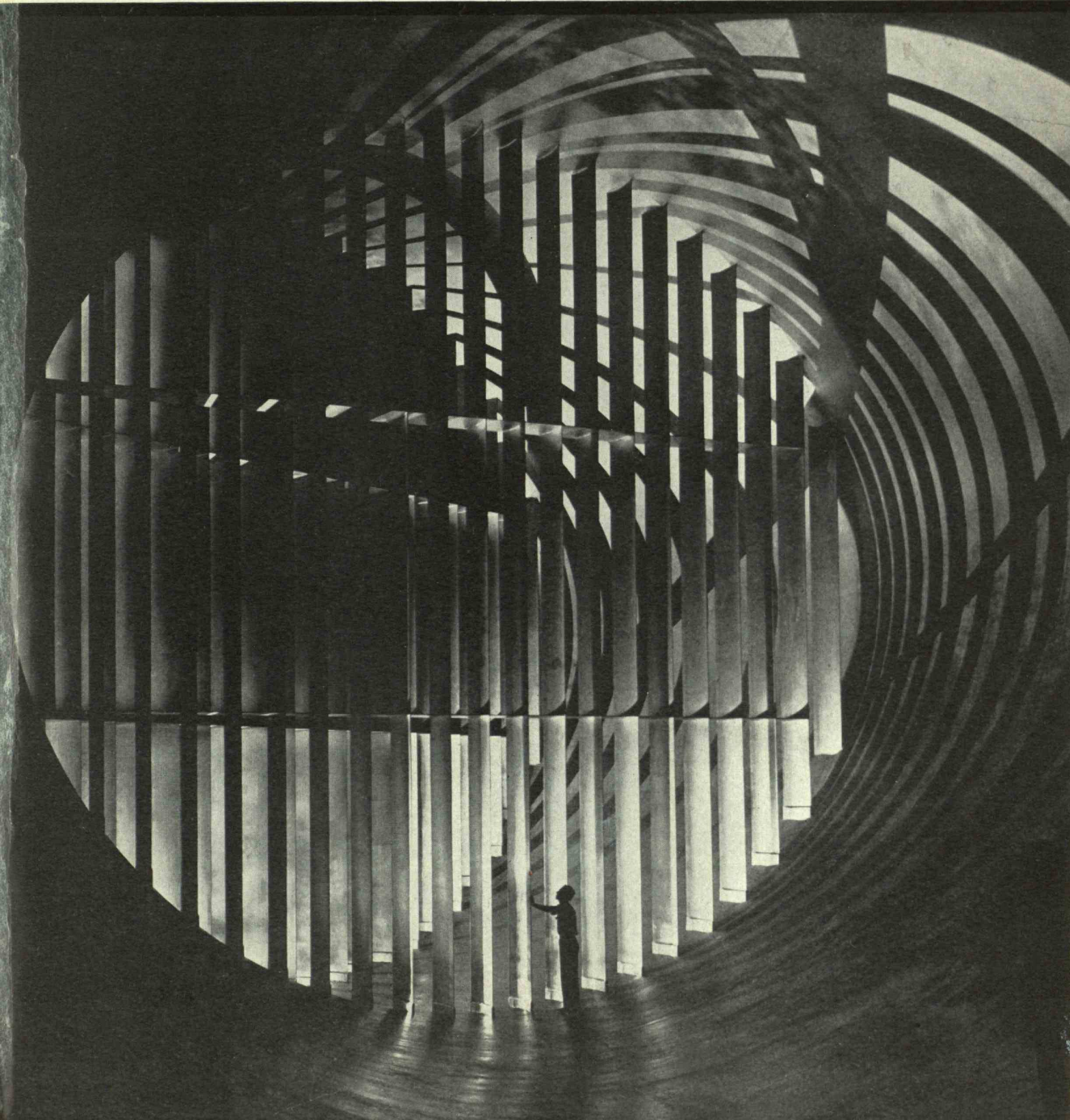


*January 1947*

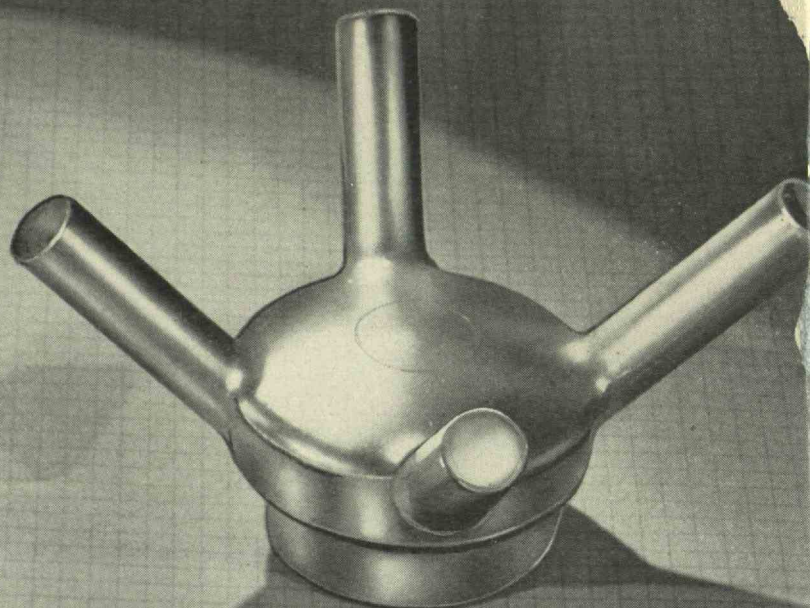
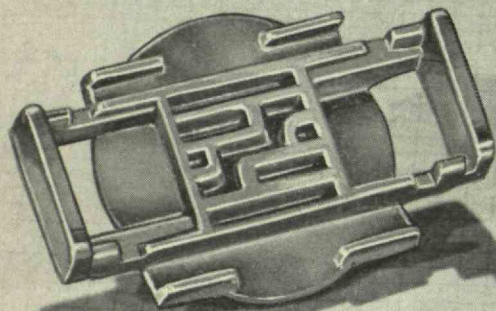
# TECHNOLOGY REVIEW

Title Reg. in U. S. Pat. Office

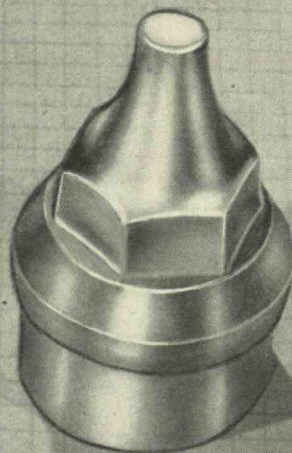
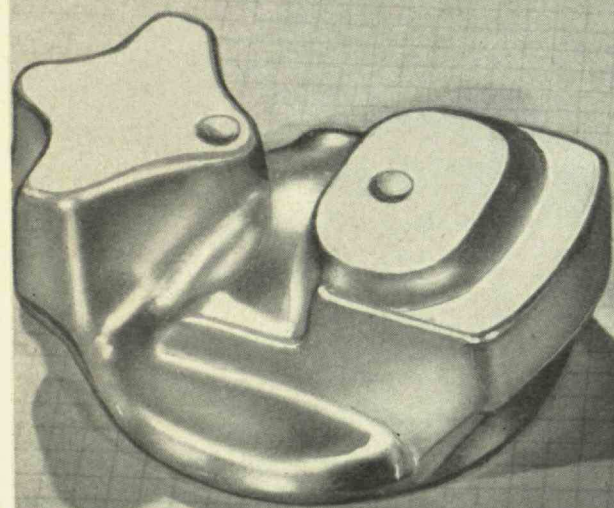




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UNLIMITED APPLICATIONS



