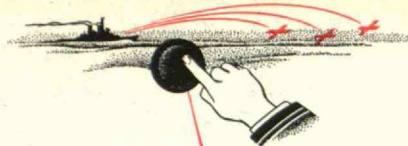


TECHNOLOGY

REVIEW

July 1954





HERE'S

HOW KETAY FIRE CONTROL RELAYS

keep naval guns "ON TARGET"

... with MPB bearings

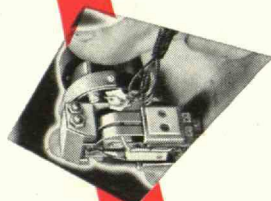
ACTUAL SIZE MPB 3C

accurate concentricity

of miniature bearing roller guides

increases relay sensitivity

and dependability



Fire control relay designed and manufactured by Ketay Manufacturing Corporation of New York.

OPERATING CONDITIONS — maximum sensitivity and consistency of response depend on free-rolling, concentrically accurate bearings . . . bearings serve as rollers and guides for rotating armature shaft which is displaced right and left to close desired circuits . . . unit actuated by 3 to 40 volts. **CRITICAL** — low-friction bearing rotation . . . ability to withstand 2,000 ft.-lbs. shock (equal to recoil of 16 in. naval guns), plus temperature changes from -55°C to $+71^{\circ}\text{C}$. . . long wear and attention-free bearing operation. **RESOLVED** — by use of MPB No. 3C, radial retainer bearing.

In any problem involving miniaturization of precision mechanisms, when accuracy and dependability are essential, it pays to specify MPB miniature ball bearings. Each MPB bearing is the product of exclusive production processes, designed to hold ultra-precise tolerances . . . give long, trouble-free operation.

For design ideas, get the most complete information ever offered on miniature bearings. Request, on your letterhead, MPB catalog —54d.

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or write for copy

Miniature Precision Bearings, Inc.



Keene, New Hampshire

LUMMUS COKING UNITS

give top performance for

Pan-Am Southern

Lummus has built two delayed coking units for Pan-Am Southern Corporation in the past few years, one at El Dorado, Arkansas, and the other at Destrehan, Louisiana... and Pan-Am Southern is well satisfied with them.

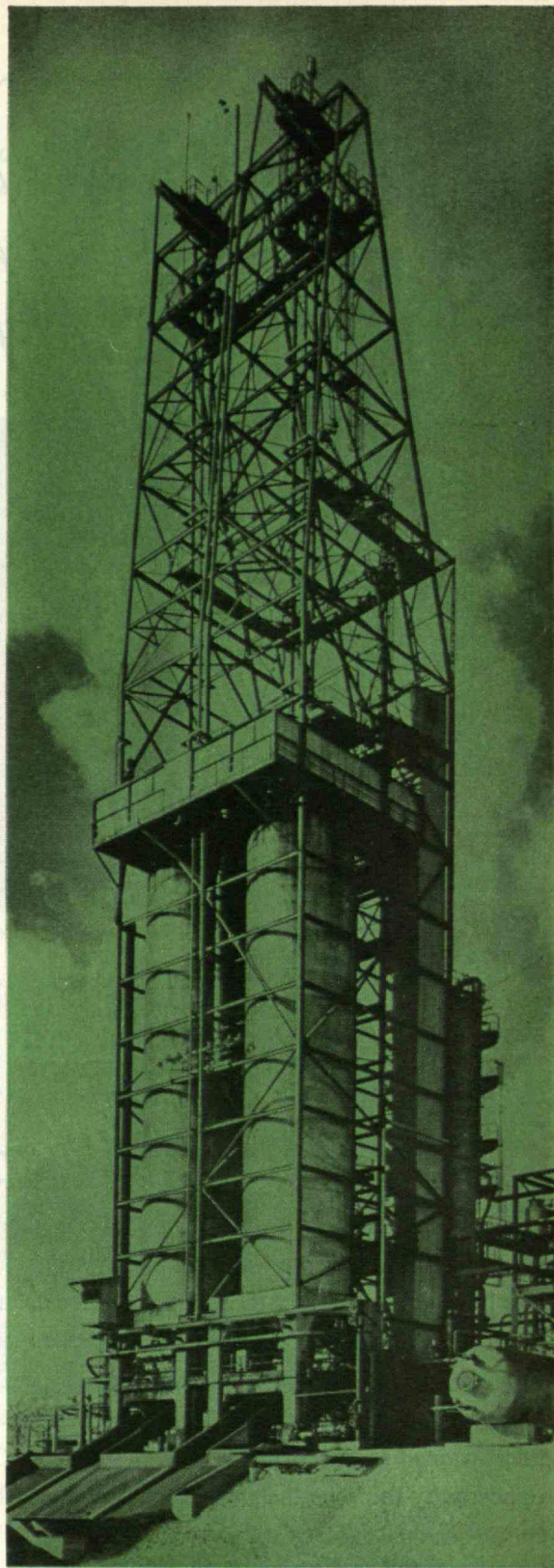
The El Dorado unit, despite a 42 day steel strike during the construction period, was completed ahead of the specified date, and for less than the guaranteed maximum cost. It was designed to charge 9,300 B/D of reduced crudes, but since coming on-stream, the daily rate has averaged 10% above the designed capacity. The unit went on-stream immediately and operated 181 out of the first 199 days after completion (a 91% service factor). In the first half of 1953, it achieved and has since averaged a 97% service factor (224 day run, 6 day down-time). On-stream maintenance and repair costs are correspondingly low.

