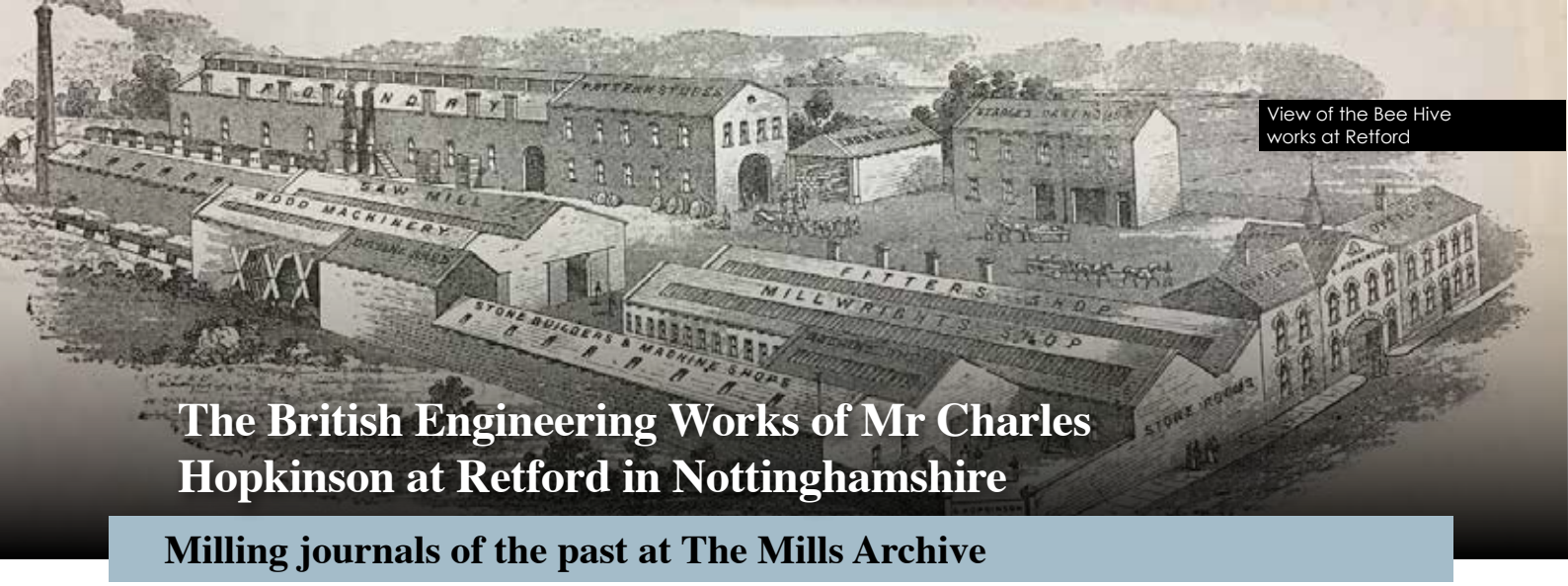


View of the Bee Hive works at Retford

# The British Engineering Works of Mr Charles Hopkinson at Retford in Nottinghamshire

## Milling journals of the past at The Mills Archive

by Mildred Cookson, The Mills Archive, UK

The August 3rd 1885 issue of the Miller reports a visit to the Bee Hive Works of Mr Charles Hopkinson, millwright and engineer. The workshops covered nearly four acres with a spacious courtyard in the middle. They were entirely self-sufficient and within their walls their roller mill plants were made and finished, "providing all that was needed for every part of a modern flour mill".

Passing through the main entrance and the cluster of offices one would walk into the courtyard which featured a railway line allowing the pig iron and other raw materials to enter the works, leaving later as highly finished machinery. This workshop railway siding linked directly with both the Great Northern and Midland, Sheffield and Lincoln lines, allowing railway trucks to be run right into the works. As they passed in and out, all trucks were weighed with their loads on a weigh-bridge, which stood at the very end of the works shown in the engraving.

The pig iron delivered from the trucks was first broken for smelting; the fragments were then hoisted up to a landing at the mouth of a cupola to start their treatment. Beside the cupola stood a receiver, into which the molten metal was drained whilst hot. Adjacent to the cupola, the foundry was entered by a small side door, giving access to a building of imposing proportions. Here the manufacturing process for every kind of metal casting that would be required in a modern flourmill could be observed.

In this shop were cast pulleys of every description, the metallic parts of centrifugals, scalpers, bran dusters and rollers of every size. At one end of the foundry was the drying furnace, in which the sand moulds were dried for use after they had been shaped. To ensure accurate work Mr Hopkinson employed, as far as possible, only cast iron patterns, for both small as well as large castings.

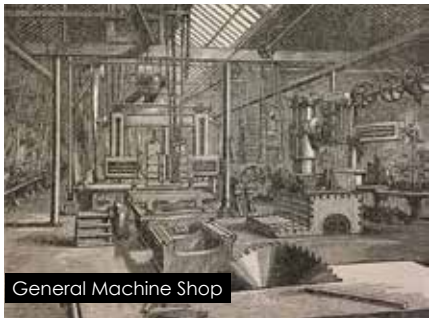
Separate from the foundry was the engine room where a steam engine served the double purpose of supplying power to the blower, which stood by its side and as well as to a sand mill, located on the other side of the wall in the yard. Next to the engine room, the castings were trimmed, cleaned and stocked the in the fettling shop in preparation for the finishing work in the fitting shop. The various stores separated smaller castings, such as elevator and other pulleys, the smaller parts of centrifugals and similar machines from other stores containing wrought iron and a shed containing all sizes of shafting neatly packed away.