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**METAL CORPORATION**

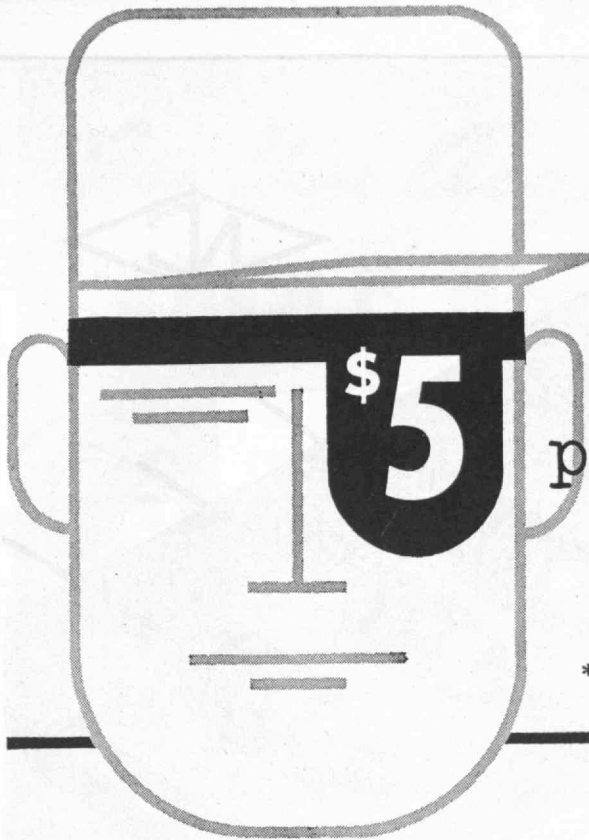
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Eye Accidents

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\*(Society for the Prevention of Blindness)

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Eye Accidents are Preventable

