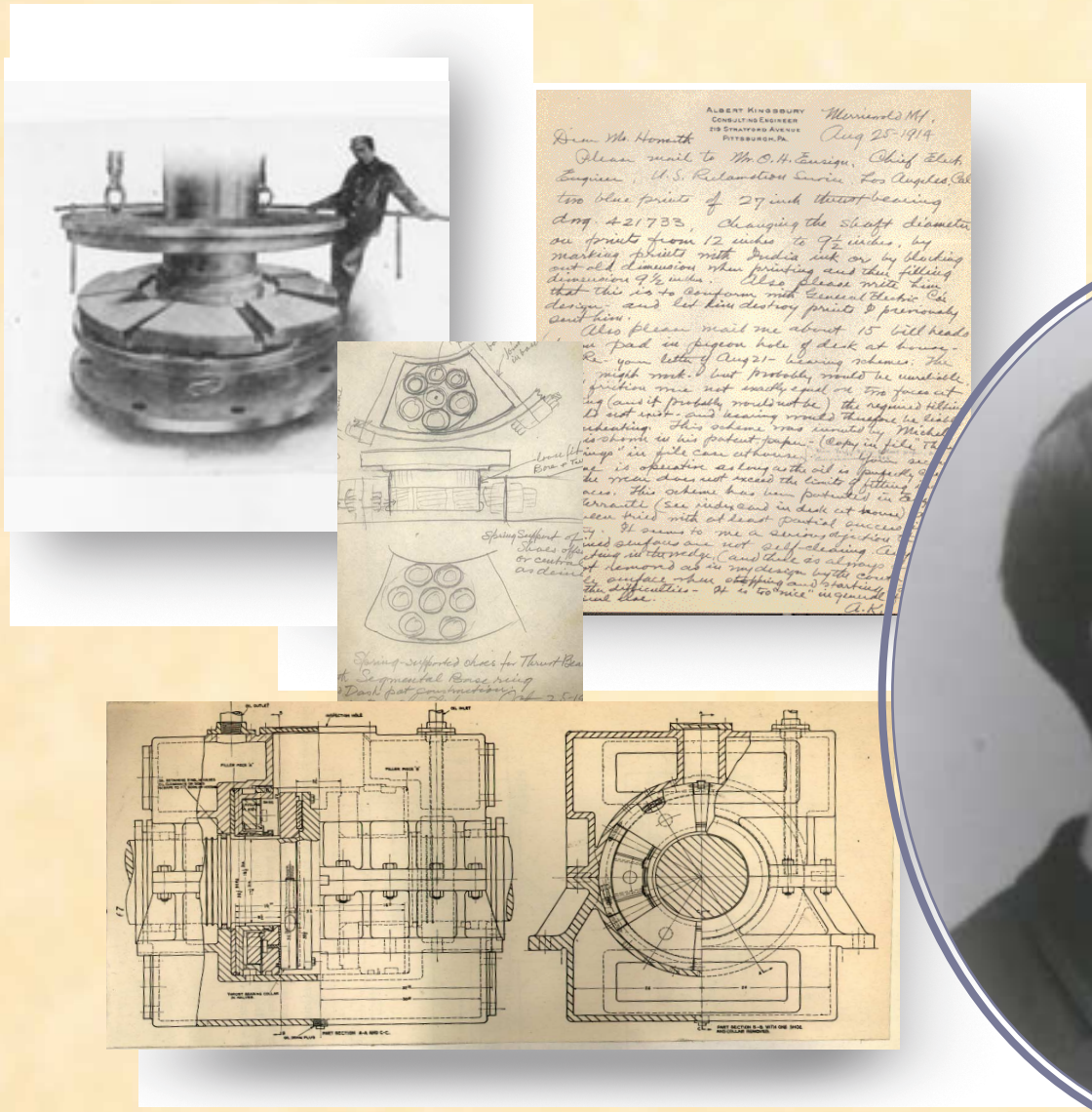
Kingsbury, Inc.

The Best Support In The Business.

Over the past 90 years,
Kingsbury innovation has endured.
The same can't be said of every invention
of the past.

Although the bearing had not yet been proven in an operational generator, it faltered only once. With a single modification, the bearing performed flawlessly. More importantly, it supported 100 times the load of previous bearings, increasing the generating capacity of the unit dramatically. The other nine



Professor Kingsbury, shown at right, was a prolific inventor who constantly jotted down ideas wherever he was. The picture at top left is one of ten 61" bearings made for the Cedars Rapids Mfg. & Power Co. of Montreal.

generators at Holtwood were also fitted with Kingsbury's bearings and soon power plants around the country followed suit.

