

The Horse Engine and Cider
making equipment at
Bickham Farm



Devonshire Association
2012-2013

Location

Bickham Farm is in the parish of Kenn four miles south of Exeter at OS 842 914. And it is about three quarters of a mile south of the village.

Introduction

In 2012 the recorders were given permission to record the horse engine in a barn at Bickham Farm. The farm is at present producing organic vegetables for the vegetable box market and also processing some of the produce into pre packed soups. The building has recently been very well restored, with the assistance of Natural England. It is a bank barn, which means that it is built into sloping ground. The entry on the north side into the large single original upper floor room is at ground level. The room at the western end, which is a later addition and has a wide full-height opening, is also at ground level. The entry to the lower floor, facing south, is not quite level as it slopes down from west to east, and to the south. On the lower floor there are three rooms in the original building, with one in the later addition. The horse engine is in the middle room of the original barn with new concrete slopes to the two doorways.

The Horse Engine

Horse engines were developed as a means of producing rotary motion of greater power than that of a man, where water power was not available. All farms had one or more horses so that the driving power was available at all times, it only needed to be attached.

The horse engine at Bickham has three take-off gears, which is very unusual and for this reason it was decided to make an in-depth survey. The right-hand gear is engaged by adjusting wedges holding the arm to which the bearing is fitted. The shaft it drives passes through the wall and across the next room to work the apple mill, which is fitted to the joists of the first floor. This room also houses the cider press. The rear gear passes through the back wall and is engaged by loosening a bolt threaded into the pulley which clamps it to the shaft, sliding the gear into the main wheel and retightening the bolt. This shaft has a large wooden flanged pulley on the inside of the wall. On the outside there are spokes of what we think was originally a gear of approximately 10 feet (3.02 metres) in diameter, driving a gear on a shaft passing through the wall to the upper floor room. The left-hand gear is operated by a lever and slides on a keyway to engage the main wheel. It is the only gear that could be engaged and disengaged while the horse wheel was in motion. The shaft passes through the wall into the next room and is immediately fitted to a 20-tooth gear driving a 60-tooth gear, speeding up the drive. The shaft crosses the room to a 24 inch (0.61 metres) pulley wheel, then on through the wall into the next room. Here there are two more pulley wheels: the one next to the wall being 24 inch (0.61 metres) and the other 10 inch (0.25 metres).

Though termed a horse engine, its size suggests that it was worked by a pony or ponies. It is very similar to two other horse engines seen by the authors: one at Upton Hellions Barton and another at Gittisham Farm¹, both of which were used to work apple mills. At Gittisham the apple mill is free-standing whereas the one at Upton Hellions is fitted to the underside of the

upper floor, as at Bickham. The mill being arranged in this way enables the apples to be shovelled into the mill from the upper floor and after passing through the pulp is then spread on to the cider press.

The pony was harnessed to the main drive post, by traces, to a swingle tree² attached to the drive arm. The gearing here is all metal. The centre gear of 7 feet (2.13 metres) in diameter has 120 teeth. Made in eight sections, it is bolted to a circular wooden eight spoke frame in such a way that the sections overlap the joints. This was a very versatile system that could be used to drive four different pieces of equipment. The large slot in the main upright post could have taken two ponies. Gearing up increased the shaft speed but more effort was needed from the ponies. Large horse engines were known to use four horses.

The Cider Equipment.

The apple mill is the usual type with two sharp toothed cogs which loosely mesh with each other to pulp the apples,

The press is a pull-down type, with the screw fixed to the middle of the bottom plate, passing through the cheese of apple pulp and straw to the top platen, which has a ratchet operated nut. As the nut is tightened down it squeezes the cheese. This type of press requires less headroom to operate and is far simpler to build.

