The devil is i

... of a clock by Munca

The article by Brian Loomes in the January 2014 issue of *Clocks* describing a mahogany longcase clock by William Muncaster of Whitehaven reminded me of a clock that I restored just over ten years ago. It was signed 'Muncaster & Son, Isle of Man' and was then residing in a quiet and picturesque Peak District village, almost as far from the sea as is possible to get in England. The case and dial are fairly 'standard' examples from the nineteenth century, but it is the movement that deserves most attention. At first glance this also seems unremarkable, and it is only when it is examined in detail we can see that the Muncasters may have been making their own clock movements at a time when most other 'makers' were merely buying them from firms such as Harlow of Ashbourne in Derbyshire (often sold through Birmingham wholesalers or factors) or one of the movement makers in the North Staffordshire town of Newcastle-under-Lyme.

There is no need to repeat the details of the family's history here, except to summarise that William Muncaster moved from Whitehaven in what was then Cumberland (now Cumbria) to Castletown on the Isle of Man, probably sometime between 1821 and 1828. This shop was later run by his son William junior, while William senior moved to Douglas in the 1830s and worked there with another son, John, until he died in 1851, followed by John seven years later. After 1853 the Douglas shop was run by William junior who returned to Castletown in 1859. The signing of this clock without any first names or even a town suggests that it was made by the family firm for sale at either of their two retail premises on the island.

The case, **figure 1**, is veneered in high quality mahogany with a swan-necked pediment, baluster hood pillars and a flat-topped trunk door, without any quarter columns on the corners of the trunk. The 14in wide dial, **figure 2**, has a cast-iron falseplate that identifies it as having been made by Finnemore & Son, one of the most prolific of the Birmingham dialmakers working in the first half of the nineteenth century. While not of the standard of the previous generation of dialmakers, such as James Wilson or Osborne's Manufactory, nevertheless they made many attractive clock dials.

This one has a moon in the arch, **figure 3**, with the popular 'home and away' scenes, in this instance represented by one of a classical temple overlooking a bridge and a lake with a sailing ship being displayed the following month. The two faces of the moon have very rosy cheeks, lips and nose. Instead

Figure 1. The mahogany case with a swan-necked pediment to the hood.

in the detail

aster & Son, Isle of Man

Figure 2. The dial was made by Finnemore & Son of Birmingham about 1840.

of the moon humps having the usual transfer maps of the western and eastern hemispheres, here they are replaced by two large stylised gilt flowers.

The dial corners are filled with female figures representing the Four Continents, clockwise from the top left: Europe, Asia, Africa and America, **figures 4** to **7**. The young women representing the different peoples of the world have been discussed many times before, so it suffices to say that they are all wearing