After 25 years of continuous use, Kingsbury's first fluid-film thrust bearing at Holtwood Station was inspected and showed almost no wear. In fact, engineers predicted that it would last another 1300 years. As a result, in 1987 the American Society of Mechanical Engineers (ASME) designated it as an International Historical Mechanical Engineering Landmark (one of only 23 ever conferred).

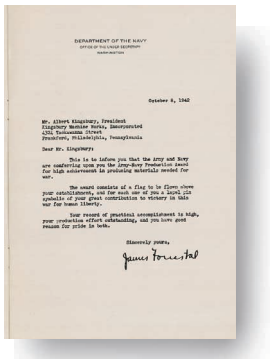
A youthful fascination becomes a career.

The mechanical ingenuity of Albert Kingsbury was evident early in his life. He graduated from high school and served three years as a machinists' apprentice before entering Ohio State University to study mechanical engineering. Low on funds, Kingsbury left the school after his sophomore year and pursued work as a machinist. He returned to school several years later, enrolling at Cornell University where he first began his work on lubrication problems.

Kingsbury's fascination with lubrication science and its application continued throughout his life.

After graduation in 1889, he went on to teach mechanical engineering in New England, eventually becoming a full professor at the University of New Hampshire.

He then joined Westinghouse Electric in 1903 and it was there that he was first able to test his fluid-film thrust bearing in machinery. In 1910, he received a U.S. patent on his invention.


DEPARTMENT OF THE NAVY

October 6, 1942

Mr. Albert Kingsbury, President
Kingsbury Machine Works, Incorporated
1351 Tacksonia Street
Frankford, Philadelphia, Pennsylvania

Dear Mr. Kingsbury:

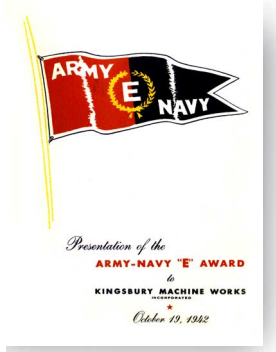
This is to inform you that the Army and Navy are conferring upon you the Army-Navy Production Award for high achievement in producing materials needed for war.

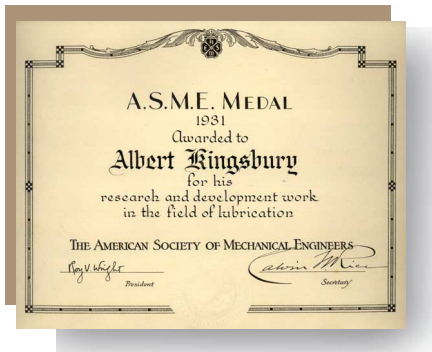
The award consists of a flag to be flown above your establishment, and for each one of you a lapel pin symbolic of your great contribution to victory in this war for human liberty.

Your record of practical accomplishment is high, your production effort outstanding, and you have good reason for pride in both.

Sincerely yours,

James Forrestal

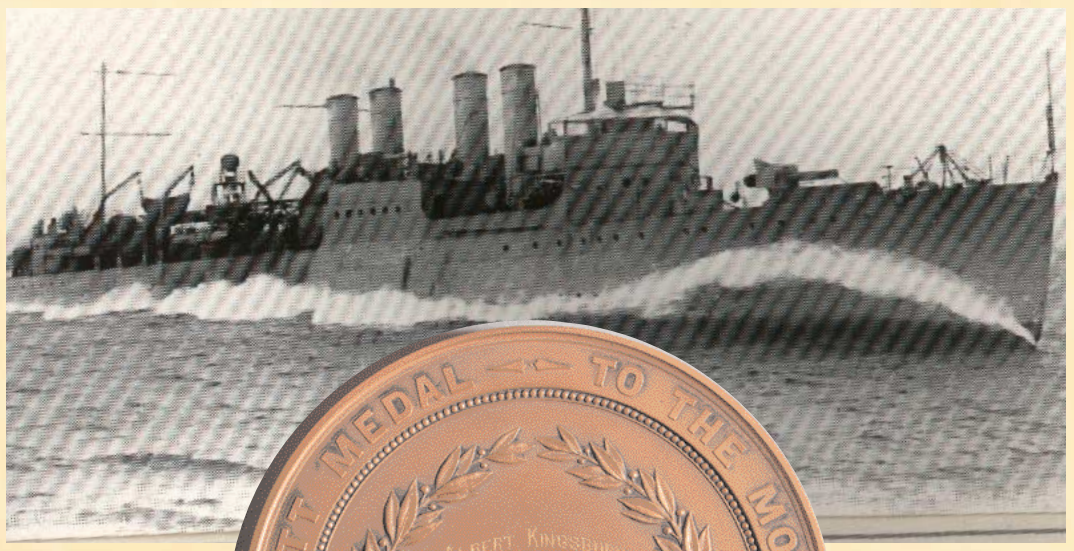



A.S.M.E. MEDAL
1931
Awarded to
Albert Kingsbury
for his
research and development work
in the field of lubrication
THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS
President
Secretary

A breakthrough technology reaps multiple rewards.