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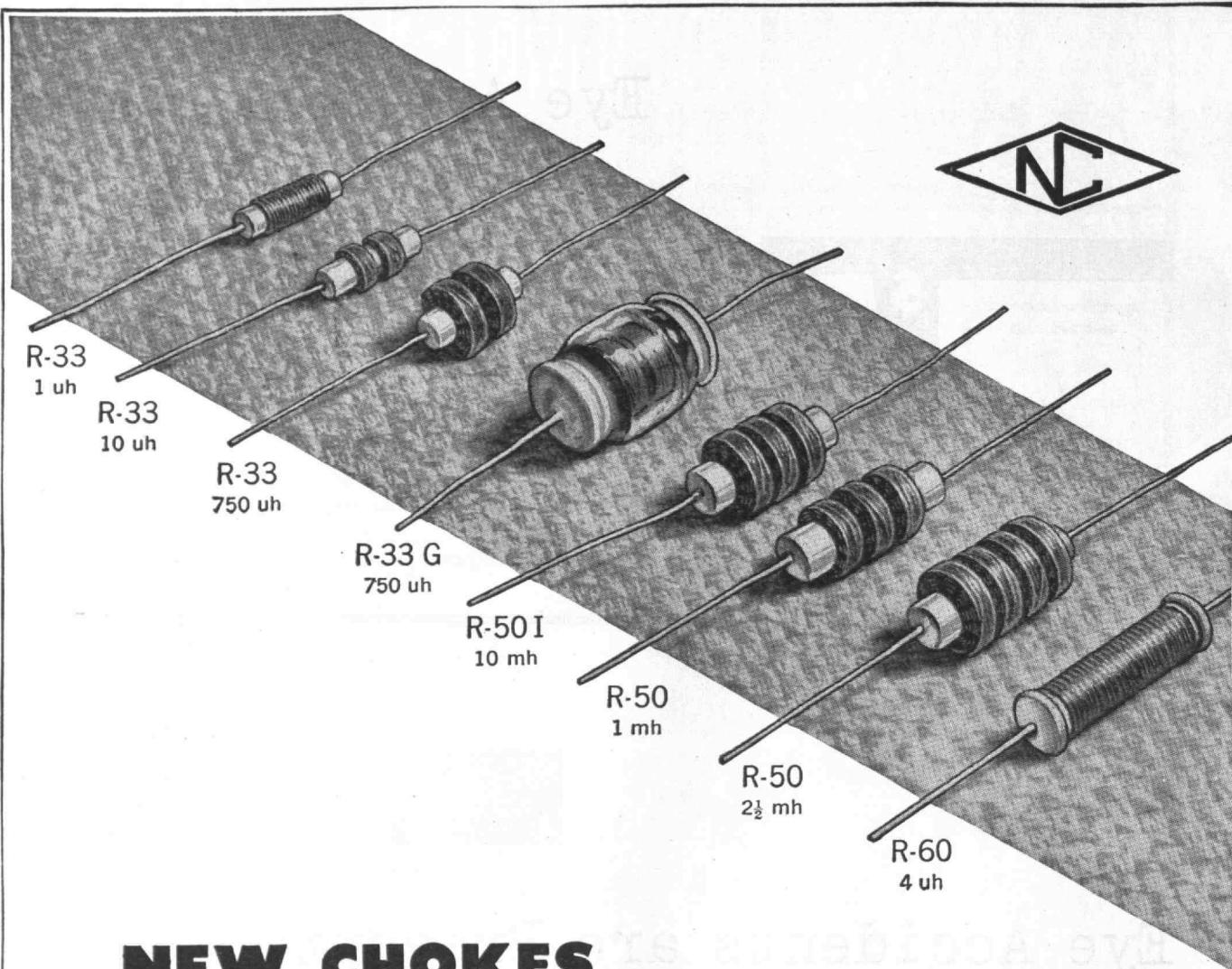
Send to your nearest A-O Safety Representative or direct to American Optical Company, Box T, for a copy of the new booklet, "Eye Accident Costs," which tells how much eye accidents cost, how to prevent them and how much you can save by preventing them.

American  Optical

COMPANY

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BRANCHES IN PRINCIPAL CITIES



## NEW CHOKES

The enlarged line of chokes now offered by National includes many new sizes and types and provides units suited to specialized as well as standard applications. Many popular new chokes are illustrated above, including the R-33G which is hermetically sealed in glass. Other models cover current ratings from 33 to 800 milliamperes in a variety of mountings carefully planned for your convenience. These as well as old favorites like the R-100 are listed in the latest National Catalogue.

**NATIONAL COMPANY, INC., MALDEN, MASS.**





# Are You Acquainted with the **WHOLE Norton Family?**

## ABRASIVE PRODUCTS

Grinding wheels ranging from tiny internals  $3/16 \times 3/16$ " to the 72" diameter segmental type — wheels of Alundum<sup>®</sup>, Crystolon<sup>®</sup> and diamond abrasives, of many different bonds; a wide variety of abrasive bricks, sticks, hones and segments; mounted points and mounted wheels in nearly 200 sizes and shapes; abrasive grain for polishing, lapping and tumbling.

