Aug. 8, 1944. J. H. FURBACH 2,355,371

STOP WATCH MECHANISM

Filed July 16, 1942 3 Sheets-Sheet 1

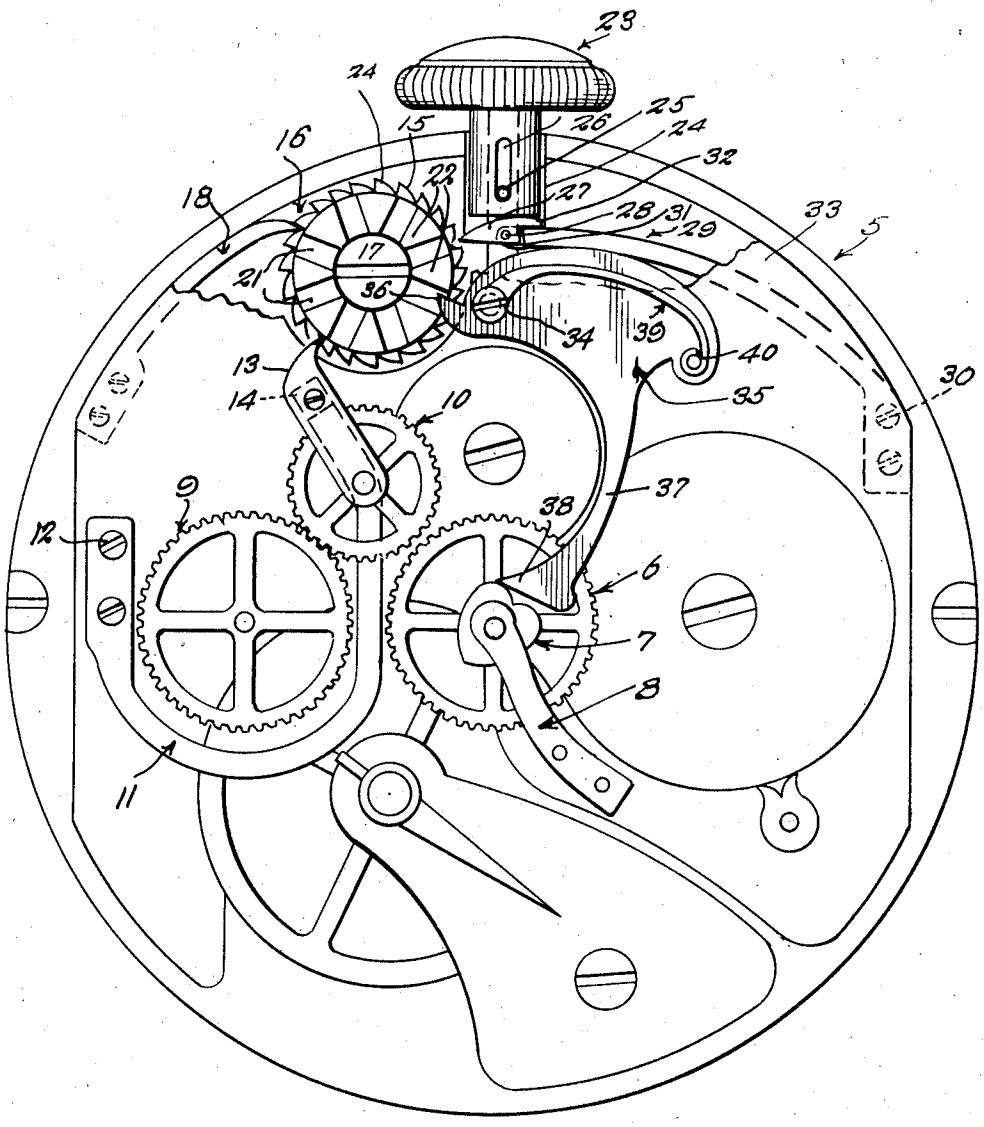


Fig. 1.

