

*May* 1943

# TECHNOLOGY REVIEW

Title Reg. in U. S. Pat. Office





# *The CORRECT wheel will lick the GRINDLINS*



With each development the Grindlins go into action.

The Norton idea of providing special structures of Grinding Wheels for specific types of work cannot be "whispered" down.

Yes, the Norton No. 12—extreme open structure may double or even treble your grinding machine production—IF THE JOB CALLS FOR THIS KIND OF WHEEL.

But a No. 8- or 5- or 3-structure wheel may look more like the "wonder wheel" IF you have been using the **WRONG** grain, grade or structure combination on the job.

When you hear sounds like the whisperings of the phantom Grindlins, it's time to tune your ear to catch the voice of engineering experience.

**NORTON COMPANY • Worcester, Massachusetts**  
Behr-Manning Division—Troy, N. Y.

**NORTON ABRASIVES**



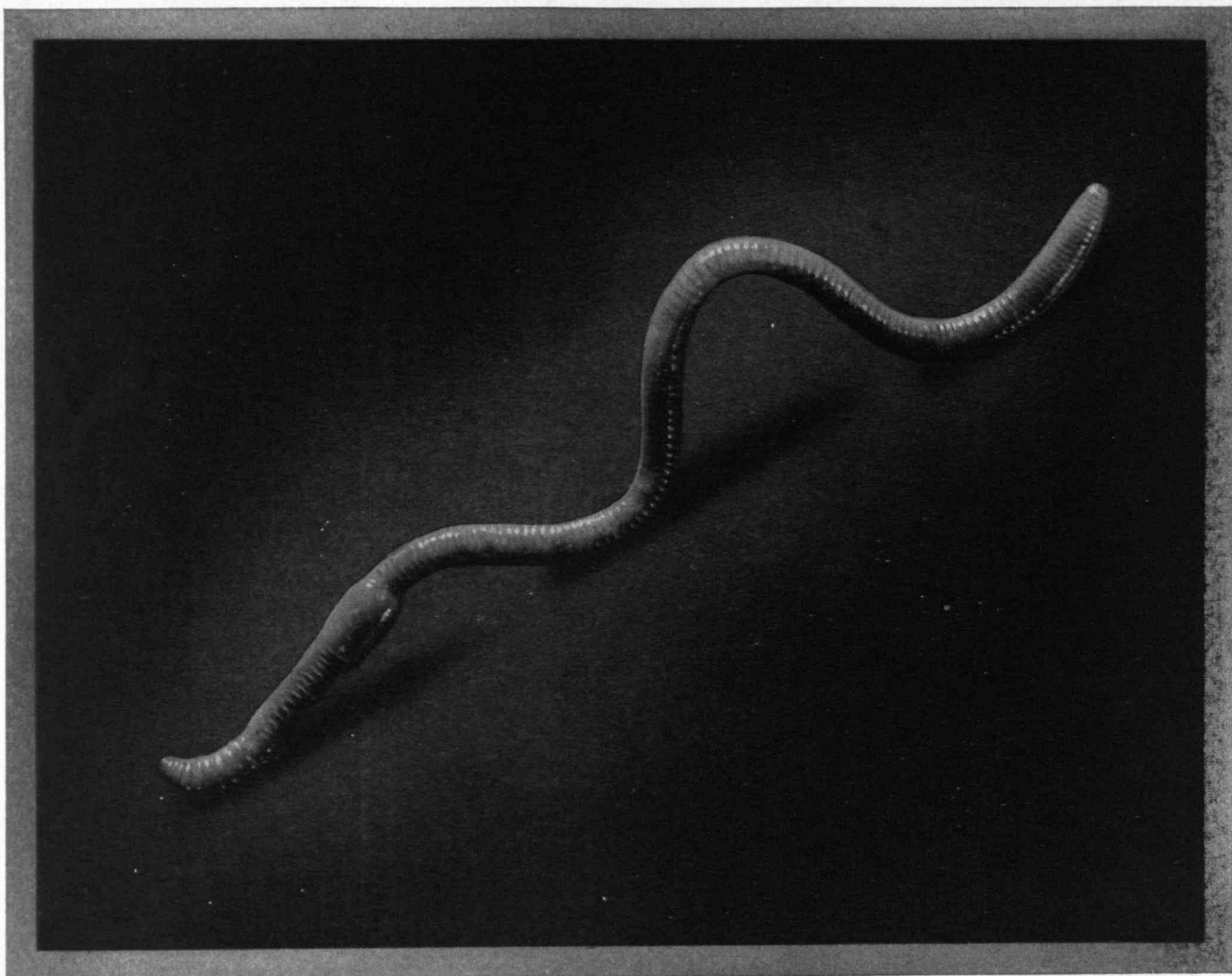
**Every Eye Accident  
PREVENTED**  
**Saves Man-Power for War-Power**