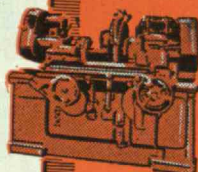
## NORBIDE<sup>®</sup>

"The hardest material made by man for commercial use" — that is NORBIDE, the trade name for Norton Boron Carbide. It is serving industry in three forms: (1) Norbide Abrasive for grinding and lapping carbide tools, and for lapidary work; (2) Norbide Molded Shapes for pressure blast nozzles and for plug, ring and other types of gages; (3) Norbide Metallurgical Compound for improving the hardness and cutting ability of tool steels and as a deoxidizing agent.



## GRINDING AND LAPPING MACHINES

Norton cylindrical grinders range from the neat, compact 4 x 12" Type C to the gigantic 36 x 816" Type D and include special types for grinding crankshafts, camshafts, rolls and car wheels. Norton surface grinders are available in three sizes, 6", 10" and 12". There are three Norton Tool and Cutter Grinders and the Norton Buraway. Lapping Machines range from the small 10-U to the large Hyprolap<sup>®</sup> for flat and cylindrical work, and include special machines for crankshafts and camshafts.



## PULPSTONES

Norton ingenuity developed for the pulp and paper industry a line of segmental stones running as large as 72 x 54" and weighing up to ten tons — stones that convert the logs of the forest into wood pulp for newspaper, wall paper, towels, toilet tissue, cartons, wall board, paper plates and countless other uses.



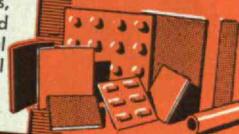
## NORTON FLOORS

The hardness, toughness and abrasive properties of Alundum abrasive are made use of in NORTON FLOORS — Alundum Stair and Floor Tile, Alundum Ceramic Mosaic Tile and Alundum Aggregate for terrazzo and cement floors. They are for use in public and commercial buildings wherever it is necessary to provide floors and stairs with an extremely wear-resisting and permanently non-slip surface (wet or dry).



## POROUS MEDIUMS

Norton Porous Mediums are made in a wide variety of shapes and rates of permeability for the aeration, filtration and diffusion of liquids, solids and gases. Important uses are in activated sludge sewage disposal plants, for municipal water filtration plants and in many commercial filtration and aeration processes.



## REFRACTORIES

The terrific heat of the electric furnaces which produce Alundum and Crystolon abrasives also gives these materials valuable refractory properties — properties which are made use of in a complete line of Norton refractory grain, cements, bricks, plates, tiles and other shapes for metal melting and heat treating, for enameling furnaces, ceramic kilns, boiler furnaces, gas generators; also refractory laboratory ware for ignition, incineration and filtration.



## OILSTONES AND COATED ABRASIVES

Oilstones and sharpening specialties in sizes and shapes to meet every need of the industrial worker, the farmer and the home craftsman; and abrasive paper and cloth in a wide variety of coatings and types for both industry and the home mechanic are available through the Behr-Manning Corporation of Troy, New York, Division of Norton Company.



Informative literature in any or all of these Norton products available on request — also Norton engineering service. Write today.

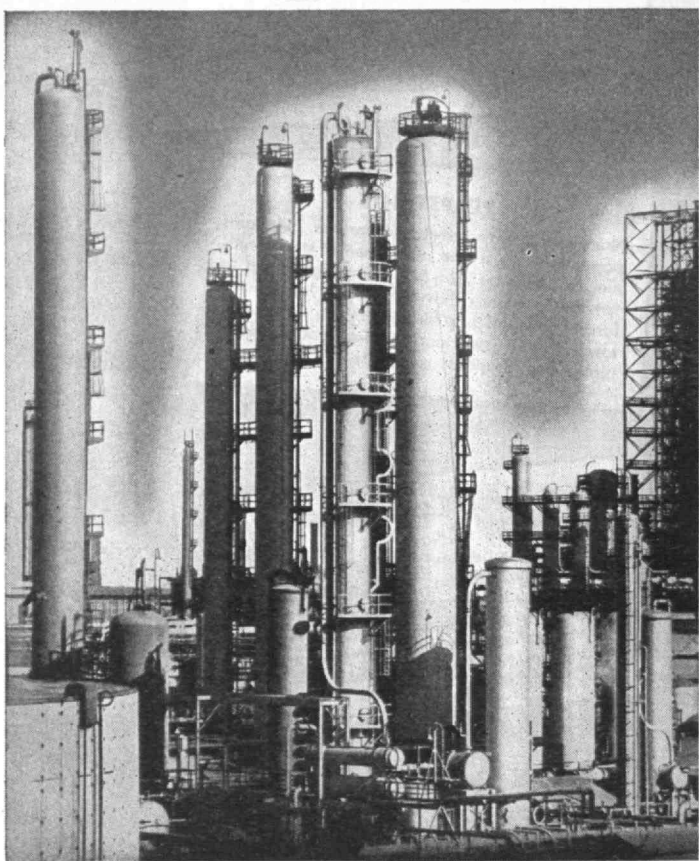
\* Trade-marks registered U. S. Patent Office