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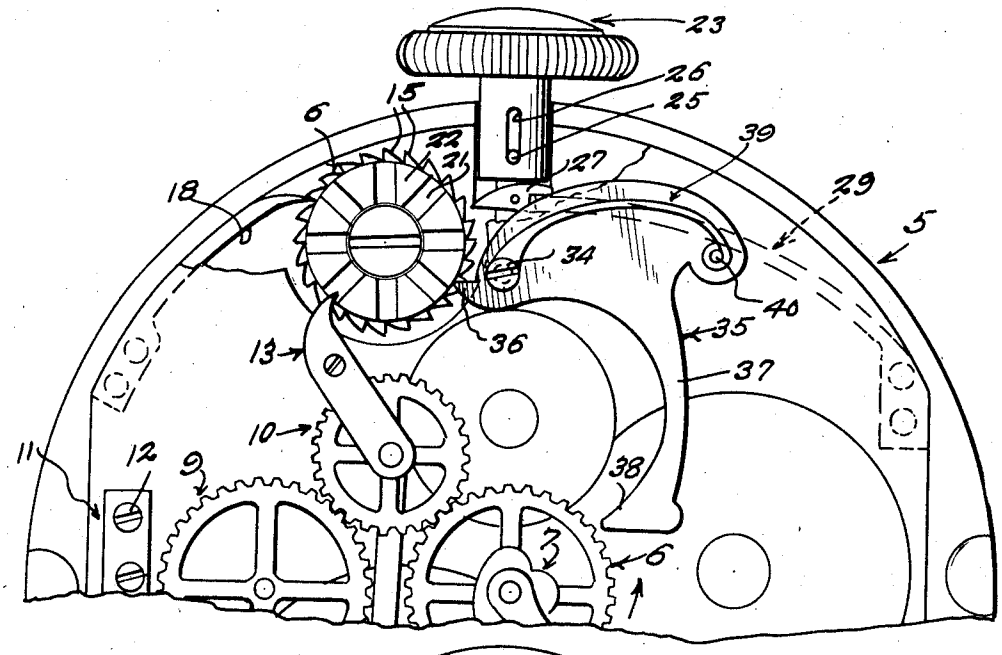


Fig. 2.

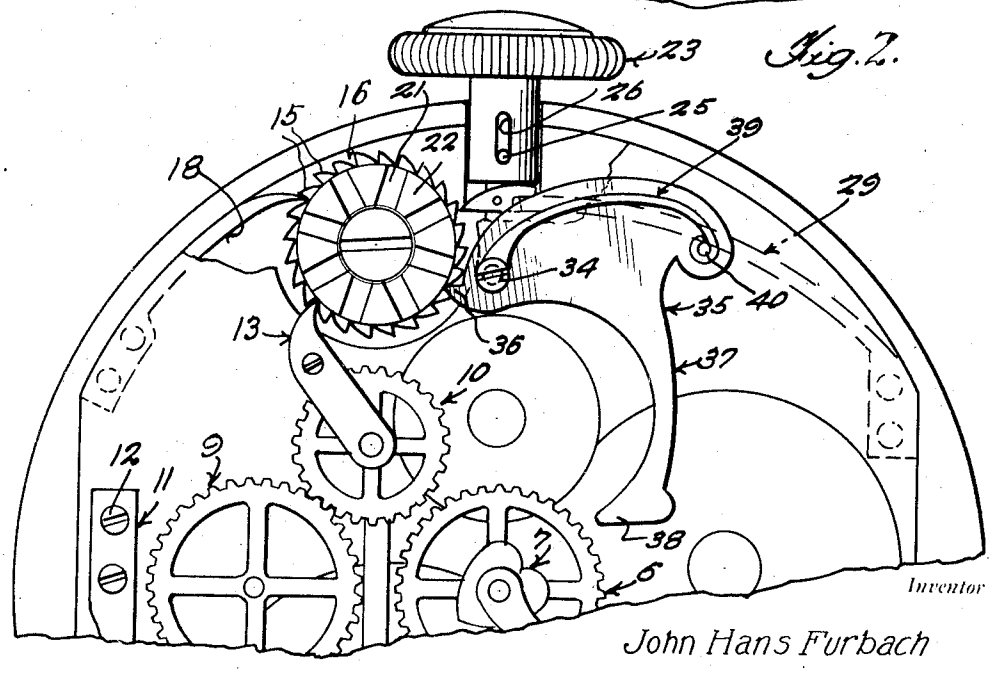


Fig. 3.

