Forest Hills Connection

Peirce Mill preservationists have been active during the “quiet” season

JANUARY 26, 2016 BY **Lee Armfield Cannon**

Historic Peirce Mill is the only surviving mill of the many once operating on Rock Creek. (photo by William Mills)

Peirce Mill may seem deserted, waiting quietly for spring. Don’t be fooled by appearances, though. A closer look at the neighborhood historic site at Tilden Street and Beach Drive shows plenty of activity, though the mill’s machinery is hibernating for the season.

For nearly 20 years, Friends of Peirce Mill has been working with the National Park Service and restoration experts to return the mill to its original, 19th century form. With a completion target of this April, they hope to show off the latest phase of the ongoing restoration: the Barrel Hoist Project.

Phase 1 of the Barrel Hoist Project is complete. (photo courtesy of Deborah Dougherty)

A little history

Peirce Mill was built on the banks of Rock Creek in the 1820s by father-and-son team Isaac and Abner Peirce. It operated until 1897, when obsolescence and breakdowns of the machinery forced its closure. Throughout the 20th century and up to the present day, enthusiastic local champions of the mill have saved it time and again, and restored it to operating capacity. Thanks to their efforts, the mill has remained standing and has also been grinding grain commercially or serving as a functioning historical site on and off for more than 100 years.

These days, the mill is exhibiting how our forefathers processed grain to feed the new nation. Traditionally-milled flour and meal unfortunately do not satisfy modern health regulations, so Peirce Mill's products go to feed livestock on a farm near the city. However, some area residents remember buying the mill's flour as recently as the early 1990s.

(For more information about Peirce Mill, check out a more **comprehensive look at the mill's history** and visit the **Friends of Peirce Mill** and **National Park Service** websites.)

Jeanne Minor, Peirce Mill's first female miller (Photo courtesy of William Mills); Peirce Mill of yesteryear.

Corn at the front door, meal at the back door

In the 18th and 19th centuries, flour and meal were often hand-milled in homes or, at best, milled in the community mill, where many strong men and boys were necessary to handle the raw and processed materials. Milling the hard wheat varieties grown at the time was a difficult process and usually resulted in coarse, low-quality flour. Even as milling technology progressed and led to faster processing, the sheer number of stamping boots in the mill resulted in inefficiency, and also frequent contamination of the product at all stages of the process.

Enter Oliver Evans, a Delaware miller and soon-to-be inventor. Looking around at the poorly milled, contaminated meal and flour available in his day, he decided there had to be ways to improve the product and make the process more efficient as well. Beginning in 1785, Evans spent five years designing and building inventions in his brother's mill that relieved the need for so much human labor and closed the system to contaminants. Using gravity and the ancient Roman idea of a bucket hoist, Evans created a vertical system with which a farmer need only drag his wheat or corn in the door, dump it into a receiving hopper, then pick up his barrels of finely-milled flour or meal and load them onto his cart.