Gas oil from the coker (53% yield of reduced crude charge) is used for catalytic cracking charge stock where its low Conradson carbon allows it to be processed without penalty. Yield structure compares favorably with that obtained from catalytic cracking of virgin gas oil. The coke produced in the process is of sufficiently high quality for use in the manufacture of electrodes for aluminum production.

The new (and similar) Destrehan installation is achieving equally satisfactory records.

Lummus engineers have done an outstanding job for Pan-Am Southern. Why not consult with Lummus on your next coking project?

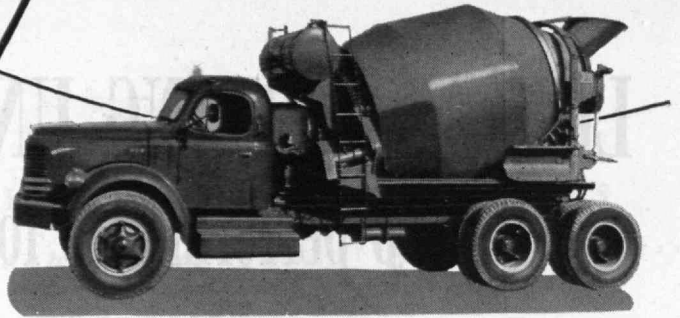
THE LUMMUS COMPANY, 385 Madison Avenue, New York 17, New York. *Engineering and Sales Offices:* New York, Houston, Montreal, London, Paris. *Sales Offices:* Chicago, Caracas. *Heat Exchanger Plant:* Honesdale, Pa. *Fabricated Piping Plant:* East Chicago, Indiana.



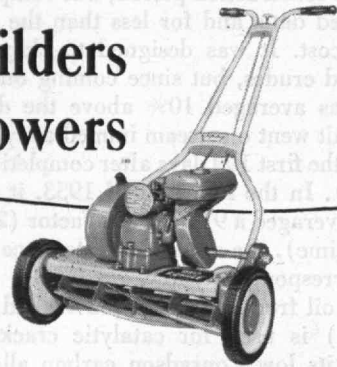
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World's Largest Builders of Power Lawn Mowers



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Good to Know that the technical ability you have developed and the skills you have acquired are really wanted, and needed. And to know that nowhere in American industry is a higher premium placed on top engineering and technical ability than at REO. M.I.T. men are among the finest trained engineers in the world, and at REO they find full opportunity to prove their worth and establish their future.

It's Also Good to Know that ability is rewarded, and that at REO you are not just another cog in the machine, but an important part of an important operation. Your climb up the ladder of success is largely dependent on you, but at REO you get every help and assist that anyone could ask for.

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REO

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Joseph S. Sherer, Jr.

