Dec. 8, 1953 H. THIÉBAUD 2,661,591

WATCH MOVEMENT HAVING AN AUTOMATIC WINDING MECHANISM

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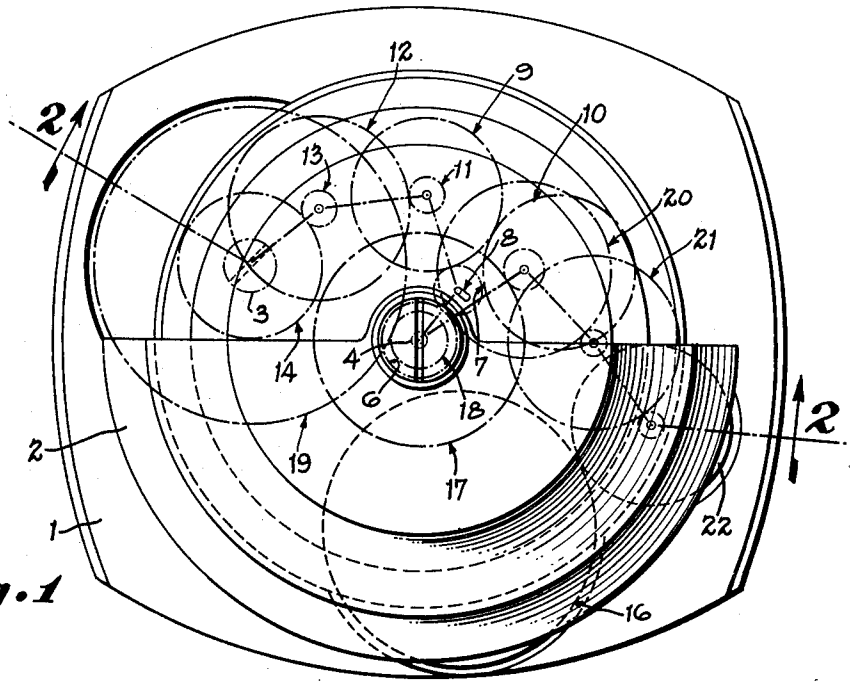


Fig. 1

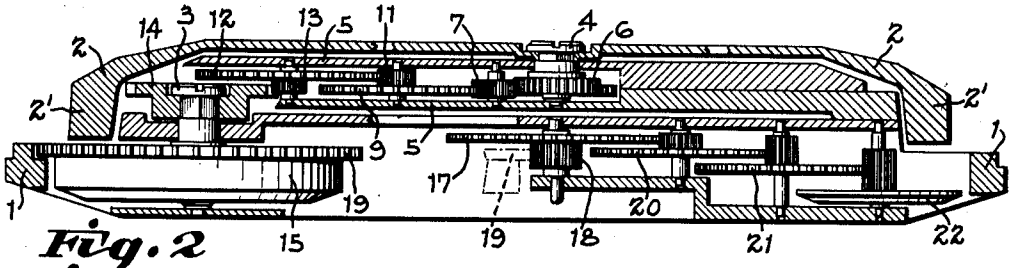


Fig. 2

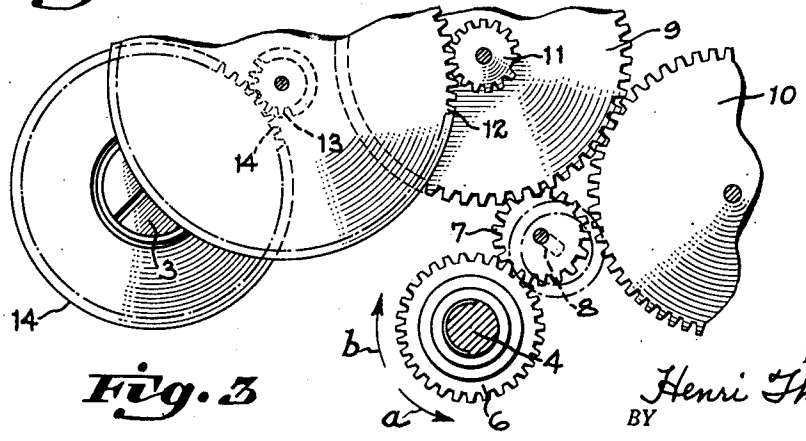


Fig. 3

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WATCH MOVEMENT HAVING AN AUTOMATIC WINDING MECHANISM

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1 Claim. (Cl. 58—82)

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This invention relates to watch movements having an automatic winding mechanism for the spring motor of the type comprising an oscillatory weight which is pivotally mounted in the center of a non-circular movement plate.

In watches having such non-circular or oblong movement plates, the various watch movement elements usually are arranged within a circular circumference so as to allow the oscillatory weight to turn along a circular path surrounding the movement elements. Automatic winding mechanism is also known in which the oscillatory weight moves like a pendulum between two buffers, and in this case it is known to locate certain parts of the watch movement between the buffers, but such parts did not project beyond a circular boundary line corresponding to the outer periphery of the oscillatory weight.

The use of a non-circular or oblong movement plate for watch movements offers certain advantages when it is possible to utilise the entire available space on such plates for arranging the wheels or other members of the watch movement.

It is an object of the present invention to provide a watch movement having an automatic winding mechanism in which movable parts of the watch movement arranged underneath the oscillatory weight pass beyond the circular path described by the point of the weight having the greatest radial distance from its axis of oscillation.

