

THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

THE WATKINS WOOLEN MILL  
Lawson, Missouri  
NATIONAL HISTORIC MECHANICAL  
ENGINEERING LANDMARK



April 15, 1980 2:00 p.m.



**DEDICATION CEREMONY  
NATIONAL HISTORIC MECHANICAL ENGINEERING  
LANDMARK**

Watkins Woolen Mill  
Lawson, Missouri  
April 15, 1980, 2:00 p.m.

Welcome

**Paul Braisted, Vice President, ASME Region VII**

Introduction

**John Lindholm, Chairman, Kansas City Section**

Presentation of Centennial Plaque to Wisconsin Department of Natural Resources

ASME Landmark Program

**Professor J. J. Ermenc, Chairman, National History and Heritage Committee**

History of Watkins Woolen Mill

**Lee Oberholtz, Secretary, Watkins Mill Association**

Presentation of Plaque

**Donald N. Zwiep, President of The American Society of Mechanical Engineers**

Acceptance of Plaque

Closing Remarks

**John C. Lindholm**

Wording on Bronze Plaque

**NATIONAL HISTORIC MECHANICAL ENGINEERING LANDMARK  
WATKINS WOOLEN MILL**

1861 - ca1890

The Watkins Woolen Mill is among the best preserved examples of a mid-19th century woolen mill in the United States. Its variety of machinery for preparing, spinning, and weaving--some of it modified during its life at the mill to improve its performance--presents an unsurpassed cross section of textile technology at that time and is the finest collection of early textile machines in situ in North America. The mill was designed and built by Waltus L. Watkins (1806-1884), a machinist and master weaver from Frankfort, Kentucky.

The American Society of Mechanical Engineers 1980

## The WATKINS WOOLEN MILL

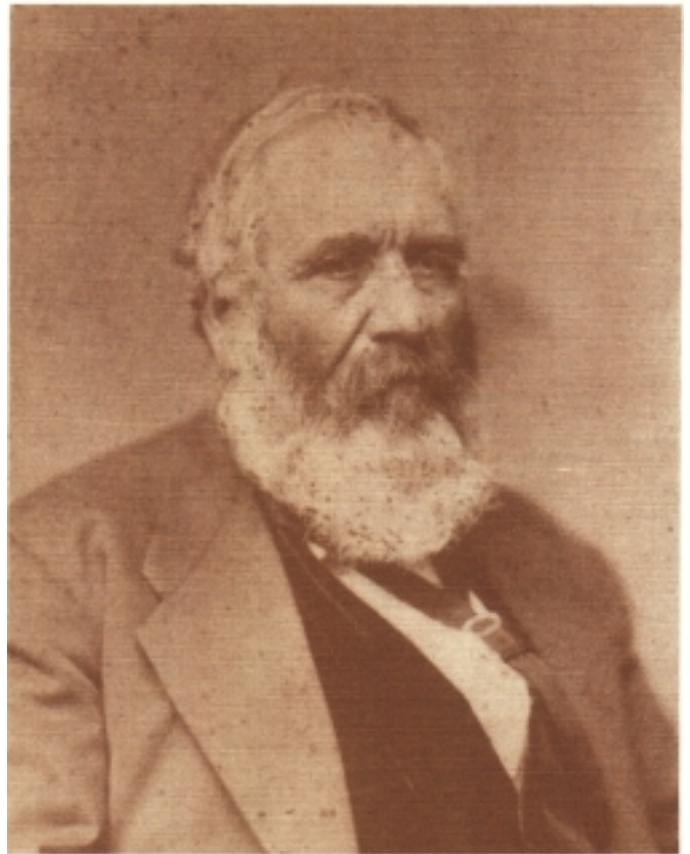
Waltus Locket Watkins was born in Woodford County, Frankfort, Kentucky. When he was a young man he learned the machinist's trade in the East, and worked on one of the first locomotives built in the United States. He gained experience in cotton manufacturing in the cotton mills of his uncles, and for two years was superintendent at a mill in Frankfort, Kentucky.

