JOHN FORDHAM'S Anchor conversion

by **John Robey**, UK

Figure 1. Lantern clock signed 'John Fordham, Dunmow Nº 190'.

A friend recently showed me a lantern clock to discuss what he thought were unusual features. It had been bought at a local auction in a very dirty condition, not having run for many years. A thick green layer of verdigris had completely obliterated any patina. An unrestored condition is just how collectors like to find clocks as it makes any recent repairs or alterations much easier to detect than when they are clean and shiny. It is difficult to clean a blackened brass clock to leave it in a state that is both clean and yet still shows the patina of age. This clock appeared from its box as shown in **figure 1**, and no doubt it will mellow to that golden colour of a well maintained antique.

It is a standard size clock 14¼in (375mm) tall with a chapter ring 6⅜in (163mm) diameter and signed 'John Fordham, Dunmow Nº 190'. The Essex market town of Dunmow, now known as Great Dunmow, lies between Bishop's Stortford and Braintree. Clockmakers like John Fordham who numbered their clocks are appreciated by collectors as this provides extra information that is not usually available from other sources. Not only does it give an indication of his output over his known working life, but if some clocks are also dated this enables when others were made to be estimated. John Fordham's known numbered clocks include 98, 125, 146,

Figure 2. Front of the movement.

Figure 3. Movement with the hour wheel removed.

179 (dated 1706), 184, 204, 273, 329, 397, 494, 495, 505, 530, 532, 547 and 548. Since this dial is numbered 190 it was probably made a couple of years after number 179, so about 1708 would not be unreasonable.

Clockmakers of Britain 1286-1700 by Brian Loomes (published by Mayfield Books in 2014) lists clockmakers and watchmakers born before 1700, even if they mainly worked in the eighteenth century. These include several clockmakers in Essex named Fordham and one in London, but there is little family history and few firm dates, so while they are likely to be related this is not confirmed. John Fordham was working in Dunmow from about 1680 till the mid eighteenth century, and took an apprentice in 1716.

A Thomas Fordham, clockmaker, was made a Free Brother of the Clockmakers' Company in 1687, implying that he had been apprenticed outside the City of London, and remained a member until at least 1705. A clockmaker of this name is known in Dunmow in the early eighteenth century and he is likely to be the same man returning to his home town. He could have been John Fordham's son who was apprenticed to his father, but moved to the capital to gain experience, then moved back to Dunmow.

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However, I have recently seen a London longcase clock with the date 1691 scratched on the rear of the dial and 'Fordham' neatly engraved on the back of the date ring. So this is either a different man or Thomas Fordham was actually an engraver, which might explain why he was a Brother of the Clockmakers' Company rather than a full member. Further research is needed to determine whether we are talking about one man or two.

A Joseph Fordham is said to have

Figure 4. Right-hand side of the movement showing the undecorated hammer spring and stop.