The fitting shop provided one of the most interesting sights to be seen in the works. Here, in a spacious and well-lit building, endless rows of lathes and other machinery were busy at work finishing rollers and other components of flour milling machinery. At the lower end of the shop rollers underwent every part of the process of turning, with lathes cutting off the ends and boring out rough rolls. Of special interest was a lathe called a horizontal borer, for boring out the brasses used in various machines.


Part of saw mill showing wood-working machinery


Foundry - Chilled Roll department


Special machine tool shop for chilled rolls


General Machine Shop


Erecting and finishing shop for centrifugals


Roller mill erecting and finishing shop

Chilled roll and finishing shop

Once the roller had had its ends trimmed and had been bored, it was fitted with a spindle and again turned. This required great care, and several lathes were employed on this work. For the next stage it was removed to another lathe fitted with an emery wheel, to be smoothed. The roll was then as smooth and bright as polished steel, and here, if it was only intended for middlings reduction, the process finished.

Should the roll, however, be meant for a break mill, it would of course need to be grooved. To groove the rollers, special machines of Mr Hopkinson's own design and make were used. The groover was a lathe with a bed on which the roller was secured, and subjected to the action of the cutting tool, which was made of hardened steel. The roller had a double motion, travelling the length of the bed to meet the grooving steel, while it made a partial revolution on its own axis; the arc traversed being graduated according to the pitch of the corrugations. One of the groovers was furnished with a double bed, on which two rollers could be grooved at the same time.

At the end of the fitting shop was a small steam engine, which could be used for night work, providing an important economy for the firm. Here also was a leviathan lathe for turning wheels of larger dimensions, it was provided with double gearing, and had a triple simultaneous action, turning both inside and out, and boring with one movement. Further along were several drilling and planing machines used for the fitting and planing of roller mill and centrifugal frames.

Along one side of the room ran a millwrights' shop where different parts of the roller mills, centrifugals, aspirators, bran dusters, and other machines were put together. The shop also included the smiths' forge furnished with a steam hammer and a 25 hp engine that was kept in reserve against any breakdown.

The end of the fitting shop had been extended right up to the saw-mill, bridging the gap shown on the engraving and separated by an iron door. This department was fitted out with the most modern sawing and planing machinery and gave access to the drying shed filled with large stacks of wood of all kind and sizes as well as wood kept specifically for cogs. Outside, across the timber yard, was the millstone shop, where a millstone miller could choose between the best French burrs and a large assortment of peak stones.

Other features of the site included the joiner's or finishing shops where the centrifugal and other machines were built up and received their final touches, a wood pattern store, which was a building with several stories containing all kinds of patterns in a well ordered museum and, near the offices, a well-lit drawing shop. This complete millwrights and engineering workshop was highly regarded, as evidenced by their advertisements. The geographical and historical spread of our holdings at the Mills Archive mean that I can only provide snapshots; if you would like to know more please email me.

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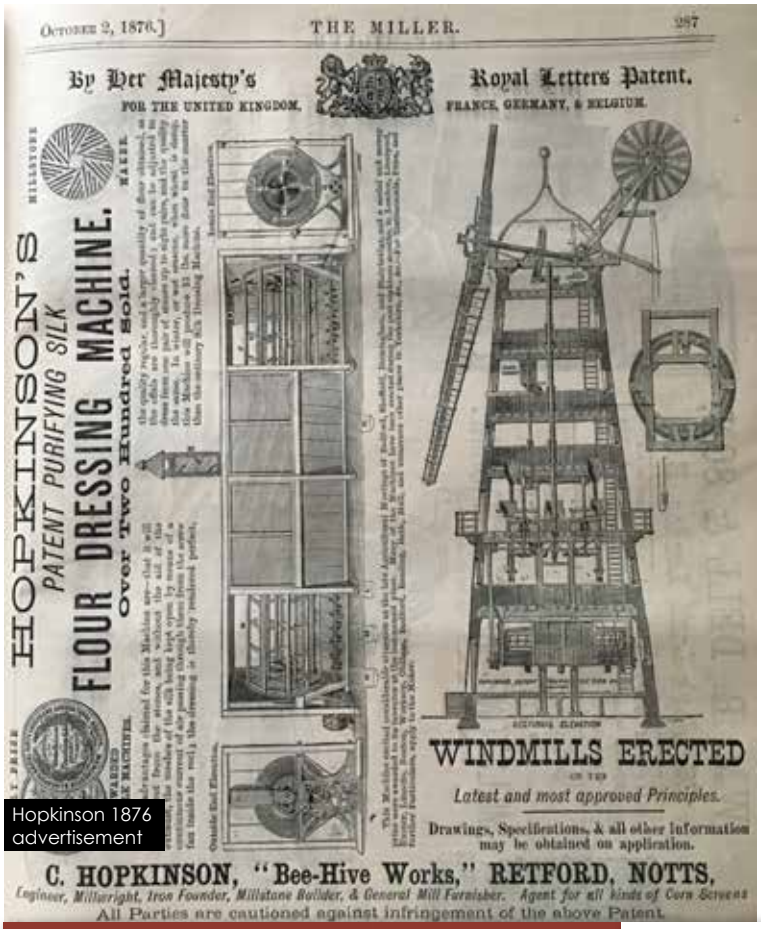


Hopkinson 1876 advertisement