

# United States Patent

Dubois

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## [54] TIMEPIECE HAVING OSCILLATING ROTATION INDICATOR

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## [30] Foreign Application Priority Data

March 26, 1970 Switzerland .....4600/70

- [52] U.S. Cl. ....58/125 R, 58/88 G, 58/95 R  
 [51] Int. Cl. ....G04b 19/02  
 [58] Field of Search.58/125 R, 126 R, 126 D, 127 R, 58/125 B

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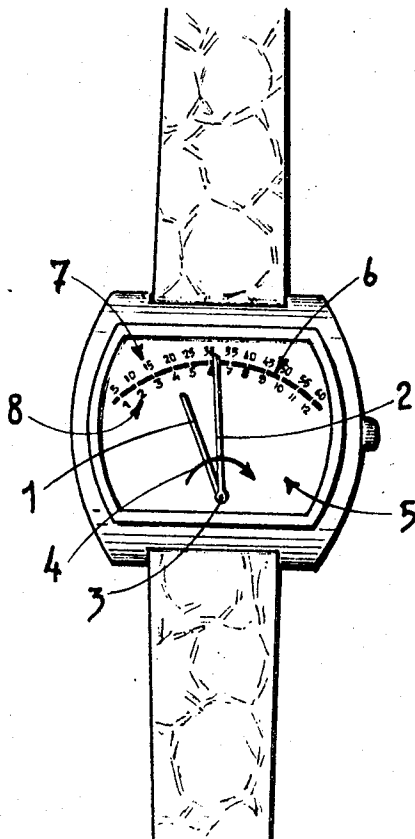
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## [57] ABSTRACT

A timepiece with an oscillating rotating indicator, accomplishing slow displacements followed by instantaneous return to initial starting position, characterized by the fact that it comprises at least one snail-shaped cam driving an oscillating rotating lever controlling the indicator, the lever being pressed against the cam by an elastic return device, the slow travelling of the indicator resulting from the lever climbing the snail-cam and its instantaneous return resulting from the lever falling along the sharply cut edge of the cam, when the cam rotates.

