eyes to guide them, skilled hands can't produce. Protect your workers' eyes *now* — before it is too late... for the war of production cannot spare the services of a single man or woman. To win this war, *all* skilled hands must be producing on full-time schedule.

American Optical Company offers you a complete

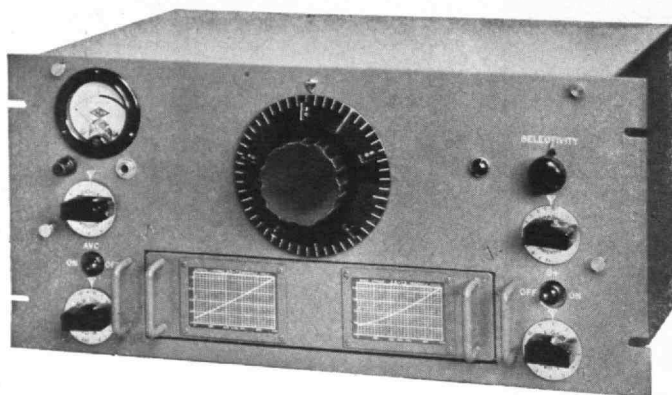
line of scientifically designed goggles... a specialized type for every kind of eye hazard in your plant. For effective protection against impact, we recommend goggles equipped with Super Armorplate lenses... without power or ground to individual prescription. Call in your American Optical Safety Representative today.