It is a further object of the invention to dispose the main spring drum, the escapement wheel or the balance wheel underneath the oscillatory weight so that these members project outwardly beyond the periphery of the outer rim of the oscillatory weight. This arrangement allows in a watch movement of comparatively small dimensions to use comparatively large wheels or a large spring drum and affords a maximum increase of the adjustment accuracy of the watch, while at the same time to reduce the manufacturing cost of the watch.

A preferred example of a watch movement according to the invention is illustrated by way of example in the accompanying drawings, in which

Fig. 1 is a diagrammatic plan view of the watch movement;

Fig. 2 is a section along the broken line II—II of Fig. 1;

Fig. 3 is a fragmentary plan view of the winding train drawn to a larger scale.

The represented watch movement comprises

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a non-circular, oblong movement plate 1 and an oscillatory weight 2 the kinetic energy of which is transmitted to the arbor 3 of the main spring drum by a train of reducing gears.

The oscillatory weight 2 is secured to a shaft 4 mounted in the center of the movement. The winding train is arranged between two auxiliary plates 5. The shaft 4 carries a pinion 6 constantly in mesh with a pinion 7 the axis of which having its opposite ends engaged in slots 8 provided in each auxiliary plate 5. According to the direction of rotation of the pinion 6 oscillating together with the weight 2, the pinion 7 is moved towards one end or the other of the slots 8 while always remaining engaged with the pinion 6 and thus effects a movement of rotation corresponding to that of the pinion 6. When the pinion 6 oscillates in the direction of the arrow *a* in Fig. 3, the pinion 7 is moved towards the left hand end of the slots 8 and brought into mesh with the wheel 9 of the winding train as represented in Fig. 3 in full lines, and when the pinion 6 oscillates in the direction of the arrow *b* the pinion 7 moves towards the right hand end of the slots 8 and is brought into mesh with a wheel 10 while disengaging from the wheel 9. The wheels 9 and 10 are in mesh with each other, so that the wheel 9 always is driven in the same direction of rotation whether the central pinion 6 oscillates in the direction *a* or in the direction *b*. The movement of the wheel 9 is transmitted by the intermediary of the winding train 11, 12, 13 to the ratchet wheel 14 mounted on the spring barrel axis 3. An oscillatory weight driven winding train of the described type is claimed in my copending application Ser. No. 62,298 of November 27, 1948, now Patent No. 2,536,615, and forms no part of the present invention.

The energy which will be accumulated in the spring barrel 15 serves to entertain the oscillations of the balance wheel and hair spring system 16. The driving energy is transmitted to this system by an ordinary watch movement train comprising a centerwheel 17 having its pinion 18 in mesh with a gear crown 19 of the spring barrel 15, an intermediate wheel 20, a second wheel 21 and an escapement of which the escapement wheel 22 only is shown.

The described watch movement is destined for use with a small watch having a movement of relatively small overall size, but comprising a relatively large main spring barrel and a large balance wheel. The provision of an oblong movement plate as shown is advantageous for creating such a type of movement when the entire

available space offered by the plate can be utilised for disposing the movable members of the watch movement. This is rendered possible according to the invention owing to the fact that the main spring barrel **15**, the escapement wheel **22** and the balance wheel **16**, which are countersunk in the depth of the movement plate **1** as shown in Fig. 2, pass underneath the peripheral rim **2'** of the oscillatory weight **2** which is pivotally mounted in the center of the movement, and extend beyond the circular path described by the point of the rim **2'** having the greatest radial distance from the center of the movement. This arrangement of the said three members of the movement allows to make full utilization of the space available on the movement plate for mounting the various elements of the watch movement, to increase the size of those elements passing beyond the rim of the oscillatory weight, and consequently to diminish the production cost while at the same time increasing the quality of the watch. In other words, the oblong movement plate is larger at the ends than the periphery path travelled by the oscillating weight and this greater length of the movement plate is utilized to mount the spring barrel and the regulating mechanism, which includes the escapement wheel and the balance wheel; particularly, the barrel and the escapement wheel extend into the end portions of the movement plate which lie outside of and beyond the periphery of the path of movement of the weight.

While I have shown and described a certain preferred embodiment which my invention may assume in practice, it will be understood that variations may be made in the ararngement and disposition of the various parts of the watch movement without departing from the spirit of the invention or the scope of the appended claims:

I claim:

In a watch movement having an automatic winding mechanism, an oblong movement plate, an oscillating weight pivotally mounted in the center of the movement plate, said weight being substantially semicircular in outline and having a flat upper surface on the central portion thereof and a peripheral rim portion substantially thicker than the central portion which rim depends to a plane below the plane of the central portion, said weight having a path of oscillation which at its periphery substantially coincides with the outer edges of the movement plate at the narrow dimension thereof but is substantially within the outer edges of the movement plate at its greater dimension, a main spring barrel mounted in the movement plate in a plane beneath the path of oscillation of the peripheral rim portion of the weight, a train of wheels interconnecting the oscillating weight and the main spring barrel, said wheels disposed within the path of movement of said oscillating weight and regulating means including an escapement wheel and a balance wheel mounted in the movement plate in a plane beneath the path of oscillation of the peripheral rim portion of the weight, said main spring barrel and said escapement wheel each having a portion extending into the end portions of the movement plate which are beyond the path of oscillation of the weight.

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