ENGLISH LANTERN CLOCKS WITH IRON FRAMES

John A. Robey*

A series of seven lantern clocks is discussed that have the corner posts, top and bottom plates and movement bars all made of iron, but with cruciform front and rear bars and brass wheels typical of English work. One clock retains its original painted iron dial and original iron balance, two have been redialed, while the others have English brass dials. The only one that is signed (by an unknown maker) is smaller than any other known lantern clock. These clocks appear to have been made in England (five of them probably in the same workshop) at various periods throughout the seventeenth century. Apart from the miniature one, they were probably all made in London. They may have been produced as more affordable versions of the all-brass lantern clock.

It is often assumed that any lantern clock made largely of iron is from Continental Europe, but a number of iron-framed lantern clocks are known which are almost certainly of English origin.[1] The seven clocks discussed here are all similar to each other, although one is considerably smaller than not only all the other six clocks but also any conventional lantern clock. With one exception they were originally made with a balance, but most have been updated with later pendulums and a couple have had new dials fitted. They are mostly unsigned and the only one with an original name is by an unrecorded clockmaker. Hence it is difficult to date these clocks or suggest a maker or place of origin.

The clocks discussed here should not be confused with what have been called 'blacksmith-made' lantern clocks. These are often crudely made country clocks with at least some parts of the movement made of iron. The iron parts might comprise simple corner posts of round or square section bar, the top and bottom plates or the countwheel, but rarely, if ever, the wheels, which are usually of brass in the English manner. While a couple of lantern clocks are known to have been made by blacksmiths, in general these craftsmen were highly skilled in forging iron for horseshoes, door hinges and latches, railings, gates, etc, but clocks were beyond the skills of most forgers of iron. In general clocks with iron components were made by clockmakers who possessed skills in the forging of iron and preferred this material, perhaps on the basis of cost, their customers being less affluent than those living in larger towns and cities.

Likewise, it is erroneously said that early turret clocks, which are made largely from iron, were made by blacksmiths and because such clocks are often large and difficult to transport it was the local smith that was called in to provide a new church clock. While making the wrought-iron frames would be no problem for a village blacksmith, they rarely understood clock gearing, pivots, pendulums and escapements. Nor were they likely to possess the specialist tools needed: small lathe, dividing plate, etc. While they were called in to repair existing clocks, new church clocks were made by clockmakers who specialised in this type of work or by a clockmaker working in conjunction with a local smith for the heavy ironwork.

While the lantern clocks under discussion have a vaguely Gothic type of corner posts and a higher proportion of iron in their construction than conventional English lantern clocks, they have otherwise very few similarities with Continental Gothic clocks. Although the lantern clock is said to have evolved from the Gothic clock, in reality there are a considerable number

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1. In this article the word English is used as this is the origin of the vast majority of lantern clocks, with only a handful of early clocks from Scotland, and just one later clock known so far from both Wales and Ireland.

of differences and only a few similarities. The English lantern clock has more in common with later weight-driven iron Renaissance clocks (which have been largely ignored, especially in the English-language literature), but even here there are a number of quite fundamental differences. These weight-driven iron Renaissance clocks must not be confused with the sophisticated highly decorative gilt-brass spring-driven Renaissance clocks, often of great complexity with astronomical features.[2]

The main features that identify these clocks as being English are the movement bars and the positioning of the arbors of the strike-work, the countwheel with a separate gear and the brass wheels. Lantern clocks (and most thirty-hour posted-frame longcase clocks) made in Britain have the going and striking trains pivoted between three vertical movement bars, the central one a narrow rectangular strip while the front and rear bars are cruciform in shape. The arbors of the strike-work are pivoted at the ends of these horizontal extensions: the hammer arbor on the right with the arbors for the lifting piece/warning detent and locking/countwheel detents on the left for a clock with separate weights for each train (such as balance-wheel clocks). The arbors for the hammer and the strike-work are the other way round for a clocks with a single weight on the Huygens' loop principle (such as most, but not all, pendulum clocks). On Continental clocks these arbors are pivoted between the corner posts with a screw-in pivot at one end to facilitate assembly and removal of the arbors. A very few English makers of posted-frame clocks, such as John Belling of Truro, Cornwall, used the Continental construction. Many Continental clocks have a rotating vertical hammer arbor, which is not seen on English lantern clocks.

Continental clocks have a one-piece countwheel and gear, with either the teeth on the inside of the rim and the slots on the outside, or vice versa. The crossings have to be offset to allow access for the pinion of report or countwheel detent. English clocks have a separate countwheel and gear wheel, with both the slots and teeth on the outer edges.

The iron Gothic-framed English lantern clocks known to the author are described below in approximately chronological order, a discussion of their age being reserved for the conclusion. One of these clocks (Clock 2) is examined in detail.