*Install a Complete AO Eye Protection  
Program in Your Plant*

The sooner our fighting forces get ALL the weapons and equipment they need, *the sooner the final big offensive will begin.* Make sure that no eye accidents occur in *your* plant to take irreplaceable workers from their jobs, to keep tools of war from our boys at the front.

American Optical Company, pioneer manufacturer of eye protection equipment, is prepared to give you the benefit of long and varied experience in promoting eye safety. AO offers a complete line of comfortable protective goggles—a design for every type of eye hazard . . . free posters, helpful literature, and the services of a highly trained AO Safety Representative—to cooperate with your Safety Director. Get in touch with your nearest American Optical branch office today.

**American Optical**  
COMPANY  
SOUTHBRIDGE, MASSACHUSETTS



## *Unlike an angleworm* **TYGON** IS STILL FLEXIBLE AT 80° BELOW!

**RUBBER** and angleworms have this in common: at room temperatures both possess flexibility — at 80° below neither can wiggle a molecule!

Unlike an angleworm, unlike rubber, certain Tygon formulations retain their flexibility at temperatures even lower than 80° below. In fact, one Tygon formulation can be readily bent in an 180° arc at 105° below zero!

This startling characteristic of Tygon is but one of many amazing properties of this versatile rubber-like synthetic.

Tygon was originally developed as a corrosion-resistant material for the process industries, and has been used for several years as a protective lining for tanks and equipment in which corrosives are made and handled. Tygon's ability to withstand the oxidizing elements that attack rubber, its resistance to most of the corrosive agents which attack metals, plus its remarkable flexi-

bility in application, has extended its usefulness to all industry seeking a material with the physical properties of rubber but without rubber's characteristic weaknesses.

Tygon molded and extruded items, for example, possess remarkable resistance to corrosion, show no tendency to swell in the presence of oil or water, have an abrasion resistance in excess of rubber, and a dielectric strength in many cases over 1000 volts per mil. Tygon molding formulations are non-corrosive to metal, and may be molded to extremely close tolerances. Tygon flexible tubing, in tests on high speed vibrating automatic machines, has consistently shown a flex life ten to twelve times that of rubber. Tygon is non-toxic which permits its use on food and beverage equipment.

In addition to molding and extruding formulations, Tygon is made in rigid or

flexible sheets for use as protective linings or for gasketing; and in liquid form for use as a corrosion-resistant paint, or for impregnation of fabrics.

If your design problems call for the use of rubber-like materials where such factors as strength, durability, low temperature flexibility, resistance to corrosion and abrasion, are important — it will pay you to investigate Tygon. Write today, without obligation, for Bulletin 1621-A. Address your requests to: Engineering Department, U. S. Stoneware Company, Akron, Ohio. In Canada, to: Chamberlain Engineering, Ltd., Montreal.