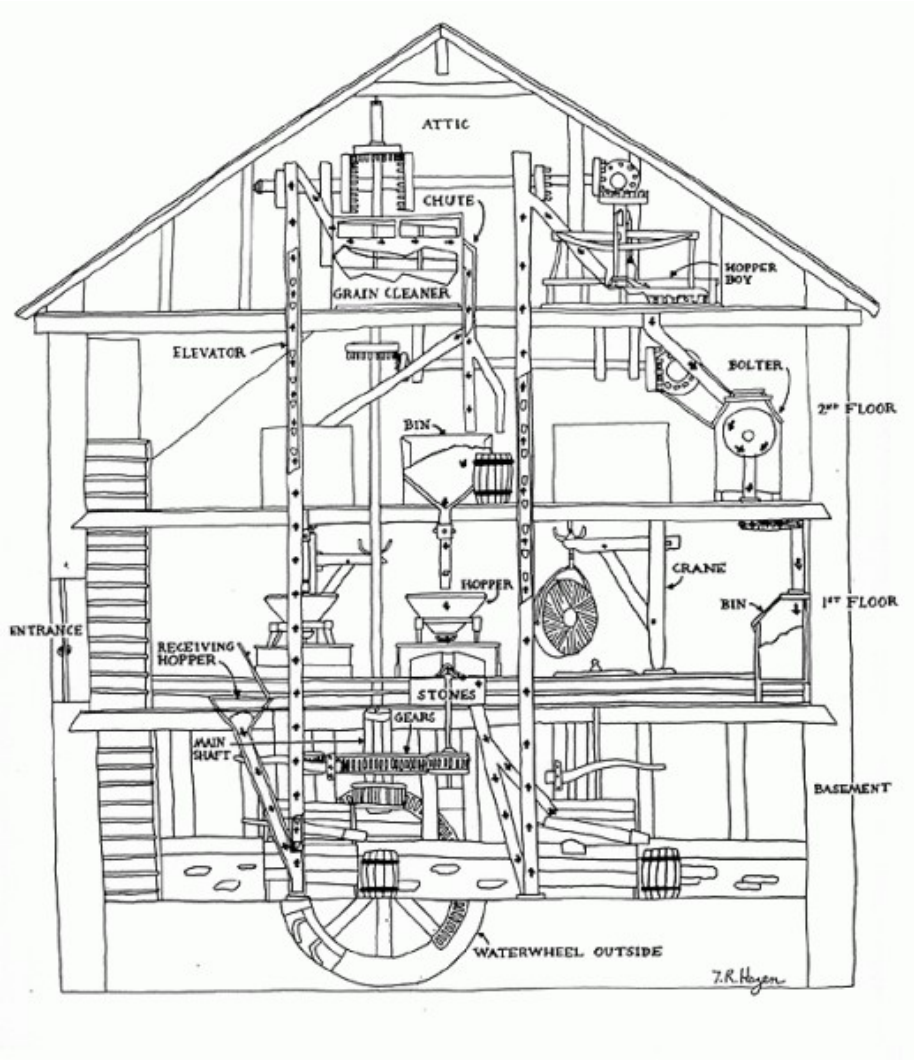


Diagram of the workings of Peirce Mill, drawn by former miller Ted R. Hazen.

The first stage of Evans' process was dropping the grain down a chute into the basement. There, the grain was lifted, one double-handful at a time, by metal cups affixed to a canvas conveyor belt. This was mounted inside a vertical chute that stretched from the basement all the way up to the third floor of the building. The metal cups scooped up the grain and lifted it up to the top of the system, where the cups emptied into a grain cleaner, a machine with a rotating inner cylinder of mesh that cleaned the grain and removed contaminants such as dirt, rocks or sticks.

The grain next fell through another chute in the floor into wooden storage bins on the second floor, positioned directly above the three pairs of millstones. The miller could then engage the top millstone, called the running stone, and release the grain from the storage bin above him to fall into a wooden hopper. This in turn fed the grain steadily into the center hole in the running stone.

The process of milling corn was relatively simple. As the running stone spun, the kernels were sliced over and over by the grooves cut into the millstones, which acted like scissors. Corn needed only to

go through the millstones, then drop into chutes that led down into bins in the basement, where it could be packed immediately.

Milling hard-grain wheat was more challenging. The process of slicing the grains generated a lot of heat and released the moisture in the raw grain. Heat and moisture were two other sources of inefficiency in the milling process. Before Evans began automating more and more processes, millers had used family members or hired men – or more often young boys – to spread freshly milled wheat flour out on a wide floor and rake it continuously until it cooled and dried, making it suitable for packing into bags or barrels.

Evans knew this process of cooling and drying was a major cause of the bottle-necks in the milling process, so he invented a machine that could take the place of the boys and their rakes – a wooden tub with rotating rakes he named the hopper boy.

The hopper boy machine. (photo courtesy of William Mills)

Once the wheat flour dropped out of the millstones on the first floor into another chute into the basement, the conveyor belt of tin cups would lift the flour once more from the bottom of the mill to the top again, this time dropping it cupful by cupful through a different chute into the hopper boy. The hopper boy was fitted with a rotating shaft that dragged rakes through the hot, moist flour, spreading it evenly and cooling it. The teeth of the rakes were angled, so that the flour was pushed very slowly

toward a center hole, where it dropped down into yet another machine, the bolter.

The bolter was similar to the grain cleaner, with its rotating cylinder of screens, but the mesh in the bolter was graduated, with very fine mesh on one end, to allow only the finest flour through, to wider at the other end, to allow only coarser particles or bran to fall through. The bolter then dropped the different gradations of flour into different storage bins on the first floor, so they could be packed and given to the farmer in separate containers.