Kingsbury's lubricated bearings have been lauded many times over the years.

Albert Kingsbury's contributions to mechanical engineering have been recognized over the last century by a number of well-respected organizations. His many honors include the Elliott Cresson Gold Medal from the Franklin Institute, the John Scott Medal from the City of Philadelphia, Honorary Doctoral degrees from Worchester Polytechnic Institute and the University of New Hampshire, the Modern Pioneer Award from the National Association of Manufacturing, and the designation as an Honorary Member of ASME. The company was also presented with the prestigious Army/Navy "E" Award or its "high production achievement" during World War II.

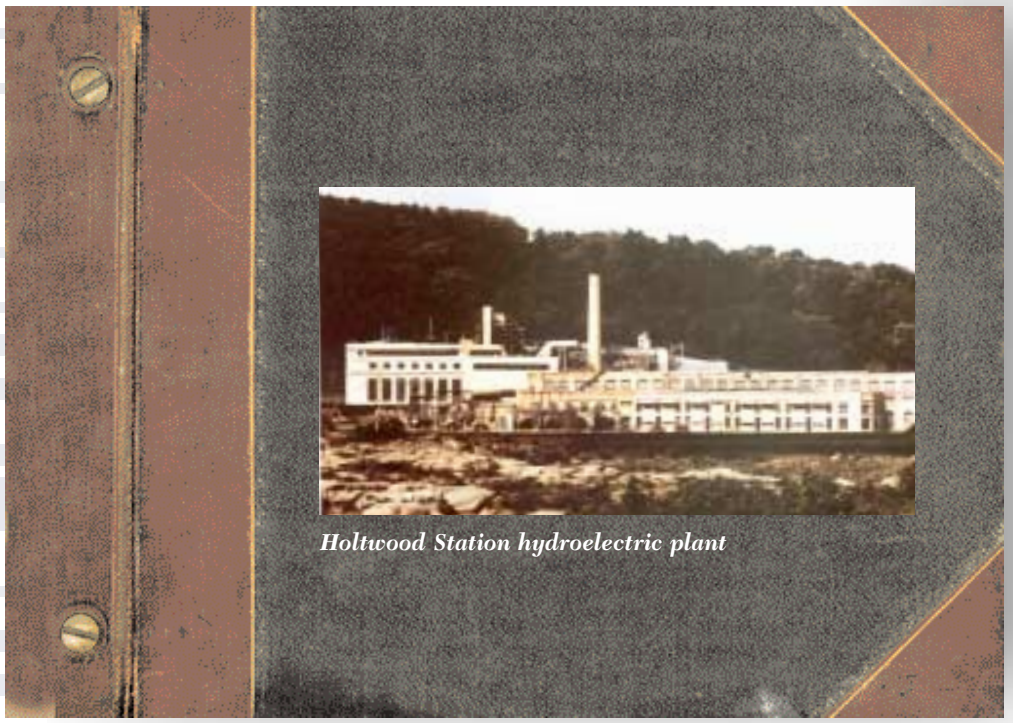


In 1940, Albert Kingsbury became an Honoray Member of the ASME for his work in the field of lubrication.

Kingsbury was awarded the Franklin Intitute's Elliott Cresson Medal for scientific achievement in 1922.

The City of Philadelphia's John Scoott Award for outstanding contributions to the welfare of mankind was bestowed upon Professor Kingsbury in 1931.

A simple idea saves an industry and launches a company.



Holtwood Station hydroelectric plant

It was 1912. Electricity was just coming into widespread use in the United States. To meet the increasing demand, privately owned utilities built hydro-electric plants along rivers to have unlimited access to the water needed to generate power. They soon realized, though, that the generating potential of the plants was hampered, not by the availability of resources, but by the load capacity of their bearings.

Holtwood Station, located on the Susquehanna River in Pennsylvania, was one of the most sophisticated hydroelectric plants of its time. Each of Holtwood's ten 10,000-kilowatt generators weighed about 180 tons and accepted 45 tons of force from the water passing through its turbines. Under such a heavy load, conventional roller bearings rarely lasted more than two months before failing.