American  Optical

COMPANY

SOUTHBIDGE, MASSACHUSETTS





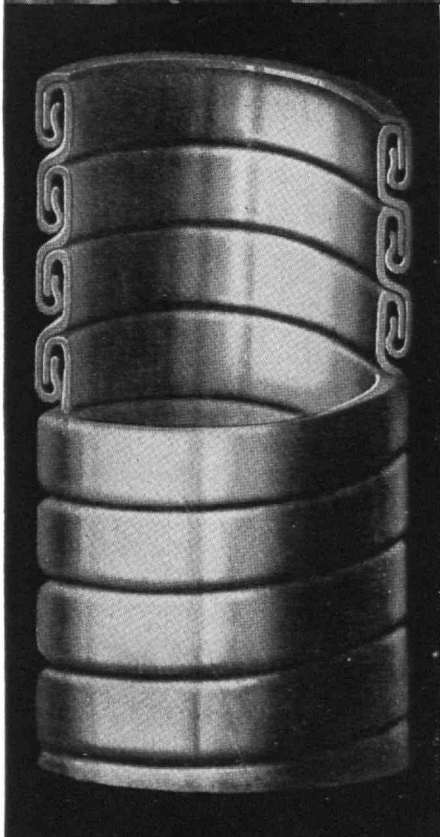
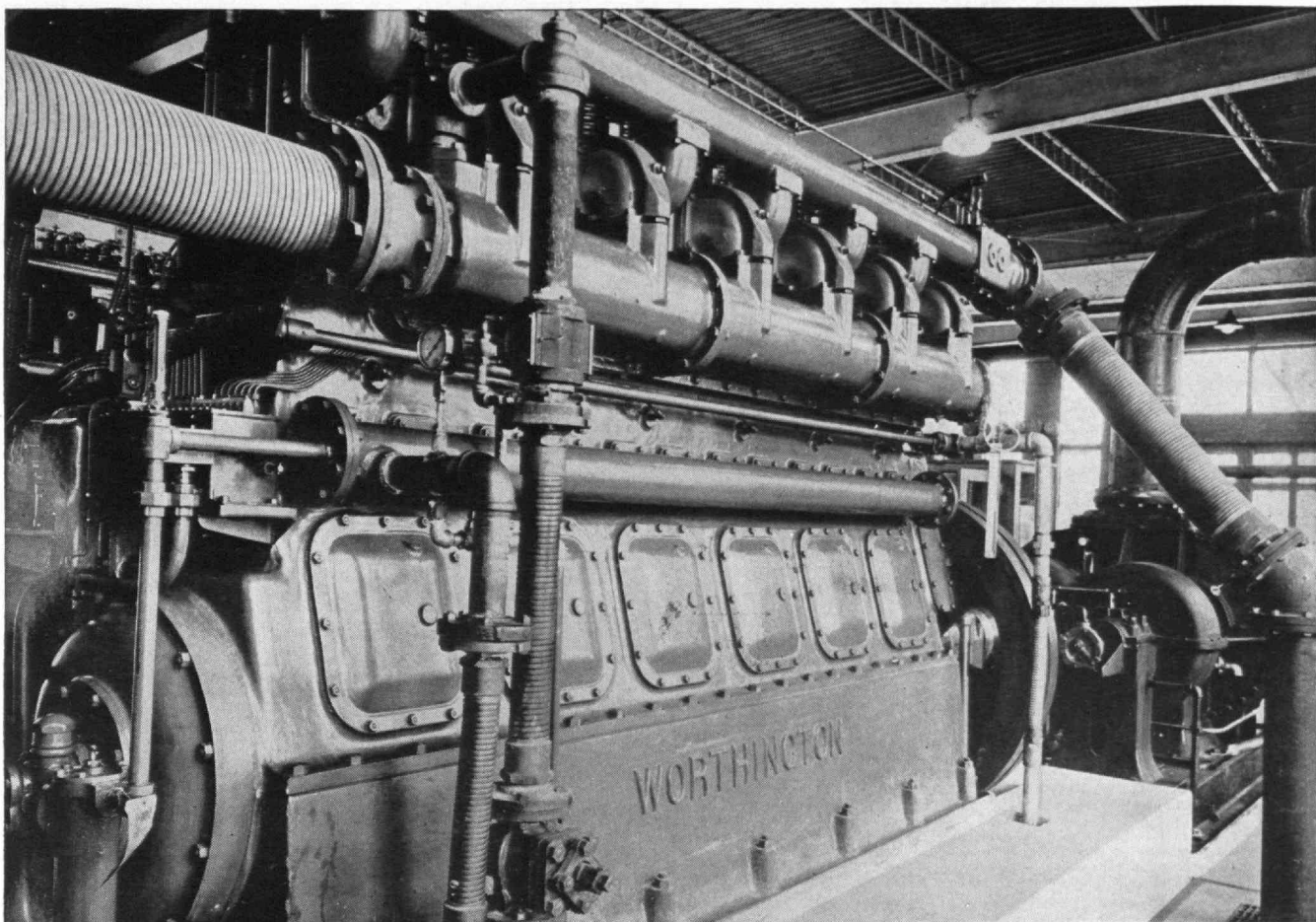
IF THIS WERE AN OFFICIAL ARMY OR NAVY PHOTOGRAPH . . .

it would be on the restricted list, with publication prohibited. Actually it is from the National Catalogue published before the war. Yet basically the receiver is the same. True, it is now built to government specifications rather than the amateurs'. There are new refinements that we cannot even tell you about, but which make it a better receiver than the one you have known. But basically it is still the same receiver.

When you turn to it after the war as to an old friend, you will find that it looks different, performs better and handles more easily. Yet you will find that it is still designed and built in the tradition that made a receiver engineered for peace meet the rigorous demands of war.

NATIONAL COMPANY, INC., MALDEN, MASS.





PENFLEX Metallic Hose

... Armored for Safety

... Flexible for Service

Uninterrupted Service and Safety are important factors in generating power for War Production. PENFLEX Metallic Hose with 4-wall interlocking joint construction and $\frac{3}{8}$ " "come and go" per lineal foot of length is designed for long life, trouble-free service on intake and exhaust lines, oil, water and other connections. It resists thermal and mechanical strains and fatigue... it absorbs vibration and provides safe, economical service.

PENFLEX WELD corrugated, jointless Tubing gives leakproof service on fuel oil feed, circulating water, and starting air lines.

Full data in practical diagrammatic form in Bulletin 71.

In sizes 1" to 18" I. D.