In 1830, he moved to Liberty, Missouri, where he built a small cotton mill. He converted his plant to a woolen mill when he discovered that the area was not adaptable to cotton. Within a few years the mill was destroyed by fire, and Watkins turned all his attention to farming. In 1834, he married Mary Ann Holloway, also of Kentucky. Shortly after, he purchased a tract of land in Clay County and once again set up a woolen mill and farm. By the spring of 1861, the Watkins Mill began partial operation. During the winter months when inclement weather hindered its operation, the mill would close down; hence, it operated approximately nine months out of the year.

Consumption of wool more than doubled in America during the Civil War as the need for woolen cloth increased. As Watkins prospered, his complex grew. A flour mill was established in 1849 which used six oxen to provide power for grinding. A general store stocked food staples, shoes, shirts, hats, hardware, and buggy and wagon parts. The plant even manufactured brooms at one time. Mill workers lived in small houses on the grounds.

Watkins' real estate in 1860 was valued at \$12,000; by 1870 it had increased to \$122,000.

Watkins died on January 24, 1884, but the business was carried on by his three sons, John, Judson, and Joe. John had become his father's partner in 1873, and the others had joined in 1882.



Waltus Locket Watkins

By 1883, cloth sales had declined, and yarn sales constituted the major source of income. Eventually, the Watkins Mill suffered from the economic malaise that swept the woolen industry of the Midwest, and it ceased to operate sometime around the turn of the century.

Processes Used at the Mill

The Watkins method of converting raw wool into finished cloth and yarn offers a production model illustrative of pioneer manufacturing in general.

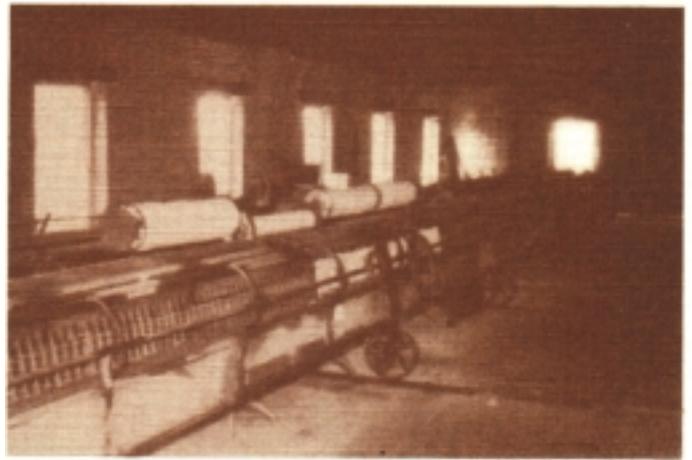
Equipment for converting the fleece into woolen cloth was located on three floors. The first operation involved the sorting of raw wool into appropriate classes, determined by color, fineness, length, strength, and other qualities.

Watkins used a picking machine typical of most pioneer mills. This was a large rectangular box containing a revolving cylinder armed with spikes to knock out excess burrs and dirt. From the picking room, the wool moved to the first floor, where washing and dyeing took place. Watkins' washers contained an alkali-soap solution, and as the fleece moved in the machine, all dirt, grease, and vegetable matter were removed. Following several rinses and squeezings, the damp wool was hung on racks on the fourth-floor drying room. During July and August, workers on the fourth floor suffered from the intense heat and humidity, since wool in process was never allowed to dry completely.

Dyeing was done on the first floor. Fleece could be dyed "in the wool" after its conversion to yarn, or by the piece as it came from the loom. Typical of other mills, Watkins possessed its own formula, which was probably acquired from skilled artisans or through a long process of experimentation.

Carding involved straightening and intertwining long and short wool fibers in preparation for spinning. Wool taken from the fourth-floor drying racks at Watkins received a light application of oil to make it soft and pliable. It was then transported to the third-floor carding department. Each carding machine was equipped with a large revolving cylinder, flanked by smaller rollers, all of which revolved in various directions. As a result, the brushed fleece formed a flat web, similar in appearance to a thin sheet of cotton batting. Rollers at the rear of the carding apparatus divided the web into several extended ropes, or rovings which resembled yarn. After winding them on large spools, the card operators transferred the rovings to spinners on the opposite side of the third floor.