Facing financial ruin, the utility was desperate for a solution. At the same time, Albert Kingsbury was completing tests on his new invention, a pivoted shoe bearing that rested on a film of oil instead of balls or rollers. Holtwood invited Kingsbury to install his fluid-film bearing in one of the units as a test.

An aerial view of the generators at Holtwwod Station, where the first fluid film bearing was installed in 1912.

Professor Kingsbury and Admiral Watts pay a visit to workers at the Navy Yard in 1942.

Kingsbury Machine Works is born in the Cradle of Liberty.

Attracted by the success of his bearing at Holtwood, prominent customers like General Electric, Allis-Chalmers Manufacturing and the United States Navy soon sought Professor Kingsbury's expertise. Encouraged by this, Kingsbury left Westinghouse in 1921, moved to Philadelphia and started Kingsbury Machine Works.

He continued to look for ways to increase bearing load capacity and soon developed the Equalizing Thrust Bearing which utilized pivoted bearing shoes that uniformly distributed the load on the surface of the bearing, reducing uneven wear.

Throughout the twenties, demand for Kingsbury products grew. The bearings gained widespread acceptance, not only in power generation, but in marine propulsion as well. In fact, by 1925, over 700 U.S. Navy ships had Kingsbury bearings on board. The company continued its support of the American military over the next two decades, through World War II. By 1941, every Navy vessel was outfitted with Kingsbury bearings in its main propulsion systems.

Even the U.S. Coast Guard was grateful to Kingsbury Machine Works for its manufacturing contribution in the war effort. In the words of Lt. Commander M.D. Jester, excerpted from a combat report regarding the sinking of a German U-boat, "Our engines worked perfectly throughout. The slightest failure would have been disastrous for our attacks were executed at top speed."

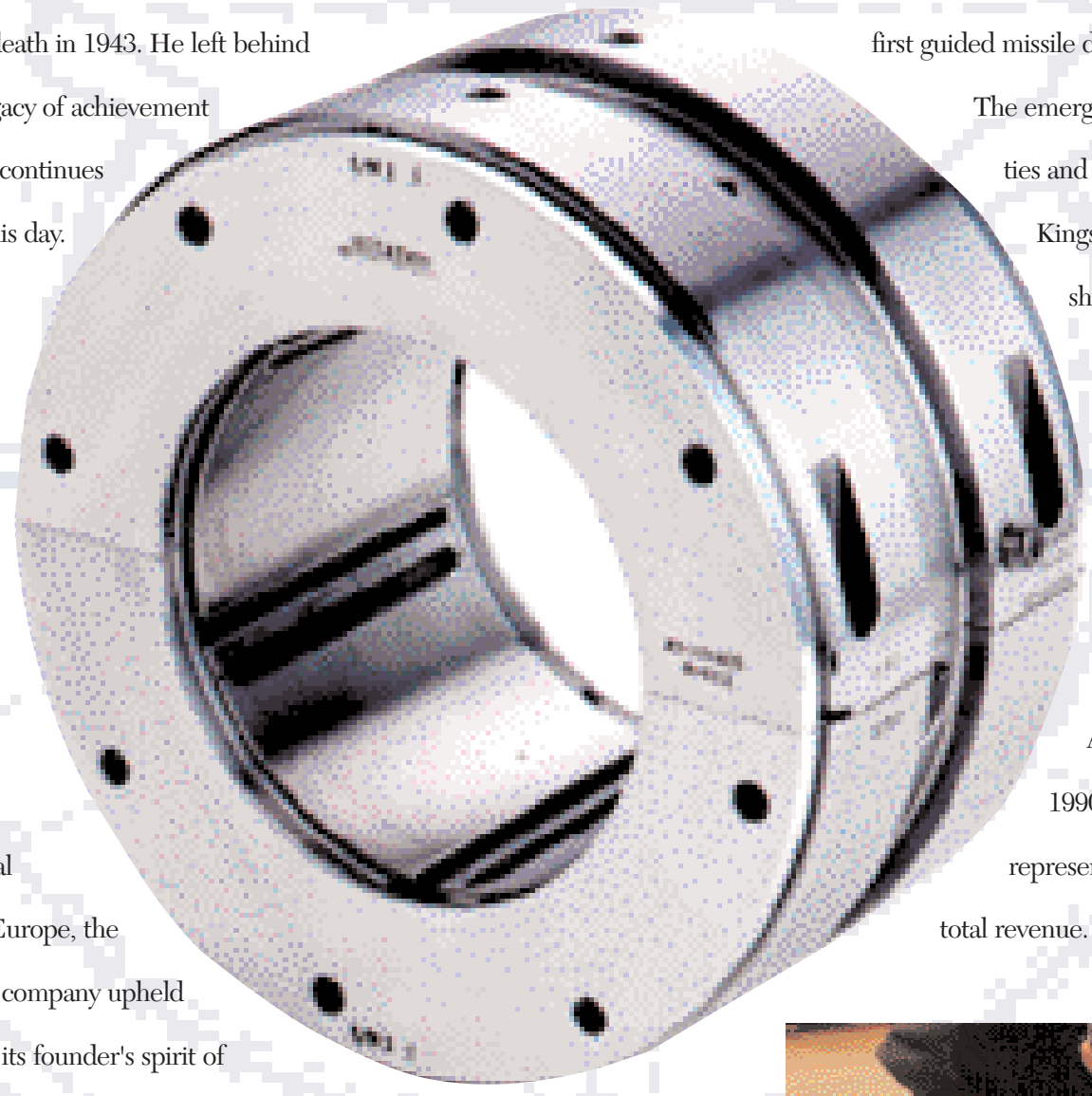
Professor Kingsbury's talents extended beyond mechanical engineering to business as well. He sucessfully sheparded the company through the Great Depression. In fact, when millions of people were losing their jobs at other companies, he refused to lay off his employees. Instead, he cut the work week back to two days. When the company beg to prosper again in the early 1940s, Kingsbury astonished his employees by repaying them for every day of work they had missed.