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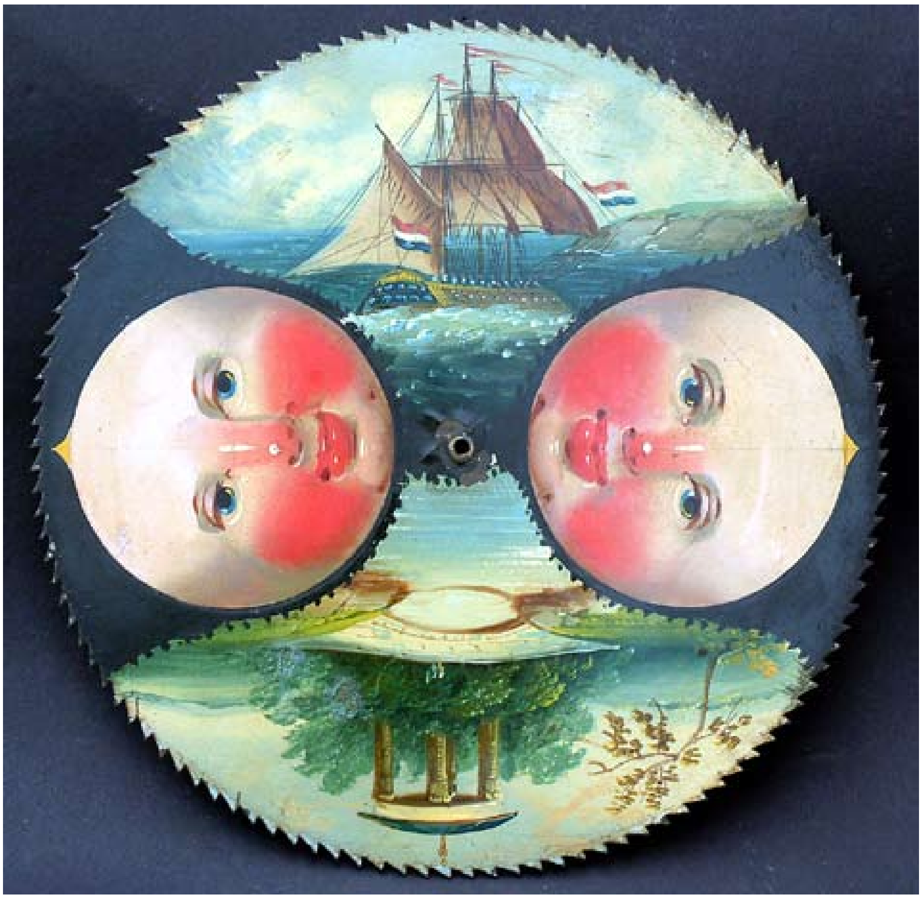
a bright red cloak over their national costumes, but note the face peering from behind the chapter ring on the scene representing Europe. I am not sure what it signifies—was it a discrete self-portrait of William Finnemore?

The hands are a mixture, only the brass calendar hand being original. The iron seconds hand is a very nice example of an unusual pattern from the late eighteen century, while the hour and minute hands are modern replacements stamped out of brass in a heavy version of the style of iron hands that were popular in the late eighteenth century. Since there are no minute numerals and the divisions have reverted back to a minute 'track' this dial can be dated to the Third Period, which started about 1830. Although dating clocks by their style is not an exact science, the dial is usually the major component of longcase clocks that can be most precisely dated. Cases are usually somewhat less easily dated, while movements can often be only described with any confidence as 'early' or 'late'.

There is the advantage of a named falseplate to help fit the dial to the movement. However, the Finnemore firm operated for over forty years, from 1812 to 1854, and used a variety of different falseplates. From 1828 William Finnemore traded with his son, also William, as Finnemore & Son until William senior died in 1838, but the firm continued to be listed in directories under that name for a couple more years. It is also likely that any existing falseplates continued to be used until stocks became exhausted. Based on the style of the dial and what is known about the Muncaster firm this clock can be dated to the late 1830s or early 1840s.

Turning now to the eight-day movement, it seems to be a typical early Victorian example, **figure 8**, but, as they say, the devil is in the detail. When we look at the strikework, **figure 9**, there is the expected rack-and-snail striking with pallet-tail locking, and while the



rack hook is not of a distinctive shape, the lifting piece and warning detent have been filed to add some decoration. However, it is the rack itself, **figure 10**, that is shaped in a most distinctive manner. The left-hand end has been filed to resemble a bird's head with a sharp beak, the stop pin forming an eye, while the wavy lower edge indicates just that: waves on the sea, so that the rack might be representative of the seagulls floating on the sea round the coast of the Isle of Man.

The bird theme is continued on the winding clicks, **figure 11**. Here the actual clicks that engages with the ratchet teeth are in the shape of a bird's tail, with the ends that assist when the clicks needs to be disengaged resemble its head, complete with a punched dot for the eye. Only very occasionally are clock components given the shape of an animal and when this does occur it usually resembles a bird's head. Even then they are normally only found on clocks made in the previous century.

Figure 11 also illustrates another interesting detail: the wheel teeth have been slit very deeply. In fact all the wheels on both the going and striking trains have the same very deeply-slit teeth, as shown on another wheel in **figure 12**. Sometimes on eighteenth-century clocks it is the wheels of the motionwork that are deeply slit, while the train wheels are of a more reasonable length. On this clock the teeth of the train wheels that are almost twice as long as is necessary and this makes them rather weak. While this is not particularly

Figure 3 (left_. The moon disc showing a classical temple and a sailing ship.

