SAMUEL STRETCH'S original balances

by **John Robey**, UK

Part **1** of **2**

Lantern clocks were the earliest domestic timepieces made in Britain that survive to this day. This qualifier is necessary because a very small number of earlier clocks are recorded in documents, but they have not survived and there is no indication to suggest what type they were, possibly iron clocks similar to those made in Continental Europe.

The English lantern clock evolved in the final years of Queen Elizabeth I's reign as a more attractive and reliable alternative to the all-iron Gothic clocks from Europe that were becoming outmoded.

Despite it often being claimed that lantern clocks evolved from Gothic clocks, they were of a completely different construction and made of different materials. They had similar three-wheel trains with a dial and single hand at the front of a posted-frame and a bell above, but the similarities end there. The construction of the iron frame was very complex and needed great smithing skills to make.

In comparison the lantern clock was a simple frame with two square brass plates separated by four brass corner pillars held together by screw-on finials and feet. The bell was held on a cross-shaped bell strap, with frets at the front and sides as well as side doors.

Figure 1. Lantern clock signed 'Samuel Stretch'. Photograph by Jeff Darken.

Despite being largely superseded after about 1700 by longcase and spring table clocks, this basic design survived for almost two centuries. There were detailed changes to the design of dials, hands, frets, finials and feet, which can be used to provide an approximate date, but the basic form remained unaltered, apart from the escapement. The only practical escapement available in the first half of the seventeenth century was a balance with verge pallets.

After 1658, when the pendulum was first used in Britain, this was applied to lantern clocks, initially as a short pendulum with a verge escapement and after about 1670 as a long pendulum with an anchor escapement. At the same time, instead of *separate* weights to drive the two trains, a single weight on a Huygens endless rope was used and the duration increased from twice daily winding to about 30 hours. As a

result the hammer was now on the left and the strikework arbors on the right.

Before we go much further the correct terminology needs to be discussed. The oscillator on these early lantern clocks was a circular brass ring about 4in (10cm) diameter known as a balance, *not* a balance wheel. The convention in horology is that wheels have teeth that turn pinions or, in the case of escapewheels, pointed teeth that engage with the pallet and hence drive the balance. So the balance wheel is actually the escapewheel or crownwheel. This is the correct horological term, as explained by F J Britten in *The Watch & Clock Makers Handbook, Dictionary and Guide* (14th edition, 1938), page 54, who defines the balance wheel as 'The escape wheel of the verge escapement. This term is often applied by amateurs to the "balance" proper', and this definition is used consistently in W J Gazeley's *Clock and Watch Escapements* (1956).

The practical advantages of the pendulum soon became apparent and most balance clocks were converted to both pendulum control and a Huygens endless rope, leaving a very small number of lantern clocks with their original balance escapements unchanged. Many balance lantern clocks have been discussed in *Clocks* magazine, though almost invariably most have been converted to a pendulum or with a recent reconversion back to a balance. So, after discussing a good example of a lantern clock with an original anchor escapement and long pendulum in the June 2024 issue, it is time to examine a couple that have survived with their balances intact, and remarkably they are both by Samuel Stretch of Leek, in what is now known as the Staffordshire Moorlands.

Samuel Stretch was born in 1657 at Tatton, Cheshire, the eldest son of blacksmith John Stretch and his wife Ellen. Tatton later became a deserted village when the present mansion of Tatton Park was built nearby. The family members were very early converts to Quakerism, possibly before they left Cheshire and moved to Harper's Gate (now known as Rudyard) two miles north of Leek, some time between 1668 and 1670, when Samuel would have been about 11 to 13 years old. This isolated place was probably chosen to avoid the attention of authorities trying to oppress dissenters. Samuel was married in 1681 to Mary Whittaker and they had five sons who became clockmakers. In 1684 he was living in Stockwell Street, Leek, not far from where a Quaker Meeting House was built in 1694.

