Sept. 18, 1934. G. L. HENRY 1,973,898

WINDING MECHANISM FOR TIMEPIECE DRIVING SPRINGS

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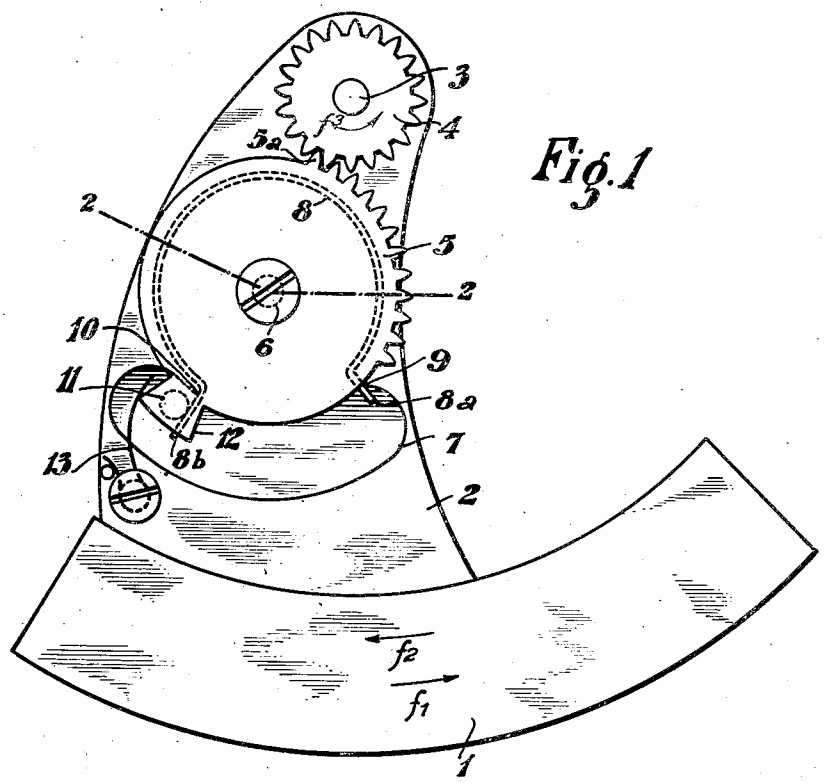

Fig. 1

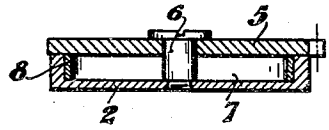

Fig. 2

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WINDING MECHANISM FOR TIMEPIECE DRIVING SPRINGS

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3 Claims. (Cl. 58—82)

This invention relates to winding mechanism for the driving spring of timepieces and particularly to pendulum actuated winding mechanism as used in self winding watches.

An object of the invention is to provide a winding mechanism of the above type which is extremely simple in construction and without using the usual pawl and ratchet device for transmitting movement from the pendulum to the winding train, which device is rather expensive.

The accompanying drawing illustrates one embodiment of the invention.

Figure 1 is a plan view of the pendulum and of the mechanism for transmitting movement to the winding train;

Figure 2 a section along the line 2—2 of Figure 1.

The winding pendulum comprises a weight 1 and an arm 2 connected to the weight and mounted on a pivot 3 fixed to the movement frame. A toothed wheel 4 can turn around the axis 3, this wheel being the first gear of a train connecting the arm 2 to the spring barrel of the watch. The arm 2 carries a satellite gear 5 freely mounted on its shaft 6 and toothed over about one third of its periphery, the toothed portion meshing with the wheel 4. The arm 2 is provided with a cavity 7 in which is lodged a blade spring 8 of circular shape and of which the two ends abut against the edges 9 and 10 of the cavity 7. The end 8*a* of the spring stays immobile relative to the arm 2, while the end 8*b* can be moved by a pin 11 carried by a lug 12 on the satellite wheel 5. The lug 12 is subjected to the action of spring 13 which is weaker than the spring 8.

When the driving spring of the watch is deenergized and the winding weight oscillates in the direction of the arrow *f*, the satellite wheel 5 abuts with its pin 11 against the end 8*b* of the spring 8. This spring end does not yield and as the satellite is thus prevented from turning about its axis, moves together with the pendulum about the axis 3 and drives the wheel 4 in counter-clockwise direction as indicated by the arrow f_3, this being the winding direction, so that winding of the driving spring is effected. When the pendulum moves in the direction of the arrow f_2, the tooth 5*a* of the satellite wheel 5 jumps over the teeth of the wheel 4 in the manner of a pawl, this movement of the satellite being permitted owing to the action of the spring 13 forming a yieldable stop for the satellite wheel. Rotation of the wheel 4 in clockwise direction is prevented by an ordinary holding pawl used in connection with the driving spring of the watch.

When the driving spring is fully wound, and the weight oscillates in the direction of the arrow f_1, the wheel 4 cannot turn about the axis 3. The satellite wheel 5 is then forced to turn about its proper axis, its pin 11 acting on the end 8*b* of the spring 8, which end is thus approaching the end 8*a*. When the weight oscillates in the direction of the arrow f_2, the satellite wheel turns in opposite direction and the spring 8 is detensioned. The satellite wheel acts thus on the driving spring as long as this latter is not fully wound; afterwards it acts only on the spring 8.

The described winding mechanism is extremely simple, as usually it is necessary in pendulum actuated winding means to provide a pawl and ratchet for transmitting the movement from the weight to the spring barrel, while in the present case only a spring blade 8, a lug 12 and a pin 11 are necessary; the spring is very cheap and owing to its circular shape and to the manner in which it is subjected to stress, it will last for a long time before being fatigued.

I claim:

1. In pendulum actuated winding mechanism for the driving spring of timepieces, said mechanism comprising a train of wheels connecting the pendulum to the driving spring and including a gear wheel mounted on the axis of rotation of the pendulum, a satellite wheel rotatably carried by the pendulum and meshing with said gear wheel, the pendulum being provided with a cavity beneath the satellite wheel, a circular blade spring inserted in said cavity and having one end fixed with respect to the pendulum, the other end of said spring projecting from said cavity, and means on the satellite wheel acting on said projecting spring end upon oscillation of the pendulum in winding direction, whereby the satellite wheel transmits movement to the driving spring as long as the resistance opposed by the driving spring is smaller than that of said circular blade spring.

2. In pendulum actuated winding mechanism for the driving spring of timepieces, said mechanism comprising a train of wheels connecting the pendulum to the driving spring and including a gear wheel mounted on the axis of rotation of the pendulum, a satellite wheel meshing with said gear wheel and rotatably mounted on the pendulum, said satellite wheel being toothed over a portion only of its periphery, a spring

carried by the pendulum and having one end fixed with respect to the pendulum, means on the satellite wheel acting on the other end of said spring upon oscillation of the pendulum in winding direction, and means for yieldingly maintaining the satellite wheel against rotation when the pendulum oscillates in opposite direction.

3. A pendulum actuated winding mechanism as claimed in claim 2 wherein said means for yieldingly maintaining the satellite wheel against rotation is a spring of smaller force than said spring inserted in the cavity of the pendulum and acted upon by the satellite wheel when the pendulum oscillates in winding direction.

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