Figure 4 (below left). Female figure with a white dress and a white horse representing Europe. Note the peering face near her feet.

Figure 5. Asia is dressed in a multicoloured outfit with a camel behind her.

important for the wheels at the top end of the trains, where there is little force on them, the great wheels are powered (often over-powered) by great lumps of lead or cast iron hanging on the lines, and here strong teeth should be a priority here.

But why were these teeth slit so deeply in the first place? It may have been noticed that the word 'slit' has been deliberately used rather than 'cut', as the teeth were not formed by using a cutter of the correct profile, as is done today. The wheels were slit in a wheel-cutting engine using a cutter like a modern slitting saw (effectively a small circular saw blade suitable for cutting brass). After each wheel had been mounted on its arbor it was placed in predetermined pivot holes in the movement plates along with its mating pinion. Then the teeth were shaped by hand using special 'rounding-up' files until each wheel and pinion pair ran smoothly. The complete process is described in detail in Chapter 3 of *The Longcase Clock Reference Book* (revised edition, 2013), which includes some contemporary descriptions of how it was done.

This method of depthing wheels

and pinions was exactly the opposite procedure to that done today. Using modern form cutter the teeth are cut to the correct profile and the positions of the pivot holes then determined using a depthing tool. The traditional method of making a clock movement was to drill and broach the pivot holes first, using templates based on experience and the teeth of the slit wheels were then rounded and depthed as described. This procedure was done, not because there were no form cutters, but because depthing tools were very expensive and virtually unknown to ordinary clockmakers. Rounding up by hand might seem a very laborious process, but a skilled and experienced clockmaker could do this with great rapidity and accuracy.

There are two consequences of slitting and rounding the teeth. Firstly, the wheels were made slightly oversized and since the clockmaker would not know how much needed to be filed off each tooth, the slits would be made a bit deeper than really necessary. With experience this could be kept to a minimum, but what if the clockmaker did not have his own wheel-cutting engine and had to rely on the services of a fellow craftsman who possessed one of these expensive machines? In this case the wheels would be slit extra deep just ‘to be on the safe side’. There was no point in finding out that they were not deep enough after the wheels had been mounted on their arbors—they would have ended up in the scrap box after a lot of wasted effort. From this we can deduce that the person who had rounded-up the wheels was probably not the one who had slit them.

Figure 6. Africa holds a spear and has a surprisingly realistic lion at her feet.

Figure 7. A bare-breasted native American wears a fanciful feather headdress.

Secondly, during slitting the same slitting cutter was used for all the teeth. Most probably it was rarely changed and all the wheels slit on any one engine would have been cut with the same cutter. (The only exceptions were on the earliest longcase clocks where the calendar wheel usually has very coarse teeth. Sometimes if the warn wheel was small a thinner cutter was used, again mainly on early clocks.) This means that if you take two wheels from the same movement and measure the tooth gaps with a feeler gauge they will usually be the same for each wheel but they will have different depths. This is shown by comparing the teeth in **figures 11** and **12**. This proves that a form cutter was *not* used—such a cutter could *not* produce fully-shaped teeth with different depths.

Another detail to note on this movement is the bell hammer. By the late eighteenth century, especially in the Midlands and the North of England, the arrangement of the hammer had become fairly standardised and simplified, not necessarily for the better—more likely it was just to reduce costs. The hammer shaft, which started off in the centre of its arbor, was moved to the rear.

