

# MILLWORK

THE NEWSLETTER OF HANFORD MILLS MUSEUM

Volume 23, Issue #1

Winter 2012

## Upcoming Events



**ICE HARVEST**  
Saturday, Feb. 4th, 2012  
10:00 – 4:00

SAVE THE DATE!

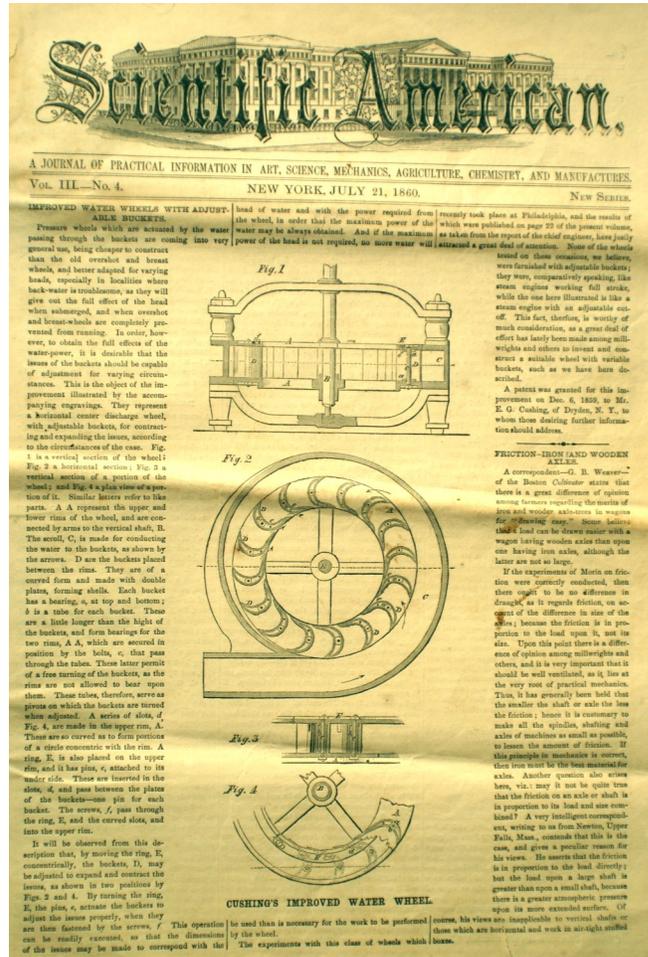
## Scientific American and the Hanfords

By Kevin Gray,  
Program Coordinator

It comes as little surprise that the Hanfords would be interested in news related to power generation, agricultural equipment, and the latest developments in engineering. With the 19<sup>th</sup> century Industrial Revolution forever changing the ways in which products were made and shipped it was crucial that entrepreneurs, particularly those in rural areas, had quick access to information on the latest innovations that could improve their businesses. One publication above all others fit this niche perfectly, and continues to be popular today: *Scientific American*.

*Scientific American* is the country's oldest continuously published monthly magazine. It began in 1845 as a weekly newspaper founded in New York City by painter, inventor, and publisher Rufus M. Porter. A mere ten months after starting it he sold the publication and focused on his vision to build a steam-powered airship (an ambitious plan that never succeeded). On the masthead of the very first issue was an explanation of the magazine's mission. It read, in part:

" [Scientific American] will contain, in addition to the most interesting news of passing events, general notices of progress of Mechanical and other Scientific Improvements; American and Foreign...[It] is particularly useful to farmers, as it will not only appraise them of improvements in agriculture implements, But instruct them in various mechanical trades, and



This cover of *Scientific American* from July 21, 1860 highlights an improved design for a water turbine, an article that D.J. Hanford would surely have been interested in.

guard them against impositions."

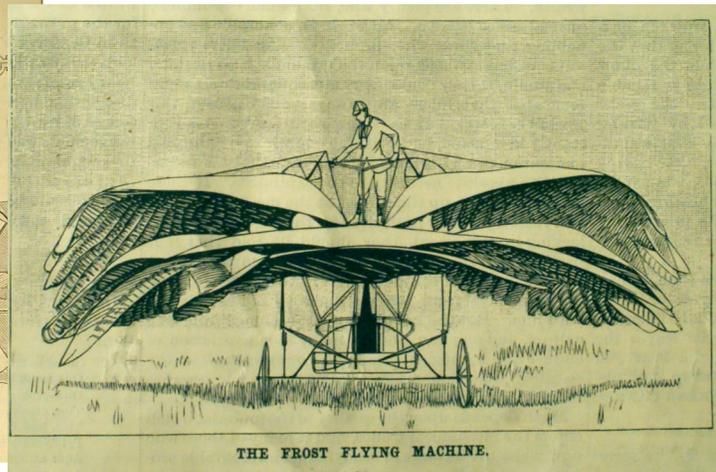
The cover of the first issue of *Scientific American* in 1845 included articles on improvements in railroad passenger cars, advancements in lithographic printing, an explanation for the cause of sound in thunder, a list of recent American patents, and a

review of a book about the history of the mill town Lowell, MA (a snippet from the article: "... the Merrimack Company employs 1250 women, whose average earnings considerably exceed \$2 each per week..."). Throughout the 1800s the magazine was known for its wonderful illustrations and