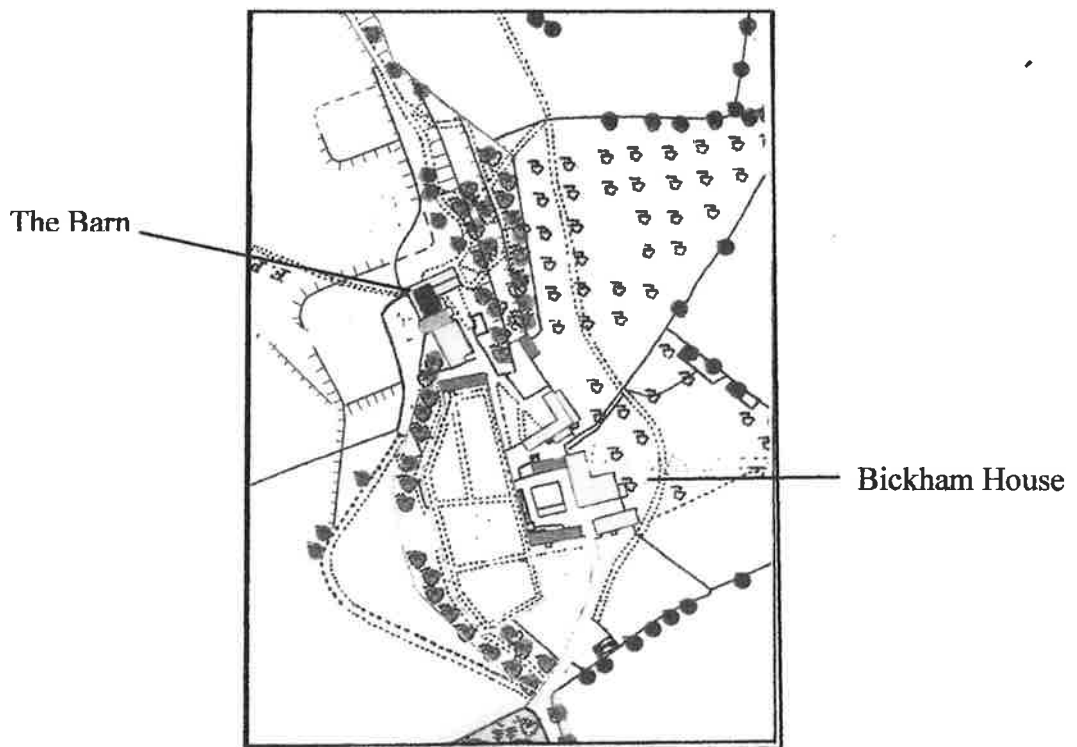
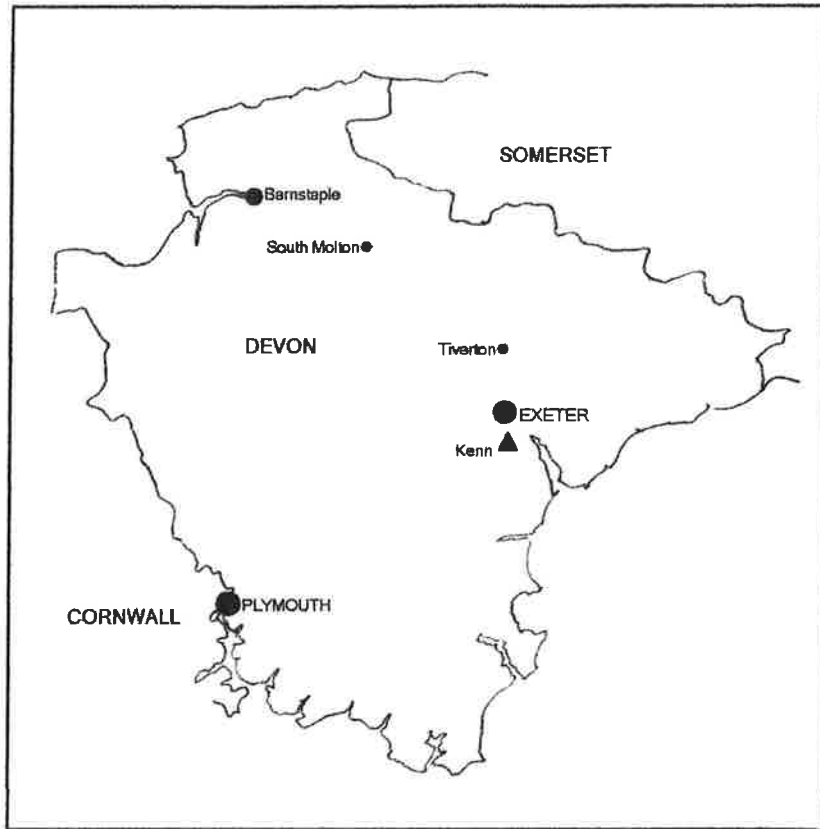
ACKNOWLEDGEMENTS

