THE TECHNOLOGY REVIEW

OCTOBER 1930

The history of vacuum systems of steam heating is a history of Warren Webster & Company

In 1888, Warren Webster & Company introduced the Webster Vacuum System of Steam Heating. Even in its early crude form the then new idea achieved marked success. It was fundamentally right for the needs of the day.

Through forty-one years this system has been steadily improved to meet changing needs. Today there are more than fifty thousand Webster Systems heating America's finer-type buildings.

Essential to the fullest development of the Webster Vacuum System was a radiator return trap of certain characteristics. Webster provided this in the Sylphon Trap, introduced in 1910.

Since that time Webster engineers have made many improvements and refinements in the original Sylphon Trap, and to date more than three million have been installed. Of this total less than one-half of one per cent have been recorded as replaced for all causes.

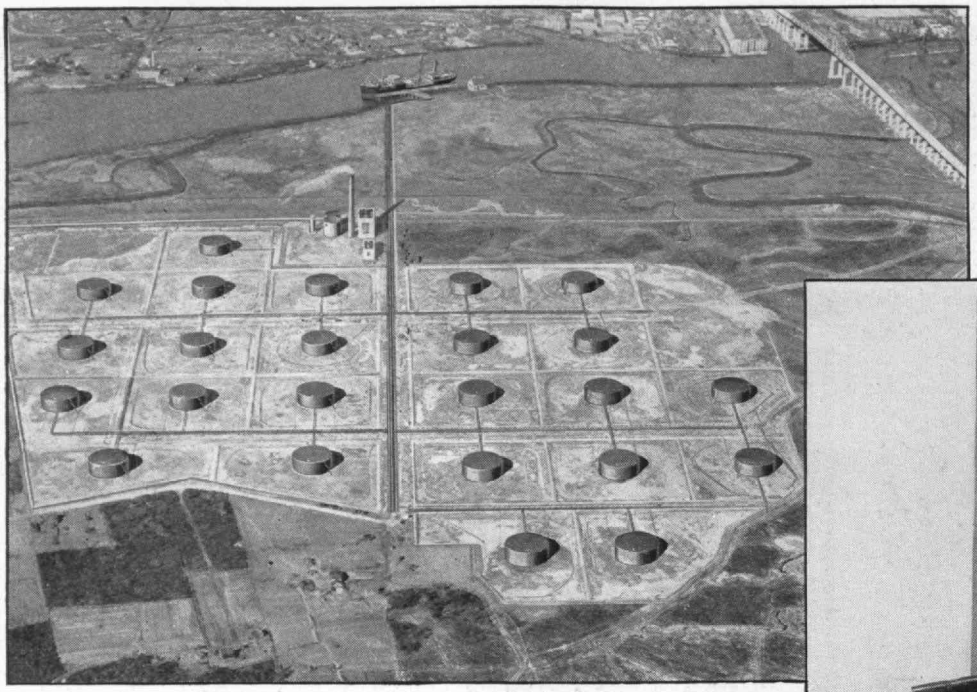
More than forty years ago, when even the idea of service was new to business, Webster saw the necessity for service to insure correct application of Webster Systems, and began building up an organization of steam-heating specialists.

Today one of the most important factors in Webster Systems is *Webster Service*—working with architects, engineers, contractors and owners to insure heating comfort and economy.

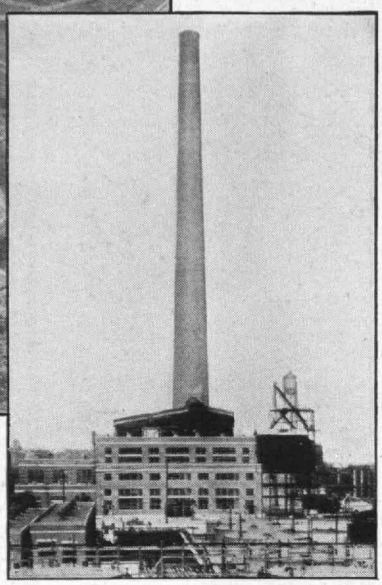
M. I. T.'s own engineering department, in 1916, adopted a Webster System as standard for all existing and future buildings. Fourteen years of satisfaction; with negligible maintenance and replacement costs. In all that time, if any better system could have been found, the best people to find it were right there at M. I. T. The New dormitory units, 1930, are equipped with Webster Systems.

