

## VI. Dam and Raceway



Some discussion of the dam gate valve has already taken place. As mentioned earlier, the valve will need to be approximately one-eighth open to allow the water wheel to turn during times when the mill is not in operation. The operational position will be one-quarter to one-half open. These positions may vary with the level of the pond and the operator will have to make adjustments as needed.

The trash rack (below left) at the dam needs to be regularly inspected for debris. This is most critical following a significant rain event and in the fall when there will be leaves flowing into the pond. If the raceway is free of debris, maintenance should be minimal to none, since the raceway is completely underground and constructed of an 0.4 m (14 in.) smooth bore pipe (below, right).



Since the mill is not operated on a daily basis, wintertime operation and maintenance may be problematic. The wheel should be kept wet and not allowed to dry out for long periods of time. This would allow wooden joints to shrink and become loose. On the other hand, if water is allowed to flow over the wheel when it is not turning, ice will form on very cold days and will be difficult to remove when it becomes necessary to operate the mill. A small amount of water

turning the wheel constantly through the winter may be the best solution. The alternative will be to have an individual designated to completely turn the water off at the dam when temperatures are predicted to fall significantly below freezing.

If the mill is to be operated and there is accumulated ice on the wheel, it will be necessary to remove it in order for the water wheel to be balanced. A small amount of ice will cause the wheel to be out of balance and the mill will not maintain a constant speed. If ice has accumulated, it will be necessary to allow water to run over the wheel for a period of time. Since the water is above 0° C (32° F) it will slowly melt the ice off of the wheel. This may take several hours depending on how cold it is.

## **VII. Grains**

The McCormick Mill is capable of grinding most any type of grain. Primarily, the grinding of wheat for whole-wheat flour and corn for cornmeal or grits will be ground. However, the mill could grind rye or buckwheat, if desired. Currently, there is no sifting mechanism on the corn stone, which is the only stone operational. Therefore, the grinding of cornmeal and buckwheat will require hand sifting of the product from the meal chest.

Either yellow corn or white corn can be used for cornmeal. White corn is more difficult to obtain and will require purchasing it from another mill that may have a supply. Yellow corn can be easily purchased locally. It would be more desirable to purchase yellow corn that has been cleaned through a separator.

Cleaned wheat can also be obtained locally. Soft winter wheat will be sufficient to make whole wheat flour. In addition, buckwheat in small quantities can be purchased. (Note: USDA requirements must be met.)

Since only small quantities of grain will be kept on site, it is very easy to properly store the grain in sealed containers. Large plastic or galvanized trashcans make very good storage containers. The tops of the cans can be sealed from rodents and insects to a certain degree. Grains can easily be stored through the cooler months, in that insect activity is at a minimum. However, in the warmer months any grain stored should be frequently checked for mothweb and weevil damage. Weevils will bore into the grain and lay their eggs. When the grain is ground, the eggs then pass into the flour. When conditions become optimal the insects will then hatch out into the flour. Therefore, it is critical that clean grain is purchased in the warmer months and that it be rotated frequently.

## **VIII. Maintenance and Lubrication**

The most important point to be made in regards to maintenance is that the mill should be operated as frequently as possible. Deterioration will take place much faster if the mill is left to set for long periods of time without being operated. A regular schedule of operation is a must.

The mill, the stones and meal chest need to be cleaned with each use during the warmer months. In addition, periodic fumigation of the mill would be desirable to control the insect population. A pyrethrin-based fumigant can be used, such as the brand name Penmist. It will be necessary to use a hand held mist blower to apply the fumigant. The mill will need to be closed to visitors for a day following the fumigation.

Rodent poison should be kept available but in discreet locations in the mill. Above rafters and beams where rodents tend to run are good locations. If poison is not effective, traps will need to be used to eliminate the rodents.

Proper storage of the finished product is also very important. Again, galvanized trashcans are very suitable. A can for each grain product would be desirable. Again, cans must be kept clean and product rotated frequently.

At the beginning of each milling day all bearings should be inspected for proper lubrication. Currently, petroleum grease is being used on the wallower shaft and in the tram pots. All other moving parts can be lubricated with bee's wax. This would include the shafts of the elevator legs, shafts of the bolting reed and their associated parts. Small holes are drilled into the bearings of these parts, into which bees wax can be pushed in. These do not require daily lubrication but should be checked periodically. The wallower shaft and millstone spindle should be greased with each operation of the mill. The water wheel shaft should be greased at least monthly.

Frequent vacuuming of the mill building is necessary to maintain sanitary conditions. Following grinding, it is especially important to vacuum up left over product from the stones, meal bin, and surrounding areas. Keeping the mill clean will minimize insect and rodent problems. The vacuum is stored in the bran chest on the lower level.

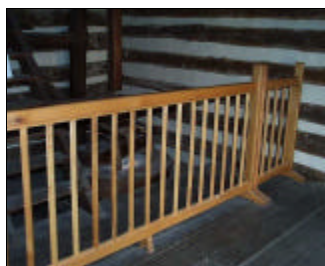
## **IX. Safety**

All mill operators must have respect for the moving parts of their mill. Turning gears are unforgiving. Momentary lapses of good common sense can lead to tragedy.

The obvious safety precaution is to stay clear of moving gears and shafts during operation. Avoid wearing loose fitting clothing that can be hooked by moving parts. Remove all jewelry, especially rings during operation and maintenance activities.

When performing maintenance activities, especially on the first level, make certain that the stones are not engaged and that the safety blocks are in place. If work must be performed on the water wheel or bull gear, make certain that the water is completely cut off at the dam.

When lifting the millstones for cleaning, keep hands and feet clear of the stone, as it is lifted by the screwjack.



Visitor safety is critical. Most visitors will be curious and not sensitive to the obvious dangers of the mill, especially children. The protective rail (left) on the first and second floor must be kept closed at all times. Under no circumstances should visitors be allowed past the rail. Visitors should be cautioned of the dangers of leaving children unattended. Access to the third floor should be limited to one or two individuals at a time with the operator's supervision.

Concerning fire, again common sense should rule. No flammable materials should be allowed in the mill. By no means should smoking be allowed in the mill. Fire extinguishers are located on each level of the mill. During operation, the operator should periodically check the moving parts of the mill to insure that no part is overheating.

A cellular telephone is provided to the volunteers operating the mill and is to be used for emergency only. In the event of an emergency, volunteers should call 911 and be prepared to give the location of the mill and the nature of the emergency.

## **X. References**

Evans, O. 1860. *The Young Mill-Wright and Miller's Guide*. 15<sup>th</sup> Edition. Blanchard and Lea. Philadelphia, Pa.

Howell, C. and A. Keller. 1977. *The Mill at Philipsburg Manor Upper Mills and A Brief History of Milling*. Sleepy Hollow Restorations. Tarrytown, NY.

Hughes, W. C. 1859. *The American Miller and Millwright's Assistant*. H.C. Baird. Philadelphia, Pa.

### **Further Reading**

Dedrick, B.W. 1924. *Practical Milling*. National Miller, Chicago, Ill.

Morton, O.F. 1973. *A History of Rockbridge County Virginia*. Regional Publishing Co., Baltimore, Md.

McClung, J.W. 1939. *Historical Significance of Rockbridge County Virginia*. McClure Company, Inc., Staunton, Va.



The McCormick Farm and Workshop are a Registered National Historic Landmark and a Virginia Historic Landmark. Further, the American Society of Agricultural Engineers has designated the site as a Historic Landmark of Agricultural Engineering. This site possesses exceptional value in commemorating and illustrating the history of the United States and the Commonwealth of Virginia.