

# Brief History of Windmills in the New World

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<http://www.windmillersgazette.com/history.html>

Early immigrants to the Western Hemisphere brought with them the technology of windmills which had developed in the Old World. Windmills of this type had the same basic design of windmills used in England and on the continent of Europe.

These wind machines typically had four large blades which powered wooden components which converted rotary motion of the wheels into usable power for human work. They most often operated grist mills for grinding grain into meal or flour. Although the European-style windmills served valuable roles, they were expensive to build and required constant human attention.

Windmills which developed in North America were quite different in design and appearance.



Daniel Halladay in 1854 is credited with having designed the first commercially successful new windmill in the New World. His windmill had a self-governing design. This means that it automatically turned to face changing wind directions and that it automatically controlled its own speed of operation.

Halladay's initial wind machine had four wooden blades which swiveled to provide varying pitch in order to regulate operating speed. Later he devised wheels comprised of "sections" of thin wooden blades which could pivot in order to control surface exposed to the wind and thus regulate wheel speed. Windmills of this design were called sectional wheel windmills.

Halladay invented his first successful self-governing windmill in Connecticut, U.S.A., and his company manufactured them there from 1854 to 1863. Delays in production and shipping, some caused by the American Civil War, prompted him to relocate the factory to Batavia, Illinois. There, in the Fox River Valley just west of Chicago in the American Midwest, his company

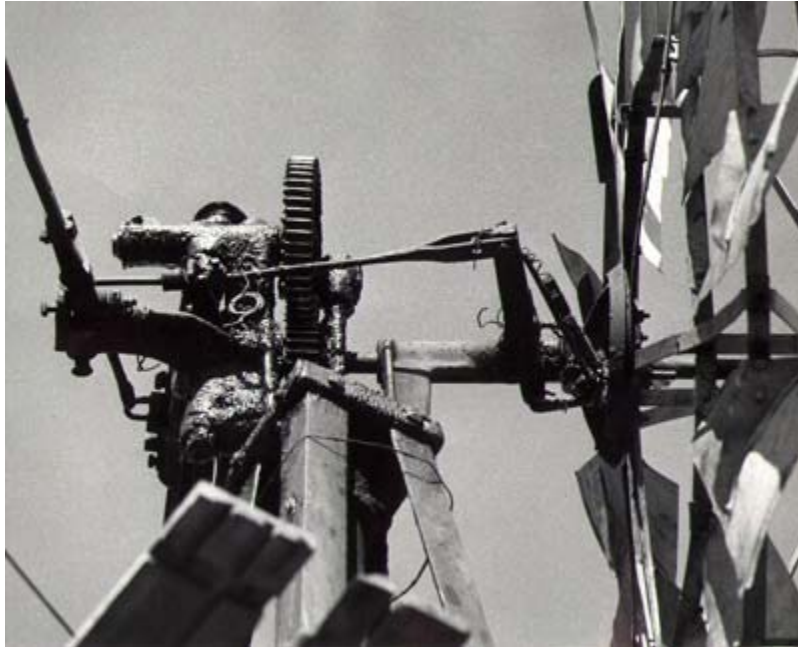
thrived. It sold its Halladay Standard windmills by the thousands to farmers and ranchers on the plains and prairies of North America as well as farther afield.

The earliest major competitor for Daniel Halladay's pioneer windmills were the Eclipse windmills invented by 1867 by the Reverend Leonard H. Wheeler. A missionary among the Ojibway Indians of Wisconsin, Wheeler and his son devised a windmill for use at their mission station. Instead of having a wheel comprised of pivoting sections, their wind machine had a "solid" wheel in which the wheel components were rigidly fastened together.



The Wheelers attached their wheel to a hinged vane (or tail), which like a weather vane kept the wheel pointed into the wind when it was operating. Their mill had a second, smaller vane attached parallel with the wheel. This side or governor vane pushed the wheel out of increasing wind velocities to regulate its speed of operation. Other contemporary mills achieved the same end by placing their wind wheel just off center. The Wheelers used a weight on the end of a lever connected with the vane to "pull" the wheel back to face the wind when its velocity subsided. All mills of this design were called solid wheel windmills.

Up to this time, all windmills in North America were built from wood, with some iron and steel parts holding the wooden components together. As early as the 1870s, however, all-metal windmills were introduced, but at first they were not especially popular. People believed that they were easily broken and difficult to repair. In time, however, the use of steel and iron for windmills increased so that by the beginning of the twentieth century the majority of windmills built were made from metal.