Class of 1923

President and General Manager

William Walworth

Class of 1926

Vice President, Engineering

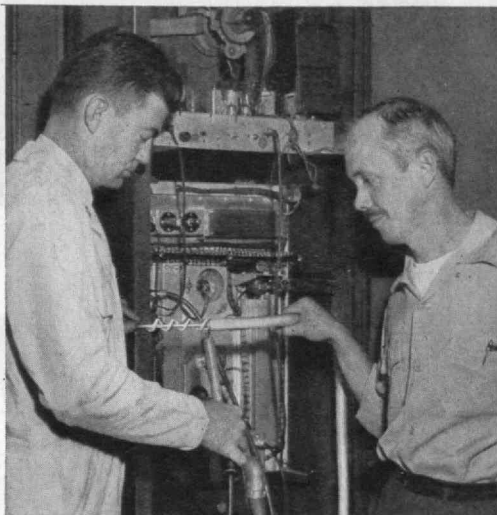
Paul H. Rosenberg

Class of 1937

Chief Engineer
Lawn Mower Division

Styroflex Coaxial Cable

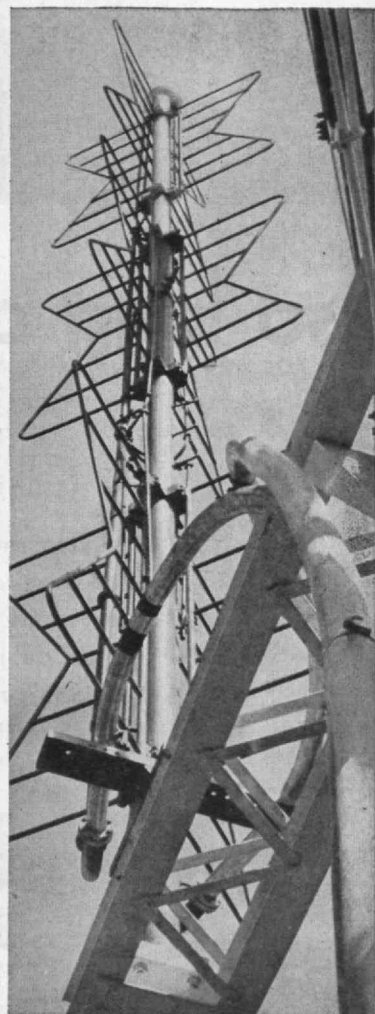
has many applications in the communication field!



Mobile Pickup



Community Antenna



Television Broadcast

Microwave

Styroflex, with its unique design, provides efficient, dependable service . . . has won the enthusiastic support of engineers as a result of successful installations throughout the communication field.

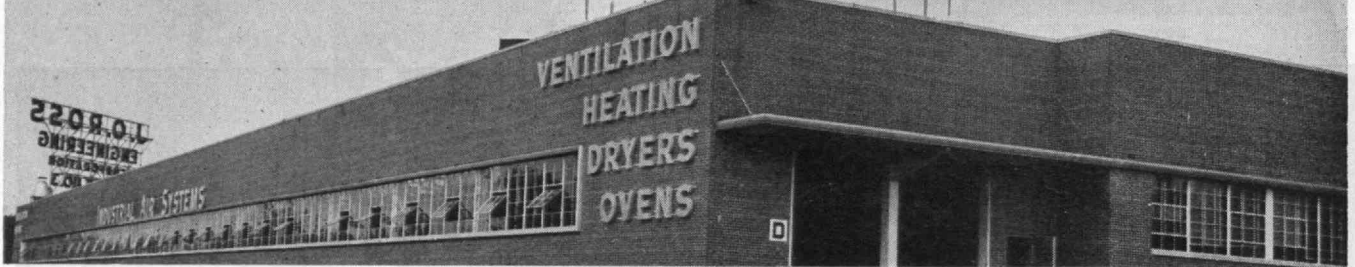
PHELPS DODGE COPPER PRODUCTS
CORPORATION

40 WALL STREET, NEW YORK 5, N. Y.



The ROSS plant and laboratory
at New Brunswick, N. J., built
in 1952.

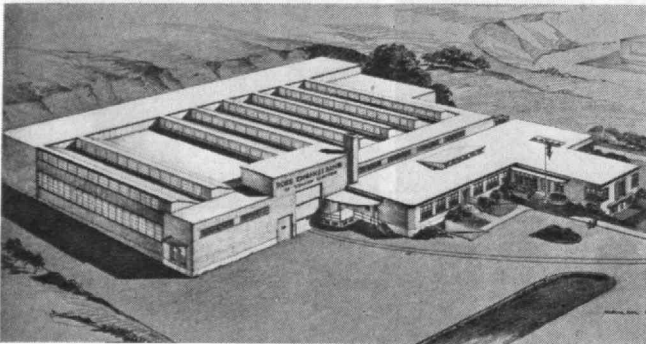
J. O. ROSS ENGINEERING CORPORATION PLANT NO. 3



so long a leader
and still

Growing!