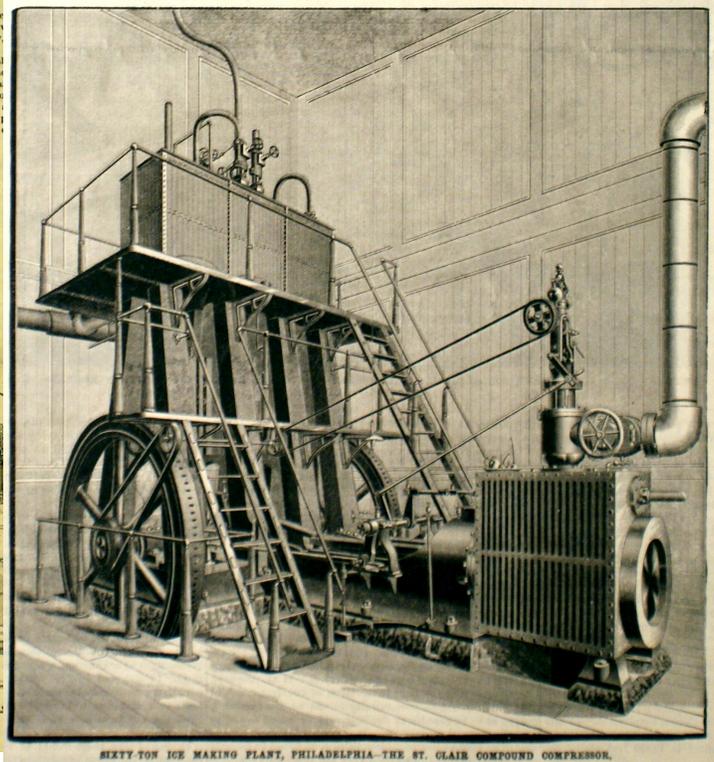
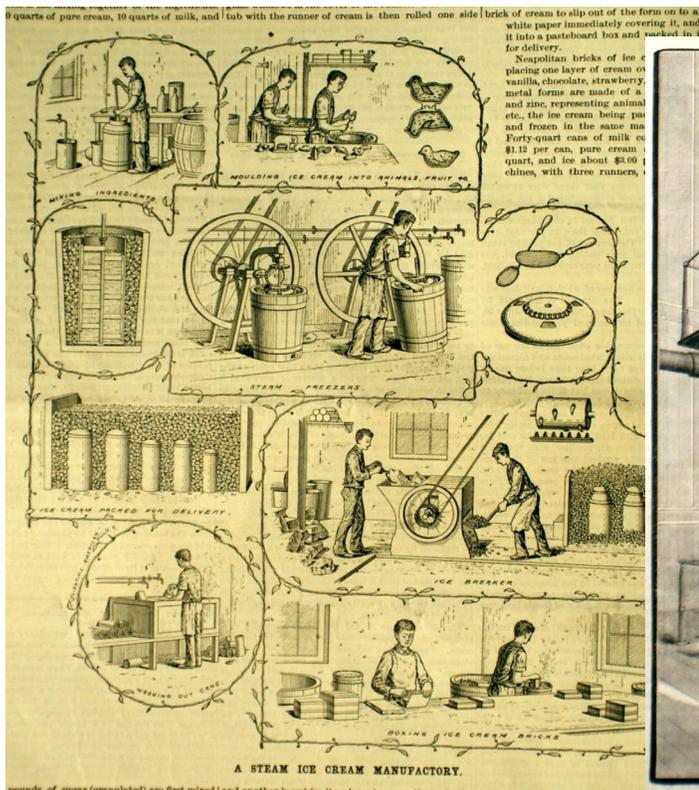
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## Scientific American and the Hanfords (cont.)



New transportation devices were regular features in the pages of *Scientific American* during the 1800s, particularly flying machines. The two contraptions shown above were not particularly successful, for rather apparent reasons.



Ice making was a new, burgeoning technology during the latter stages of the 19th century. The demand for ice in rapidly growing American cities put a strain on companies which harvested ice from lakes and rivers, and mild winters meant a significant ice shortage. Steam-powered, air-compressing ice makers were developed that could produce tons of ice all year long, including this sixty-ton ice making plant built in 1894 by the Knickerbocker Ice Company in Philadelphia (above right). A more stable supply of ice allowed for new businesses to flourish, such as ice cream companies. This diagram (above left) illustrates the steps taken to make delicious treats in a steam-powered ice cream factory.

