A QUARTET OF ALARMS

A 30-hour iron alarm

part 1 of 4

Figure 1. Late seventeent -century 30-hour iron timepiece alarm with a single hand.

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john@mayfieldbooks.co.uk

As well as telling the time, clocks are often used to wake you up in the morning or to alert you to some forthcoming event. This was the primary purpose of the very earliest house clocks—the so-called 'monastic alarms'—that were employed to alert monks that they had to attend prayers or other church rituals. Sometimes they were used to tell a 'tower warden' that it was time for him to ring the church bells to call the faithful to prayer.

Alarm mechanisms are very simple affairs, usually comprising a crownwheel and a verge with a hammer at the top end that bounces from to-and-fro inside a bell. A weight pulley and winding click are fixed directly to the crownwheel without any intermediate gearing, while a let-off lever has two arms—one to lock the crownwheel and the other that either lifts or falls at the appropriate time. Alarm mechanisms are sometimes added to striking clocks, such as English lantern clocks, but if specifically designed for use in a bedroom where hourly striking would not allow much sleep, they are often a simple timepiece with an alarm.

Three of the examples considered in this short series are single-handed clocks of this type. These three come from rural areas of different countries in Continental Europe, while the fourth one is a two-hander from an English clockmaking 'factory'. Their ages span more than one and a half centuries and all have

Figure 2. The movement from the front.

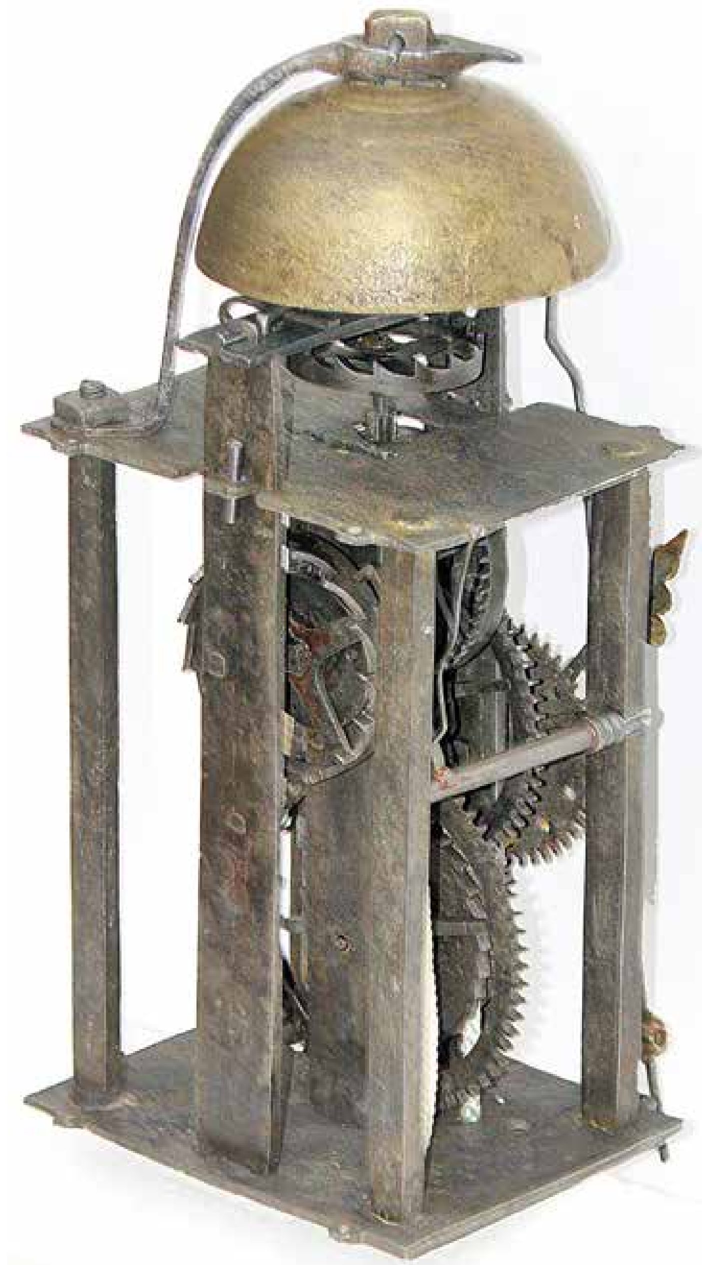


Figure 3. Rear of the movement.

different interesting features that have not been discussed in CLOCKS before. One is possibly from south Germany or the Alpine regions, another perhaps from Italy, the third is definitely French and the forth is nearer to home.