Year after year since 1921 the business of J. O. Ross Engineering Corporation has been called upon to serve a steadily widening field for its products and services. One after another new ROSS manufacturing plants have had to be built and new ROSS branch offices opened to keep apace with the increasing volume of orders for ROSS AIR SYSTEMS throughout the world. Our fourth new plant is now under construction—our eleventh branch office already opened. Still Growing!



Fine modern ROSS plant located
near Montreal, Canada.



Newest ROSS plant now being completed
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CARRIER-ROSS ENGINEERING COMPANY, LIMITED, LONDON, ENGLAND

the **Van de Graaff**[®]

... ideal radiation source

for
FUNDAMENTAL
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APPLIED RESEARCH
meets these
stringent
requirements

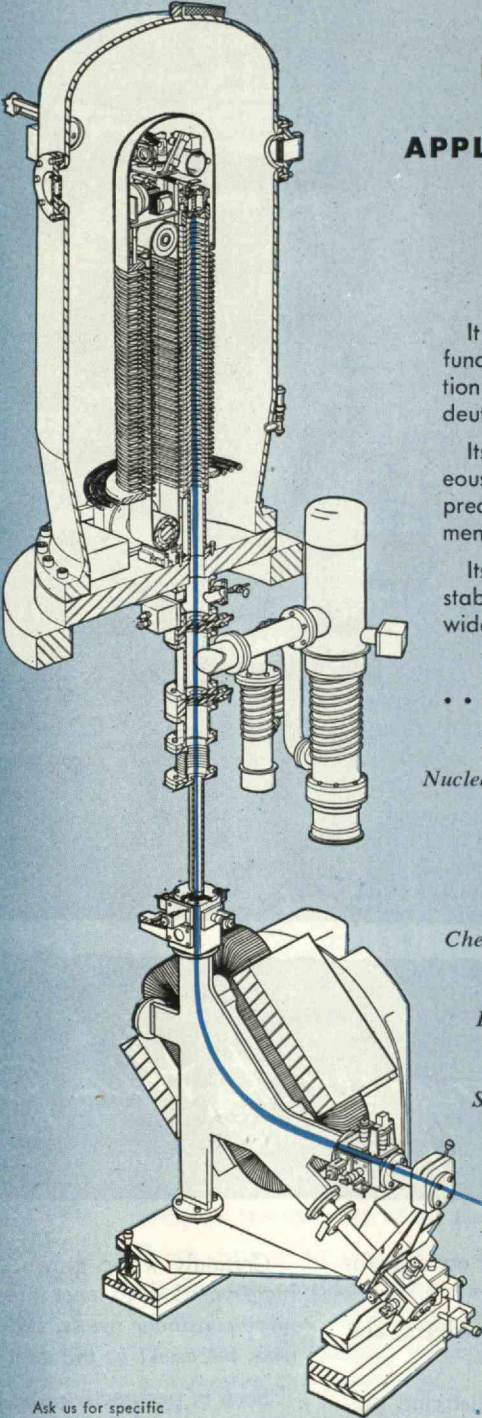
It produces a beam of any fundamental particle or radiation—electrons, x-rays, protons, deuterons, tritons, neutrons.

Its beam is intense, homogeneous, of known energy, and of predictable direction and dimensions.

Its beam characteristics are stable and controllable over a wide range of energies.

... now used in these applications

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- Cancer therapy ●
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- Radiation chemistry ●
- Chemical analysis of surface films ●
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- Industrial radiography ●
- Sterilization of foods and drugs ●
- Instrument calibration ●
- Radiation standards ●
- Injectors for giant accelerators ●
- Metallurgical research ●
- Radiation damage ●
- Geophysical research ●
- Fundamental problems in physics and chemistry ●