WARREN WEBSTER & COMPANY, Camden, New Jersey
Pioneers of the Vacuum System of Steam Heating...Founded 1888
52 U. S. Branch Offices...*In Canada, Darling Bros., Ltd., Montreal*

THE TECHNOLOGY REVIEW, October, 1930. Vol. XXXIII, No. 1. Published monthly from October to May Inclusive and in July at 10 Ferry Street, Concord, N. H. Publication date: twenty-seventh of the month preceding date of issue. Annual subscription $3.50; Canadian and Foreign subscription $4.00. Entered as second-class matter at the Post Office at Concord, N. H., under the Act of March 3, 1879.



BULK STORAGE PLANT
Staten Island, New York



POWER PLANT
Port Arthur, Texas

Building two plants for the Gulf Refining Company

A 1,920,000 barrel oil storage plant on Staten Island, and a power plant at Port Arthur, Texas, built simultaneously in fast time.

TO SERVE the New York Market, the Gulf Refining Company required a new storage plant on Staten Island. At the same time a large new power plant was needed at the refinery at Port Arthur, Texas.

We were called in to design and build both plants at the same time.

The storage plant on Staten Island has a capacity of 1,920,000 barrels, occupies 110 acres, and includes twenty-four 80,000 barrel oil tanks, steam plant, two drainage pumping stations, oil pumping station, fire pump and substation, dock for oil tankers, 9 miles of oil pipe mains, 18 miles of foamite pipe, 8 miles of steam pipe, 4 miles of levees, 3 miles of streets and roads, 4 miles of water mains, 2 miles of electric pole lines.

We did all this work in 6 months' time.

The power plant at Port Arthur, designed to utilize refinery waste products—sludge oil and pulverized paraffin petroleum coke—contains 3 boilers of 15,400 sq. ft. each and a turbine of 10,000 kw. capacity. It was also built in six months.

At Staten Island we have been called back to build large additions which are now under construction.

We are prepared to serve industrial companies in the design and construction of storage plants, factories, chemical plants, power plants, or work of almost any nature.

