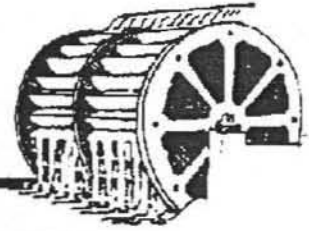


MILLWORK



Jan.-May, 2008

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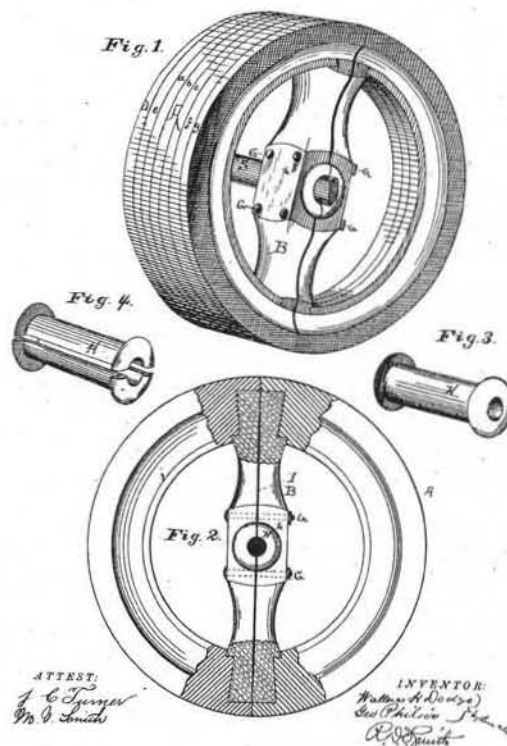
Power Transmission – An Intro. to Pulleys

by Caroline de Marrais

It is time to start the Mill for another season. There are lots of the things our Mill Operations Manager, Dawn Raudibaugh, has to do to get the waterwheel turning again. We often talk about the waterwheel and the machinery, but what about all that “stuff” in between, the belts, shafts and pulleys that transfer the power from the wheel to the machines? The part that most visitors ask about first, the “wheels,” are actually called “pulleys.”

A mill pulley (which is not the same as the pulley that lifts weights) transmits power and helps regulate machine speed. Here is a simplified description: every time you go from a large pulley to a smaller pulley you are increasing the speed. If the larger pulley is two times larger than the smaller pulley, the pulley has to turn twice in the same time period that the larger wheel turns once. If you know the speed the waterwheel is set to run, you can choose the right pulley size to operate a machine at a specific speed. For example, when running the sawmill the waterwheel generally turns at 16 rpm

(No Model.)
W. H. DODGE & G. PHILION,
SEPARABLE PULLEY.
No. 260,462. Patented July 4, 1882.



This is the drawings for the original pulley and bushing supplied by Dodge to the US Patent Office in 1882.

(revolutions per minute) and the sawmill blade turns at 500 rpm. That change in speed is done with pulley sizes.

Throughout the mill you will find pulleys made of wood, or metal, or both. The faces of earlier pulleys tend to be made up of boards laid horizontally across the face. Later wooden or wooden faced pulleys were made up of

many vertical wood sections laminated (glued) or pinned together. Pulleys made this way wear out slower than the earlier wooden pulleys. Metal pulleys are stronger than wooden pulleys, but wooden faces were considered to have better belt traction than metal faced pulleys. Wooden pulleys were also more affordable.

Did the Hanfords make any of the pulleys they used? It isn't likely. Early mill owners may have made their own, but the Hanfords bought their pulleys. Later pulleys were also often made in two halves so they could be put on a shaft without moving it. This helped keep everything in alignment. If your pulleys are not lined up perfectly, the belt won't stay on and your machine will not operate.

The Hanfords probably purchased pulleys from a number of manufacturers, but we have records from the Dodge Manufacturing Com-

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What's News?

This season's Mill staff includes a mix of outstanding veteran interpreters and new - and very enthusiastic - faces. Nancy Haynes and Ron Jennings will be returning for their fourth season. Nancy, a retired school teacher, loves giving tours and milling products. Ron, who is also retired, has a keen interest in history and gives a great tour.

