

The Vertical Three-roller Sugar Mill

Owen H Ward

Of all the mill-designs for crushing sugar cane, the most widespread type was the vertical three-roller mill. Originally all the machinery, including the rollers, would have been of wood. This must have meant that the best available tree trunk was cut up to make the rollers, so that every roller was of an approximate, and different size. This made the supply of replacement parts extremely difficult, but the advantages of iron machinery encouraged manufacturers to overcome them.

The first known reference to the use of iron for the rollers is dated 10th February 1662, when George Sitwell of Renishaw wrote to a London merchant for details of what was apparently then a novelty. The rollers were cast hollow, and were supplied to special order to fit every individual mill. By 1721 each roller was being cast in one piece with the gudgeon, which was joined to the case by a spider. In the 1770's each roller was still being individually cast to size, measured on a length of thread or other guide supplied by the plantation owner.

A further development originated in Bristol in the early 1790's, when a system incorporating small rollers, into which the rotating ends of carriage axles were set, was adapted to the sugar mill. These were popular for a time, though fallible.

The three-roller vertical mill remained the standard apparatus until the advent of the steam engine in the 1820's and 1830's, when horizontal mills became the norm, whatever the motive power.

The usual sources of the rollers were the major British ports, such as Bristol, London, Liverpool and Glasgow. During the 17th, 18th and 19th centuries thousands must have been put into service in the British West Indies alone; there were 409 windmills in Barbadoes in 1709, and Trinidad had 258 cattle mills in 1808. Hundreds of "millcases" are recorded amongst the exports in the Bristol Presentments which date from 1732 onwards. But now, none of these ports has any example in its museum collections. The markets were as widespread as can be imagined, but most customers were in the West Indies, yet so far no surviving example is known to the University College there.

DISCUSSION

On the reason for using hollow rolls, one suggestion was that it might be due to the casting process used. Another was that as the earliest known date was well before the use of coke (or coal) in smelting, even cast iron was still a fairly expensive material.

It was pointed out that in some overseas where territories scrap iron is of little value, machines can lie around for years without being interfered with, so there is still a good chance of finding examples of these rolls where they were used.

In answer to questions, O. Ward explained that the early rolls were smooth, but in later practice, they were fluted. The crushing pressure varied with the different passes.