As soon as you start looking at country-made European clocks it very quickly becomes apparent that very few are signed and where they were made is largely informed guesswork. Collectors in Britain often do not appreciate how lucky they are that the great majority of clocks made in the British Isles are signed with the maker's name and his place of work. After a quick check in various reference books further details can usually be discovered, sometimes just the basic dates of birth and death or when the maker was in business, but often information on his/her family, apprentices or even religious affiliation may be known.

In contrast, while sophisticated Continental clocks may be signed, rural ones rarely are and very often even the country of origin is not known with certainty. Anything that you read about these clocks (and that is very little in the English language) should be treated with a good deal of caution as much that is written is pure guesswork. Very often it is the constructional and technical features that need to be considered to establish a clock's origin, rather than the decorative details of the dial, which might be the case with an unsigned British clock.

The first clock considered is shown in **figure 1** and is an example of the earliest and simplest method of setting the alarm. It is made virtually all of iron, has a painted round iron dial with a cresting, a single hand, a 'cowtail' pendulum swinging at the front of the dial and runs for a day. The dial is 101/4in (260mm) tall and 71/2in (190mm) wide and inside the chapter ring is a broad dark-green band with a simple design of foliage painted in black. The pendulum bob is a small brass ball and the iron hand has a brass facing, these, along with the square nut holding the front verge support and an added peg to trip the alarm, being almost the only parts of the whole clock not made of iron.

As an aside, many British clock collectors regard the painted dial to have been introduced in 1772, ignoring the fact that painted iron dials have been used on European Gothic clocks for up to three centuries before then. What the first Birmingham dialmakers actually developed was a method of producing painted dials with a smooth

