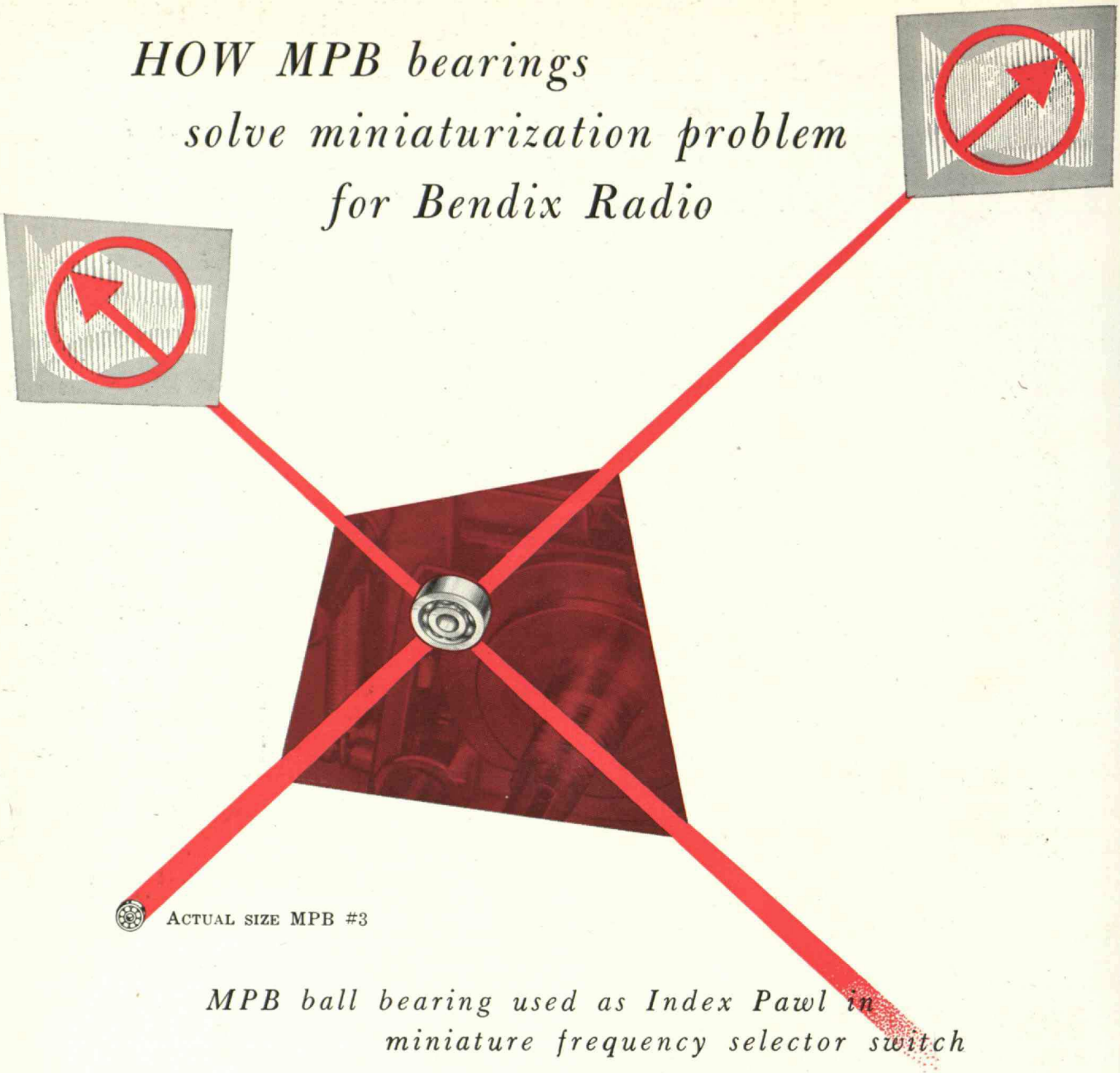
TECHNOLOGY REVIEW

December 1954

HOW MPB bearings solve miniaturization problem for Bendix Radio



ACTUAL SIZE MPB #3

MPB ball bearing used as Index Pawl in miniature frequency selector switch

OPERATING CONDITIONS — miniature ball bearing serves as index pawl in 4-position indexing device . . . bearing travels at 936 r.p.m. CRITICAL — low starting torque, low friction rotation . . . high impact loads . . . long, trouble-free bearing life. RESOLVED — by use of MPB No. 3, .1875″ o.d. full-race bearing.

