SWEDISH? S

Unsigned clock o

Figure 1. Iron dial with painted centre, re-gilded corners, pewter chapter ring and pewter spandrels.

Figure 2. Rear view showing the iron strip-frame movement.

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Unsigned clocks can often give rise to much deliberation as to their origin. This is not normally a problem with British clocks as they usually include a name, place and very occasionally a date, all of which is of great interest to the collector. However, this may not be the actual maker of all, or even any, of the clock, and is often just the retailer, selling an item under his own 'brand' name.

Unsigned clocks, especially those made by a rural clockmaker, are quite usual on examples from Continental Europe. With a combination of clues provided by the type of clock, its technical details and stylistic features, at least a country of origin can often be determined, but not always.

This has proved to be the case with the attractive little dial and movement shown in **figures 1** and **2**. Hence the question mark in the title. Several people have expressed the opinion that it is Swedish, but an experienced Stockholm horologist is uncertain, as will be discussed later.

Despite it being a simple timepiece, originally with a separate alarm mechanism (now missing, as many are), it is well made and quite sophisticated, so the title could have been 'Simple but Sophisticated Swedish? Strip-Frame', but that would be taking alliteration too far.

The iron dial is quite small. being only 7in (180mm) square, with a pewter chapter ring, pewter spandrels and the centre painted red. While each spandrel is fixed to the dial sheet with two small iron screws, the chapter ring, which does not have the hour numerals filled with black wax, is held with pewter rivets through the centre of four of the circular half-hour markers. As received, the corners were dark and the spandrels had been painted black so that not much detail could be seen.

Taking off the chapter ring and

TRIP-FRAME
f uncertain origin

Figure 3. Gilding on the dial plate under the spandrels.

Figure 4. A restored dial corner.

spandrels revealed traces of gilding underneath them, **figure 3**, so this was restored using gilt wax of a matching colour. Removal of the paint on the spandrels showed that it had been masking faces engraved on sun discs radiating beams of light, **figure 5**. The rear of the spandrels, **figure 6**, showed that the casting has a hollow back and was made using a two-part mould. The molten pewter was poured into a closed mould, not simply poured into an open mould, as brass spandrels appear to have been.

Cleaning the spandrels and re-gilding the corners resulted in quite a bright and cheerful dial. with the sun shining from each corner, **figure 4**. The polished iron hour hand is of an attractive shape with two of the cut-outs in the shape of hearts, **figure 7**, while the engraved brass alarm-setting disc fits on its pipe by a pentagonal hole, **figure 8**.

The simple iron strip-frame movement is only $5^{3}/_{16}$in tall, $1^{3}/_{8}$in wide and $2^{1}/_{8}$in deep (132mm by 38mm by 55mm). It has quite a different construction to strip frames from Germany, which have vertical movement bars united by horizontal bars at the top and bottom. These are a development of, or at least an alternative to, posted-frame clocks. In contrast this one has two vertical bars united by two rectangular iron pillars at the top and a single broader one at the bottom (**figure 9**), riveted at the rear and held with taper pins at the front.

Since the movement has only a simple three-wheel short duration train with no striking, and even the alarm was a separate unit, the plates do not need to be large, and have been reduced to narrow strips. The dial is held by short feet in the English manner, with two close together at the bottom and one at the top—again different to German practice where screws are usual. The iron plates of the movement have original inserted brass plugs, some of which have been re-bushed later.

The brass wheels have three crossings and are quite conventional, apart from the construction of the pulley and click. One very unusual, and as yet unexplained, feature is a wooden collar on the greatwheel arbor, which appears in some of the pictures, but not others. **Figure 10** shows the three train wheels at the top, the click and rope pulley below with the hour wheel and alarm pipe to their right.

The wheel counts are shown in a panel on the next page, giving the common 60 beats / minute and a one-second

Figures 5 and 6. Front and rear of the pewter spandrels.

Figure 7. The iron hour hand.

Figure 8. The alarm disc.

pendulum, with a duration of about one day. The hour wheel, with only 24 teeth, is driven by a small pinion of report with four prongs or pins.