**NORTON COMPANY  
WORCESTER 6, MASS.**

**NORTON**



# 6 IN A ROW...



## 6 THERMAL "CRACKERS"... INITIAL RUNS OF MORE THAN 30 DAYS!

A long initial run is the forerunner of satisfactory performance in the long run. An engineering and construction organization whose projects are characterized by long initial runs is, therefore, a good one to build or modernize your refining facilities.

Among the long initial runs which have characterized Lummus construction are those of six thermal cracking units. In chronological order, the initial runs on these units were 33, 35, 39, 49, 65 and 69 days. In each instance the plant was shut down for inspection purposes only.

The latest Lummus catalytic cracking plant ran 240 days on its initial start-up before it was shut down for inspection.

A reputation for long initial runs is only one index by which to judge Lummus engineering and construction. Other indices are: *experience* — Lummus has built over 600 plants throughout the world; *process development* — Lummus pioneered the commercial development of a number of processes now standard; *research and development facilities* — Lummus has complete laboratory and pilot plants for refinery development, plus broad experience required to prepare economic studies of proposed installations.

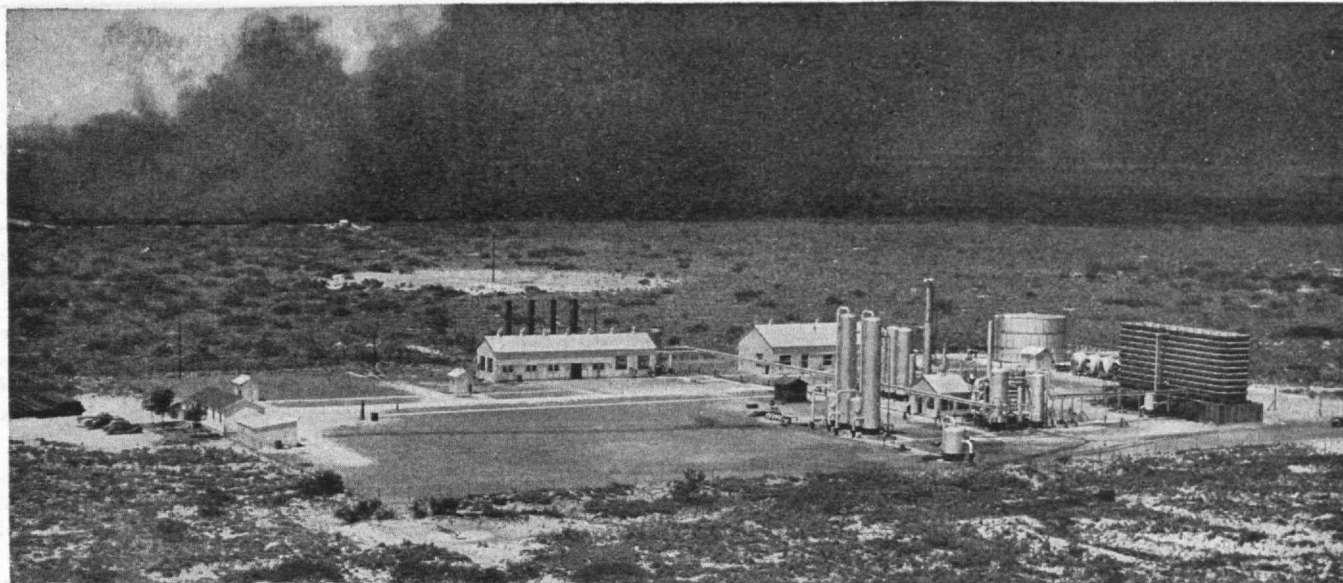
Lummus engineers are available for a discussion of the technological and economic considerations of refinery modernization or new plant construction.

## THE LUMMUS COMPANY

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LUMMUS Petroleum Processes and Plants  
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PETROLEUM REFINING PLANTS



## FOR INDUSTRY

*Carbon Black*  
*Natural Gas*  
*Natural Gasoline*  
*Pumping Equipment*  
*Pine Tar*  
*Charcoal*  
*Carotene*  
*Chlorophyll*



And for conservation too, as these two consecutive Cabot operations in the West Texas oil fields demonstrate. These plants are treating casinghead gas, the "sour" gas whose sulphur content destroys its ordinary industrial value. It is the waste gas which once was blown off in the air or burnt at the wells as a dangerous nuisance.

