# BENJAMIN STRIBLING
## Lantern clock

by **John Robey**, UK

Benjamin Stribling was born about 1663, and was married in Stowmarket, Suffolk, in 1693, aged 30, to Elizabeth Lucas, who was ten years younger. They had several children baptised there between 1695 and 1709. He was buried in April 1720, aged about 57, while his widow lived for another 34 years and was 77 years old when she died.

He was one of only two clockmakers working in this small market town in the late seventeenth and early eighteenth centuries. There is no record of where or to whom he was apprenticed, or if he took any apprentices of his own. As might be expected he made both lantern and longcase clocks.

A good example of one of his lantern clocks is shown in **figure 1**. It is of a standard size, made about 1700 with an original anchor escapement and a long pendulum. Both trains are driven by a single weight and a Huygens' endless rope, with a duration of about 30 hours.

It is in a very original condition throughout, even retaining its original iron rear cover and brass side doors, which are often found to be missing. As well as being a good typical example there are also some interesting details.

Before 1658, when the Dutchman Christiaan Huygens announced his application of a pendulum to control a clock, all domestic clocks had a verge escapement controlled by an oscillating circular balance. Timekeeping was poor, with not only day-to-day variations of up to ten minutes or more, but also long-term drifting due to deteriorating lubrication and wear.

Huygens's invention retained the verge escapement, but replaced the balance by a swinging pendulum, with improvements in timekeeping to about a few minutes a week. But it involved an extra wheel so that the crownwheel was now horizontal rather than vertical. This extra contrate wheel, with teeth at right angles to those on a normal clock wheel, was not only difficult to make, but it was not easy to achieve correct meshing with the pinion on the crownwheel arbor.

The invention in the late 1660s of the anchor escapement combined with a long pendulum, probably by William Clement, though others such as Joseph Knibb are sometimes credited with it, revolutionised clockmaking. Not only did the anchor escapement give more accurate timekeeping to within a minute a week, but more importantly for single-handed