3 Claims, 7 Drawing Figures



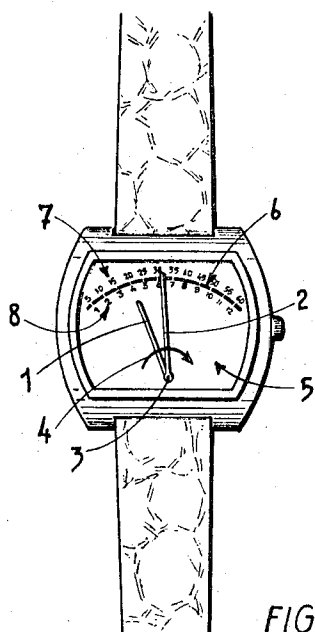


FIG. 1

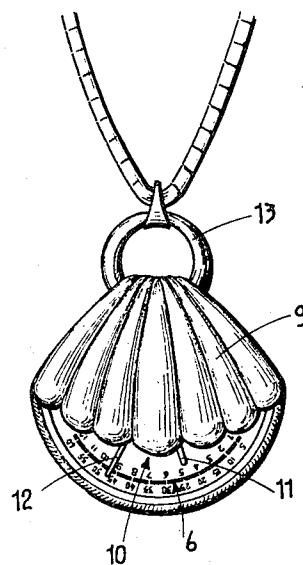


FIG. 2

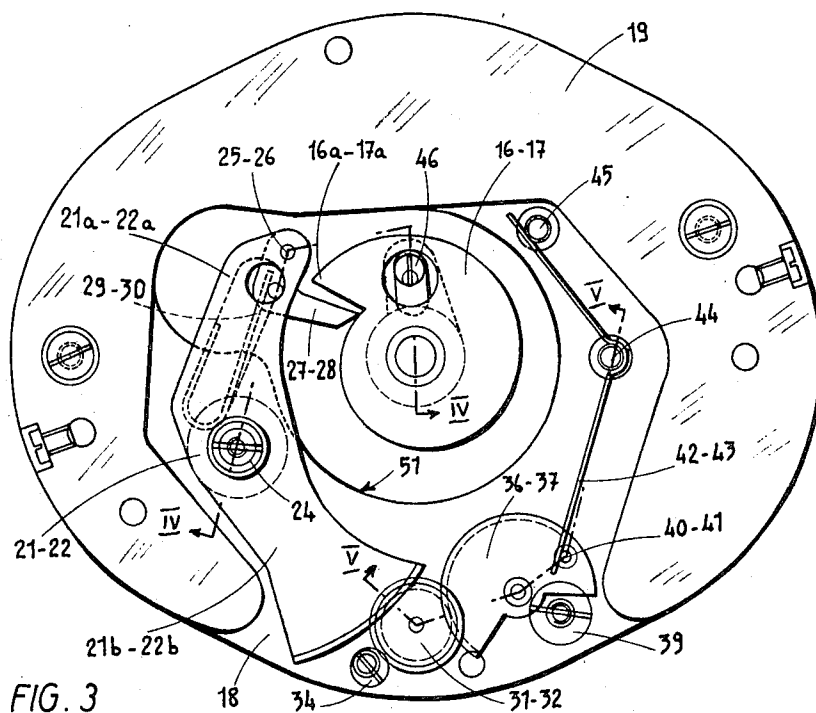


FIG. 3

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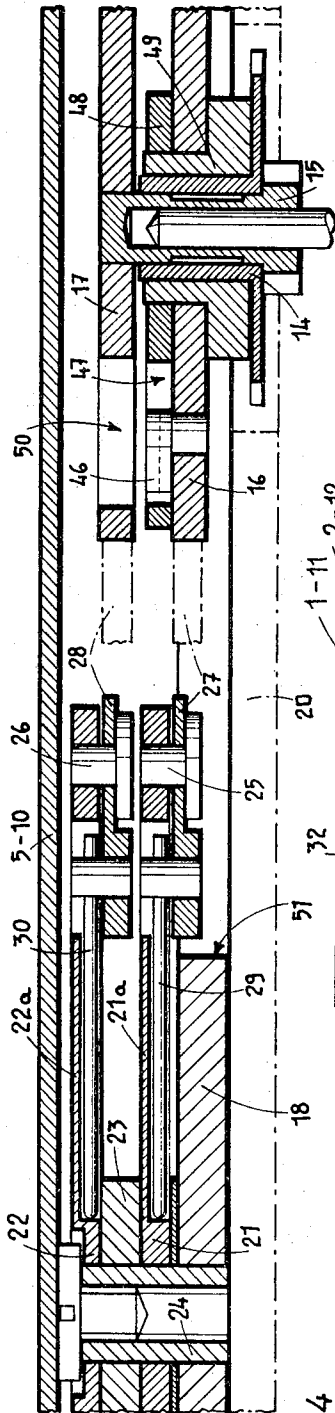