The Cabot Carbon Company puts this same gas to further valuable uses. First, Cabot plants like Keystone, shown above, strip it of its natural gasoline for the enrichment of distilled motor fuels. Propane and butane also are extracted.

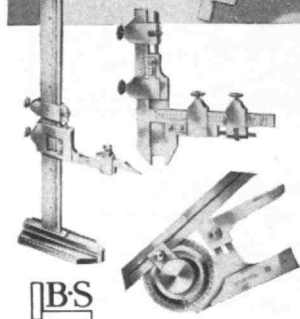
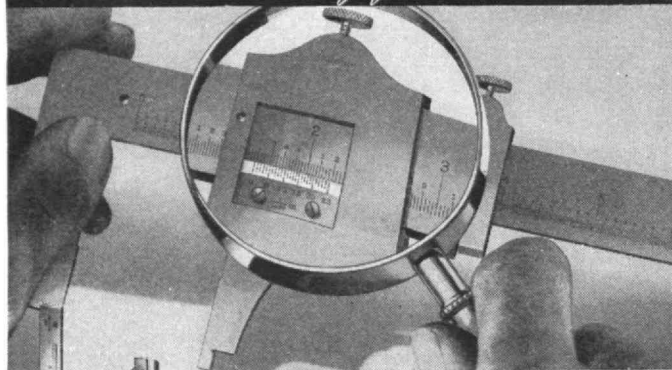
Next, this same gas is burnt at plants like Cabot's Kermit, in the background, in the manufacture of carbon black for rubber, paint, varnish, lacquer and ink. Yet carbon black, natural gasoline, butane and propane are only four of the raw materials which the group of Cabot Companies provides for industry.

**CABOT CARBON CO.**  
**TEXAS ELF CARBON CO.**  
**GENERAL ATLAS CARBON CO.**  
**CABOT SHOPS, INC.**  
**VALLEY VITAMINS, INC.**

**GODFREY L. CABOT, INC.**

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We urge buying through the distributor.

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## RENEWING A RESOLUTION

At the beginning of 1947, Diefendorf renews its resolution: that high standards and strict inspections will be maintained at all times; that every gearing problem will be given the engineering skill that comes of long experience.

Diefendorf Gear Corp.  
D. W. Diefendorf '30, President  
Syracuse 1, New York



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## THE TABULAR VIEW

**American Sidewheelers.** — H. E. Lobdell, '17, Executive Vice-president of the Alumni Association and publisher of the Technology Review (whose biography appears in greater detail on pages 104-105 of the December issue) brings to this issue a product of his hobby of stamp collecting. Based on a study of the postal history of foreign ports in China and Japan, *Orient Mails "Via Pacific"* (page 151) deals with significant matters of trade and technology in opening the Orient to American commerce and mail some eight decades back. A definitive article, emphasizing the postal aspects of the same study, has appeared by Mr. Lobdell in the yearbook of the Twelfth American Philatelic Congress.

**Antibiotic Metabolites.** — As sequel to his article on penicillin in the March 1944 issue of *The Review*, Dr. Rudolf E. Gruber, '16, discusses recent advances in the production and use of penicillin and streptomycin (page 155). From his vantage point as Vice-president of Merck and Company, Dr. Gruber speaks with authority of intimate knowledge of these two war-developed therapeutics, whose beneficial results have attracted widespread comment.

**Dust Removal.** — Well known to Review readers as a Swiss-trained engineer, Dr. Sigfried Giedion has returned to Zurich after spending several years in the United States carrying on research for his new book — soon to bear the imprint of Oxford University Press — in which he surveys the impact of mechanization on the culture of our times. *Vacuum in the Home* (page 157) is excerpted from the section dealing with origins, premises and trends of mechanization in the household, with the permission of the publisher and the co-operation of Dr. Giedion's American representative, James Martin.

**Absolute Zero.** — Having taught physics and chemistry at several universities — including M.I.T. where he joined the department of chemistry in 1930 — S. C. Collins is now associate professor of mechanical engineering and deeply engrossed in low temperature research. Recent research which Dr. Collins records (page 161) opens up new industrial operations by making available large quantities of oxygen at low cost. The greatest significance of his work, however, is undoubtedly the new knowledge of the behavior of matter which will come to light with the creation of new techniques for working at temperatures near absolute zero.