The recorders are indebted to Mr Rodney Hall for allowing them to access to the equipment. Bickham Farm is private property. It is a working farm and not accessible to the general public. Recorders: John Cann: survey, drawings and photography; Brian Rolf: survey; Roger Saunders: photography; Valerie Cann: overseeing production of the report.

NOTES

¹TDA (Vol. 133) 2001

²A swingle tree is a wooden bar which has the traces of the horse or pony attached at each end. An attachment in the centre of the bar connects to whatever piece of equipment is being used.

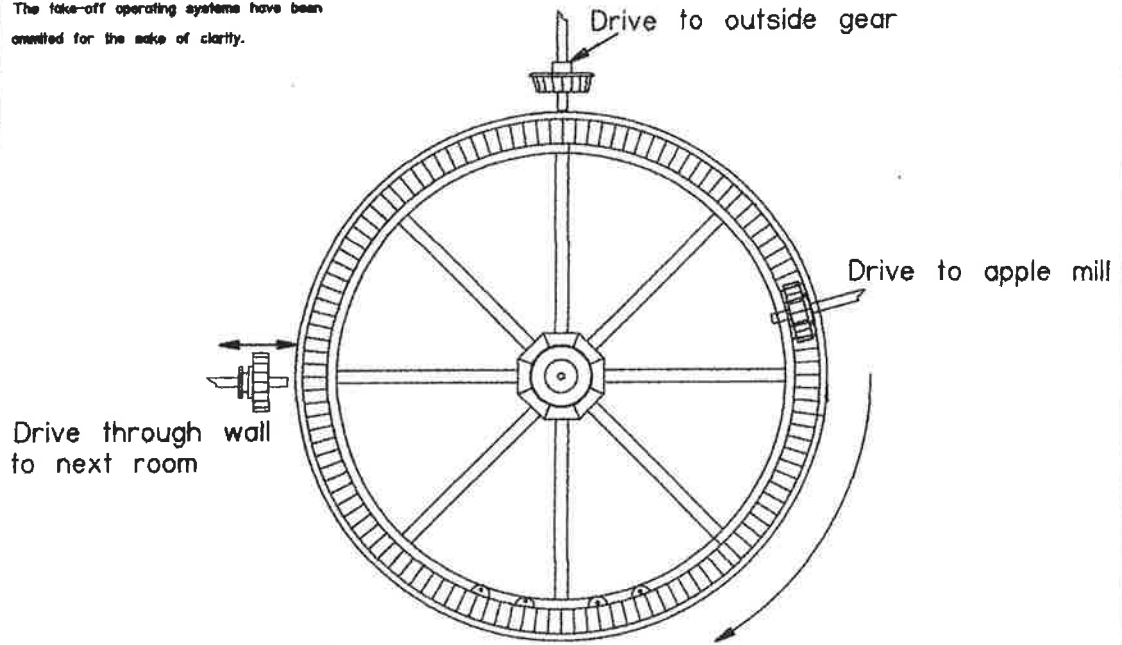


OS 1883



The Horse Engine

The take-off operating systems have been omitted for the sake of clarity.