Bob Adair was born and raised in East Meredith and his family has a long association with the village. Now that Bob has retired from Wightman's Specialty Woods in Portlandville, NY, he will be sharing his woodworking expertise with visitors to the Museum. Katrina Lyon, another East Meredith native who works part-time at the post office, has fond memories of helping at the Museum when she was a teenager. Welcome back, Katrina. Vince Mussolino discovered Hanford Mills Museum when his family moved to the area four years ago. When Vince took the Museum's blacksmith and timber frame workshops he realized that the Museum would be "a great place to work."

Wayne Ford and Scott Gravelin are this season's part-time "sawyers-in-training." Wayne has worked for more than a decade with Rondout Woodworking, the company responsible for many of the Mill's preservation projects, and has taught the Museum's timber frame workshops. Long-time volunteer Scott Gravelin will also take time out from managing his own business to help with the sawmill.

We also don't want to forget Fran Midgley and Karen Riese who are returning for another year in the gift shop. Allan Bardram, who does the great paint jobs on our buildings, and Herman Riese, who does grounds maintenance (and is Karen's husband), round out our summer staff.

Veteran Mill interpreter Bill Brindle has retired from the Museum, and is actively pursuing his love of woodworking. We'd like to thank Bill, and his wife Betty - who worked in the Museum Shop, for the many seasons they spent working at Hanford Mills Museum.



These are just a few of the faces you will see this summer. Some of our interpreters worked during the Winter Ice Harvest in February. From l. to r. are Ron Jennings, Bob Adair, Nancy Haynes, and Vince Mussolino.

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pany of Mishawaka, Indiana (no relationship to the automobile). Dodge claimed in their 1897 catalog that they were the original inventors of the first successful wood split pulley. The catalog also includes documentation from a court case they fought for their patent rights. Two features made their pulleys particularly successful to the point that many other manufacturers copied their designs.

First, their pulleys were fastened to the shaft by compression. They didn't use a set-screw or key. A set-screw went straight through the hub of the pulley into or against the shaft. If the screw loosened it would scratch the shaft as the pulley free-wheeled and did no work. A key required a slot in the shaft and pulley hub so a

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Continued from page 2
 metal bar could slide into both to hold the pulley in place. For the Dodge pulley, just bolting the two halves together held the pulley tight on the shaft providing you used the correct bushing which was their second innovation.

Dodge used wooden bushings to make a pulley fit different diameter shafts. A bushing is basically a two piece wooden tube with the center hole made the right size to fit the shaft diameter. The bushing fit inside the pulley hub and around the shaft. Not only did this innovation make it easier to get a tight fit on the shaft, but if you decided to move a pulley to a new location with a

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**OTHER EVENTS:
 Volunteer Clean-Up Day -
 Sat., May 3,
 2008, 10 am to 3 pm**

Come out and help get the Museum ready for another fun-filled year. We have inside and outside clean-up jobs to suit what you want to do, and we'll feed you lunch, too! Call 800-295-4992 or email

hanford2@hanfordmills.org and let us know you are coming.

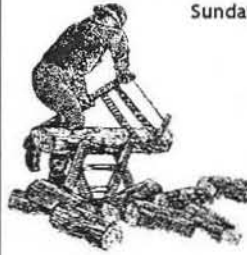
Summer Apprentice Workshop(S.A.W.) - July 21-24

See enclosed brochures to learn about our children's daycamp and other upcoming workshops.

SAW IT!

at Hanford Mills

A celebration of wood in all its forms!
 Sunday, May 25, 2008 - 10 am to 5 pm



Demonstrations:

- Pit Sawing
- Historic Sawmill
- Modern Band Sawmill
- Logging Skills
- Hand Hewing of Logs
- Woodworking Skills
- Forest Animals
- Catskill Forest Assoc.



Hands-on Activities for Kids & Adults. Try:

- Cross-cut Sawing
- Tree Walk (2pm)
- Nailing Races
- Nature Games
- Crafts & Scavenger Hunt !!!

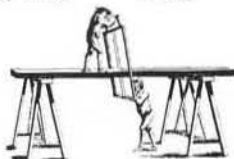
Clip out the section below and put it up to remind you of our upcoming events.



