The Sack Hoist

During 2017 the Mill Team was hard at work making the sack hoist. In doing so the team faced several challenges:

- There was not any evidence of what type of sack hoist was used in the mill or what it looked like.
- Although the team knew how a sack hoist worked, being able to recreate this was another matter. The team had to experiment with pulleys and chains to ensure that the engineering would work.
- The sack hoist is located in the cap, so all the tools and materials had to be carried up five flights of stairs. Naturally some pieces required modification, so had to be taken down five flights of stairs, fine tuned in the workshop, then carried back up to the cap.
- The cap already contained the brake wheel and the wallower, so room to spread out materials and tools was very limited.

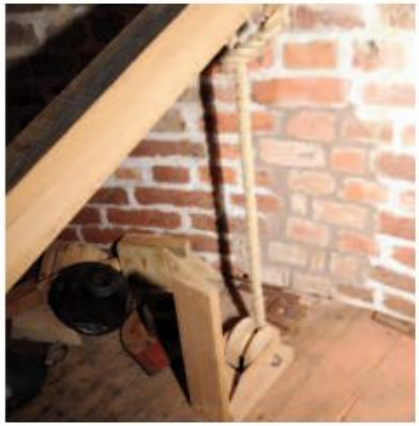
When the mill reconfiguration has been completed, visitors will see a sack attached to a chain. Nearby will be the rope used by the miller to operate the hoist. But what is hidden from view in the cap?

The chain is attached to a winding drum, which is positioned above the trap doors in the cap.

The winding drum is on an axle.

The opposite end of the axle passes over the lifting beam and is attached to the wooden drive wheel.

The default position of the drive wheel is a couple of finger widths below the wallower.



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The rope descends from the control lever to the Meal Floor (ground floor) so that the miller can operate the hoist.

When the hoist is at rest, the control lever is angled downwards underneath the lifting beam.

When the miller pulls on the rope to operate the hoist, the rope pulls the free end of the control lever down. This raises the hinged end of the control lever, thereby raising the lifting beam.

Raising the lifting beam also raises the drive wheel to the bottom of the wallower. This creates a friction drive in which the wallower turns the drive wheel.

The drive wheel turns the winding drum at the other end of the axle, thus raising the sack.

The miller counts the bangs as the sack bursts through the trap doors on each floor.

As soon as the sack has passed through the pulpit doors, the miller lets go of the rope. The rope end of the operating beam rises, thus lowering the hinged end which consequently lowers the lifting beam and the wheel drive.

As the winding drum is no longer being driven by the wallower and wheel drive, the weight of the sack and chain cause it to descend.

When the sack stops on the pulpit, the sack and chain are no longer pulling on the winding drum, so it stops.

While the miller is operating the hoist, the miller's boy runs up the stairs to the Bin Floor. He unties the sack, pushes the sack across the slide and empties the grain into the grain bin.

A gentle tug on the rope will lower the chain until sufficient chain has been unwound to enable the weight of the chain to take it down to the Meal Floor.

Observant readers will have identified the flaw in the process - the lack of mill sails means that the wallower does not turn to operate the sack hoist.

Mill volunteers have made a set of temporary arms that will fit on the upright shaft during group visits. The supervised group can then use them like a capstan to operate the sack hoist.

Would you like to join the ~Mill Team?
The Mill Team comprises skilled volunteers with significant carpentry, metalworking and engineering skills. They would welcome one or two new volunteers on Friday mornings

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