The fundamental principal of spinning was to extend and twist the rovings to create finished yarn. Like other factories in the Midwest, the Watkins Mill utilized machines on which the rovings were drawn and spun in the same operation. The rovings were threaded from the



Spinning Jacks on Third Floor

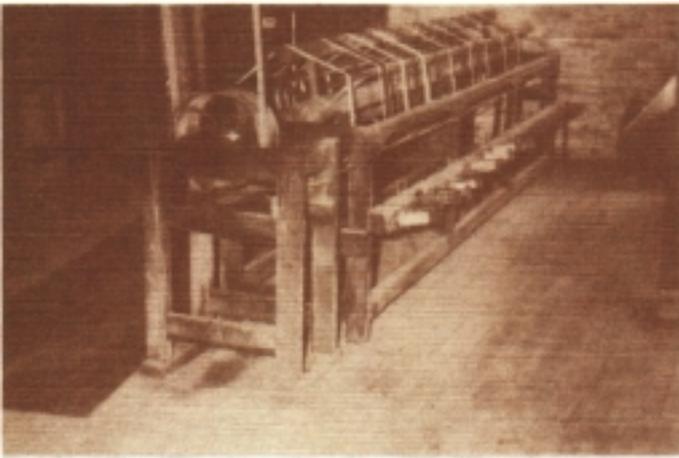
spindles, which were mounted on a movable carriage, through a set of pressure rollers, and then attached to the bobbins. The operator then moved the carriage outward, away from the bobbin rack, and simultaneously rotated a handcrank to activate the spindles. As the spindles revolved, the rovings were played out, while receiving the desired twist. A return of the carriage wound the twisted yarn on the bobbins, and the operator repeated the procedure. Continued trips of the carriage filled the bobbins, and the spinner then rethreaded.

The selection of colors for future patterns was done by the dresser tender, who would arrange the various threads in numerous color combinations when he pulled them from the spools and laid them out on a large cylindrical wheel called the reel. A reverse rotation of the reel rewound the warp onto spools called loom beams. To impart greater strength, warp, lengthwise threads, usually received an application of paste as they passed from the reel to the loom beam. Weft threads are the crosswise filler threads used in weaving.

Woolen cloth fresh from the loom was uneven in texture and often stiff and scratchy. Hence, the development of the fulling mill, which consisted of a hollow box with a watertight compartment in its base, fitted with a set of pressure rollers in the upper portion.



Ring Frame or Ply-Twister (extremely rare)



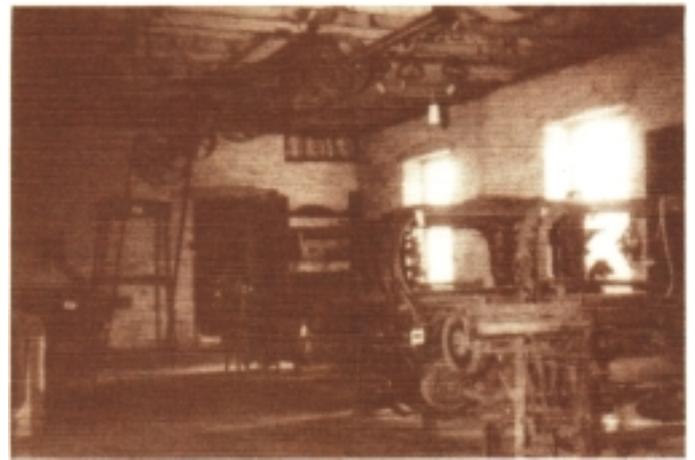
Closeup of Skeiner

The fuller ran long pieces of cloth through the rollers, and sewed them end to end. When the machine started, the wet material was drawn up through the rollers, rung out, and then dropped into the tub of warm, soapy water below. Fulling time depended on the type of fabric. The resulting cloth, shrunk to as much as one-third of its original size, received a rinse in clear water, and was placed on racks to dry.

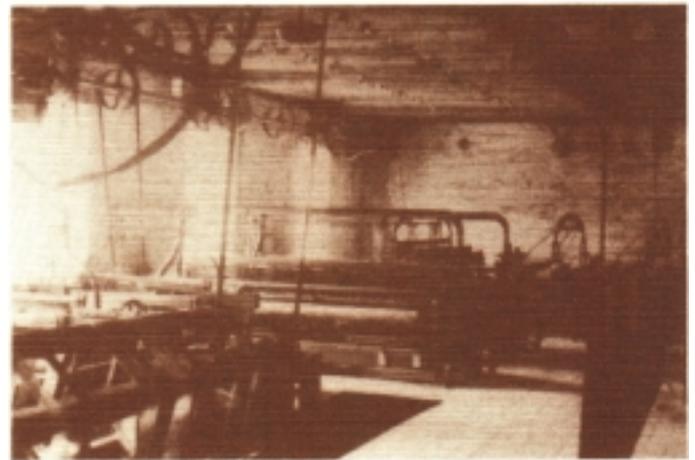
Dry cloth was napped and sheared, or pressed. Teazles, spiny heads of a plant used to raise woolen nap, had been employed in finishing woolen fabrics for centuries. With teazles set in a cylinder, Watkins' finisher