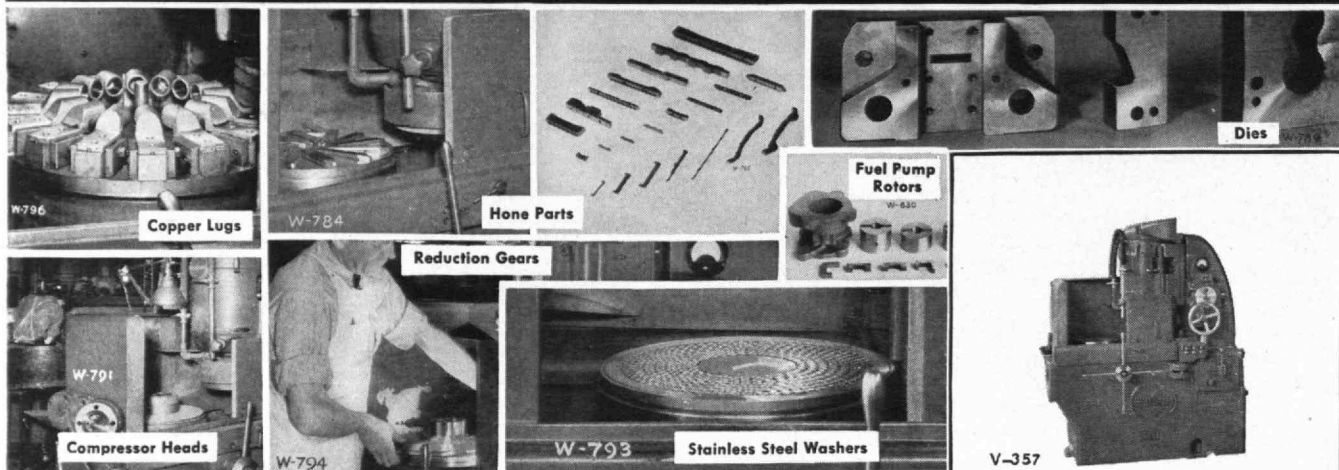


PENNSYLVANIA FLEXIBLE METALLIC TUBING CO.

7211 Powers Lane, Philadelphia, Pa.

ESTABLISHED 1902

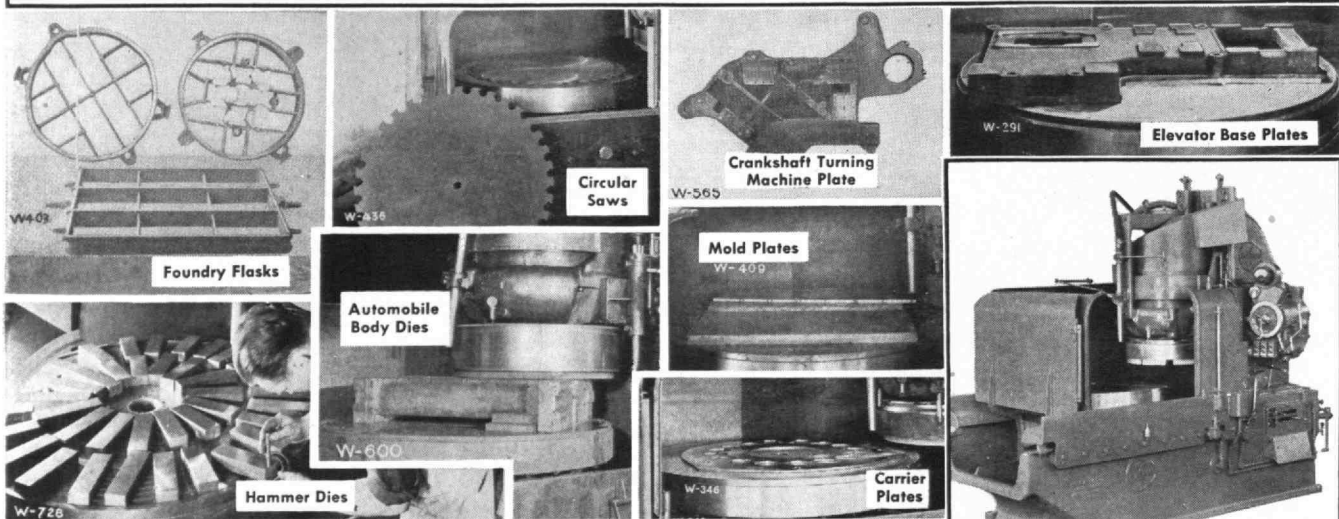
"PUT IT ON THE BLANCHARD"