*Figure 1. Benjamin Stribling's lantern clock.*

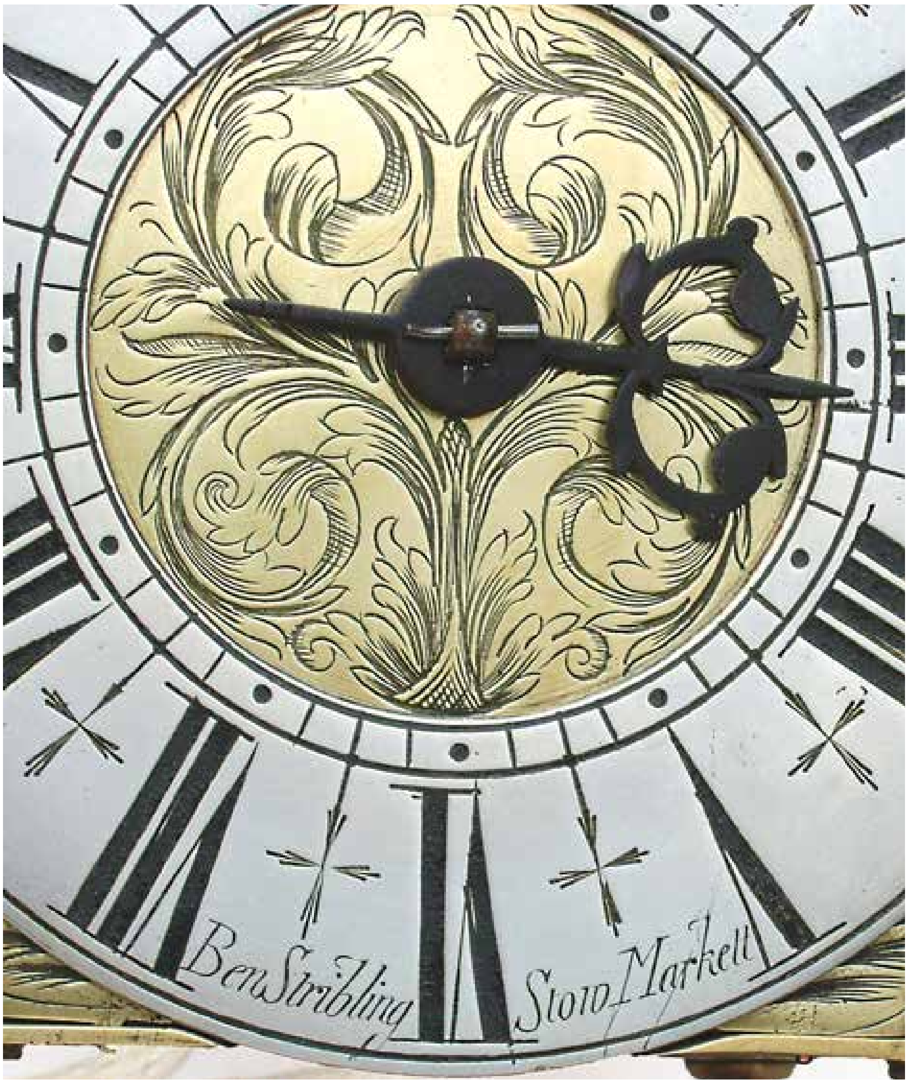



*Figure 2. The dial engraved with stylised acanthus scrolls and 'Ben Stribling Stow Market' on the chapter ring. The hand is original.*

*Figure 3 (top). Warn wheel with a parallel arbor and a brass collet.*

*Figure 4. Escapewheel with a very narrow rim.*

clocks where precise indication of the time was never a strong feature, it greatly simplified construction. It eliminated the contrate and crown wheels (both being difficult to make and adjust), and since the anchor escapewheel was in the same plane as the other wheels, simplicity of construction was the main reason for its great success. The greatwheels of a balance clock rotate in opposite directions, with the hammer on the right. But with a Huygens endless rope, both greatwheels have to rotate anti-clockwise with the hammer now on the left and the strikework on the right.

By the end of the seventeenth century, though the overall design of the lantern clock was little changed, the chapter ring became broader and larger in diameter. The centre of Stribling's dial, **figure 2**, is engraved with stylised acanthus scrolls, and has the clockmaker's name at the bottom of the $6\frac{3}{4}$in (172mm) diameter chapter ring. The frets are the popular twin-dolphin pattern, which had been in use for over 50 years, the front one being engraved. The rear of both the dial plate and the front fret are marked 'I', which may be an instruction to an engraver to 'Ingrave' them.

Both trains are typical of English posted-frame clocks, each having three wheels. Instead of the wheels fitting directly on to thick tapered arbors, as found on early lantern clocks, later clocks like this one have parallel arbors and brass collets, **figure 3**, as used

# WHEEL COUNTS

## Going train

| | | |
|---|---|---|
| escapewheel | 37 | 6 |
| 2nd wheel | 60 | 6 |
| greatwheel | 72 | 10 |
| hour wheel | 48 | |

beat = 1.0 seconds
duration = 30 hours

## Striking train

| | | |
|---|---|---|
| fly | | 6 |
| warn wheel | 40 | 6 |
| hoop wheel | 60 | 6 |
| greatwheel | 78 | 8 |
| countwheel | 48 | |
| hammer pins | 13 | |

## Overall dimensions

15¼in tall x 6¾in wide x 7¾in deep (387 x 172 x 197mm)
Frame (including feet and finials): 10¼in tall x $5\frac{7}{8}$in wide and $5\frac{7}{8}$in deep (260 x 149 x 149mm)

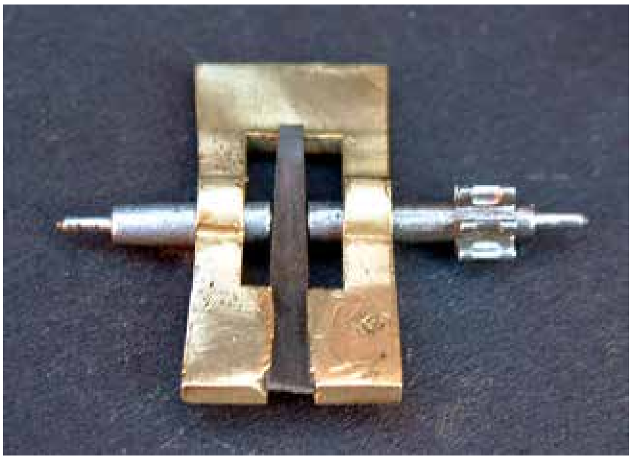


*Figure 5 (top). Casting marks 'B' and 'S' [Benjamin Stribling] on a pulley shroud.*

