



## **Vincent Pargeter (Millwright) Ltd**

101, St. Nazaire Road,  
CHELMSFORD,  
Essex, CM1 2EG

Phone & FAX 01245 265579  
Mobile 07776 300807

### **King's Mill, Shipley, West Sussex.**

#### **Report on the condition of the mill based on a visit made 6/12/14.**

King's Mill is a large smock mill on a high brick base with a stage. The four sweeps are in position, and carry a half-set of shutters in alternate bays. The fantail is in place, but two blades are missing or damaged, and the fan is tied up. The cap is more or less facing the prevailing wind.

The inspection was visual only, with no dismantling involved. A ladder was used to access the upper parts of the weather-boarding on the tower. No attempt was made to move the cap or sweeps.

#### **1. Safety of the Mill in the immediate term.**

The fantail is not turning the mill's sweeps to face the wind, so there is the potential for the mill to become tail-winded if a strong gale from the north is experienced. The fact that only a half-set of shutters is present would help to reduce the danger of the cap lifting, however, the shutters are not fully open and present more of their surface to the wind than they should.

The shutters will not open fully because the front end of the striking rod is bent, and one triangle contacts the face of the sweep before the open position is reached.

For maximum safety in a gale, I would recommend that the connecting rods on the sweeps are adjusted at the forks so that the shutters in all four sweeps will open fully. Furthermore, I think that each of the three bays that are filled with shutters in the tips of all four sweeps should be reduced to one shutter only each. The shutters nearer the centre may be left as they are. The removed shutters should be clearly marked for their position.

The locking devices on the tips of all four sweeps should be locked to hold the shutters fully open so that there is no danger of them blowing closed in a tail wind.

The above should prevent damage in all but very severe conditions and should be carried out as soon as possible.

## **2. The Fantail.**

The mill's fantail should be made to work again as soon as it can be arranged. The broken blades need to be renewed, plus any others found to be weak or rotten. For maximum life, the arms could be made from seasoned, straight-grained oak or a durable imported hardwood such as Balau. The vanes could be of pressure-treated softwood, all joints and mating surfaces to be painted during assembly. All bolts and fastenings should be hot-dip galvanized or be of stainless steel. The completed fan should be balanced, if necessary, by adding lead weights, securely fastened.

The bracing at the end of the fan-stage is a little displaced, and rotten. In the short term, this could be reinforced with added timber or steel brackets. The fantail gearing appears to be in good order.

## **3. The Curb.**

The curb appears to be in good order except that part of one of the cast-iron cog segments recently broke away. This has been put back, but its degree of security is not known. It is believed that the cog segments are set-screwed to the steel fabricated ring on top of the curb woodwork. It may be necessary to install more set-screws to attach this, or any other potentially loose segments. Mr. Eustace reported that there seemed to be a stiff position of the cap, and this needs to be investigated to determine whether there is an obstruction on the top surface of the curb e.g. a "step" or projecting bolt head. Once this problem has been addressed, the cast-iron segments have been secured and the fan is complete, the cap may be set turning again.

## **4. Improving the Rotation of the Cap in the longer term.**

The cap of this mill is large and heavy, and has long suffered from turning difficulties on its dead curb. Adequate lubrication of the curb surface with a suitable grease helps, but some minor modifications could be applied as described below.

### **Centring Wheels.**

It was noted that no centring wheels are fitted to the extreme sides of the cap. There are wheels under the sheers, but none under the side puncheons. This layout, although apparently original, is likely to subject the curb and gearing to unnecessarily heavy loading.

Two new centring wheels and two new mounting brackets could be cast and bolted into place under the puncheons. These would almost certainly improve the rotation of the cap, and are, I believe, desirable.

### **Weather Beam.**

The weather beam, that connects the forward ends of the sheers, bears the weight of the sweeps and most of the wind-shaft etc. This heavy load currently slides round the curb on several “skids” fixed to the beam’s underside, and is subject to great friction. This friction could be eased considerably by installing a system of rollers. On the mill at Burwell, Cambridgeshire, a similar problem seems to have been solved recently by fitting a pair of “skates” under the beam. These are modern, and consist of an endless loop of small diameter rollers that look like caterpillar tracks, contained in a steel fitting. They are intended to carry very heavy loads, but are quite neat and small for their capacity.