The pinions have been cut using an engine, but that on the second arbor was in a very poor state. Not only was it badly worn, but part of the leaves had broken off, probably due to a slag inclusion, **figure 11**. Pinions on good quality clocks should be hardened and tempered, but on ordinary clocks they are often found to be relatively soft, being either not hardened or made from wrought iron. This pinion was clearly not usable and was replaced. The arbor fitted directly on to the wheel without a brass collet (though one was used on the escapewheel) and fitted into an hexagonal bore with just a small rim left on the arbor to act like a collet. The arbor swelled out in the centre and the replacement was finished to an identical profile using a graver, **figure 12**.

Rope pulleys on weight-driven clocks are connected to the great wheel by a ratchet and a spring-loaded pawl (usually called a 'click' when used on a clock). This

Wheel counts

Escapewheel	30	6
Second wheel	60	6
Greatwheel	72	4
Hour wheel	24	

Figure 10. The going train, click, pulley, hour wheel and alarm pipe.

Figure 9. The movement 'plates', anchor, backcock and support for the hour wheel.

allows the weight to drive the train of gears while also being temporarily disconnected to allow the pulley to rotate in the opposite direction during winding. The ratchet can be fixed to the greatwheel and the click on the pulley, or vice versa.

On English (also French and Italian) 30-hour clocks the crossings of the greatwheel act as a simple, though very coarse, ratchet, while a circular spring with a step riveted to the pulley acts as the click. This system has been used for centuries, but it can cause significant wear on the crossings. Putting a small pivoted click and its biasing spring on the rim of the greatwheel and cutting ratchet teeth round the edge of the inner face of the pulley gives much smoother winding and much less wear. This is the method used on German short duration clocks, as well as on most eight-day and longer duration clocks.

This timepiece has a variation on the latter system, but the click is on a separate removable disc that sits on a square section of the greatwheel arbor, while the ratchet is fixed to the pulley, **figures 13**

Figure 11. Worn and damaged second pinion.

Figure 14. Alternative views of the click and ratchet.

Figure 12 (above). Second wheel with replaced arbor and pinion.

Figure 13. Greatwheel, click, pulley and wooden collar.

Figure 15 (top left). The pulley and click assembled on the greatwheel arbor. Figure 16 (above left). Hour wheel with brass friction disc. Figure 17 (top right). Brass bush holding the hour wheel against the friction disc. Figure 18 (above right). The alarm pipe, let-off flag and friction disc.

and **14**. An advantage of this arrangement is that dirt is kept out of the mechanism. Since during winding there are no forces pushing the pulley along the arbor, a pipe on the pulley butting up against the inside of the front plate suffices to keep the ratchet and click in engagement.

Figure 15 shows the assembled greatwheel click and pulley. Also shown is the wooden collar that sits firmly on the arbor close to the concave front shroud of the pulley. This collar serves no practical function and it may be there for purely cosmetic reasons. The rear side of the click housing is turned to form a series of decorative steps, while the front pulley shroud is attached to the pipe by a rather excessive amount of solder. This can be seen in **figure 10**, but if this is the work of the original clockmaker or a later repair is not easy to determine. The wooden collar hides the soldered joint and this may have been its sole purpose—just to make it look neat and tidy.

The hour wheel, which is only 1in (25mm) diameter, also has an unconventional construction. For a single-handed clock the wheel must be a friction fit on its arbor so the hand

can be set to time. On English clocks a friction disc on the arbor is held against the wheel by a slotted retainer or a cross pin. On this clock a brass friction disc that is presumably hollow (it has not been dismantled) is held against the hour wheel by a brass bush forced on from the rear and also acts as a pivot, **figures 16** and **17**. The motionwork is completed by the alarm pipe with a let-off flag and a slotted and domed brass disc, **figure 18**.

The hand arbor is retained by an iron supporting ring (with clearance for the pinion of report) screwed to the front plate, **figure 19**. The alarm pipe sits over the arbor, **figure 20**, while the alarm-setting disc is fitted on to the pentagonal spigot and the friction disc is compressed slightly when the taper pin securing the hand is pushed into place. This support is necessary to prevent the hour arbor from moving forward and allowing the hour wheel to disengage from the pinion-of-report. It is not necessary when the hour wheel is on a pipe rotating on a post fixed to the front plate. If there is not a step in the hand arbor or alarm pipe, then a calendar flag or pin performs this function, or if there is no calendar a long pin in the hour wheel suffices, but it is not as elegant as the support used here.