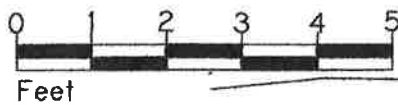
13in. square beam in two parts bolted together

Drive through wall to next room

Drive to apple mill

Supports at this angle are missing

13 in. octagonal post.



Swingel tree
Direction clockwise

The Horse Engine
Bickham Farm
Kenn

Surveyed by:-
John Cann and Brian Rolf
The Devonshire Association
2012



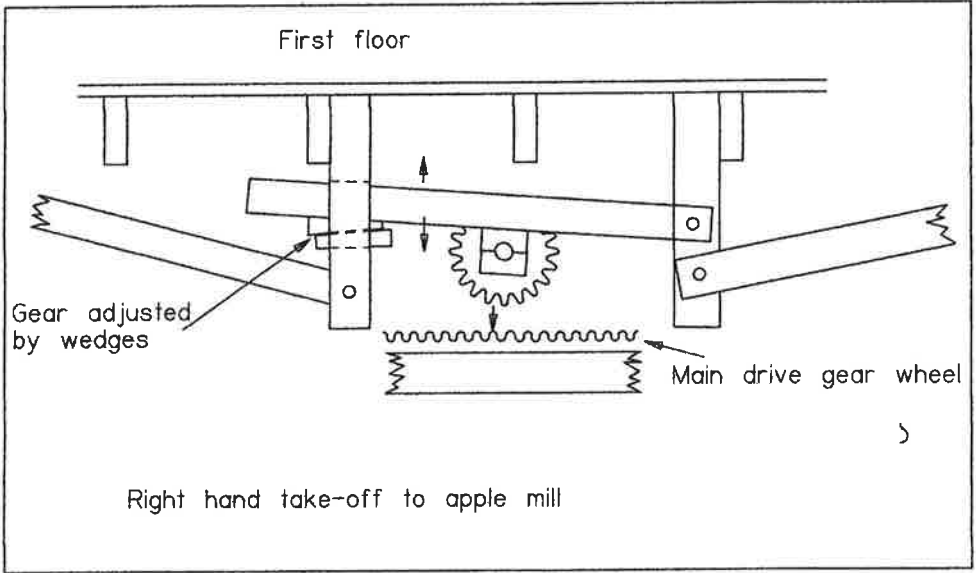
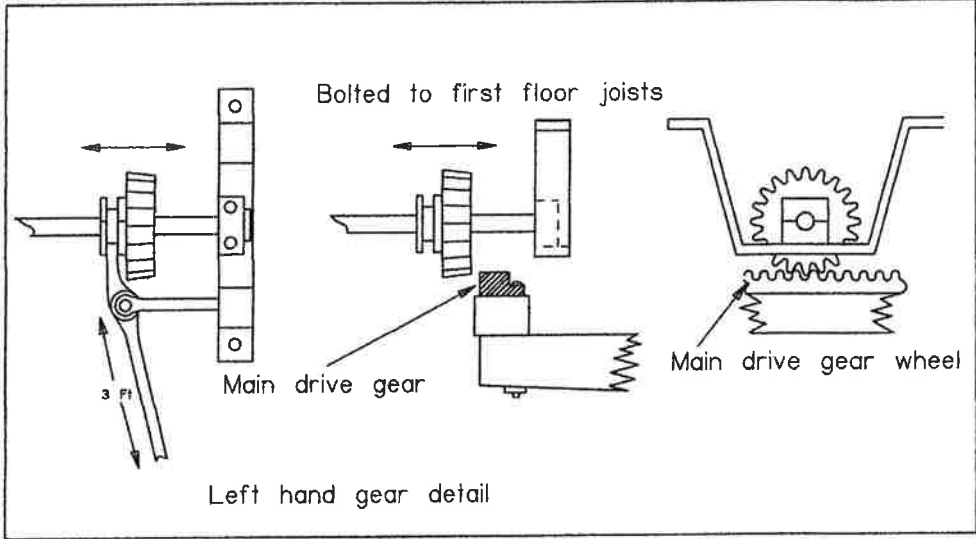
The left hand take off gear and leaver

Note missing tooth on main drive



Right hand gear which drives the apple mill.