slowly raised the nap, which he then cut to an even height with handscissors or a shearing machine.

Yarn for the retail trade moved from the spinning machines to a baler, hanker, and ply-twister located on the second floor. Yarns of several plies were formed by a twister, which pulled the threads from a rack filled with spools. After the hanker twisted yarn into hanks, the bundles were again twisted to prevent kinking and knotting. A baler then compressed the hanks to save space, making shipment less expensive.



Fancy Looms on South Wall



Broad Looms or Blanket Looms

## THE WATKINS MILL STATE PARK

Following cessation of milling operations, John H. Watkins continued to live on the Watkins farm, and was noted as a breeder of Shorthorn cattle and Berkshire hogs. For a number of years in the early 1900's, he was host to the annual fox hunt of the Missouri Valley Fox Hunters Association. The mill machinery and records were left intact by members of the family.

In 1945, the farm was sold to Henry Frass, Jr., and other members of the Frass family of Texas and Kansas City. Mrs. C. A. Mason, a member of the family, lived at the farm for 13 years, and during that time she made a sincere effort to save the home and the mill. The Clay County Historical Society sponsored a barbecue at Watkins Mill on July 17, 1954, with state senators and representatives as special guests. Many articles were published about the mill and its possibilities for a state park, but no action was taken.

On May 6, 1958, the entire property was sold at auction. The successful bidder for the buildings and the 1,600 surrounding acres of land was unable to secure the money to consummate the sale, and the property went to George Stilley of Raytown. The mill contents were purchased for the Watkins Mill Association, formed two days after the sale by Lee Oberholtz, Forest Ingram, and George Reuland, business executives connected with the Allis-Chalmers Manufacturing Company in Independence. The Watkins Mill Association was chartered on April 10, 1959, as a non-profit corporation to "procure, preserve, restore, maintain, study, and promote the Watkins Mill Estate. . . and make available to the public the historic operation in early

industry, community life, church, and school as exemplified by the Historic Watkins Mill."

In 1960, the Association purchased the mill building and 12.5 surrounding acres of land from Stilley. In 1961, a public meeting was held by the Association at Excelsior Springs with officials from the Missouri State Park Board to consider a campaign that would lead to the acquisition of 100 or more acres of the Watkins property. A Clay County bond election for the purchase of the property failed in 1962, but the next year Clay County citizens approved a \$184,00 bond issue for the purchase of approximately 783 acres.

The State of Missouri took possession of the properties in 1964, and restoration work began. The Association accepted the responsibility of repairing and putting some of the machines in working order, and contracted with the Missouri State Park Board to operate the properties. Watkins Mill State Park opened temporarily on November 1, 1965, and more than 1,500 people visited the mill during the six weeks it was open before closing for the winter. Permanently opened on June 1, 1966, more than 7,700 visitors toured the mill that year and acclaimed the restoration work and the guide service.

Watkins Mill was designated a registered National Historic Landmark, November 8, 1966, and formally dedicated, April 23, 1967.

Many of the Watkins business records and papers are preserved in the archives of the Jackson County Historical Society in the Harry S. Truman Library, Independence.

The historic buildings of the Watkins Mill complex are representative of an important segment of Missouri's past industrial, social, religious, and educational life.

## ACKNOWLEDGEMENTS

**The Kansas City Section of the American Society of Mechanical Engineers gratefully acknowledges the efforts of all who cooperated on the landmark dedication of the Watkins Woolen Mill, Lawson, Missouri.**

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**Watkins Mill State Historic Site  
Ann Matthews, Site Administrator**

**Watkins Mill Association  
Lee Oberholtz, Secretary**

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## National Historic Mechanical Engineering Landmark Program

In September 1971, the ASME Council reactivated the Society's History and Heritage program with the formation of a National History and Heritage Committee. The overall objective of the Committee is to promote a general awareness of our technical heritage among both engineers and the general public. A charge given the Committee is to gather data on all works and artifacts with a mechanical engineering connection which are historically significant to the profession--an ambitious goal, and one achieved largely through the volunteer efforts of the Section and Division History and Heritage Committees and interested ASME members.