## Speed with Economy

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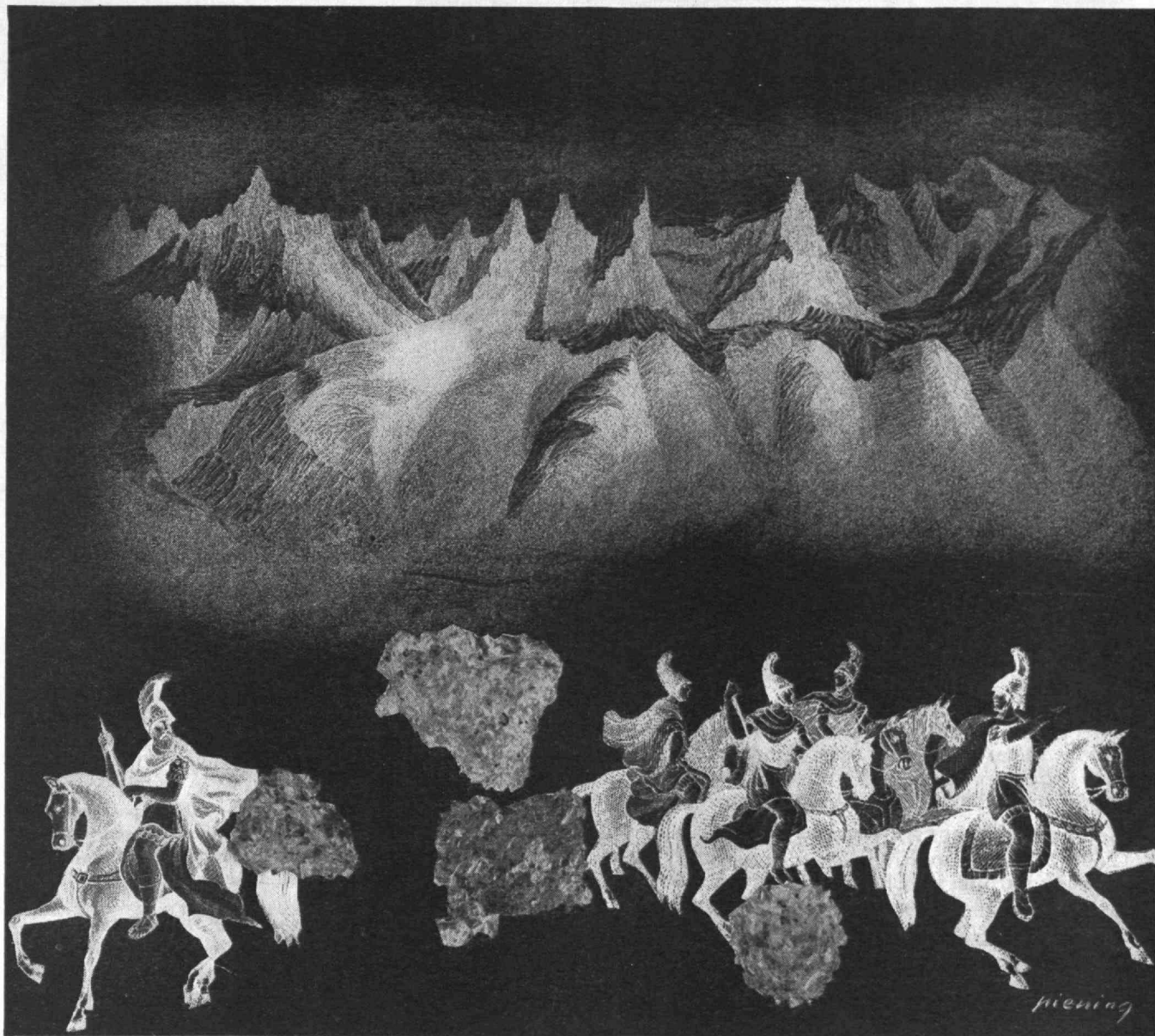


## HANNIBAL'S FROZEN ASSET

The Romans smugly thought the icy barrier of the Alps impassable. But Hannibal turned the paralyzing cold to his advantage. He had water poured into the crevices of road-blocking boulders. The expansion of the freezing water "made little ones out of big ones"—and another road led to Rome. Low temperature, which worked to Hannibal's advantage, is a distinct disadvantage to operating machinery. Under low temperature conditions, some steels that may perform

perfectly at ordinary temperatures, develop unsuspected weakness. There is always danger of a parts failure under such conditions.

One way to assure good performance at low temperatures is to specify molybdenum steels. Good hardenability plus freedom from temper brittleness give them good low temperature impact strength. They are a precaution it pays not to ignore. Practical working data are available on request.