The bolter machine sifts flour. (photo courtesy of William Mills)

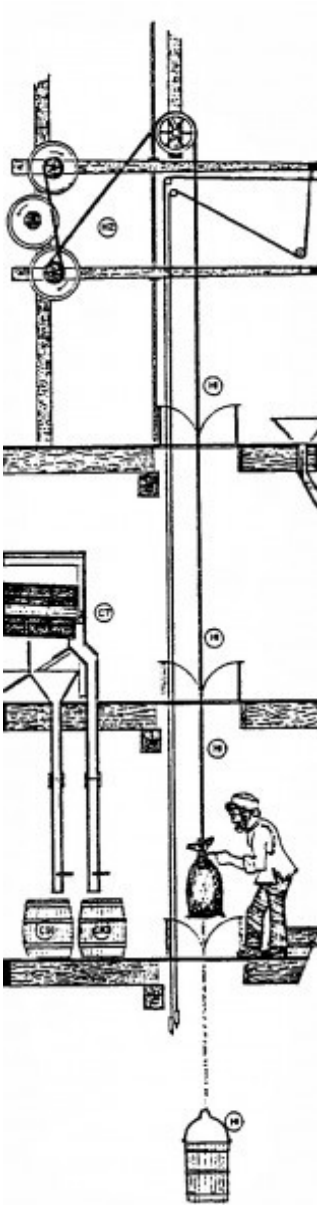
The Barrel Hoist Project

Fast-forward more than 100 years to the 1990s. The Friends of Peirce Mill formed four years after a catastrophic breakdown of the mill wheel shaft in 1993. This group of locals came together under the banner of preserving and restoring to full operation this piece of the District's history – and of the history of early American agriculture, industry, technology and society. The Friends began making plans and raising funds to move forward with a full restoration in multiple stages, the most recent of which is the Barrel Hoist Project.

One of the major hurdles to efficiency and automation in early grist mills was the time and manpower needed to move grain and meal between the various machines in a mill. The conveyor belt and cup system Evans created could move the grain to key places in the mill, but there were times when the miller needed to move grain or meal without sending it through the entire system. Thus the need for a device to move heavy loads up and down the mill, a role filled before by strong men or, at best, a pulley system.

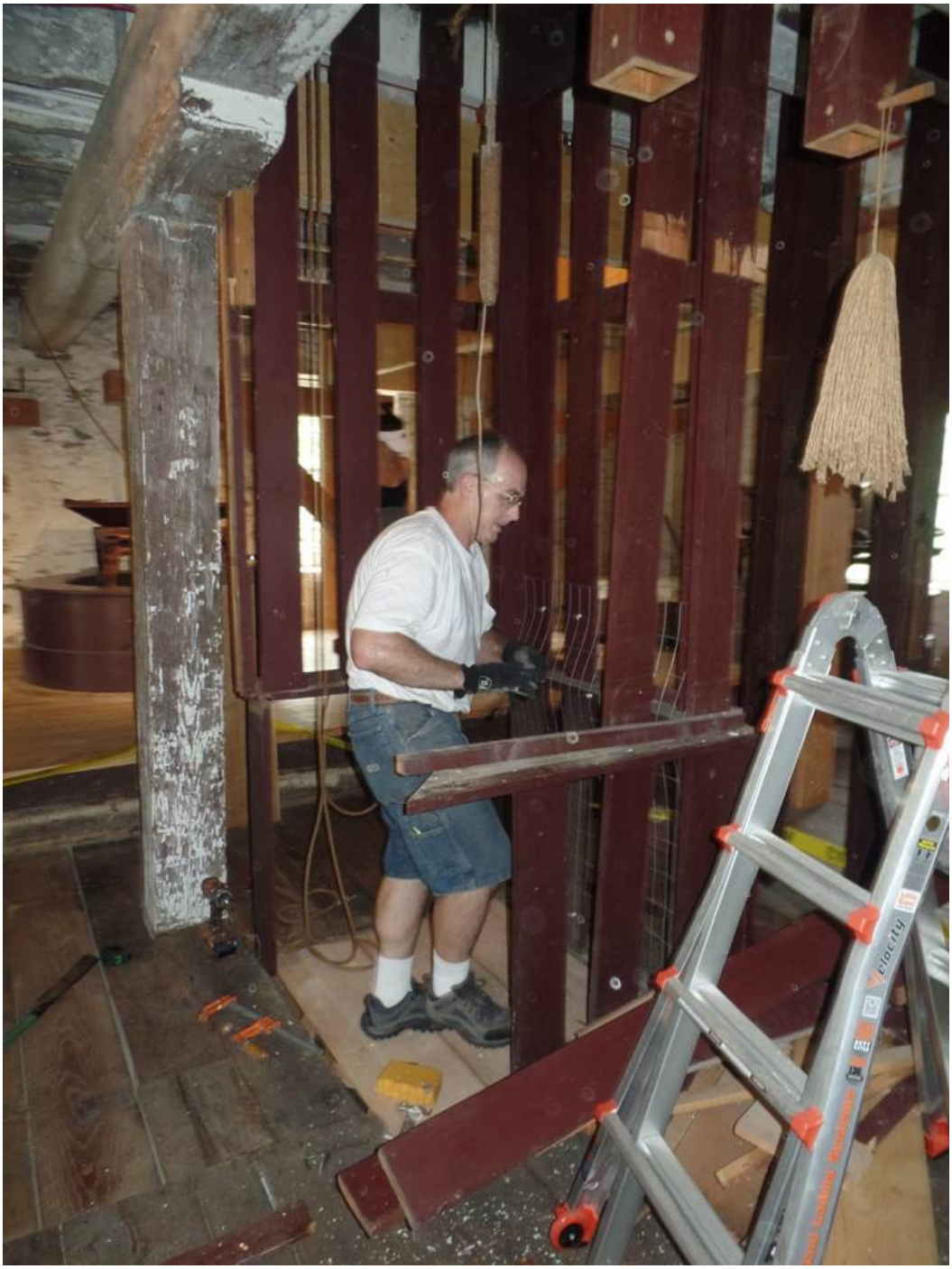
Enter, the barrel hoist. This is a portion of the milling machinery that connects to and is powered by the main shaft and can be activated and deactivated independent of the grinding function of the mill.