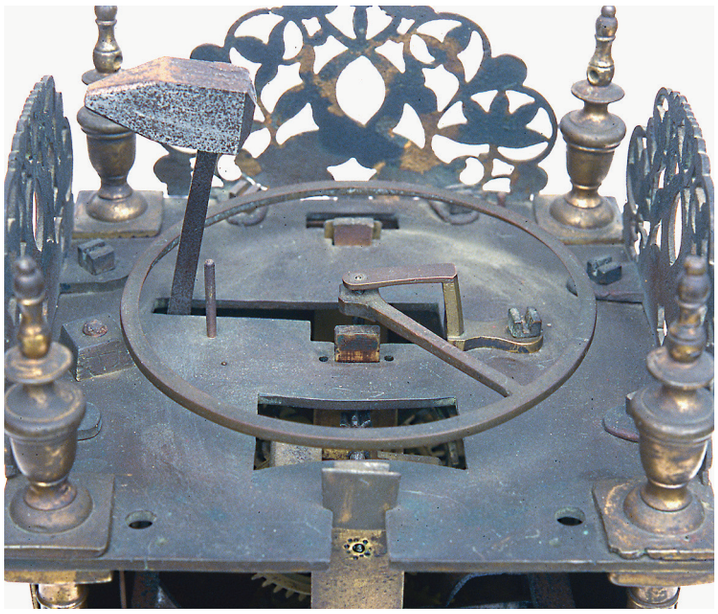

Figure 2. Top plate with original balance. Photograph by Jeff Darken.

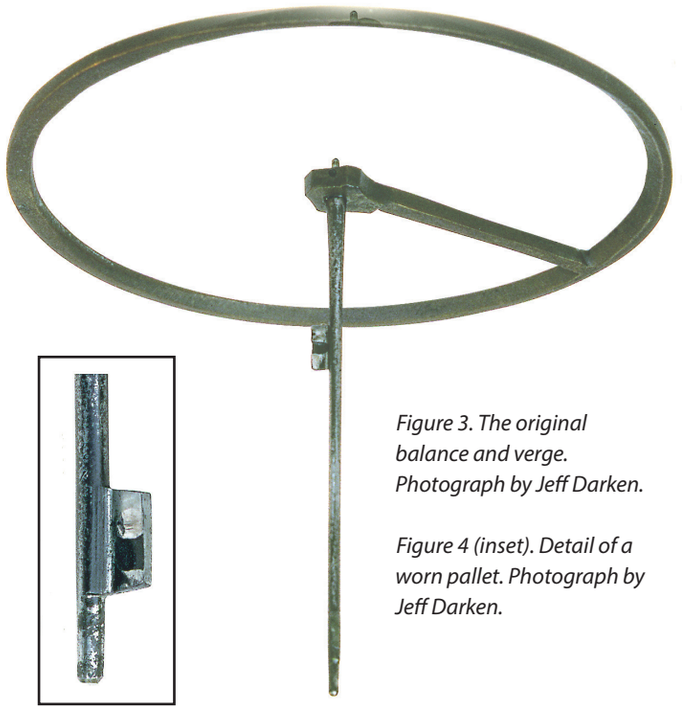

Figure 3. The original balance and verge. Photograph by Jeff Darken.

Figure 4 (inset). Detail of a worn pallet. Photograph by Jeff Darken.

Who he was apprenticed to and when is not known, but it must have been shortly after the family moved to the Leek area, although there are no suitable candidates there at that period. Lawrence Brindley was a clocksmith who made chimes for Leek church in 1667 and with his son they maintained the clock until 1680, but there is no evidence to connect him with Samuel Stretch. Leek's earliest makers of domestic clocks were Randle (short for Randolph) Maddock, working from at least 1712, and the unfortunately named John Shatwell (born 1682, died 1708), both of them being too late to be Samuel's master.

Samuel Stretch would have learnt the basic metalworking skills from his father, who is likely to have also serviced and repaired lantern clocks along with his other smithing work. Samuel might have been largely self-taught in clockmaking. Quakers developed contacts over a wide area and later Samuel was acquainted with the Darby ironmasters of Coalbrookdale in Shropshire. and it is not inconceivable that he met a clockmaker through the wider Quaker network.

Samuel was still at Leek in 1692, but

in January 1697/8 he was a clockmaker in Wolverhampton when he purchased two cottages there, and in 1706 the premises were used as a Quaker meeting house, which indicates his strong commitment as a Quaker. By 1712 he was in Birmingham before moving to Keynsham, Bristol, by 1714 to join his younger brother John who had been there since 1703. Samuel was freed there in 1718 and was still working at Keynsham when his wife, Mary, died in 1732. Samuel Stretch died in 1743 at the considerable age for the period of 86. Though he was buried at the Bristol Workhouse he was never an inmate there, it was simply used as the burial place for Bristol's Quaker community.

Samuel Stretch made lantern clocks, initially with a balance and later with an anchor escapement and a long pendulum—he never went through the verge escapement and short pendulum stage. Leek was one of those small market towns where the latest London fashions took a long time to arrive, and balance clocks were still in demand after they had been abandoned elsewhere. What is remarkable is not that he was making balance lantern clocks as late as the 1680s and 1690s, nor even that one of them survives intact, but that two of them survive with their original balances. What is probably the earliest one is discussed here, with a later one being the subject of Part 2.