To quote Mr. John F. Wroten, Jr., mechanical engineer with Bendix Radio Division, these are some of the reasons why MPB bearings were selected in the miniaturization of their frequency selector switch: "The low friction rotation of the bearing practically eliminates drag in the indexing action, and reduces to a minimum the amount of power required for disengagement. Also, the bearing displays unusually high resistance to the frequent impact loads a detent stop of this kind must withstand . . . . Because rolling contact occurs between the pawl and the plate, the plate can be made of soft stainless steel."

For problems involving miniaturization, consult MPB, pioneer manufacturer of miniature ball bearings.

Miniature *Precision* Bearings, Inc., 103 Carpenter St., Keene, N. H.

MPB

THE TECHNOLOGY REVIEW, December, 1954, Vol. LVII, No. 2. Published monthly from November to July inclusive at Emmett Street, Bristol, Conn. Publication date: twenty-seventh of the month preceding date of issue. Annual subscription $4.00. Canadian and Foreign subscription $4.50. Entered as second-class matter December 23, 1949, at the Post Office at Bristol, Conn., under the Act of March 3, 1879.

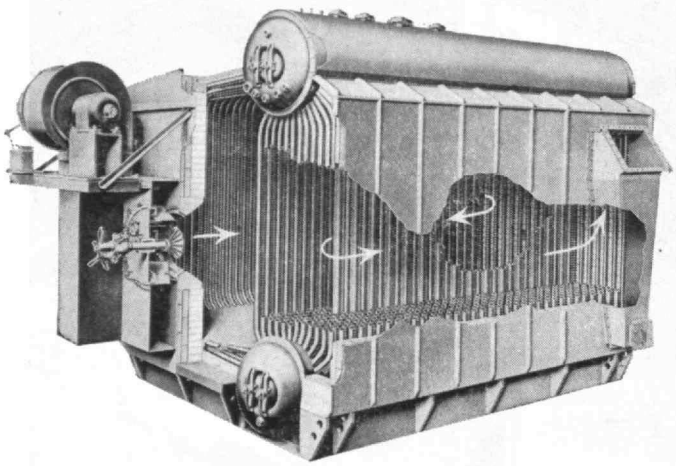
FOR STEAM CAPACITY up to 60,000 POUNDS

Choose your boiler from these two

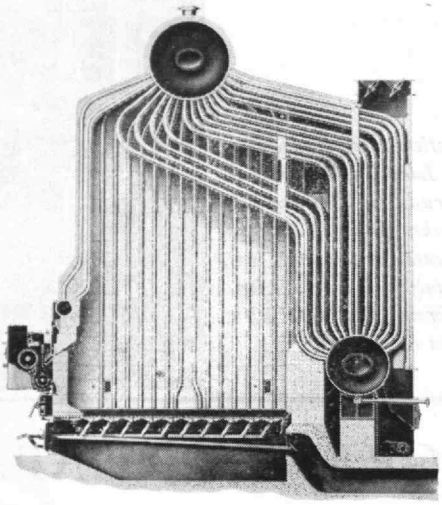
If you burn oil or gas, investigate the VP Package Boiler for capacities up to 30,000 pounds per hr . . . the VU-10 up to 60,000 pounds.

For stoker firing, the VU-10 is available from 10,000 to 60,000 pounds of steam per hour.

Whatever your fuel . . . whatever your steam capacity requirements up to 60,000 pounds per hour . . . you'll find that one of the Combustion Engineering Boilers described below will be just right for you.



