A QUARTET OF ALARMS

A week-duration iron alarm

part 2 of 4

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Figure 11. Front view with restored hands, pendulum and bell.

Last month the uncertainties that can arise when trying to identify where and when rustic Continental iron clocks were made was illustrated by a 30-hour timepiece alarm. This time its date is known with confidence, as are the initials of the clockmaker, but again there is conflicting evidence as to where it originated. It is a key-wound timepiece of

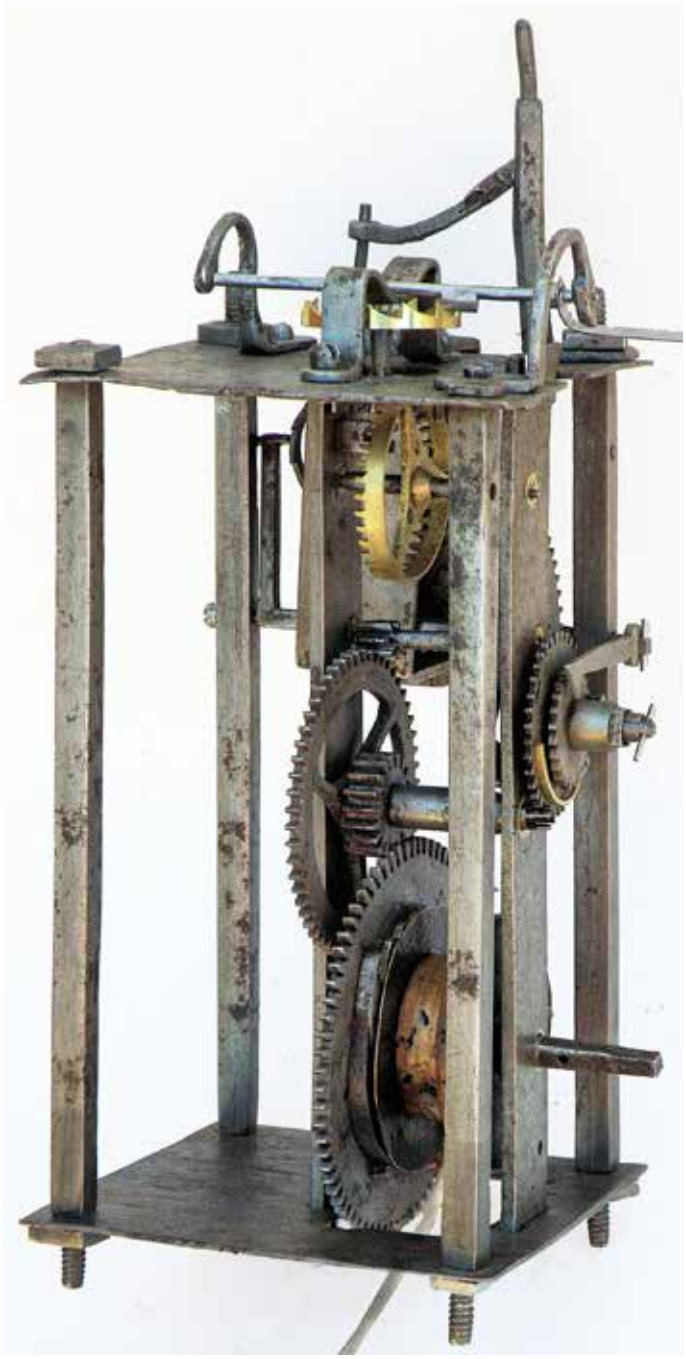

Figure 12. The posted-frame movement.