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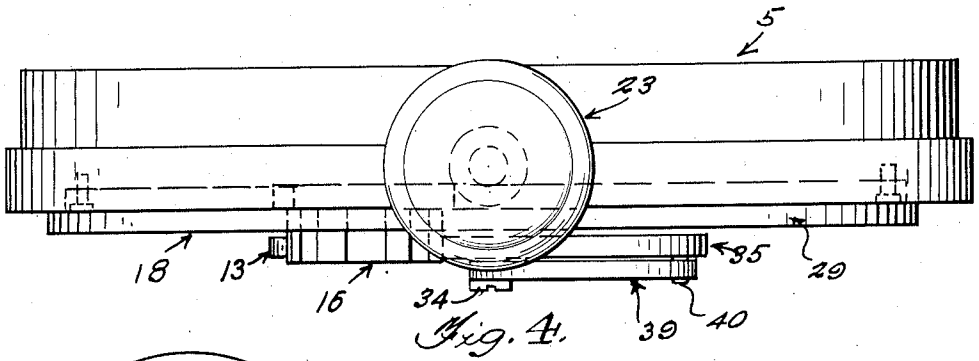


Fig. 4.

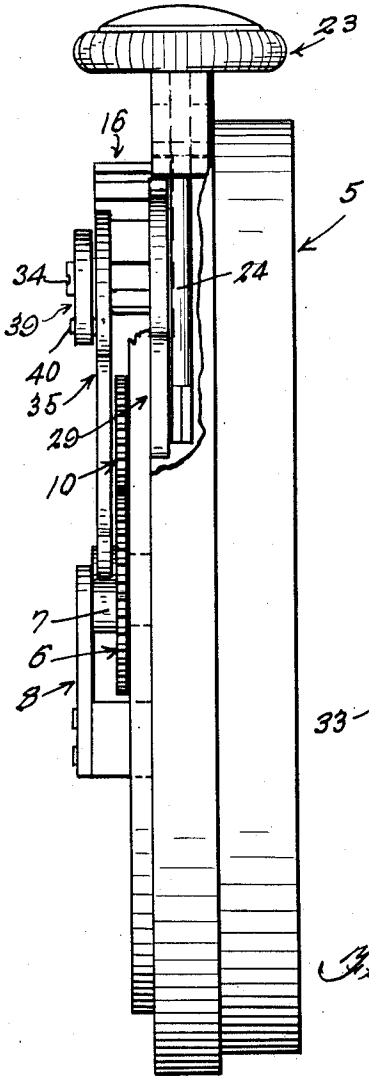


Fig. 5.

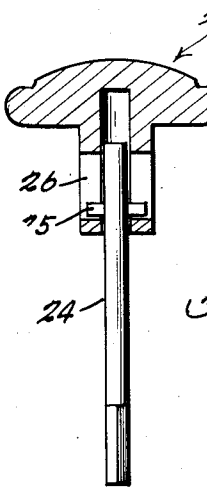


Fig. 6.

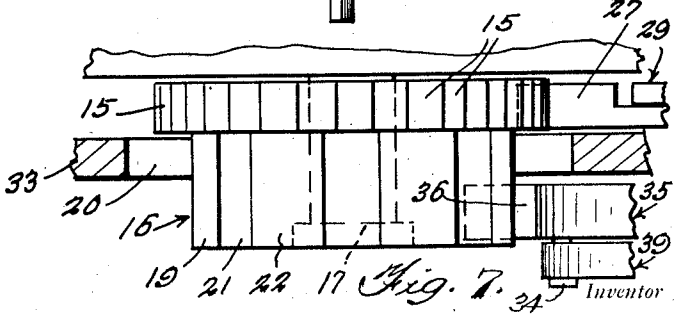


Fig. 7.

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UNITED STATES PATENT OFFICE

2,355,371

STOP WATCH MECHANISM

John Hans Furbach, Amarillo, Tex.