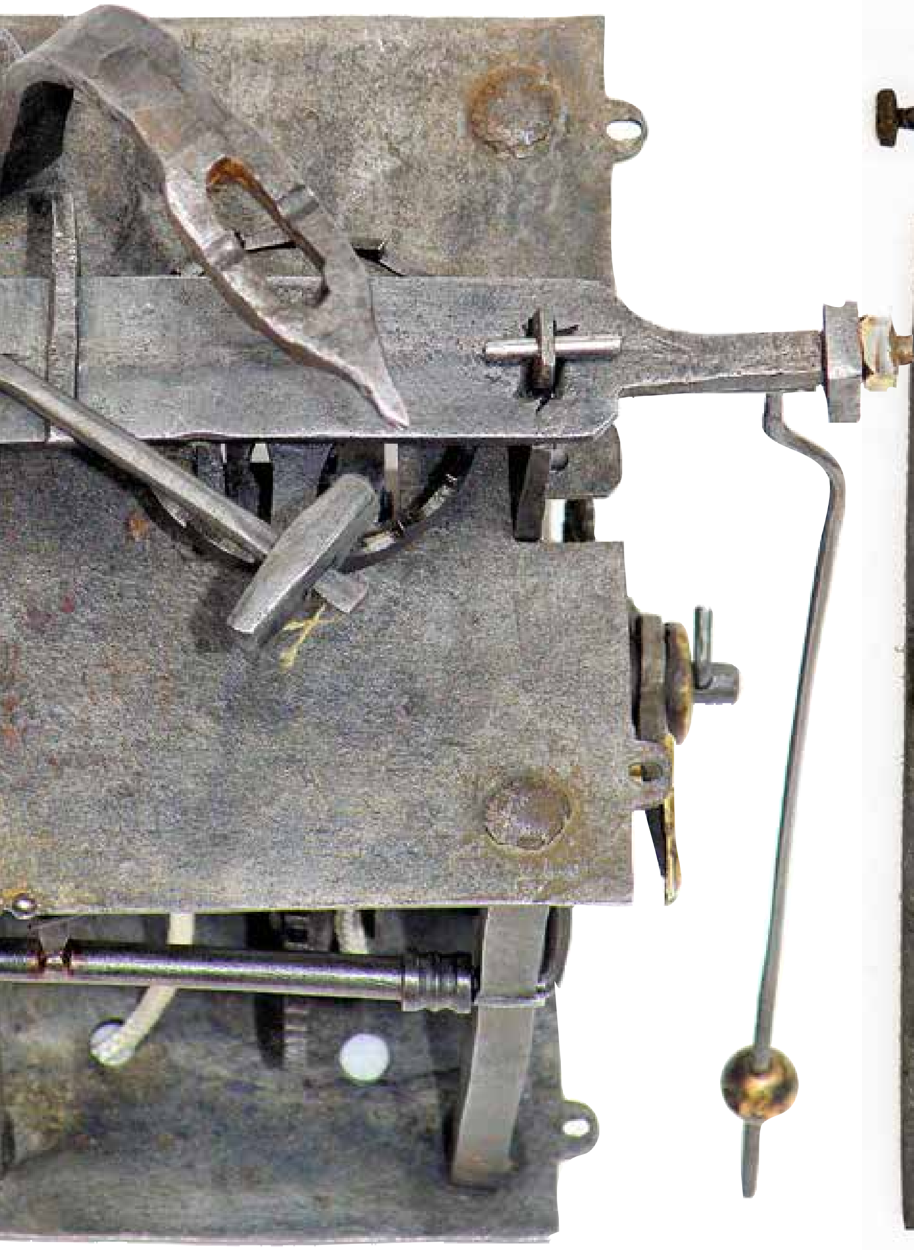


Figure 4. Top view if the movement.

Figure 5. The movement bars.

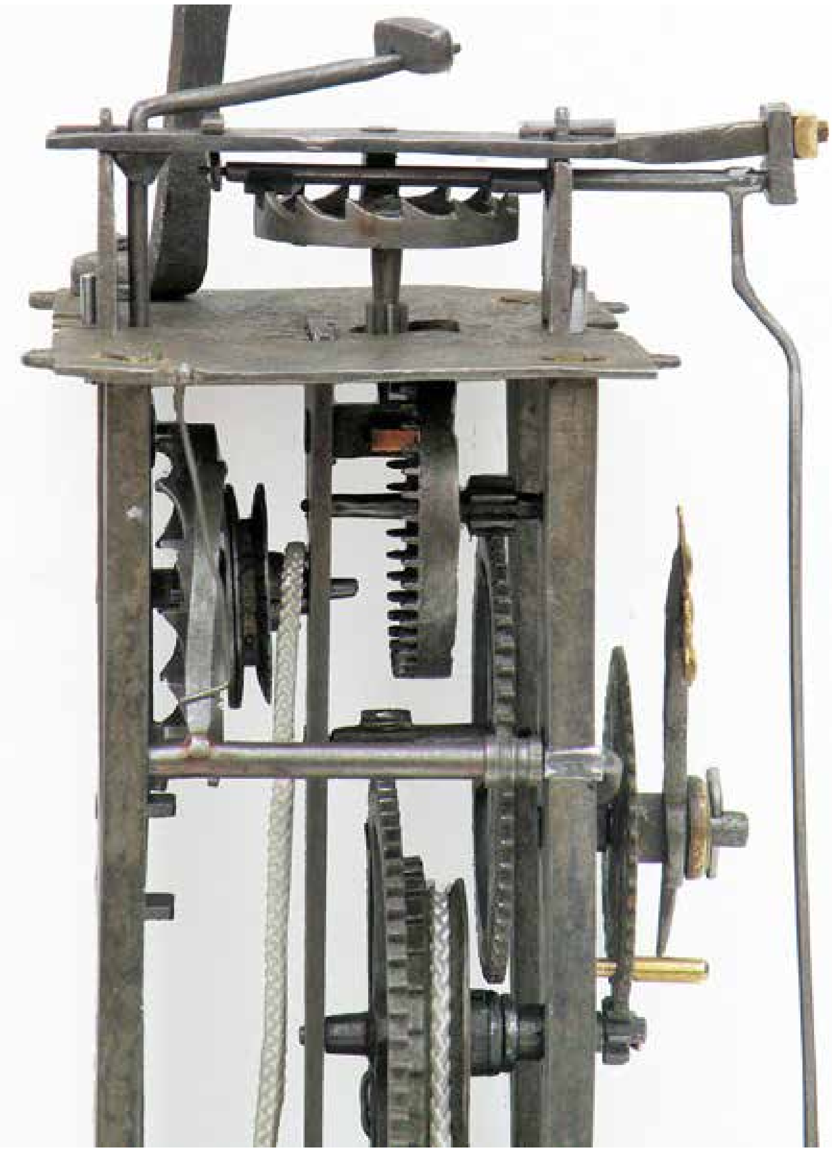
white surface that imitated vitreous enamel. The dial of this clock appears to be in a very distressed state, but its condition is typical of many iron clocks found today. While it is tempting to have the dial restored, since the exact image in the cresting cannot be determined, the advice has been to leave well alone rather than have it incorrectly repainted.

