Nov. 19, 1935. L. HATOT 2,021,777

SELF WINDING WATCH

Original Filed July 24, 1930

Fig.1

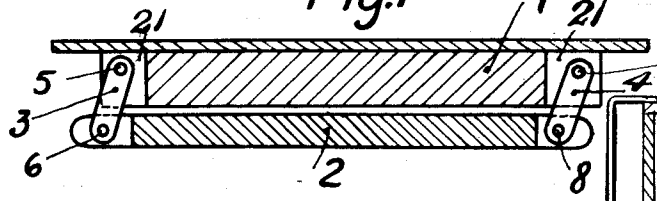


Fig.8.

Fig.2

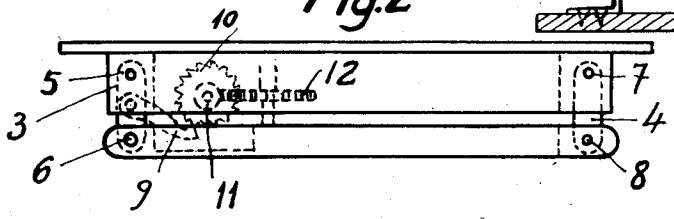


Fig.3

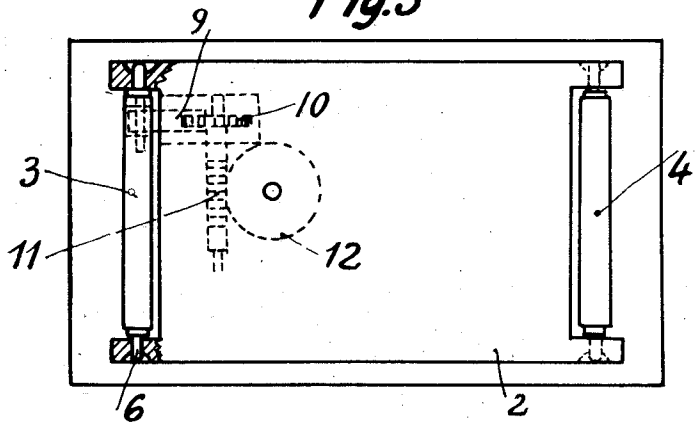


Fig.4

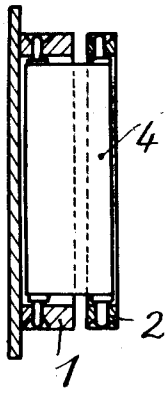


Fig.5

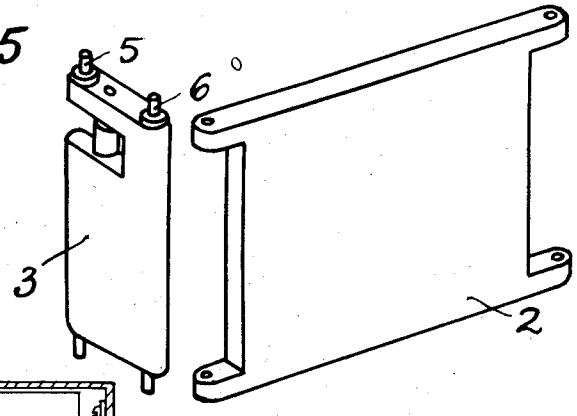
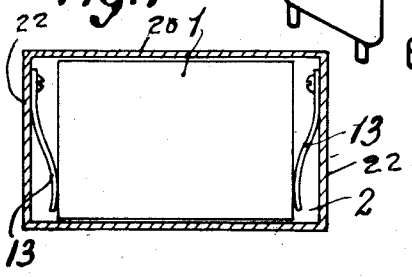


Fig.6

Fig.7



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UNITED STATES PATENT OFFICE

2,021,777

SELF WINDING WATCH

Léon Hatot, Paris, France

Original application July 24, 1930, Serial No. 470,473, now Patent No. 1,914,015, June 13, 1933. Divided and this application January 26, 1933, Serial No. 653,734

9 Claims. (Cl. 58—82)

In my prior Patent No. 1,914,015, of June 13, 1933, I have disclosed a watch with automatic winding by the shocks comprising a mass movable in a casing, wherein it is supported by means of ball bearings adapted to move on races formed on the one hand on the mass and on the other hand on the casing, said races having a length sufficient that when the movable mass effects its maximum displacement of amplitude, the balls roll constantly without sliding in their races.

