Dec. 11, 1962 C. GIGANDET 3,067,571

SELF-WINDING WATCHES

Filed Sept. 11, 1959 2 Sheets-Sheet 1

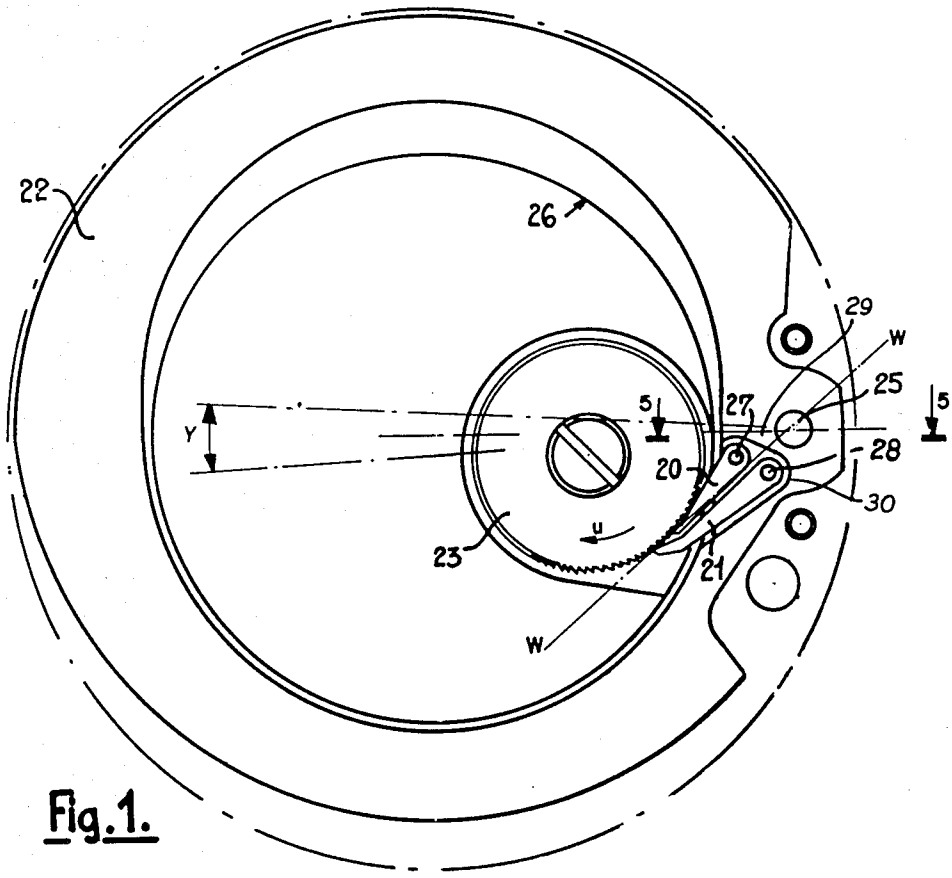


Fig. 1.

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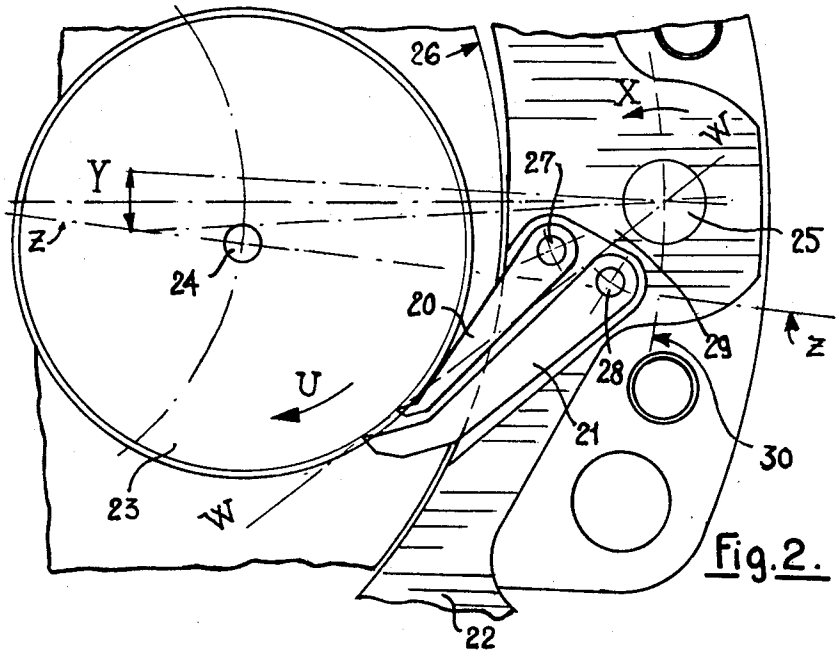