The VP Boiler — the Package Boiler with EXTRA Features



The VU-10 Boiler, as arranged for C-E Spreader Stoker firing

The VP boiler

The C-E Package Boiler, type VP . . . completely shop-assembled . . . for oil or gas firing. It is available in capacities from 4,000 to 30,000 lb steam per hr; for pressures to 500 psi. The VP Boiler has more water-cooled area per cubic foot of furnace volume than any other boiler of its size and type. The large (30-in. diameter) lower drum permits a simple, symmetrical tube arrangement . . . greater water storage capacity . . . easy access for washing down or inspection. The centrifugal fan is efficient, yet its noise level is less than half that of typical high-speed blowers used on most package boilers. Baffle arrangement is simple, resulting in low draft loss . . . simple soot blowing . . . elimination of dead pockets . . . high heat absorption.

The VU-10 boiler

The VU-10 Boiler is designed for industrial load conditions, particularly for plants with small operating and maintenance forces. Capacities range from 10,000 to 60,000 lb steam per hr . . . pressures to 475 psi . . . heat recovery equipment is available if desired. Fuel can be either coal (C-E Spreader, Traveling Grate or Underfeed Stoker) oil or gas. This boiler is a completely standardized design adaptable to many conditions. It responds readily to variations in load; it is simple to operate and maintain. All parts are easily accessible for inspection. Like the VP, the VU-10 Boiler is a complete unit — boiler, furnace setting, fuel-burning equipment, controls, forced draft — bringing you the benefit of one contract . . . one responsibility.

Fully descriptive catalogs are available on both of these boilers. We'll be happy to send yours upon request.

COMBUSTION ENGINEERING

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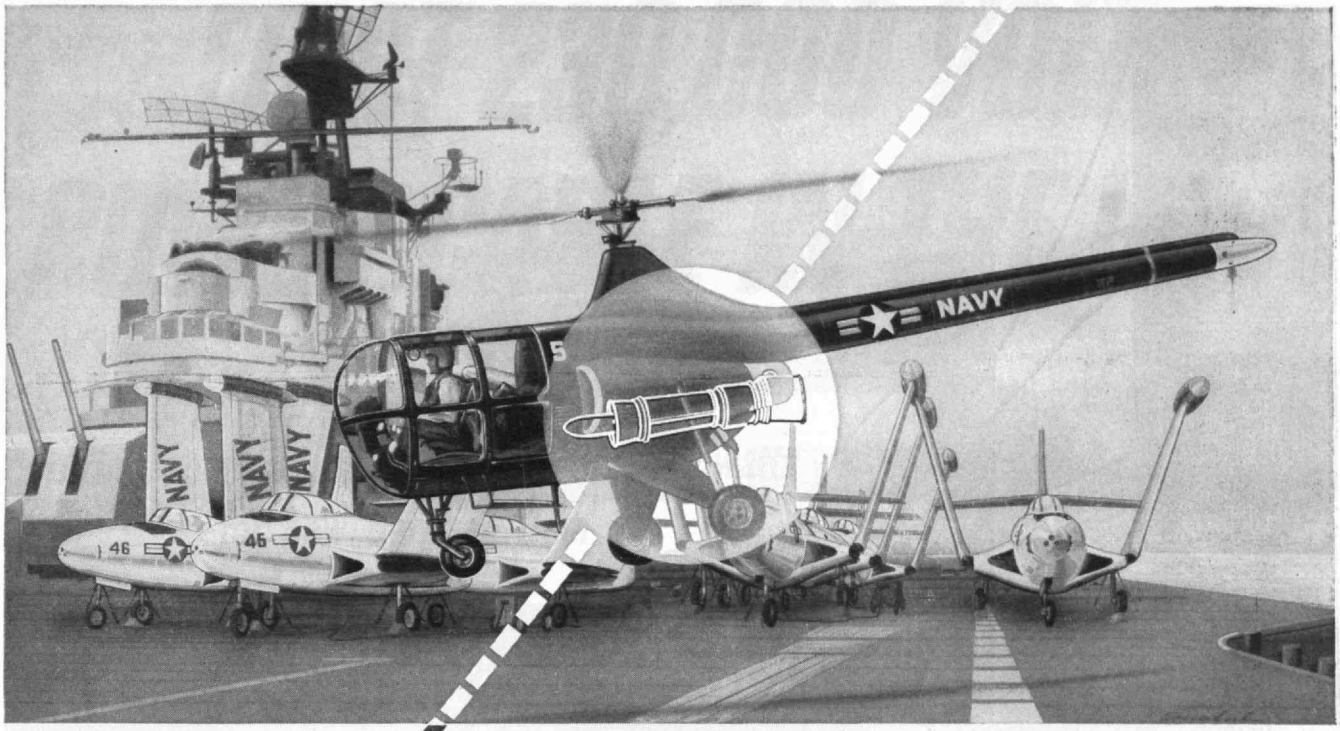
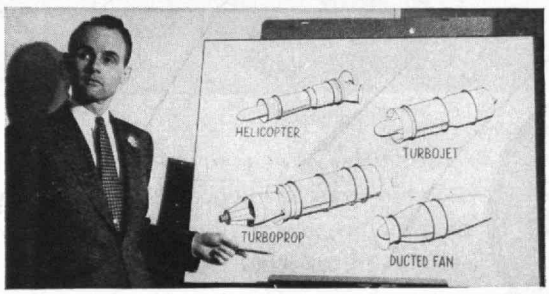
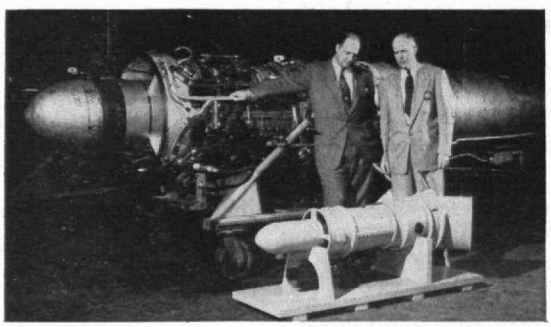
BOILERS, FUEL BURNING & RELATED EQUIPMENT; PULVERIZERS, AIR SEPARATORS & FLASH DRYING SYSTEMS; PRESSURE VESSELS; AUTOMATIC WATER HEATERS; SOIL PIPE