EXAMPLES OF WORK DONE ON THE NO. 11 BLANCHARD SURFACE GRINDER



EXAMPLES OF WORK DONE ON THE NO. 18 BLANCHARD SURFACE GRINDER



EXAMPLES OF WORK DONE ON THE NO. 27 BLANCHARD SURFACE GRINDER

The **BLANCHARD MACHINE COMPANY**

64 STATE STREET, CAMBRIDGE, MASS., U. S. A.

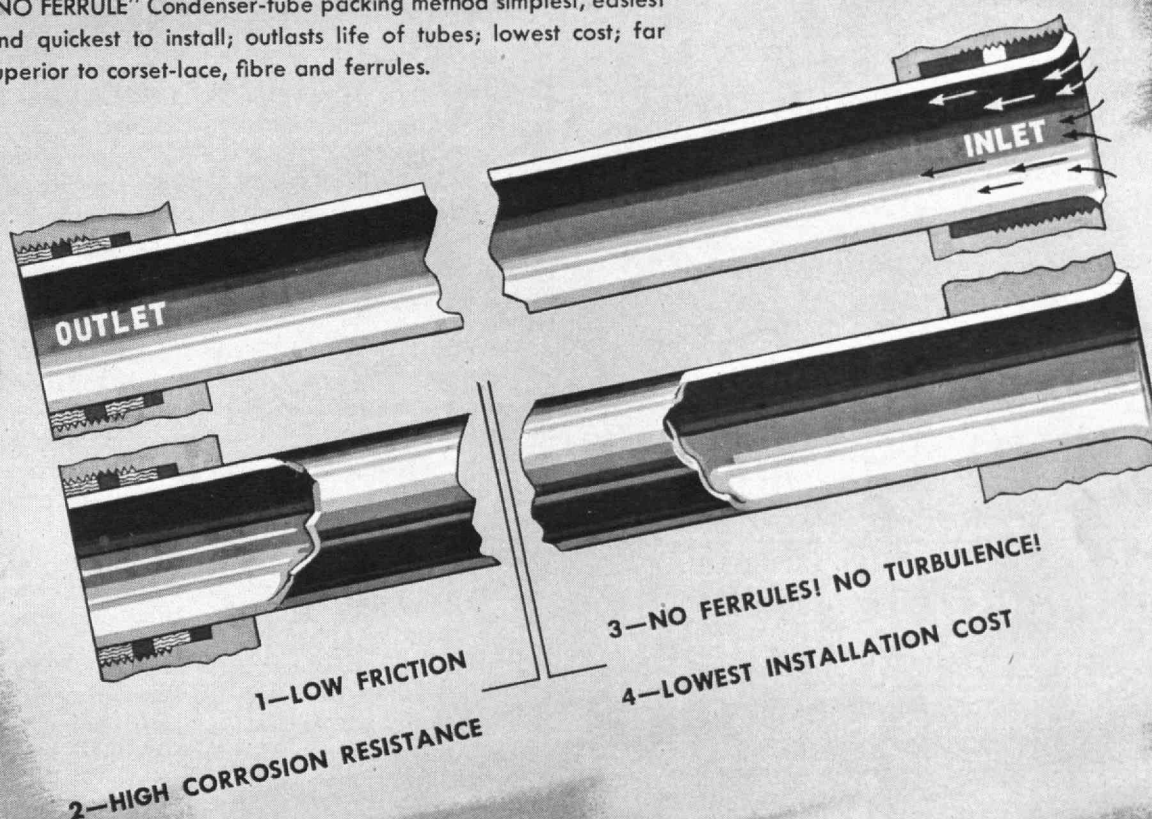


SEND FOR THIS
WORK BOOK...