FIG. 4

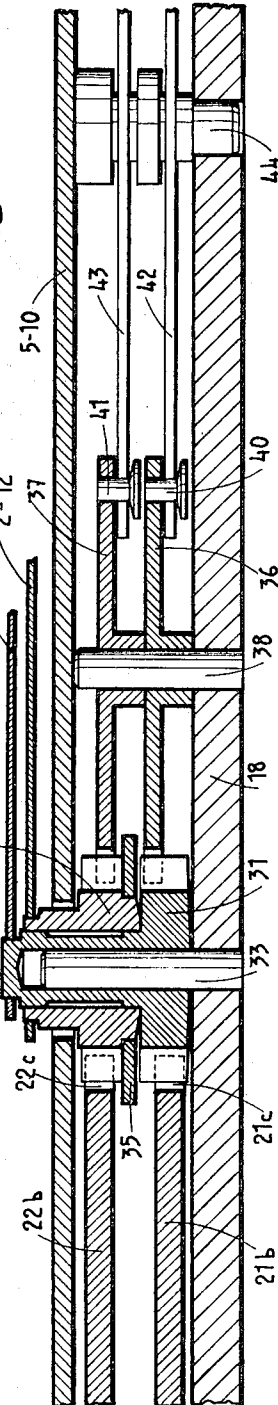


FIG. 5

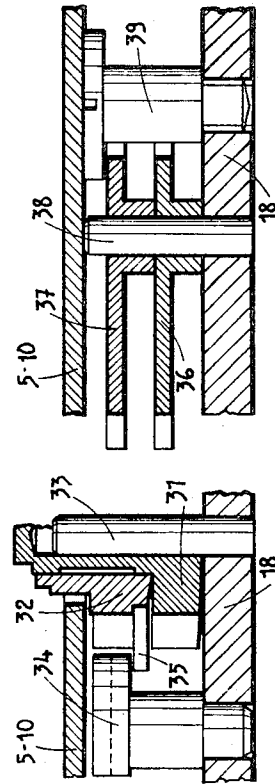


FIG. 6

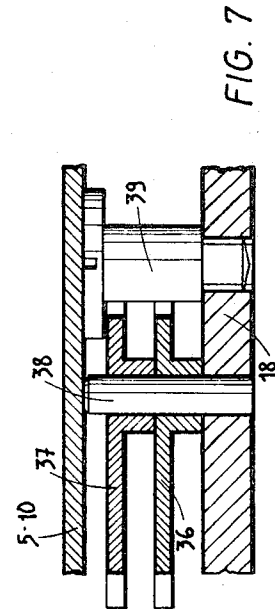


FIG. 7

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# TIMEPIECE HAVING OSCILLATING ROTATION INDICATOR

The present invention concerns a timepiece having an oscillating rotating indicator. Said indicator accomplishes slow displacements followed by instantaneous come-back to initial starting position.

This timepiece comprises at least one snail-shaped cam driving an oscillating rotating lever controlling said indicator, said lever being pressed against said cam by an elastic return device, the slow travelling of the indicator resulting from the lever climbing the snail-cam and its instantaneous return resulting from said lever falling along the cut edge side of the cam, when the cam rotates.

The annexed drawings represent two different constructions which illustrate the invention.

FIG. 1 is a plan view of a wrist-watch.

FIG. 2 is a plan view of a pendent-watch.

FIG. 3 is a plane view of an independent frame-work which can be attached to the clockwork movement of either one or the other watch of FIG. 1 and FIG. 2, at an enlarged scale.

FIG. 4 is a scaled-up sectional view along line IV—IV of FIG. 3, at an enlarged scale.

FIG. 5 is a sectional view, along line V—V of FIG. 3, at the scale of FIG. 4, and

FIG. 6 and 7 are sectional views of two portions of the mechanism, for showing the details.

The wrist-watch of FIG. 1 has a minute-hand 2 and an hour-hand 1 which pivot at a point 3 located outside of the center of the clock-work. They travel slowly in the direction of the arrow 4 and come back instantaneously to their starting position. The calibration 6 of the dial 5 is an arc concentric to point 3. This calibration has two scales; the outside scale 7 has sixty divisions for showing the minutes with hand 2, the inside scale 8 has twelve divisions for indicating the hours by means of hand 1.

In the present example, scale 7 goes, left to right, from five to sixty, thirty being in the middle, whereas scale 8 goes, left to right, from one to 12, six being in the middle. It is however possible to have scale 8 with the figure twelve in the center and six being at the beginning and at the end of said scale.

The watch shown in FIG. 2 is a pendent-watch the case 9 of which partially overlaps dial 10. This way, only the tips of hands 11 and 12 are visible. These hands have their pivot in the vicinity of the pendent-clip 13, outside of the center of the clockwork. The calibration is similar to that of the wrist-watch of FIG. 1.

The work of these two watches comprise two snail-cams 16 and 17 respectively mounted on the hour-wheel 14 and on the cannon pinion 15 (FIG. 4), in lieu of the usual hour and minute-hands, respectively. These cams are driving a mechanism which is entirely carried by an independent frame-work which comprises a base-plate 18 and a stirrup shaped brace 19 which covers the outside part of said base-plate. Said base-plate is attached to the base-plate of the clockwork in lieu of the ordinary dial, by means of feet not shown which fit the usual dialfoot holes. The watch-dial 5 or 10, according to FIG. 1 or FIG. 2, is mounted on the brace 19.

The independent frame-work carries the mechanism which comprises two oscillating rotating levers 21 and

22, mounted coaxially one above the other, separated by a brace 23, both hinged on a journal 24 carried by the independent frame-work base-plate 18. Each lever has two arms; one of these arms, designated with reference to the two levers, by 21a and 22a respectively, carries a pawl 27, respectively 28, hinged in 25, respectively in 26, and drawn back by a return-spring 29, respectively 30, said spring being attached to the corresponding lever.

The two other arms 21b and 22b, respectively, of each lever 21 or 23, have a toothed arc or sector 21c, respectively 22c, in mesh with a pinion 31, respectively 32. These two pinions are coaxial and bush-type; the first is engaged on a swivel-pin 33 carried by the plate 18, the second being engaged on the bushing of the first one. Pinions 31 and 32 carry the hour- and minute-hands respectively. These are shown by 1 and 2, or by 11 and 12 in FIG. 1 or 2 respectively.

Pinions 31 and 32 are held in place by an excentric attached to plate 18 and bearing on a disc 35 forced on pinion 32 (FIG. 6).