New Small Aircraft Gas Turbine Developments Create Opportunities For You At General Electric



Small Power plants under development or study by G. E. include these engines for use on helicopters, fighters, trainers, transports, missiles and dromes.



You will work on XT-58 **Helicopter Engine** being developed for U. S. Navy as shown above in front of J47-GE-17 jet engine, or on other small engines and related developments.

You can now join General Electric engineers who once again lead the way into new fields of aircraft propulsion. A new and expanding department offers the stability of employment traditionally provided General Electric professional people in addition to individual professional development and an opportunity for self-expression and rapid advancement. Investigating a variety of power plant systems is providing challenging problems in mechanical design, aerodynamics, control design and other related fields. This work combines the great potential of the gas turbine with the interesting and progressive field of aeronautics.

Located in New England, the G-E Small Aircraft Engine Department with its current staff of outstanding men in the field of propulsion systems is seeking to fill positions of responsibility. Work is being carried on under contract in areas of design, development and manufacture affording an opportunity for all phases of engineering activity.

For Further Information Contact

David B. Price
Small Aircraft Engine Department
1000 Western Avenue
West Lynn, Massachusetts

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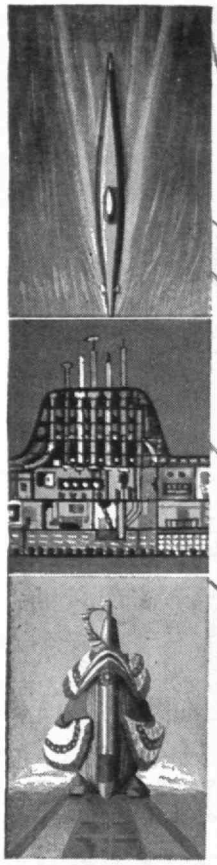

EB

ELECTRIC BOAT

U.S.S. NAUTILUS

WORLD'S FIRST NUCLEAR POWERED VESSEL

dynamics for defense

On May 17, 1897, the New York Times reported the launching of the "Holland"—"the little cigar-shaped vessel... which may or may not play an important part in the building of the navies of the world..."