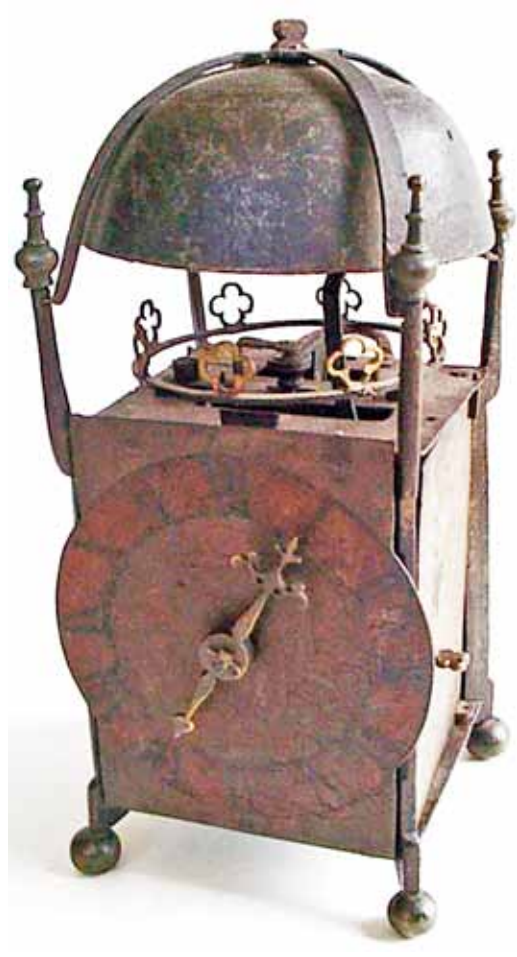

Fig 1. Clock 1. A lantern clock with the canted Gothic corner posts, top and bottom plates, bell strap, painted dial and side doors all made of iron. (J. Hooper)

1. CLOCK WITH A PAINTED IRON DIAL AND ORIGINAL BALANCE

Figs 1-3 show a clock that survives in remarkably original condition. It has a red-painted iron dial, now much worn, with a separate iron chapter ring that overlaps the corner posts. This contrasts with Continental clocks where a one-piece painted iron dial does not extend beyond the sides. The side doors are of iron.

2. The origin of the English lantern clock and its comparison with Gothic and Renaissance clocks will be discussed in a future article.

Fig 2. Side view of the movement with brass wheels and iron movement bars. (J. Hooper)

The tapered arbors of the brass wheels are pivoted in brass bushes (which may be original) in iron movement bars of typical English form, the front and rear ones being of cruciform shape. The hammer spring and its L-shaped stop or counter are undecorated. The buttressed iron corner posts are set at 45 degrees to the edges of the sheet-iron top and bottom plates. The posts have some Gothic features and stand on brass ball feet with simple brass finials on the top of tall upstands that serve as supports for the bell strap.

The bell is held with a cross pin through a lug on the top of the bell. This type of lugged bell was used on the earliest English lantern clocks. The clock is 13½in tall to the top of the lug. The brass hand is modern and there are holes in the top plate that once served to secure decorative frets, now missing, but there is no way of telling if they were of iron or brass.

The most remarkable feature of this clock is the iron single-spoked balance wheel, which appears to be original with no signs of the clock ever having been converted to a pendulum. The single spoke is typical of English lantern clocks (although they were normally made of brass), whereas on Continental clocks the balance normally has two spokes. It is surmounted by eight brass decorative quatrefoils. As the balance

Fig 3. Close-up of the single-spoked iron balance with eight brass quatrefoil attachments. The hoop for hanging the clock on a wall can be seen to the right. (J. Hooper)

Fig 4. Clock 2. An iron-framed lantern clock with a brass dial added by James Wright of Knowle, about 1700-10. The iron bell strap is modern.

is presently not hidden by a fret these brass attachments catch the eye as the balance rotates slowly back and forth, the normal beat for English lantern clocks being about 1.4 seconds.[3]

All the wheels appear to be original apart from the escapewheel, which has been replaced by one from an eighteenth-century Dutch clock.

2. IRON CLOCK REDIALED BY JAMES WRIGHT OF KNOWLE

This movement is virtually identical to Clock 1 and has been examined in detail. It was converted to a longcase or hooded wall clock about 1700-10 by James Wright of Knowle, Warwickshire.