*Figure 6. The fly spring fits into a dovetailed slot in the fly casting.*

*Figure 7 (top). The large anchor pallets.*

*Figure 8. Severe delamination of the wrought-iron rear cover.*

on longcase clocks. The 37-tooth escapewheel has an extremely narrow rim, **figure 4**. The pulley shrouds have what are probably 'B' and 'S' casting marks, **figure 5**, used by the founder to identify his customer. They are sometimes misinterpreted as identifying the founder, but if Stribling had cast them himself why would he need to mark his own parts? Instead of the fly spring being riveted to the casting, it fits into a dovetail slot, **figure 5**, a method not seen before.

The pallets have relatively short impulse faces, though the anchor itself is quite large, **figure 7**. The pallet arbor is pivoted at the front in an extension of the front movement bar, and at the rear in a conventional cast-brass back cock of the type used on posted-frame 30-hour movements, screwed to the top plate.

The hammer on pendulum clocks is on the left-hand side, with a large aperture in the top plate for the hammer head to pass through during assembly. This aperture can be shared with either the fly or, as here, with the anchor pallets. The hammer spring has a so-called witch mark or barrier in the form of an X-cross, to ward off evil spirits that might cause malfunction of the movement.

The rear cover of most lantern clocks does not normally merit special attention, but this one is an exception, **figure 8**. It has serious delamination caused by layers of slag in the wrought-iron.

As I am probably one of the few surviving people that has witnessed the traditional method of making genuine wrought iron; it is worth a diversion to describe the process. This was shortly before the making of wrought iron at the Atlas Forge in Bolton ceased in 1975. The furnaces and equipment were later taken to the Ironbridge Gorge Museum, but when I last visited it, everything rescued from the Atlas Forge appeared to be abandoned and neglected.

The process of making wrought iron is called puddling and uses a reverberatory furnace, with a fire at one end. The flames reverberated off the furnace roof to melt cast iron at the other end, so that the coal fuel would not contaminate the molten metal. The puddler, dressed in a suit of iron plates and thick leather, and wearing a face mask of wire gauze, stirred the molten cast iron with a very long iron pole. The excess carbon was burnt off to eventually produce a pasty ball of pure iron and slag about 2-3ft in diameter.

Then, using large iron tongs this red-hot ball was put on to a two-wheel trolley with a very long handle to keep the heat away from the puddler; it was transferred to a nearby steam hammer. Many