Since then, Electric Boat has built 226 submarines for the United States Navy and more than 100 for friendly foreign nations. Today, EB leads in the application of nuclear energy to propulsion with the world's first atomic-powered vessels, the U.S. Navy submarines "Nautilus" and "Sea Wolf".

For 74 years, divisions of Dynamics have pioneered in hydrodynamics, electrodynamics, aerodynamics and nuclear dynamics. In 1954, under the group concept of "Dynamics for Defense", they continue to make new and notable contributions to the military security and industrial progress of the nation.

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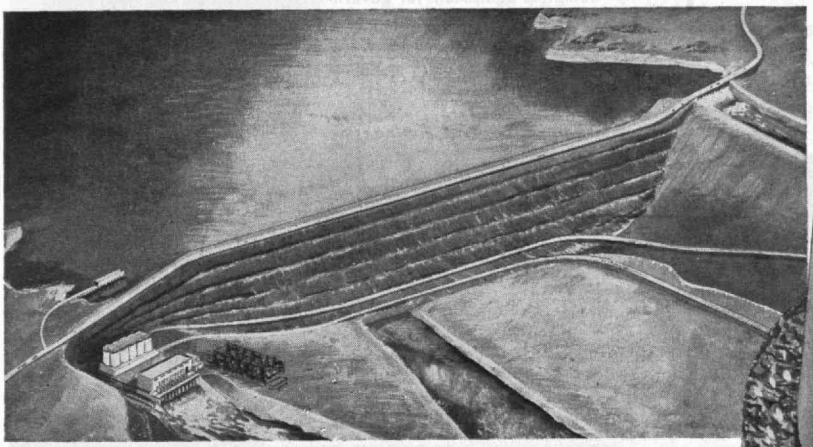
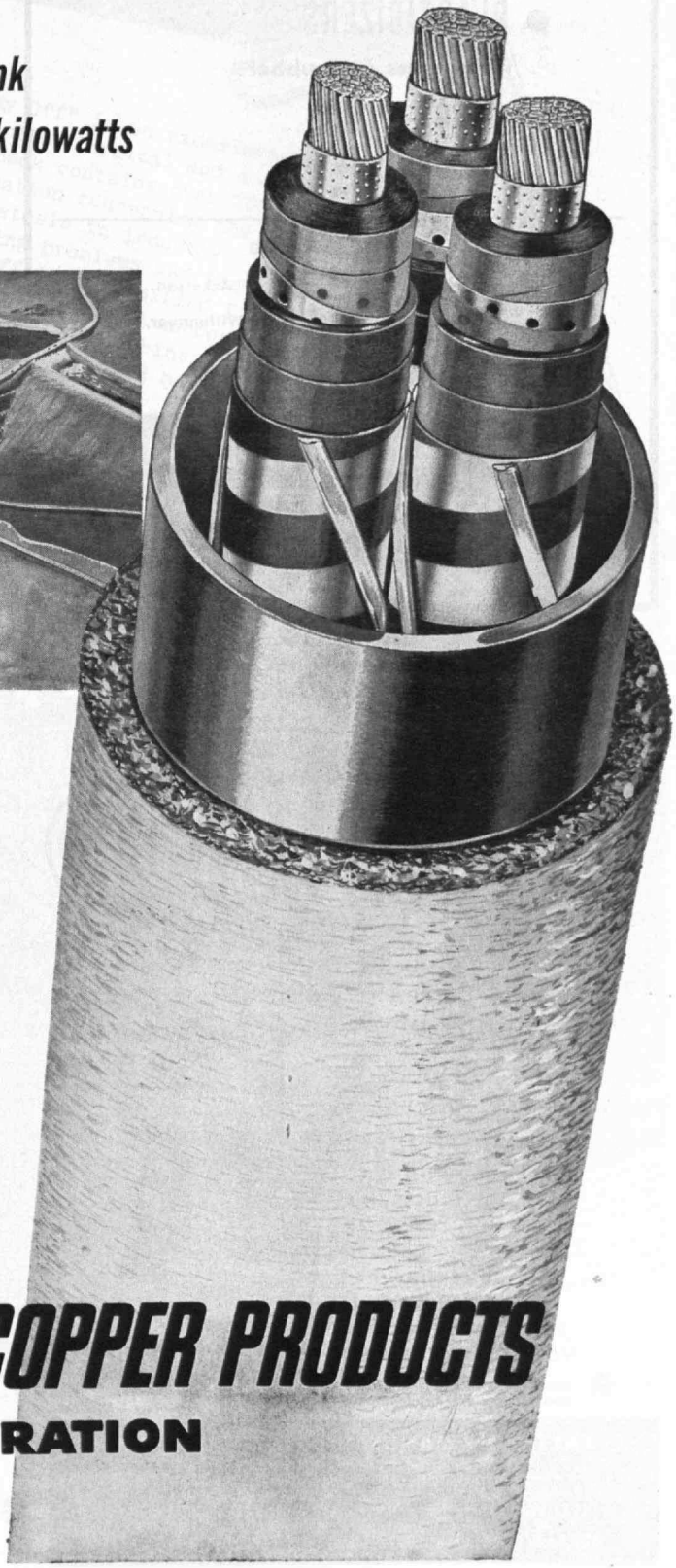
FIRST 230,000 VOLT POWER CABLE IN THE U.S.!