Application July 16, 1942, Serial No. 451,176

1 Claim. (Cl. 58—76)

The invention relates to improvements in stop watches, and more particularly to an improved sweep second hand operating and flyback mechanism, the primary object of the invention being to provide a simplified and more efficient mechanism of this character having fewer component parts.

Other important objects and advantages of the invention will be apparent from a reading of the following description taken in connection with the appended drawings, wherein for purposes of illustration a preferred embodiment of the invention is shown.

In the drawings:

Figure 1 is a schematic elevational view showing the mechanism in initial normal position.

Figure 2 is a view similar to Figure 1 showing the parts operated to the intermediate position.

Figure 3 is a view similar to Figure 2 but showing the parts operated into the final position before return to the position shown in Figure 1.

Figure 4 is a top plan view of Figure 1.

Figure 5 is a side or edge elevational view of Figure 1 partly broken away.

Figure 6 is a transverse vertical sectional view taken through the crown.

Figure 7 is an enlarged fragmentary top plan and horizontal sectional view showing details of the toothed and notched wheel.

Referring in detail to the drawings, the numeral 5 generally designates a stop watch case and works involving a sweep second hand (not shown) which is operated by the center wheel 6 on which is a heart wheel 7. A jeweled bridge 8 supports the heart wheel and the center wheel 6 substantially at the center of the works. Spaced to the left of the center wheel 6 is the fourth wheel 9 which is adapted to be operatively connected to the center wheel by the intermediate wheel 10 which is mounted on the upper portion of one arm of a U-shaped lever spring 11 which is mounted to the watch mechanism as indicated by the numeral 12 to the left of the fourth wheel 9. The arm of the lever spring 11 on which the intermediate wheel 10 is mounted is positioned between the fourth wheel and the center wheel, this portion of the lever spring 11 terminating in a pawl 13 carried by a bridge 14 connected to the lever spring 11. The effective terminal of the pawl 13 is upwardly directed to engage in the notches between adjacent ones of the 24 ratchet teeth 15 which are provided on the periphery of the wheel 16 which is rotatably mounted by a countersunk screw 17 substantially directly above the intermediate wheel 10. A spring pawl 18 is mounted along the edge wall of the works, with its laterally inwardly directed terminal constantly engages the ratchet teeth 15 to prevent reverse rotation of the wheel 16.

The wheel 16 comprises the forwardly projecting cylindrical part 19 which projects forwardly through an opening 20 in the plate of the works. The cylindrical portion is formed with eight similar radial slots which are equally circumferentially spaced, the slots being designated 21 and the segmental abutments defined therebetween by numeral 22.

A crown 23 is mounted alongside the wheel 16 in a suitable opening 24 in the watch casing and works, the crown having freely movable therein the stem 24 which has lateral pins 25 working in opposite sides of a vertical slot 26 which limits the movement of the crown relative to the stem 24. The stem and crown are arranged to wind the watch and also set it, and also to start, stop, and flyback the sweep second hand.

The lower end of the crown overrides a click 27 which is horizontally pivoted as indicated by the numeral 28 on the free end of the lever spring 29 which is suitably anchored along the right hand upper portion of the watch as indicated by the numeral 30, the said free end having a notch and shoulder 31 which cooperates with the click, the latter having an overhanging portion 32 which is adapted to rest upon the upper side of the lever spring 29 as shown in Figure 1 of the drawings. The lower end of the crown 23 is adapted to engage the curved upper surface of the click when the crown is depressed, and to depress and down tilt the click into engagement with the adjacent one of the ratchet teeth 15 on the wheel 16, against the resistance of the lever spring 29. The lever spring 29 is mounted behind the plate as indicated in Figure 7 of the drawings.