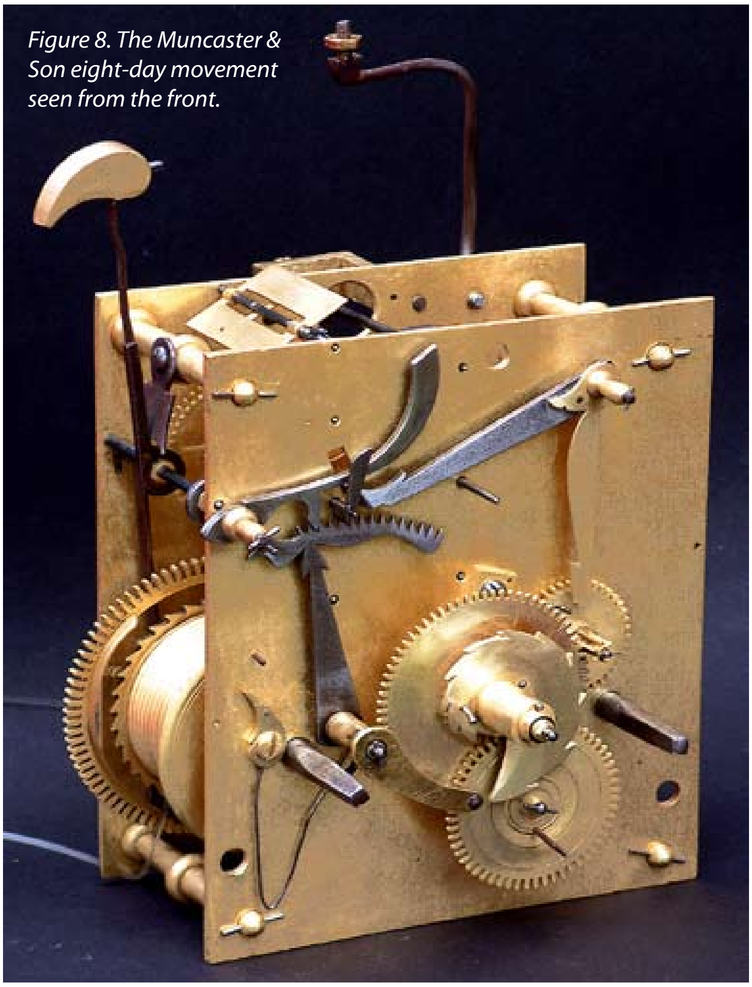


Figure 8. The Muncaster & Son eight-day movement seen from the front.

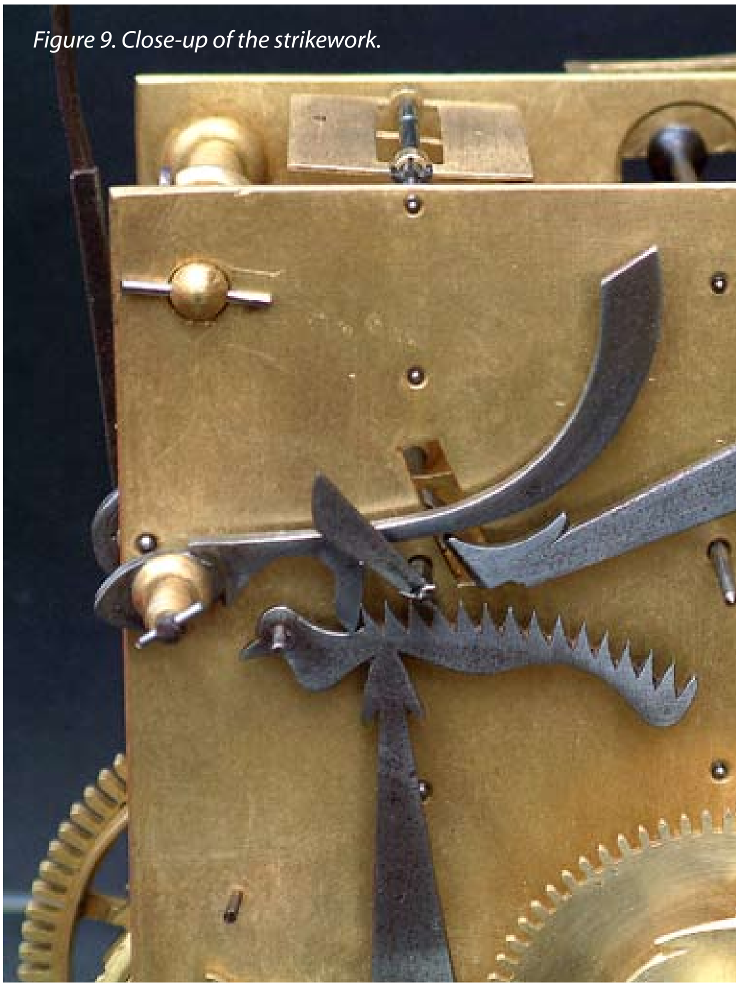


Figure 9. Close-up of the strikework.