Evans created a three-roller system that could be engaged and disengaged from the main mill shaft. The system worked by raising and lowering the middle roller, so that it would touch either the top or bottom roller. The movement of the center roller would rotate the top roller to wind up a rope that lifted up a heavy barrel through trapdoors in the floor, then would switch to rotate the bottom roller to unwind the rope and lower the barrel back down. In the 1970s, the National Park Service miller added a cage around the barrel hoist shaft, so that he could use the machinery with less risk to the public. The current restoration of the barrel hoist has seen that cage removed, to open the space visually and allow visitors more access to the millstones.



The barrel hoist operates with three rollers; the center roller moves up and down to touch and activate the top and bottom rollers, as shown in this diagram.

The Barrel Hoist Project is expected to have four phases, the first of which is already complete. Phase one involved conservator and mill restoration expert Steve Ortado – who began his carpentry career as a boat builder – and his assistant. They removed the cage and shored up the floorboards so barrels will land on and take off from a sturdy surface. Phase two will be the fast-fix of the project, restoring the trapdoors through which the barrels will rise in the various floors. Phase three involves reversing the cog wheel, the apparatus that winds and unwinds the ropes moving the barrels. Finally, phase four will see new safety railings built around the trapdoor on the first floor.



Mill restoration expert Steve Ortado removing the circa-1970s cage from the barrel hoist. (photo courtesy of Deborah Dougherty)

The Friends, the Park Service and Ortado – as well as Jeanne Minor, Peirce Mill's current miller – are confident they can have the barrel hoist up and running by the first day of the milling season, Saturday, April 9th. In the meantime, curious visitors are welcome inside the mill on Saturdays and Sundays from noon to 4 p.m. to see the machinery at rest, learn more about this example of revolutionary technological design and hear about how the mill operated as a center of economic and social life in the community.

In April, Peirce Mill will resume milling-season operating hours, which are Wednesday through Sunday, 10 a.m. to 4 p.m., with milling demonstrations from 11 a.m. to 2 p.m., every second and fourth Saturday.

Your friendly neighborhood mill

In these days of ever-shrinking federal funding, Peirce Mill has been fortunate to have many loyal and enthusiastic advocates who maintain the mill, design restoration projects and make the case for restoring and preserving the mill as an important piece of the neighborhood's and the District's history. There are easy ways for Forest Hills residents and other locals to show their support of the mill: Simply drop by and visit! Watch the mill machinery in operation. Say hello to Miller Minor. When the Park Service can report high interest in the mill – lots of visitors, lots of attendees at the mill festivals – it becomes so much easier to make the case for the mill as a teaching tool and a community gathering place.

If you're interested in doing more, consider **donating to the Friends of Peirce Mill** to help them in their mission to restore and maintain the mill for future generations.

Friends of Peirce Mill and the National Park Service offer tours of the mill building and machinery demonstrations.