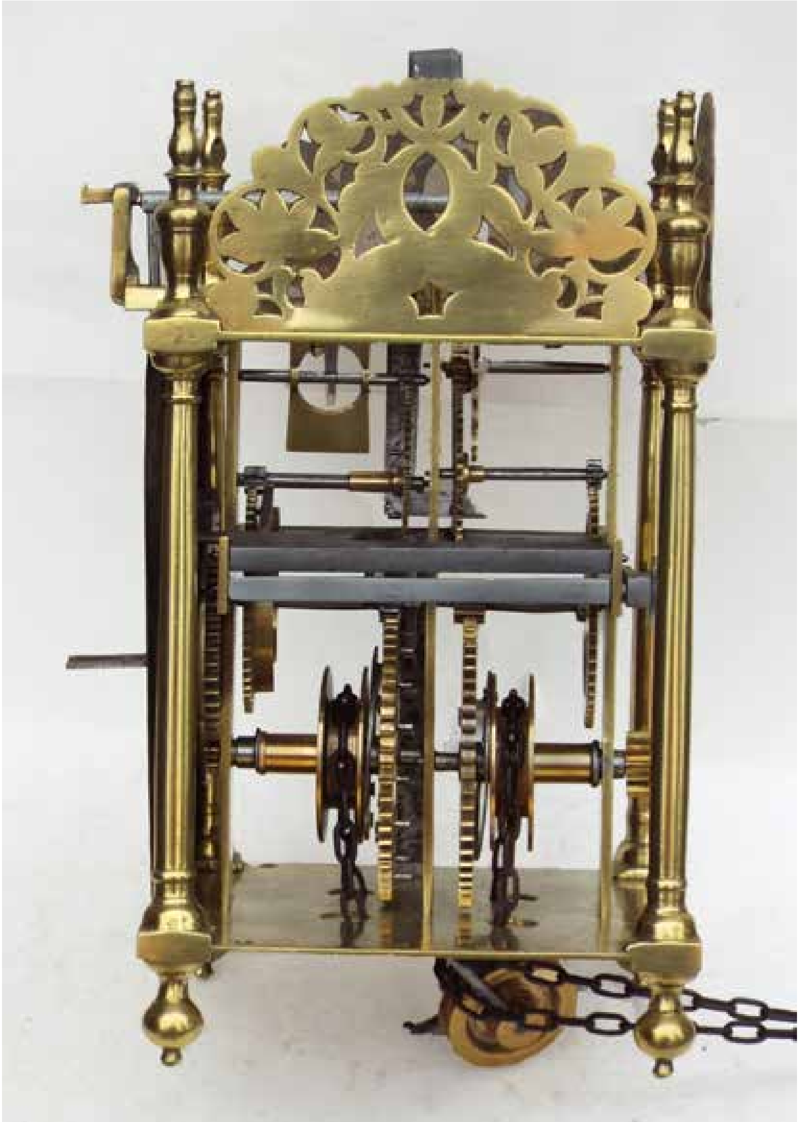


Figure 5. The two strikework arbors on the left-hand side of the movement.

been working in Bocking from 1700 to about 1775, and another at Braintree from about 1710 to about 1720 or later. A man of this name was married there in 1745 and buried there in 1750. Much of this information is probably based on known clocks, so the estimated dates may not be reliable and could even relate to the same man. This is all rather confusing and warrants further research.

The dial centre is engraved with scrolling acanthus-like leaves, emanating up from the VI position, **figure 6**. The frets are the well-known so-called twin-dolphin pattern (they actually represent mythical sea monsters), which was introduced before the English Civil War and remained popular until the end of the seventeenth century. The rather slender finials are complemented by ball feet that are a little smaller than usual. There is an anchor escapement and a weight on a chain rather than a rope.

The owner was puzzled by some of the conflicting evidence. F**igures 2** and **3** show that the hammer is on right-hand side as usual on clocks with a balance escapement, and there are winding clicks on both pulleys, yet there was a single weight on a continuous Huygens loop. Instead of the weight pulling down

WHEEL COUNTS

Going train

escape wheel	[25]	[14]
third wheel	[42]	[6]
second wheel	54	7
great wheel	56	[12]
hour wheel	48	
beat	1 second	

Striking train

fly		6
warn wheel	60	6
hoop wheel	54	7
great wheel	56	[8]
hammer pins	16	
countwheel	39	

Later wheels and pinions are shown in square brackets.

Figure 6. The dial.

Figure 7. The top plate and the anchor escapement.

on the left-hand side of both pulleys, it acts on the left-hand side of the going pulley and on the right-hand side of the striking pulley, so the chain is positioned diagonally across the bottom plate. While this is not ideal it can work without any problems, especially if the end of the weight is rounded to prevent snagging on the counterweight.

It had also been noticed that there was an extra wheel in the going train and a large brass pinion of 14 leaves. Also the back cock had been raised up. This indicated that it had been a balance clock converted to a long pendulum with an anchor escapement, and a new dial fitted by John Fordham. Yet there were no empty holes in the top plate where the top cock for the balance had been screwed, nor any signs of filled holes., **figure 7**. Clockmakers who updated an escapement rarely filled empty holes and the blocking of holes to disguise alterations is a relatively recent practice.