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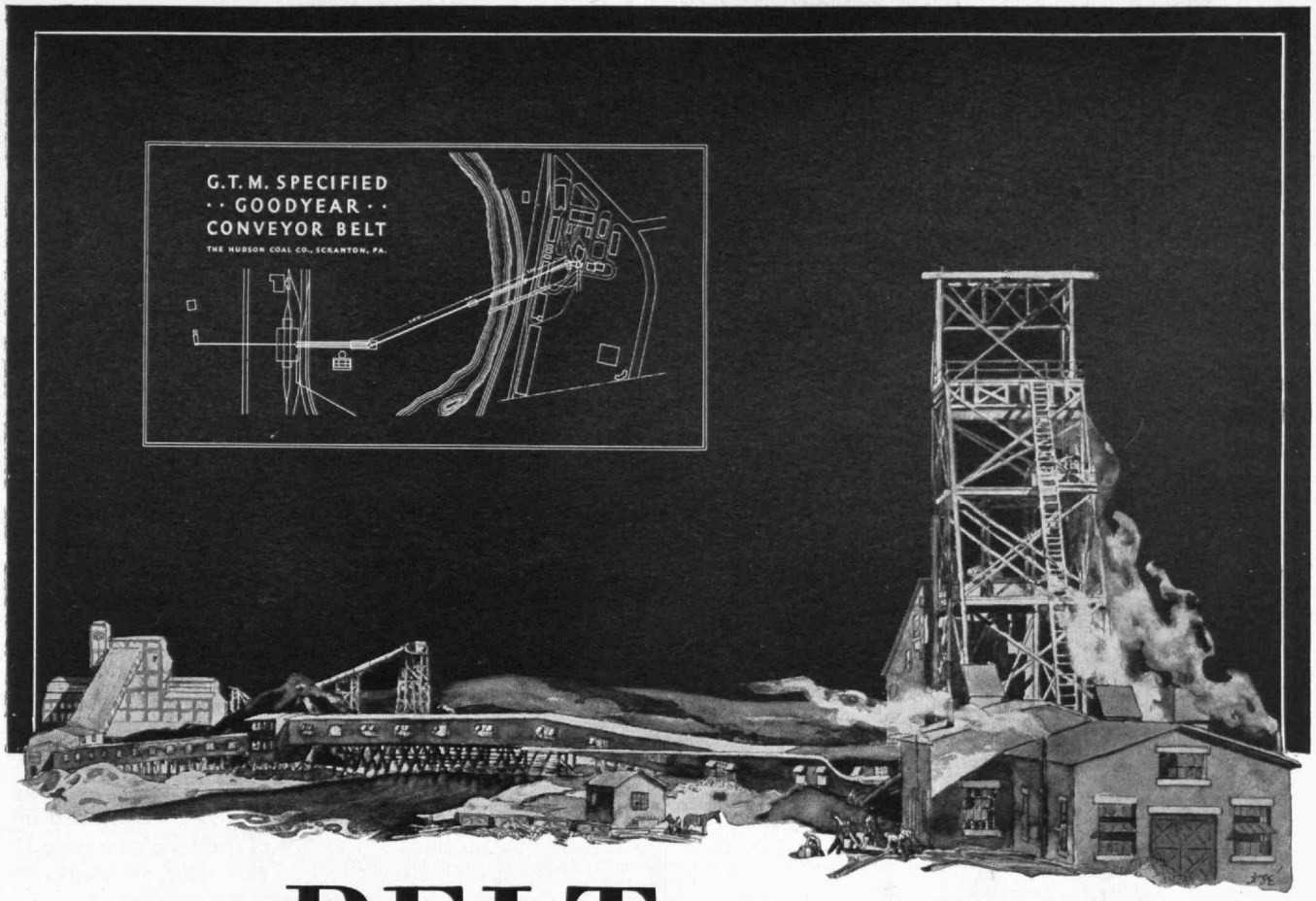
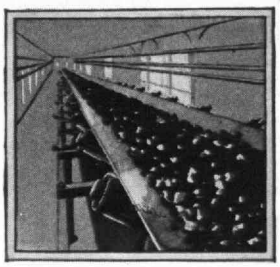
MAXIMUM RETURN TO CLIENTS PER DOLLAR INVESTED



The BELT

that moved a mountain across a river



Conveyor equipment supplied by Heyl & Patterson, Pittsburgh, Pa.

At the Marvine Colliery of The Hudson Coal Company, Scranton, Pa., in 1921 were two isolated mine shafts, one on either side of the Lackawanna River. For efficiency in grading and shipping operations, obviously coal from one shaft had to cross the river—an extraordinary mechanical feat. *Now for nine years* a tireless Goodyear Conveyor Belt—over 2100 feet in over-all length, 48″ wide, 7-ply construction, moving at 300′ per min.—has carried, without noticeable signs of wear, safely and easily across the river the mammoth production of Shaft No. 1 of this famous colliery. Over 1,700,000 tons—literally, *a mountain of coal!—has been so transported at a belt cost to date of less than $.0000062 per ton-foot!*

Your mountain, too, can be moved! The G.T.M.—Goodyear Technical Man—will help you move it. He is a rubber expert. He knows how to apply rubber—in Belting, Hose, Molded Goods, and Packing—to your considerable benefit. For data on the greater profits he can bring to your business, just write to Goodyear, Akron, Ohio, or Los Angeles, California.