**U. S. STONWARE**

AKRON, OHIO

ENGINEERS • MANUFACTURERS • ERECTORS • *of* CORROSION-RESISTANT EQUIPMENT



## Wartime readjustments . . . #8



BEFORE MOTHER GOES MARKETING, THE McARGLES ALWAYS CALL A KITCHEN CONFERENCE TO FIGURE COUPON POINTS

AMERICANS are willingly adjusting themselves to wartime rationing, but every one will be happier when the need is over.

The burden is heaviest on Mother. She's getting a taste of the severe budgeting that could become permanent, if she were left with inadequate life insurance.

No man wants to ration his family for life—for lack of life insurance. With taxes and War Bonds, money for life insurance may be hard to save—but the effort is doubly worth while in wartime!

For life insurance premium dollars are fighting dollars. Through investment in basic war industries—and in Government Bonds—premium dollars

support the war program, combat inflation, and provide protection for American families.

Talk things over today with a New England Mutual representative . . . so your family won't be rationed in the post-war world!

### New England Mutual contracts meet present-day needs because:

- 1 **DIVIDENDS** begin at the end of the first year.
- 2 **CASH VALUES** begin at the end of the second year.
- 3 A **PREMIUM LOAN** is available beginning with the second annual premium.

## New England Mutual Life Insurance Company of Boston

George Willard Smith, President Agencies in Principal Cities Coast to Coast  
The First Mutual Life Insurance Company Chartered in America—1835

(347)

## Call another kind of conference!

A little study makes ration coupons go farther—and makes insurance dollars go farther, too.

But you don't need an adding machine, an abacus, and a family huddle to readjust your wartime insurance program. One able underwriter is enough.

A number of them are listed below. They're alumni of your college and they talk your language. They are also trained representatives of the First Mutual Life Insurance Company Chartered in America.

Out of their experience you'll get practical, constructive suggestions. They'll help you make the most of your limited life insurance dollars—help you protect your present policies with premium loans if necessary. Call an insurance conference and check your protection now when you need it most.

RAYMOND P. MILLER, '18  
Salem

ARTHUR C. KENISON, '19  
Boston

BLAYLOCK ATHERTON, '24  
Nashua

If none of these folks is near you, you can get similar service at the New England Mutual office in your city. Or use the coupon below, and the Home Office will be glad to have a competent representative confer with you. There is no obligation, of course.

NEW ENGLAND MUTUAL LIFE  
INSURANCE COMPANY OF BOSTON  
Box 1-3, 501 Boylston St., Boston, Mass.

Please have one of your representatives get in touch with me, without obligation on my part.

Name \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_

# Bus to Berlin

EVERY TIME I take the bus in the morning I think, "I'm going home!"

Going home—*by way of Berlin.*

Not for the fun of it, but because that is the way we all must go.

Tom's on *his* way, too—he's going by way of Iceland, and Ireland, and Casablanca.

And I'm on *my* way, too—by way of Elm Avenue, and Main Street, and the Boulevard, to Gate 10 every morning.

For my job in a war plant, and Tom's job in the war itself, are just different parts of the same journey.

It's the *long way* to go, but it's the *only way*.

For home, you know, isn't just a place and a roof.

It's love, and security, and freedom from fear and want and drudgery, and freedom itself!

So I don't count the miles any more, I just count the stops—on the way to Berlin and Tokio.

Because the roads to Berlin all lead home again!     ✓     ✓     ✓

NOT ALL of our progress on the road that leads to Berlin and Tokio, and back home again, can be measured in terms of miles

or military objectives—though these are the payoff.

The performance of a single worker in a war industry, or the discovery of a single scientist, is real progress.

Or the production of a single company. General Electric produced a billion dollars' worth of war products in 1942!

Or new problems solved—research in electronics, metallurgy, plastics, television, or incandescent and fluorescent lighting.

For these are things which will shorten the miles, and lengthen the distance between stops, for the boys who are going to Berlin and back.

And they lead to job, and home, and freedom, and opportunity, in a better world tomorrow. General Electric Company, Schenectady, N. Y.