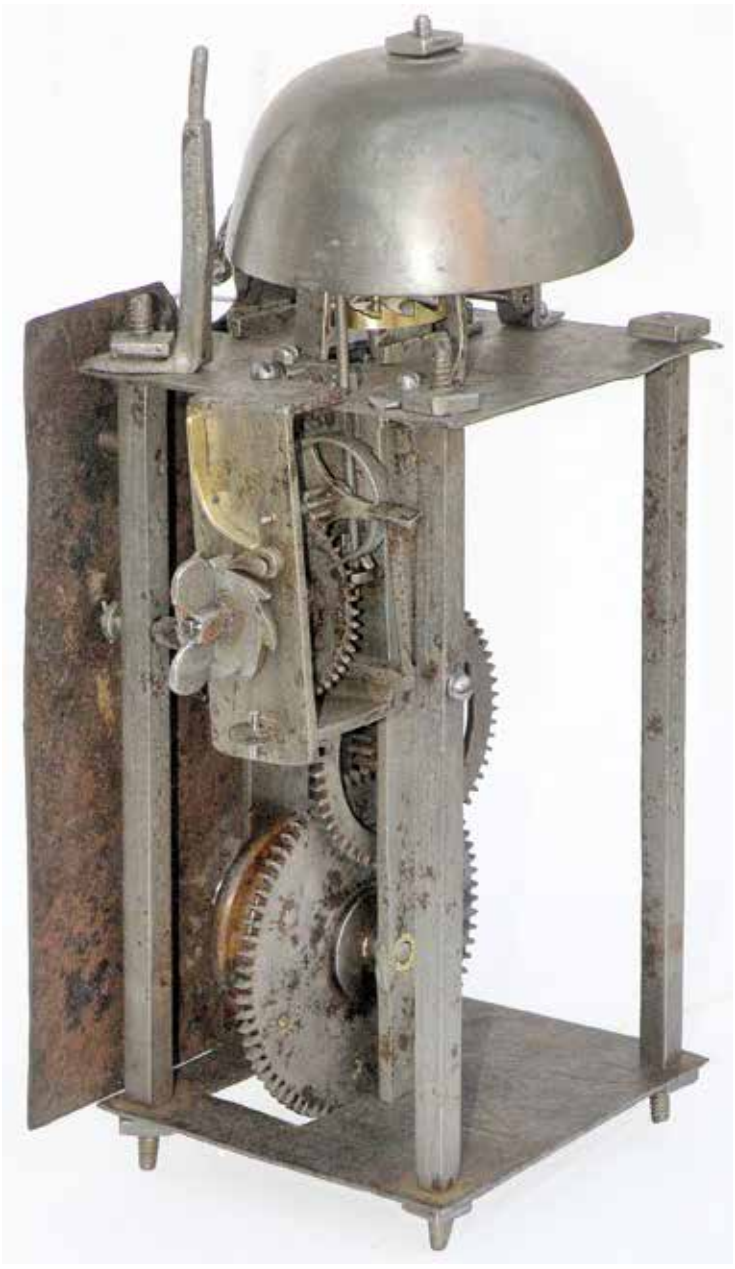

Figure 13. Movement showing the alarm on the right-hand side.

one week duration and with a spring-driven alarm, but I have been unable to find any published illustration of an iron clock with any of these features. It would be rash of me to say that it is unique as another one is sure to be discovered, but at least it is unusual.

The clock in its present condition is shown in **figure 1**, but it should be realised that certain parts are a restoration. When received there was a poorly repaired pendulum rod, an original, but very worn and mangled verge and pallets, while the brass crown-wheel was distorted and unequally divided. It was never going to work properly in this state and the only recourse was to rebuild the escapement. There were no hands so a robust iron hand was formed from a piece of old wrought iron together with a much lighter one to act as an alarm hand.

There was no bell or anything to support it, though there was a notch on the left-hand edge of the top plate and a nearby screwed hole, both indicating the position of a now-missing bellstand. This was made and a small period bell fitted. However, towards the front right-hand side there was (and still is) a vertical post with a plain round spigot at the top without any screw thread. The purpose of this remains a mystery. It is in the wrong position to act as a bellstand and while an arm might have been attached at the top which in turn held a bell, this seems a most unlikely arrangement.

Since there are no sheet-iron doors, rear or top covers, nor a hanging hoop or spikes, nor any sign that they ever existed, this clock might have been fitted into a wooden case, either a tall case or more likely a basic hooded wall case. As the bell is in full view and there is nothing to keep dust out of the movement a case of some sort is more than likely. Was the vertical post there to hold it in position in a case that might have been no more than an open-fronted box with a simple moulding round the dial?