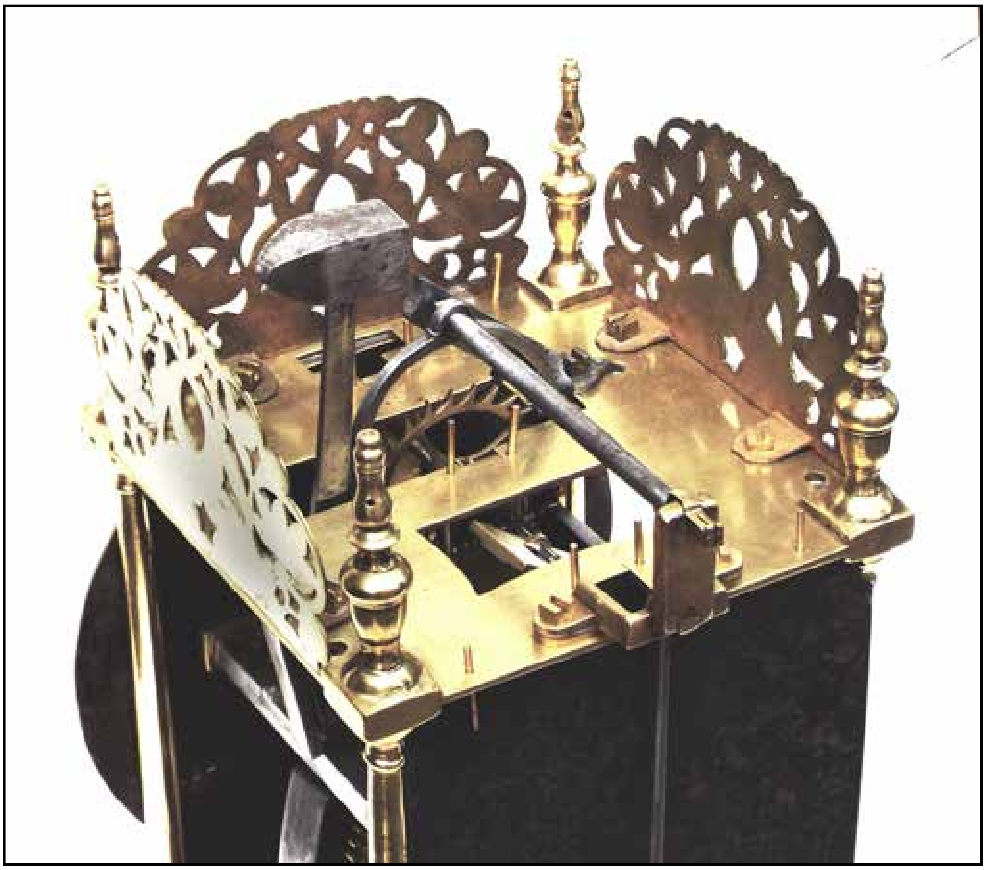
When examining an assembled lantern clock it is often difficult to see if there had been a bridge on the central movement bar, behind which the vertical pallet arbor or verge passed. Also there would have been a brass block or potence to support the lower end of the verge. Since no sign of where they might have been had been noticed when the clock was cleaned, these parts had probably been cut off and all traces of where they had been riveted filed away. Nor was there any indication that there had ever been a hoop for hanging the clock on the wall, nor spikes to keep it steady. The conclusion was that the clock had sat on a wall bracket or in a tall case. Lantern clocks were often housed in cases, few of which have survived.

We eventually realised that John Forham had been rather cunning when converting this clock. By adding an extra wheel to the going train the new escape wheel sits quite high in the movement and protrudes through the top plate. Since the new anchor is quite large the pallet arbor sits higher above the top plate than expected. But the front end of the pallet arbor is not extended to pivot in a front cock riveted to the top plate near the front movement bar. Instead the arbor extends forward for only a short distance with the pivot just in front of the anchor.

