

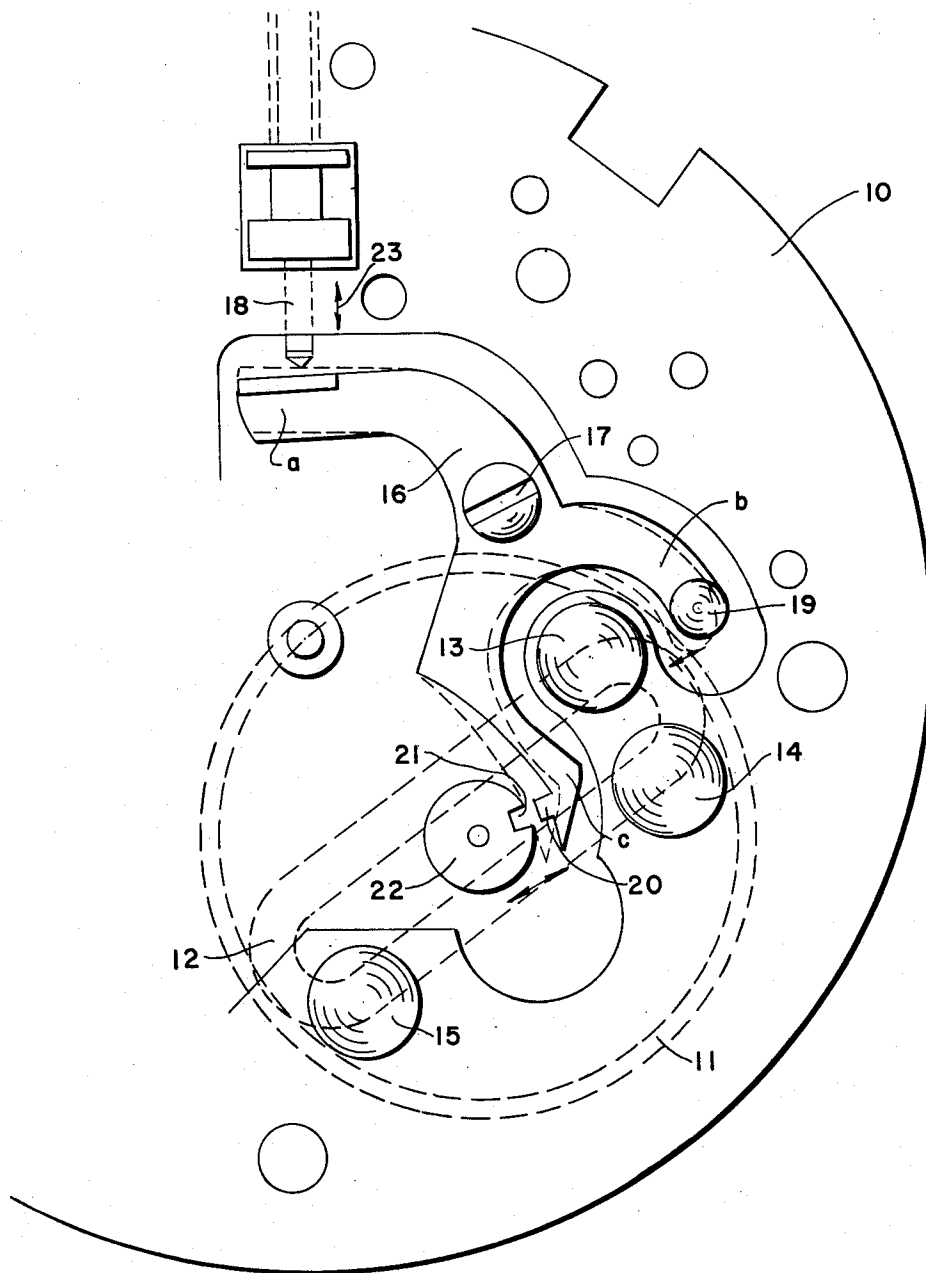
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ELECTRIC WATCH

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ELECTRIC WATCH

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This invention relates to battery powered electric watches and more particularly relates to an improved setting device for a battery powered electric watch wherein the balance staff carries the impulsing mechanism and provides the drive for the watch train.

In a certain type of battery powered electric watch the balance assembly carries a moving coil which co-operates with a series of stationary permanent magnets to impulse the balance wheel and staff which, in turn, drives the train of the watch through a suitable indexing mechanism. In this type of arrangement, the stem which is usually used to wind the main spring of an ordinary watch has no function other than to be used for the setting of the hands.

The present invention relates to a setting device for a watch of this type wherein actuation of the setting stem in order to set the watch arrests the movement of the balance wheel so that the hairspring is in a cocked or tensioned position and interrupts the contacts between the coil and the battery.

According to a specific embodiment of the invention, this is accomplished by means of a lever having three fingers, one of which engages the setting stem, a second of which carries a magnetic member subjected to the magnetic field of one of the energizing magnets of the watch, and the third of which stops the balance wheel. According to the preferred embodiment of the invention, this third finger carries a nose or protuberance which engages a groove or slot in a roller carried by the balance staff. This roller may be the same roller which is now used to carry the contact arrangement.