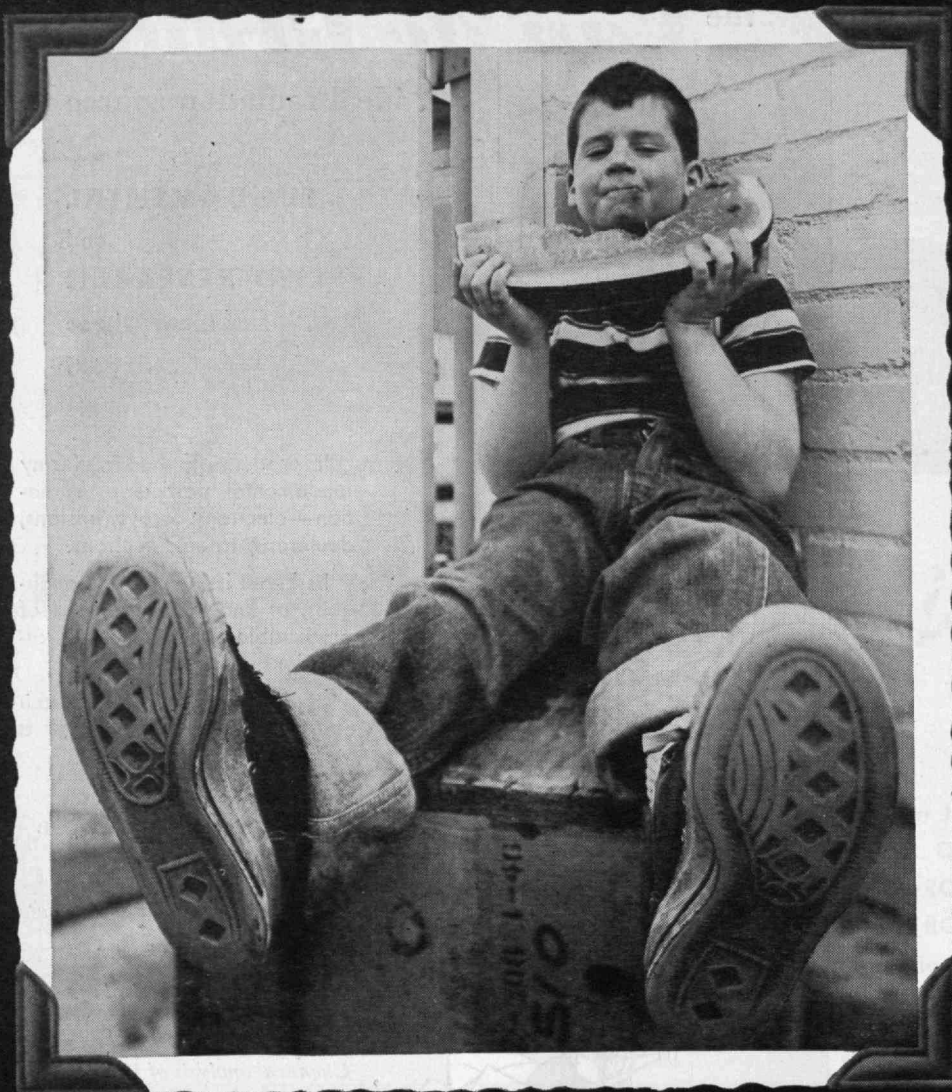


Ask us for specific recommendations on the application of Van de Graaff particle accelerators in your radiation engineering program.

HIGH VOLTAGE ENGINEERING CORPORATION

7 UNIVERSITY ROAD

CAMBRIDGE 38, MASSACHUSETTS



What's wrong with this picture?

You probably have a snapshot like it in your own photograph album.

It happens when you get too close to your subject, and the camera can't handle the perspective.

In another sense, you can get an equally distorted picture of the modern corporation. For viewed too close-up, it frequently looks bigger than it is.

Take Union Oil. In 1910—when we did but a \$12,000,000 volume—we seemed much smaller. *Yet at the time this was 23% of the total petroleum business in the western states.*

In 1953 we looked much bigger because we did a whopping \$325,000,000 volume. *But this was only 13% of the petroleum business in the West.*