Figure 12. Another one of the wheels with very deeply slit teeth with rounded tips.

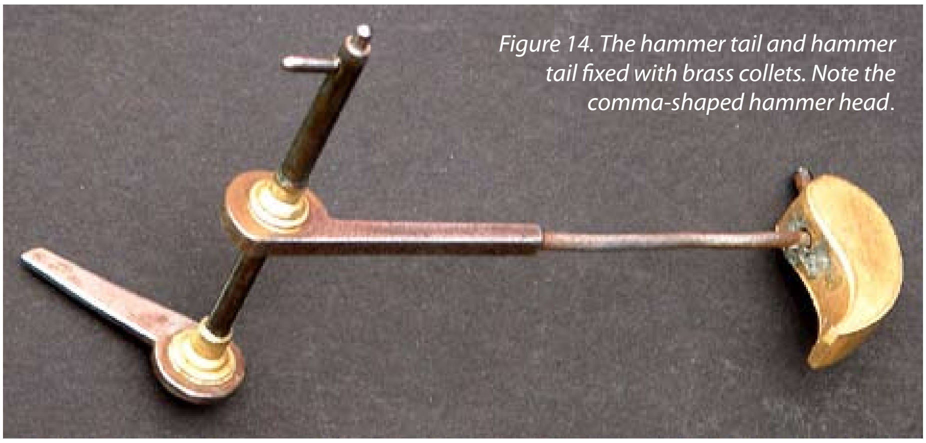


Figure 14. The hammer tail and hammer tail fixed with brass collets. Note the comma-shaped hammer head.

Instead of having a separate hammer stop to prevent the hammer head from jangling on the bell, the hammer spring itself acted as a combined spring and stop. The top of the spring was forged to a sturdy L-shape that pushes against a short arm below the hammer shaft to provide the force to impel the hammer forward, while a step just below the arbor stops against the top of the spring. It is a system that will be so familiar to most horologists that many do not appreciate that there are several alternative methods, yet is is quite difficult to explain clearly and succinctly. There is much more to the correct setting up and operation of the bell hammer so that it strikes clearly that is often appreciated.

However, it can be seen from **figure 13** that the maker of this movement did not just follow blindly what others were doing. Instead he used a central hammer with a separate stop screwed to the top left-hand pillar. The spring has just a slight curve at the top and it pushes against a stout pin fixed in the arbor. This is an arrangement that is normally only found on much earlier clocks. Not only is the layout different to usual, but so is its construction, **figure 14**. The components are normally made from forged iron parts fitted onto the arbor either by riveting and filing so the joints are barely visible or by brazing. Here the hammer shaft and the hammer tail are fitted to a rather slender shaft with brass collets in a similar manner to those used to fit wheels to their arbors. This method is by no means unique and it was the system used by James Hawthorn, a movement maker from Newcastle-upon-Tyne, who sold movements to the trade, but I am not suggesting that this was one of those supplied by him as his strikework is of a