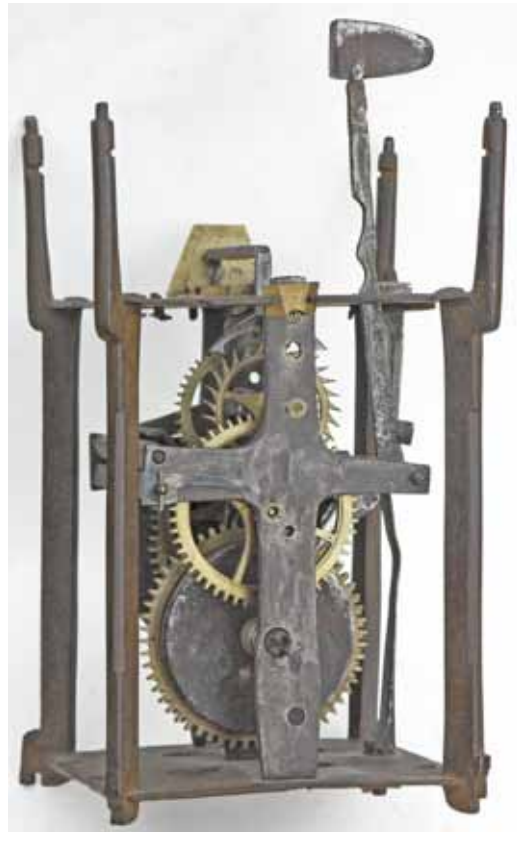

Fig 5. Movement from the front.

He fitted a new 6¾in square brass dial and an anchor escapement, the clock having previously been changed from its original balance to a short pendulum at an earlier date. A number of longcase clocks are known by him, but apart from the marriage of a man of this name in 1686, he does not appear in local records.

The clock with Wright's dial is shown in Fig 4. As the converted movement was intended to fit in a case the frets were removed, leaving a large empty space below the bell. James Wright probably engraved the dial himself as the rear of the chapter ring has practice engraving including different versions of his name. The circle of herringbone engraving inside the chapter ring is typical of his longcase dials. The spandrels (presumably small cherub heads) have been removed, the screw holes filled and the present engraving added, probably in the early twentieth century.

3. English balance-wheel lantern clocks originally had an escapewheel of either nineteen or twenty-one teeth, but they have often been incorrectly reinstated with twenty-five teeth, which, with the usual train, gives a beat of exactly one second. While it might seem reasonable to assume that an exact one-second beat was used, this was not the case and is confirmed by William Derham in *The Artificial Clock-maker*, 1696, p63.

Fig 6. Movement from the rear showing the iron countwheel.

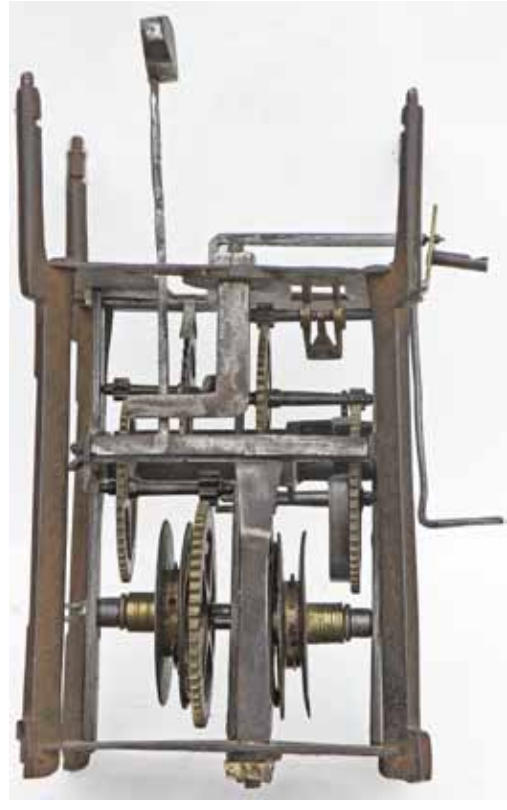

Fig 7. Right-hand side of the movement.

Figs 5-8 show the movement. The clock measures 12½in tall and bearing in mind that the ball feet are missing, it is the same size as Clock 1. The top and bottom plates are approximately 5⅛in square and separated by 6⅜in. The upstands supporting the bell are 2⅜in tall to the base of the screwed end that would have held the now missing brass finials. The corner posts, which are of the same shape as Clock 1, extend ⅜in below the bottom plate. Presumably they have been shortened and would have either terminated in screwed ends with brass ball feet or they would have been extended as in Clock 5 (Fig 19).

The corner posts are set at 45 degrees to the edges of the plates, the top plate being riveted onto a step near the top of the posts. Each corner of the bottom plate has a 45 degree slot the width of the pillar which fits round the pillar and into a horizontal slot in the pillar, the joint being brazed together. The front posts are chamfered on the front outside edge for a distance of 3⅜in. This is to accept a chapter ring of a maximum diameter of 5⅞in to overlap the movement. This chamfer on Clock 1 can just be seen in Fig 1.

Both the hammer spring and the L-shaped stop or counter are plain, without any decoration and are held on the bottom and top plates respectively by screwed nuts in the typical English manner.

The top plate (Fig 8) shows all the expected signs of the location of the cocks for the original balance and its short pendulum replacement, as well as for the missing frets, side doors and back plate.[4] In contrast to Clock 1, which has a separate hoop for hanging, this movement appears to have had a hoop integral with the top plate and was cut off when converted to short pendulum.

