

Retrograde display mechanism

Example embodiments of this invention seek to provide a retrograde display mechanism.

Retrograde displays known as rack displays are known, driven by short-addendum toothed pinions. These rack mechanisms comprise a rack rotating on a staff, with a hand attached to the rack. The rack is a relatively large part, which means that these mechanisms take up a significant amount of space in a timepiece. A large number of mechanisms made up of a feeler in contact with a snail are also known. The snail rotates on a staff and is attached to a hand. The snail is produced depending on the information to be displayed, and has a straight part at the end of its travel that enables the feeler to return to its original position under the action of a spring.

The example embodiments seek to produce a retrograde display mechanism that takes up little room whilst operating reliably.

According to a first aspect of the present invention, there is provided a retrograde display mechanism comprising: a star attached to a sprocket, the star having a series of points, each point having a flank; a feeler for pressing against one of the flanks under the action of a spring; and a hand connected to the feeler; wherein the flanks are shaped and sized depending on the information to be displayed.

In a preferred embodiment, the feeler, the hand and the spring are mounted on a barrel rotating on a staff. The mechanism comprises a stop that blocks the recoil of the barrel after the feeler has finished its travel along the flank of the

point of the star and drops onto the next flank for another cycle.

The flanks of the points of the star may be of such a shape and size as to produce a linear display.

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The drawing shows, as an example, an embodiment of a retrograde display mechanism according to the invention.

In the drawing:

- figure 1 shows a top view of the mechanism,
- 10 - figure 2 is a cross-section through the staff holding the hand in the mechanism,
- figure 3 is a similar view to the view in figure 1, with the retrograde feeler in an end position prior to the resetting of the hand, and
- 15 - figure 4 is a top view of the retrograde star.

Figures 1 to 4 of the drawing show a simplified retrograde sector display mechanism. In horology, this display is used, for example, to indicate the power reserve of a watch or, in this case, the sweep-second. It has the advantage of not jumping. The hand is moving all the time, unlike many retrograde movements of the prior art.

The mechanism comprises:

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- a retrograde star 1,
- a spiral spring 2,
- a retrograde feeler 3,
- a spiral spring fixing pin 4,
- a stop pin 5, and
- 30 • a hand 6.

The retrograde mechanism is driven by means of wheels R1 and R2. The retrograde star 1 is attached to the wheel R2 and has several identical points evenly spaced around its circumference.

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The tip of the retrograde feeler 3 is in constant contact with a point of the retrograde star 1 and presses against the flank B of the said point. The spiral spring 2 maintains this constant contact. The cross-section of the staff A (figure 2) shows the mechanism in detail. The spiral spring 2 is attached to the barrel 7. Similarly, the retrograde feeler 3 and the hand 6 are pressed onto the barrel 7. The barrel is free on the staff A. The pin 4 is used to hold the spiral spring 2.

During operation, the retrograde mobile R2 rotates clockwise, driving the tip of the retrograde feeler 3 by means of the flank B. When the tip reaches the end of its travel (figure 3), the flank releases the feeler, which drops onto the next flank C. The process is repeated on flank C to the next flank. The hand is thus in constant movement. The pin 5 acts as a stop during the drop, and prevents the tip of the retrograde feeler 3 from falling to the bottom of the profile of the retrograde star 1.

The flanks B, C of the points of the retrograde star 1 are carefully designed so that the retrograde hand 6 moves linearly on a dial, not shown.

As shown in figure 2, the spiral spring 2, the retrograde feeler 3 and the hand 6 are pressed onto the barrel 7, and are consequently fixed in their respective positions on the said barrel 7.

The spiral spring 2 is tensioned, and fixed to the frame of the mechanism by means of the pin 4. As shown in figure 1, the hand 6 is at the beginning of its travel against the stop 5 and the retrograde feeler 3 is also at the beginning of its travel in contact with the flank B of a point of the retrograde star 1. The star 1 attached to the wheel R2 is driven in the direction of the arrow (see figures 1 and 3) by the mobile R1, and in turn drives the feeler 3, which, as the wheel R1 turns, moves along the flank B of the point of the star 1. The hand 6, which is in a fixed position relative to the feeler, is driven by the said feeler 3 against the action of the spring 2, and

indicates the values displayed on the dial, not shown. When the feeler 3 goes beyond the position shown in figure 3, the spring 2 returns the feeler 3 and the hand 6 to their original position pressing against the stop 5, and the cycle can begin again on flank C of the star 1.

The mechanism described above with reference to figures 1 to 4 can be adapted to indicate any type of information usually displayed by a timepiece, such as seconds, minutes, hours, dates, days, phases of the moon, etc. The mobiles R1 and R2 must simply be sized appropriately and the points of the star 1 adapted to the values to be displayed.

The device described offers the advantage of being simple and of providing a constantly moving display. As soon as the feeler passes a point of the star, the next cycle starts and the display continues without interruption.

CLAIMS:

1. A retrograde display mechanism comprising:
 - a star attached to a sprocket, the star having a series of points, each point having a flank;
 - a feeler for pressing against one of the flanks under the action of a spring; and
 - a hand connected to the feeler; wherein
 - the flanks are shaped and sized depending on the information to be displayed.
2. A mechanism according to claim 1, wherein the feeler, the spring and the hand are mounted on a barrel rotatable about an axis.
3. A mechanism according to claim 2, wherein the barrel is rotatable on a staff.
4. A mechanism according to claim 2 or 3, further comprising a stop to block the recoil of the barrel under the action of the spring when the feeler has come to the end of its travel on one flank and drops onto a next flank.
5. A mechanism according to any one of the preceding claims, wherein the flanks of the points of the star are shaped and sized so that the position of the hand provides a linear display.
6. A mechanism according to any one of the preceding claims, wherein the information includes time in seconds, minutes, hours; date; day of the week; or phases of the moon.
7. A mechanism according to any one of the preceding claims, wherein the points of the star are disposed on an imaginary circle centred on the axis of rotation of the star.

8. A mechanism according to any one of the preceding claims, arranged such that as the star rotates in a first direction the feeler moves along in contact with the flank of a first one of the points, to the end of the first point and then drops off to contact a flank of a second point.