The Disused Ancient Clock in Porlock Church:

A Striking Clock without Face or Hands

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The structure of this clock resembles that of the old clock made at Glastonbury for Wells Cathedral, the works of which are now in the Science Museum at South Kensington.[1]

The wheels are supported in a frame consisting of three upright bars, connected by a similar bar at the top and another at the bottom ; and the frame is fixed below to a massive block of hard wood, apparently oak. The upright bars are parallel, one at each end, and one intermediate. The frame is 44 in. long and 32 in. high.

The time and striking movements are end to end, as in the Wells clock, not side by side as in modern clocks : the intermediate upright supports the wheels of both movements.

The two drums for the weight cords are of wood : they occupy the lowest part of the frame, and the cords (of ordinary hempen rope) formerly passed upwards and over pulleys at the ceiling high above. The weights are big lumps of stone, still existing. The clock is wound up by means of four curved iron bars projecting radially from one end of each drum. The ' click ' comes into action only *once* in each revolution of the time drum, but *four times* in a revolution of the striking drum.

The striking mechanism is of the ' locking plate ' form, as would be expected in an early clock. Its wheels are of iron, with large teeth : the pinions are of the ' lantern ' form.

The time mechanism consists of only three wheels. The

[1] See *Peter Lightfoot—Monk of Glastonbury, and the Old Clock at Wells*, by R. P. Howgrave-Graham, M.I.E.E. *Avalon Press, Glastonbury.*

drum wheel resembles that of the striking movement, having large teeth ; but the intermediate wheel, though of iron, has small teeth ; the pinions of both this and the escape wheel are solid, as in modern clocks.

The escapement is of the ' anchor ' form : the escape wheel is of brass, and is thicker than the other wheels : the anchor is large in proportion, possibly indicating an early date. There is no dial, nor any provision for dial or hands : the clock told the time simply by striking the hours.

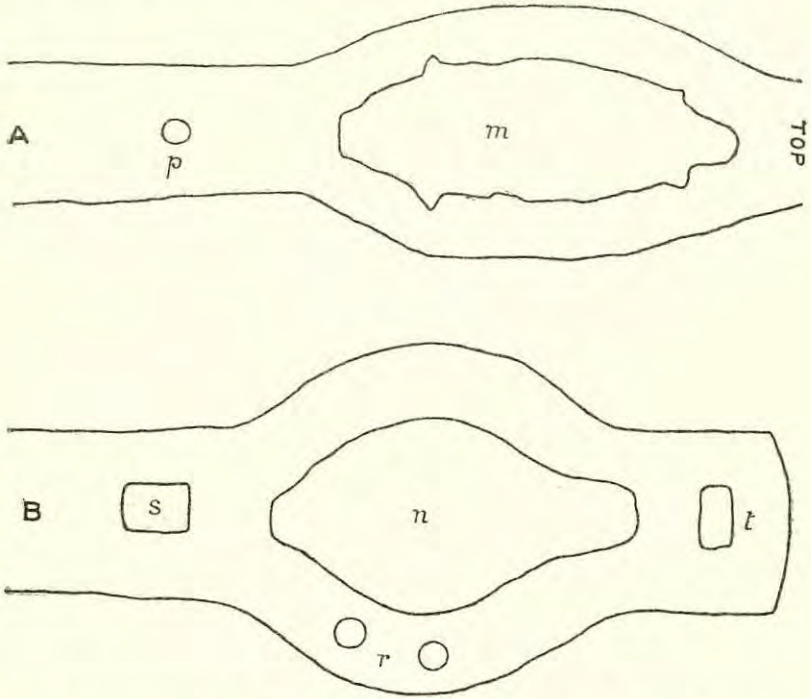
The axis of the anchor passes through a large and somewhat elliptical hole in the adjacent upright bar of the clock frame and works in an iron support attached to the outside of the bar above the hole : on the other side of the support is the attachment of the spring suspending the pendulum, which latter is of the ordinary modern form.