Admiral Watts of the United States Navy chats with Professor Kingsbury.

Albert Kingsbury creates an enduring legacy of technical achievement.

Kingsbury provides comprehensive repair and service at its dedicated facility in Hatboro, PA.

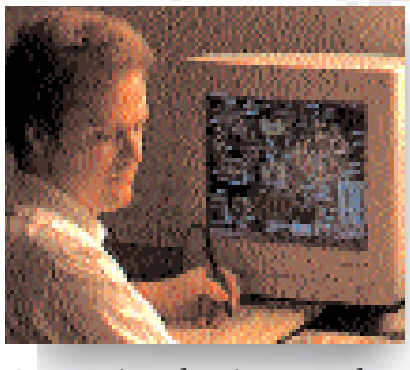
Professor Kingsbury led his company to technical and financial success right up until his death in 1943. He left behind a legacy of achievement that continues to this day.



After World War II, when the United States was called upon to take an active role in the economic recovery of Europe, Kingsbury experienced a consistent flood of new orders from its U.S. customers that were participating in the rebuilding of European manufacturing.

As its bearings appeared in industrial facilities and power generators across Europe, the company upheld its founder's spirit of innovation with the creation of the first hydraulic thrust meter bearing. Two years later Kingsbury introduced the first horizontal pivoted-shoe journal bearing. As its relationship with the U.S. Navy continued, the first nuclear submarine (USS Nautilus) was equipped with a Kingsbury vibration reducer and its bearings were installed in the first guided missile destroyer.

The emergence of international opportunities and increased competition prompted Kingsbury to form a business partnership with Kimura, a Japanese firm, to sell the company's line of bearings. This was followed by representation in England, Australia, Italy, China, India, Latin America and Southeast Asia. By the end of the late 1990s, international business represented 30 percent of Kingsbury's total revenue.



Our experienced engineers use the latest technology to meet customers' application criteria.

Kingsbury's field service engineers can come to your site to diagnose problems and supervise installations anywhere in the world.

