

Mullins Mill, Kells, County Kilkenny



This weir on the King's River or Avonree is at Kells, County Kilkenny. The millpond is on the right. This provides a supply of water to turn the millwheel. Water from the millpond can be seen spilling over the weir, into the river, which is at a lower level than the pond.

This sluice in the weir is designed to release a large quantity of water out of the millpond. This would lower the level of water above the weir. Sometimes this is done to clean out the millpond. You can see the gears which are used to raise the boards in the sluice. When the two gear wheels on the iron shaft are turned, the toothed strip moves upward. This is called a rack and pinion gear. The round toothed wheel is the pinion, and the toothed strip on the wooden post is the rack.



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At the end of the mill pond is a channel leading to the mill wheel. The grid over the entrance to this channel is there to prevent dirt and branches, which are carried down by the river, from getting into the millrace. They might damage the mill wheel or stop it. This wheel is in working condition and visitors to the mill can see it in action during the summer. Mullins Mill is open to the public.

The mill wheel is made of iron, with a series of wooden paddles attached around the rim. As the water flows under the wheel, it pushes at the paddles, and the wheel turns. The flow of water is towards us in this picture, and this causes the wheel to turn in an anti-clockwise direction. At the centre of the mill wheel is a shaft, and this passes through the side wall of the mill.



Inside the mill the shaft has a gear wheel on the end. This is called the pit wheel. The teeth on its rim connect with teeth on another gear wheel on a shaft at right angles to the mill wheel shaft. Above this gear wheel on the same shaft is a larger gear wheel. The teeth on the lower wheel are bevelled at an angle.

Here you can see the shaft on the left with its two gear wheels, the lower one being turned by the pit wheel, the shaft being turned by this gear, and the top gear wheel moving along with the shaft. On the right is another spur gear like the top one on the main shaft.

This gear wheel can be lowered so that its teeth engage with the teeth of the top wheel. This shaft in turn rotates. This arrangement of a large central gear wheel and smaller followers is called a sun-and-planet gear.



The shaft of the planet gear passes up through the floor and turns the top stone of a pair of mill stones. You cannot see the actual stones in this photo, because they are hidden inside this wooden case. Grain from the floor above pours into the wooden hopper at the top of the case, and is shaken into the opening in the top of the upper millstone. It is ground into flour between the stones, and goes through a chute to the floor below, where it is sifted and bagged.

This old millstone is lying outside the mill. It is made of a number of stones fitted together and held by an iron band. Every year when the milling season is over both stones would have to have the surfaces in contact “dressed”. Grooves would have to be cut in the surface to help in the grinding of the grain. smooth.





Not all the power in the mill is transmitted by gears. Here, below the millstones a chute delivers flour to a sieve, and this is shaken by a mechanism which gets its power from a belt connecting the wheel on the left to a wheel directly over the sieve.



The shaft from one of the planet wheels on the floor below turns the belt wheel.

On the top floor of the mill a set of bevel gears drives a shaft at right angles to the main shaft coming from the bottom floor. This in turn powers a whole series of belt wheels bringing power to the various machines which clean the grain ready for grinding on the floor below.