What should we look out for when assessing the originality of a balance lantern clock? Or has it been reconverted after having been updated to a pendulum?

Firstly, there should be no sign of new parts or the use of modern machining brass, which has a redder tinge than yellow cast brass. Then identify any empty or filled-in holes in the top plate. If there has been a previous update to a pendulum new holes will have been drilled to attach cocks for the pallet arbor, though the original balance cock was often modified to support the new horizontal crownwheel of a verge escapement.

The aperture in the top plate through which the hammer head was inserted should not have been enlarged to provide clearance for an anchor escapement. If it has been enlarged there may be signs of where the aperture was filed smooth. And there should be wear on the teeth of the crownwheel and pallet flags, or evidence that parts have been moved to compensate for wear.

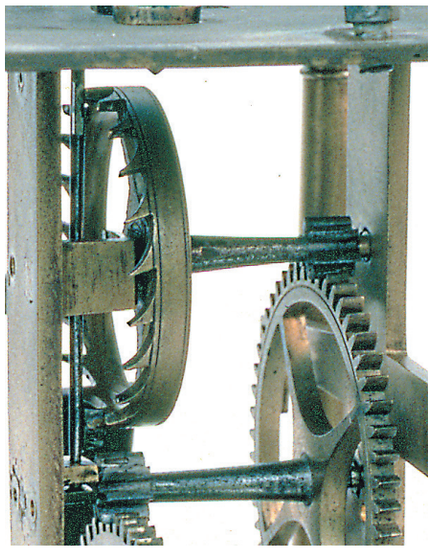

Figure 5. The crownwheel with undercut teeth. Photograph by Jeff Darken.

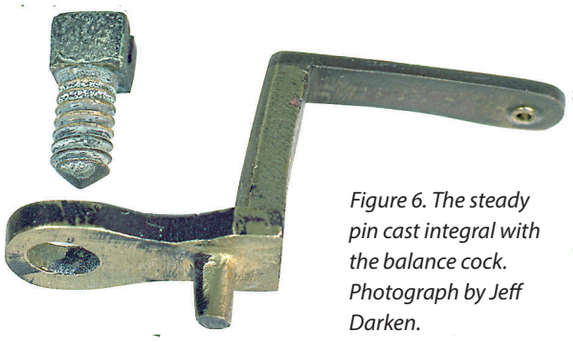

Figure 6. The steady pin cast integral with the balance cock. Photograph by Jeff Darken.

The balance should be a brass casting filed to size with a variable thickness and wider on the side opposite the single arm to equalise its weight. The verge should have a quite small diameter, increasing towards the top and then swelling out to form a seating for the balance itself. It should be forged in one piece, without separate pallets or a collet where the balance is attached. The crownwheel should have 19 or 21 undercut teeth; any variations from this indicate that it is a replacement. The form of these parts should be similar to those on the two Stretch clocks illustrated in this two-part article.

The first clock, shown in **figure 1**, is signed 'Samuel Stretch' at the top of the dial centre, which is filled with tulips. Why there is no placename is not clear—it is unlikely to have been made when Samuel was still living at Harper's Gate, which would be a place unknown to most people. It was probably made about 1685, by which time he was working in Leek.

The top plate, though now dark and tarnished, shows no sign of alteration, **figure 2**, apart from the missing iron hoop for hanging the clock on a wall. Both the hammer and the balance cock are inside the rim of the balance and as it slowly oscillates a banking pin prevents the single arm from hitting the hammer shaft if the swing becomes too large. Having said that, the main purpose of the banking pin was probably to prevent the balance from swinging so far that the pallets disconnected from the teeth of the crownwheel, causing a disastrous runaway.

The balance and pallet arbor, or verge, sometimes called the balance staff, are quite lightly made, **figure 3**. As might be expected the pallets are worn, so the verge has been lowered to enable the crownwheel teeth to contact unworn areas of the pallets, **figure 4**, and the crownwheel has been moved on its arbor. Also it has been dished to compensate for wear and reduce the drop of the teeth on to the pallets, which will rapidly accelerate the wear. **Figure 5** shows the original balance top cock with the sturdy steady pin being part of the brass casting. While all these features showing wear and the means of compensating for it could be reproduced by a very skilled and experienced faker, they are likely to be discovered by an expert in lantern clocks. In particular faking the wear on the faces of pallets and the leaves of pinions is difficult to do convincingly, especially as the wear pits on pallets have varying depths along their length caused by drop, recoil and impulse.

Part 2 of this article will consider the other Stretch lantern clock with an original balance, which has a high quality dial and front fret.