Pinions 31 and 32 mesh with two toothed-sectors 36 and 37 placed coaxially and one above the other on a journal 38 carried by the plate 18. Sectors 36 and 37 are secured by a screw 39 carried by plate 18 (FIG. 7). Each of these sectors 36 and 37 respectively carry a peg 40, respectively 41, on which rests a blade-spring 42, respectively 43, said springs being retained by two lugs 44 and 45 of the plate 18. Through the medium of sectors 36 and 37, and pinions 31 and 32, springs 42 and 43 respectively work to elastically press oscillating levers 21 and 22 on cams 16 and 17 respectively, by means of pawls 27 and 28 respectively. When the cams turn clockwise, they slowly rock levers 21 and 22 backwards, driving pinions 31 and 32 clockwise and bending progressively springs 42 and 43. It is noticed that the gear-ratio between pinions 31 and 32 and toothed-sectors 36 and 37 is such that the amplitude of the rotating stroke of the sectors is smaller than the amplitude of rotation of the pinions. When the pawls 27 and 28 are caught by the sharply cut edge of the cams 16a and 17a, respectively, levers 21 and 22 instantaneously fall back to their initial position by the action of springs 42 and 43. Simultaneously, the watch-hands come back to their initial position, i.e. zero.

It is to be noticed that the position of one of the cams can be adjusted with regard to the other. For this, the cam 16 carries an excentric 46 (FIG. 3 and 4) fitted in an elongated aperture 47 of a plate 48 mounted on a hub 49 itself mounted on the hour-wheel 14. The excentric 46 can be turned with a screw-driver through opening 50 of the snail-cam 17; this modifies slightly the position of cam 16 with respect to cam 17 and facilitates fine adjustments.

Pawls 27 and 28 being hinged on levers 21 and 22 respectively and being elastically retained only by springs 29 and 30, they are able to move against this retaining action in the case whether the cams turn anti-clockwise, e.g. when the hands on the watch are re-set manually. This move of the pawls prevents a damage to the mechanism which would otherwise occur if arm-ends 21a and 22a respectively were to directly hit the sharp edge on cams 16 and 17 respectively.

It is to be noticed also that the whole mechanism, excepted cams 16 and 17, is carried by an independent

frame-work, that is base-plate 18 and brace 19; thus any clockwork can be adapted to fit the construction of the invention and transformed into a watch of the types described herein; all this can be done without any elementary modification of the movement under consideration. It is sufficient to install two snail-cams in place of the regular hands of the watch, then to replace the regular dial by bottom-plate 18. The cams thus appear through a central opening of the plate 18 so as to rest at a level above the level of the plate 18, that is to say at the level of the pawls 27 and 28 which thus correctly engage on the cams.

The disposition of the present invention can be applied to any type of watch : pocket or wrist-watch with manual or automatic winding-system, of any sizes; it can also be applied to clocks and other timepieces.

What I claim is :

1. Timepiece with oscillating rotating indicator accomplishing slow displacements followed by instantaneous return to initial starting position and comprising: at least one snail-shaped cam driving an oscillating rotating lever controlling the indicator, the lever being pressed against the cam by an elastic return device, the slow travelling of the indicator resulting from the lever climbing the cam and its instantaneous return resulting from the lever falling along the sharply cut edge of the cam as the cam rotates characterized by the fact that it comprises an elastically-returned pawl hinged on the

lever, the pawl being in contact with the cam, the pawl being biased to give way when the cam turns backwardly.

2. Timepiece with oscillating rotating indicator accomplishing slow displacements followed by instantaneous return to initial starting position and comprising: at least one snail-shaped cam driving an oscillating rotating lever controlling the indicator, the lever being pressed against the cam by an elastic return device, the slow travelling of the indicator resulting from the lever climbing the snail-cam and its instantaneous return resulting from the lever falling along a sharply cut edge of the cam when the cam rotates, the lever having two arms with one of the arms coacting with the snail-cam and the other of the arms driving the indicator, and the other of the arms of the lever having a toothed-arc meshing with a pinion integral with the indicator and characterized by the fact that the elastic return device comprises a toothed-sector meshing with the pinion, the sector carrying a journal on which bears a control return spring.

3. Timepiece as claimed in claim 2 and characterized by the fact that: the gear-ratio between the pinion and toothed-sector controlled by a return spring is such that the rotating stroke of the sector has a smaller amplitude than the rotating stroke of the pinion and of the indicator carried by the pinion.

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