Fig. 2.

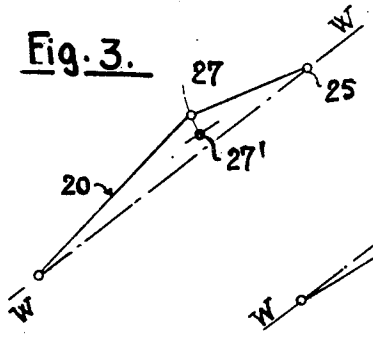


Fig. 3.

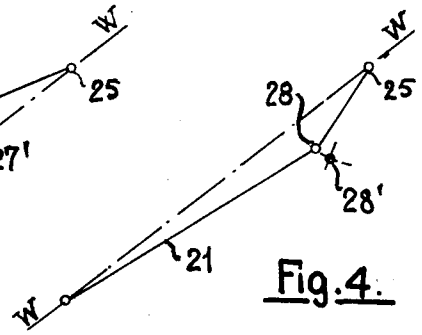


Fig. 4.

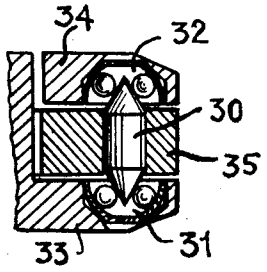


Fig. 5.

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SELF-WINDING WATCHES

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2 Claims. (Cl. 58—82)

The present invention relates to watches of the type wound automatically by the inertia of an oscillating mass.

It is one object of the present invention to provide a self-winding watch which constitutes a new or improved watch of this type.

It is a further object of the present invention to provide a compact self-winding watch which includes a movement and an automatic winding mechanism for such movement, the mechanism comprising an oscillating mass of generally annular form surrounding the movement, the mass having over at least its greater part a thickness which is approximately equal to that of the movement and being pivoted at a point adjacent the periphery of the movement; a ratchet wheel coupled to the movement so that rotation of the wheel winds the movement; and two pawls pivoted on the oscillating mass in the immediate vicinity of the said point at which said mass is pivoted and so coacting with the ratchet wheel that one of said pawls advances and the other recedes on this wheel, when the mass moves in one rotational direction, and vice versa when the mass moves in the other direction.

With these and other objects in view which will become apparent in the following detailed description, the present invention will be clearly understood in connection with the accompanying drawing, in which:

FIGURE 1 is a fragmentary plan view of a watch designed according to the present invention;

FIG. 2 is a fragmentary plan view of the watch, shown at an enlarged scale;

FIGS. 3 and 4 are diagrammatic views demonstrating the operation of the mechanism of the watch shown in FIG. 1; and

FIG. 5 is a section along the lines 5—5 of FIG. 1, but on a smaller scale.

Referring now to the drawing, and in particular to FIGS. 1 to 5, two pawls 20 and 21 pivoted on an oscillating mass 22 drive a ratchet wheel 23 disposed coaxially with the barrel (not shown) of the watch, the axis 24 of which is indicated in FIG. 2, the ratchet wheel 23 rotating the barrel (not shown.)

The mass 22, which is of annular shape, only a part of which is shown in FIG. 2, oscillates on a pivot 25 disposed in the vicinity of a line Z—Z passing through the center of the movement, which is of round shape and the contour of which is indicated at 26, and the axis 24 of the barrel (not shown).

The two pawls 20 and 21 are approximately parallel and their respective pivot points 27 and 28 are disposed on the mass 22 and in particular on a part 29 of the mass 22 lying inside an arc of a circle 30, the center of which coincides with the center of the movement and which passes through the center of rotation 25 of the mass 22.