The painted iron dial is 7½in (19cm) tall by 5½in (14cm) wide and is held with two screws into the front pillars at the top and a small brass tab at the bottom left. There might have been a similar one on the right, but if so it is now missing. The ground colour is a pale blue with rococo scrolls in white and black surrounding 'C 1756 A' near the bottom. The white chapter ring has hour numerals for a single hand, half-hour markers in the form of stars and an inner anti-clockwise 1-12 for setting the alarm. A winding square protrudes through the dial just below the

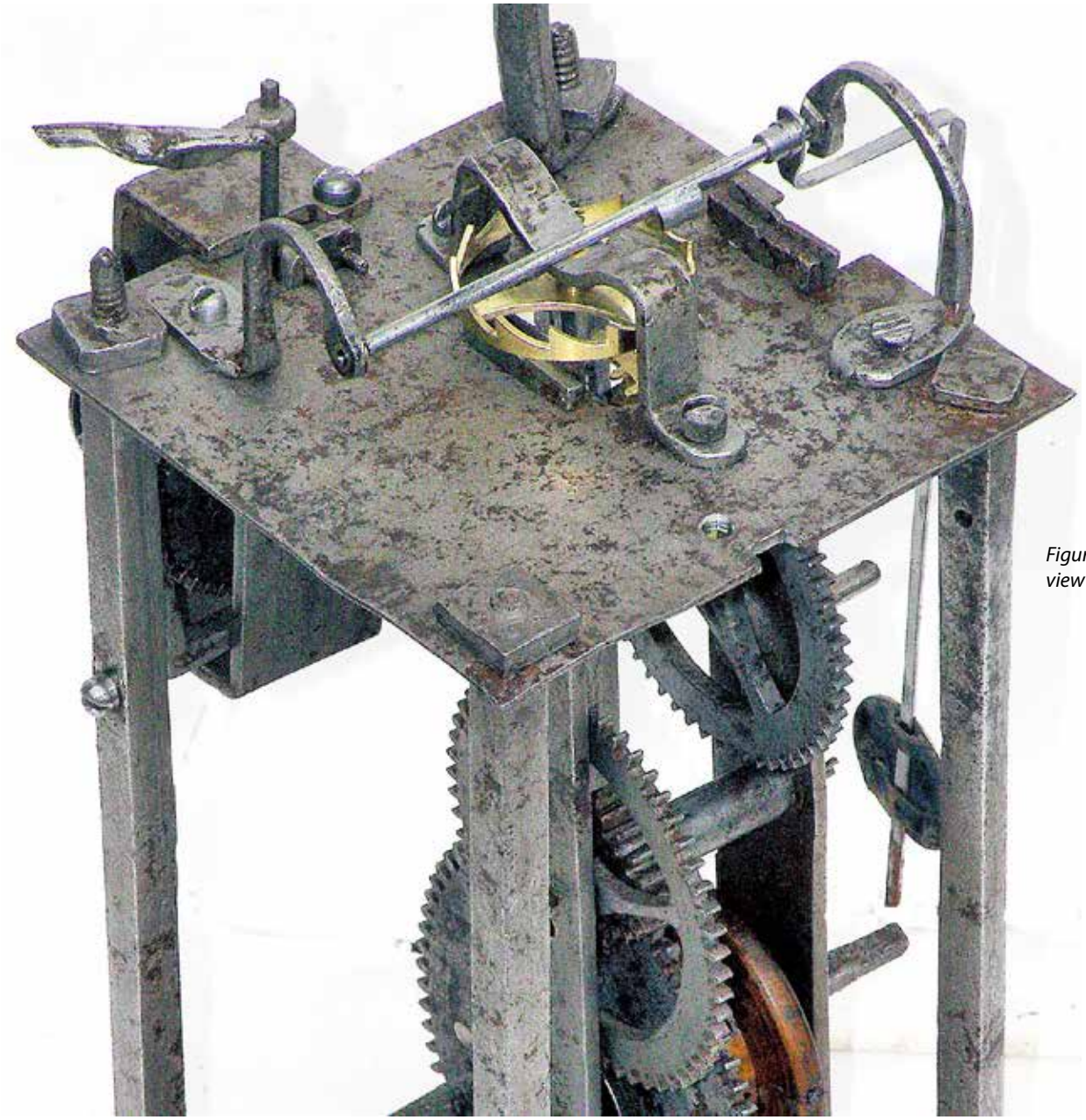

Figure 14. Top view showing the

Fiaure 15. The aoina train.