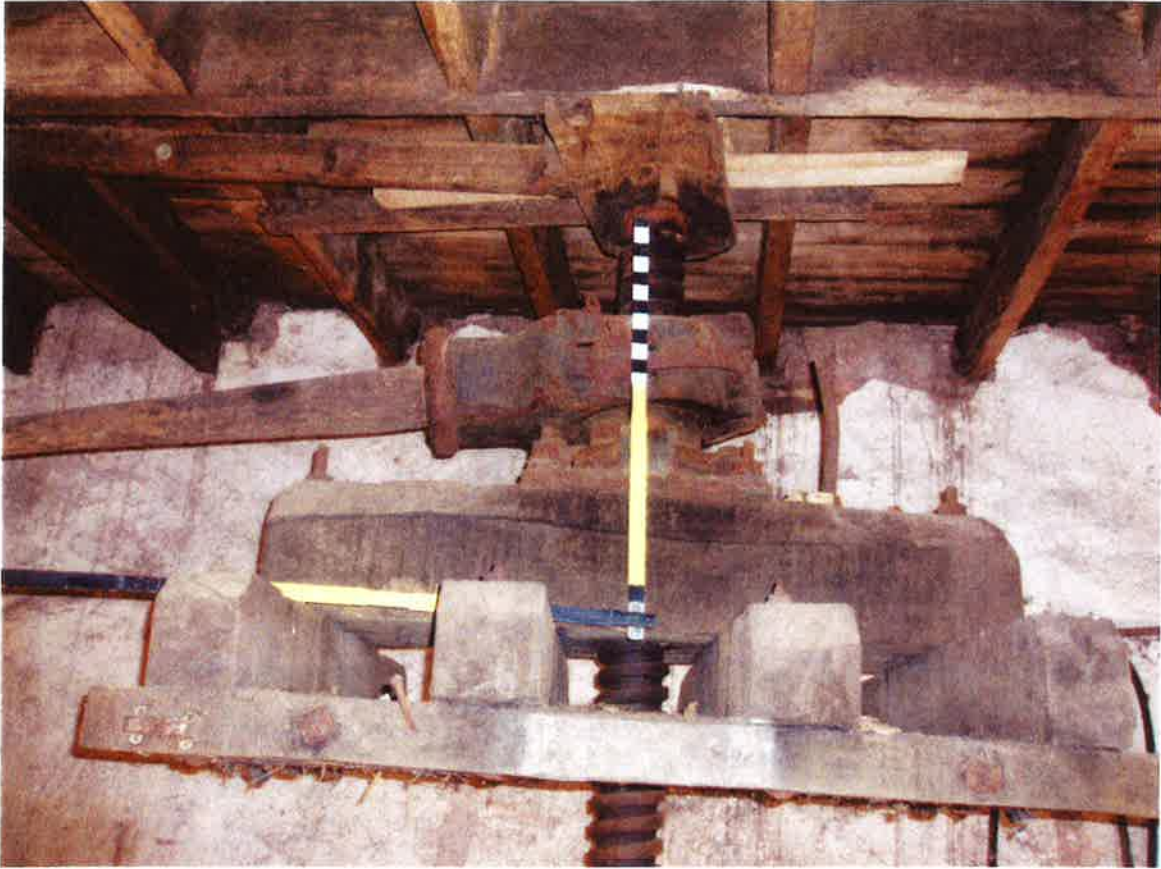
Wedge adjusting system



Take-off gears
 The Horse Engine