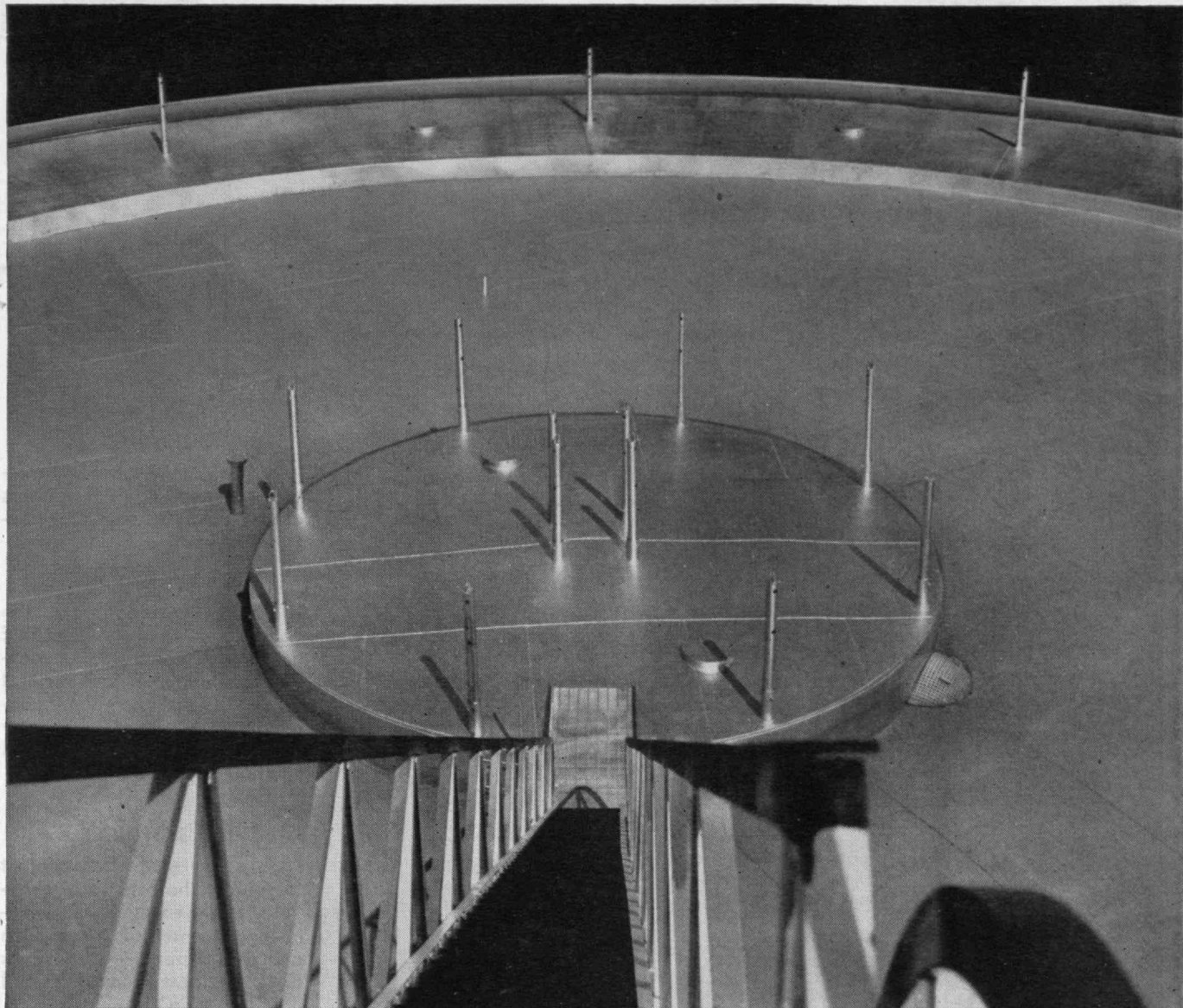
Certainly we've grown. We've *had* to grow to serve a bigger market, to meet increased competition and to satisfy more consumer needs. *But in proportion to the total business, we aren't as big as we were 44 years ago.*

Seen in perspective, the picture is clear: Union Oil, like so many so-called "big" companies, is really getting smaller all the time!

UNION OIL 76 COMPANY
OF CALIFORNIA



Buy American and protect your standard of living

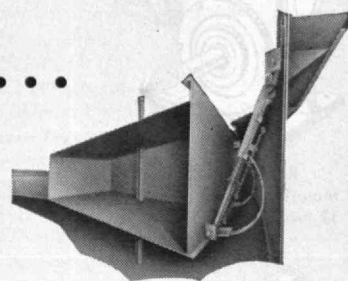


You are looking down...

into a Graver Center-Weighted "Floater." It's a well-built tank especially designed to conserve volatile vapors by means of Graver's own "Vapor-Stop" Seal—the improved seal which maintains firm closure between the floating roof and the shell. This patented Graver seal mechanism is an integral part of all Graver Float-

ing Roof designs. It is flexible, yet firm—tight, yet responsive. It provides centering action for the roof and prevents the entrance of air and rain.