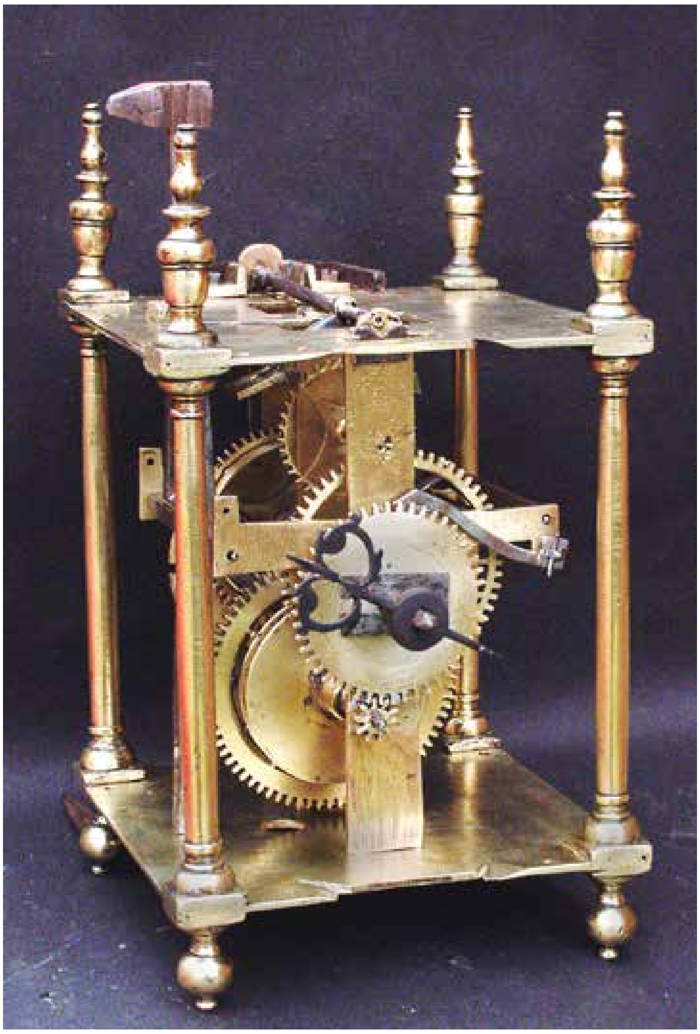
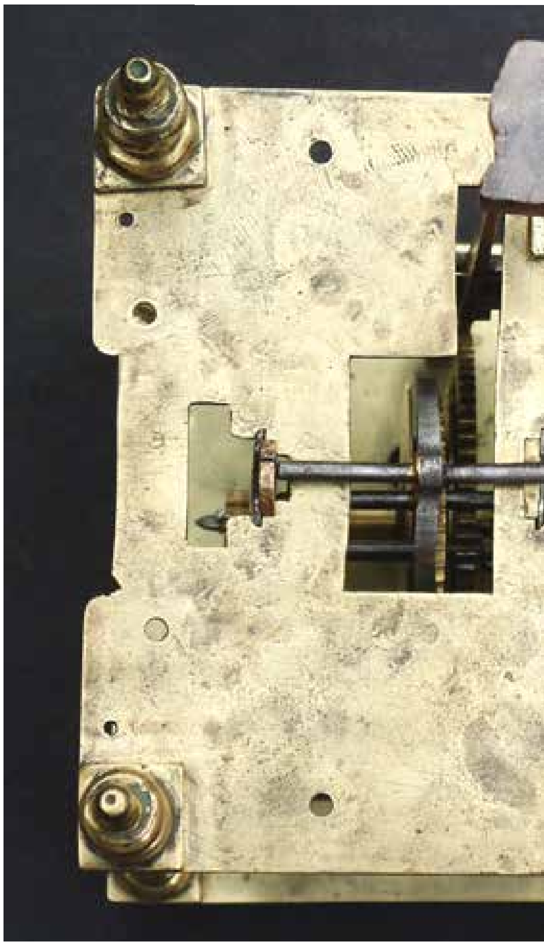


*Figure 9. Front of the movement.*

*Figure 10. Rear of the movement.*

*Figure 13. Top plate and the original*



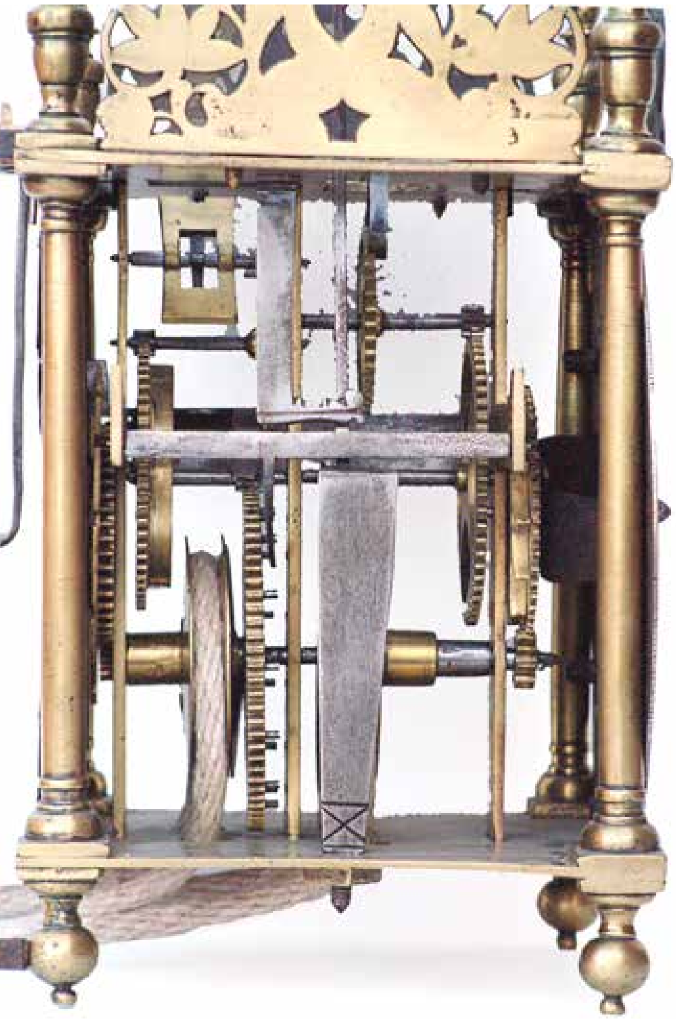
blows from the hammer compressed and consolidated the pasty mass of iron into a small billet. In the process streams of red-hot slag, which is molten sand and other impurities, were sprayed out. The need for the sheet iron leggings became very evident, as onlookers quickly scattered to avoid being burnt by flying red-hot slag. After an hour or so of back-breaking sweat-drenched labour the result was just a small ingot of wrought iron.