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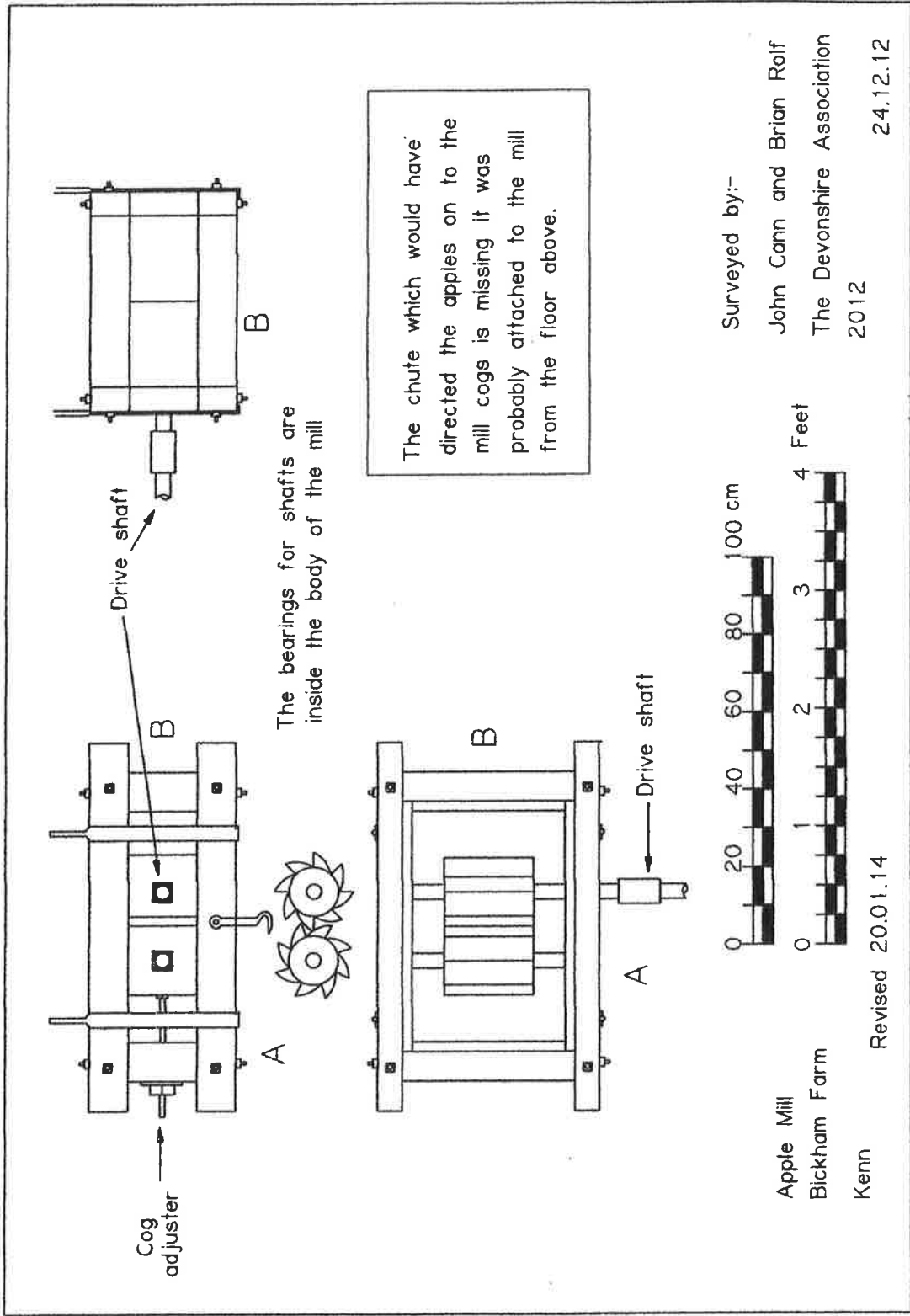