This shape of dial is often found on clocks from southern Germany, the German-speaking region of Switzerland and the Austrian Tyrol, while the construction of the frame, especially the movement bars and the method of supporting the verge of the escapement would confirm this. However, certain details, to be discussed later, are also found on clocks from the Italian Dolomites, and since it had previously belonged to an elderly clock collector in Rome this might suggest an Italian origin. At present it is probably safest just to say that it is 'Alpine'.

Regarding when this clock was made, the only thing that can be said definitely is that since the escapement is original (in fact the whole clock is very original with little modification or replacement) it must date to after 1658 when the pendulum was first introduced. How long after is difficult to judge, perhaps about 1680 or 1690. The type of alarm setting as well as the use of taper pins to hold the dial and the bell all indicate a relatively early date.

Figures 2 to **3** show the simple posted-frame movement, while the top view, **figure 4**, shows the crown-wheel, the support for the verge, the alarm hammer and the stand with a slot for the lugged bell. The movement bars are shown in **figure 5** and the first thing to note is that some of the pivot holes have small brass bushes, but these are probably later repairs. Some eighteenth century iron clocks do have brass bushes fitted as original, but they are relatively large plugs and the pivot holes are often drilled off-centre. The rectangular-section corner pillars are riveted to the top and bottom plates.

The front and rear movement bars have two lugs at the bottom that fit into holes in the plate (like English posted-frame clocks), but a slot near the top fits over a tenon filed in the plate edges and is held with a taper pin. The central bar simply sits in a slot at the top with a tenon at the bottom fitting into a slot and is held by a taper pin underneath. Tenons on the vertical extensions of the front and rear bars fit into slots in the top bar. This top bar has an arm riveted to the



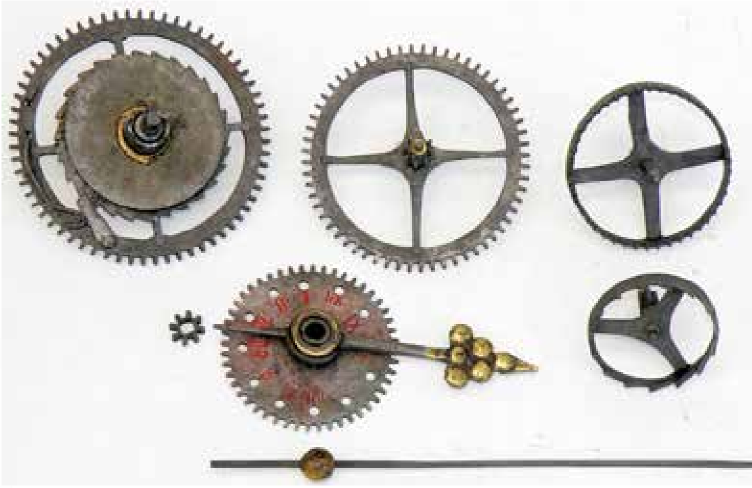


Figure 7. The going train, verge pallets and pendulum.

Figure 6. Side view of the escapement and alarm.

