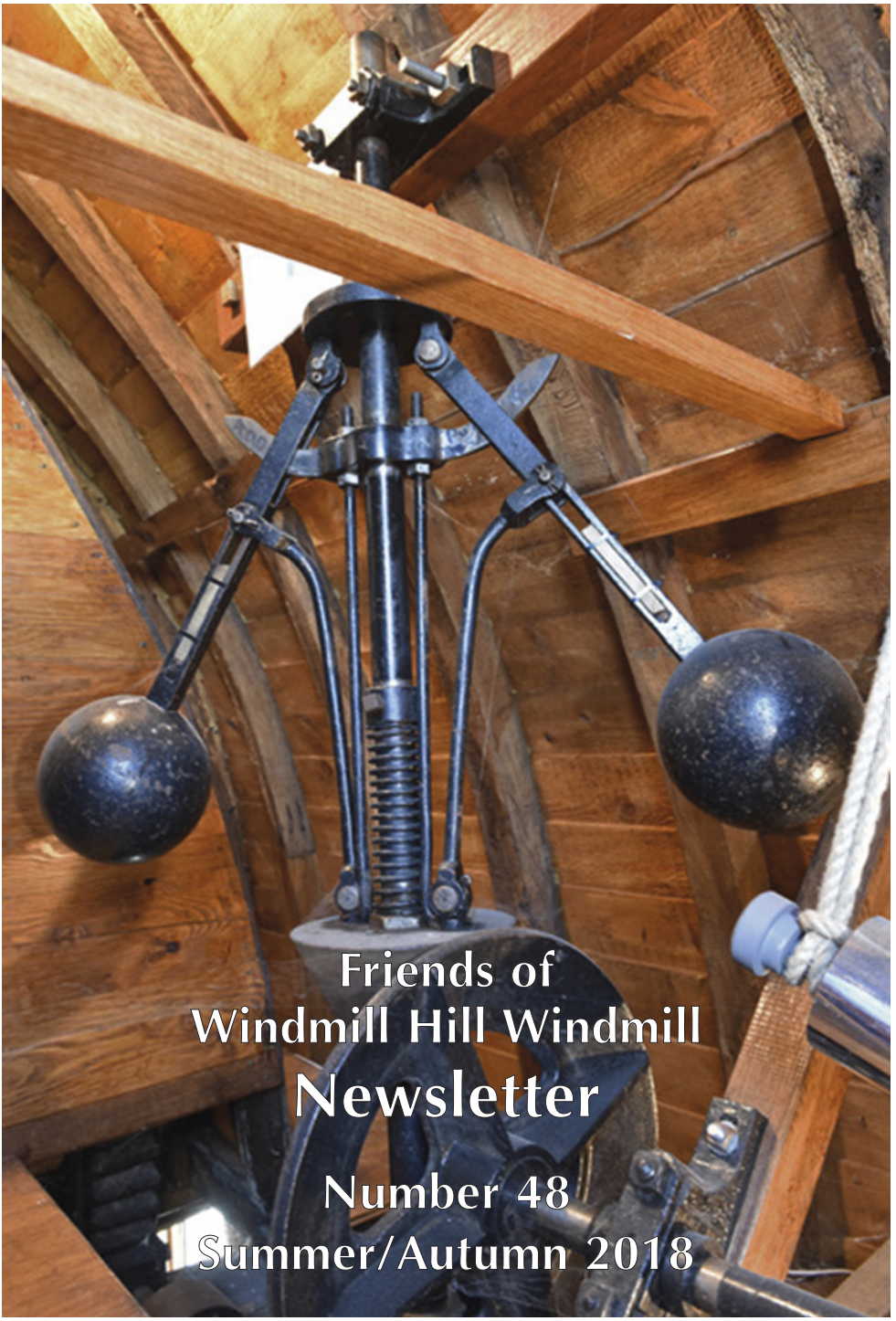

Friends of Windmill Hill Windmill Newsletter

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Summer/Autumn 2018

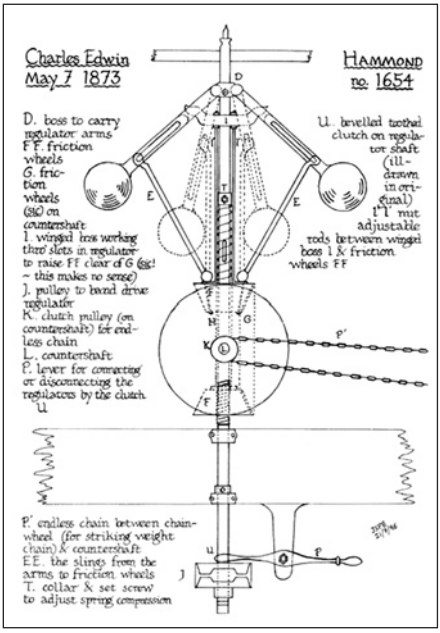
Rhys Clatworthy asks if the Hammond's Governor was a successful innovation

We are nearing the point when we can finally return the windmill back to milling flour again after more than one hundred years. Our next challenge will be to discover whether the Hammond's Governor was successful in the windmill at Windmill Hill. The key question for me is '*was it designed to both open and close the shutters?*'. All the articles I have read seem to imply that it was!

