Feb. 13, 1923.

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J. V. ORR.

WATCH.

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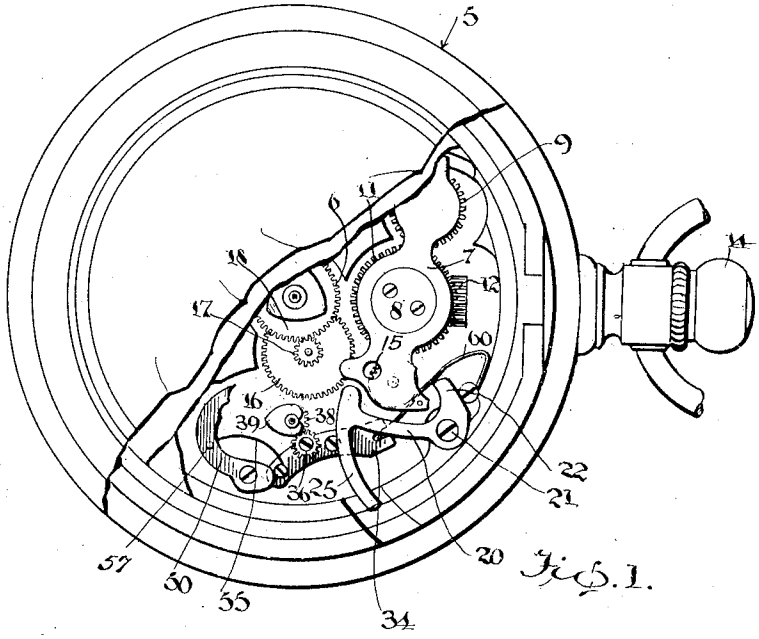



Fig. 1.

Fig. 2.

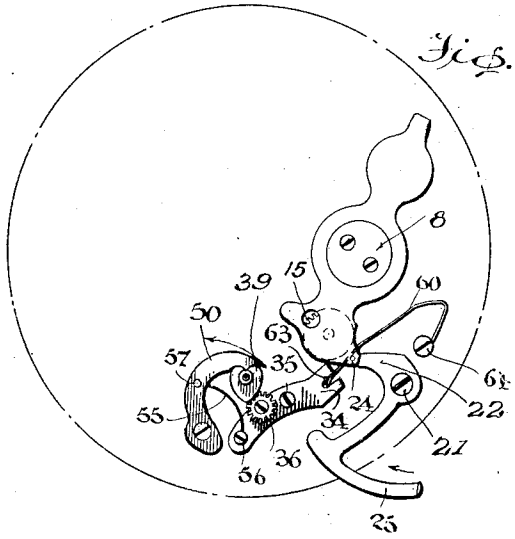



Fig. 3.

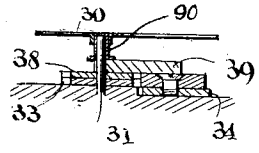
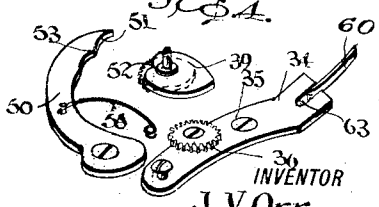



Fig. 4.




WITNESSES

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# UNITED STATES PATENT OFFICE.

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## WATCH.

Application filed December 10, 1921. Serial No. 521,466.

*To all whom it may concern:*

Be it known that I, JAMES V. ORR, a subject of the King of Great Britain, and resident of Monroe, in the county of Snohomish and State of Washington, have invented certain new and useful Improvements in Watches, of which the following is a specification.

This invention relates to watches and more particularly to the means for setting the same.

Briefly stated, an important object of this invention is to provide a watch having novel means whereby the second hand of the same may be set at 60 so that when the hour and minute hands are set the second hand will be in exactly the right starting position.

In carrying out the invention the second hand setting mechanism does not in any way interfere with the operation of the watch or place an excessive strain on the same.

Further the invention aims to provide a watch having a second hand setting mechanism which is entirely automatic in its operation and which is not easily rendered inoperative and further which does not in any way interfere with the time keeping qualities of the watch.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawing forming a part of this application and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a plan view of the improved watch, parts being broken away to illustrate the improved second setting mechanism.

Figure 2 is a plan view of the improved second hand setting mechanism, and the yoke associated with the same.

Figure 3 is a detailed sectional view through the means for setting the second hand, the view illustrating the spindle of the second hand and the gear mounted thereon, which gear forms a part of the ordinary watch.

Figure 4 is a group view of the improved second hand setting mechanism.