Kingsbury Headquarters, Philadelphia, PA

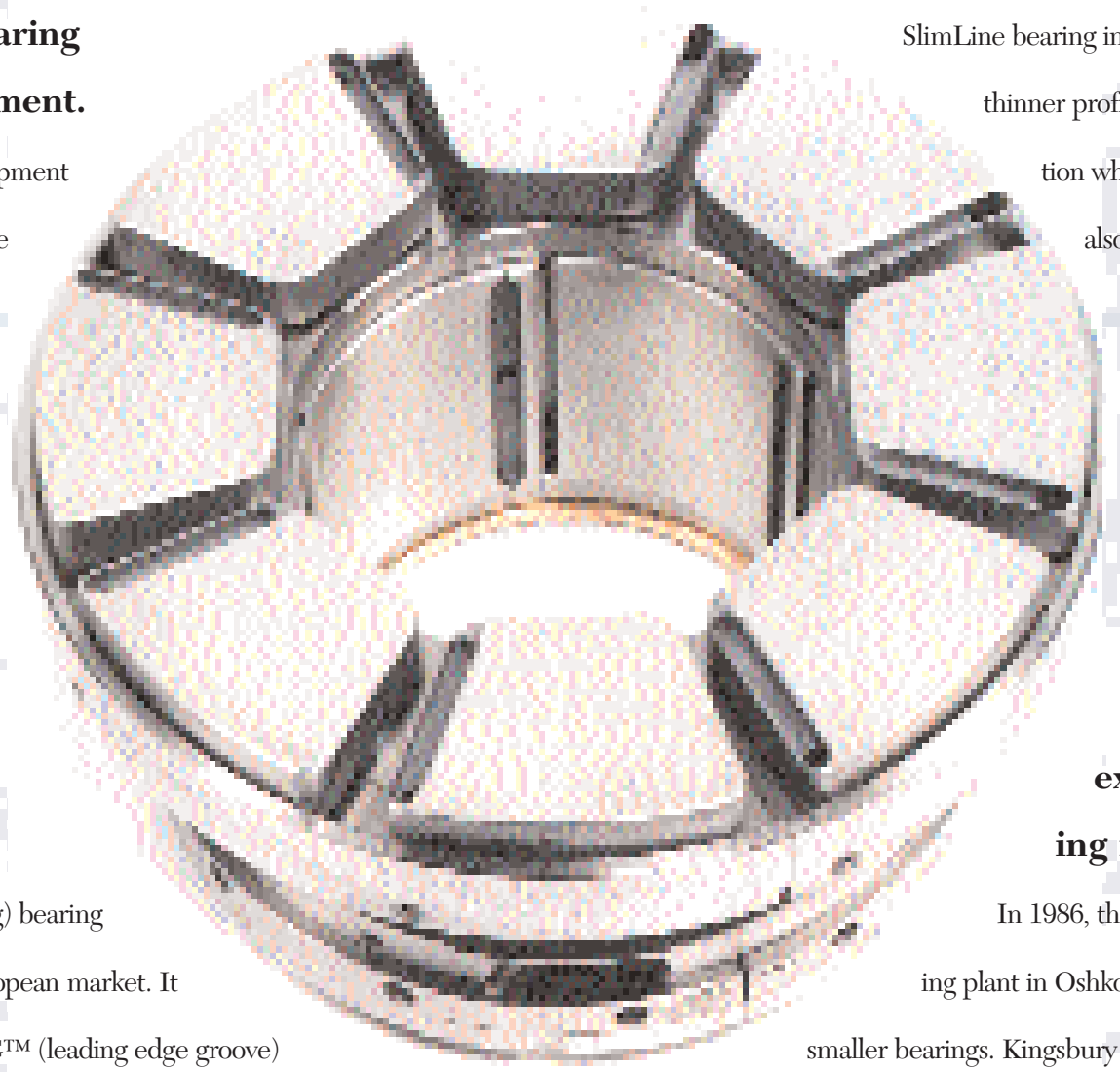
Repair & Service Division, Hatboro, PA

Standard Bearing Production Plant, Oshkosh, WI

Throughout this period of growth abroad, Kingsbury was improving its operation at home as well. The company broke ground at a big new facility in northeast Philadelphia in 1967 and remains there to this day.

At the forefront of bearing research and development.

A separate Research and Development lab was also created, featuring the industry's largest test rig with a gas-powered turbine. The facility is dedicated to bearinginnovation and has created several new bearing designs since its inception in 1971.



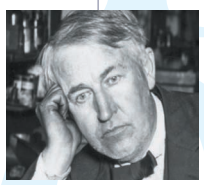
In the early 1980s, Kingsbury designed the NE (non-equalizing) bearing to meet the demands of the European market. It was quickly followed by the LEG™ (leading edge groove) bearing, a direct-lube design which cuts oil flow in half and drastically lowers operating temperatures.

In addition, the LEG influenced a number of later product developments. The KingCole, for example, combined the design advantages of the LEG with smaller European sizes. (It was named Factory Product of the Year by the United Kingdom Manufacturing Industry in 1996.) The recent SlimLine bearing incorporated LEG technology into a thinner profile for an equalizing bearing application where space is tight. And Kingsbury also patented a groove modification for the LEG that all but eliminates the sub-synchronous vibrations found in all direct-lube bearings.