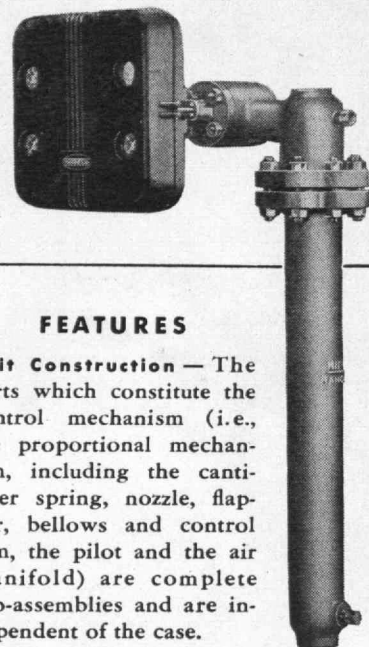
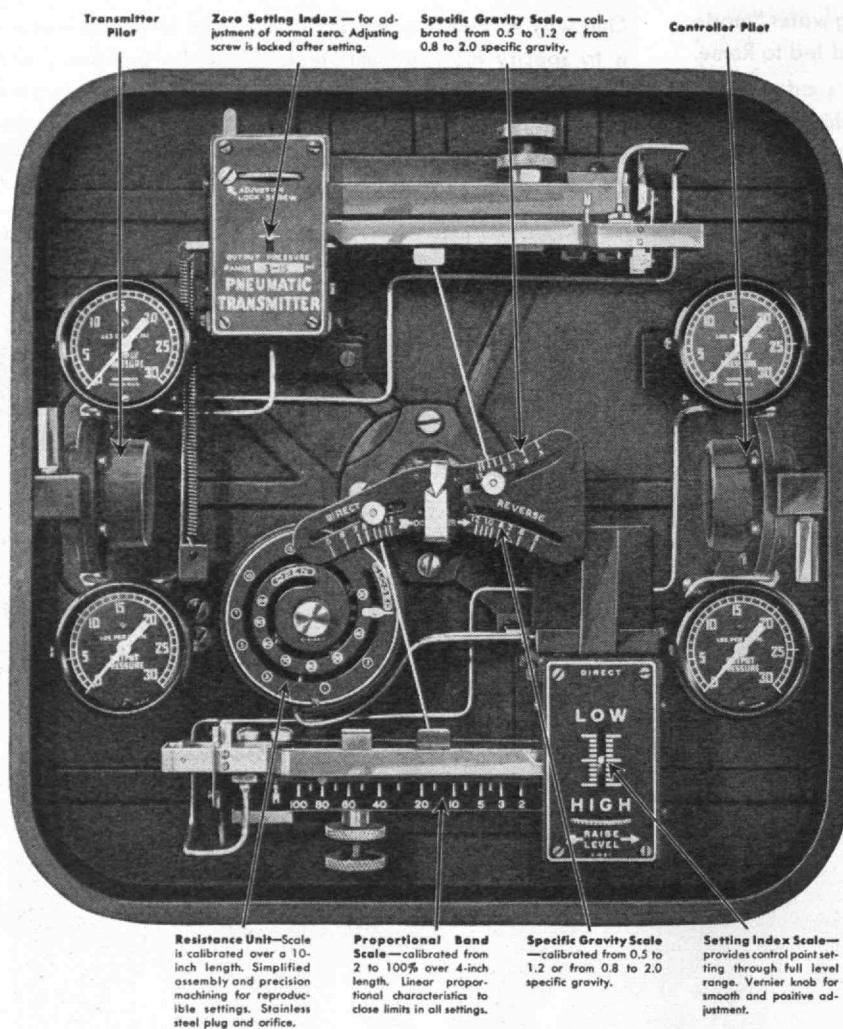


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# Remote Pneumatic Level Indication

## WITH 12000 SERIES LEVEL CONTROLLERS



### FEATURES

**Unit Construction** — The parts which constitute the control mechanism (i.e., the proportional mechanism, including the cantilever spring, nozzle, flapper, bellows and control arm, the pilot and the air manifold) are complete sub-assemblies and are independent of the case.

**Pilot** — The large capacity pilot is fastened directly to the air manifold by means of two screws, eliminating any major air tubing connections and facilitating removal. Simplified construction permits disassembly in the field for cleaning.

**Air Passages** — All air passages are bronze or copper, preventing the formation of scale or rust beyond the air filter in the supply line.

**Knife-Edge and Flexure Bearings** — The lost motion and friction is reduced to such a point by the use of knife-edge and flexure bearings that the response to changes in level is practically instantaneous.

**Torque Tube Sub-Assembly** — All parts of the torque tube sub-assembly are of inconel and are fused together by the atomic-hydrogen arc welding process. Monel and stainless steel assemblies also available.

The 12600-20 Series of Level Controller-Transmitters have been developed in order to provide level indication or recording in addition to the primary function of controlling level. The Controller-Transmitter provides increased flexibility to meet process requirements.

**CONTROLLER MECHANISM** — available with either proportional (12600-20) or proportional-reset (12610-20) action. All features of the basic controller have been retained, e.g. the easily calibrated specific gravity scale, the proportional mechanism, the large capacity balanced pilot, the vernier control point setting, the reversible control action.

**TRANSMITTER MECHANISM** — operates from the same measuring element, that is, from the same displacer and torque tube assembly. Otherwise, it is completely independent from the controller mechanism. Separate supply and output gauges have been provided to simplify operation and servicing.



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