

# Friends of the Pine Creek Grist Mill

Wildcat Den State Park, Muscatine, Iowa

## Progress Report

Where we stand September 7, 2006



With the coming of September the weather has cooled off and made working in the mill much more pleasant. We have continued to work on completing the millstone grain cleaning and handling system as well as several other projects. As in past years we will continue restoration till it gets too cold to work in the mill.

### MILLSTONE SYSTEM RESTORATION

Both the north and south slanting elevators are fully restored and operational. The north elevator required a new boot (the box at the base of the elevator) and as I have described before, all of the south elevator in the basement was completely missing. We finished up the south elevator, installed a belt and the buckets in it and it works well. We discovered that the head of the elevator, its cover and drive also had some old problems that we corrected.

The same shaft (made of wood no less) that drives the two elevator belts also drives the "big bolter" and the short elevator that carries the grist from the millstones to the elevator. This belt has stretched a bit and given us a few minor problems. We have it working well at this time, but a permanent fix will require the construction of a new idler pulley for it. Most likely this will be one of those jobs we do over the winter in our home shops.

With the elevators finally working, we were finally able turn our attention to reinstalling the smutter. Some time ago Dick Clevenger restored the smutter for us (another one of those winter projects). The smutter cleans smutt (a black fungus), dirt and other debris from the buckwheat before it goes to the millstones. The machine does this by a combination of aspiration and agitation against a metal screen. Aspiration is widely used in the mill for cleaning grain. The process is quite simple and ingenious. The grain falls down vertically down a chute while a current of air passes upward in the opposite direction. The weight of the grain carries it downward while the lighter dust and debris is carried upward (and eventually out of the mill) by the air current.

What we have now is almost a new smutter. Like many of the mill's machines, it is largely built of wood and like so many items in the basement, it suffered badly from dry rot. Dick replaced all of the wood parts and the machine now looks like the day it came from the factory. At this writing we have it back in position hanging from the basement ceiling as it did originally. Getting the machine back into place proved to be a challenge to say the least. Once in place, we started bolting the rest of the machine together. This gave us a chance to consider how the machine worked again to make sure we were getting it back together correctly :-).

Once the smutter installation is completed, we still have to reconnect it to its flat belt drive and build a chute to connect it to the elevator that carried the grain to the millstone feed bin on the second floor. The smutter has a unique drive arrangement that uses a friction drive. Pulling on a lever on the first floor shoves a lever that in turn presses a pulley on a jackshaft against a pulley on the top of the same second jackshaft that powers the millstones. Getting this strange drive arrangement working again will take the usual amount of reverse engineering that we on the restoration crew enjoy so much.

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## **Progress Report Where we stand**

### **COTTLE SCREEN**

It seems like we are always finding something new to repair on the cottle. Since last month we have replaced the rotted door that controls the flow of grain into the machine's revolving screen. We have also replaced the rotted (and mostly missing) chutes that collected any debris that tailed over the end of the screen. Inside of the cottle we worked on replacing some rotted boards and even patched a hole chewed in it by some critter. Currently we are working on the bin that collects the grain as it passes through the rotating screen.

### **BOILER RESTORATION**

Randy Kauffman of the Kauffman Companies has the steel on order for the boiler smoke box. I suspect that he will be fabricating it later this month. Scott Gibbs will do the MIG welding of the parts to assemble it.

The new siphon tube for the boiler pressure gauge and three water level tri-cocks have been installed. We are still in discussions with a possible volunteer who could possibly do some tuck pointing on the boiler's brick work. I would like to see this done to prevent further deterioration.

### **STEAM ENGINE RESTORATION**

When time permits we are still doing some work on the steam engine. For some time now we have been wanting to replace the missing 4" steam exhaust pipe that ran from the engine's steam chest to an outlet on the creek side of the mill. We have the pipe, what we did not have is a 4" pipe flange to connect the pipe to the engine. Industry standard flanges available from any industrial supplier would not work as the design of mating flange on the engine possibly predates the civil war. Fortunately Scott Havel of Lewis Brothers Industrial Services stepped forward and volunteered to make a flange for us. He fabricated it by modifying an existing stainless steel flange and I am happy to say it looks great on the engine. As soon as we have time we will be getting pipe cut and start working on the exhaust pipe.

The other project on the engine we are working on is rebuilding the drive belt idler. This idler keeps the belt that connects the engine pulley to the main line shaft tight when the engine is running. After a lot of experimenting with it and discussion we have all come to the conclusion that the idler probably never did work very well. And that settling of the building warped its supports and made the problem even worse. We have started rebuilding it and are making sure that this time it will be right so we will have no future belt tracking problems.

### **OTHER PROJECTS**

I have finally found time to engrave PUSH / EMERGENCY / STOP placards for the emergency stop mushroom switches in the basement and second floor. I have also installed more DO NOT ENTER signs are appropriate in the mill. Dick Clevenger has started work on a new chute that will allow grain to bypass the storage bin on the second floor. This will allow us to continuously circulate grain from the receiving bin in the basement, up the 5" elevator to the third floor and back down the chutes to the receiving bin again. Plastic covers on the 5" elevator (already in place) and over the descent chute will allow visitors to see the grain in motion through the system.

We also discovered that settling of the building had warped the main line shaft in the basement. The south end of the shaft was 1.25" low at its pillow block. Joe Clark and Peter Allenger went over the alignment of the shaft very carefully and corrected the problem by installing a hard wood shim block under the pillow block. We tested the mill for twenty minutes after the shim had been installed and were pleased that there is less vibration in the system now since the shaft is no longer flexing.

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Peter Allenger is feeding the new belt into the south elevator. This is done by wrapping a long rope attached to the belt through the elevator and over its pulleys. Its a three man job to do this. The buckets are bolted on after the belt is in place and tightened.

Yes, that's Bob Delong *inside* of the cottle collection bin! Bob had to climb inside (no easy task) to repair a rotted 2X4 brace. The cottle's rotating screen will take Bob's place after the machine's final assembly. The new boards in the "Y" shape collect any debris that tails-over the rotating screen.



Here Scott Gibbs is steadying the smutter as it is being moved across the flywheel pit prior to its being hoisted back into its original location. The black cylinder on the top of the machine has paddles in it that beat the grain against the slots in the sides of the cylinder. This agitation helps to remove dirt from the grain. The cylinder cannot be seen once the machine is in place.



No, Dick Clevenger is not jumping through a hole in the floor. Actually he is standing on the top of the smutter while installing part of the agitator drum. The smutter hangs from the basement ceiling with part of it projecting up into the first floor.

To get ready for Heritage Day Bob Delong and Dick Clevenger are clearing the turbine of mud and getting it turning again. This requires opening up the penstock gate and giving the turbine shaft a few turns with a large pipe wrench to get it moving again. Note the water boiling out from the bottom of the turbine.



Joe Clark and Peter Allenger are shimming up the south end of the main line shaft in the basement. The hard wood block they are placing under the pillow block raised the shaft to level it.

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