The present pallet arbor of the early eighteenth-century anchor escapement may not have been the first one as there are two

4. For an annotated view of the top plate of a similar conversion from balance to short pendulum and then long pendulum, see John A. Robey, 'An Unusual English Lantern Clock', *Antiquarian Horology*, Sept 2010, p. 409.

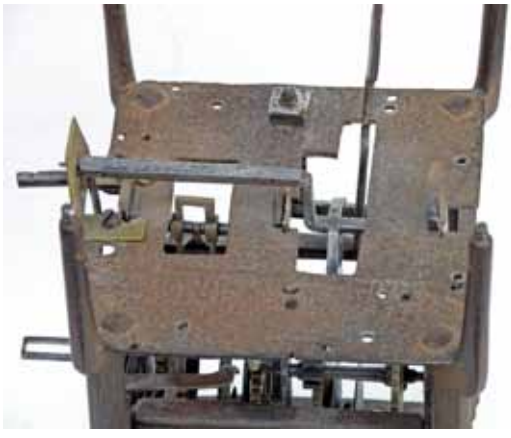

Fig 8 (left) . Top plate showing the later anchor escapement with its cranked pallet arbor.

Fig 9 (above). Detail of the lug on the bell.

Fig 10 (left). The English-style iron movement bars viewed from the front. Left to right: front, centre, rear. The two large holes near the top and bottom of the front bar are for the later brass dial.

clearance notches filed in the hammer shaft. A notch often had to be provided when converting to either short or long pendulum as otherwise the hammer shaft fouled the horizontal pallet arbor. It can be supposed that the lowest notch is to clear the verge arbor and the upper one to clear a higher placed anchor arbor pivoted in a cock at the front and the backcock, fabricated from brass and iron, at the rear. It appears that there was not sufficient clearance, so the arbor was cranked downwards to pivot in the front movement bar. There is no other justification for the rear pivot to be above the top plate and the front pivot below it, as this is a very unsatisfactory mechanical arrangement. The anchor swings about a sloping line through the centre of each pivot, hence there has to be extra clearance between the pivots and their holes.

The bell, like that of Clock 1 is of the early type with a lug (Fig 9), which passes through a

Fig 11. The going train.

slot in the replaced bell strap and is held by a taper pin.

The iron movement bars (Fig 10) have brass bushes for the upper wheels of the trains. While these bushes may be later repairs, there is a good chance that they are original. The centre bar retains the bridge into which the crownwheel was pivoted and under which the vertical pallet arbor of the balance passed. In this clock it is a cock rather than the more usual bridge and has been utilised for the escapewheel of the later anchor escapement. In the middle of the bar is the lower support for the end of the original balance arbor. Just above this, the centre of three holes is where the potence for the balance arbor has been riveted.[5] Just above the bridge is a hole that has no matching holes in the front or rear bars. This is where the potence for the crownwheel of the later verge escapement was riveted.

The brass great wheel and second wheel of the going train (Fig 11) are original, but the escapewheel of the balance-wheel escapement was replaced by a contrate wheel and then by the present anchor escapewheel. The counts are as follows, with the later wheels and pinions in brackets:

escapewheel	(29)	-	(6)
second wheel	54	-	8
great wheel	56	-	4
hour (dial) wheel	48		

These are the same as on most balance-wheel lantern clocks, apart from the second pinion, which normally has seven leaves.[6]

The striking train (Fig 12) has not been altered, with counts of:

fly		-	7
warn wheel	48	-	6
hoop wheel	54	-	7
great wheel	56	-	4 (8 hammer pins)
countwheel	39		

Apart from the fly pinion, which is usually of six leaves, this is a commonly found train on

5. The potence and bottom block were sometimes separate items, as here, or combined into one piece, as on later verge escapements for short pendulums.

6. An exception is an early clock by Henry Steven of London with a second wheel of 60 and pinion of 8.

Fig 12. The striking train.

English balance-wheel clocks. The countwheel is of iron, as is the hoop, but all the toothed wheels are of brass.

The four-pronged pinions of report on both the going and striking great wheels have been filed from their arbors, as is usual on balance-wheel lantern clocks. Both spiked pulleys for the ropes have clicks and iron cheeks and the movement has not been converted to Huygens' loop. There are four extra holes in the bottom plate where all the ends of the two separate ropes can be tied, with pulleys for the weights and their counterweights. This doubles the duration from twice a day to daily winding.[7]

3. IRON LANTERN CLOCK CONVERTED TO A LONGCASE CLOCK

The clock shown in Figs 13-17 was, like Clock 2, converted to a longcase clock in the early eighteenth century by adding a square brass dial and changing the balance to an anchor escapement.[8] The dial, which appears to have been made specially to fit this old movement, has birds engraved in the up corners and large stylized flowers in the lower corners. It once had cast-brass spandrels but these are now missing. There is a plain matted centre with ringing in the middle. The chapter ring is engraved for a single hand.