The pawls 20 and 21 are held elastically in engagement with the ratchet wheel 23 by springs (not shown) and the mass 22 is shaped in such manner as to be able to pivot about the pivot 25 through an angle y.

When the mass 22 moves in the direction of the arrow X, the pivot 27 of the pawl 20 approaches the straight line W—W which passes through the center of

rotation 25 of the mass 22 and through the point of action of the pawl 20 in such manner that the triangle formed by the pawl 20, which is shown in FIG. 3, flattens out following upon the passage of the pivot 27 of the pawl 20 to the pivot position 27′ (FIG. 3). Then the free end of the pawl 20 advances and the pawl 20 drives the wheel 23 in the direction of the arrow U.

During this movement, the pivot 28 of the other pawl 21 passes the pivot position 28′ (FIG. 4) in such manner that the pawl 21 which will skip over the teeth of the wheel 23 recedes on the latter. When the mass 22 oscillates in the other direction (in a direction opposite to the arrow X), the functions of the two pawls 20, 21 are reversed and the wheel 23 is driven again in the direction indicated by the arrow U, by the pawl 21, while the pawl 20, which will now skip over the teeth of the wheel 23, recedes on the latter.

As shown in FIG. 5, the pivot 25 of the mass 22 is formed by a pivot member 30 which rotates in ball-bearings 31 and 32, the first of which is supported by a lug 33 of the frame of the watch and the second by a bridge 34, mounted on this lug. The part 35 of the mass 22, carrying the pivot 30, has lateral cavities intended for the passage of the lug 33 and of the bridge 34 while the remainder of the mass 22 surrounding the movement has a thickness approximately equal to the thickness of the latter.

The illustrated pawl mechanism occupies a minimum of space and may be constructed in such manner that the oscillation of the mass 22 corresponds exactly to an advance by one tooth of the wheel 23. In a movement having a diameter of approximately 23 millimeters, the wheel 23 will, for example, have a diameter of 9.2 millimeters and 180 teeth, which gives a circumferential pitch of its teeth of about 0.16 millimeter.

This drive of the wheel 23 with very small advances dispenses with a reduction gear and facilitates the obtaining of a very flat watch.

The watch according to the present invention may also contain a movement of a shape other than circular.

In accordance with another embodiment of the present invention, the mass can also be formed as a part of the case of the watch in relation to which the movement oscillates.

While I have disclosed one embodiment of the present invention, it is to be understood that this embodiment is given by example only and not in a limiting sense, the scope of the present invention being determined by the objects and the claims.

I claim:

1. A wrist watch, including a movement,
said movement having a spring barrel and an automatic winding mechanism,
said winding mechanism comprising an oscillating mass of substantially annular configuration surrounding said movement,
a ratchet wheel connected directly coaxially to said spring barrel,
two pawls pivoted directly to and within the periphery of said oscillating mass and turning alternately said ratchet wheel in the same direction during the oscillations of said mass,
the pivoting points of said pawls being disposed at opposite sides of and adjacent to an imaginary line extending through the center of rotation of said mass and substantially tangentially to said ratchet wheel,
imaginary lines connecting the center of rotation of said mass with each of said pivoting points of said

pawls forming obtuse angles with another imaginary line connecting said pivoting points of said pawls with the engaging point of said pawls with said ratchet wheel, and

said pawls cooperating with said ratchet wheels to cause a winding movement of said winding mechanism upon oscillations of said mass in either direction.

2. The watch, as set forth in claim 1, wherein said two pawls are disposed substantially parallel and said pivoting points of said pawls are disposed adjacent said center of rotation of said mass.

References Cited in the file of this patent

UNITED STATES PATENTS

1,914,015	Hatot	June 13, 1933
2,029,559	Colomb	Feb. 4, 1936
2,618,117	Maar	Nov. 18, 1952

FOREIGN PATENTS

271,423	Switzerland	Jan. 16, 1951
271,426	Switzerland	Jan. 16, 1951
832,124	Germany	Feb. 21, 1952
305,172	Switzerland	Apr. 16, 1955