THE GREATEST NAME IN RUBBER

GOODYEAR

BELTS MOLDED GOODS HOSE PACKING

THE TABULAR VIEW

THE next best thing to knowing a person is to read what he has written, and Gerrit A. Beneker expresses his ideas and personality in his writing with the same insight and energy that is characteristic of his art (see cover). Beneker was born in Grand Rapids, Mich., on January 26, 1882. After his graduation from the city high school, he turned from the more conventional life to learn the mechanics of art which was to be his life work. On leaving art school, he became the pupil of Charles W. Hawthorne of Provincetown. He is now living at Truro, Mass. ¶ Once established, Beneker turned from the realm of pure art to philosophical art. He has lectured much on the general subject of art in its relation to various aspects of the business and social world, stressing always, as he has done in his article for The Review, the art of living a good and useful life. In this respect, he is reminiscent of the Nineteenth Century thinkers — rather a modernistic Ruskin, Arnold, and Hazlitt, crying out against the Twentieth Century apostles of "art for art's sake." He is himself something of a constructive radical. Perhaps he is best known to the public for his famous poster "Sure! We'll Finish the Job," of which three million prints were distributed on the last Victory Loan. As author of the article on page 11 and as the artist of the cover of this issue, he speaks to Review readers in two mediums.

AMERICANS interested in the much heralded five-year program of the Union of Socialist Soviet Republics will find an engineer's interpretation valuable and informative, and The Review is happy to present such a paper. As stated in the Editorial Note preceding the article, it is not expedient to divulge the name of the author. Suffice it to say that he is prominent in both business and engineering circles. His article will be published in two parts; the next appearing in the November issue of The Review.

PROFESSOR FREDERICK G. KEYES has long been interested in the physical properties of steam. In 1921 a group of scientists and engineers laid out a comprehensive program of steam research, sponsored by the American Society of Mechanical Engineers, to be carried on jointly by Harvard, the Bureau of Standards, and the Institute. As Head of Technology's Department of Chemistry, Professor Keyes has had direct charge of the steam research here, and it was to make a report on his progress that he journeyed to Berlin and the meeting of the World Power Conference, of which he writes on page 18.

ARTHUR H. COMPTON holds a high rank among the world's experimental scientists. As proof of this one need only to point to the fact that in 1927 he was awarded the Rumford Gold Medal by the American Academy of Sciences and that in the same year he was honored by being awarded the Nobel prize in physics. A contributor to a recent number of *Science* has noted that "everything he undertakes has been so carefully planned that signifi-

(*Continued on page 6*)

Union & New Haven Trust Company Building
New Haven, ... Connecticut
Cross and Cross . . . *Architects* . . . New York

Johnson Heat Control In This Building

The first floor, mezzanine and half the basement are used as banking and safe deposit quarters. This space is heated by direct radiation, automatically controlled by 21 Johnson wall thermostats connected directly with Johnson valves on the radiators. The indirect heating system, which also serves to ventilate this space in summer, consists of exhaust and supply fans, the latter equipped with oil screen filters. The heating units in this system and the louvres controlling the air supply are controlled by Johnson Thermostats. Louvres are also in the bank's skylights, and are operated by Johnson Control from a switchboard panel in the Superintendent's office. General offices, from the second to the twelfth floors, inclusive, are heated by direct radiation; and the steam supply is divided to heat independently five tiers, each Johnson Controlled from the switchboard panel in the Superintendent's office.

Johnson Control applies to every system, form and plan of heating and ventilating: interestingly described complete in the Johnson book, sent gratis on request.