Figure 10. The bell with a lug to hold it.

top surface that curves round to supports the rear verge pivot below the bar. The narrower front of the top bar passes through the dial and the block that can be seen in **figure 6** supports the front verge pivot. (Continental verges have pivots at both ends, whereas English lantern and bracket clocks use a knife-edge at the rear of the verge.)

In **figure 6** the rope has been slipped off the alarm pulley to show the type of V-pulley that was usually used on Germanic clocks, even into the nineteenth century. A hard braided or laid (twisted) rope grips by wedging itself into the shallow angle of the pulley which has roughened sides, rather like a worn coarse file. Despite primarily relying on friction, this type of drive is very reliable, though of course a counterweight is essential. The parallel-sided pulleys with spikes that dig into a soft braided rope that we are used to seeing on English rope-driven clocks are confined to the western side of Europe. As well as English (and Welsh) clocks, they are also found on French and Flemish (Belgium) clocks.

It is these constructional details that provide clues to the clock's origins. The tenon and slot fixing at the top of the front and rear bars is typically Germanic (this term will be used to include all the German speaking areas adjacent to southern Germany), but the same method was normally used at the bottom end as well. Germanic clocks have square-section pillars with screwed ends held to the plates with square nuts, rather than the riveted pillars seen here. Yet this type of top bar supporting the verge is a typically Germanic construction. On French and many Italian iron clocks with verge escapements there are separate curved iron cocks screwed to the top plates. However, there is a valley in the Fiuli region of the Dolomites in the far north-eastern corner of Italy, bordering on Slovenia to the east and the Austrian Tyrol to the north, that made iron clocks with some of these features (although not the riveted pillars). So an origin in the far north of Italy is not ruled out. Readers can now appreciate some of the problems that arise when trying to research these rural clocks—and things do not get any easier when the next one is considered in Part 2.

The wheels and escapement of the going train are shown in **figure 7**. The great-wheel, which sits rather low in the frame and protrudes through a clearance slot in the bottom plate, has a rope pulley with teeth cut round the edge of the inner cheek and a separate click, rather than a circular spring click acting on the crossings. The V-pulley has no spikes but takes a hard rope that wedges between the roughened sides. Both this type of pulley and click (with the occasional exception) are not found on English and French posted-frame clocks, but are commonly found on those from regions further to the east and south. All the train wheels have separate forged rims and crossings, this being the usual method of making iron wheels, which are not cut from a sheet. Apart from the three-

Figure 8. The alarm mechanism.

Figure 9. The clock in its iron case.

spoked crownwheel the rest of the train wheel have four crossings. Also shown is the solid hour wheel with the hand fixed firmly to it. The counts are:

crown-wheel	15 — 5
contrate wheel	45 — 6
2nd wheel	60 — 8
greatwheel	64 — 8
hour wheel	48

This gives 180 beats a minute or a half second pendulum. The pendulum bob is a small brass ball that screws on to the rod for rating adjustment. The commonest Germanic method is a light brass disc held by friction and simply pushed up or down for adjusting the rate.

The alarm mechanism comprises the usual crown-wheel, this one with 15 teeth, and a pulley click that acts on the crossings, a verge with a hammer and a locking lever, **figure 8**. The crown-wheel pivots between an L-shaped cock on the rear movement bar (to let the verge lie centrally over the wheel) and the central bar. The bottom of the verge pivots in a cock on the rear bar, supported by an end block. The top end pivots in the cross bar which has a slot to allow the verge flags to pass through during assembly. The alarm lever is pivoted in the rear left-hand pillar and sits in a slot in the front pillar, held in place with a thin wedge. A wire spring helps it to relock. The general arrangement of the alarm is shown clearly in **figure 6**.

To see how the alarm operates we have to go back to **figure 7** and look at the hour wheel. This has 12 holes, each one accompanied by a red-filled Roman numeral, into which a peg can be inserted. As the wheel rotates the peg lifts the front arm of the alarm lever and the shorter rear arm then releases the crown-wheel. There are two consequences of this very basic system, which is the one found on Gothic and other early iron clocks. Firstly, the alarm can only be set to the nearest hour and secondly, the hand must be fixed to the wheel, which makes setting it to show the correct time rather inconvenient. If the hand was moveable then the alarm is unlikely to go off at the required time.