In the documents of the application which eventuated into the above patent there were included the description and illustration of a special type of watch similar to the precedent with the single exception that instead of being supported for rolling on ball bearings, the movable mass is pivotally secured to small arms at one end thereof, said arms being pivotally secured by their opposite end to the stationary casing.

One object of my present invention is a watch of the oscillating type just above described.

Another object of my invention is to provide a watch of the type set forth which may be easily manufactured and which is efficient in operation.

A further object of my invention is to provide a watch of the type set forth which can be readily and suitably used as a lady wrist watch.

With this in view, it should be noted that such a watch to meet with the convenience of users should not exceed the ordinary dimensions of watch sizes, but on the other hand, if it is intended to work properly, the driving mass should be mobile and heavy enough to move under the effect of small inclinations or shocks and at the same time to produce for each motion the power necessary for the corresponding winding even when the spring is almost fully tensioned.

As said above the watch according to my invention is mainly characterized by the fact that the mobile mass is mounted at the extremities of arms pivoted to the fixed part.

Consequently the mobile mass is able to move practically without friction, parallel to one of its sides, between two flexible damping members in a casing having the same shape the width of which, in the direction perpendicular to the direction of movement, may be limited to just what is needed for locating the width of the mass with eventually the guiding means, and the length of which, in the direction of movements, may be nearly equal to the length of the mass.

By giving the mass square or rectangular dimensions nearly equal to the dimensions of the casing and by enabling said mass to oscillate in a direction parallel to one of its sides, I can employ a mass having the maximum dimensions.

In order to give the mass the maximum dimensions also in thickness I use preferably the movement of the watch as mobile mass.

My invention will now be described with reference to the accompanying diagrammatic drawing.

Fig. 1 represents a longitudinal sectional view of the parts the relative motion of which causes the clock work spring to wind up.

Fig. 2 is a side elevation of the same parts showing the drive transmission members.

Fig. 3 is a plan view of the elements illustrated in Fig. 2 seen from underneath certain parts being removed.

Fig. 4 is a transverse section taken in the plane of one of the arms.

Fig. 5 is a perspective view of a form of pivoting arm and Fig. 6 shows the stationary part seen in perspective.

Figure 7 is a diagrammatical plan view, taken from the side of the movable mass, and showing the springs used for damping the oscillating movement of the movable mass when the latter reaches the ends of its travel.

Fig. 8 is a view similar to that of Fig. 1 of another form of embodiment, in which the connection between the movable mass and stationary part is constituted by flexible elements.

Referring now to the drawing, the driving mass 1 is connected to the stationary plate 2 by means of two arms 3 and 4 arranged as the small sides of a parallelogram of which one of the long sides is constituted by the driving mass 1. The arm 3 is articulated at 5, and 6, to the shoulders or projections 21 of the mounting included in the mass 1 and to the plate 2 respectively, the second arm 4 being similarly articulated at 7 and 8, to said parts 1 and 2 respectively.

In a preferred embodiment, the driving mass 1 comprises a mounting enclosing the mechanism of the watch movement, the plate 2 being integral with or fixedly secured to the casing 22. The weight of the driving mass being in this way considerable, use may be made of very small relative displacements which do not to any great extent decentralize the movement relatively to the casing and which also do not affect the reading of the time.