It is accordingly a primary object of the present invention to provide an improved watch setting mechanism for a battery operated electric watch, which, upon setting of the watch automatically arrests the balance wheel so that the hairspring is in a cocked position and disconnects the battery from the coil.

It is another object of the invention to provide an improved watch setting mechanism for a battery operated electric watch utilizing a lever for arresting the movement of the balance wheel wherein the position of the lever is controlled by the position of the setting stem but is moved by means of magnetic attraction.

It is still another object of the present invention to provide an improved setting mechanism for an electric watch of the foregoing type wherein the magnetic attraction is provided without adding additional permanent magnets to the watch structure.

These and further objects and advantages of the invention will become more apparent by reference to the following specification and claims and appended drawings wherein:

The single FIGURE of the drawing shows a partial plan view of an electric watch illustrating the details of the setting mechanism of the instant invention.

Referring more particularly to the figure of the drawing, there is shown an electric watch having a pillar plate 10 which has mounted thereon in a customary manner a balance wheel shown in phantom at 11. This balance wheel carries an elongated looped coil also indicated in phantom at 12. As the balance wheel oscillates, the coil is carried through a magnetic field provided by three permanent magnets 13, 14 and 15, which, in conjunction

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with the periodic energization of the coil from a battery, supplies the driving force for the watch.

A three fingered lever 16 is pivotally secured to the pillar plate 10 as by means of a shouldered screw 17. The lever 16 has a first finger *a* which engages the end of the setting stem 18 mounted in the pillar plate in a conventional manner. The second finger *b* carries a magnetic member 19 which may consist of a small, soft iron cylinder. This cylinder lies within the magnetic field of the permanent magnet 13 and is attracted towards this magnet so as to tension the lever 16 in a clockwise direction. A third finger *c* extends from the lever 16 and carries a nose or protuberance 20 which is adapted to enter a slot 21 in a roller plate 22 carried by the balance staff of the watch. This roller plate may be the same roller plate which carries the contact system described in other copending applications of the assignee.

During the time that the watch is running and the setting stem is in its most inward or inactive position, the lever 16 is in the position shown by the solid line in the FIGURE of the drawing. If the watch is to be set, the setting stem 18 is withdrawn or moved upward and the lever 16 is caused to rotate in a clockwise direction by means of the magnetic attraction between the magnet 13 and the magnetic cylinder 19 on the finger *b* of the lever. This attraction causes the lever 16 to rotate until the fingers *a*, *b* and *c* occupy the positions shown by the broken lines in the drawing. In this position, the nose or protuberance 20 enters the slot 21 in the roller 22 to arrest the motion of the balance wheel in a position in which the hairspring, not shown, is cocked and the contact between the coil carried by the balance wheel and the battery, not shown, is broken. When the setting stem 18 is returned to its inactive position, the lever 16 is returned to the solid line position by means of stem 18 causing the lever 16 to rotate counterclockwise thereby causing nose 20 to move out of slot 21. Accordingly, since the balance wheel 11 is locked in the cocked position when nose 20 engages slot 21, the cocked hairspring (not shown) restarts the oscillation of the balance wheel.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment is therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What is claimed and desired to be secured by United States Letters Patent is:

1. A setting device for a battery powered watch comprising: a reciprocable setting stem movable into a setting and inactive position; a balance staff; electro-magnetic means mounted on said balance staff; a roller mounted on and oscillatable with said balance staff; pivotally mounted lever means having a first end constantly engaging said setting stem and a second end engageable with said roller when said setting stem is in the setting position; magnetic material mounted on said lever; permanent magnet means for the dual purpose of first providing the magnetic flux for cooperating with said electro-magnetic means for driving said balance staff and second for constantly attracting said magnetic material; said first end of said lever being constantly urged in engagement with said setting means by the magnetic attraction of said magnetic material by said permanent magnet means; and locking means mounted on said second end of said lever and engaging said roller, when said setting stem is in said setting position, for locking said balance staff in a non-oscillating position.

2. A setting device in accordance with claim 1 wherein said second end of said lever comprises; a first finger

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being engageable with said roller when said setting stem is in the setting position; and a second finger carrying said magnetic material.

3. A setting device in accordance with claim 2 wherein: said roller has a slot formed therein; and said second finger carries a protuberance which is matingly engageable with said slot of said roller.

4. A time setting device for a battery powered watch comprising: a reciprocal setting stem movable into a setting and inactive position; a balance staff; electro-magnetic means mounted on said balance staff; a roller mounted on and oscillatable with said balance staff and having a slot formed therein; a pivotally mounted lever having first, second and third fingers; magnetic material mounted on said first finger; permanent magnet means having the dual purpose of first providing the magnetic flux for cooperating with said electro-magnetic means for driving said balance staff and second for constantly attracting said magnetic material on said first finger; said second finger being constantly urged in engage-

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ment with said setting stem by the magnetic attraction of said magnetic material by said permanent magnet means; said third finger being engageable with said roller, when said setting stem is in the setting position; said third finger having a protuberance formed thereon which is matable with said slot of said roller when said third finger is engaging said roller; and said protuberance of said third finger, when mated with said slot of said roller, locking said balance staff in a non-oscillating position.

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