Then the iron ingot had to be reheated and rolled into a more usable form, such as a sheet, plate or bar. The Atlas Forge made bar, so the red-hot ingot was passed several times through a rolling mill, and finally through rolls with shaped grooves to produce round or square-section bar, which became longer at each pass until it was like a snaking length of red-hot iron. Removing all the slag was vital when making iron that need great strength, such as for high-pressure boilers for steam engines and locomotives.

Forges that specialised in making high quality wrought-iron plates, such as the Bowling Ironworks in Bradford, produced several grades known as Best, Best-Best, and Best-Best-Best. The invention of the Bessemer Converter replaced the sweated labour of the skilled puddlers and produce mild steel, which eventually replaced wrought iron completely. No doubt the pubs and ale-houses near these ironworks did a roaring trade, and the puddlers earned every penny of their wages.

When good quality wrought iron is filed smooth and well finished it is difficult to distinguish it from mild steel. However, since it is mostly pure iron it resists rusting more than mild steel, which contains a very small proportion of carbon that allows the metal to rust more easily. Wrought iron will eventually rust if it is left in damp conditions, revealing its fibrous structure and any slag inclusions. These are sometimes seen on the bell stands or crutches of longcase clocks, where the metal has split open along a slag line.

The rear cover of Stribling's clock is an extreme example where the forging process has not removed most of the slag, producing a sandwich of iron-slag-