The alternating displacements of the mobile mass effects the winding of the clock work spring through suitable means such as those generally

shown in dotted lines, comprising a catch 9 mounted on one of the pivoting arms, a ratchet wheel 10 cooperating with said catch, said wheel being keyed on a screw threaded rod 11 suitably supported on the movable mass and adapted to cooperate with a correspondingly toothed ratchet wheel 12 of the usual type for winding up the clock driving spring (not shown).

It will be evident that, in order to dampen the shocks produced by the movable mass, use may be made of blade springs 13 suitably positioned between said mass and the casing as shown in Fig. 7, and that the guiding of the mobile mass may be suitably obtained by means of flexible members, such as blade springs 14 and 15 connecting the movable mass 1 to the stationary part (Fig. 8).

As shown by Fig. 7, the stationary part 2 comprises a casing 20, in which is mounted the movable mass 1, slidable between the ends 22 of the casing. Between each end of the movable mass and the opposite end of the casing is the spring blade 13, secured at one end to the casing end and bearing at its free end on the opposite end of the mass. The two spring blades, bearing against the opposite ends of the mass, permit a limited reciprocation of the mass, but normally tend to return the mass to an intermediate position in the casing.

It is obvious that, my present application being a division of my Patent No. 1,914,015, various improvements described in the latter particularly as regard the drive transmission mechanism may be applied in combination with the herein described oscillatory watch mechanism.

What I claim is:

1. A self winding wrist watch comprising a clock work mechanism with a spring, a movable mass, a plurality of oscillating arms, pivoted on one hand to a fixed part of the watch, on the other hand to the movable mass, and means for transmitting the movement of the movable mass to the spring of the clock work mechanism.

2. A watch according to claim 1 in which the said means for transmitting the movement of the movable mass to the spring of the mechanism comprise a pawl pivoted on one of the oscillating arms, and a ratchet wheel carried by the mechanism of the watch, said ratchet wheel being engaged by said pawl.

3. A watch according to claim 1, in which the said movable mass is constituted by the clock work mechanism itself.

4. A watch according to claim 1, comprising damping springs adapted to act upon the movable mass at the ends of the travel of the latter.

5. A watch according to claim 1, in which the said movable mass constituted by the clock work mechanism is of rectangular form and travels in a direction perpendicular to the wrist, along the longer side of the rectangle.

6. A self-winding watch comprising a watch movement having a spring, and a casing, a mounting enclosing the watch movement and movable within the casing, arms pivoted both to the casing and to the mounting at points defining a parallelogram, whereby the mounting and the enclosed watch movement are adapted for limited, substantially rectilinear motion relative to the casing as an incident to shocks or changes in position imparted to the watch, and means for transmitting the rectilinear motion of the mounting and enclosed watch movement to the spring of the watch movement.

7. A self-winding watch comprising a watch movement having a spring, and a fixed casing part, a mounting enclosing said movement and having outwardly extending shoulders thereon, arms pivoted both to the fixed casing part and to the shoulders at points defining a parallelogram, whereby the watch movement is adapted for limited, substantially rectilinear motion relative to the fixed casing part as an incident to shocks or changes imparted to said watch, and means for transmitting said motion to said spring.

8. A self-winding watch comprising a watch movement having a spring, a case, a plurality of arms each pivoted to both the movement and the case, forming a suspension for the movement and for imparting a substantially rectilinear motion to said movement, relative to said case as an incident to shocks or changes in position imparted to said watch, the travel of the movement being limited by the transverse walls of the case, spring means at at least one end of the case for preventing injury of the movement due to its contact at the end positions of its travel with said transverse walls of the case, and means for transmitting said motion to said spring.

9. A self-winding wrist watch comprising a watch movement having a spring, a fixed part of the watch, a mass movable relatively to said fixed part, said mass including the watch movement, a plurality of yielding coupling elements connecting the mass with the fixed part of the watch to maintain the mass and fixed part in approximately parallel relation, and means for transmitting the movement of the mass to the spring of the watch movement during the movement of the mass relative to the fixed part of the watch.

LÉON HATOT.