Phelps Dodge to supply vital link carrying potential output of 400,000 kilowatts for new Garrison Dam





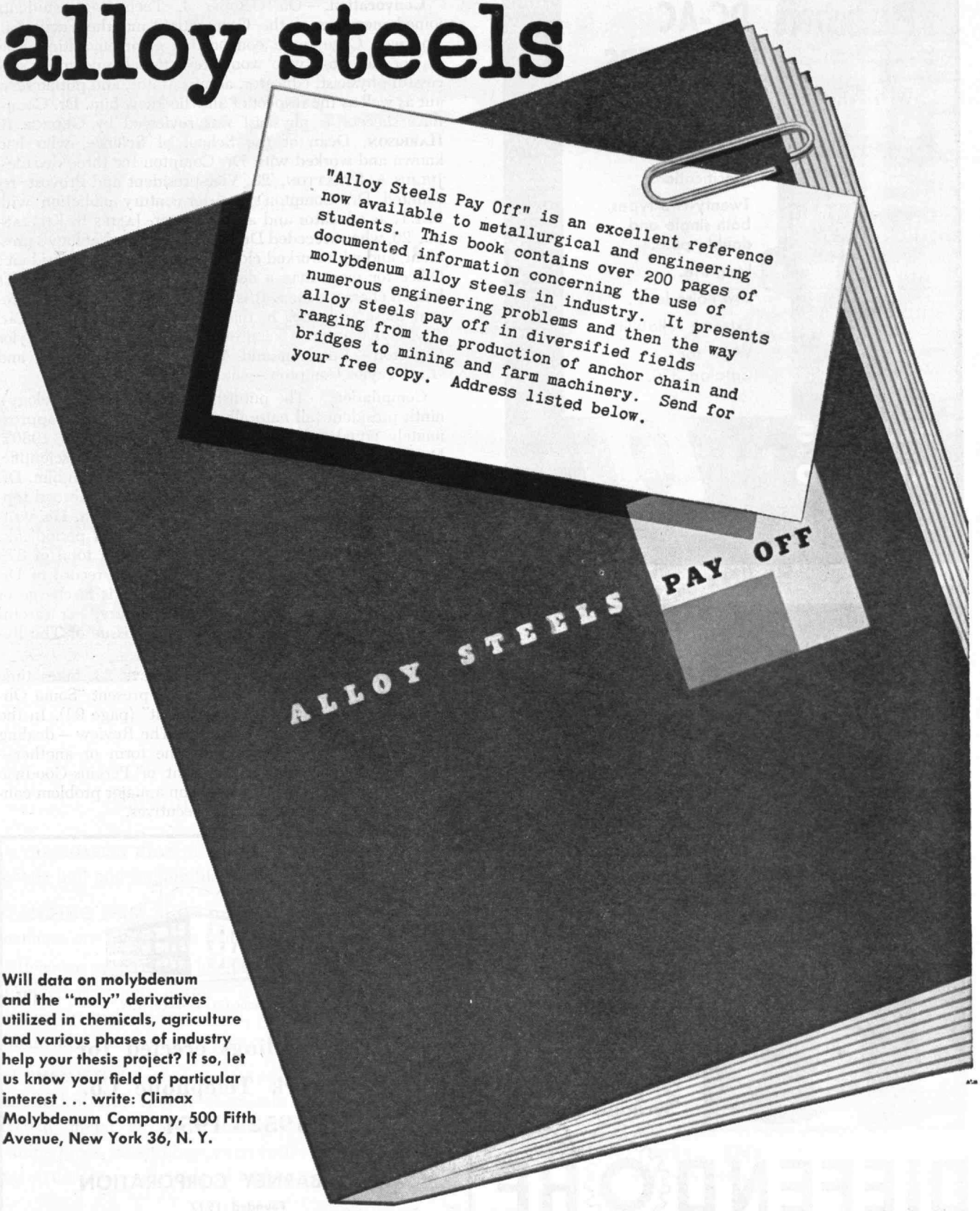
Habirshaw pipe-type power cable will provide a dependable and economical means of carrying this tremendous bulk of hydroelectric power at 230,000 volts, from the powerhouse to the outdoor switching stations at Garrison Dam, being constructed at Riverdale, N. D., by U. S. Army Corps of Engineers.