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THE ALL METAL SYSTEM. THE ALL PERFECT GRADUATED CONTROL OF VALVES & DAMPERS. THE DUAL THERMOSTAT CONTROL

THE TABULAR VIEW

(Concluded from page 4)

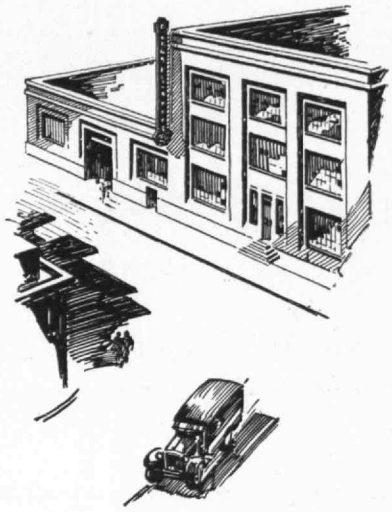
cant results have followed sooner than anyone has a right to expect. He has made a brilliant contribution to the theory of light." ¶ In his article beginning on page 19 his explorations in the field of atomic structure are described. It is noteworthy that at the end of his article he remarks that in 1922 he predicted that within ten years the electron positions in the lighter atoms would probably be known as reliably as were, at that time, the positions of the atoms in certain crystals. Investigations, which he describes in his article, indicate that that prediction is now verified. ¶ Dr. Compton was born in Wooster, Ohio, where later he attended the college of that name. His graduate work was done at Princeton and at Cambridge University, England. At the present time, he is a professor of physics at the Ryerson Physical Laboratory at the University of Chicago. He is a brother of Dr. Karl T. Compton, President of the Institute.

AFTER Mr. McDaniel's article on the Baha'i Temple was in print, news came of the tragic death of its designer, Louis Bourgeois. The greater part of Mr. Bourgeois' later life had been spent in developing his plans for this temple. Although he did not live to see it realized in stone and steel, work is going ahead rapidly, and many architects predict that it will be a notable and unique contribution to ecclesiastical architecture. Mr. McDaniel, a graduate of the Institute in the Class of 1901, is a member of the Research Bureau in Washington, a private firm of consulting engineers who have been retained as managing and supervising engineers. He therefore writes with direct and specific knowledge.

JOHN BAKELESS really needs no formal introduction to the careful Review reader as he has contributed several times since 1928. His interests in the outside world have been chiefly academic as befits the life of an author and editor. After graduation from Williams and Harvard, where he received his Master's degree, literary ambition led him into editorial work, first on *The Living Age*, and later on the *Independent*. As managing editor of *The Forum* he has continued to enlarge his literary activities. Since 1927, he has been a lecturer in journalism at New York University. Besides contributing to various magazines, Mr. Bakeless is the author of two books: "The Economic Causes of Modern War" and "The Origin of the Next War." His interest in economic conditions and the increased use of science to remedy social and international evils was illustrated in his article "Science and the World of Affairs," published in the April Review 1929.

A FEATURE of the November issue will be an article by Stuart Chase, '10, "Prometheus Enchained," the thesis of which is that modern engineers have never recognized their power or potential value to society. "The greatest need in all the bewildered world," writes Mr. Chase, "is for philosopher engineers."

"We Want An *Economical Building*"



EVERY phase of building—and there are many—must be carefully considered in any class of construction today. When the Metropolitan Edison Company, Reading, Pa. decided to build a modern utility building, store house and garage to serve its big Middletown power station and large surrounding customer territory, engineers of W. S. Barstow & Company, Inc., were called in.

"It must be an economical building," the company officials said.

The engineer assigned to this work planned not only to build economically but to keep down the future costs as well. His knowledge of fire hazard and close contact with insurance brokers alone meant savings of thousands of dollars. An engineering firm of long experience, the W. S. Barstow Company is familiar with building detail that will later mean economical operating costs. See us about the building job you are contemplating.