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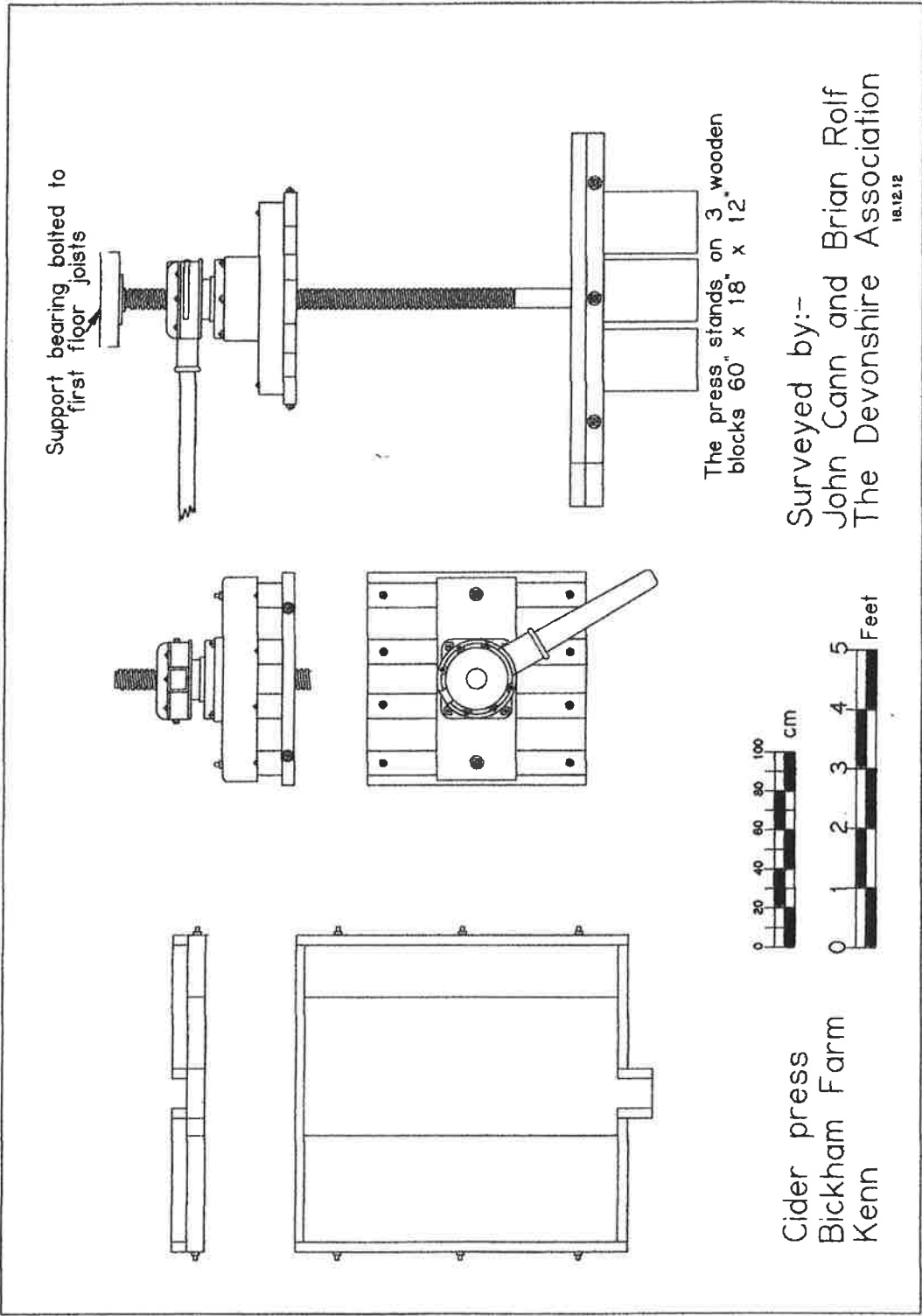