From time to time you may expect similar technological improvements from Graver...where increasing emphasis will continue to be placed on research and development.



Graver's "Vapor-Stop" Seal!

The seal is free and limber, yet continues to close the gap and prevent loss of vapors. It is successful on both converted tank shells and new construction.

GRAVER

...a conservation design to fit every need

GRAVER TANK & MFG. CO., INC.

East Chicago, Indiana.

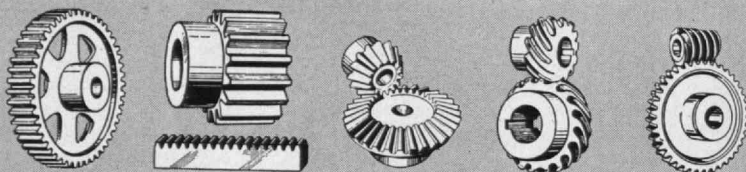
NEW YORK • CHICAGO • PHILADELPHIA • ATLANTA • DETROIT • CLEVELAND • PITTSBURGH
HOUSTON • CATASAUQUA, PA. • SAND SPRINGS, OKLA. • CASPER, WYO. • ODESSA, TEXAS
LOS ANGELES • SAN FRANCISCO • FONTANA, CALIF. • EDGE MOOR, DEL. • TULSA

First choice of cost-wise buyers

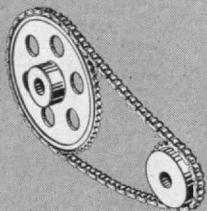
STANDARDIZED STOCK

BOSTON *gear*[®]
PRODUCTS

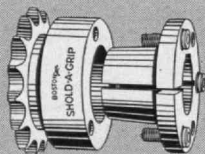
For new assemblies — for all maintenance



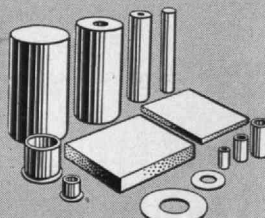
STOCK GEARS: Spur • Racks • Miter • Bevel • Helical • Worms and Worm Gears



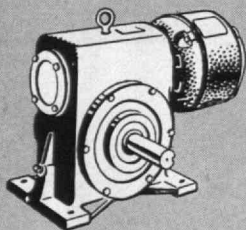
SPROCKETS and CHAIN
For drives ranging
from fractional to 40 hp



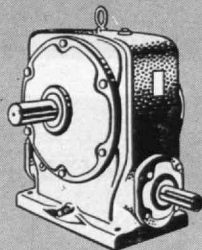
Eliminates re-boring
SHOLD-A-GRIP
Interchangeable Tapered
BUSHINGS and SPROCKETS
Fit $\frac{1}{2}$ " to $1\frac{1}{4}$ " pitch sprockets
to any shafts $\frac{1}{2}$ " to $2\frac{1}{2}$ " by 16ths



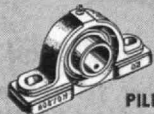
BOST-BRONZE
oil-impregnated
BEARINGS



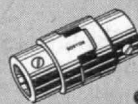
RATIOMOTORS
Motorized Speed Reducers
32 types—1/20 hp to 3 hp



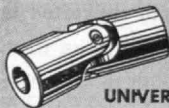
REDUCTORS
Standardized Speed Reducers
.005 hp to 36 hp



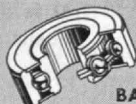
PILLOW BLOCKS



COUPLINGS



UNIVERSAL JOINTS



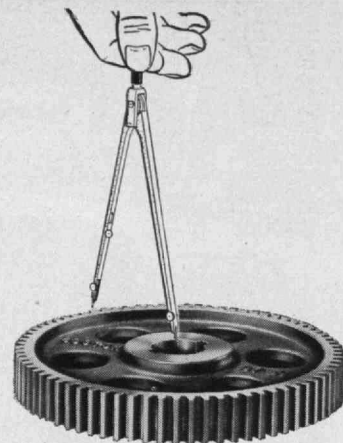
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