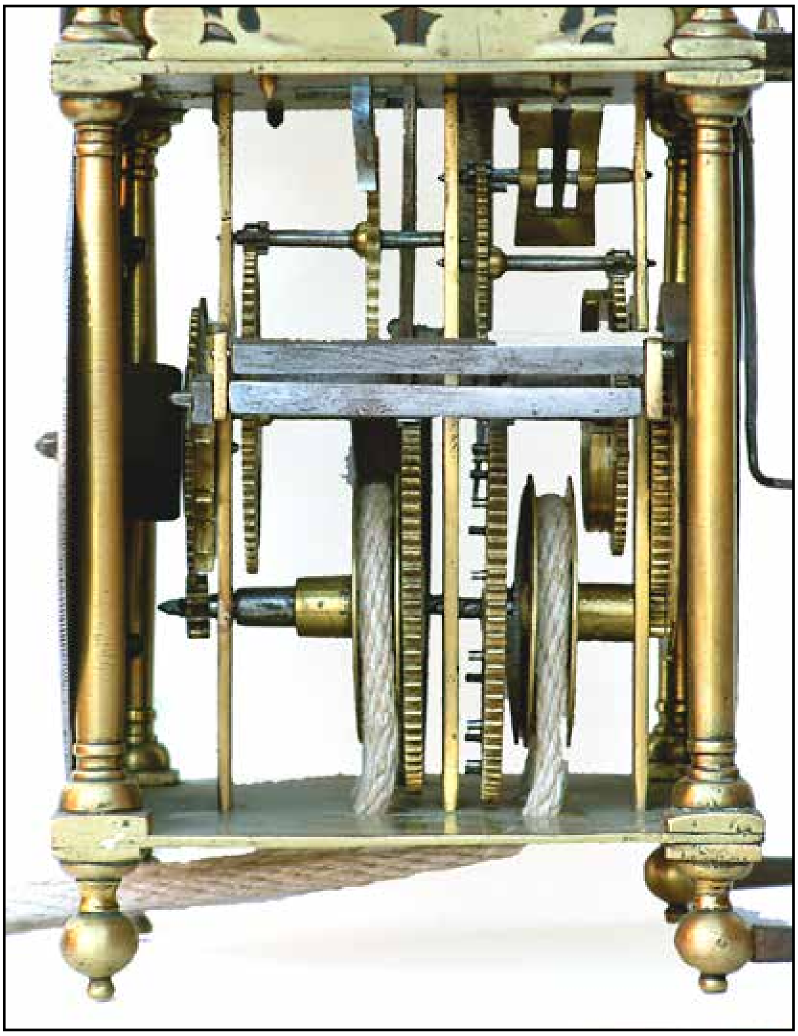
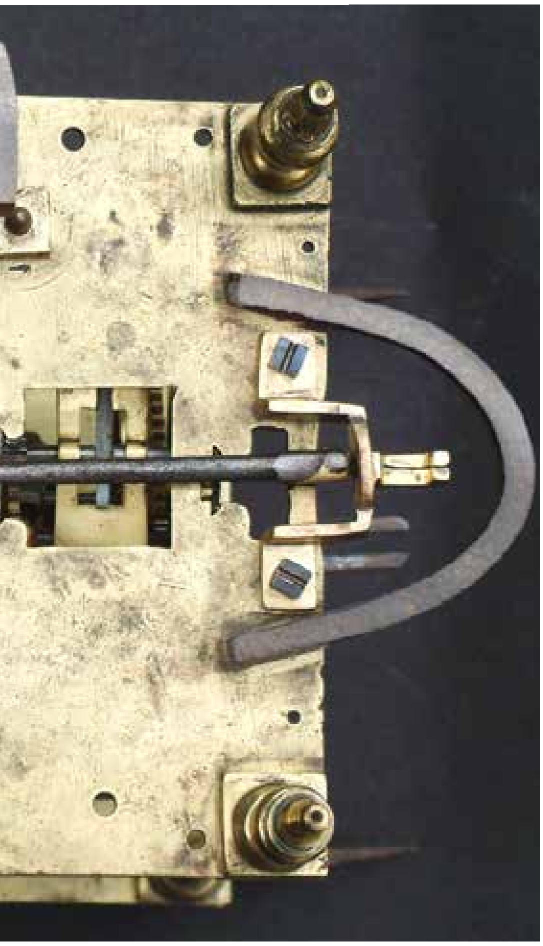


*Figure 11. Left-hand side of the movement.*

*Figure 12. Right-hand side of the movement.*

*anchor escapement.*



iron. Rust has attacked the boundary between the different layers causing a large part to become almost detached.

The original brass side doors, about 1/16in (1.5mm) thick, have a rippled surface from having had any imperfections removed with a large scraper. Both surfaces of each door include a total of 16 cleaning dates, ranging from 1747 to 1824, an average of less than every five years. A couple also include 'strippd', when the clock was completely dismantled for cleaning, whereas on the other occasions superficial cleaning and oiling probably sufficed. **Figures 9** to **13** show different views of the movement, with the wheel counts and dimensions on page 10.

Collectors looking to buy a lantern clock will be exceptionally lucky to find one with its original balance. Of the many thousands of lantern clocks that were produced, only about 14 clocks are known to have survived with an original balance. All the others have been converted to either a verge escapement and a short pendulum or to an anchor escapement and a long pendulum, and often first to a short pendulum and then a long one.

At the same time the opportunity was often taken to update the clock from two weights to a single weight on a Huygens endless rope or chain. Also the motionwork was altered to increase the duration from an inconvenient twice daily winding to daily winding. Some clocks have been reconverted back to a balance, but it is rarely done correctly, and the trend now is to accept these changes as interesting in their own right and part of the clock's history to improve timekeeping.

So the potential customer looking for a lantern clock has three options (apart from waiting a very long time for one with an original balance to appear for sale): buy a clock converted to a pendulum, find one that has been reconverted back to a balance, or acquire one that was made with an original pendulum, either short or long and with a Huygens loop. Benjamin Stribling's clock is a good example of what to look out for. It may not be as old as a former balance clock, but it will be very much as it was when it left the clockmaker's workshop.