An interesting feature is that there is a hole in the *top* bar, also somewhat elliptical in shape, but wider than the one just mentioned, and having a peculiar elongation at one end. This hole is just above the escapement, and I suggest that it formerly transmitted the verge of a previous ' balance ' escapement. The verge may have been suspended from a support fixed into the two small round holes at the side of the elliptical opening ; while the four-cornered hole at one end of the opening may have borne a support on the under side, which held the lower end of the verge, or the pivot of the crown wheel : all three holes are extant (*see* illustration).

If my suggestion is correct, this clock is of venerable antiquity, and comparable with the clock of Wells Cathedral. Like most early clocks of value, it was ' converted ' after the invention of the pendulum, by the substitution of a new escapement, with a new intermediate wheel, and a new upright bar of the frame to support them.

The ' foliot ' balance, which was used with the crown and verge escapement in early clocks, consisted of a horizontal bar suspended by a string so that it could oscillate like the balance wheel of a watch ; but it had no balance spring to regulate its movement, and it therefore had no natural period of oscillation. It was very sensitive to accidental variations in the driving force of the machinery ; it would race when the machinery was clean and well oiled, and would lag under reversed conditions.

It is remarkable how long men took to discover that a pendulum has a natural period, and is therefore more efficient and at the same time simpler than the foliot balance.



OUTLINES TRACED FROM RUBBINGS OF PARTS OF THE CLOCK-FRAME.
Reduced in size.

A, upright end-bar of frame, scale ½: *m*, hole transmitting axis of 'anchor': *p*, hole for pivot of escape wheel.

B, upper horizontal bar of frame, scale ½: *n*, hole formerly transmitting verge of foliot balance; *r*, holes into which was riveted the arm from which the balance was suspended; *s*, hole into which was fixed the support for the lower end of the verge, or for the pivot of the crown wheel; *t*, end of the upright bar.

The discovery of the use of the pendulum was probably made by several workers independently, but is especially associated with Galileo, who early in his life proved by experiment that the *time* of the swing of a hanging weight is but little affected by the *length of arc* through which it swings.

In a work entitled *The Evolution of Clockwork* (recently published by Cassell & Co.) Mr. J. Drummond Robertson records his very thorough investigation of the 'Romance of the Pendulum,' in the course of which the following facts, among others, are brought out:

Galileo toward the end of his life contrived, in collaboration with his son Vicenzio, a novel and ingenious clock escapement regulated by a pendulum; but it was never put into general use. Shortly afterwards Huygens made experiments on the adaptation of the pendulum to the crown and verge escapement, and introduced the important innovation of hanging the pendulum not by a pivot, but by means of a string or a flexible strip of metal, so that it could oscillate without friction, while it was connected with the escapement by means of the 'crutch'. A patent for his invention was obtained in the Netherlands in 1657. A much improved form of escapement, known as the 'anchor' escapement, was invented in England soon afterwards. Dr. Robert Hooke claimed to have made the invention soon after the Fire of London (1666), but the skilled clock makers of the time may have had some part in the matter: a clock by Tompion, dated 1676, has the anchor escapement, and from that time onwards the anchor has been the usual form of escapement in clocks of most countries. It has an advantage over the crown and verge in not requiring so wide a swing of the pendulum, while at the same time it is less liable to disturbance of rhythm.

When the clock at Porlock was 'converted', the present intermediate wheel, with small teeth and a solid pinion, was inserted to fit the new escapement. The present upright frame-bar with the elliptical hole was at the same time substituted for a simple bar.

The clock was still going when I first saw it, about 1880. I hear that it was superseded at the Victoria Jubilee. It now stands under the tower, near its former position, and is properly cared for; but some parts of it have become detached. It is to be hoped that the detached parts will be re-inserted, and that provision will be made for the safety of the clock in the future. So quaint a clock is worthy of preservation in a museum.