Top platen of cider press. In this type of press a ratchet in the lever screws the platen down the fixed screw allowing it to be used in a restricted place.

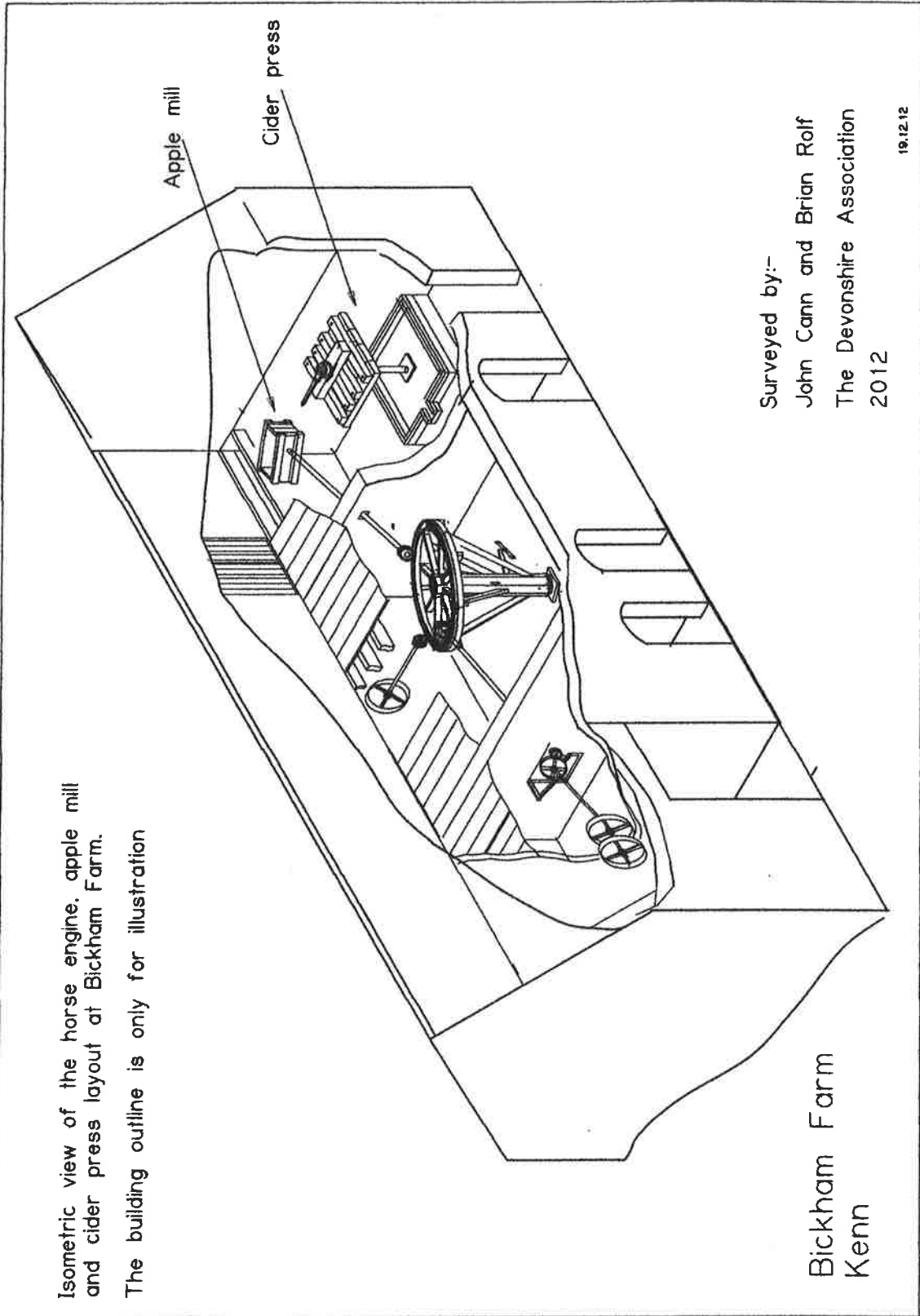


The apple mill





Isometric view of the horse engine, apple mill
and cider press layout at Bickham Farm.
The building outline is only for illustration



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19.12.12

Bickham Farm
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Since the recorders visit to survey the equipment considerable repairs and rebuilding have taken place, including replacing the missing gear teeth.

May 2014