Figure 16. Punch mark on the iron wheels and the crossings forge-welded to the rim.

Figure 17. Greatwheel, click wheel, barrel and spacer.

chapter ring.

The simple posted-frame movement, **figures 12** and **13**, has slender square-section corner posts with screwed ends held to the top and bottom plates with square nuts, while the screwed lower ends are extended to form very basic feet. There are only two movement bars with a large empty space at the rear, with the alarm mechanism in a sub-frame that hangs from the right-hand side of the top plate. There is a large rectangular aperture in the bottom plate for the weight cord to pass through and it also allows the greatwheel to protrude below the plate—the tips of the teeth can be seen in **figure 11** below the dial.

The top pivot of the brass crown-wheel locates in an iron bridge that curves down to clear the teeth while allowing the verge to sit just above it, **figure 14**. There are various solutions to the problem of positioning the axis of the verge close to the wheel teeth. No matter what method is used it usually results in the top pivot of the crown-wheel only just protruding above the crossings. This makes removing wear and polishing the pivot a very awkward task. Even if the wheel is held in a step chuck, accessing the pivot while avoiding the rotating saw-shaped teeth can be problematical.

If the wheel is removed from its arbor it is not easy to remount it without wobble. If any readers have found a solution to polishing the top pivot without removing the wheel please let me know. The pivots of the verge sit in separate curved cocks screwed to the top plate, rather than suspended beneath a top bar as used for the clock in Part 1. The significance of these in determining where it was made will become apparent later.

While a 30-hour clock with an anchor escapement normally has just three wheels, with a crown-wheel and verge escapement an extra one—the contrate wheel—is needed, but here there are five wheels to give a longer duration, **figure 15**. The crown-wheel shown is the original that was found to be distorted and unevenly divided and was replaced. The first three wheels are of iron with the contrite wheel and crown-wheel of brass. Apart from the solid great wheel, all have just three crossings and the second and third wheels have the crossings forge-welded to the rims, **figure 16**. The three iron wheels, as well as the contrate wheel, have a punched 'O' to aid assembly so the teeth mesh with the same pinions leaves every time. This was commonly done on iron wheels that were filed by hand.

The winding arrangement is not the same as that normally found on simple iron clocks. **Figure 17** shows the components of the great wheel assembly. Instead of the great wheel being riveted firmly to its arbor and a rope pulley—either with a V-groove for a hard rope or spikes for a soft rope—rotating on the arbor linked together by a ratchet and click, the arrangement is reversed. The arbor has an extended front end squared to take a winding key, and on to it is firmly fixed a short wooden barrel having a wooden outer rim and a sheet-iron inner

Figure 18. The hour wheel and the ratchet wheel with an alarm let-off pin.

rim.

Behind the barrel a removable brass click wheel is squared on to the arbor, while the solid iron great wheel rotates at the rear followed by a spacer. The teeth of the click wheel have been filed by hand and are very unevenly divided—not that this makes a great deal of difference, but it not something that a maker of quality clocks would do.

The wheel counts are:

Crown-wheel	13 — 6
Contrate wheel	36 — 6
Third wheel	56 — 6
Second wheel	56 — 18 — 4
Great wheel	72
Hour wheel	36

This gives almost 170 beats/minute with a pendulum length of about 5in (12.5cm).

Instead of the hour wheel being driven by a pinion of report on the end on the great-wheel arbor, a four-pronged pinion is filed on the end of the arbor of the second wheel to engage with the hour wheel. There is no separate clutch spring for setting the hand, instead the hand is simply a friction-tight fit on the split round pipe. The extra wheel extends the duration to about 3½ days for a single weight drop, which increases to a week if a doubled line and a pulley are used

Another deviation from conventional practice is the alarm-setting arrangement. Rather than the usual oval friction spring with a pin (as described in *Clocks*, June 2014, pages 30-31, on an English 30-hour clock by Joseph Donisthorpe), a more complex method is used. An iron click wheel sits over the pipe of the hour wheel, the two being linked by a click, **figure 18**. A pin on the click wheel lets off the alarm when the alarm hand, which is squared on to the short pipe of the click wheel, arrives at the 12 o'clock position. This is not a unique arrangement as it has been seen on a late eighteenth-century horizontal table clock, which, although signed by a clockmaker in Warsaw, Poland, was probably made in Augsburg in Bavaria, or more likely the nearby small town of Friedberg.