Make CONDENSER *tubes* *last* MANY YEARS *longer ...*

10,000 INSTALLATIONS

Naval, Marine and Industrial service proves John Crane Metallic "NO FERRULE" Condenser-tube packing method simplest, easiest and quickest to install; outlasts life of tubes; lowest cost; far superior to corset-lace, fibre and ferrules.



JOHN CRANE *Metallic* CONDENSER PACKING

"NO-FERRULE" METHOD FOR NEW AND OLD CONDENSERS

The New John Crane "No Ferrule" method bonds the tube to the tube-sheet in this way:

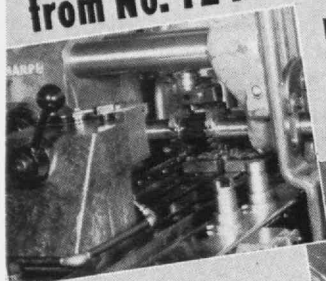
Illustration top left shows outlet-end of old condenser packed with Metallic and Fibre Expansion Rings. Perfect Bond. Free to expand . . . Inlet-end shows Fibre Expansion Bushing with Lead-slug-insert, bonding tube to tube sheet . . . On new condensers, bottom illustration, inlet-end is packed same as on old units. Outlet-end is belled (no packing). Ask for comparative studies showing advantages of metallic packings over fibre and corset-lace ferrules.

CRANE PACKING COMPANY, 1800 Cuyler Avenue, Chicago, Illinois
Branches: Baltimore, Buffalo, Boston, Cleveland, Dallas, Detroit, Houston, Los Angeles, New Orleans, New York, Philadelphia, Pittsburgh, San Francisco, St. Louis, Tulsa
CRANE PACKING CO., Ltd., Hamilton, Ontario, Canada. Montreal, Toronto, Vancouver

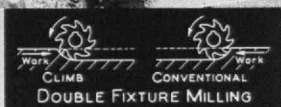
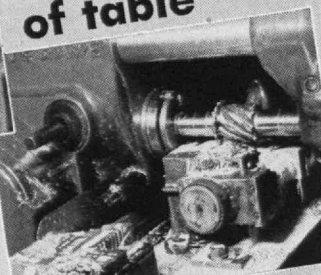
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2-OCEAN CONDENSER SERVICE
The only world-wide service of its kind . . .
49 engineers in U. S. A., South America,
Canada, England.

Greater Production from No. 12 Plain Milling Machines

Use a fixture
at each end
of table



Climb mill in one
fixture and con-
ventional mill in
the other—one ma-
chine and one set
of cutters often can
do the work of two.



BROWN & SHARPE MFG. CO.
Providence, R. I.

BROWN & SHARPE

EQUIPMENT FOR THE CHEMICAL INDUSTRIES Made by ARTISAN from any metal

Autoclaves

With or without agitators
Steam, Dowtherm, Elec-
tric or Gas Heated

Condensers and Heat Exchangers

Single Pass and Multipass

Distillation Equipment

Continuous Rectifying
Batch Rectifying
Steam Distillation
Plain Evaporative

Evaporators

Horizontal Tube
Vertical Tube
Basket Type
Forced Circulation

Jacketed Kettles

Hemispherical or Stand-
ard
Dished Heads

Pipe, Pipe Coils, and Bends

Large fabricated pipe,
particularly copper,
monel, and stainless
steel. All types of proc-
essing piping.

Pipe coils — in any metal
— helical, zigzag, pan-
cake, from all sizes of
pipe and tubing

Reactors

Plain, jacketed, or with
coils. Agitated — horse-
shoe, turbine, or pad-
dle-blade type

Tanks

All types and sizes

ARTISAN METAL PRODUCTS INC.

20 SULLIVAN SQUARE

BOSTON, MASS.