*The volume of General Electric war production is so high and the degree of secrecy required is so great that we can tell you little about it now. When it can be told completely we believe that the story of industry's developments during the war years will make one of the most fascinating chapters in the history of human progress.*

**GENERAL  ELECTRIC**

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## THE ONLY REAL HERMETICALLY-SEALED RESISTORS

*...that will stand the most severe salt water  
immersion and temperature shock tests*

STYLE "B"  
90 WATTS

STYLE "C"  
50 WATTS

STYLE "A"  
120 WATTS

STYLE "D"  
35 WATTS

STYLE "MFA"  
PRECISION  
7.5 MEGS. MAX.

STYLE "E"  
20 WATTS

STYLE "MFB"  
PRECISION  
4 MEGS. MAX.

STYLE "F"  
10 WATTS

SPRAGUE  
**KOOLOHM**

## POWER WIRE WOUND RESISTORS AND METER MULTIPLIERS

These Koolohms, designed for the toughest resistor applications facing the industry today, again emphasize the importance of exclusive Koolohm construction features combined with Koolohm engineering ingenuity in solving almost any wire wound resistor problem.

For Koolohms are entirely different from



conventional wire wounds. There are no other resistors like them. No other type of resistor can match their performance on exacting jobs. AVAILABLE WITH NON-INDUCTIVE WINDINGS. Get the facts! Write for catalog and sample Koolohms. SPRAGUE SPECIALTIES COMPANY (Resistor Division), North Adams, Mass.



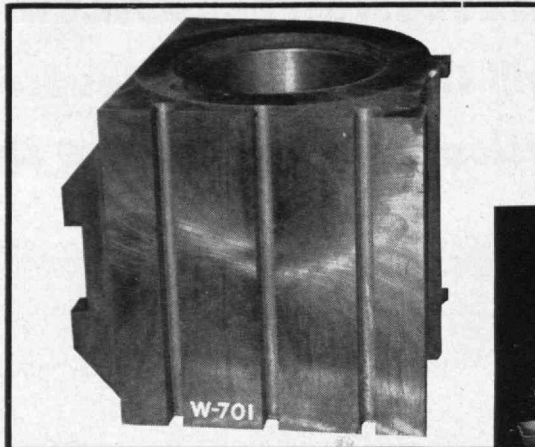
BLANCHARD

**CHECK THESE  
ADVANTAGES  
OF BLANCHARD  
GRINDING**

- ★ **Production**
- Adaptability**
- Fixture Saving**
- ★ **Operation Saving**
- ★ **Material Saving**
- Fine Finish**
- ★ **Flatness**
- ★ **Close Limits**

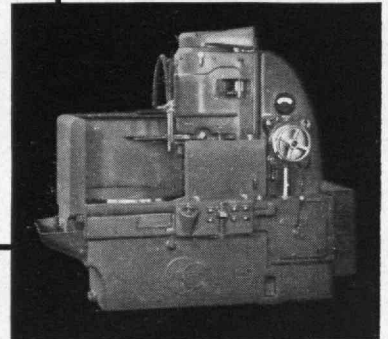
..... Especially  
valuable on jobs like  
the one illustrated.

**"PUT IT ON THE BLANCHARD"**



Semi-Steel  
Stock per side  $\frac{1}{8}$ "  
Limits  $\pm .005$ "  
square .001"  
to .0015" in 16"

No. Sides 6  
1 piece (6  
surfaces)  
1 hour and  
35 min.