Martin Brunnarius, the well-respected author of *The Windmills of Sussex*, writing about the Hammond's Governor at Herstmonceux, states:

'The mechanism is basically a large centrifugal governor, similar in action to the type used for tentering the stone. These in turn drove a large clutch cone forwards or backwards, and via a little shackle chain and pulley, immediately pulled the weight wheel into the ***open and closed striking position****. The adjustment of this system must have been very critical and it is interesting to note that the conventional weight chain was retained.'*

'Mr Charles Edwin Hammond, of Clayton, who patented this arrangement in 1873, obviously intended it to be an additional refinement readily incorporated. ***The existing Cubitt's gear provided an accurate initial setting and torque limiter was provided to ensure that the mechanism did not act too fiercely and strain the existing gear when increasing the sweep speed'****.*



If our governor was successful it is obvious that the adjustment on the sleeve with the two opposing nine-inch cones is extremely critical to ensure that the sweeps retain their optimum speed for milling. At this point neither of these two cones would be in contact with the main larger clutch reaction to close the shutters. But this clutch never existed on our Hammond's Governor, and there is no clutch shown in the drawing made by Martin Brunnarius.

cone to move it either forward or backward to open or close the shutters.

This bring us to the 'torque limiter' and to the question as to whether this was involved in the closing of the shutters.

If the torque limiter is involved in the closing of the shutters (bearing in mind that the weight on the weight chain has been retained) its purpose would be to intervene with the governor and the weight on the weight chain and to avoid any ferocious action. There would be two forces trying to do the same job of closing the shutters, which could be disastrous! The torque limiter is adjusted by a compression spring and collar; so, this adjustment would be extremely critical to be able to control these two forces.

If on the other hand, the limiter did not have any involvement in closing the shutters, then it would be adjusted to a torque level sufficient to open the shutters. Any attempt from the governor to close the shutters would be neutralised. This would also make the lower cone on the sleeve pointless.

Hammond Sweep governor clutch mechanism as fitted in the mill

We do have the original torque limiter but the compression spring and collar are missing so replacements will have to be made if we are to investigate further. It would be wonderful to show if the Hammond Governor was successful. If anyone has any thoughts or opinions, it would be interesting to hear them.

On 7th May 1873 Charles Edwin Hammond took out a patent on a novel centrifugal governing mechanism designed to control the speed of a windmill. [Patent No. 1654].

The first of these was fitted into the cap of Jack Windmill at Clayton, and the second in the rear of the bin floor at Windmill Hill Windmill at Herstmonceux.

This could only be applied to Cubitt's patent sweep control and was intended as an additional refinement. Cubitt's method controlled the sweeps by relying on a counterweight load operating the shutters in response to a change in wind pressure via a series of levers and rods. The drawback with this was that power was lost unnecessarily when a sudden gust of wind occurred causing the sweep speed to vary, or if the work load within the mill changed. In this latter case the miller would be required to alter the weight setting to compensate.

Hammond's governor was intended to override the Cubitt gear whenever the sweep speed varied from a predetermined norm, whatever the wind or load conditions. Two opposed iron cones were fitted to a keyed sleeve. These were, according to sweep speed, raised or lowered by centrifugal weight levers. In turn the small cones drove a larger iron cone backwards or forwards which, via a light shackle chain and pulley, immediately pulled the Cubitt's weight wheel into the 'open' or 'closed' shutter position. The existing weight and chain were retained, acting in a second groove in the rim of the weight wheel. This was used to provide the initial setting and controlled the mill entirely at the idle position in the governor's action. A torque limiter was provided to prevent the existing striking gear being strained as the sweep speed increased.

SOURCE: Sussex Mills Group
www.sussexmillsgroup.org.uk

Diary Dates

Heritage Day Opening: 16th September

The windmill will be open from 11 until 4pm on Sunday 16th September for Heritage Open Day. The event will have a World War One theme as part of the local programme of events to mark the centenary of the end of the war in 1918. We will have music from the period, displays about bread and food-rationing, plus traditional fete games, as well as tea and cakes. There will also be an opportunity to make 'windmill' poppies which will be planted around the outside of the mill.

Christmas Opening: 8th December

Front cover photo:

Charles Hammond's Patent Governor 1873

100 club prize draw *The recent prizewinners:*

April 2018		June 2018	
1st	J Izzard	1st	Roger Wintle
2nd	M Bidgood	2nd	Hue Mead
3rd	G Beecher	3rd	Roger Wintle

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