JAMES DONOVAN '28, Treasurer and General Manager

THE TABULAR VIEW

Product Presages. — Improvements to be foreseen in the material appurtenances of life after the war are not to be regarded as incentives to winning the war: Our vital reasons for victory lie far too deep for that. Yet there is point in surveying means whereby at least one of the Four Freedoms may be implemented in time to come and whereby as well some of the problems of re-adjustment may be met. Prospects for one major industry were sketched for *The Review* in January by a noted engineer. A noted industrial designer this month (page 176) canvasses a number of manufacturing and allied activities to desery not merely what new things are to be, but more the industrial revolution which may be expected to attend the production of them. A graduate in 1920 of the College of the City of New York, CLARENCE P. HORNING has written often and well of subjects in his field of industrial design, in which he concentrates on product and trade-mark design, books, packaging, and maps.

Medicament. — War on malaria is an essential phase of war on the Axis, and a phase in which the Axis might have had a serious advantage but for the speed and effectiveness with which American chemical manufacturers have brought into production synthetic drugs matching in therapeutic value the quinine once supplied by the East Indies. RUDOLF E. GRUBER, '16, discusses the entire subject in this Review (page 179). Dr. Gruber, who is vice-president of Merck and Company, Inc., writes with the authority of firsthand experience in Java and Central America.

No Glue. — Research in ceramics goes forward steadily at Technology, and as fast as new techniques of investigation become available they are brought to bear on the problem. FREDERICK H. NORTON, '18, Associate Professor of Ceramics, explains in this issue (page 182) how clay has in recent months given up more of its secrets as a result.

Problem People. — Sometimes the forest bulks so large that it is easy not to see the trees; so it is in international matters, holds BERTHA S. W. DODGE, '22, in an essay (page 185) continuing the discussion of cultural relationships between nations initiated in the November Review by Robert G. Caldwell, Dean of Humanities at the Institute. Mrs. Dodge has known Central America through residence as well as travel, in Guatemala, in Costa Rica, and in Panama.

Polka Dots. — Our cover this month bears a photograph made some years ago by HAROLD E. EDGERTON, '27, Associate Professor of Electrical Measurements at Technology, for the Winchester Repeating Arms Company. It shows shot falling through one of the relatively few shot towers in the country. The polka-dot effect is the result of reflection of the stroboscopic light source on the shot during the 1/100,000-second flash, some of the images being out of focus.

... and we made a Sapphire!

YOU'RE LOOKING at a sapphire being made in the incandescent heat of a specially designed furnace... a synthetic sapphire... better than the natural gem. It takes hours to grow one of these sapphire boules.

What's so wonderful about it? Sapphire is necessary for the security of this country. Out of this jewel stone are made hard, long-wearing bearings for precision instruments. The various precision devices of a modern battleship require more than 4,000 jewels; about 100 more are needed in fire-control mechanisms. Modern pursuit planes and bombers require up to 100 sapphire bearings in their instruments.

In 1940, this country was completely dependent upon Europe for sapphire jewels. The call went out for American-made sapphire to meet this nation's needs.

Because we at Linde are experienced in the production of gases and in the accurate control of high temperature gas flames, we volunteered to try to make sapphire. After two years of experimental research, we learned how to produce the high-purity raw materials needed and also how to make sapphire from those materials. Today, we make more synthetic sapphire than this country ever imported from Europe... enough to meet all industrial and military needs. Thus America need never again be dependent upon an outside source.

Right now, we make colorless sapphire because colorless jewels make harder bearings. No sapphire is available for anything but war production. In the future we stand ready to make ruby and other gem stone materials for the jewelry trade... and for you.

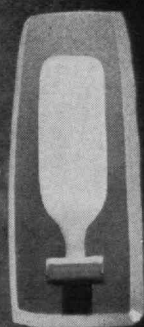
This research development by The Linde Air Products Company is paralleled by other recent achievements of Electro Metallurgical Company, Carbide and Carbon Chemicals Corporation, and National Carbon Company, Inc.—all of which are Units of Union Carbide and Carbon Corporation.