There is a straight iron cock screwed to the top plate, rising up at an angle of about 45 degrees, **figure 8**, which appears to have been forged from a posted-frame bell stand. It has been fitted in the same position occupied by the original balance top cock, which explains why no empty holes are visible in the plate. In addition, the rear end of the pallet arbor pivots in a brass back cock that has been extended vertically. Another advantage of adding an extra wheel is that the pinions can have a larger number of leaves and run more smoothly than the usual ones with six leaves.

When balance lantern clocks were converted to a pendulum, either short or long, two other updates almost invariably also took place. Firstly, the two separate weights were converted to a single weight to power both trains on the now familiar Huygens loop principle. The main advantage of doing this was to make sure that the striking train did not stop before the weight reached the floor, so that the hammer struck the same number of times as indicated by the hour hand. If the clock stops in the middle of a strike this will resume when the weight is rewound, leaving the strike still in its correct sequence.

To convert a clock to operation by a single weight in accordance with the principles laid down by Christiaan Huygens, where the single weight is on the left and the counterweight on the right, necessitates significant



Figurer 8. The anchor and cocks.

The duration of a balance lantern clock was an incovenient half a day, rather than a full day or more.

modifications to the layout of the striking train as its direction of rotation has to be reversed. This involves turning over the countwheel, turning round the front and rear movement bars and swapping the positions of the hammer arbor and the strikework arbors. So the hammer is now on the left and the strikework on the right. But the hammer tail, the warning detent and the locking detent are now in the wrong position on their arbors. In addition the short straight lifting piece has to be replaced by a longer hook shape.

All this involves a major rebuilding exercise, and though it was done, there was a simpler and easier solution at hand. Instead, the striking train and everything associated with it could remain as it was, and the going train reversed instead. This was achieved by inserting a small idler wheel on a post between the pinion-of-report and the hour wheel. As this would only reverse the rotation and not alter the gear ratio, its count could be any suitable number. This cannot be added without altering the size of the hour wheel, which leads to the second modification usually made during conversion to a pendulum.

The duration of a balance lantern clock was an inconvenient half a day, so this was usually increased to a full day or more. This was done by doubling the count of the going pinion-of-report from four to eight leaves, or as on the Fordham clock, tripling it to 12 leaves, with the hour wheel re-cut to mesh correctly. Fordham also doubled the duration of the striking train by doubling the pinion-of-report. This made the striking train run slower and by cutting an extra gap in the hoop on the locking wheel and having twice the number of hammer pins on the greatwheel, this doubled the duration of the striking train. On Fordham's conversion the weight falls half the distance in 20 hours while powering the going train, and it also takes 16 hours to fall the rest of the distance while striking, resulting in a total duration of 36 hours.

There is no way of knowing if John Fordham had an old balance clock in stock that he decided to update and sell to a customer with a small budget to spend on a clock, or if he was asked to update a clock by an existing customer. It may have been in use for many decades and cleaned regularly by John Fordham. It was probably more profitable for him to make and sell a new clock rather than re-use an old movement, so he might have explained that he could fit a new dial so it looked more modern, and he

Figure 9. Square-dial lantern clock by John Fordham, number 505. Photograph by Brian Loomes.