The movement has some similarities with Clocks 1 and 2, but also some distinctive differences. Like the previous two clocks there are iron Gothic corner posts, sheet-iron top and bottom plates, iron movement bars of English form, brass wheels and iron cheeks on the spiked rope pulleys. Unlike the previous clocks the countwheel is of brass rather than iron.

The angled corner post are different to Clocks 1 and 2, the front ones being plain apart from projecting forward above the bottom plate and below the top plate. The rear posts, which would not have been hidden behind the original dial, are more elaborate and have a closer affinity with Germanic Gothic clocks. The projections near the top and bottom plates have Gothic shapes and there is also a similar projection in the centre. These projections on Gothic clocks are known in German as *Nasen* ('noses') or *Wassernasen* ('water noses'), which correspond to the more prosaic English architectural term 'drip-mould', a course of masonry designed to keep water from running down a vertical wall.

The top part of the rectangular bars that form the corner posts have been forged to a square section, terminating in pyramidical knobs that serve as upstands to support the bell strap (not present). There are no brass finials or separate feet. The top plate is riveted onto a step on the corner posts, as in the two previous clocks, but the bottom plate is riveted onto a step from underneath, and is unlike the construction described for Clock 2.

The front and rear movement bars are decoratively shaped at the ends of the cross arms. The hammer arbor is pivoted between the right-hand ends of the outermost movement bars, as usual on English lantern clocks, with a

7. See John A. Robey, 'An Unusual Lantern Clock', pp. 410-12, for a discussion on increasing the duration of balance-wheel lantern clocks.

8. This clock was examined and photographed in less than ideal conditions at an AHS meeting.

Fig 13. Clock 3. The unsigned brass dial.

Fig 14. Movement from the front, showing the decorative ends to the movement bars.

Fig 15. Rear of the movement. Note the 'noses' on the rear corner posts.

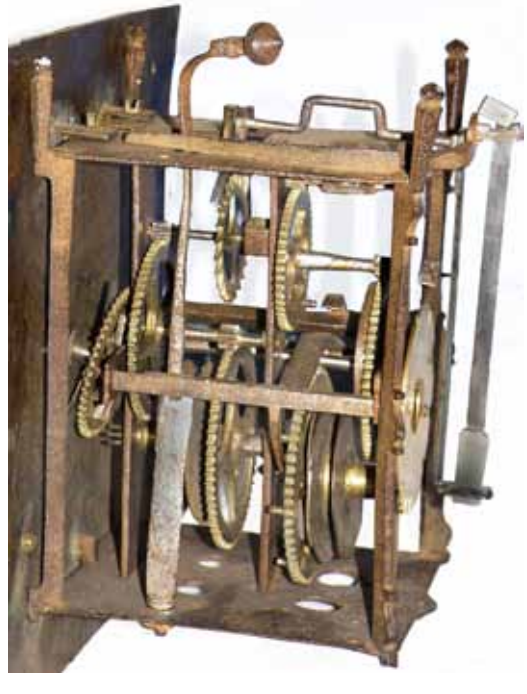

Fig 16. Left-hand side of the movement, with the later pallet arbor, cranked to clear the fly.

Fig 17. Top view showing the horizontal hammer stop and the later anchor escapement.

plain hammer spring. Rather than the hammer stop being the usual L-shaped arm hanging down beneath the top plate, it is a tapered iron horizontal arm riveted on edge to the top of the top plate. This type of hammer stop is known on some Somerset lantern clocks, although it is normally set below the top plate.[9] The hammer head is of an unusual shape with the end of the shaft bent horizontally. The latter is also known on a few Somerset lantern clocks,[10] which might give a further clue to its origins.

While the striking train, with the wheels fitted directly onto steeply tapered arbors without separate collets, is unaltered, the going train has been converted from balance to anchor escapement. The bridge, behind which the vertical pallet arbor would have passed, remains (Fig 16). The crownwheel was replaced by the present escapewheel and anchor pallets added. The pallet arbor is cranked to clear the fly; this is occasionally found on posted-frame longcase movements made with an anchor escapement even when not converted from a lantern clock. The front of the arbor pivots in an iron cock, possibly modified from the original top cock for the balance and repositioned. The rear of the arbor pivots in an iron and brass back cock. There is no evidence of the movement having been altered to a verge-and-crownwheel escapement with a short pendulum. Empty holes in the top plate indicate that earlier there were decorative frets, possibly of brass, at the sides and also on the front, where the holes were utilised to attach the present brass dial. There were also hinged side doors and a back plate, like a typical lantern clock. The rear edge of the top plate (Fig 17) shows where a hoop for hanging was originally riveted.