Hanford Mills Museum's 2008 Special Events

"Saw It" at Hanford Mills Museum ~ Sunday, May 25 ~

Explore over 200 years of sawing & lumber history - human-powered pit sawing, a water-powered circular sawmill, and a modern gasoline-powered portable band saw will be in operation. Watch demonstrations, listen to live music, visit with wildlife from the forest, and try a variety of family activities.



Independence

Day Celebration ~ Friday, July 4 ~ Old-fashioned family fun! Sample mill-made ice cream, enjoy

music by Hilton Kelly and the Sidekicks, join in traditional family competitions including frog jumping and tug-o-war, and bring your poles for the kids' catch & release fishing derby - catch a big one and you get a prize!

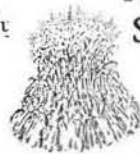
Antique Engine Jamboree ~ Sat & Sun, September 13 & 14 ~

Don't miss this chance to see old time engines of all shapes & sizes at work, and to celebrate antique gas & steam power at Hanford Mills. View scores of antique engines throughout the site - dozens will be running and "doing" things!



Miller's Harvest Festival ~ Sunday, October 12 ~

See the Mill's gristmill and other food processing machinery at work. Celebrate ingenuity and industriousness, and explore the skill of farmers at work. The Museum will also be running its steam engine. Sample food cooked in the historic John Hanford Farmhouse, visit a mini-farmers' market, and try traditional crafts and activities.



Winter Ice Harvest ~ Saturday, February 7,

2009 ~ Try hands-on ice harvesting.



For more information ~ www.hanfordmills.org or call (607) 278-5744 or 1-800-295-4992

Remember we are open 10 am to 5 pm, Tues. ~ Sun., May 15 to October 15, 2008

And Mondays on Memorial Day, Labor Day and Columbus Day



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different size shaft you didn't have to buy a whole new pulley – you only needed a different size bushing.

Dodge advertised that all their pulleys were marked with the word "Independence" since they received their first patent on July 4, 1882. I went looking for the Dodge "Independence" logo in our mill. Unfortunately, it is too dark in the mill (even with a flashlight) and working pulleys tend to get dirty, so I couldn't find the logo. I did find a pulley on the main shaft with a Dodge paper label. Its location and use suggests it is a Hanford original. There are many other Dodge-style pulleys throughout the mill, but I couldn't see a logo on any of them. One pulley definitely came from another company, the Ohio Valley Pulley Works in Maysville, Kentucky. It also had a paper label. None of the other pulleys had any visible distinguishing marks.

Besides the regular pulleys located throughout the mill, there are a couple other types of pulleys you might notice in the mill. One is the step pulley. A step pulley is a series of different size pulleys all in one piece. This allows the operator to vary the speed of his machine without changing the speed of the power source. You will find this kind of pulley on the mill's wood lathe. When cutting a spindle or other turned piece different speeds might be used for different parts of the work.

Another pulley is the "fast-and-loose" pulley. This type of pulley provides a way to

**EVERY GENUINE
DODGE PULLEY
HAS THIS STAMP
ON THE HUB**




**EVERY PULLEY
A SEPARABLE
OR SPLIT
PULLEY**

Dodge Manufacturing was proud that it received its patent on July 4, 1882. They made sure all their pulleys had their Independence logo.

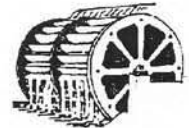
turn a machine on and off without having to stop and start the power source. Throughout most of the mill, including the sawmill, the waterwheel must be stopped and the belt put on the machine's drive pulley before it can be run. When you are done, you must stop the waterwheel again and take the belt off the pulley.

However, some machines use "fast-and-loose" pulleys. These are double pulleys with one pulley fastened tight to the shaft with the other pulley rotating loose around the shaft. When the machine is not in use, the belt is on the

loose pulley and the machine is not being powered. To get power, a lever is used to slide the belt from the loose to the fast pulley, and the machine comes to life. In many places you can't see this operation clearly, but you can see it at work on the Mickel Tub Cover Cutter and on the wood lathe.

This is a simple introduction to just one part of the mill's power train. There is a lot more to learn about using mill pulleys if you're interested. There is also a lot more to the power train (belts, shafts, bearings, and gears). We'll explore these in a later article. 

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