

Insight of The Bell Mill

The building and machinery of the Bell Gristmill essentially date from the year 1903; the original mill having burnt on May 29th of that year. The building is three stories high.

The basement is an incredible structure in itself. The foundation rests on a slab of stone and concrete, 4½ feet thick, and shows no appreciable signs of deterioration. It was built with two windows and a door to the west and to the north; the north wall, however, is covered by the wheelhouse.

Going out through the north door of the basement, one comes into the wheelhouse. This structure is attached directly to the north wall of the mill and is constructed with heavy beams to hold various shafts in place and covered with barn board siding. In it is the main shaft that continues into the basement. This shaft is changed from horizontal to vertical by two large pinion gears. These gears have wooden teeth which required periodic maintenance when the mill was operating. At the bottom of the vertical shaft is the water turbine that converts the water energy to usable power. The turbine is basically an unencased wheel that lies horizontally and catches the moving water in the cups that constitute the wheel. Before the turbine, lying in an east-west direction is a metal culvert pipe called a flume. It is through the flume that the moving water flows down from the intake above the dam to the turbine. The amount of water flowing past the turbine could be controlled by a valve called a gate that is just at the end of the flume. The gate could be opened or closed in varying degrees to control the speed that the mill machinery was operating at. It was controlled by a wheel on the north wall of the first floor which, by a series of shafts and gears, could move the gate vertically. A square wooden shaft can be seen to rise up from the gate into the beams, where a rack gear converts the turning movement. The flume and the turbine were both enclosed in a narrow channel of water bordered by cement. By this and by the sluiceway that carried water from the turbine back into Bear Creek, back pressure is reduced so that the turbine can turn. Presently, the turbine is buried in mud, and sediment is built up in the small channel and on the earthen floor. This sedimentation was caused by Hurricane Hazel in 1954, which swept away the northeast corner of the wheelhouse (this has since been repaired) and caused the shifting of some beams and the wheelhouse cement foundation walls, as can be seen. At one time, there were two turbines in the wheelhouse. The second turbine was situated on the same flume and operated from water that came out another outlet in the wheelhouse just east of the

present one. Evidence of this second turbine can be seen in a remaining shaft, the remaining pieces of the second central timbers by the flume. The intake of the flume is blocked off by boards dropped over its mouth. Occasionally, when the mill was in operation, this intake was blocked and a man crawled up the length of the flume to clear debris. There is a manhole to enter the flume at its end in the wheelhouse; it once had a heavy metal cover which has disappeared.

The office wall on the north side was moved inwards, making the office smaller in 1954, after the washed out dam from Hurricane Hazel necessitated a change to diesel power. The wall was moved to accommodate a D-315 model Caterpillar Diesel Engine, which sat on the first floor between the altered office and the roller. From the diesel engine, a belt was run through the floor to the main shaft in the basement; where the belt passed through the floor can still be found.

Other alterations made to accommodate the diesel were the door in the west wall, used for ventilation, and the insulated wall.

On the north wall is an instrument that looks like a small metal drum with a dial on front and a pulley and bell on top. This is a motion indicator that is used to control the speed the mill runs at; when the mill starts running too fast, centrifugal force causes the bell to start ringing. If this happened, either more grain had to be fed to the machinery or the gate had to be lowered to slow the mill down. The speed the mill ran at was crucial; extreme vibrations would occur if the speed was not right. The motion indicator was run by a belt around the pulley on its top, which was, in turn, run off of a slender shaft that rose vertically through the floor from the basement.

At the south side of the basement is a storage bin for the unprocessed grain that was brought to the mill. Access to this huge bin is from above on the first floor. Horses and wagons would pull up alongside the mill on the road that used to pass along the south side, and unload their grain through the small door there. The grain was weighed on a type of scale that rested above the basement storage bin, and then released through the scales into the bin below. The weight of grain brought by each farmer was recorded, and the farmers loaded the processed grain they purchased at the next door. The grain they brought in was often used as payment for the feed or flour they bought.

From the storage bin in the basement, the grain was carried to the upper floors for processing by the two grain elevators built at the north

side of the bin. The elevators consist of canvas belt with many metal cups bolted to it that run inside box-like wooden shafts running the entire height of the mill. The elevator, powered from the third floor, would scoop up grain in the cups in the basement bins and dump the grain at the third floor.

Now one comes to some of the actual machinery used in processing the grain. The cleaning mill consists of two screens and a blower; all that serve to clean the grain. The two screens are built into the machine on a slight slant so that they can shake. When the grain to be cleaned is fed into this mill, the blower blows away all the chaff, and the shaking screens separate the smaller impurities from the grain.

The grain then alternated between rollers and sifters eight times. The roller, as its name implies, rolls the grain between two rollers. The pressure between these rollers can be adjusted by the small wheel at the south side of it.

There are three different flour sifters of varying age in the mill. The oldest and most interesting is a large round spoked machine that had fabric socks protruding from its drum. It is incomplete, but when it worked, must have sifted the flour by its springed ends periodically hitting some object. It was chain driven and was once attached to a blower at its centre, which didn't rotate. A blower was used to ventilate the mill. It circulated the air by blowing the dust-ridden air out. The mill was a very dusty place to work, and this arrangement was a very necessary part of it. Another flour sifter can be found - a large wire screened drum that rotated. A smaller and new version of it, a Greey Wizard flour sifter, completes the collection; it is a completely enclosed affair, and works on a similar principle.