4, 5, 6. IRON LANTERN CLOCKS WITH ORIGINAL BRASS DIALS

A handful of English lantern clocks exist with iron Gothic pillars, iron plates and movement bars, plain hammer spring and counter with no decoration, and brass wheels. In contrast to the previous clocks they have original brass dials and frets. These clocks have been discussed in detail elsewhere,[11] with further illustrations of the movements, but they are included here for comparison. Unfortunately for today's horologists they are all unsigned.

Clock 4, probably the earliest of this group (Fig 18), has corner posts and movement bars that are very similar to Clock 2. The top and bottom plates are fixed to the pillars in a very similar fashion to Clocks 1 and 2. There are brass ball feet and finials, including the one above the bell, very similar to, although not exactly the same as, those on Clock 1. The chapter ring is of copper, or a copper-coloured brass, and has primitive flower-like half-hour markers. The dial centre is simply engraved with circles and shaded arcs. The 'heraldic' frets are of a pattern popular before the English Civil War and include a shield.

This clock was originally made with a balance, which has been re-instated. It is approximately the same size as Clock 2. The dial and frets indicate a date of about 1630.

9. Brian Loomes, *Lantern Clocks & Their Makers* (2008), pp193, 194, 430.
10. Loomes, *Lantern Clocks,* pp194, 429, 432.
11. Loomes, *Lantern Clocks*, pp340-4.

Fig 18. Clock 4. Iron-framed lantern clock with a copper chapter ring and pre-Civil War style brass frets. Replaced hand. (B. Loomes)

Fig 19. Clock 5. A similar clock with heraldic frets, dial engraved with tulips, simple finials, but no brass feet. Hand possibly original. (B. Loomes)

Clock 5 (Fig 19) has similar canted iron corner pillars and iron movement bars. The iron top and bottom plates are fixed to the pillars in the same manner as Clocks 1, 2 and 4. The brass finials are of a simple teardrop shape, but the lower part of the pillars are extended to form integral feet, rather than standing on separate brass balls. The bell strap fits into notches low down on the upstands, giving a rather squat appearance.

The same heraldic frets are used, but the dial is of a much more sophisticated design, being engraved with large flowers in both the centre and corners. It has a re-instated balance escapement. It is likely to be later than Clock 4, probably made in the 1650s.

Clock 6 (Fig 20) has very similar canted iron pillars and iron plates fixed in the same manner as before. The dolphin frets, the wider chapter ring with half-hour markers of the meeting-arrow-heads pattern and the floral engraving emanating from a vase indicate that this clock is even later. There are brass ball feet and the finial design is mid-way between those in Figs 1 and 18 and Fig 19. There is an original anchor escapement yet the hammer is still on the right-hand-side with separate weights for the going and striking trains, a feature that is very occa-sionally found on conventional lantern clocks. It probably dates from the 1690s.

The iron movement bars are less tapered than those in Fig 10, the horizontal arms being approximately parallel with a small vertical extension for the locking arbor, as is common with brass bars. As might be expected on a later clock the arbors are less tapered and the wheels are fitted with collets, rather than directly onto the arbors.

Fig 20. Clock 6. A later clock with dolphin frets and a wider chapter ring. (B. Loomes)

Fig 21. Clock 7. Miniature lantern clock with an iron frame. No frets. (M. Hurst)

7. MINIATURE IRON LANTERN CLOCK BY W. THORNBURGH

The normal size for a lantern clock is about 15in tall, with miniature versions down to 6¾in tall, an example by John Drew of London, being noted as 'exceptionally small'.[12] However the clock in Figs 21-27 is even smaller at only 5¾in tall. The chapter ring is a mere 2⅝in diameter by ⅜in wide with the top and bottom plates only 2½in square.

The canted iron pillars are of slightly different form to any of the previous clocks. They extend downwards to act as feet and upwards as square-section finials. The bell strap, top finial and side doors, all of brass, and the bell, are old replacements. The iron top plate is riveted to steps in the pillars in a similar manner to all the previous clocks, with the bottom plate fixed by a similar method to Clock 3. The stocky movement bars are of iron with colleted brass wheels, while the countwheel is also of brass. The movement originally had a balance, the central movement bar having holes for the bridge and lower pivot block for the pallet arbor, but it has been converted to anchor escapement.