The cable, a product of Phelps Dodge Copper Products Corporation, will consist of three 500,000 circular mil copper conductors, insulated with 835 mils of impregnated paper.

These insulated conductors will be pulled into pipes, which will be filled with oil at a pressure of 200 pounds per square inch.

PHELPS DODGE COPPER PRODUCTS CORPORATION

60 case histories of alloy steels



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CLIMAX MOLYBDENUM

THE TABULAR VIEW

Convocation. – On October 4, Technology students joined members of the Corporation and the Faculty in Rockwell Cage for a convocation commemorating Karl Taylor Compton who won international renown as successful physicist, educator, administrator, and public servant as well as the respect of all who knew him. Dr. Compton's success as physicist was reviewed by GEORGE R. HARRISON, Dean of the School of Science, who had known and worked with Dr. Compton for three decades. JULIUS A. STRATTON, '23, Vice-president and Provost, recounted Dr. Compton's quarter-century affiliation with M.I.T. as educator and administrator. JAMES R. KILLIAN, JR., '26, who succeeded Dr. Compton as Technology's president, and who worked closely with him in the President's Office for more than a decade, spoke on Dr. Compton's human characteristics. It is The Review's privilege to present these addresses in this issue of The Review: "Karl Taylor Compton – Scientist," page 83; "Karl Taylor Compton – Educator and Administrator," page 85; and "Karl Taylor Compton – the Man," page 87.

Compilation. – The published writings of Technology's ninth president fall naturally into two broad and approximately equal groups. From 1910 until the mid-1930's, Dr. Compton's writings were almost exclusively scientific, but as his duties as M.I.T. President closed in on him, Dr. Compton's writings dealt more and more with broad topics in education, national service, and religion. His writings are scattered through many books and periodicals, but ELEANOR L. BARTLETT has compiled a total of 379 titles in what is believed to be a complete record of Dr. Compton's published work. Miss Bartlett is in charge of Special Collections in the Hayden Library; her careful compilation appears on page 89 of this issue of The Review.

Competition. – EDWARD MCSWEENEY, '23, takes time from a busy administrative career to present "Some Observations on Executive Development" (page 93). In the second of his articles to appear in The Review – dealing with business administration in one form or another – Mr. McSweeney, who is president of Perkins-Goodwin Company, makes sage comments on a major problem confronting the nation's first-rank executives.