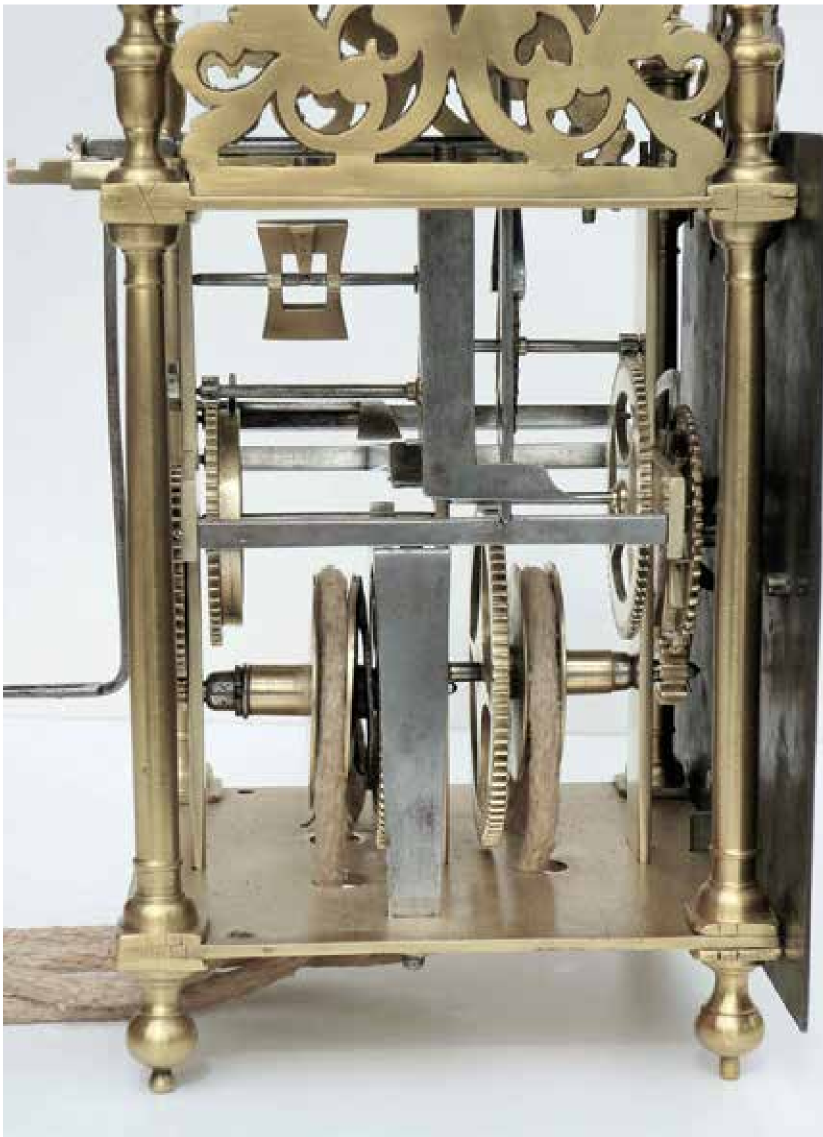


Figure 10. Movement of Fordham's square-dial clock, with an original anchor escapement. Photograph by Brian Loomes.

could make it more practical by ensuring that it ran for a whole day without having to rewind it.

Replacing the dolphin frets was probably a luxury the owner could well have done without, as was the significant expense of rebuilding the striking train simply to avoid any possibility that the new chain, which Fordham also proposed, did not snag on the weight. The owner would get a more fashionable looking and practical clock for the minimum expense. It would have served many more generations, before being regarded as completely old fashioned and its single hand and daily winding becoming too inconvenient.

John Fordham made a number of lantern clocks but illustrations of only one other have been found, number 505, shown in 'Lantern clocks with square dials', by Brian Loomes, *Clocks* May 2016 pp11-16, and reproduced here as **figures 9** and **10**. The dial has a similar design of stylised acanthus scrolls, though they are simpler and not as sophisticated as those in **figure 6**. Instead of the twin-dolphin frets found on the earlier clock, they are now in the form of scrolling foliage, a design that was popular in the late seventeenth and early eighteenth centuries.

The movement has the usual arrangement for an early eighteenth century lantern clock, having an anchor escapement, a Huygens loop, the hammer on the left-hand side and there are just three wheels in each train. The pallet arbor is positioned just above the top plate with the anchor itself hanging down to engage with the teeth of the escape wheel, which sits quite low down. There does not appear to be a hoop or spikes, so the clock may have been housed in a wooden case.

After many years hidden away in a cupboard, attic or outbuilding, John Fordham's converted balance lantern clock was sent off to auction. It then began the next stage of its life as a prized historical artefact in a collection to illustrate the wide variety of clocks that have been made to aid timekeeping.

The question can be asked: is it better to have a clock made in the early eighteenth century with an original anchor escapement and of a contemporary design, or does its much earlier origin and later conversion make it more desirable to the twenty-first century collector? It certainly gives an author much more to write about.