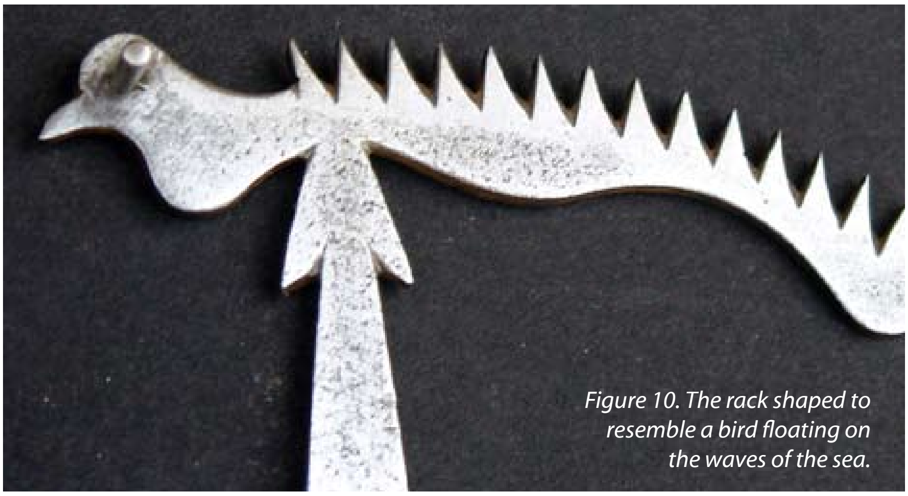


Figure 10. The rack shaped to resemble a bird floating on the waves of the sea.

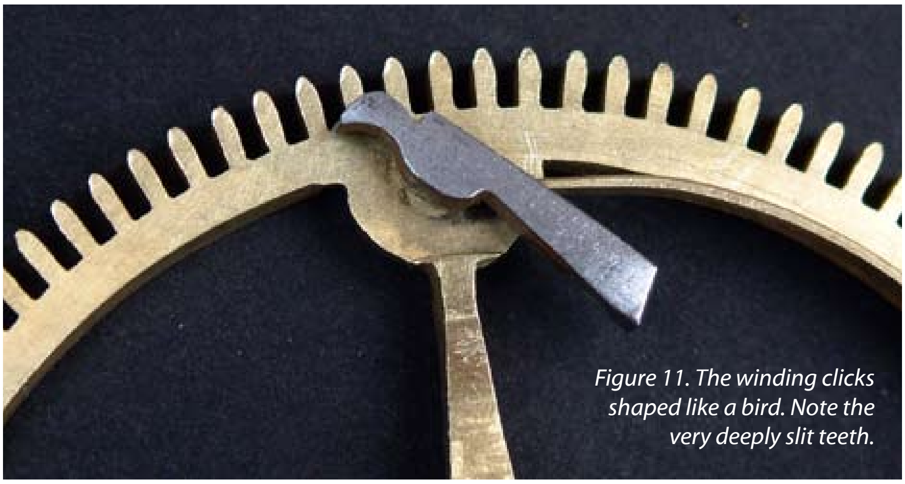


Figure 11. The winding clicks shaped like a bird. Note the very deeply slit teeth.

quite different shape. It must have made getting the components in the correct positions before soldering the collets in place rather easier than with the more traditional method. The final thing to note about the hammer is the 'comma' shape of the brass hammer head with an iron insert to strike the bell. This photograph was taken before a previous poor solder joint between the hammer head and the iron shaft had been repaired.

Before a firm pronouncement can be made about who actually made this movement, other examples of clocks signed by any of the Muncaster clockmakers need to be examined. If they all show similar details to those shown here, and if these same features do not appear on clocks signed by others, then it is reasonable to attribute them to the Muncaster firm. However, without these additional observations the movement might have come from the workshop of some other movement maker who added these quirky touches to his work. Since there are no scribed circles on the front plate it is reasonable to speculate that the maker produced a small batch of movements following a tried-and-tested layout using a template to mark the positions of the wheels. It is likely that he did not have the expensive machine necessary to slit the teeth of his own wheels but had to send them to someone who could do the job for him.

One day we may know more about the working practices of not only the Muncasters, but also other clockmakers. This will only be by detailed study of their movements. This clock also shows that is it not just early examples that can provide interest. Even in the nineteenth century there were some who were not just content to assemble a dial and a movement made by specialists and fit it into a case provided by a cabinetmaker, but preferred to make the movement themselves. While not possessing any technical innovations or improvements to improve timekeeping, this clock shows that much can be learnt from even relatively late longcase clocks, and, as I said earlier, the devil is in the detail.

Figure 13. The hammer is in the centre of its arbor with a separate stop screwed to the top pillar.