The use of metal allowed windmill manufacturers to create wind wheels containing curved blades. Curved blades were much more efficient than the older-style thin, flat wooden blades. The use of curved blades also permitted introduction of back-gearing to windmills. Back-gear windmills typically had wheels which revolved two or three times for each stroke of a pump, and this allowed the steel windmills to begin turning in much lighter winds than were necessary for the less efficient wooden-wheel mills. By the 1940s, iron and steel had completely supplanted wood as a construction material for windmills as manufactured in North America.

Perhaps the most important technological innovation in water-pumping windmills during the twentieth century was the introduction of oil-bath or self-lubricating designs. In these windmills the main casting doubled as an oil reservoir. The moving parts of the mills operated in this bath of oil in a manner similar to the operation of parts in an automobile engine lubricated by oil from the crankcase. The first widely sold oil-bath windmill in North America was the Wonder Model A made by the Elgin Wind Power and Pump Company of Elgin, Illinois, about 1912. Within a decade virtually every windmill company in North America had begun offering its customers oil-bath-style windmills.



The windmill industry in North America remained very active into the 1930s. During this decade the combination of major economic depression with introduction of electricity (and electric water pumps) to rural areas began a slow decline from which the windmill industry in North America never fully recovered. Gradually windmill manufacturers either shifted major production to other products or saw their share of the market for water supply goods shrink and shrink. Today a handful of companies continue to market high-quality new water-pumping windmills, while hundreds of individuals throughout the continent earn their livelihoods by repairing and maintaining older water pumpers still in the field. Some of these firms and individuals advertise in the Windmillers' Gazette.

Several companies continue the manufacture of windmills in the United States. These firms include the Aermotor Windmill Company, Inc., San Angelo, Texas; Dempster Industries, Inc., Beatrice, Nebraska; Muller Industries, Inc., Yankton, South Dakota; and KMP Pump Company, Earth, Texas. The American West Windmill Company, Amarillo, Texas, imports and distributes mills made in Argentina, Second Wind Windmill Service, Ft. Worth, Texas, imports and sells mills made in Mexico, while O'Brock Windmill Distributors in North Benton, Ohio, import and sell mills made in South Africa.



Several museums contain important collections of historic windmills and related artifacts. The largest of the windmill museums is the [American Wind Power Center](#) in Lubbock, Texas, but just behind it in size comes the [Mid-America Windmill Museum](#) in Kendallville, Indiana. The [Canadian National Wind Power Center](#) in Etzikom, Alberta, interprets the history of wind power in Canada. Of much interest are the [Shattuck Windmill Museum](#) in Shattuck, Oklahoma, the [Windmill State Wayside](#) near Gibbon, Nebraska, and the [Spearman Windmill Park](#) in Spearman, Texas. In South Africa the [Fred Turner Museum](#) in Loeriesfontein contains an important open-air display of water-pumping windmills of the types used in the region. The [Morawa District Historical Society Museum](#) in Morawa, Western Australia, which also publishes the quarterly *Windmill Journal*, has the preminent collection of historic windmills in Australia and hosts an important wind power history website. With plans to open to the public in the future, the Kregel Windmill Company Museum in Nebraska City, Nebraska, preserves the last fully intact historic windmill factory in the United States. Numerous private windmill collections are also in locations where they may be viewed by members of the traveling public. The [Vintage Windmills](#) internet website provides an important means of communication among individuals and institutions preserving historic wind machines.



Important repositories for documents, records, and historic trade literature for windmills include the Windmill Manufacturers' Trade Literature Collection at the [Panhandle-Plains Historical Museum](#), Canyon, Texas; [Nebraska State Historical Society](#), Lincoln, Nebraska; [American Wind Power Center](#), Lubbock, Texas; William McCook Collection, [Scienceworks, Museum of Victoria](#), Melbourne, Australia; [Southwest Collection, Texas Tech University Libraries](#), Lubbock, Texas; Library, [National Museum of American History](#), Washington, D.C.; [American Heritage Center, University of Wyoming](#), Laramie, Wyoming; and [F. Hal Higgins Agricultural History Collection, University of California at Davis](#), Davis, California.

Since 1982 the Windmillers' Gazette has chronicled water-pumping windmills as used in North America and around the world. Its articles have documented evolution of technology and applications in the manufacture, distribution, and use of these devices, which by the thousands continue to employ the free power of the wind to serve humans. Wherever you are in the world, if you are interested in wind power utilization, you will enjoy reading the quarterly Windmillers' Gazette.

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