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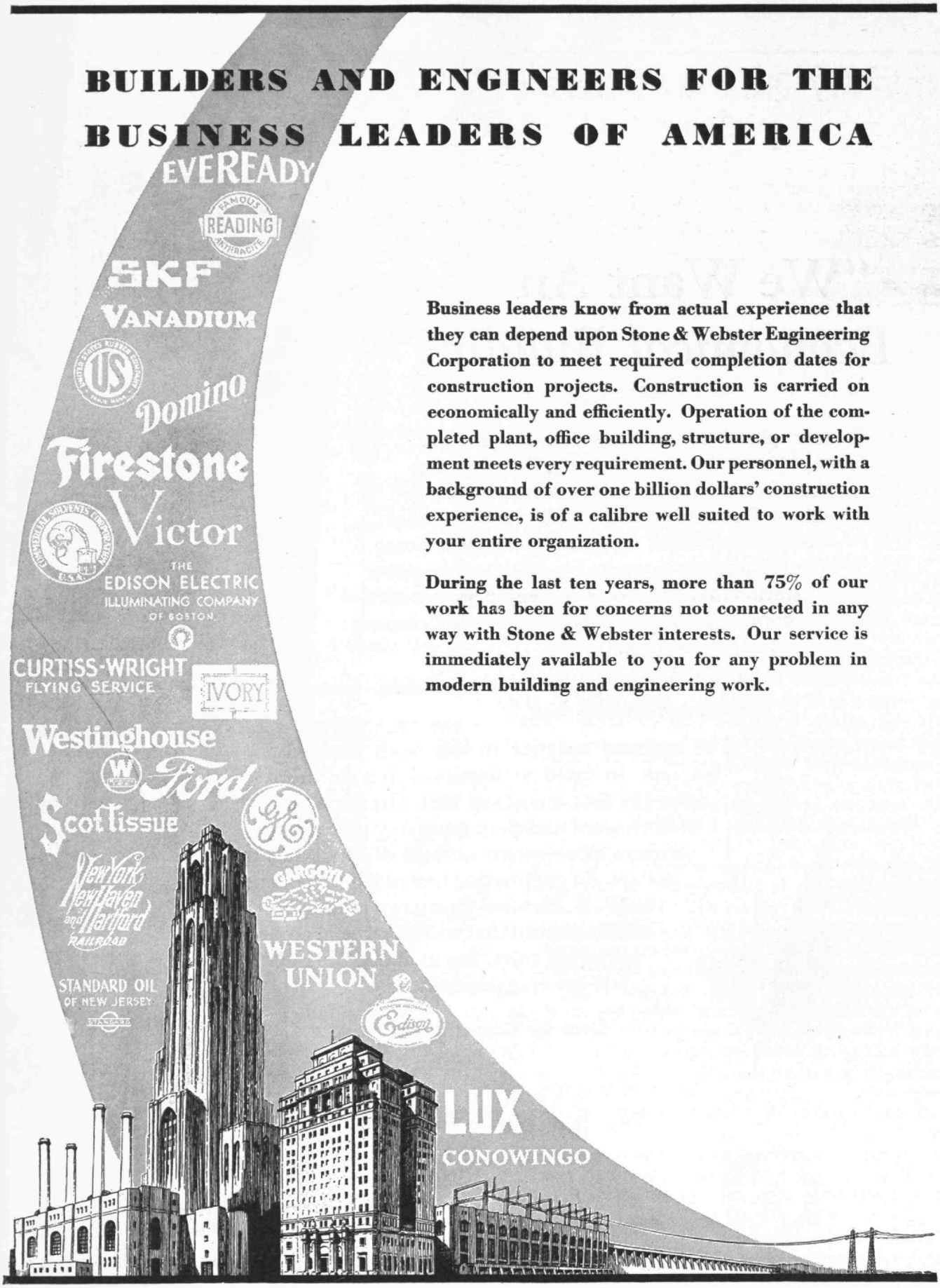

Business leaders know from actual experience that they can depend upon Stone & Webster Engineering Corporation to meet required completion dates for construction projects. Construction is carried on economically and efficiently. Operation of the completed plant, office building, structure, or development meets every requirement. Our personnel, with a background of over one billion dollars' construction experience, is of a calibre well suited to work with your entire organization.

During the last ten years, more than 75% of our work has been for concerns not connected in any way with Stone & Webster interests. Our service is immediately available to you for any problem in modern building and engineering work.

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