The top plate (Fig 25) shows the very unusual feature of the central movement bar being held in place by two latches, which were added when the escapement was updated. When originally made a conventional wide wedge sufficed, but

12. Loomes, *Lantern Clocks*, pp410-14.

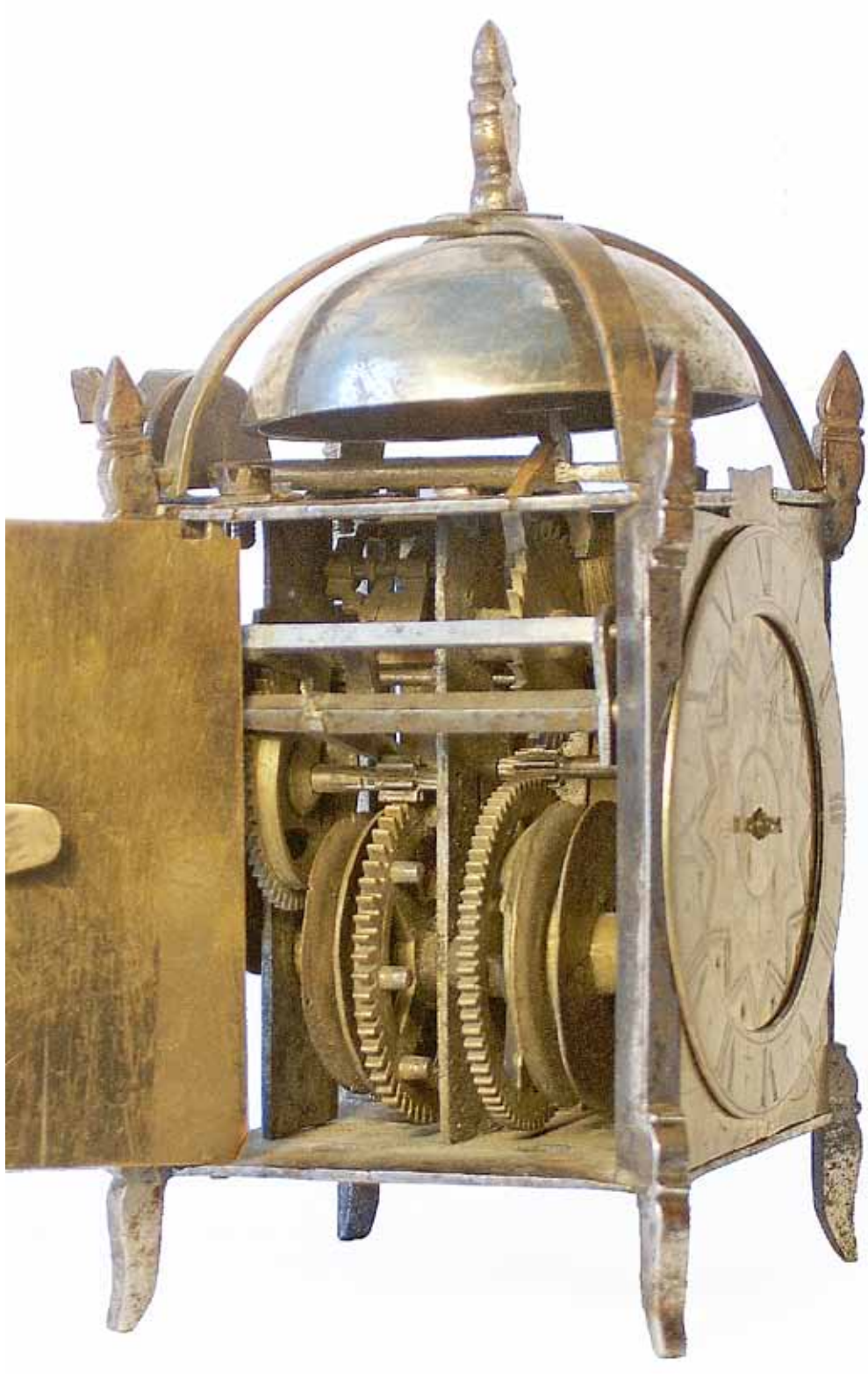

Fig 22. Side view showing the brass wheels. Later bell, strap, finial and brass side doors. (M. Hurst)

Fig 23. Front view of the movement with iron movement bars. (M. Hurst)

when converted to an anchor escapement the pallet arbor was very close to the top plate with little room for a wedge. It is likely that this is when the latches were fitted.

Another unusual feature is the detachable hammer head. The plain hammer spring is fixed to the bottom plate with a conventional screwed nut beneath the bottom plate, while the undecorated counter is fixed to the top plate with a taper pin. There are no screwed holes for frets. The two shallow dovetailed recesses on either side of the top plate do not have any corresponding slots in the bottom plate, so are unlikely to have been for the original doors, nor for frets as there are no recesses at the front. They might have been for the original bell stand. Alternatively, was there a decoratively pierced cover that doubled as front and side frets as well as a support for the bell?

The counts of the going train are as follows, with the later escapewheel in brackets:

Fig 24. Rear view showing the brass countwheel. (M. Hurst)

escapewheel	(30)	-	6
second wheel	66	-	8
great wheel	72	-	4
hour (dial) wheel	40		

This gives a theoretical pendulum length of almost 21 inches.

The striking train has not been altered, with counts of:

fly		-	5
warn wheel	42	-	5
hoop wheel	50	-	7
greatwheel	56	-	4 (8 hammer pins)
countwheel	39		

The fly and warning arbors both have five-leaf pinions, which are rarely found. Even at this small size there are four-pronged pinions-of-report driving the dial wheel and countwheel.