A similar situation occurs with iron balance-wheel clocks where the great-wheel rotates once an hour and has a pin to let-off the strike. Again the hand must be fixed or the strike will not sound when the hand reaches the hour. For these clocks (apart from just stopping it and restating at the correct time) the balance is lifted so the pallets disengage and are then re-engaged at the correct time—while holding onto the weight to prevent it crashing to the floor.

For a pendulum clock this method appears not to be possible, but there are a couple of ways of getting round the problem. With a verge escapement the pendulum can be lifted past the horizontal to free the pallets (again making sure that the weight is held to control the train which can now run freely). This works provided the there is sufficient clearance below the cross-bar for the pallets not to contact it. But for an alarm with a fixed hand there is an even simpler method: the taper pin holding the hour wheel and hand on its post can be removed and the wheel slid out of engagement with its pinion-of-report and put back so the hand points to the correct time. This only works for a timepiece, not a striking clock.

I cannot find either of these two methods mentioned in print and thought that this might be due to it being too obvious, but experienced horological contacts in Germany and Italy appear to be unaware of these methods. The introduction of a moveable hand, an alarm-setting disc and (for striking clocks) the starwheel, rendered the earlier methods obsolete. But these were known from the mid-sixteenth century so this clock was still using a system that was about a century and a half out of date. That is taking tradition to its extreme.

Like most of these iron clocks the movement is enclosed in a sheet-iron box-like case. Two small tabs at the rear of the top and bottom movement plates, seen most clearly in **figure 4**, fit into slots in the rear cover and are held by taper pins, **figure 9**. An identical arrangement at the front holds the dial. The side doors, which have 'proper' hinges, are just a push fit behind the dial and have door pulls but no turnbuckle or spring catches. The early type of lugged bell, **figure 10**, is held on a single-armed stand screwed to the movement top plate, while a hoop and spikes are riveted to the case rear for hanging the clock on a wall.

Iron clocks with the pillars and plates held together with screwed nuts, rather than a riveted frame as on this alarm, usually have a separate top cover with tubular spacers. The bell stand is then fixed to the top cover, which helps keep dirt from the escapement. Perhaps the riveted frame and lack of a top cover was just a consequence of it being a simple clock rather than due to any regional preference. The bells found on clocks from the Fiuli area of Italy have a distinctive stepped shape and are not lugged, so the bell of this clock is of little help in pinpointing its origins.

When researching any clock that appears to be unusual the first thing to do is scan though as many books and publication as possible to find something similar. Nothing like this alarm could be found and in any event few books show the movements and constructional details that are necessary to identity these clocks. Quite recently I can across a small Dutch book by W J F Hana who published a number of picture books on clocks, including the first one devoted to English lantern clocks, which was translated and an English edition published in 1979. The revised fifth edition of his *Klokkenkijkboek* (literally 'Clocks View Book' though 'A Picture Book of Clocks' would be a better translation), published in 1978, has unfortunately not been translated, but colour plate A and illustration 4 show an interesting alarm with some similarities to the one in this article.

The clock illustrated in the Hana book has a similar type of dial, hand and alarm, although the holes for the alarm-setting peg are on a separate disc, rather than drilled in the hour wheel itself. However, the very simple iron timepiece movement is a basic 'strip-frame' not a posted frame, and has a balance wheel, rather than a cowtail pendulum. No opinion is expressed as to its origins, but it is said to be about 1600. This may be optimistically too early as this type of frame was still being used on some Germanic clocks (often two-train and sometimes three-train) until the late eighteenth century and on some simple rural Dutch clocks in the early nineteenth century. Also the balance did not disappear overnight once the pendulum was introduced, despite the latter's acknowledged superiority. For instance an iron clock with an original balance made in northern Switzerland and dated 1706 is shown in *Lantern Clocks & Their Makers* by Brian Loomes.

Next month the iron timepiece alarm under discussion has an origin that is equally elusive and again there are conflicting clues. While it is weight-driven, key-wound and runs for a week, the alarm is spring powered. Perhaps best of all it is initialled and dated—but is that enough to tell us where it was made?