THE LINDE AIR PRODUCTS COMPANY
Unit of Union Carbide and Carbon Corporation



GENERAL OFFICES: NEW YORK, N. Y.

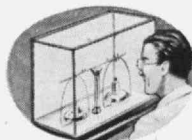
Offices in Principal Cities



HIS BEARINGS ARE RIGHT—Chronometers, compasses, and other navigational aids must be rugged as well as precise. Sapphire bearings can "take it."



FLYING JEWELS—Pilots' lives and the success of their missions depend upon accurate instruments. Sapphire bearings assure continued accuracy.



LABORATORY WARRIORS—Delicate balances, time instruments, and other important precision equipment of the research worker need sapphire jewels, too.



YOURS IN THE FUTURE—Flawless gems... such as rubies, sapphires, and spinel... made by this same Linde process... will be available for jewelry in the future.

BUY UNITED STATES WAR BONDS AND STAMPS

BATH IRON WORKS CORPORATION

*Shipbuilders and
Engineers*

BATH, MAINE



Hevi Duty Electric Co. Electric Furnaces MILWAUKEE, WISCONSIN

Hevi Duty Precision Electric Heat Treating Furnaces are built in a large variety of types and sizes — for many heat treating operations — with temperature ranges to 2500° F. (1371° C.). They are standard production equipment in many national industrial plants.

Write for descriptive bulletins

GEORGE A. CHUTTER, '21
District Manager
90 West Broadway
New York

ELTON E. STAPLES, '26
District Manager
205 W. Wacker Drive
Chicago, Ill.

MAIL RETURNS

Best of Luck

DEAR FELLOW ALUMNUS:

Today, to my surprise, I accidentally bumped into an issue of *The Review* — that for November. We were quite glad to see one since we have been away from the Institute for eight months now. I elected myself to let you know because of the fact that Uncle Sam elected us to represent the Class of '42 on this front. We have been overseas for five months now, and we are all going to apply for a job with Cook's Travel Service if and when we return. Maybe by now you are quite curious as to whom I refer to as "we."

Here we are: Tom Crowley, XV, Charlie Kelley, I, Bob Krucklin, I, and Okie O'Connor, III. It might be possible to inform the Secretary of the Class of 1926 that Captain Gustave R. Peterson is also in the battalion. Captain Charles R. Mills, '38, is likewise here. Lieutenant Robert M. Emery, '34, has been killed.

Well, best of luck to all, and chalk up all the Japs and Huns on the Walker wall.

Refugees from Axis bullets,

TOM, CHARLIE, BOB, OKIE.

P.S. Kelley received a silver star.

North Africa

Invitation

FROM HAROLD E. DATO, '41:

. . . The picture of the wagon wheel in the December issue struck my fancy, perhaps because it was very well placed in the make-up. . . Which brings to mind that this is about the time a new managing board would be elected for *The Tech*. If so, I should like to hear who the new men are.

One thing before I close. Undoubtedly quite a number of Technology men are out here in the armed services. Who and where they are I do not know. . . I should, however, like to have some of these men up to my place for the evening or over a week end for a bit of a respite from the monotony of service. You might pass the word along that all they need do is phone me or drop in at the address given below. 141 Merchant Street, Honolulu, T. H.

Antedated

FROM HALLOCK C. CAMPBELL:

I have greatly enjoyed the recent copies of *The Review*, particularly the articles on plywood and veneers, which antedated the display in *Life* by many months. . . Philadelphia, Pa.

Speed with Economy



*Air Reduction Sales Co.
(Alteration and Rehabilitation)*

After the war, in converting plants to peacetime products, there will undoubtedly be quite a demand for alteration and reconstruction. . . You will find that we can offer you valuable suggestions on such projects — *based on long experience.*

W. J. BARNEY CORPORATION
101 PARK AVENUE, NEW YORK
INDUSTRIAL CONSTRUCTION

Alfred T. Glassett, '20, Vice President