A flour purifier used a series of silk screens that ground grain into flour.

After the flour purifier came the flour distributor. It was the mechanism used to sort the flour by using different choices of chutes to send flour to different places for various types of processing. When in use, pipes would be patched from the upper structure to the lower structure in moving the flour. In the lower, box-like structure are two wooden augers that were used to move the flour horizontally to chutes going down to the first floor.

In the centre of the first floor, there are five funnel-like hoppers into which the finished product falls. At the bottom of each of these

hoppers is a flour-packer assembly which holds the bags to the bottom of the hoppers and controls, with a lever, the release of finished product into the bags. Between the two north hoppers is a piece of dowling hanging on a string which was used to tap the sides of the bags to help them get completely filled. The small metal hopper used for flour once had a special assembly on it, since broken, that would weight out an exact amount of flour when it filled a bag. This was convenient when a larger number of 50 pound bags were being filled to ship out.

The process for chopping is located on the north side of the mill. The chopper has a small hopper on top in which the grain to be chopped, is dumped; from here it goes through a simple cleaning screen before actually entering the grinding part. The grain is ground between two counter-rotating circular plates; plates used for this purpose fill a wooden box on the first floor. The two circular plates are both driven by the same continuous belt – only in different directions. How this is done can be seen in the basement where this belt comes from. The plates are engaged to grind by a handle on the west end of the chopper. From being ground, the chop falls into the bin below. When the chopper was running in the mill, it was important that it not run out of grain. When it did, the whole mill would begin to shake and the chopper itself would vibrate wildly. This usually triggered the motion indicator to ring; the chopper insisted on being satisfied.

The mill was a rather unique assembly of machinery; a mechanical jungle of belts, shafts, and pulleys that would always require grease and adjustment in the morning before starting. To trace the many changes made in the mill over the years would be impossible; the patched holes in the floors and the many chutes, some which now lead no where, all attest to the humming business of an earlier era.

Insight of the Mill

Let us take a look at the interior of the mill. The mill is composed of three storeys and a basement. The timber of the mill was horsedrawn from five miles away and hewn by hand. The stonewall of the basement was done by hand, displaying great skill.

We will begin in the basement of the mill. Hanging from the centre of the ceiling is a dust collector. This implement was used to collect and remove the dust particles within the mill. Mind you, it was still dusty but it helped to keep some of the dust down. In the south-east corner is where a storage bin may be found. Farmers would drive up the ramp at the south end of the mill and dump their wheat into a trough. This trough went down through the first floor into this bin. From this bin the wheat was carried upstairs by grain elevators. Quite often a stray animal would find itself sliding down the trough into the bin. Mr. McMaster bears in mind the time when a skunk did exactly that and the problem of trying to remove the skunk. Moving closer to the stairway are the main wheels which help supply the power. Off through the north door is the power room. There is no floor here but planks. At the north wall is a long steel culbert called a flume. The flume is what carries the water into the wheel. The wheel lies horizontal and has cups on the outside of it. These cups catch the water which puts the wheel in motion, thus turning the shafts to provide power. Also under the stairs is where the battery sat for the Delco System.

Now lets continue up a flight of stairs to the first floor. Suspended from the ceiling are five hoppers. The hoppers are where the finished product drops into, and the flour of chop waits to be bagged and weighed. The hoppers consisted of middlings, flour, shorts, bran and chop. West of these hoppers is the roller, which is made up of corrugated steel rollers. Its purpose is to separate the kernel by grinding. At the north wall stands the chopper. Its job is clear by the title. A set of scales sat near the hoppers at one time. Unfortunately, some of the equipment has been removed. You also will find a wheel on the north wall. This wheel regulates the amount of power desired. In the southwest corner is what at one time was Mr. Bell's office. Presently the office consists of a work bench and cupboard space. There used to be a barrel of molasses in the corner. Mr. McMaster remembers when a farmer would come in for a gallon of molasses. Quite often, they would get to talking and forget about the running molasses. Next thing they knew there would be syrup all over the floor. Beside the barrel once sat a wood stove. It too has disappeared.

In the opposite corner was Mr. Bell's desk. Here, he would sit in the evening calculating the income and expenses for the day. For example, in the year of 1905 they brought in forty dollars and ninety-two cents for the cider account. The price for one cattlebeast was one dollar. On the work bench we found the old motion indicator. This indicator would determine the speed the mill was operating at. If the mill was running too slowly, the amount of grain entering would be decreased. Let us journey up to the next flight.

On the second floor, there isn't too much equipment; mostly storage bins. There is a flour distributor and sorter near the stairs. Behind the sorter there was more equipment; now gone. The type of equipment is unknown. The cleaning process was also performed here. The flour was shaken through silk cloth, this illustrates the fineness of the flour. Beside the large storage bin sits the purifier which removes the bran by the means of air current. This allows the miller to produce inexpensive, high quality flour.

On the third floor, the magnetic separator is situated. This piece of equipment would remind you of a bingo drum. It is a large cylinder covered with screening, on the side are magnets. Most of the floor is made up of elevator tops. In the centre of the floor is the tops of the hoppers, from here you may look down to the first floor.

Hopefully this has given you an idea of the floor layout of the mill.

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