Figures 21 to **23** show the assembled movement, but apart from the let-off tab there is no sign of where an alarm was fitted. The answer to this lies in the seatboard, **figure 24**, which has a couple of pairs of holes for an alarm rope. The pair of holes on the left (as viewed from the rear) do not have any associated holes for fixing screws. The alarm unit planned to be positioned here was moved to the right-hand side where there are two additional holes for wood screws. However, even here there is no depression or other mark to indicate that an alarm mechanism was ever fitted. It may well be that, though an alarm let-off flag and setting disc had been fitted, the customer decided not to proceed with adding the necessary crownwheel, verge, hammer and bell, instead using it as a basic timepiece. Since the hole in the dial had been made large enough to take the alarm pipe, this and the alarm disc was retained for purely aesthetic effect.

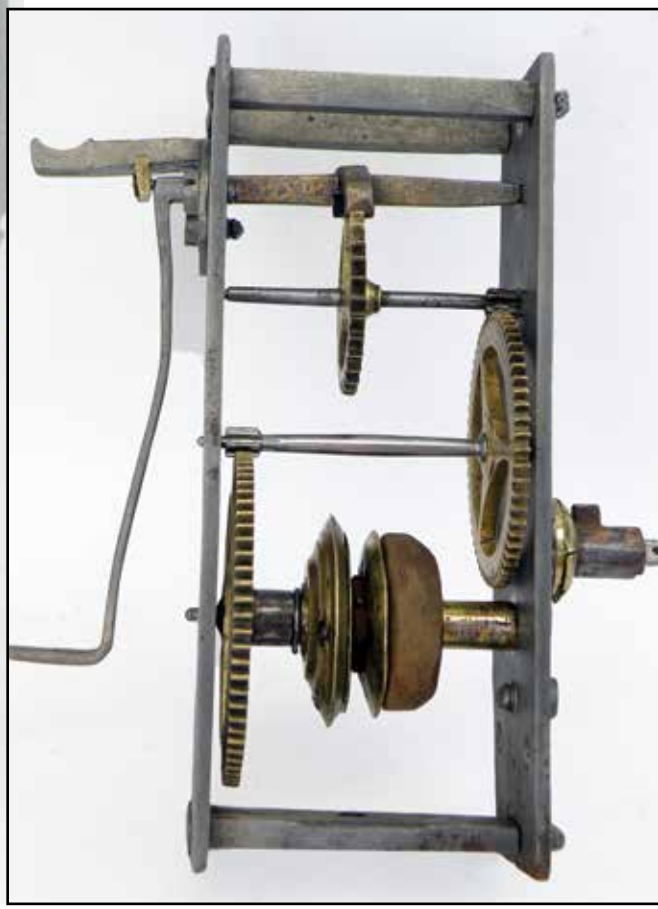
Another feature of the seatboard are locating slots for the lower ends of the narrow plates and a recessed area for the bottom pillar. They are very accurately and neatly cut so that the movement sits in exactly the correct position. Since the alarm mechanism (assuming that it had been fitted) needed to be precisely located in relation to the movement for the let-off linkage to work correctly, such a precise positioning of the movement was essential. The movement is fixed to the seatboard by a screw through a metal strap and into the lower pillar, **figure 25**.

Now we come to the question raised at the beginning of this article: where was it made? The German collector who sold the clock thought it was Swedish, as did a Dutch collector and a Dutch dealer who specialises in iron and rural clocks. Strip-frame movements are not infrequently found on Swedish rural longcase clocks, but they are usually cruder in construction than this example.

In situation like this the best recourse is to ask a knowledgeable expert, so I sought the opinion of a Swedish collector of iron and other local clocks. He replied that though he had seen a number of clocks with similar movements, none were exactly like this one. The dial could be Scandinavian, but he had not seen hal

Left to right

Figure 19. The hand arbor retained by a support screwed to the front plate.
Figure 20. The alarm pipe sits over the hand arbor.
Figure 21. Front of the movement.
Figure 22. Rear view.
Figure 23. Side view.