In the drawing wherein for the purpose of illustration is shown a preferred embodiment of the invention, the numeral 5 generally designates a time piece having a mechanism 6, the said mechanism partly consisting of a yoke 7 rotatably supported as indicated at 8 and having one end portion provided with a gear 9 which may be said to be the winding gear and which is rotated for the purpose of winding the spring of the watch. The winding gear 9 is constantly in mesh with a gear 11 having connection with a spur gear 12 operated by the usual stem 14. When the yoke 7 is swung in a counter-clockwise direction the winding gear 9 is engaged with the gear of the spring and when the yoke is swung in a clockwise direction the gear 9 is swung out of engagement with the gear of the winding mechanism, all of which is present in the standard watch.

The other end portion of the yoke 7 is provided with a gear 14 adapted to be swung in mesh with the gear 16 of the hand setting mechanism. As illustrated in Fig. 1 the gear 15 forming a part of the hand setting mechanism is operated in connection with a smaller gear 17 which is in turn connected to a relatively large gear 18 mounted on the shaft or spindle extending centrally through the watch and having connection with the large and small hands.

The yoke 7 is operated by a setting lever 20 pivoted to the watch mechanism as indicated at 21 and having a yoke contact branch 22 which engages the laterally projecting lobe 24 formed at one end portion of the yoke. When the finger piece 25 is drawn outwardly the yoke is swung on its pivot 8 so that the gear 14 is engaged with the hand setting mechanism so that the winding gear 9 is thrown out of mesh with the gear associated with the spring of the watch.

The second hand is designated by the numeral 30 and is secured to a hollow spindle 90 mounted on a spindle 31 to which a small pinion 33 is rigidly connected. As illustrated in Figures 2 and 4, a lever 34 which might be said to be a second hand setting lever is pivoted intermediate its ends as indicated at 35 and is provided with a pinion 36 adapted to be swung into mesh with the pinion 33 fixed on the spindle 31. A second pinion 38 is rotatably mounted upon the spindle 31 and is also engaged by the pinion 36 when the lever 34 is swung in a clockwise direction. When the lever 34 is swung in a clockwise direction and the gear 36 is swung into mesh with both of the pinions 33 and 38, the pinions 33 and 38 being of a total thickness equal to the thickness of the gear 36.

A setting cam 39 is rigidly secured to the

upper pinion 38 and when swung about the axis of the spindle 31 the cam causes the spindle 90 to also move whereby the second hand 30 is swung to a predetermined position.

In other words the spindle 31 which is connected to the operating mechanism of the watch positively rotates the gear 33 and the gear 33 in turn rotates the gear 36. When the gear 36 is thus rotated the gear 38 is rotated and consequently the cam 39 rigidly secured thereto is also rotated. It is important to note that the hollow spindle 90 to which the second hand is connected is securely connected to the cam so that when the cam is rotated the second hand will also be rotated. However, there is no direct driving connection between the spindle 31 and the second hand and when the lever 34 is in its normal position as illustrated in Figures 2 and 3 the rotary motion of the spindle 31 is transmitted to the gears 33, 36 and 38 and then through the cam and the hollow spindle 90. It will be seen that when the cam 39 is swung to a predetermined position by means to be later described the second hand will also be swung to the predetermined position. However, the cam 39 is swung to a predetermined position only when the lever 34 is swung on the pivot 35 and during this movement the gear 36 is out of engagement with the gears 33 and 38 and consequently there is no driving connection between the spindle and the second hand.

When the lever 34 returns to its normal position as illustrated in Figure 2, the gear 36 is again engaged with the gears 33 and 38 for re-establishing the driving connection between the spindle and the second hand and it will be observed that the second hand again begins to turn at exactly the right moment and in synchronism with the minute hand of the watch. That is to say, when the minute hand of the watch is set at the proper calibration on the dial of the watch and the member 25 is moved inwardly the minute hand will begin to move the instant the driving connection between the spindle and the second hand is re-established.

With reference to Figures 3 and 4 it will be seen that the cam 39 is operatively connected to the spindle 90 so that when a rotary motion is imparted to the cam the second hand 30 will be brought to a predetermined position which would most likely be "60" on the dial of the watch.

The means for swinging the cam 39 to a predetermined position consists partly of a second hand setting arm or a cam operating arm 50 curved longitudinally and having its inner edge provided with a pair of notches or recesses 51 to receive the cheeks formed on opposite sides of a V-shaped recess 52 in the rear portion of the cam. The recesses 51 in the inner edge of the cam operating arm 50 provides a V-shaped member 53 which is snugly received within the V-shaped recess 52 when the arm is swung in a clockwise direction whereby the cam and consequently the second hand is firmly held against movement in either direction. Assuming that the cam is in the position illustrated in Figure 1 the inward movement of the arm 50 would swing the cam to the position illustrated in Figure 2. When the cam is thus swung to the position illustrated in Figure 2 the second hand assumes the predetermined position where it is held by the arm 50 which has its V-shaped projection 53 within the notch 52.

When the second setting lever 34 is swung in an anti-clockwise direction the spring link 55 connected as indicated at 56 to the lever draws the arms 50 into engagement with the cam. One terminal portion of the spring link 55 is connected to the intermediate portion of the arm 50 as indicated at 57 and as the spring 55 is lowered slightly, a more or less yielding connection is provided between the second hand setting lever 34 and the arm 50.