In order to fit these skates, it would be necessary to cut two housings in the underside of the beam. This is 12” (305mm) deep oak, and the required housing depth would be 50mm. The total depth of the skates is 63mm, and their load-bearing capacity is 10 tonnes each. I think that cutting the necessary housings would not affect the strength of the beam significantly. The standard skates will need a little modification by welding on steel fastening brackets which would keep them radial to the centre of the curb.

While these skates would not be original, they should solve a problem that has afflicted the mill since it was built. They are quite unobtrusive, and very obviously modern, so they could not be mistaken for original fittings. I feel that they would be acceptable if they eliminated the periodic breakdowns of the winding gear that this mill has suffered from.

## **5. Sweeps.**

The mill received four new sweeps and one new inner stock last year. The outer stock dates from 1991, and the alignment of all the sweeps was noted to be good. As they are mostly new, the sweeps were not climbed or viewed closely on this occasion.

As mentioned before, the striking rod that passes through the wind-shaft and controls the shutters, is bent at the front, just behind the cross. This needs to be straightened, and probably needs to be taken out to work on it.

It may be necessary to cut the rod behind or at the bend in order for it to be withdrawn from the rear of the wind-shaft. Once out, the rod can be straightened and welded securely back together.

When the rod is back in place, the shutters will need to be adjusted at the connecting rod forks.

## **6. Weather-boarding.**

The weather-boarding on the mill was all renewed around 1990 when repairs to the mill’s timber frame were complete. The boarding was of good quality red pine, pressure- treated against decay, but despite this, it is now rotten. Why the life of the

boards has not been longer is not known, but today all the boards on the tower and cap are in very poor condition – a life of 25 years.

The only remedy to this situation is to replace all the present weather-boarding with new. This is a huge undertaking considering that the tower requires approximately 2,600 metres run of boards. Maybe a different method of preservation should be considered, such as Accoya – A new non-toxic treatment which alters the molecular structure of the wood, making it less absorbent and more resistant to decay.

The existing boards have not rotted right through yet, but this may soon happen, and the need to weatherproof the mill is urgent.

The windows and doors of the mill need to be checked, repaired and painted as necessary.

### **7. The Fan-stage.**

The fan-stage is showing signs of decay. It may be possible to repair it, but it would be better to renew the whole structure in dry oak heartwood. All joints should be painted during assembly, and fastenings should be galvanized, or of stainless steel.

### **8. The Reefing Stage.**

The timber stage around the base of the wooden smock is getting into bad condition and may be unsafe in places already. The stage structure needs to be repaired piecemeal where decay is apparent. Oak heartwood or treated softwood should be used to renew the components and the whole of the stage needs repainting.

The decking needs new oak slats in places, and needs thorough inspection and replacement where necessary.

The steel tube handrail has been bent out of shape in places and needs to be re-shaped where this has happened. Some of the timber supporting posts also need replacement.

### **9. The Internal Timber Structure of the Mill.**

The mill's internal structure looks to be in good condition, apparently unchanged since the repairs of 1990.

### **10. Machinery in the Mill.**

The mill's machinery looks still to be in good condition.

### **11. Summary/Timetable.**

**Step 1.** It would be wise to carry out the work specified in Paragraph 1 to avoid possible gale damage this winter.

**Step 2.** The next step would be to implement the work in Paragraphs 2 & 3, then 4 so that the fantail can turn the cap satisfactorily, preferably in 2015. The mill should then be safe for a while during which time sources of finance can be indentified. If this takes time, it may be necessary to repair leaks in the weather-boarding to protect the internal timber frame.

**Step 3.** This step would involve all the major works in Paragraphs 6, 7 and 8 to complete the repair of the mill. The mill will need to be scaffolded for access to the upper parts, and the work will probably take the spring, summer and autumn of one year.

**End of Report.**

*Vincent Pargeter*

Director, Vincent Pargeter (Millwright) Ltd.

22/12/14

Director: V.G. Pargeter, Company Secretary: Genesis Secretaries Ltd.

Registered Office: 47, Church St., Great Baddow, Chelmsford, CM2 7JA.

Registered Number 04924930