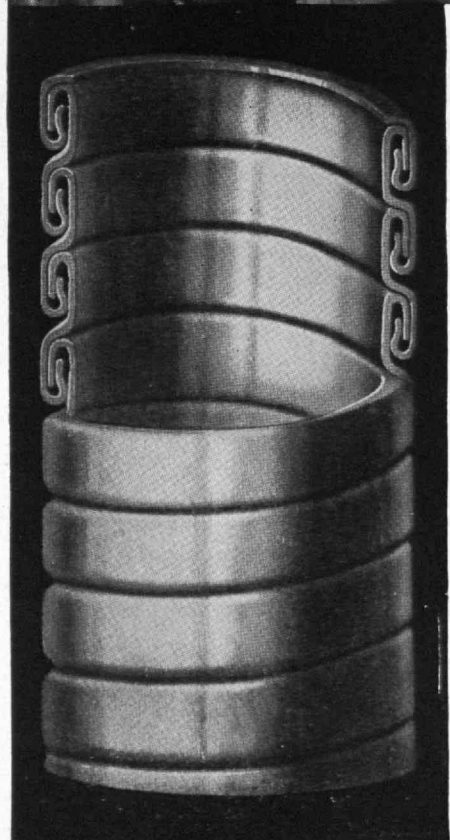
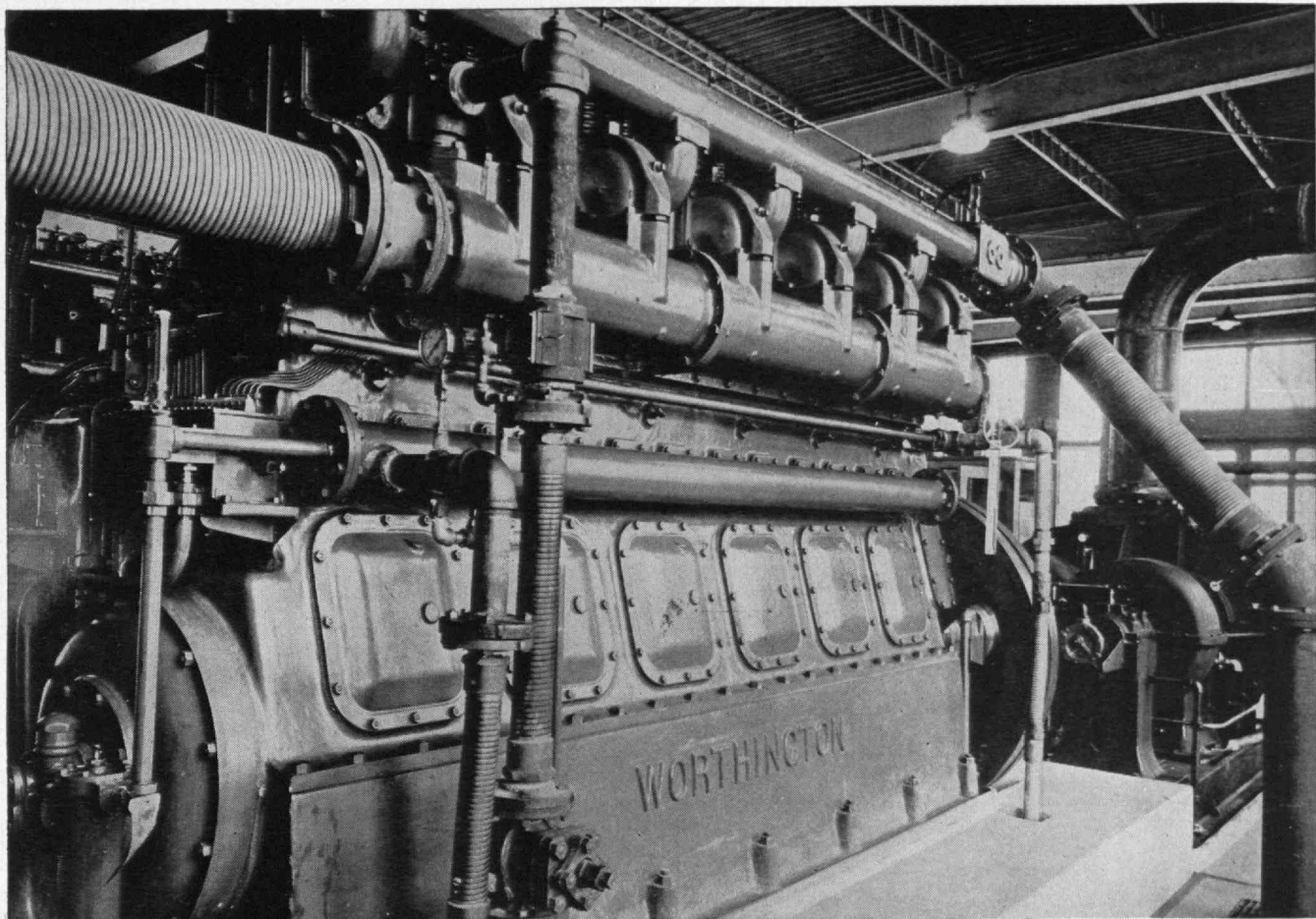
THE SHAPER TABLE,  $15\frac{1}{2}$ " x 16" x 16", illustrated here, is an excellent example of large, heavy work which may be ground with ease on a Blanchard No. 18 Surface Grinder with 6-inch extended column. These tables come to the Blanchard as rough, semi-steel castings. Six sides are ground,  $\frac{1}{8}$ " stock being taken off each side.

