Building the Wallower

In October 2012 the Trust installed the 1.75 ton, 10ft (3m) diameter brakewheel on the windshaft, the culmination of a year's hard work by our volunteers. In this photograph of the mill model, the brakewheel is painted green.

The model also shows the red painted wallower on the upright drive shaft. The wallower engages with the brakewheel and transfers the wind power generated by the sails to the drive shaft so as to operate the mill's machinery.

Preparation for the wallower project took place during the first half of 2013. The sketch by John Boucher, mill consultant, was examined and the component parts and their construction processes were determined. Because the Trust is working towards Museum Accreditation with Arts Council England, it was able to obtain a £2,000 grant from the Museum Development East Midlands small grants programme towards the cost of the timber and a band saw.

Although the wallower was only half the diameter of the brakewheel, the design of the wheel was more complex. This therefore involved a lot of measuring, remeasuring and precision to ensure that the wheel will work as expected.

The biggest expense was the purchase of the seasoned oak for the main structure of the wheel.

The wooden teeth were made from donated hornbeam. Each tooth was individually numbered as it had been tailored to meet a particular housing.

The wallower was strengthened with a metal band on each side of the wheel. Each stud hole had to be drilled in precisely the right place to ensure that

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the pre-drilled holes in the top and bottom metal bands aligned with the studs.

The centre of the wallower is square, so that it will fit on the upright drive shaft.

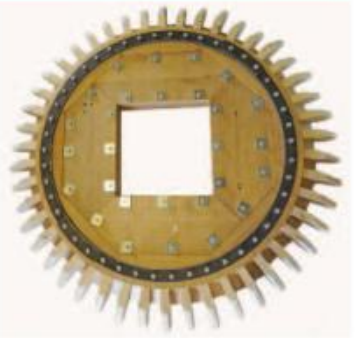
The construction of the wallower has been completed and during November it was dismantled in the workshop and taken to the mill. Chain hoists were used to lift the components to the cap where it was be fitted around the top of the upright shaft.

At the time of writing the team still have to fine tune the teeth so that they fit into the slots in the wheel. This emphasises the difference between professional and volunteer working. A mill wright would work full time on a task and would thus make and fit the wallower components within a couple of weeks. By contrast the wallower team spent a year making the components during which time the wood has both dried out as its seasoning continues, as well as absorbed moisture from the damper autumn air. This is why time has to be spent fine tuning the teeth.

When the wallower is raised to engage with the brakewheel, the turning of any one of the windshaft, brakewheel, wallower and upright shaft will turn all four. This will pose a challenge for the Mill Team as they have been turning the brakewheel (and windshaft) periodically to avoid the weight of the brakewheel from bowing the windshaft by being left in one position. The Mill Team will have to test whether they can manually turn all four components via either the brake wheel and / or a capstan on the upright shaft. If that is not possible, it may be necessary to take the wallower out of mesh until an electric motor is installed.

The Mill Team will shortly start examining the next steps in the mill's restoration these are expected to comprise:-

- Addressing the broken bottom bearing at the base of the upright shaft.
- Making the sack hoist which will be powered by the wallower and be able to raise and lower sacks through the trap doors.
- Examining the possibility of installing an electric motor on the ground floor to turn the bottom of the windshaft and thereby turn the wallower, brakewheel and wind shaft.



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