There are just 24 ratchet teeth, each one heavily punch marked, despite there being no similar marks on the train wheels. Hence the alarm can be only set to the nearest 2½ minutes, but even this is much more satisfactory than the setting to the nearest hour on the alarm in Part 1. A spare hole in the click wheel shows that the maker did not get the time of let-off right first time and the slot in the hour wheel was probably for a longer clickspring.

The alarm mechanism comprises the usual crown-wheel (with 13 teeth in this example), a vertical verge and a two-armed let-off lever, pivoted in two L-shaped bars that form a little self-contained unit on the right-hand side of the movement. The hammer is just a push fit on the top end of the verge with no taper pin to retain it—it is a miracle that it has not been lost during the last two and a half centuries.

Instead of the usual small weight pulley rotating on the arbor of the crownwheel

Figure 19. Components of the alarm.

there is a separate 48-tooth iron wheel engaging with a six-leaf pinion on the arbor of the crown-wheel. A spring barrel is riveted to the wheel with an iron ratchet wheel squared on to the spring arbor and positioned on the outside of the little 'movement bar' together with a click. The spring arbor was in a very poor state and the outer end had broken off, probably due to slag inclusions in the wrought iron. After attempts to rescue as much of the original as possible by fitting a new squared end did not prove very successful, mainly due to the poor quality of the iron, a new one had to be made.

But how was the alarm wound? A removable winding key seems unlikely so a small iron pulley with a pull-cord, as used on other spring-powered alarms and also on pull-repeat bracket clocks, was made. However, it was soon discovered that the operation is not quite the same as on other pull-wind arrangements, where, after the cord is pulled the pulley rotates back to its starting position as the alarm runs. With this alarm the spring barrel is fixed to the wheel and not to the clock plate and the click holds the spring arbor (and hence the pulley), so it cannot be pulled again to reset the alarm.

So it was back to the drawing board! The solution was a fixed winding key, forged and filed from a piece of old wrought iron, squared on to the end of the spring arbor and held with a taper pin. This is likely to have been very similar to the original arrangement and can be seen in **figure 13**.

Why a rural clockmaker would make this type of spring-driven alarm, instead of the conventional type, remains a mystery. There does not seem to be any technical or operational reasons—if it was in a simple wall case then an opening side door would also have been necessary. The clockmaker made himself and the local joiner quite a bit of extra work. But CA did not follow convention, for not only did he make a spring-powered alarm with a hand instead of a setting disc, but he added an extra wheel to extend the duration and used a barrel with key winding.

So after presenting the facts we come to much less certain ground—this is where informed speculation comes into play. Who was CA and where did he work? Like the clock in Part 1 we have to look at the constructional features to come to a considered conclusion. The frame is so basic it could have been made almost anywhere, but the pillars are quite a bit more slender than used in southern Germany, while the method of fixing the two movement bars is not Germanic. Nor are the two curved supports for the verge escapement. The alarm lever pivots between the right-hand movement bars with a removable pivot screw at the rear. All these are typically French features, while the use of a ratchet and click instead of a friction spring to set the alarm hand has a parallel on a French iron clock where it is used for resetting the hour hand

However, the cowtail pendulum is not a French feature and while this type pendulum was widely used on German clocks, no French examples are known. The cowtail pendulum and this type of support are to be found on some Italian clocks, so this might be an alternative suggestion. An Italian collector informs me that there are many different types of clocks made in various regions of Italy and 'it is difficult to exclude that this clock was not made in Italy maybe near to a mountain area in north or central Italy'. It might have come from the border area of France with Germany, perhaps near the Jura or Black Forest where there were likely to have been a cross-fertilisation of ideas, which would not stop suddenly at the present country boundaries. Or perhaps from near the French-Italian border. Or is it the exception that proves the rule? Until we find out where it was made there is little chance of identifying CA, and even then he may not be included in any published list of clockmakers. The one consolation is that the year of making this unusual alarm is known precisely.

Next month we are on firmer ground when a late eighteenth or early nineteenth-century longcase alarm from Normandy is considered. The quirky frame of the movement is typical of that region, and though the timepiece and the alarm are quite conventional, its tall case has some unusual constructional features.