Accordingly, two major programs are carried out by the Sections and Divisions under the direction of the National Committee: 1) a listing of industrial operations and related mechanical

engineering artifacts in local Historic Engineering Records; and 2) a National Historic Mechanical Engineering Landmark program. The former is a record of detailed studies of sites in each local area; the latter is a demarcation of local sites which are of national significance, people, or events which have contributed to the general development of civilization.

In addition, the Society cooperates with the Smithsonian Institution in a joint project which provides contributions of historical material to the National Museum of History and Technology in Washington, D.C. The Institution's permanent exhibition of mechanical engineering memorabilia is under the direction of a curator, who also serves as an ex officio member of the ASME National History and Heritage Committee.

The Watkins Woolen Mill is the 41st landmark to be designated since the program began in 1973. The others are as follows.

**Ferries and Cliff House Cable Railway Power House, San Francisco, California**

**Leavitt Pumping Engine, Chestnut Hill Pumping Station, Brookline, Massachusetts**

**A. B. Wood Low-Head High-Volume Screw Pump, New Orleans, Louisiana**

**Portsmouth-Kittery Naval Shipbuilding Activity, Portsmouth, New Hampshire**

**102-Inch Boyden Hydraulic Turbines, Cohoes, New York**

**5000 KW Vertical Curtis Steam Turbine-Generator, Schenectady, New York**

**Saugus Iron Works, Saugus, Massachusetts**

**Pioneer Oil Refinery, Newhall, California**

**Chesapeake & Delaware Canal, Scoop Wheel and Engines, Chesapeake City, Maryland**

**U.S.S. Texas, Reciprocating Steam Engines, Houston, Texas**

**Childs-Irving Hydro Plant, Irving, Arizona**

**Hanford B-Nuclear Reactor, Hanford, Washington**

**First Air Conditioning, Magma Copper Mine, Superior, Arizona**

**Manitou and Pike's Peak Cog Railway, Colorado Springs, Colorado**

**Edgar Steam-Electric Station, Weymouth, Massachusetts**

**Mt. Washington Cog Railway, Mt. Washington, New Hampshire**

**Folsom Power House #1, Folsom, California**

**Crawler Transporters of Launch Complex 39, J. F. K. Space Center, Florida**

**Fairmont Water Works, Philadelphia, Pennsylvania**

**U.S.S. Olympia, Vertical Reciprocating Steam Engines, Philadelphia, Pennsylvania**

**5-Ton "Pit-Cast" Jib Crane, Birmingham, Alabama**

**State Line Generating Unit #1, Hammond, Indiana**

**Pratt Institute Power Generating Plant, Brooklyn, New York**

**Monongahela Incline, Pittsburgh, Pennsylvania**

**Duquesne Incline, Pittsburgh, Pennsylvania**

**Great Falls Raceway and Power System, Paterson, New Jersey**

**Vulcan Street Power Plant, Appleton, Wisconsin**

**Wilkinson Mill, Pawtucket, Rhode Island**

**New York City Subway System, New York, New York**

**Baltimore & Ohio Railroad, Baltimore, Maryland**

**Ringwood Manor Iron Complex, Ringwood, New Jersey**

**Joshua Hendy Iron Works, Sunnyvale, California**

**Hacienda La Esperanza Sugar Mill Steam Engine, Manati, Puerto Rico**

**RL-10 Liquid-Hydrogen Rocket Engine, West Palm Beach, Florida**

**A. O. Smith Automated Chassis Frame Factory, Milwaukee, Wisconsin**

**Reaction-Type Hydraulic Turbine, Morris Canal, Stewartsville, New Jersey**

**Experimental Breeder Reactor 1 (EBR-1), Idaho Falls, Idaho**

**Drake Oil Well, Titusville, Pennsylvania**

**The Springfield Armory, Springfield, Massachusetts**

**East Well's Power Plant (Oneida Street), Milwaukee, Wisconsin**