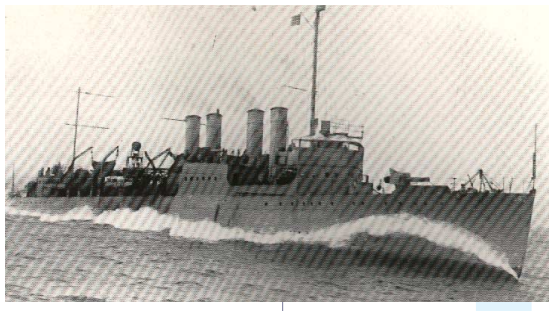
Kingsbury's dedication to serving its customers' needs extends beyond developing new technology.

In 1986, the company purchased a manufacturing plant in Oshkosh, WI to produce components for smaller bearings. Kingsbury opened the doors to a facility in Hatboro, PA in 1992 dedicated solely to repair and service. And in recent years, both the Oshkosh and Philadelphia facilities were ISO 9001 certified, assuring customers that Kingsbury complies with the highest industry standards.

Thomas Edison may have invented the light bulb, but the concrete phonograph of 1912 was not one of his brighter ideas.



1910
Dr. Kingsbury receives U.S. patent for his fluid-film thrust bearing



1916
U.S. Navy begins long-standing relationship

1912
Installation of first Kingsbury bearing at Holtwood Hydroelectric station

1923
Franklin Institute awards Kingsbury the Elliott Cresson Gold Medal

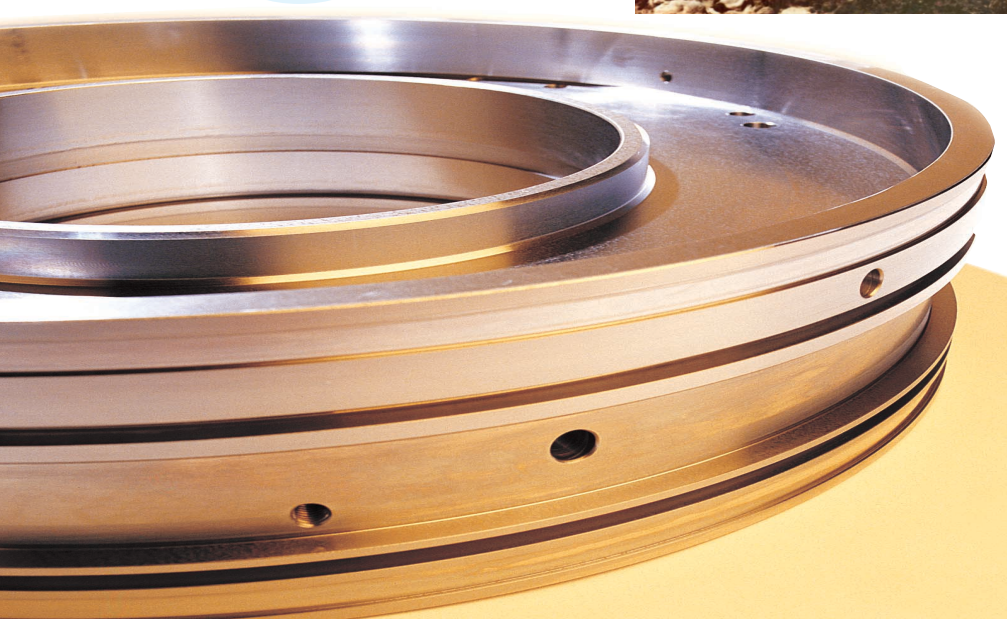
The U.S. Postal Service introduced the Air Torpedo in the 1920's in the hopes of speeding mail delivery. Unfortunately, it bombed.

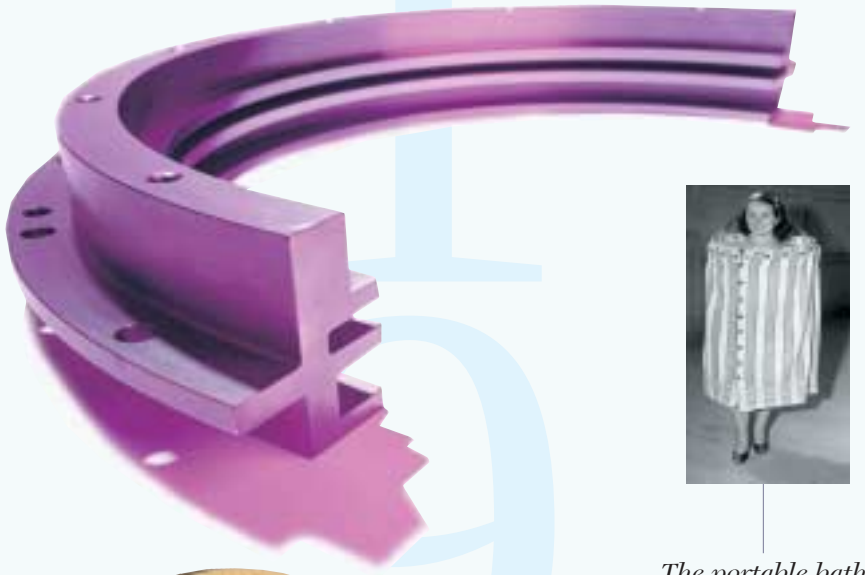
1924
Incorporation of Kingsbury Machine Works