## Patents, Pulleys, and Power

By Alan Rowe,  
Research & Preservation Coordinator

In a previous issue of *Millwork* (see: "Power Transmission—An Intro. To Pulleys," Jan.-May, 2008) we learned about the use of split pulleys, specifically wooden split pulleys, and how they made the business of milling a much more pleasant prospect. Unlike a solid cast iron pulley, a split pulley can be unbolted at the hub, split into two halves, and easily removed from the shaft. Another virtue of the wooden split pulley is the use of an interchangeable wooden bushing. By using wooden bushings of various inside diameters, a pulley may be applied to shafts of many different sizes. It is obvious to see why the mechanics of a rapidly industrializing nation would enthusiastically embrace a pulley that was both easy to remove from fixed line-shafting and interchangeable between line-shafts of various dimensions.

Given the advantages of the wooden split pulley and the growing market for power transmission devices in America's shops, factories, and mills in the late nineteenth century, several contenders arose to supply their needs. It should come as no surprise that legal battles broke out between the various pulley manufacturers as they jockeyed for dominance in their field. In our previous article, the patent claims of the Dodge Manufacturing Company of Mishawaka, Indiana were put forward without enough consideration of the complexity of the issue as it existed at the time. To put it simply, Dodge claimed that they originated the idea of the split wooden pulley with the interchangeable bushing, and pointed to their patent, issued July 4, 1882, as irrefutable proof. Eventually, Dodge went to war against their competitors in the courts and on October 23<sup>rd</sup>, 1896 they scored a sweeping victory against several rival firms. That decision, rendered by Judge George R. Sage of the circuit court for the Southern District of Ohio, was so pleasing to Dodge that

they printed the decision in its entirety in their 1897 price list, a copy of which is in the Hanford Mills Museum collection. Although Dodge continued to tout their legal victory as the final word on the subject, in reality several of their competitors successfully fought this ruling in subsequent court battles. The conclusions of the "Sage decision," as Dodge's 1896 victory came to be called, were invalidated in court cases in 1898 and 1899 against the Ohio Valley Pulley Works of Maysville, Kentucky, and the Fulton Pulley Company of Fulton, New

York. In each case, the courts determined that the Dodge patent failed for "want of novelty" and thus the defendant's pulleys, even if similar in construction, did not infringe upon Dodge's designs. And so it was that Dodge failed to discourage its competitors with legal slings and arrows, and instead focused on winning customers to its favor by virtue of sound pulley designs and superior workmanship. The latter strategy proved to be successful, as long after most of its competitors vanished from the field the Dodge →



**THE GILBERT WOOD SPLIT PULLEY.**

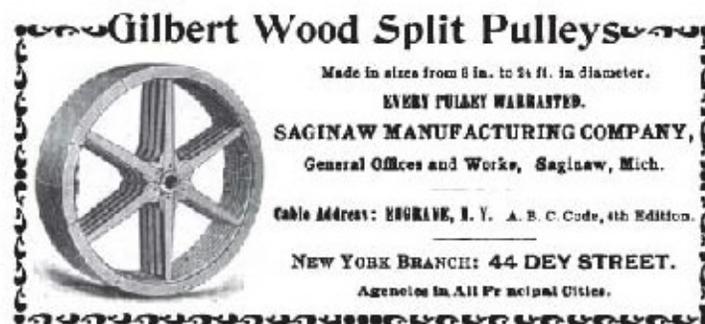
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Advertisements for the Gilbert Wood Split Pulley. Manufactured by the Saginaw Manufacturing Company, Gilbert pulleys may be found in several locations throughout the Mill.

## Pulleys, cont.

The use of many Dodge pulleys throughout the mill is a testament to the quality and durability of their product, but it is important to note the common use of several competing pulley designs throughout the mill. A 40-inch diameter pulley made by the Ohio Valley Pulley Works occupies a prominent place on the shaft that powers woodworking machinery in the Mill's box room. Several examples of the Gilbert wood split pulley, named for its inventor, Henry J. Gilbert, may be found in prominent positions on the mill's main shaft. The Gilbert pulley was the product of the Saginaw Manufacturing Company, of Saginaw, Michigan. Dodge took Saginaw to court in 1897, and failed to convince the court that the Gilbert pulley infringed in any way on the principles of the Dodge design. One [blank-inch] Gilbert pulley has the honor of driving the sawmill, and several others are held in the Museum's extensive pulley collection.

The great variety of pulley types and pulley manufacturers represented in the Mill preserves in solid form the state of the art of power transmission in the late 19<sup>th</sup> and early 20<sup>th</sup> centuries. This visual record, when studied in concert with the written record as found in the court cases, trade journal articles, and manufacturer's catalogs helps us to understand the often shifting and complicated world of patents, pulleys, and power.



A 40-inch diameter pulley manufactured by the Ohio Valley Pulley Works, Maysville, Kentucky. This pulley drives the C.B. Rogers & Co. 16-inch jointer located in the box room.



A Gilbert pulley (background next to wall) as installed on the Mill's main shaft. This 40-inch diameter pulley drives the Mill's circular saw.

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