*The* **BLANCHARD**  
**MACHINE COMPANY**  
64 STATE STREET, CAMBRIDGE, MASS.

Send for your free copy of "Work Done on the Blanchard." This book shows over 100 actual jobs where the Blanchard Principle is earning profits for Blanchard owners.







## **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

## SPEED UP LIGHT TURNING AS WELL AS GRINDING with 9" ROTARY MODEL PERMANENT MAGNET TYPE CHUCK

Transferred easily from machine to machine or machine to bench—especially useful for pieces difficult to hold in chuck jaws. Catalog of full line on request. **No Wires—No Heating—No Operating Costs.** Brown & Sharpe Mfg. Co., Providence, R. I., U. S. A.

For sale only in the U. S. A. and its Territories and Canada.



# BROWN & SHARPE

## BATH IRON WORKS CORPORATION

*Shipbuilders and  
Engineers*

BATH, MAINE

## THE TABULAR VIEW

**Sweet Music.**—Why is so little known about starch? Answers to this question, which is of much industrial importance, are suggested (page 363) by RICHARD S. BEAR, Associate Professor of Biophysical Chemistry at Technology, in an illuminating essay reporting recent advances in research. Professor Bear, a graduate of Princeton and the University of California, joined the Institute Faculty in 1941.

**Unity.**—Co-operation between science and the humanities in bettering mankind's estate was the theme of a penetrating address to chapters of Sigma Xi and Phi Beta Kappa by JAMES B. CONANT, President of Harvard University, which is basis of his essay in this issue of The Review (page 366).

**Targets.**—Replanning of cities, if it is to be effective, requires agreement on standards. To this end, FREDERICK J. ADAMS, Associate Professor of City Planning at Technology, has been studying questions of the crowding of people on land, tentative answers to which he presents on page 368.

**Protection.**—The relations between patents and industrial research are analyzed in the concluding portion of a discussion by ROBERT E. WILSON, '16, of recent attacks on the American patent system (page 371). Dr. Wilson's article is drawn from his address as Perkin medalist for 1943.

**Tides.**—HERBERT S. SWAN, industrial consultant and city planner who has frequently discussed social trends for The Review, is concerned in this issue (page 360) with the ebb and flow of workers and employment.

**Light.**—Our cover this month depicts crystals of magnesium, of interest not only because the light metal is today of such urgent utility in the war effort but also because these crystals were produced by the direct thermal reduction of dolomite in vacuum, the technique representing the first large industrial application of high vacuum.

## SHIPS, GUNS, PLANES, TANKS PLUS essential goods and services

Yes, America is meeting the challenge here and abroad on all fronts. We know that the fighting front and the home front must *both* be supplied at an ever-increasing tempo. It is with full realization of the need at hand that this firm is perfecting its facilities for handling vital war work and supplying goods and services needed at home.

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