1937
Inspection of first Kingsbury bearing at Holtwood reveals that it will last for another 1300 years

1931
City of Philadelphia presents Kingsbury with the John Scott Medal

1931
The CH bearing, a thrust and journal combination in a housing for pumps, is introduced.





1940
Dr. Kingsbury becomes Honorary Member of ASME; also receives Modern Pioneer award from the National Association of Manufacturers

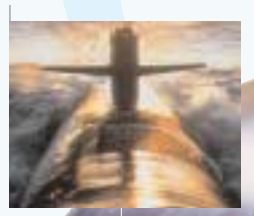
The portable bath house of 1944 allowed wearers to change on the beach without attracting attention. Needless to say, it was a washout.

1942
U.S. Navy presents "E" Production award for manufacturing efforts during WWII

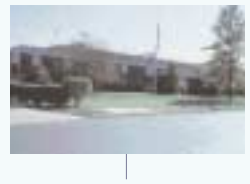
1950
Dedication of Kingsbury Hall at University of New Hampshire

1946
First hydraulic thrust meter bearing created

1957's Ford Edsel cost an unprecedented $250 million to produce and quickly bombed with the American public.



1954
USS Nautilus, first nuclear submarine, is outfitted with Kingsbury vibration reducer bearing



1967
Move operations to new facility in northeast Philadelphia

1969
All Nimitz class nuclear aircraft carriers supplied with Kingsbury main propulsion bearings

1971
Establish Research & Development facility

1977
World's first cryogenic wind tunnel at NASA Langley installed with Kingsbury bearings

Even in the 70's, the Lunacycle was a little too loony.

For obvious reasons, the invention of the electric mini car didn't go very far.

All attempts to solve big city rush hourtraffic problemswith this vehicle prove unsuccessful.

1984
Patent for LEG (Leading Edge Groove) thrust bearings

1987
First Kingsbury bearing at Holtwood Station designated an International Historic Mechanical Landmark

1994
Work begins on the design of KingCole bearing

1998
Design work begins on SlimLine bearing

The computerized, solar-powered bicycle was not such a hot idea.

2001
Patent received for SSV grooves on LEG bearing

The future looks bright at Kingsbury.

Dr. Kingsbury's invention of the fluid film bearing was driven by more than inspiration. It was the result of 14 years of curiosity, hard work and perseverance. His bearing technology not only filled a need, it revolutionized an industry and propelled rotating equipment beyond conventional limits.

That same vision and dedication lives on at Kingsbury today and will continue to spur innovation in the years ahead. As machines get more and more complex, and markets get more competitive, we will continue to make bearings that improve our customers' machine performance and reduce their operating costs.

Kingsbury's research and development lab, now under the leadership of a full-time lab director, will develop bearings with greater load capacity, lower oil flows, and less power loss than ever before. We'll be expanding our Repair & Service division with a facility dedicated exclusively to journal bearing repair. And our international growth will continue as we open our first office in Europe and extend our reach with global strategic partners.

Since 1912, Kingsbury has led the industry in product innovation, unequaled engineering capabilities and superior aftermarket services.

It's a tradition we plan to carry on for another 90 years.

Multi-pallet CNC machining centers are used in large-scale production at our Philadelphia plant.

Large installations are a Kingsbury specialty.

April 29, 2002

This celebration is a salute to all the people, past and present, who have contributed to ninety years of success for Kingsbury, Inc.

Their loyalty, expertise and hard work through five wars and many years of peace have made the company a model of what American business should be.

The Kingsbury family extends to each and every one its sincerest gratitude and appreciation.

Margaretta Clulow

Chairman

Kingsbury, Inc.

The Best Support In The Business.

www.kingsbury.com

KINGSBURY, INC. 10385 Drummond Road, Philadelphia, PA 19154 USA Telephone (1) 215 824 4000 Fax (1) 215 824 4999