The dial is naïvely engraved with a twelve-pointed star of shaded double lines with small stars near the half-hour positions. In the centre is a basic Tudor rose and simple floral decoration in the corners. Although the engraving is badly rubbed a minute trace of gilding remains.

Fig 25. Iron top plate and the later anchor escapement. Note the very unusual use of latches. (M. Hurst)

Figs 26 and 27 The dial with simple engraving, and detail of the very naïve signature of W. Thornburgh on the lower edge of the dial. (M. Hurst)

Just detectable on the chapter ring, but not discernible in the illustrations, is hatching on alternative quarter-hour divisions. The half hour markers are of an unsophisticated fleur-de-lis design which first came into use about 1670, which may be the date of this clock.

The bottom of the dial is crudely signed 'W * Thornborgh' or 'W * Thornburgh'. but this is not the name of a known seventeenth-century clockmaker. Thomas Thornburgh, goldsmith of Salisbury, died in 1674, and John Thornburgh, goldsmith of Southampton, died in 1718,[13] but a goldsmith is likely to have had access to engravers who could produce better work than the engraving on this dial. George Thornburgh, watchmaker of Westminster, took an apprentice in 1718, and John Thornburgh, also a watchmaker of Westminster and probably related, took an apprentice in 1732.[14] Any London clockmaker would have been able to call on the services of a number of competent engravers, so a London origin is unlikely. At present the identity and location of this maker remains unknown.

13. Public Record Office wills, available online. A number of other Thornburgh wills from the late seventeenth and early eighteenth centuries are listed, but none of them have any obvious connections with the name on this clock.

14. Dennis Moore, *British Clockmakers & Watchmakers Apprentice Records 1710-1810* (2003), p323.

CONCLUSIONS

Five of the seven clocks discussed here (Clocks 1, 2, 4, 5 and 6) have movements so similar that they are likely to have come from the same unknown workshop or produced by clockmakers who were closely associated, by apprenticeship for instance. Clock 1 appears to be the oldest, but as there are no other comparable English examples with painted iron dials just how old is difficult to ascertain.

Although there may be earlier unsigned clocks, the first English lantern clocks that can be confidently dated were made in London by Robert Harvey before his death in 1615.[15] He was free as a clockmaker in Oxford in 1588,[16] but was working in London by 1602.[17] This gives a relatively narrow time span for the introduction of these clocks, which are now considered to be of the 'standard' all-brass construction.

It is tempting to think that Clock 1 is earlier than the known clocks by Robert Harvey, but it might be contemporary or even later. Perhaps it was made, like the other iron-framed lantern clocks, as a less expensive version of the all-brass clock. Apart from the extra cost of brass compared to iron, the expense of engraving a dial would have been a significant proportion of the total.

Clock 2 is probably of a similar age to the one with a painted iron dial, particularly as it has the same type of lugged bell.

The iron frames of Clocks 4, 5 and 6 are of the same style and with the same method of construction as Clocks 1 and 2. The styles of their engraved dials, brass frets and conventional bell fixing confirm their later date. While the engraving of Clock 4 is unsophisticated, the dials of the other two are much more accomplished and in the London style. Were they made in London or in the provinces using dials engraved in the capital? If it is accepted that the clock with the painted dial, and possibly also Clock 2, were made at the beginning of the seventeenth century, then a London origin for these five clocks is a distinct possibility, this being the only place in Britain at this time where domestic clocks were made.[18]

It is difficult to draw any firm conclusions about the re-dialed Clock 3 and the miniature clock by W. Thornburgh. The unsophisticated dial of the latter suggests a provincial origin, yet it is tiny even by London standards. It is unlikely that these two clocks emanated from the same workshop as the others, but there does appear to have been a small number of seventeenth-century English clockmakers producing iron-framed lantern clocks. Were they produced by clockmakers who also made conventional brass-dialed lantern clocks, perhaps as an alternative offering to those who could not afford the all-brass version? If so is this why the full-size iron-framed clocks are all unsigned? Or were there makers who concentrated on such clocks, perhaps having come over from the Continent and combining the European tradition of iron Gothic clocks with the brass wheel castings that were readily available in England. To understand more about English lantern clocks with iron frames more examples need to be studied and the author would be interested in details of any others that are known.

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15. Loomes, *Lantern Clocks*, pp20-3.
16. C.F. C. Beeson, *Clockmaking in Oxfordshire* (1989, 3rd edition), p110.
17. Loomes, *Lantern Clocks*, p467.
18. This discounts the clock signed by James Porrvis [Purvis], Salisbury, 1567, who cannot be traced in the records as a clockmaker or owner. The present author regards this clock as having probably been imported from Continental Europe. See Loomes, *Lantern Clocks*, pp10-12.