In front of the plate 33 and pivoted at the point 34 to the plate is the flyback lever which is generally designated 35 and which has close to its pivot the upturned nose 36 which has a straight upper surface and a rounded under surface for cooperation with the peripheral surfaces of the segments 22 on the wheel 16. To the right of the pivot 34 the flyback lever 35 comprises an irregular plate terminating in a depending inwardly curved arm which terminates at its lower end in a laterally inwardly directed toe adapted to cooperate with the periphery of the heart wheel 7 in a well known manner. A bowed flyback operating spring 39 is mounted on the pivot 34 and has its opposite end anchored as indi-

cated by the numeral 40 adjacent the right hand extremity of the flyback lever. The crown 23 is normally held in its elevated position by the tension of the upper lever spring 29, while the return spring 39 on the flyback lever 35 normally holds the flyback lever 35 engaged with the wheel 7, whereby the heart wheel is kept from rotating the sweep second hand around the face of the watch (not shown).

As soon as the crown 23 is depressed, assuming that the watch works is running, the lever spring 29 is depressed so that the click engages one of the teeth 15 of the wheel 16 and in so doing rotates the wheel and causes the flyback lever 35 to be moved by the wheel 16 and retracted from the heart wheel, so that the heart wheel is then free to run and move with the sweep second hand, this action being accompanied by connection of the fourth wheel 9 with the center wheel 6 by the displacement of the intermediate wheel 10. When the crown is released and then depressed a second time the sweep second hand will be stopped. Then by releasing and depressing the crown a third time the flyback lever 35 is permitted to resume engagement with the heart wheel 7 in a manner to turn the heart wheel and hence the sweep second back to zero.

In the first position of the parts illustrated in Figure 1 of the drawings, the click 27 is out of engagement with the teeth 15 of the wheel 16 while the nose 36 of the flyback lever 35 is engaged in one of the slots 21, the pawl 13 engaging the periphery of a segment 22.

In the second position shown in Figure 2 of the drawings, the crown having been depressed the second time and released, the click 27 is out of engagement with the wheel 16, while the nose 36 of the flyback lever has come out of the slot in the wheel 16 and has assumed the first of two positions against the periphery of the adjacent segment of the wheel 16, the nose of the pawl 13 having become disengaged from the peripheral surface of the corresponding segment and having fallen into the adjacent notch.

In the third position of the parts shown in Figure 3 of the drawings, the crown having been depressed the third time and then released, the click 27 is disengaged from the wheel 16, the terminal of the pawl 13 has come out of the slot in the wheel 16 and has assumed the first of the two positions on the periphery of the next segment of the wheel 16, and the nose 36 of the flyback lever has assumed the second of two positions on the periphery of the segment of the wheel 16. It is obvious that the next depression of the crown displaces the described parts into the position shown in Figure 1 of the drawings, by reason of which the sweep second hand is returned to zero position.

Although there is shown and described herein a preferred embodiment of the invention, it is to be definitely understood that it is not desired to limit the application of the invention thereto, except as may be required by the scope of the subjoined claim.

Having described the invention, what is claimed as new is:

In a stop watch mechanism for operating a sweep second hand, said mechanism comprising a center wheel adapted to operate the sweep second hand, a heart wheel on said center wheel, a spring pressed flyback lever pivotally supported to normally engage said heart wheel and return the sweep second hand to zero position, said flyback lever having a nose at one side of its pivot, a slotted wheel having ratchet teeth on its periphery and having an axial extension formed with radial slots defining segments between them, with which segments and slots the nose on the flyback lever is arranged to operatively engage, a spring dog engaging the teeth of said slotted wheel to prevent reverse rotation thereof, said mechanism having a fourth wheel at one side of said center wheel, a first lever spring carrying an intermediate wheel normally connected with said fourth wheel, said first lever spring including a pawl engaging with either the slots or the segments of the slotted wheel in accordance with the position of the slotted wheel, a second lever spring anchored at one side of said mechanism and having its free end located adjacent to said slotted wheel, a click pivoted on the free end of said second lever spring, a depressible crown over said click, said crown having a relatively slidable stem connected thereto for winding and setting said mechanism, said crown being adapted to be depressed to engage said click with one of the ratchet teeth of said slotted wheel to turn the same to cause the nose of the flyback lever to be displaced and said pawl to be displaced, thereby removing the flyback lever from engagement with the heart wheel, and freeing the heart wheel for rotation while operatively connecting said fourth and center wheels for moving the sweep second hand away from zero position.

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