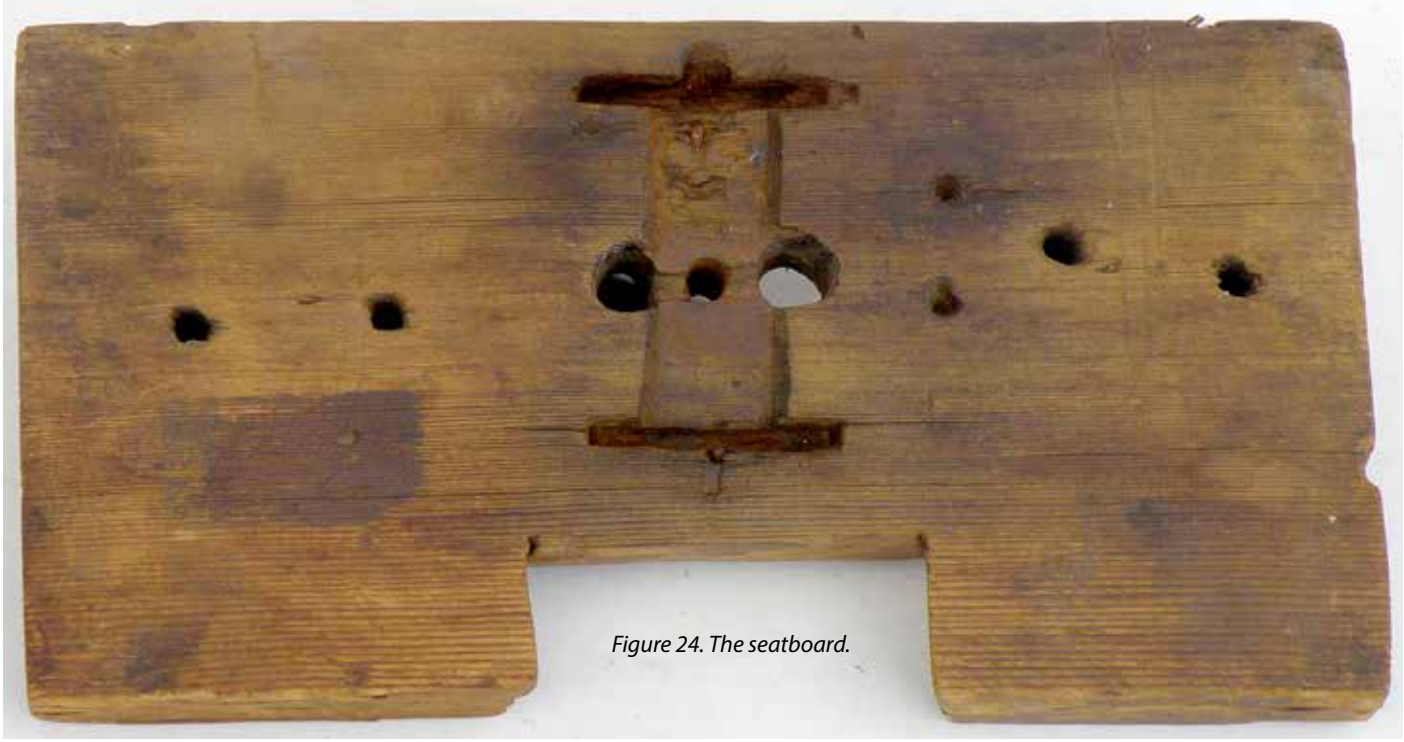


Figure 24. The seatboard.

hour markers like these, not this pattern of spandrel, which might have been made by the clockmaker himself. Also most rural Swedish clocks have 64 beats / minute, though there are numerous exceptions.

He made the interesting observation that there is no sign of woodworm in the pine seatboard. Woodworm exists in Skåne (Skania) County in the very south of Sweden, Denmark and the rest of Europe. But they cannot survive the cold climate of the rest of Sweden, Norway or Finland, indicating that these areas of Scandinavia are a likely origin.

Despite the reservations I have a feeling that this clock may well turn out to have originated in Sweden—time will tell. It is much easier to say where it was *not* made and constructional features eliminate Britain, France, Belgium, the Netherlands, Italy and much of Germany. My guess is that it dates from the third quarter of the eighteenth century. If it had originally been housed in a long case it would have been very slender, so it is more likely that it had been used as a hooded wall clock.

This little timepiece movement, which has suffered the indignity of losing both its case and alarm mechanism, is well made, neatly finished and of good quality. The click and pulley arrangement, as well as the support for the hour wheel, are more sophisticated than on most country-made clocks, and the inclusion of a wooden collar just to improve the appearance of the movement indicates the work of a craftsman proud to produce a good product. We can forgive the poor pinion, as its shortcomings due to faulty materials would not have become apparent until it had been in use for a considerable period.

Acknowledgement

Grateful thanks are due to Eric Read of Stockholm for useful discussions.

Figure 25. Underneath the seatboard