The second hand setting lever 34 is automatically operated when the main setting lever is pulled out by a spring 60 having one terminal portion received within a notch 63 in the forward portion of the lever 34. The other terminal portion of the leaf spring 60 is bent upon itself and is secured to the watch mechanism as indicated at 61. The spring 60 normally acts to urge the second hand setting lever 34 in a clockwise direction and when the pin depending from the projection 24 engages the intermediate portion of the leaf spring 60 the second hand setting lever 34 is swung in a counter clockwise direction, thereby swinging the arm to its operative position as illustrated in Figure 2.

In operation when the finger piece 25 is pulled outwardly the yoke is swung to a position so that the rotation of the gear 14 will turn the minute and hour hand and the movement of the yoke will swing the spring 60 to the left thereby causing the second hand operating lever 34 to move about its pivot 35. When the second hand setting lever 34 has thus been moved on its pivot the arm 50 is engaged with the cam 39 so as to automatically position the second hand at "60."

When the setting lever 20 has been drawn outwardly to the position illustrated in Figure 2 the minute and hour hands may be set and inward movement of the finger piece 25 permits the second hand to begin turning at once.

Having thus described the invention, what I claim is: —

1. In a watch, the combination of a hand

having a spindle, a spindle turning member connected to the spindle, an actuator for operating said spindle turning member, and a spring for operating said actuator.

2. The construction set forth in claim 1, and a lever connected to said spring for controlling the same.

3. In a watch, the combination with a second hand having a spindle, of a cam connected to said spindle, a setting arm movable into engagement with said cam to turn the second hand to a predetermined position and a spring member to operate said arm.

4. In a watch, the combination with a hand having a spindle, of a cam connected to said spindle, a setting arm movable into engagement with said cam to turn the hand to a predetermined position, and yieldable means associated with the setting mechanism of the watch to operate said setting arm.

5. In a watch the combination of a hand having a spindle, a spindle turning member associated with said spindle, an actuator for operating said spindle turning member, a spring for operating said actuator, a lever connected to said spring for controlling the same, a second spring engaged with said lever, and a yoke engaged with said second spring for operating the same.

6. The construction set forth in claim 5, and a manually controlled lever associated with said yoke.

7. In a watch, the combination with a yoke, of a spring operated thereby, a second hand setting lever operated by said spring, a second hand adjusting device associated with said lever, and a hand under the control of said adjusting device.

8. In a watch, the combination with a yoke, of a spring operated thereby, a lever operated by said spring, a second hand adjusting device associated with said lever, means to position said yoke and a hand under the control of said adjusting device.

9. The combination of driving and driven gears, an idler gear establishing connection between said first named gears, means supporting the idler gear for movement into and out of engagement with the driving and driven gears, a hand operated by said driven gear, a lever operated by said means, and a cam connected to said hand and adapted to be positioned by said lever.

10. In a watch, the combination with a second hand, of a cam associated therewith, an arm adapted to rotate said cam, a longitudinally curved spring connected to said arm, a lever pivoted intermediate its ends and having connection with said spring, and means to swing said lever.

11. In a watch, the combination with a second hand, of a cam associated therewith, an arm adapted to rotate said cam, a longitudinally curved spring connected to said arm, a lever pivoted intermediate its ends and having connection with said spring, and means to swing said lever, said means consisting of a leaf spring.

12. In a watch, the combination with a second hand, of a cam associated therewith, an arm adapted to rotate said cam, a spring connected to said arm, a lever having connection with said spring, means to swing said lever, said means consisting of a leaf spring having connection with said lever, and a yoke connected to said second named spring.

13. In a watch, the combination with a second hand, of a spindle associated therewith, of upper and lower pinions mounted on said spindle, a cam having rigid connection with one of said pinions, and means for rotating said cam to arrange the second hand in a predetermined position.

14. In a watch, the combination of a spindle, a second hand associated with the spindle, upper and lower pinions mounted on said spindle, a cam having rigid connection with one of said pinions, a lever having a pinion meshing with both of said first named pinions, an arm to set the cam, and means establishing connection between said lever and said arm.

15. In a watch, the combination of a spindle, a second hand associated with the spindle, upper and lower pinions mounted on said spindle, a cam having rigid connection with one of said pinions, a lever having a pinion meshing with both of said first named pinions, an arm to set the cam, means establishing connection between said lever and said arm, said means being a longitudinally curved spring.

16. In a watch, the combination of a spindle, a second hand associated with the spindle, upper and lower pinions mounted on said spindle, a cam having rigid connection with one of said pinions, a lever pivoted intermediate its ends and having a pinion meshing with both of said first named pinions, an arm to set the cam, means establishing connection between said lever and said arm, and means engaged with said lever for setting the same.

JAMES VICTOR ORR.